

A First Draft--

A DISCUSSION OF THE GATEWAY FERRY SYSTEM
UNDER PRESENT FORMULATIONS
UNDER ALTERNATE FORMULATIONS

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I INTRODUCTION

A Overview:

The Gateway parcels, proximal to the high density population of the New York City Metropolitan Area, are irreplaceable, underdeveloped shore lands whose recreation potential is inestimable. Many organizations and government agencies are working to see that this valuable resource is not wasted. Homeowners are being asked to sacrifice. The great recreation needs within the metropolitan area add strong pressures.

20,000,000 people or 10% of the nation's citizenry lives within the metropolitan area. In New York City alone, 2.5 million people have annual incomes of less than \$5000, 2.5 million people lack cars. There is great need for recreation facilities which have relatively inexpensive and available transportation access. A comparison of a New York City beach facility with one in neighboring Nassau County, Jones Beach, and with National Standards shows the following:

Table 1

site	peak-day attendance	beach acreage	square feet per person
Ex: Coney Island	850,000	67	5-10
Jones Beach	250,000	241	35
National Standards	--	--	50-75

Obviously, the need for extensive recreation facilities is great.

The National Park Service under the U.S. Department of Interior is to be commended since they are fully committed to the premise of providing adequate recreation facilities in the metropolitan area. They have been utilizing staff time in dollars to reverse the trend they have found at existing national parks which was reported by a NPS spokesman--of those people who visit national parks, if their annual income is greater than \$15,000 they will visit a national park four times a year, and if their annual income is less than \$15,000 they will visit a national park once in four years. The NPS realizes its responsibility in developing Gateway to attract the latter group to a national recreation area.

Commitment to Gateway has been demonstrated by Congress in its plans to appropriate \$100-160 million for development over a thirty-

year time-table. Various federal sub-divisions are in the process of donating lands. The City of New York is donating extensive acreage whose assessed valuation is in the tens of millions of dollars. Citizen participation is evident in the many committees which have been formed to promote Gateway. Many regional planning organizations have developed Gateway proposals.

Yet not all actions have had benign effects on the participants. People living within the ongoing communities of Broad Channel and Breezy Point have been asked to forgo their houses for the greater good of the more numerous populations who would use Gateway. The sacrifice of homes, of friends, of day-to-day living patterns have been requested of approximately 22,500 people.

The overview of

- 1) the irreplaceable, underdeveloped shore lands of inestimable recreation value,
- 2) the great recreation needs within the metropolitan area,
- 3) the commitment and good intentions of the NPS, Congress, City of New York, federal agencies, community committees; and regional planning offices,

4) and the mandated sacrifice of homes sets the importance of necessary accountability documentation. Though Gateway is still very much in the planning stages, the plans themselves hold the substance for critical examination. They can be studied to see that the demonstrated resources of land, need, commitment, and sacrifice are not dissipated, though the intentions may be good. Accordingly, the general question becomes:

"How satisfactory and complete are present plans for the proper utilization of the Gateway lands which will be available during the three development stages?

B Proper Utilization:

Obviously, the question hinges on a definition of proper utilization. For beach facilities, proper utilization is defined to be the optimal number of people per unit of land or the inverse of that fraction. In the metropolitan area, the amount of land becomes the limiting factor since beach lands, not people, are scarce. The importance of calculating the number of people a land area will

serve cannot be exaggerated, because the population figure determines the size and variety of facilities planned. The chain becomes 1) number of people planned, 2) size and variety of facilities planned, 3) facilities built based upon plans, and 4) number of people served reflects planned number. The effects of planning are self-fulfilling.

The NPS does not want to turn Gateway beaches into copies of Coney Island whose beach usage normally reaches densities of 5-10 square feet per person. Instead, they plan to use an a priori national beach standard of 60 square feet per person. Table 1 clearly shows that even Jones Beach at 35 square feet per person does not allow its users this much space. At a 60 square feet per person density, the NPS plans to develop the Breezy Point tip and Riis Park, whose combined acreage is approximately 70 acres, to hold a peak daily attendance of 130,000 persons. A comparison of this Gateway complex with nearby Coney Island shows the following:

Table 2

site	peak-day attendance	beach acreage	people utilization factor per acre
Coney Island Beach	850,000	67	6 to 7
Gateway at BP-RP	130,000	70	1
CI less G at BP-RP	720,000	67	5 to 6

Though nearby Coney Island has similar acreage to the Breezy Point complex, it will serve 5 to 6 times as many people as the complex. Clearly, the usage at the two areas should be made more equal. Nobody wants Coney Island utilization anywhere, not even the people who use the Coney Island Beach. But the need, the demand cannot be overlooked. A 60 square feet beach standard may work where land is plentiful or the demand is light, but it would be a poor utilization of Gateway lands if the 60 square feet standard is used within the metropolitan area. If New Yorkers find a beach overcrowded, it is up to them to decide whether they should go elsewhere; the alternative, practiced in planning Gateway, may force people to stay home and is therefore paternalistic. Planning should not be contingent on one standard, but should be prepared in a contingency format with the independent variable defined as actual demand.

C Gateway Access:

Present transportation plans remain unfortunately inadequate if they are delivering to Gateway only those figures that have been based upon the 60 square feet standard. Transportation is access-availability and if X-number of people are planned for a site and transportation is planned to deliver this X-number, surely access will be limited to only the X-number of people, even if the demand is greater. By setting the beach density at 60 square feet per person, inadequate transportation schemes are being developed, inadequate transportation modes will be instituted, and thus the under-utilization of the beach is guaranteed. Gateway could very easily become a negative form of a self-fulfilling prophecy.

D The Ferry System:

Taking the long perspective, the question, whether the ferry system is in fact the preferred transportation mode for the amount of money to be spent, must be investigated. Surely, all are concerned with spending on a priority scale and though the ferries are an attractive transportation mode, they may be an extravagant expenditure.

As the ferry system is formulated, the ferries will have a rather limited passenger capacity and cannot possibly begin to serve either the metropolitan area's demand or even the very low beach capacity estimates proposed by the NPS. Even now, the ferry system is known to be not the principal transportation mode, and other forms are being proposed. To place the ferry's originating point at the Coney^{Island} Pier seems doubly inhumane especially since expectations will be severely crushed when it becomes apparent that only 1/15th of the daily Coney Island Beach users will be served at most by ferry; tempers may flair at the beach itself, in the media, and in memos when the limited ferry capacity figures are more fully understood.

Ferries entail a great capital expenditure. As the report will show, for the most part new boats will have to be purchased and there are, of course, terminals that must be constructed. But the ferries will be used for principally 26 peak days a year and at

most for 83 seasonal days. As it stands now, there are no alternative uses for the ferries, except for a limited Gateway utilization, in the 282-day off-season to generate fares for defraying capital costs. On the other hand, it would be economically advisable to use existing transportation modes or new forms which could receive a full 365-day utilization. Buses, for example, are heavily used on weekdays for commuting, but plentifully free on weekends. Use of buses would entail no Gateway capital expenditures; but this bus usage and other transportation modes would have to be studied before they become attractive for Gateway. Hence, the question becomes one of asking if the capital costs are worth only 83 days of seasonal use and if the money could be better spent in an improvement that could be used by Gateway during the season and by some other need during the larger off-season of 282 days.

Together with the small capacity, the proposed fare structure (due primarily to the great capital costs) will inhibit middle-income people from using Gateway. The reimbursement program for low-income families is weak, but ~~theoretically~~ Theoretically, the lower-income family is availed of Gateway through the program. For upper-income families, transportation costs are easily absorbed. But the transportation costs will be high enough to make the Gateway sites unattractive to middle-income families.

It has been argued that ferries are needed for people to reach certain water-surrounded areas. This may be true for a New Yorker traveling to Sandy Hook. But there is no need for a New Yorker to go to Sandy Hook by boat (this trip has a long traveling time and SH is more proximal to New Jersey) when he can go to the Breezy Point peninsula, the Jamaica Bay uplands, Floyd Bennett Field, Fort Wadsworth, and Great Kills by land access.

This report cannot answer the questions of whether the seasonal ferry system should be massively expanded to increase its limited passenger capacity thereby entailing great costs or whether the ferry proposal should be replaced by a land transportation system that could be used they year-round for Gateway and some other need. What is apparent, though, is that the ferry system as formulated will neither meet the metropolitan area's demand nor transport the

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required numbers to Gateway parcels; it is, in effect, an expensive divertisement serving limited numbers of lower- and upper-income families and devoid of middle-income users. There may be better utilizations for the money earmarked for ferry capital expenses.

At this point in Gateway planning, this report suggests that not only should transportation modes be critically reviewed, but also the whole Gateway project merits a thorough analysis. The former is shown to be necessary if the ferry system is an indication of what is being planned within the access context. The latter is shown to be necessary if the 60 square feet per person constant, or^a similar figure, is the planning standard. The good intentions are obviously present, but the planning proposals must be on the same high level as the intentions. New perspectives, possibly greater expertise, and more sensitivity to the practicalities involved with metropolitan numbers are needed in a further discussion of Gateway proposals.

II THE PROJECTED CAPACITY OF THE NEW YORK CITY PORTION OF THE GATEWAY FERRY SYSTEM

A Summary:

The National Park Service plans a five-boat ferry system during the initial Gateway development stage. The portion of the system which will serve New Yorkers is defined by this paper to be the three boats which originate at the Coney Island Pier.

The approximate hourly one-way capacity of the New York City portion will be 10,000 passengers. About 60,000 New Yorkers will be delivered to Gateway areas on a peak twelve-hour day.

Compared to the peak 850,000 daily attendance at the Coney Island Beach and to the NPS's projected 130,000 peak daily attendance of Riis Park and the Breezy Point tip, the theoretical 60,000 passenger maximum daily capacity figure shows that the ferry system will not satisfy the population's demand and will not be the principal mode of access to the Gateway areas.

It should be noted that even this maximum ferry capacity is rather high because no replacement vessel has been included, in Gateway planning to date, which would substitute for one of the five boats in the event of a breakdown.

B Definitions for Capacity Calculations:

The tentative ferry plans call for five 3,000-passenger craft to be used on three Gateway routes. Two of the three routes will favor New York City use, with New Jersey earmarked for the third one:

- 1 Serving primarily NYC residents
Coney Island to Breezy Point.....2 boats
Coney Island to Sandy Hook via BP.....1 boat
- 2 Serving primarily New Jersey residents
Belford, NJ or Great Kills, SI to
Sandy Hook.....2 boats.

The site under 2 has not been definitely determined with choices narrowed to either Belford or Great Kills; transportation linkage for New Jerseyites to either site is rather hypothetical. Owing to the two factors, the report will concentrate on that ferry portion slotted for New York City use. This decision will have the advantage of decreasing the number of pertinent, but unspecifiable variables.

The following theoretical capacity calculations will make one assumption that may very well weaken the calculation's validity and which may have an actual detrimental effect for the ferry system: The NPS plans to purchase five boats and place all five boats into active service. No provision has been reported for a replacement vessel whose services become necessary should one of the five boats need maintenance. To insure full capacity service, the Staten Island Ferry System has the procedure of keeping a replacement vessel ready for operation to be used when necessary. Such a procedure would be beneficial for the Gateway system.

C Capacity Calculations:

- Given:
- 1) 26 peak days of maximum capacity
57 days of 50% maximum capacity
 - 2) 2 3,000-passenger ferry boats
between Coney Island and Breezy Point
at 3/4 hour round trip (includes dockings)
 - 1 3,000-passenger ferry boat
between Coney Island and Sandy Hook via Breezy Point
at 1 1/2 hour round trip (includes dockings)
 - 3) 12 hour day of 6 hours of one-way service between the
hours of 8 AM and 2 PM for arrivals

Then:

Max. Hourly Capacity:

$$\begin{array}{rcl}
 \text{CI BP} & = & 2 \times 3,000 \times 4/3 = 8,000 \text{ people/hour} \\
 \text{CI SH} & = & 1 \times 3,000 \times 2/3 = \underline{2,000 \text{ people/hour}} \\
 \text{total hourly capacity} & = & 10,000 \text{ people/hour}
 \end{array}$$

Daily Capacity:

$$\begin{array}{rcl}
 \text{peak day} & = & 10,000 \times 6 = 60,000 \text{ people/day} \\
 \text{non-peak day} & = & 10,000 \times 6 \times 1/2 = 30,000 \text{ people/day}
 \end{array}$$

Seasonal Capacity

$$\begin{array}{rcl}
 26 \text{ peak days} & = & 26 \times 60,000 = 1,560,000 \\
 57 \text{ non-peak days} & = & 57 \times 30,000 = \underline{1,710,000} \\
 \text{total seasonal capacity} & = & 3,270,000 \text{ people/season}
 \end{array}$$

D Examination of the Maximum Daily Capacity Figure:

The 60,000 maximum daily ferry capacity figure does not satisfy New York City demand nor transport anything near the maximum capacity figures for initial Gateway beaches.

850,000 people normally jam Coney Island Beaches, and if 60,000 of these people could use the Gateway ferry system at Coney Island, 790,000 people would still be on the Coney Island Beach. At an

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attendance of 850,000, density at Coney Island is approximately 10 square feet per person, and with the removal of 60,000 people the density will thin to at most 11 square feet per person or a net gain of 1 square foot of sand per person because of this ferry system!

Using the Breezy Point complex as an example, let us see if the ferry system could be the principal Gateway transportation mode. The initial Gateway land areas on the Rockaway peninsula will be Riis Park and the Breezy Point tip. The NPS speaks in terms of a maximum daily attendance for these sites of 130,000 people. On a twelve-hour park day, with people arriving between the six hours of 8 AM and 2 PM, 48,000 persons will be delivered to the Rockaway units. 82,000 New Yorkers or about three times the daily ferry capacity will have to find an alternate mode of access to this Gateway area.

It is apparent that as far as New York City needs go, the ferry system can neither substantially lessen the crowding at Coney Island nor deliver the numbers of people that could fill the initial Gateway areas. Unless the ferry service is expanded, it will not be the principal transportation means and alternative forms of transportation will become necessary.

III PRELIMINARY ESTIMATES OF CAPITAL COSTS AND OPERATING EXPENSES

A Summary:

The inconsistencies in capital cost data are noted. The lack of clarity in certain cost estimates causes a rethinking of the attractiveness of the ferry system since it appears that many tens of millions of dollars will need to be spent in capital costs for a ferry system whose use is limited to 83 seasonal days and which will not ease the any of the metropolitan area's non-seasonal problems. A priority study is suggested.

Using the lowest estimates, annualized capital costs and operating expenditures for the New York City portion of the ferry system are calculated. These figures will set the basis for the next section on Fares and Funding of the Ferry System.

B A Discussion on Some Critical Aspects of Capital Costs:

Plans call for the purchasing of five ferry boats and the construction of three terminals or slip sites. Capital costs list the ferry boats at \$5,000,000 each and the terminals at a high figure of \$10,000,000 each. At these estimates, the ferry system will initially cost \$55,000,000.

Though the \$55-million figure may very well be the system's correct price, other sources list lower estimates. Adjusting the Stanwyck Corporation's 1968 figures in terms of boat capacity and for the passage of three years, the maximum price of 3,000-capacity boat should be \$4,000,000. There will be a \$200,000 reduction in price for each subsequent boat. Five ferries might then cost not \$25,000,000 but

4,000,000	1st boat
3,800,000	2nd boat
3,600,000	3rd boat
3,400,000	4th boat
<u>3,200,000</u>	5th boat
\$17,000,000.	

The NYC Department of Marine and Aviation, the Circle Line and Tri-State report that spartan, side-loading ferry slips, rather than enclosed terminals for end-loading craft, could be built for \$1,000,000 each, one at Breezy Point and the other at Sandy Hook. Improvement of the Coney Island Pier would cost \$750,000. A breakwater

may be needed if the Coney Island Pier is used, and the cost of the Norton's Point Breakwater is estimated to be \$10-million. Slips and breakwater would cost then not \$30-million, but \$12,750,000; slips alone would cost \$2,750,000. The total capital costs of the ferry system can be estimated to be not \$55,000,000 but \$29,750,000 with breakwater, \$19,750,000 without breakwater. There is a significant disparity within the costs of the ferry system.

The disparity calls for a further examination of the capital costs, because actual price figures are needed to determine whether the ferry system of limited capacity should even be developed. It seems that \$55-million or even \$20-million may be too much to spend on a limited transportation facility to be used on the maximum for 83 days and principally only for 26 days. At the present, there are no off-season uses for the ferries, except for limited winter Gateway service, that could help defray these capital costs. There may be presently modes within the City which are used heavily on weekdays that could be used on weekends for Gateway use without great capital costs or if capital expenditures are needed, the modified transportation alternatives may have potential for 365-day use. A priority study is required.

C) Annualized Capital Costs and Operating Expenditures for the New York City Portion of the Ferry System:

A discussion of fares and subsidy appears in the next section. In order to calculate fare schemes, the various annual costs must be estimated. However, not knowing the definite location of the New Jersey originating site makes ferry travel times to Sandy Hook an unspecifiable variable. This problem arose earlier in the Capacity section and the same approximation will be used, namely only the set variables of the NYC portion will be discussed.

The model described below may be limited by another first principle. Cost estimates are not necessarily those furnished by the National Park Services but will reflect the lowest available figures.

Two sets of cost figures are listed below, one for ferries alone and the second for ferries and piers. The NPS used the former in its fare estimates and may reflect an accounting technique. The latter formulation will give a truer cost estimation.

1) Capital Costsa) Ferries

Given: 3 3,000-passenger ferry boats

Then: 1st boat: \$4,000,000
 2nd boat: 3,800,000
 3rd boat: 3,600,000
 \$11,400,000

Then: If annual interest = 8%
 annual 25 yrs amort = 4%
12%

And annualized ferry capital cost = 12% of \$11.4 million
 = \$1,368,000

b) Piers

Given: 3 pier locations at Coney Island, Breezy Point, Sandy Hook

Coney Island: \$ 750,000
 Breezy Point: 1,000,000
 Sandy Hook: 1,000,000
 \$2,750,000

Then: Annualized pier capital cost = 12% of \$2,750,000
 = \$330,000

c) Summary

- (1) annualized ferry capital costs = \$1,368,000
- (2) annualized pier capital costs = \$ 330,000
- (3) annualized capital costs = \$1,698,000

2) Annual Operating Expendituresa) Ferries alone

Given: 2 CI-BP ferries *12-hour day 8AM-8PM*
 @ 3/4 hr round trip with ~~6 hrs of arrivals~~ = 32 round trip/day
 1 CI-SH ferry *12-hour day*
 @ 1 1/2 hr round trip with ~~6 hrs of arrivals~~ = 8 round trips/day
 Then: seasonal round trips for 3 ferries = 40 x 83 = 3320

Direct labor (boat crews and repair forces),
 maintenance, and fuel (estimated by an
 adjusted Stanwyck figure to be \$250/round trip) =
 $\$250 \times 3320 = \$ 830,000$
 Insurance and misc. (2% of \$11.4 million) = 228,000
 Storage (\$20/day/boat x 3 x 282 days) = 16,920
 Annual ferry operating expenditures = \$1,074,000

b) Ferries and piers

This calculation is similar to the one above, except that
 the Insurance and Misc. percentage is taken on the capital
 costs of the ferry piers as well as the ferries and becomes \$283,000.
 Annual ferry-pier operating expenditures = \$1,129,920.

c) Summary

- (1) annual ferry operating expenditures = \$1,074,920
 (2) annual ferry-pier " " = \$1,129,920

3) Summary of Total Costsa) ferries alone

- (1) annualized capital costs = \$1,368,000
 (2) annual operating expenditures = \$1,074,920
 (3) total \$2,442,920

b) ferries and piers

- (1) annualized capital costs = \$1,698,000
 (2) annual operating expenditures = \$1,129,920
 (3) total \$2,827,920

IV FARES AND FUNDING OF THE FERRY SYSTEM

A Summary:

The NPS formulated the fare schedule on the basis of three factors. The effects of the fares on Gateway utilization are noted and alternative possible fare formats are discussed in conjunction with an analysis of the three factors.

B. The NPS Fare Structure:

How high the ferry fares are rests on the devised funding schemes for the system. In estimating fares, the National Park Service took three factors into consideration:

1) the total capacity of the system calculated as a function of travel times along various routes and of individual boat capacities;

2) annualized costs based upon all capital and operating expenditures of the ferries alone without the piers;

3) reimbursing the ferry and subway fares of low-income people and the developing of a separate federal funding to cover the subsidy program.

The generated fare schedule is as follows:

1) from CI to BP round trip = \$.60;

2) from CI to SH round trip = \$1.20.

Before the assumptions of the ferry-fare schedule are discussed in conjunction with alternative fare schemes, the general effects of the NPS fare schedule are examined.

C General Effects of the Fare Schedule:

We speak in terms of a facility's being public when we say that it is developed with public funds. At times, it is forgotten that another criterion must be satisfied before we can indeed call a facility public and that criterion concerns availability. Availability can be prevented by passing euphemistic requirements that are acceptable to some extent on the common sense level; at one time, enfranchisement was limited to those who own property, but today we consider the requirement discriminatory.

The proposed ferry-fare structure is a lucid indication of ~~a~~ publically-funded facility's possessing an income requirement restricting availability through limiting access. Though it has been

been argued that funds must be generated through fares to cover costs of the ferry system, once fares are levied, the park is no longer truly public because there will be those who cannot utilize the facility due to the expense of the fare, eventhough they have paid for some of the development of the park through taxes. Gateway then is not public; it has been developed with public funds.

Two factors, concerned with funding and fares, are the cause for limited access to Gateway.

1) It has been argued that the ferry-subway fare-reimbursement proposal will permit low-income families to enjoy Gateway beaches, and the logistics of the reimbursement plan are designed for repeated visits by the same person. Besides the fact that the logistics of the program are terrifically horrendous, there are other problems. The total capacity of the ferry system is so small in comparison to New York City numbers that even with the NPS reimbursement funds, the ferry system will allow at most one free round trip per summer to Gateway for a person whose family's income is less than \$5000. Repeated visits by the same person is out of the question when the total seasonal capacity of the NYC ferry portion is only 3,270,000 round trips and there are over 2.5 million people in NYC whose annual income is less than \$5000. What about the family whose income is \$5500, \$6000, \$6500...and the number of round trips involved? If the under-\$5000 families are served just once, the remaining seasonal ferry capacity becomes 770,000 which cannot possibly begin to serve the residual of 5-million New Yorker! To reduce the number of free round trips below 2.5 million would necessitate a lower income requirement or the enactment of a selection procedure, whether by stochastic or non-stochastic means. Either mode would be heartless and would result in a person whose family's annual income is less than \$5000 visiting by ferry Gateway beaches once every two or three summers.

2) The NPS's fare structure would not attract middle-income families. At 60¢ per person for round trip ferry fare and 60¢ per person for round trip subway fare, the transportation costs to Breezy Point for a family of four would be \$4.80. At \$1.20

per person for round trip ferry and 60¢ per person for round trip subway, the transportation costs to Sandy Hook for a family of four would be \$7.20. Transportation for a day at the Coney Island Beach or Manhattan Beach now costs a four-membered family only \$2.40, ½ the cost to Breezy Point and 1/3 the cost to Sandy Hook. A ferry ride in itself is not that great of a drawing card, since New Yorkers are rather used to the Staten Island Ferry System which till now only costs 10¢ per roundtrip per person. Clearly, Gateway will not be attractive to a family whose annual income is below \$10-15,000. Those who could afford the levies will be tourists and New Yorkers whose annual incomes are greater than \$15,000. NYC people who are in the latter category can afford traveling to beaches like Jones Beach or out of the metropolitan area entirely and they do so. In any event, because of the proposed ferry-fare structure, Gateway might be serving the very people who normally visit existing national recreation areas, those whose incomes are about \$15,000, but not people who rarely if ever visit national parks, those whose incomes are less than \$15,000.

Hence, Gateway may become less public than advertised.

D Fare and Funding Assumptions:

The proposed scheme rests on certain assumptions that need further clarification. The first assumption concerns the accuracy of constants used in the fare calculations and the second concerns revenue generation.

1) Accuracy of constants--

Since the original fares have been proposed, the physical ferry system has been modified and the capacity of the system has been altered. Also, as noted in the Preliminary Estimates section, the NPS's estimates on capital costs and operating costs need more validation. Both sets of constants affect fare calculations.

2) Revenue Generation (see Table 3)--

Some have assumed that generated ferry fares must be shown to cover the complete costs of the ferry system. Even the capital costs of piers, not included in the NPS formulation, may have to be added.

It is argued here, however, that there are alternative funding schemes, as shown by Table 3, based on the principle that generated revenues could pay directly only a portion of the ferry system's debits:

a) The ferry system's capital costs are considered part of the total Gateway development costs; at most, the annual operating costs could be covered by the generated-fare revenue. In this way,

(1) all fares are reduced but paid
and/or

(2) some fares will internally subsidize part or all of the reimbursement program lessening the need for a separate federal funding of the reimbursement plan.

b) The ferry system's annual operating costs are placed in the same category as ground maintenance or life-guard service; at most, the annualized capital costs should be covered by the generated-fare revenue. In this way,

(1) all fares are reduced but paid
and/or

(2) some fares will internally subsidize part or all of the reimbursement program lessening the need for a separate federal funding of the reimbursement plan.

Proposals under a) make the fares a function of the cost of living, since operating costs will reflect inflationary trends. Proposals under b) make the fares stable since interest rates and amortization are set. Between a) and b), b) is suggested because the stable fares, though initially somewhat higher, will cheapen relative to wages influenced by inflation.

c) There is a third alternative not listed on the table. The total capital costs could be absorbed in the initial development appropriations and the annual operating costs could be absorbed in an increased NPS annual budget. There is no concomitant need for fares to cover any of these costs, if the necessary money comes from the General Tax revenues which are based on an ability-to-pay formulation. The Federal contribution would be reduced, if it became the State's responsibility to provide transportation to ferry staging areas such as the Coney Island Pier. But once the person arrives at a staging area it would be the Federal responsibility to see that he gets to the beaches without charging him a fare. There would be no need for the costs or logistics of a reimbursement plan on the Federal part.

Free ferry transfers, and supportive free bus transfers, to all who appear at a ferry staging area means that Gateway will not only be a publically-funded facility, but a public one as well.

Table 3

seasonal capacity	# of free round trip fares *	# of passenger round trip fares	ba. round trip fare **	total revenue \$	facility	annual capital cost \$	annual operating expenditure \$	balance \$
PS-1 3,270,000	--	3,270,000	.87	2,827,920	f+pier	2,827,920		16,980
PS-2 3,270,000	--	3,270,000	.75	2,442,920	ferry	2,442,920		4,580
-1 3,270,000	--	3,270,000	.52	1,698,000	f+pier	1,698,000	--	3,400
-2 3,270,000	--	3,270,000	.42	1,368,000	ferry	1,368,000	--	5,420
-1 3,270,000	--	3,270,000	.35	1,129,920	f+pier	--	1,129,920	15,080
-2 3,270,000	--	3,270,000	.33	1,074,920	ferry	--	1,074,920	4,130
-3 3,270,000	1,635,000	1,635,000	.75	1,226,250	f+pier	--	1,129,920	96,330
-4 3,270,000	2,500,000	770,000	1.50	1,155,000	f+pier	--	1,129,920	25,080
-3 3,270,000	1,090,000	2,180,000	.80	1,744,000	f+pier	1,698,000	--	46,000
-4 3,270,000	2,500,000	770,000	2.25	1,732,500	f+pier	1,698,000	--	34,500

note: A-3 1,635,000 = 50% seasonal capacity
A-4 2,500,000 = number of people in 1968 whose annual incomes less than \$5000
B-3 1,090,000 = 33.3% seasonal capacity
B-4 see A-4

* note: Unlike in the NPS formulation, no fare differential was included in the fare to Sandy Hook over Breezy Point; both fares were set equal. It was felt that to do otherwise would create a segregated park based on economic levels; facilities would then receive as well different amounts of utilization.

V REDUCTION OF INITIAL CAPITAL INVESTMENTS

A Summary:

Two proposals have been circulated which are purported to reduce capital expenditures, and they are

- 1) leasing in-service Staten Island ferry boats on weekends, and
- 2) using a concessionnaire.

Each plan raises questions which weaken its attractiveness.

Instead, it is suggested that concentration be placed on

- 3) seeking surplus vessels,
- 4) locating Federal funding through non-Department-of-Interior appropriations,
- 5) pushing design changes on SI ferry boats not yet constructed but in planning stages,
- 6) utilizing, if available, air cushion vehicle service on weekends, and
- 7) utilizing the Whitehall Ferry Terminal on weekends.

B Circulated Proposals:

1) Leasing of In-Service SI Ferry Boats--

The Department of Marine and Aviation under New York City's Transportation Administration owns and operates the Staten Island Ferry system. It has been proposed that boats not needed on weekends be leased to the NPS for Gateway service, and there would be an obvious advantage in cost-sharing. There are three boats normally three boats free on weekends. They are relatively new and will need less maintenance than some of the system's older boats. The three boats are the Kennedy (3182 passengers), the Lehman (3182 passengers), and the Verrazzanno (2954 passengers or 4500 if no cars).

Unfortunately, four strong reasons work against Gateway usage of these craft and they are

- a) The boats are open-ended because of loading design and will take on water if they are transported to the lower harbor,

b) There must be compatibility between boat and slip, and U-shape slips, necessary for these open-ended passenger loading boats, are much more costly than the conventional side-loading boat slip suggested for Gateway use,

c) Each vessel has capacity for 40 cars, a use not required for Gateway and therefore a not needed operating cost because of additional size of craft, fuel, etc., and

d) Gateway weekend usage would interfere with maintenance overhaul schedules mandated for the boats by necessity and by the United States Coast Guard.

2) Using a Concessionnaire for Ferry Boats--

It has been proposed that one way to reduce initial capital costs would be to allow an organization like the Circle Line operate either totally or partly the ferry system. The Gateway season is only 83 days, and the capital costs could be absorbed through the concession's use of these boats for non-Gateway service in the off-season of 282 days. Spreading the capital costs over full annual-use basis would reduce Gateway's debits; this once capital cost also becomes subsumed under the annual operating budget, and the Congressional appropriations for ferries per se is reduced. The problems of the ferry operations are transferred to the concessionnaire, and the NPS's concern becomes one of outcome.

The Circle Line does not have any available passenger capacity in its present ferry system that could be used for Gateway. New boats would have to be purchased, but the firm knows of no way to successfully use these extra boats during the off-season. To offset the non-seasonal period, either Gateway passenger fares would have to be raised even higher or a direct federal subsidy will be necessary. The former would be unthinkable since the unsubsidized ferry fare will become about double what is anticipated for the initial passenger tariff; the latter means that the Federal government would be paying the full capital costs in an indirect way. In either event, the cost advantage of using a concession is lost, and the comfort in having an outside organization take over the ferry operation's logistics is not worth the additional cost, to the Federal government or in passenger fare, of the concession's profit.

Accordingly, unless a guaranteed alternate, income-producing, non-seasonal use for the ferry boats is found, use of a concessionnaire is not suggested.

C Alternate Proposals:

3) Surplus Vessels--

The Toll Bridge Authority of the Washington State Highway Commission operates the Washington State Ferries, a system of 19 open-ended vessels that ply the Puget Sound waters in the Seattle Metropolitan Area and which annually serves 6 million people and cars. Thirteen ferries were acquired when they were surplussed through the construction of the San Francisco Bay bridges, and two more were gained when they were surplussed through the building of the Chesapeake Bay Bridge. This mechanism of surplus boat acquisition seems to be workable and obviously of less cost than purchasing new boats directly from the manufacturer or distributor.

A surplus boat inquiry was sent on 28 Jul 71 to:

The Hon. Gerald Turetsky
Regional Administrator
General Services Administrator
26 Federal Plaza
New York, New York 10007

His reply of 3 Aug 71 contained the following:

"At the present time, the type of vessel that you describe is not available in our excess or surplus inventory. Past experience reveals that very few ferry boats have become available for disposal as surplus property over the years. However, we will retain your requirement for ready reference should such an item become available in the future.

"The Department of Defense is the primary source for the type of property in which you are interested...(and)...is responsible for handling the sale of all surplus military vessels:

Defense Surplus Sales Office
Naval Supply Depot
P.O. Box 660
Newport, R.I. 02844

Accordingly, a letter was sent to the
above on 6 Aug 71; a reply was sent out on 11 Aug 71 by Frederick
F. Knoll, Chief of the Defense Supply Agency which contained:

"We cannot forecast that distant a period as to
disposals on vessels and therefore cannot assist you at this time.

"This office is authorized by Public Law to negotiate with states, territories, possessions and/or political subdivisions thereof, subject to obtaining fair market value for the property. We cannot, however, retain requests for longer than 75 days and if after that period your requirement still exists, you may re-submit your request.

"I suggest, based on the above, that you submit your request about one year before you need the vessel. We trust at that time we will be able to assist you in this matter.

It is suggested that further contact be made with the above. Ferry boats could, of course, be asked for as well as boats that would need a minimum of conversion to passenger seating. Bell Aerospace of Buffalo has constructed an air cushion vehicle, presently being used by the United States Navy in Vietnam, that could hold four buses or could have a 150-passenger cabin; these vehicles could not be in excess or may eventually become surplussed. Also, it should be noted that the chances are that such craft would not be sold ^{but transferred} to the National Park Service, since the Department of Interior is not a political subdivision but a 'peer Federal unit. At the least, inventory lists should be examined.

A letter has been also sent on 10 Aug 71 to Chairman Sol Linowitz of the National Urban Coalition asking for the Coalition's assistance in locating surplus ferry boats. A reply has not been received as yet.

On 10 Aug 71, a note was sent to R.D. Timpany, Trustee of the New Jersey Central Railroad, concerning the fate of the railroad's excessed ferry boats. A reply has not been received as yet.

Since the Department of Marine and Aviation is purchasing replacement boats for the SI ferry system, it has been proposed that the replaced vessels be sold to Gateway. Before such action is taken, the boats in question should be thoroughly inspected. The life-span of a ferry boat is pegged at 25 years. The to-be-replaced boats were built in 1937, and so their age is fast-approaching 25 years. After twenty-five years, maintenance requirements and their concomitant costs soar. An analysis of maintenance needs and refurbishing becomes a necessity.

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4) Non-Department-of-Interior Federal Funding--

During the Kennedy Administration, the Housing and Home Finance Agency gave \$13-million in a 50-50 match to the Washington State Ferries System for four new super-ferries of 2,600-passenger and 160-car capacity.

Accordingly, it is suggested that inquiry be made in the Department of Transportation or in the Department of Housing and Urban Development to see if similar funds are available.

As a side note, it should be stated that a surplus in the billions of dollars is anticipated in the interstate highway categorical trust fund since not all states have provided the necessary matching funds. The trust is due to expire in 1977, and the remaining funds may become available to other transportation modes. Hopefully, these funds will go to improve urban mass transportation; but there may be some monies available if not for Gateway transportation alone, then for a combination NYC-Gateway joint project.

5) Design Changes on New Staten Island Ferry Boats--

Two new ferry boats are in the process of being ordered by the Department of Marine and Aviation, one due to arrive in 1973 and the other in 1974. Capital costs funding is being shared by the City (25-30%) and the Federal government (70-75%). One design change could allow the boats to be jointly utilized by the DMA and the NPS: the bow should not be open, but closed, and in that way, the boats could travel in the Lower Harbor without taking on water. To be compatible with a closed-bow craft, a few of the Staten Island ferry slips may have to be modified, and the Gateway slips, some if not all, could be designed from the start with this joint usage in mind.

6) Weekend Air Cushion Vehicle Service--

Mr. Albert M. Channon
Vice-President
D-A-R-T
120 Buckingham Road
Brooklyn, New York 11220

On 6 Aug 71, a letter was sent to the above

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asking him for a detailed explanation of the proposal he presented to us in regard to Gateway. No reply has been received to date.

D-A-R-T is an American distributor of British Hoovercraft Corp. of England which produces the SRN-4, an air cushion vehicle (acv) of 533-passenger capacity. The company is hoping to snare a DOT grant for a 2-year demonstration project that would provide acv transportation back and forth between midtown Manhattan and the airports. The firm feels, however, that passenger volume will drop on weekends, and so the firm would be willing to provide weekend Gateway transportation at the passenger fare of a nickel per head. Neither the number of acv nor routing was clear.

Such service could become a useful auxillary for Gateway's initial years. For example, the distance between the Rockaway Park subway station and Breezy Point is relatively short, but the road may be rather congested for the proposed bus shuttle; the SRN-4 has a capacity equivalent to 10 buses, could make at least 3 round trips in an hour, does avoid the congested roads, becomes a recreation activity in itself, and costs the passenger much less.

There are drawbacks to the proposal. As will be shown in the Watercraft Prototypes section, an acv is about 3X as expensive to fund in terms of the number of passenger served as a conventional ferry, and Gateway should not be pressurized into accepting this system after the 2-year demonstration project ends. Acv service is modern and pleasurable; public enthusiasm could be fanned. Terminals may be necessary during the 2-year demonstration project and that will entail sinking capital funds. Both factors will work towards accepting the system. But to run such a system independently or without large off-season alternative uses may mean after the demonstration period either large Federal subsidy or extremely high passenger fares. The latter is antithetical to the notion of a public park; the former may be a poor use of tax dollars.

Accordingly, though the service, should it become available, provided by D-A-R-T may be initially attractive; but before the two-year project is accepted, the ramifications should be questioned.

Recently, it has come to our attention that Hover-Flite of Buffalo's Bell Aerospace, another distributor of British Hovercraft, is in the process of negotiating a similar airport contract with the NYC Board of Estimate. Should Hover-Flite, not D-A-R-T, receive the franchise, a similar project would be available. Bernard Shatzkin (212 Mu 7-8800), the firm's attorney, said that they will use initially ten to fifteen 150-passenger vessels and then go soon afterwards to 600-passenger capacity sev. He is delighted to have a weekend use for what would be otherwise idle craft and promised a rather small fare.

7) Whitehall Ferry Terminal--

See the section, Ferry Staging Areas.

VI WATERCRAFT PROTOTYPES

A Summary:

The National Park Service anticipates purchasing five new 3,000-passenger ferry boats for the first phase of operations. Three forms of watercraft have been examined and they are hydrofoils, air cushion vehicles, and cycloidally-propelled conventional ferry boats. For the initial phase, cycloidally-propelled conventional ferry boats are suggested to be the selected watercraft; these boats should be fitted for side-loading and have toilet facilities that include sewage-holding systems. In later years, not only could more conventional ferry boats be added to the fleet, but because of their greater speeds and therefore shorter traveling times, large-capacity acvs could also be utilized in long-distance runs.

B Types of Watercraft:

1) Hydrofoils--

Large amounts of debris floating in the Harbor prevent the utilization of hydrofoils as a possible alternative. There would be safety hazards and great maintenance expenses. As it is, their gas turbine engines require more maintenance than conventional ferry's diesel engines.

Model PT-150 of the surface-piercing foil-type has a passenger capacity of 250, a cruising speed of 39 knots, a life span of 10 years, and a cost of \$1,615,000. A conventional ferry can have a passenger capacity of 3,000, a cruising speed of 17 knots, a life span of 25 years, and a NPS estimated cost of \$5-million. Compared to a ferry, the hydrofoil's capacity is $1/12X$ as great, speed is $2X$ as great, life span is $2/5X$ as great, and cost is $1/3X$ as great. Weighing these factors in regard to a constant, similar number of passengers served per unit cost, capital investment for this hydrofoil is

$$\begin{aligned} (\text{Capacity} \times \text{Speed} \times \text{Cost} \times \text{Life span}) &= \\ 12 \times 1/2 \times 1/3 \times 5/2 &= 5) \end{aligned}$$

5X greater than that of a conventional ferry.

Between its costs and the debris in NYC waterways, hydrofoils are not a viable alternative for the Gateway ferry system.

2) Air Cushion Vehicles--

In comparison to convention ferries, acvs do have greater maintenance expenditures and capital costs. Unlike, hydrofoils, acvs float above the the surface and so will not be as greatly affected by harbor debris, but because of their gas turbine engines, acvs, in comparison to conventional ferries, do have higher maintenance costs. The SRN-4 has a passenger capacity of 533, a cruising speed of 61 knots, a life span of 10 years, and a cost of \$4.2-million. Compared to the ferry specifications, listed in the Hydrofoil section, the acv's capacity is 1/6X as great, speed is 4X as great, life span is 2/5X as great and cost is 4/5X as great. Weighing these factors in regard to a constant, similar number of passenger served per unit cost, capital investment for this acv is

$$\begin{array}{rcll} \text{(Capacity x Speed x Cost x Life span} & = & & \\ 6 & \times & 1/4 \times 4/5 \times 5/2 & = 3) \end{array}$$

3X greater than that of a conventional ferry.

Though the cost factor is three times as great for the SRN-4 in regard to a conventional ferry, the acv's speed is four times as great and the speed of the acv gives it comparable passenger capacity. Speed may win in a trade-off with cost under certain circumstances. This greater speed could satisfy the needs of more distant potential park users in areas of upper Manhattan, the Bronx, Queens, and western Brooklyn where distances along existing rapid transit links to Gateway sites are so great, that travel times may become prohibitive. Costs may be reduced if alternative uses are found in the off-season.

3) Cycloidal Propulsion Ferry--

In 1968, the Stanwick Corporation prepared a consultant's report on the Staten Island Ferry Service and suggested that new ferries should be activated by cycloidal propulsion. Such a

"propellor consists of a rotating platform from which is suspended circumferentially a series of blades. By means of a single control,

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these blades may be programmed to oscillate slightly about their own axes and take positions during each platform revolution so that thrust can be provided in any direction...Two units mounted athwartship...affords slightly great speed, while the bow/stern configuration provides the highest degree of control for precise positioning of boat. The manufacturer claims greater efficiency for cycloidal propellers than screw propellers in bow-mounted installations...

The great control of the cycloidal propellor is shown by the following incident. A cycloidally

"propelled ferry was observed on Lake Constance where it approached an occupied slip and lay to off the slip in 35 knot beam wind. For ten minutes it held a stationary position till the slip was vacated. The boat then moved sideways and entered the slip without touching a piling. There were no racks in the slip as experience has shown they are not required for boats equipped with cycloidal propulsion...

It should be noted that without cycloidal propulsion, racks are needed to cushion the boat's entrance into the slip. Racks break and add to harbor debris.

Compared to a conventionall propelled slip, a similar capacity cycloidal boat should have lower maintenance costs "because of fewer pieces of machinery, absence of electric motors and controllers. The smaller power plants will not consume as much fuel...Manning levels and machinery space maintenance requirements will be reduced."

"In summary, the potential savings in rack repairs, the reduced operating costs, increased ship control offered by cycloidal propulsion make this a most attractive system."

C Side Considerations:

1) Side-loading--

The selected ferry boat should have side-loading of passengers. Staten Island Ferries have end-loading, and this design requires an extensive U-shape slip. These boats cannot be used in open waters of the Lower Harbor because of the open bow's taking in water. A side-loading boat utilizes a rectangular pier, which will cost far less than the U-shape facility. Such a side-loading boat can have a closed bow, and open water would no

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longer be problematic.

2) Sewage-holding System--

Ferry boats will operate near swimming beaches. Toilet facilities may be on board. Needless to say, discharging of raw sewage is not to be encouraged, and the New York State Attorney General is in the process of preventing the Circle Line from discharging their raw sewage into New York Harbor. All Gateway boats that contain lavatory facilities should have sewage-holding systems.

VII FERRY STAGING AREAS

A Summary:

Six variables have been isolated in discussing the fitness of a site for utilization as a ferry staging area. They are as follows:

- 1) water proximity to Gateway areas;
- 2) nearness to crowd-generating rapid transit links;
- 3) existing facilities and effects on existing community
- 4) safety;
- 5) program concerns;
- 6) environmental effects.

Coney Island Pier is slotted by the NPS to be the principal Brooklyn ferry staging area, and it has been found to satisfy conditions 1), 2), and 3), but not those of 4), 5), and 6). Because these conditions were not satisfied, a review was made of the potentials of alternate Brooklyn sites. These alternate sites were Coney Island Creek, Sheepshead Bay, the 69th Street Pier, the Long Island Railroad Pier, and Floyd Bennett Field.

The review demonstrated the possibility of using the Coney Island Pier site for the initial ferry staging area, if the following conditions were met:

- 1) construction of a breakwater of Norton's Point;
- 2) use of transfer vehicles between the Stillwell Avenue Station and the ferry;
- 3) redecoration and modification of the station-through -pier complex;
- 4) initiation of controls so that a ferry pier is environmentally compatible with a swimming beach;
- 5) separation of Coney Island Beach users from those going on the ferry.

The potentials of the other Brooklyn locations as auxillary sites are also delineated.

Whitehall Ferry Terminal in Battery Park was inspected and found to have strong possibilities that would encourage its usage as a Manhattan ferry staging area.

B Coney Island Pier:

The Coney Island Pier has been chosen by the NPS as the principal ferry staging area for Gateway. Its water proximity to Breezy Point and Sandy Hook, its closeness to the Stillwell Avenue subway station, and its possession of existing pier facilities are all pluses for its use as a transfer point.

1) water proximity to Gateway areas--

Coney Island Pier is centrally located for water access to Breezy Point and Sandy Hook, and the water routes from these two sites to Coney Island are the most direct ones in the Gateway area. At most, twenty minutes of running time separates Breezy Point from Coney Island and sixty-five minutes separates Sandy Hook from Coney Island. With the eventual development of the Jamaica Bay uplands, the centrality of the Coney Island site is reinforced, and under these new conditions, only Floyd Bennett Field could become a geographical rival.

2) nearness to crowd-generating rapid transit links--

The Coney Island Pier is near the Stillwell Avenue subway station. Four subway trains feed into this station. The B Train originates in Manhattan, the D Train originates in the Bronx, the F Train originates in Queens, and the N Train originates in Manhattan. Crossing Brooklyn at various points, the trains bring people from many different socioeconomic neighborhoods from four of the five boroughs.

At an eight-to-ten minute normal weekend headway--defined as the time between trains' stopping in a particular station--for the four train routes containing 2000-passenger trains theoretically arriving at the Stillwell Avenue station, a hypothetical average of 44,000 passengers are generated each hour. If headways are reduced to 4 minutes, as theoretically done during weekday commuting, the weekend hourly capacity increases to 120,000 passengers at the station. And it should be noted that the Stillwell Avenue Station itself has a capacity of 200,000 people and so could serve even the maximum theoretical capacity. Between the hours of 8 A M and 2 P M, the station could generate daily under 8-10 minute headways, 264,000 people, and under 4 minute headways, 720,000 people. The subway station

certainly does have the capacity to generate large crowds.

From the station to the Pier, the approximate pedestrian route is as follows: 2 blocks south on Stillwell Avenue to the Boardwalk ramp; up the ramp and $2\frac{1}{2}$ blocks west on the Boardwalk to the Pier; $3\frac{1}{2}$ blocks south on the Pier to its end. On a whole, there is enough width on the eight-block route to handle a crowd; however the two ramps on either side of Stillwell Avenue into the Boardwalk lack the necessary breadth individually and therefore should be joined.

An eight-block walk is not much to ask of the unencumbered and the able, but the distance would be trying for parents with young children and difficult for the elderly and the disabled. A glide-a-ride service, used during the '64-'65 NY World's Fair, would be a needed auxiliary in transferring the latter group between subway station and ferry. A corridor for this people-mover could easily be cordoned off. The service should entail passenger fares, since those who may have most need of it may not be able to afford the additional cost.

3) existing facilities and effects on existing community

The Pier itself is an important existing facility to be used as the ferry mooring. Besides extending the Pier, little more would have to be modified for a side-loading ferry.

Much can be done to improve the aesthetic attractiveness of the Station, Stillwell Avenue, the Boardwalk, and the Pier. The physical structures are for the most part available, but in their present design they add little to what can become a festive, exciting Gateway milieu. Natural horizontal lines are formed in the locality by the rows of one- and two-story buildings, the long but low elevated subway tracks, the long streets, the long Boardwalk, the long Pier, the long beach, and the long horizon. Horizontals can be utilized to direct movement toward the ferry site, and if the horizontals do not end abruptly or narrow too quickly, they can have a calming effect. Verticals are either absent in the area or lack visual emphasis. Introducing strong verticals can have an exciting effect. Tall, tapering verticals will cause

upward eye movements, a soaring feeling as in viewing a Brancusi sculpture. Tall flagstands, slim fountains, nightly light beams, etc. could all be effectively used. With proper coloration, the verticals could be used for an upward expansion, the horizontals could show direction and an interplay of the two will generate lively tension, anticipation, and excitement.

Because of space availability, comfort stations, information and ticket booths could easily be placed at the Stillwell Avenue Plaza just before the Boardwalk and on the Boardwalk itself. The NPS need not introduce food facilities here, since the existing Coney Island commercial interests will be more than able to satisfy the requirements. However, facades must be refurbished in an attractive manner and the vendor may need to be shown the aesthetic needs of a national recreation area. Neither food nor lavatory facilities should be on the Pier itself because of space constraints and so that there will be unnecessary additions to the confusion of boarding/leaving the ferry.

It should be noted that national park's presence will hopefully effect secondary improvement in the surrounding neighborhood because of the modifications that Gateway will introduce. The Boardwalk commercial units may see this as a shot-in-the-arm. Any improvement on the Boardwalk by Gateway may be the start of an eventual Federal refurbishing of the area.

In regard to the Coney Island Pier, three disadvantages exist entailing questions of safety, program, and environment.

4) safety--

The Coney Island shorefront is obviously unsheltered. When moored, the ferry will pitch. Pitching of a ferry boat becomes hazardous while passengers board or depart from the boat. Pitching can be prevented by sheltering the shorefront through the construction of a breakwater similar in design to the one at Breezy Point.

The Coney Island Beach also suffers from storm sewage pollution, beach erosion, and oil spills. The community and local elected officials--State Senator Albert B. Lewis, Brooklyn Borough President Sebastian Leone, Congressman Celler, and Congressman Biaggi, support the Interstate Sanitation Commission's

proposal for a mile-long dike originating at Norton's Point to improve the Coney Island beaches. The dike has a projected cost of \$10-million. Official action by the Army Corps of Engineers is not expected before 1972. The proposed Norton's Point Dike might shelter the pier and prevent pitching. The effects of the dike should be examined, and if it is found to prevent such pitching, the NPS should support its construction. In any event, the Coney Island Pier requires sheltering.

5) program concerns--

Maintaining Coney Island Pier as a ferry staging site in addition to its normal swimming utilization may be confusing from a programming perspective. Coney Island Beach in itself is a heavily utilized recreation facility as noted in the first section of this report. It would improve the program if a clear physical division could be made relatively quickly between Breezy Point or Sandy Hook people and Coney Island people. This division becomes all the more critical since the ferry system's daily capacity is inadequate in terms of Coney Island numbers; tempers will be short in the ensuing confusion.

Cordoning a right-of-way from the station to the Pier may be an attractive alternative, but the action could add confusion among those who make a wrong decision and add irritation from those people who now use the Stillwell Avenue route to the beach who own commercial units along the route.

A crowd separation mechanism needs further discussion.

6) environmental effects--

Using the Pier site on the beach also has environmental ramifications. Initially, three 3,000-passenger ferries will be departing and arriving at the Pier at approximately one every twenty minutes. Debris will undoubtedly be thrown overboard from the boats and Pier. Fuel and grease hydrocarbons will escape into the waters. If the toilet facilities on the boats lack sewage-holding equipment (the Circle Line boats do not have such equipment and the NYS Attorney General is taking action), raw sewage could be dumped into the waters. These three possible sources of new pollution could alter dramatically the cleanliness of the swimming waters and the beach. Accordingly,

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for the Coney Island Pier to be compatible with the swimming beach, proper controls must be instituted.

C Alternate Brooklyn Sites:

1) Coney Island Creek--from W.23rd Street--

Coney Island Creek is the complement of Coney Island Pier--where one site has weakness, the other has strength. Pitching is not a problem here, as the Creek is in a sheltered waterway, and so condition 4) is satisfied. Condition 5) is satisfied since the Coney Island Creek site is on the north shore of Coney Island, while the beach is on the south shore; early crowd division occurs naturally. The Creek is presently used for boat transport, and so the ferry system will not have 6) environmental effects that would be adverse to existing use patterns.

However, the disadvantages are many, if not critical. 1) water proximity to Breezy Point and Sandy Hook is not as satisfactory, with the additional distance of rounding Norton's Point; the increased distance will mean a decrease in the number of people being transported by the same number of ferries. It is a ten-block walk to W.23rd Street from the Stillwell Avenue station, and so the lessening in the nearness to crowd-generating rapid transit link may mandate the use of a people-mover service not just as an auxiliary to walking, but as the principal means of transfer between station and pier. There are no 3) existing facilities here as a pier, but the projected pier may not need to be extensive if side-loading boats are used. The Army Corps of Engineers says that regarding Coney Island Creek in order to accommodate the 3,000-passenger boats, "a channel 300 feet wide, 18 feet deep, and one mile long would have to be dredged. The quantity involved is about 300,000 cubic yards. The material would be disposed of in the approved dumping ground at sea. The total cost of dredging is approximately \$600,000." Capital expenditures besides pier construction and dredging would include acquiring the land from W.23rd Street to W.27th Street. If additional western land is needed, it may be possible to gain the NYC park of Kaiser Playground from W.27th Street to W.31st Street. However,

these capital expenditures may be far less than building a Breakwater at Norton's Point, refurbishing the Coney Island Pier and Boardwalk portion. Yet it may be more desirable to sink capital improvements into the Pier area, rather than the Creek locality, because of the recreation facilities at the beach and the great number of commercial units near the beach.

This latter consideration which involves a choice between neighborhoods appears to tip the balance in favor of initially improving Coney Island Pier, but a total comparative re-examination of the sites is necessary before the Creek can be completely discounted. If the Coney Island Pier is still found to be the superior site, the Creek may still have potential as an auxillary pier, should the developed ferry system require additional slips.

2) Sheepshead Bay--eastward from the fixed pedestrian bridge--

Sheepshead Bay is another complement of the Coney Island Pier. Small craft are moored here--thereby presenting a possible political situation--in the sheltered waters and so condition 4) is satisfied. Condition 5) is satisfied since Sheepshead Bay is so far away from Coney Island that the subway station serving Sheepshead Bay is not even the Stillwell Avenue one but the Sheepshead Bay station. 6) Factor is satisfied since the Bay is used for boating.

Questions of 1) water proximity receive a somewhat positive reply. Though distance to Sandy Hook is increased, distance to Breezy Point decreases and the distance to the Jamaica Bay uplands also is much less.

However, the disadvantages of Sheepshead Bay are plentiful. Not only is the Sheepshead Bay station a small 2) crowd-generating rapid transit link, but also the functional distance between station and the Bay is considerable. On a weekend, just the Bronx D Train serves this station and the station could generate on an eight to ten minute headway, 11,000 people per hour. The three ferries operating from the south Brooklyn shore have a capacity of 10,000 people per hour, and clearly there will be 1,000 disappointed people per hour at Sheepshead Bay unless a shuttle is instituted to carry them either to

Manhattan Beach or Coney Island. The greatest theoretical hourly capacity of the Sheepshead Bay station is nowhere near that of the Coney Island station, 30,000 people vs. 120,000 people; if additional ferry boats are anticipated as more developed park areas are opened, the Sheepshead Bay station may not generate enough people. Even if the Sheepshead Bay area had the potential for increased capacity, it still have the present limitation of poor walking route between station and Bay. The distance between station and Bay is increased to approximately eight blocks because the route crosses the Belt Parkway; the intervening streets are narrow for a pedestrian crowd which will have to pass through commercial and residential areas. The use of people-movers may be difficult because of the station's lack of space for a staging area.

3) Existing facilities are limited to a paved, wide street next to the Bay and a promise of a pier through the acquisition of commercially-owned moorings. Regarding the improvement of Sheepshead Bay, the US Army Corps of Engineers states, "A 10-foot shoal at the entrance to Sheepshead Bay precludes use by...ferries at present. To enable the bay to be used, dredging of this small bar is required as well as dredging of an extensive shoal area offshore. The dredging would require the removal of about 200,000 cubic yards. The material would be disposed of in the approved dumping ground at sea. The total cost of this work is approximately \$400,000."

Sheepshead Bay's initial capital expense may be less than Coney Island Pier's expenses, if a breakwater is included. But the subway station at Sheepshead Bay cannot possibly generate a Stillwell Avenue crowd, and that may mean eventual access limitation. Transfer between station and pier will be more complicated and more costly at Sheepshead Bay. Sheepshead Bay streets are not as expansive and do not lend themselves as grandly for improving aesthetic appeal. Accordingly, Coney Island Pier has more potential for a principal, initial site, but Sheepshead Bay has long-term possibilities that demand further review.

3) The 69th Street Pier--

The 69th Street Pier has potential for an auxillary ferry terminal area, but not as an initial or principal

staging area. It satisfies only requirements 6), since it is in the Upper New York Harbor well-traveled by ships, and 5), since it is greatly distanced from other recreation areas.

In fact, it is greatly distanced from 1) other Gateway areas and 2) crowd-generating transit links. The 69th Street Pier is midway between Coney Island and the Whitehall Ferry Terminal in lower Manhattan. Compared to the Coney Island Pier, water distance to Breezy Point, Sandy Hook, and the Jamaica Bay uplands is relatively greater, but similar to Fort Wadsworth. There is no advantage in regard to proximity to crowd-generating areas. The Bay Ridge Avenue Station, through the Manhattan N Train and the Queens RR Train, can generate at 8 minute headways, 22,000 people per hour and that is a sizable crowd. Twelve blocks of narrow streets through residential areas separate the Bay Ridge Avenue station from the Pier and the logistics of crowd transfer are awesome and costly. Parking space is unavailable. Yet the site could serve the 125,000 residents of Bay Ridge who could walk to the pier.

Neither 3) existing facilities nor 4) safety can be discussed in regard to this Pier. The area is slotted for improvement as a NYC Park, and the pier itself may be re-designed, if not totally replaced.

In any event, the site lacks crowd potential and will find its greatest usage from the immediate neighborhood. On a long-term perspective, the underdeveloped pier has potential as an auxiliary ferry site.

4) Long Island Railroad Pier--at 65th Street--

The site has grand long-term potential and at least demonstrates an efficient way of linking subway with ferry. It is located between the Owl's Head Pollution Control Plant and the Brooklyn Army terminal. Its chief advantage is piers constructed to carry the weight of railroad tracks. Theoretically, the tracks run along the Bay Ridge Division, crossing through Brooklyn and connecting with Penn Central Tracks through Queens and the Bronx. All of the tracks may not exist today, and the pier site has not been maintained. The all-important right-of-

way exists and loops together many of the right-of-ways of non-connected subway links within Brooklyn and the other Long Island Railroad lines. The whole right-of-way need not be improved for immediate Gateway use; but for every mile track improved, a link may be made with a different subway track or Long Island spur.

The potential of the right-of-way as a new rapid transit route is staggering and in regard to Gateway, it could be a means of transferring large numbers of people via subway to the ferry without the need of intervening blocks or vehicles. The costs of the system would be reduced by 365-day usage; the vacationer, the weekender, and the commuter would benefit.

5) Floyd Bennett Field--

3) Existing facilities include two berths, situated at the southern tip of the Field, bordering the Rockaway Inlet. If this portion of the Field is not retained by the US Navy, then no dredging will be necessary for ferry landing.

It has 1) proximity to the Jamaica Bay uplands and Breezy Point. The Rockaway Inlet is too treacherous for swimming and is used for boating; 6) environmental effects would be minimal. Plans for Floyd Bennett are not set, and so 5) program concerns are non-existent. 4) Safety considerations have not been examined in regard to tidal currents of the Rockaway Inlet.

The big question mark revolves around 2) proximity to crowd-generating rapid transit links. Presently rapid transit service is practically absent from the site. There are proposals to extend the Utica Avenue subway down Flatbush Avenue with a station at Floyd Bennett. This is also the one parcel within Gateway that has the space to absorb a parking lot. By either subway or auto, FBF could eventually be the recipient of large crowds, and the berths at the southern tip of the Field could become a ferry staging area.

John Freund

D Manhattan--The Whitehall Ferry Terminal:

The Staten Island Ferry System has six slips at its Whitehall Terminal in Battery Park. Though four slips are free on weekends, one slip (3) is relatively free on a year-round basis. Isolated from the others, access could be controlled to this slip so that there is a division between Gateway and SI Ferry users (5). With improvement for compatibility with a closed-bow vessel or for a side-loading boat, this slip could become in a later Gateway development phase a Manhattan staging area for ferry service.

(1) Running time between Whitehall and other Gateway areas is comparable to the Coney Island to Sandy Hook Trip. The latter will take one-way at least 40 minutes (sans docking), while running time from

Whitehall to Sandy Hook	is	60 minutes,
Whitehall to Great Kills	is	50 minutes,
Whitehall to Breezy Point	is	50 minutes,
and Whitehall to Coney Island	is	40 minutes.

Though the running time for a Whitehall ferry is somewhat longer, the overall traveling times, including subway or bus and ferry, for Bronx, Manhattan, and Queens residents is much shorter.

The 1, 4, 6 and RR Trains originating in the above three boroughs serve the Whitehall area on weekends. The generated capacity (2) is similar to the Stillwell Avenue Station, and the subway stations ^{in the Whitehall} are just as close if not closer to the slip as the Stillwell Avenue Station is to the Coney Island Pier. These trains will have the added bonus of serving primarily Gateway needs on weekends, since there will be no commuting crowd; the Stillwell Avenue Station will have the dual usage for the Coney Island Beach and Gateway.

The slip is sheltered (4) and ferry usage is evidently acceptable in the area (6).

The running time is the limiting variable, and until more than the anticipated five vessels are placed into Gateway service, use on a Whitehall route would be extravagant in comparison to a Coney Island route. However, once additional vessels are secured, the Whitehall slip should be opened.