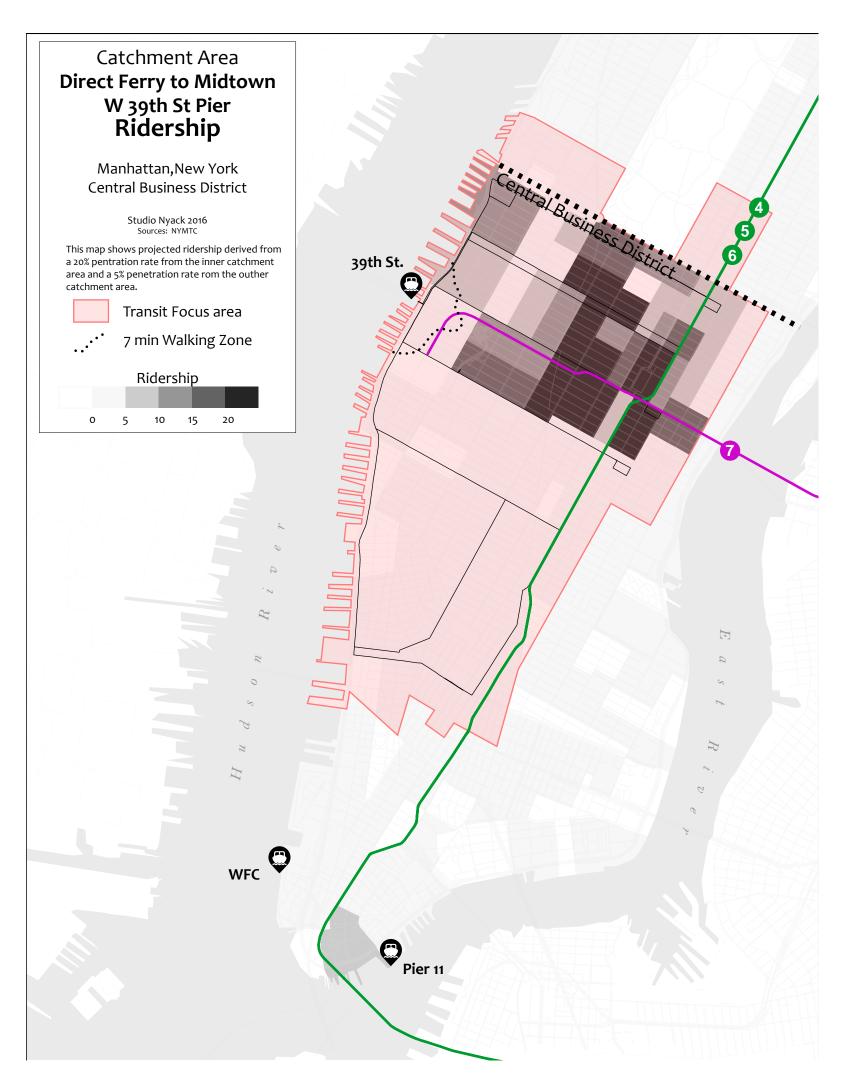
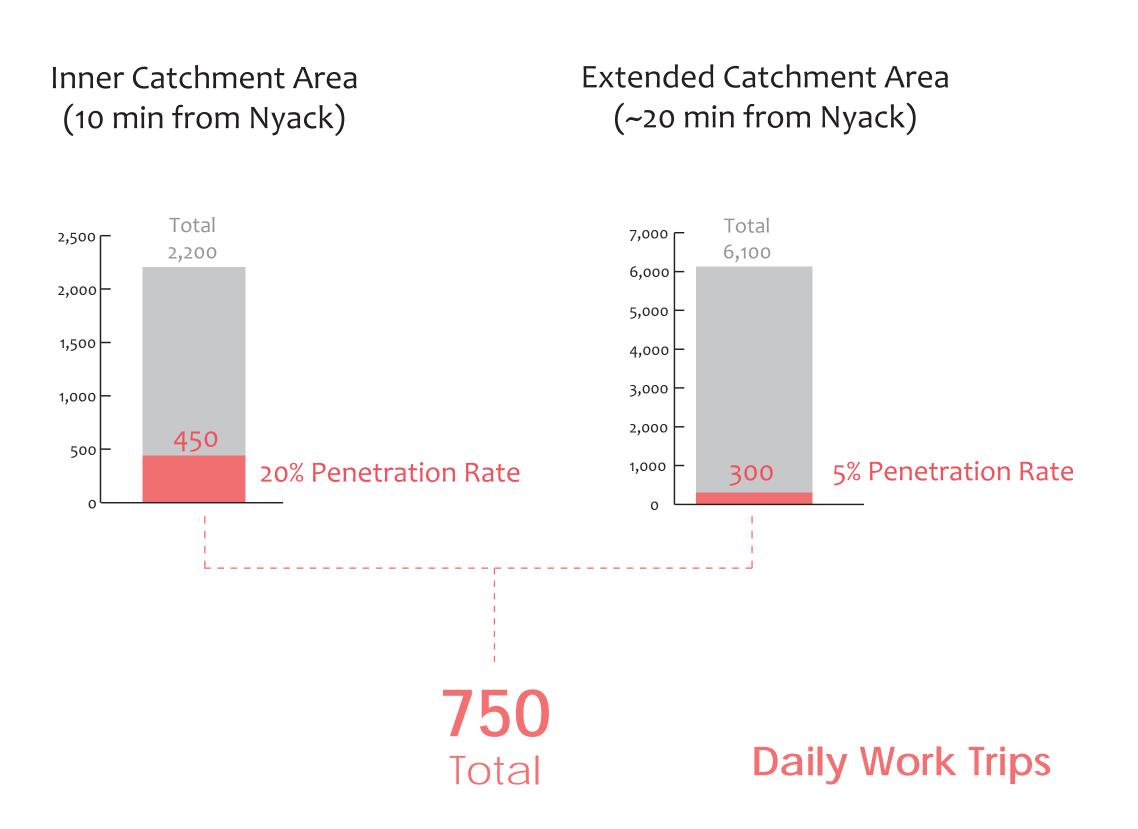
Modes Pier Sites Excursions Parking Sustainability Ridership Projections Feasibility Conclusion Appendix



Ridership Projection: Direct Ferry to Midtown W 39th St.



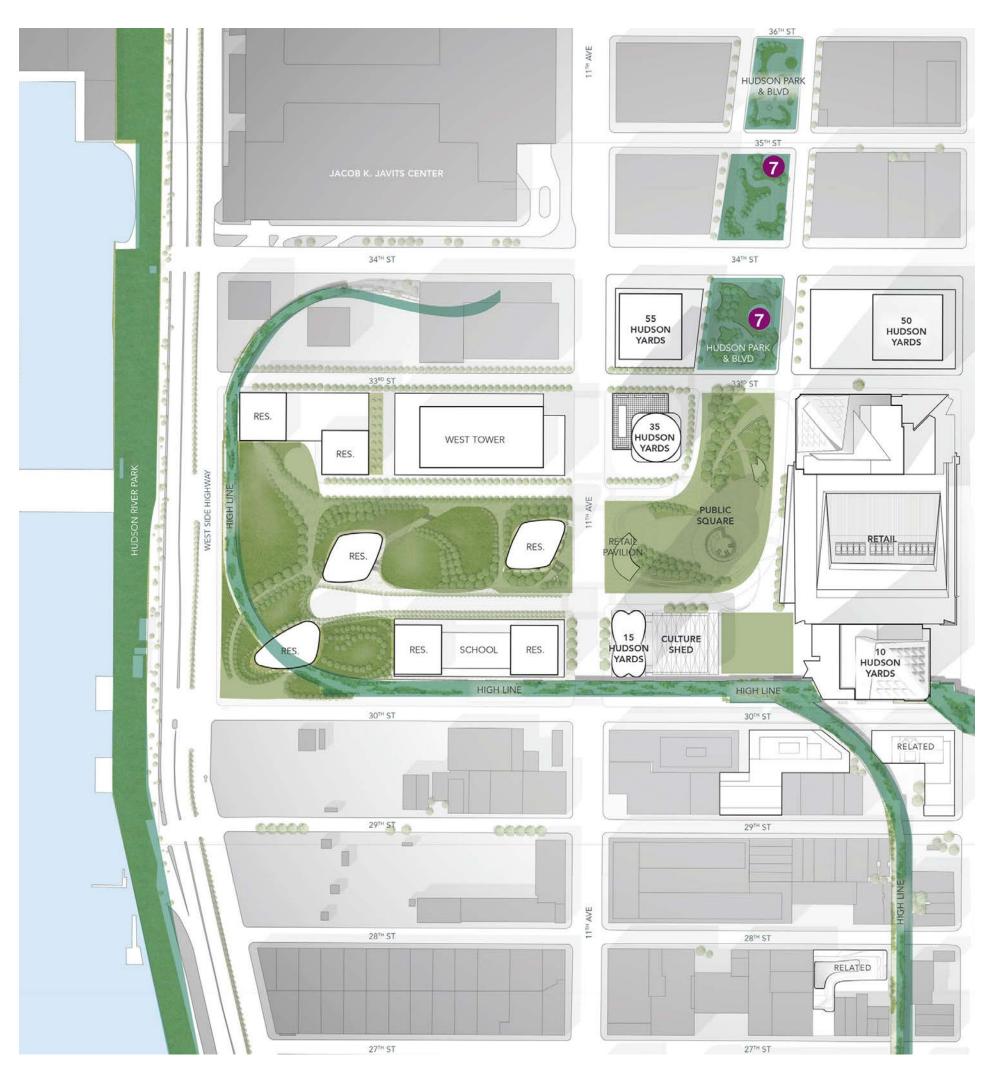
Total Projected Ridership to Midtown Connected Area



Modes Pier Sites Excursions Parking Sustainability Ridership Projections Feasibility Conclusion Appendix



Hudson Yards





10 Hudson Yards expected to open May 2016

Full build-out of the Eastern Yard expected in 2018

Additional jobs to be added in next 8-10 years at Hudson Yards

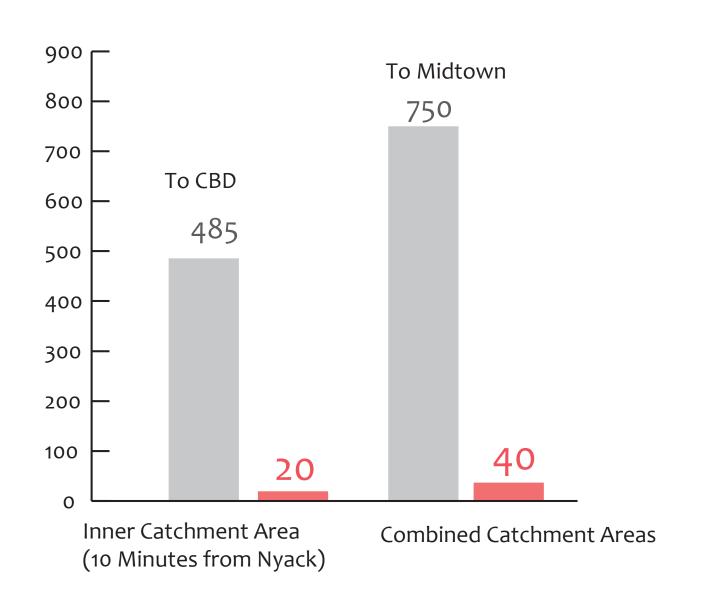
Modes Pier Sites Excursions Parking Sustainability Ridership Projections Feasibility Conclusion Appendix



Ridership Projection: Direct Ferry to Lower Manhattan



Projected Ridership to Lower Manhattan



Approx. 20 - 40 Daily Work Trips

5% Penetration Rate for outer catchment area

20% Penetration Rate for inner catchment area (10 Minutes from Nyack)

Lower Manhattan is not an option at this time due to low ridership

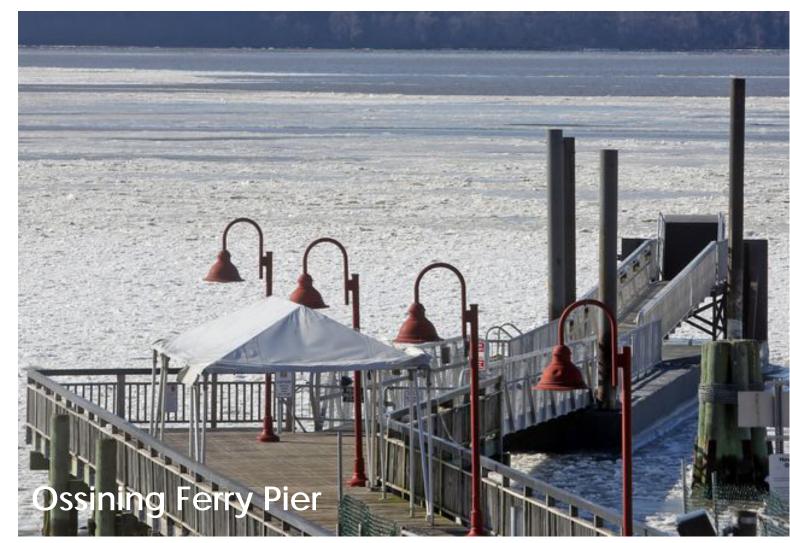
^{*}Lower Manhattan defined as south of the Brooklyn Bridge and Chambers Street

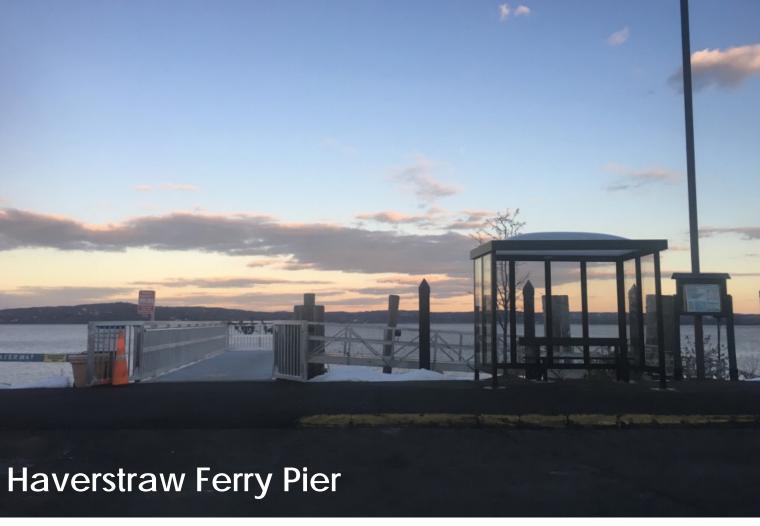
Chapter 12 ECONOMIC FEASIBILITY

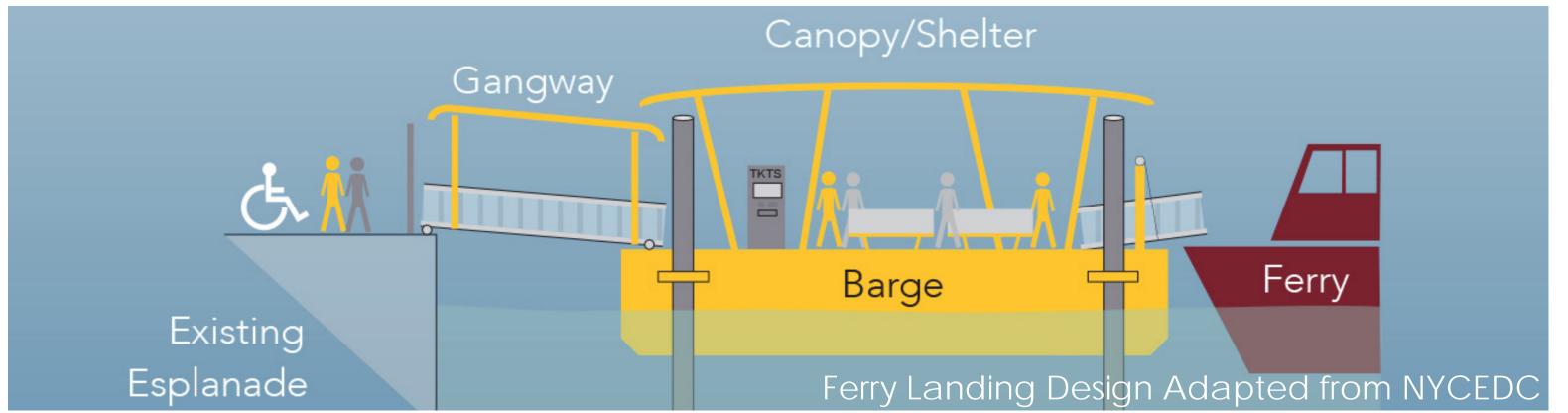
Sites Excursions Parking Sustainability Ridership Economic Feasibility Conclusion Appendix



Financial Feasibility Considerations







Revenue ≥ Costs?

+ Market Assumption - Ticket Revenue

Nyack - Tarrytown: \$18,000-\$20,000/month Nyack - Midtown Manhattan: \$448,000-\$512,000/month

- Non-farebox Funding: "X" Factor
- Capital Costs:
 Pier Cost: Highly Variable
- Operating Costs (for N-TT):
 \$700/h*8h/day = \$5600/day
 \$5600/day*20day/mon = \$112,000/mon

Pier Sites Excursions Parking Sustainability Ridership Economic Feasibility Conclusion Appendix



Feasibility Considerations











Strong political will is essential to introduce new service

MTA is subsidizing Haverstraw - Ossining Ferry, Newburgh - Beacon Ferry services

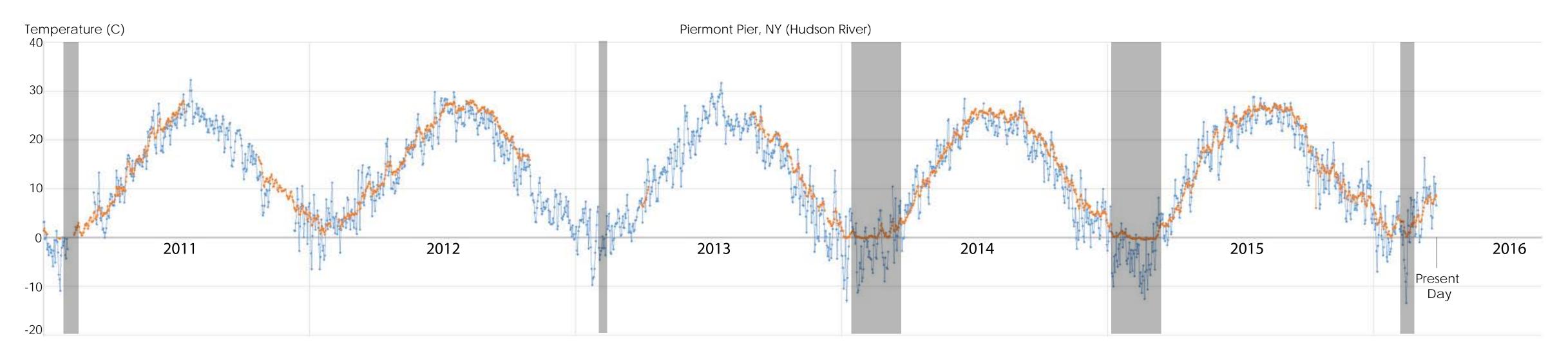
MTA is not proactively seeking to subsidize a new ferry-to-rail service; need to secure grants

Operators would want to study feasibility before introducing a new service

Catchment Profile Modes Pier Sites Excursions Parking Sustainability Feasibility Conclusion Appendix Ridership



Operating Issue - Weather Conditions



Water Temperature Air Temperature Suspended Service

No specific shutdown temperature

Decided by ferry operators

Decision made at least the night before

Substitute buses ready







Research Questions - REVISITED

1. What is the *feasibility* of a ferry service that enhances connectivity between Nyack, Tarryrtown, and the greater Hudson Valley/ New York City region?

2. What are some *implementation* strategies that would address the question above?

Conclusion Appendix Sites Excursions Parking Sustainability Ridership Feasibility



Research Questions - REVISITED

	feasibility	implementation
Ferry Options	Commuter and excursions	Begin with commuter service due to 'known' ridership
Catchment Area	Nyack and lower Rockland County	Promote ferry to Lower Rockland County, not just Nyack
Residential Profile	Interest in additional transit options	
Transit Modes	Time and Cost savings	
Pier Sites	Available options	Consider piers already used by private operators
Excursions	Potential for Nyack as a destination	Develop Nyack's tourism potential
Parking	Proposals and Alternatives	Show how a terrace will benefit Nyack, not just ferry users
Sustainability	Overall negative environmental impact	
Ridership Projections	Commuters to Mid and Lower Manhattan	
Economic Feasibility	Revenue, Costs, Subsidies	Model schedule and fare system based on H-O and N-B

Sites Excursions Parking Sustainability Ridership Feasibility Conclusion Appendix



Conclusions

- 1. A **Nyack-Tarrytown** ferry service is feasible with capital improvements and operating costs subsidized by the MTA.
 - A **parking terrace** is necessary to support a commuter ferry service. The terrace would also serve to accommodate increased demand for parking in Nyack.
- 2. A market exists for a service between Nyack and **Mid Manhattan/39th St.**, which will be further enhanced by additional job development at the nearby Hudson Yards.
- 3. A market can be created for weekend excursions from the 39th St. pier to Nyack and the lower Hudson Valley.
- 4. A market does not exist for a Nyack to **Lower Manhattan** ferry service due to a very low level of Rockland commuters destined for this area now and in the near future.



Chapter 14 APPENDIX

HISTORICAL BACKGROUND EVOLUTION OF FERRIES

CASE STUDIES

SAUSALITO, SAN FRANCISCO, CA
HAVERSTRAW - OSSINING, NY
ROCHESTER - TORONTO, ON
VANCOUVER SEABUS, VANCOUVER, BC
KINGSTON, SEATTLE, WA
WEEHAWKEN FERRIES, NJ - NY
OAKLAND FERRY, SAN FRANCISCO, CA

TRANSIT MODE COMPARISONS OUTCOMES MATRIX

SUSTAINABILITY

PROPOSED NYACK - TARRYTOWN FERRY

SCHEDULE
FARE

HAVERSTRAW - OSSINING FERRY
INFORMATION FROM MTA



Evolution of Ferry Services - Early History



First Half of the Twentieth Century Decline of the ferry

Nyack-Tarrytown ferry ended after opening of Tappan Zee Bridge in 1955

Construction of many bridges/ tunnels resulted in ferry services curtailed by 1957 except SI ferry



Evolution of Ferry Services - Recent History



Late 1980s and Early 1990s New York Waterway & Seastreak, East River Ferries, among others

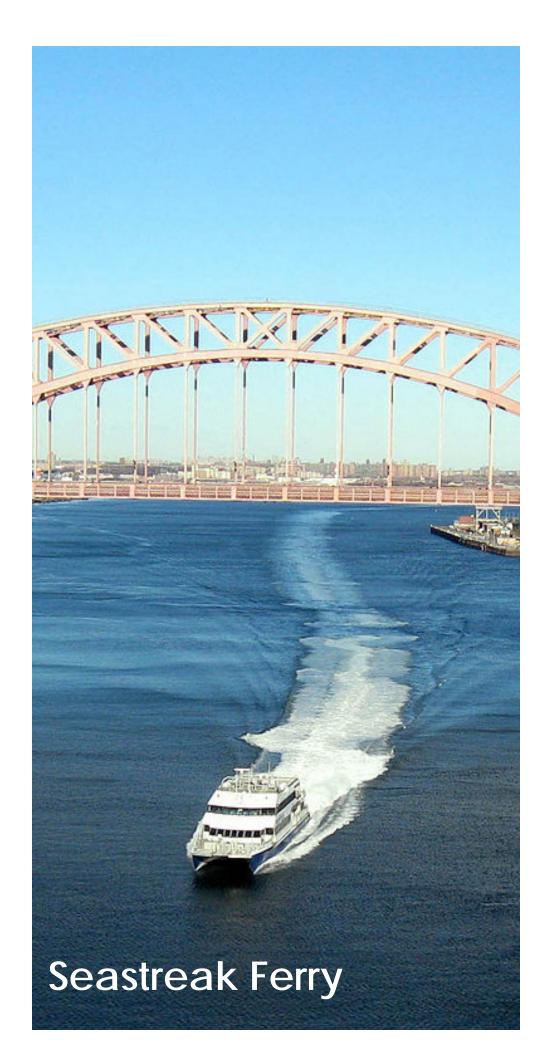
Ferry services between N.J. and NYC

More recent ferry services across the East River between Manhattan/ Brooklyn/Queens Haverstraw - Ossining Newburgh - Beacon

Early 2000s and Later Ferries as tools for resiliency Hurricane Sandy



Evolution of Ferry Services - Present Day





Staten Island Ferry

Private Ferries

New Jersey Terminal Manhattan Terminal Brooklyn & Queens Terminals East River Ferry **Baseball Ferries**

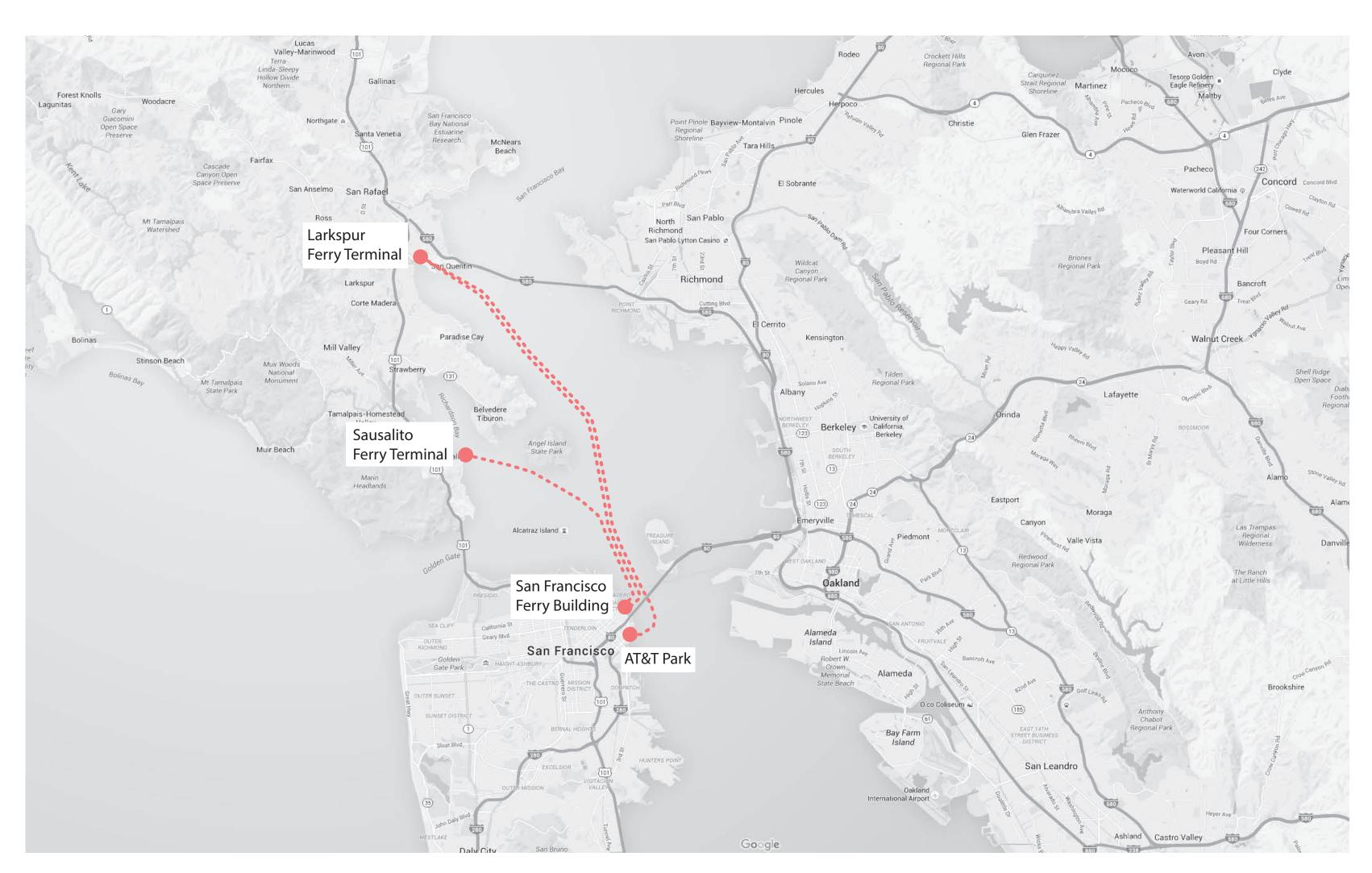
Ferry Operators

Sightseeing Tours Commuter

e.g. New York Waterway NY Water Taxi Seastreak Hornblower



CS1: Sausalito, San Francisco, CA



Like Nyack: an artsy community

"Wrong side of the river" for commuting

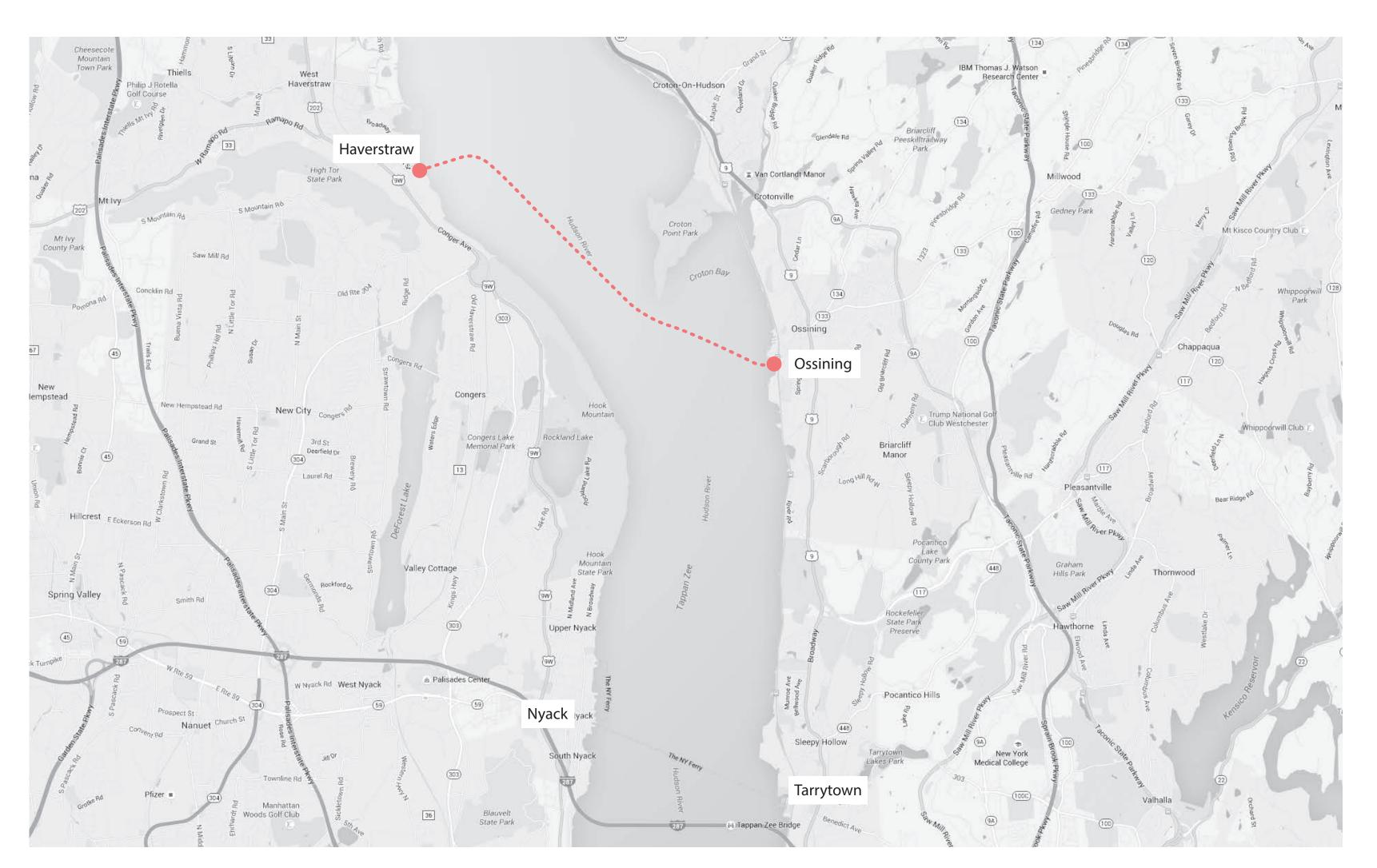
For commuters and tourists who walk/bike across the bridge

Much higher daily ridership than projected for Nyack-Tarrytown

Fare is subsidized directly by bridge tolls



CS2: Haverstraw - Ossining, NY



High-speed commuter ferry across the Hudson River

Accessible parking

Schedule integrated with rail

Subsidized by MTA as extension of Metro North service

Best example for implementation



CS3: Rochester - Toronto (Failed)



Much longer than Nyack to Lower Manhattan

More direct, less circuitous route than driving

Private operator

Must know the market Mis-estimated demand for travel and affluence level

Ensure a solid economic plan

Prepare for contingencies Fuel costs



Appendix - Vancouver SeaBus, Vancouver, BC



One-route passenger ferry for commuters, leisure, and tourism

Comparable distance with Nyack-Tarrytown

Successful in great part due to its 15-min turnaround

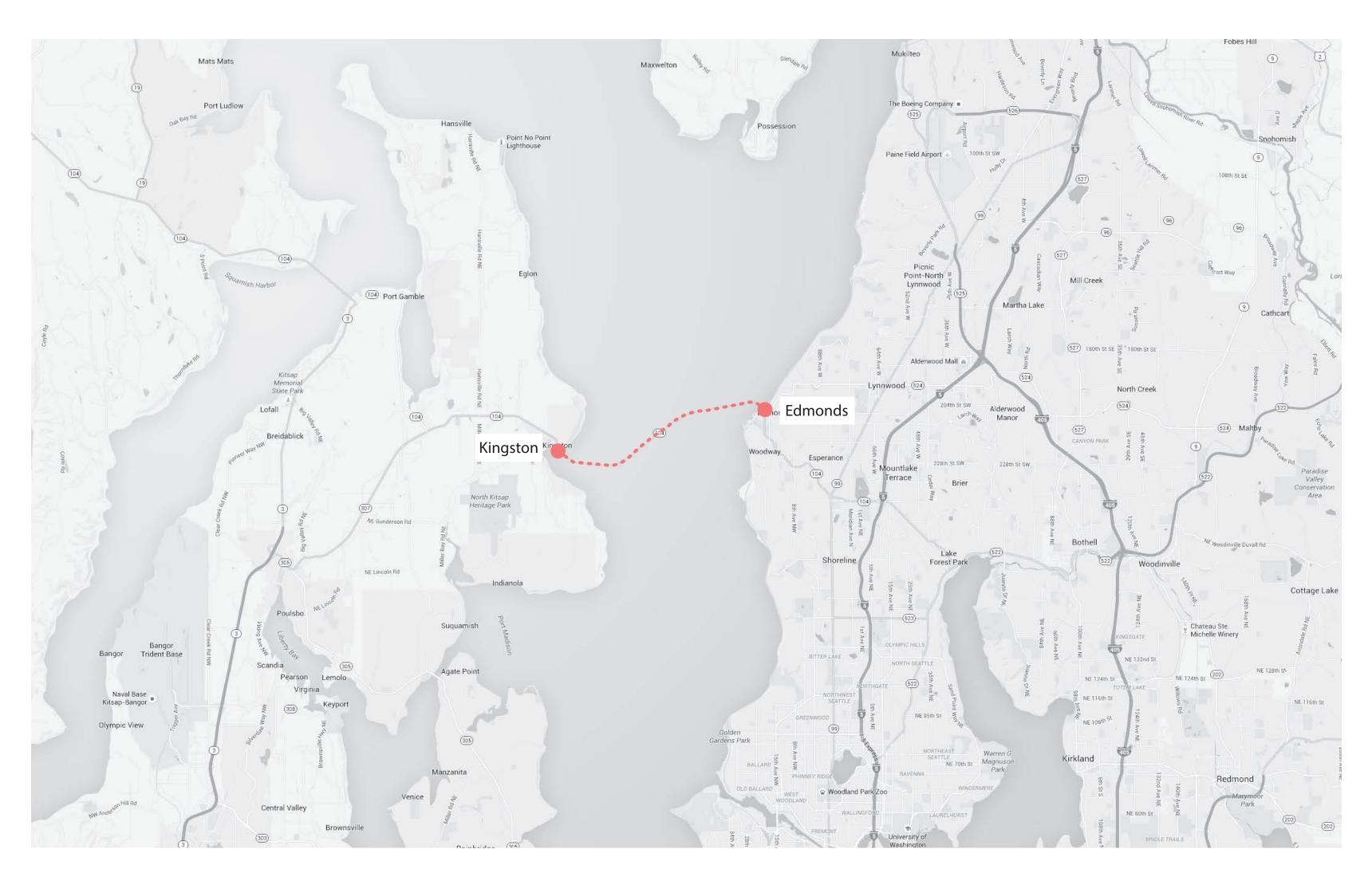
High connectivity with bus and rail at both ends

Owned by the same providers of bus and rail services

Part of a greater regional plan



Appendix - Kingston, Seattle, WA



Intergovernmental Cooperation: Federal, State, Local

Route Identification

Stakeholders

Questions addressing ridership, commuter destination, and connectivity



Appendix - Weehawken Ferries, NJ - NY



Port Imperial ferry terminal and Lincoln Harbor close to each other

One of the Port Imperial routes overlaps with Lincoln Harbor ferry

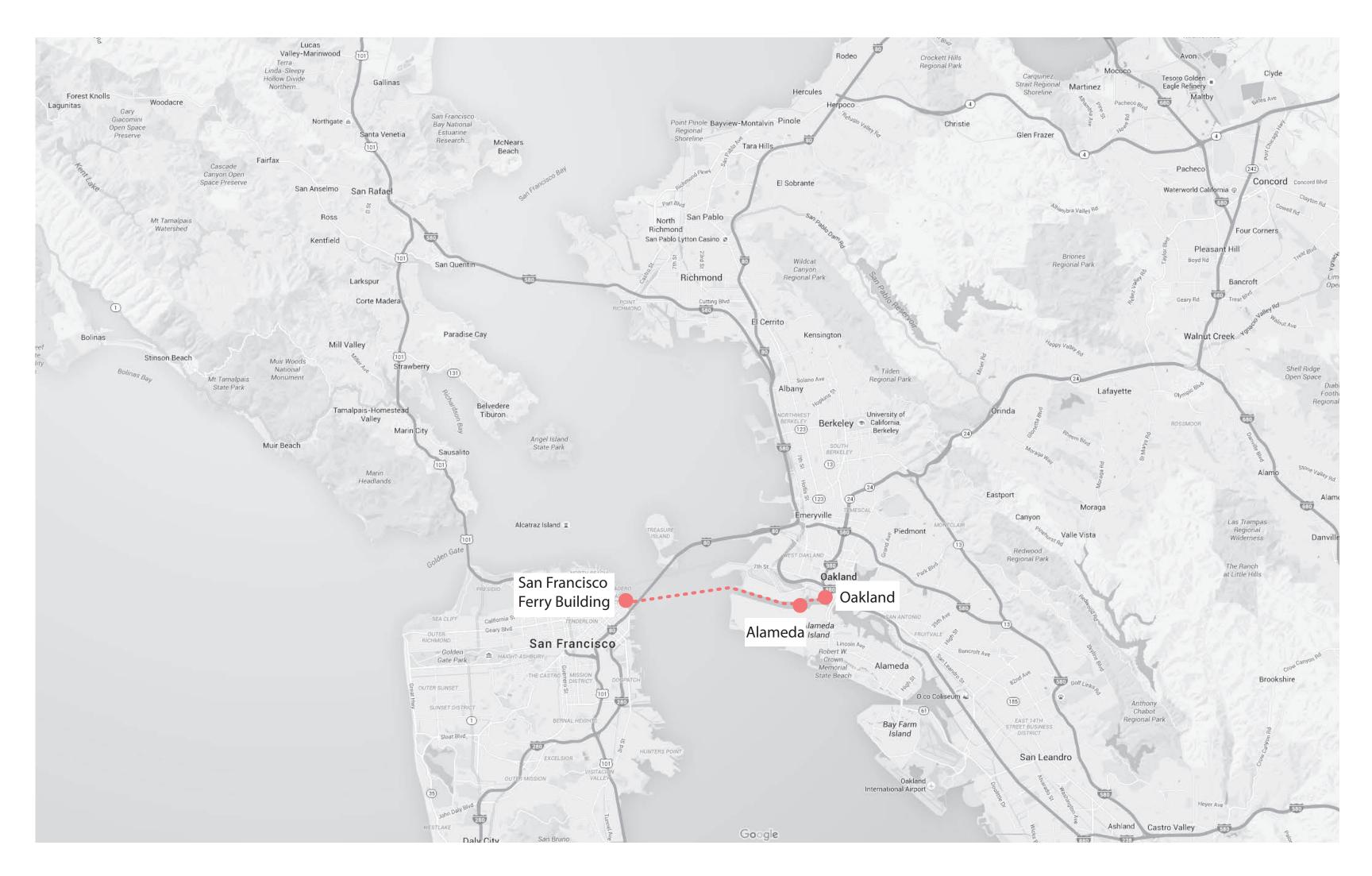
The different time schedules and destinations make the ferries coexist

Only Port Imperial provides a 24/7 parking structure

Shuttle bus between two harbors is helpful for each of the ferry lines



APPENDIX: Oakland Ferry, San Francisco, CA



The 6-mile-distance trip is shorter than Nyack - Manhattan ferry route, but they have the similar purpose to connect regional center and surrounding counties in a metropolitan area

Encourage public transportation: add more transit choices

Mixed-use parking structure adds to the possibility of waterfront's future prosperity

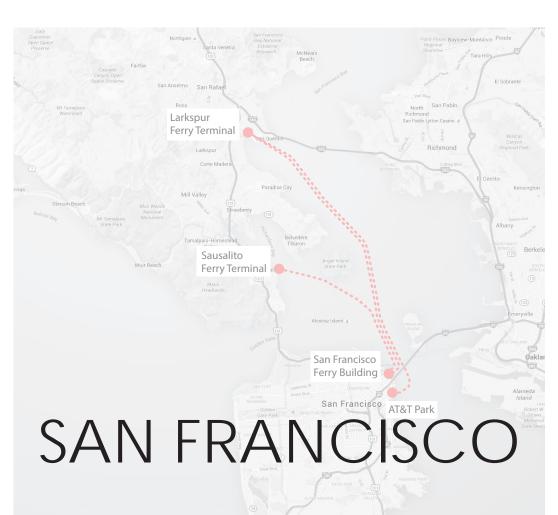


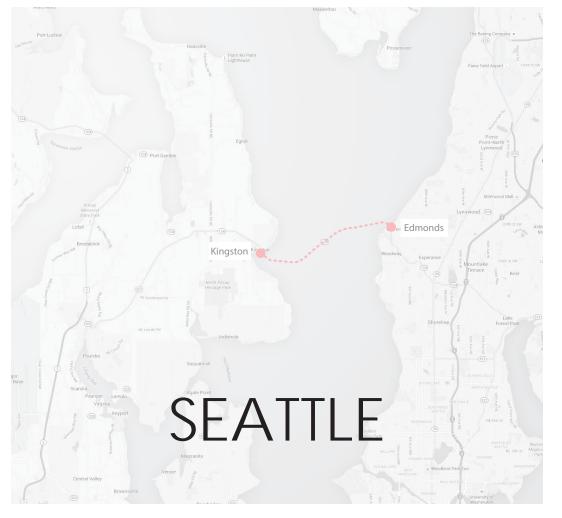
Case Study Takeaways













Parking Structure

Shuttle Bus

Know the Market

Economic Plan + Contingency

Increased Transit Choices

Bridge Toll Subsidies

Vertical Cooperation

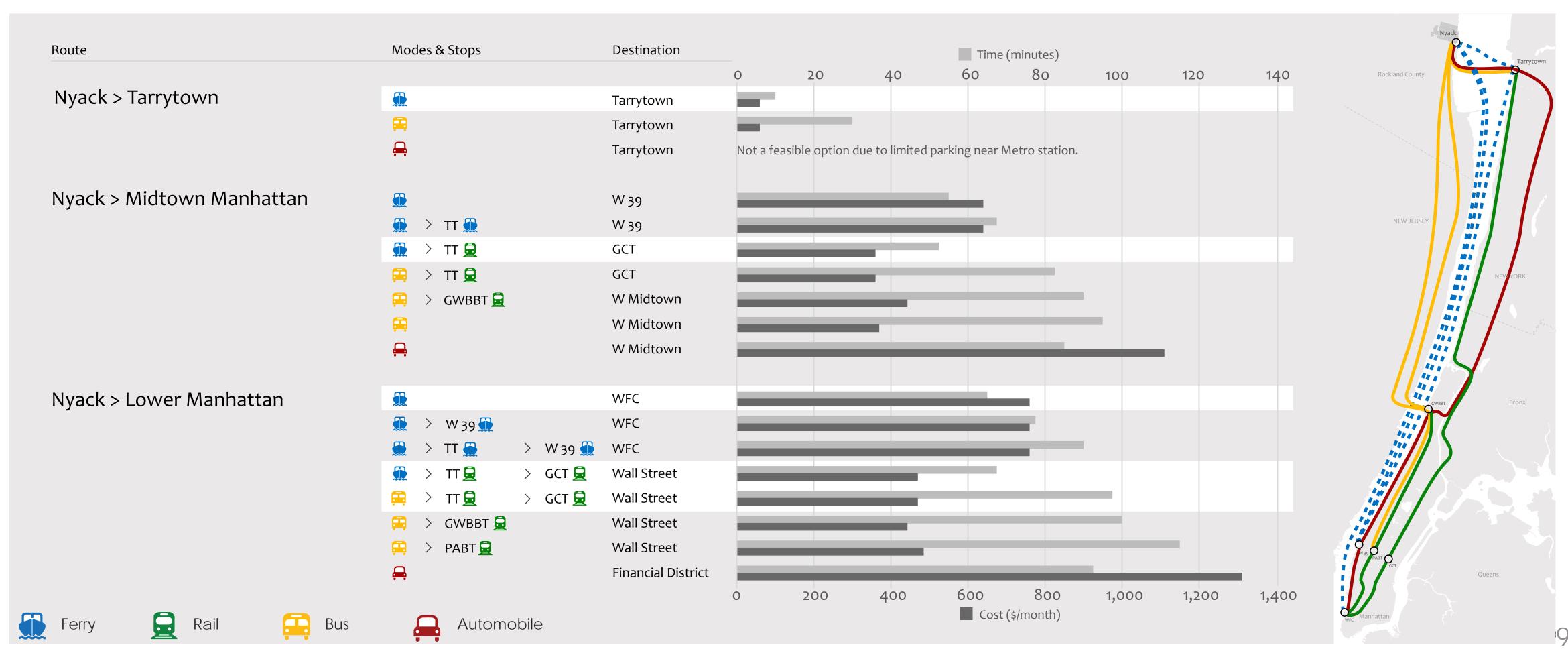
Route Identification

Turnaround Time

Connectivity

Consolidated System

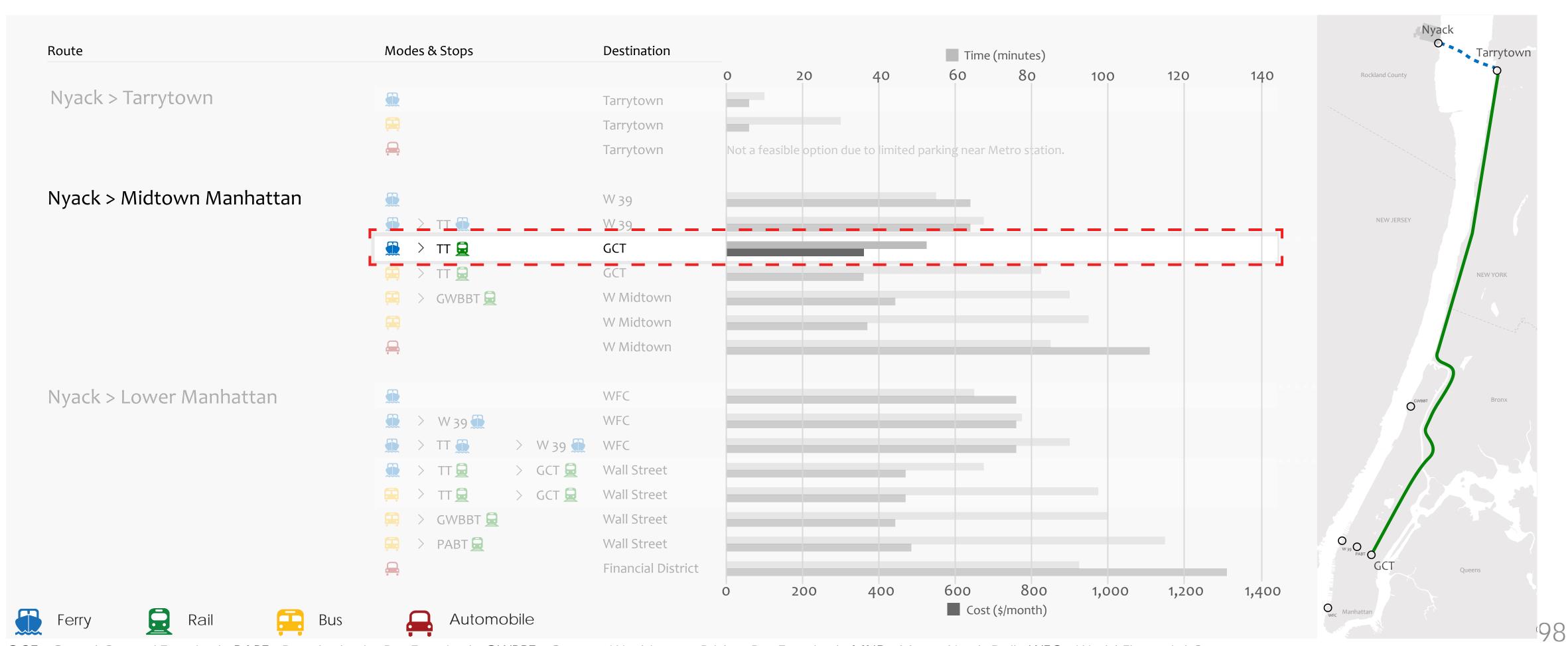




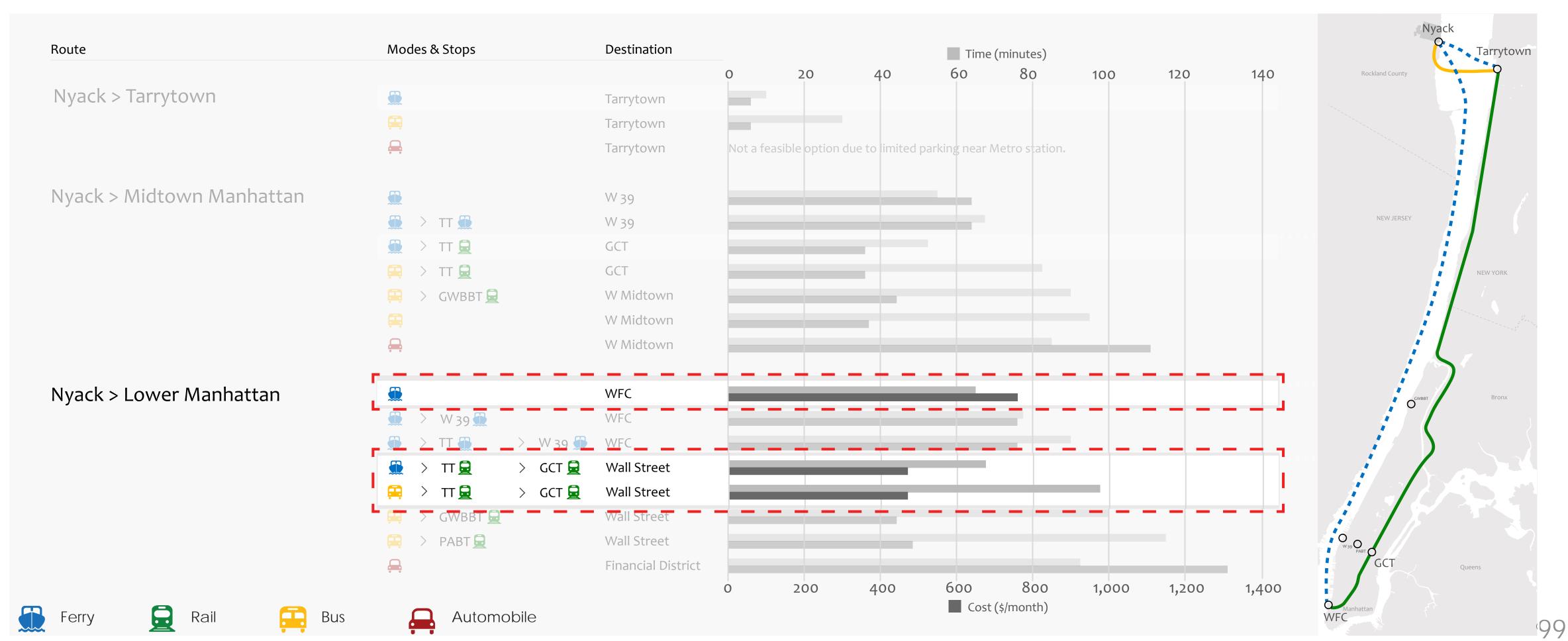






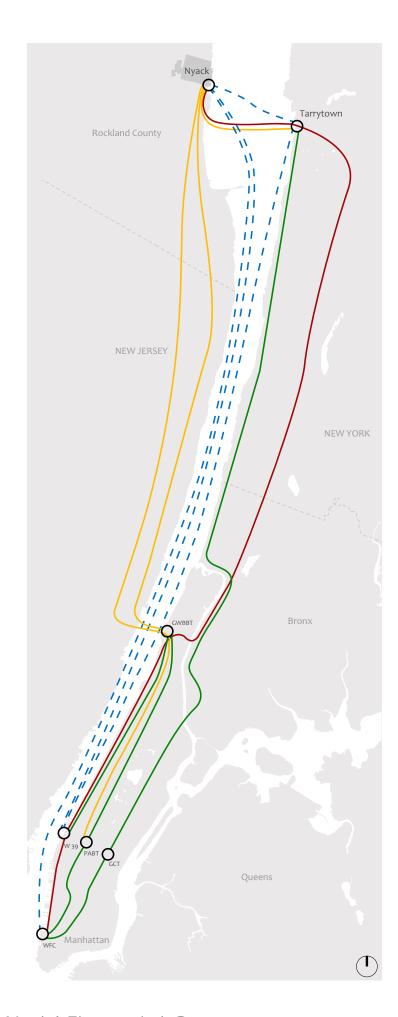








Origin-Destination	Mode	Time (Minutes)	Cost (\$/month)
Nyack-Tarrytown	Ferry	15	60
	TZx Bus	25-35	60
	Private Auto	Not a feasible option due to limited pa	rking near MNR station
Nyack-Midtown Manhattan	Ferry → W 39th St. Ferry Terminal directly	55	640
	Ferry → W 39th, stopping at Tarrytown	65-70	640
	Ferry \rightarrow MNR \rightarrow GCT	60-65	360
	TZx Bus \rightarrow MNR \rightarrow GCT	75-90	360
	Private Bus Line into GWBBT → Subway	80-100	443
	Private Bus Line → PABT	70-120	370
	Private Auto → West Midtown	60-110	1,110
Nyack-Lower Manhattan	Ferry → WFC Ferry Terminal directly	65	760
	Ferry → WFC, stopping at W 39th	75-80	760
	Ferry → WFC, stopping at Tarrytown and W 39th	85-95	760
	Ferry \rightarrow MNR \rightarrow GCT \rightarrow Subway down to Wall Street	85-95	475
	TZx Bus \rightarrow MNR \rightarrow GCT \rightarrow Subway down to Wall Street	90-105	475
	Private Bus Line into GWBBT → Subway down to Wall Street	90-110	443
	Private Bus Line into PABT → Subway down to Wall Street	90-140	485
	Private Auto → Financial District	65-120	1,322
Tarrytown-Midtown Manhattan	Ferry → W 39th St. Ferry Terminal directly	55	610
	MNR → GCT	40-45	300
	Bus Line to Broadway at W 242 St→ Subway	110-120	116.5
	Private Auto → West Midtown	55-75	930
Tarrytown-Lower Manhattan	Ferry → WFC Ferry Terminal directly	60	720
	Ferry → WFC, stopping at W 39th	70-75	720
	MNR → GCT → Subway down to Wall Street	70-80	416.5
	Bus Line to Broadway at W 242 St → Subway down to Wall Street	130-140	116.5
	Private Auto → Financial District	55-100	1,192





Value Point: 1 = Low 2 = Medium 3 = High

Origin-Destination	Mode	Time (Minutes)	Cost (\$/month)	Time Points	Cost Points	Total Points	Rank
Nyack-Tarrytown	Ferry	15		3	3	6	1
	TZx Bus	25-35	60	1	3	4	2
	Private Auto	Not a feasible option due to limited pa	rking near MNR station			0	3
Nyack-Midtown Manhattan	Ferry → W 39th St. Ferry Terminal directly	55	640	3	2	5	2
	Ferry → W 39th, stopping at Tarrytown	65-70	640	2	2	4	4
	Ferry \rightarrow MNR \rightarrow GCT	60-65		3	3	6	1
	TZx Bus \rightarrow MNR \rightarrow GCT	75-90	360	2	3	5	2
	Private Bus Line into GWBBT → Subway	80-100	443	1	2	3	6
	Private Bus Line → PABT	70-120	370	1	3	4	4
	Private Auto → West Midtown	60-110	1,110	2	1	3	6
Nyack-Lower Manhattan	Ferry → WFC Ferry Terminal directly	65		3	2	5	1
	Ferry → WFC, stopping at W 39th	75-80	760	2	2	4	2
	Ferry → WFC, stopping at Tarrytown and W 39th	85-95	760	2	2	4	2
	Ferry \rightarrow MNR \rightarrow GCT \rightarrow Subway down to Wall Street	85-95		2	3	5	1
	TZx Bus \rightarrow MNR \rightarrow GCT \rightarrow Subway down to Wall Street	90-105		2	3	5	1
	Private Bus Line into GWBBT → Subway down to Wall Street	90-110	443	1	3	4	2
	Private Bus Line into PABT → Subway down to Wall Street	90-140	485	1	3	4	2
	Private Auto → Financial District	65-120	1,322	2	1	3	8
Tarrytown-Midtown Manhattan	Ferry → W 39th St. Ferry Terminal directly	55	610	3	2	5	2
	$MNR \rightarrow GCT$	40-45		3	3	6	1
	Bus Line to Broadway at W 242 St→ Subway	110-120	116.5	1	3	4	3
	Private Auto → West Midtown	55-75	930	2	1	3	4
Tarrytown-Lower Manhattan	Ferry → WFC Ferry Terminal directly	60		3	2	5	1
	Ferry → WFC, stopping at W 39th	70-75	720	2	2	4	2
	MNR → GCT → Subway down to Wall Street	70-80	416.5	2	3	5	1
	Bus Line to Broadway at W 242 St → Subway down to Wall Street	130-140	116.5	1	3	4	2
	Private Auto → Financial District	55-100	1,192	2	1	3	5

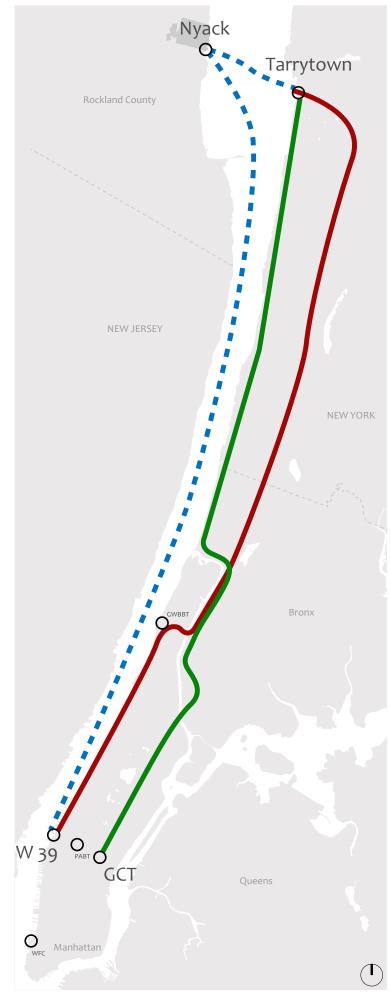


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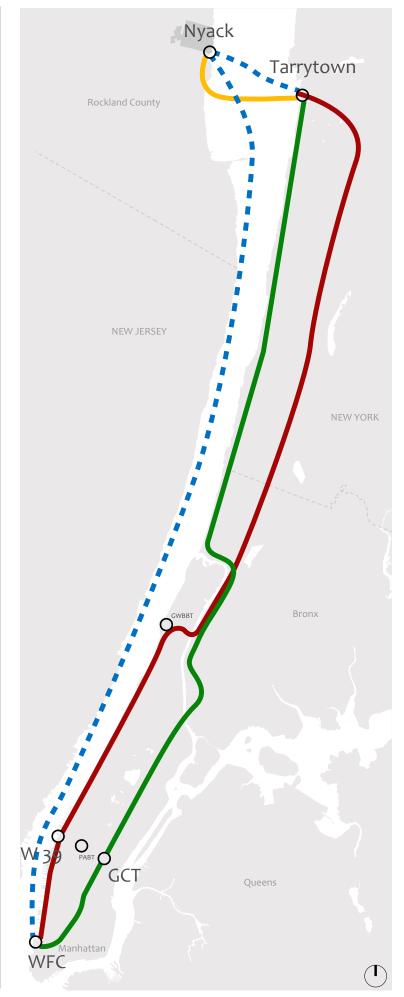


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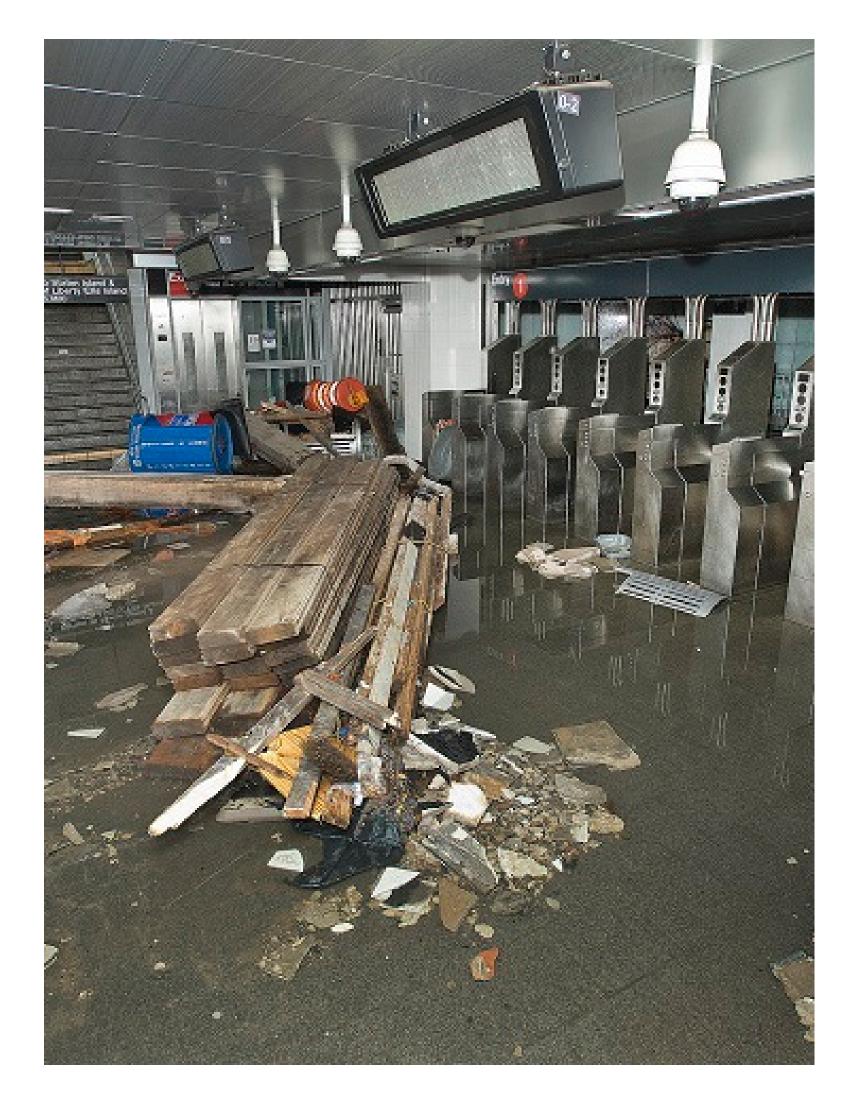
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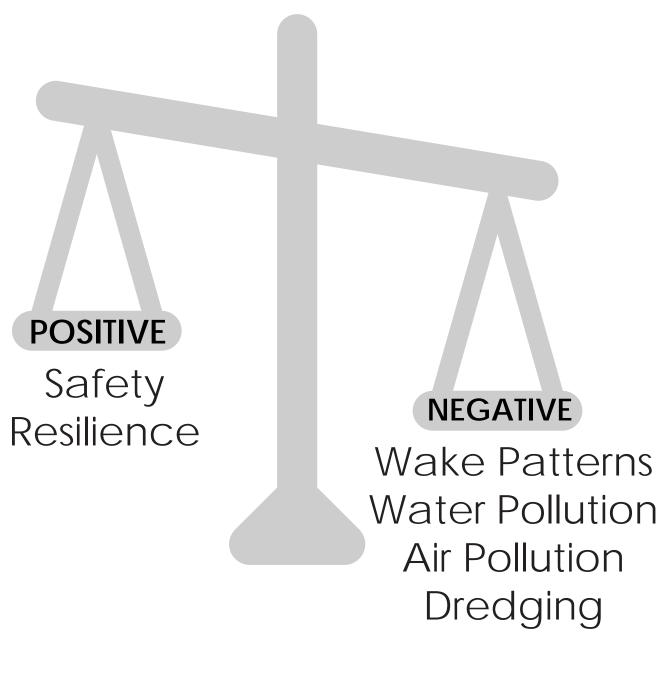


GCT - Grand Central Terminal PABT - Port Authority Bus Terminal GWBBT - George Washington Bridge Bus Terminal MNR - Metro-North Rail WFC - World Financial Center



Environmental Impacts

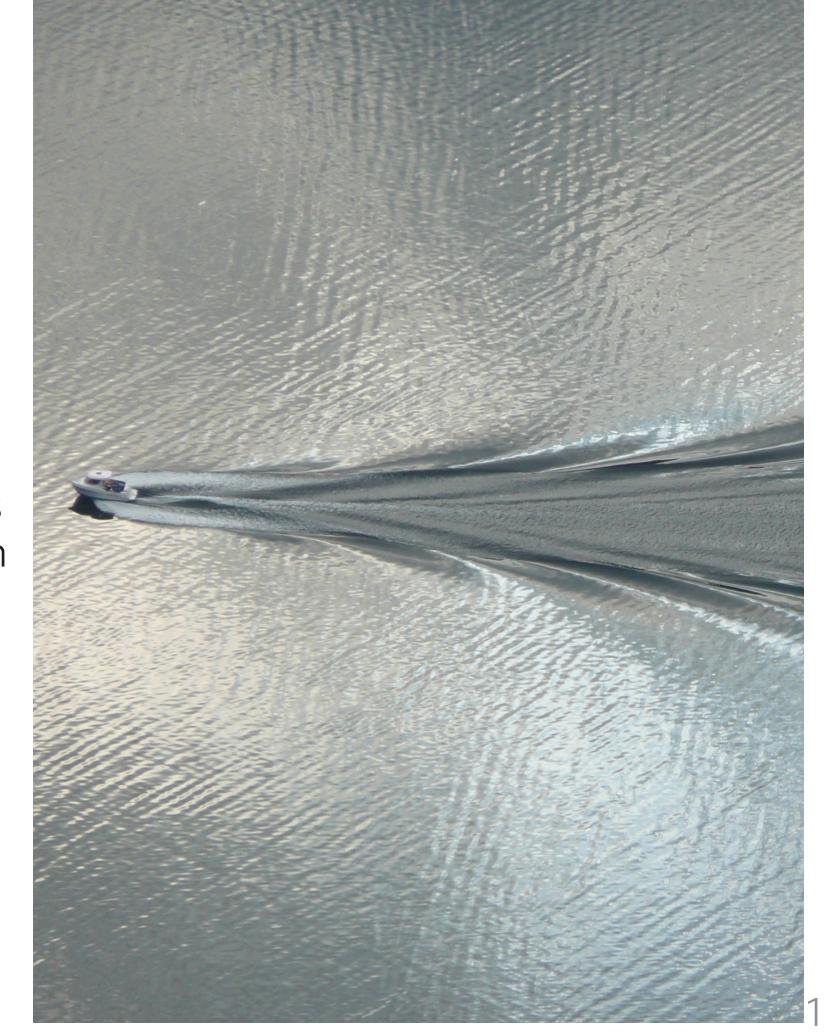




Emissions

Ferry v. automobile/bus

4,360 BTU v. 4,342 BTU (per passenger miles)





Proposed Ferry Schedule

Proposed Nyack-Tarrytown Ferry Schedule

Weekday	y Schedule	AM
	,	2 4. 4 .

Weekday Schedule PM

Nyack	Tarrytown	Nyack	Tarrytown
6:00 AM	6:15 AM	5:15 PM	5:00 PM
6:30 AM	6:45 AM	5:50 PM	5:35 PM
7:00 AM	7:15 AM	6:15 PM	6:00 PM
7:30 AM	7:45 AM	6:45 PM	6:30 PM
8:00 AM	8:15 AM	7:20 PM	7:05 PM
8:30 AM	8:45 AM	7:50 PM	7:35 PM
9:00 AM			8:45 PM



Proposed Ferry Fare

Proposed Nyack-Tarrytown Ferry Fare

One Way Fare	
	\$ 3.00
Child 5 and under	
Two Children ride free for every paying adult	Free
Child 6 - 11	\$ 1.50
Senior 62 +	\$ 1.50

Multi-Trip Fares	
10-Trip	\$ 27.00
20-Trip	\$ 48.00
UniTicket Monthly Pass for Nyack-TarryTown Ferry/Metro-North train combination	\$ 345.00
Special Fare	
Bike Surcharge	\$ 1.00



Haverstraw -Ossining Ferry Information from MTA

- Haverstraw Pier Cost: approximately \$1 million
- Operating Costs Estimate: \$700/h * 8h/day = \$5,600/day
- Number of annual operating days varies from year to year
- Approximate Round-Trips: 257
- Subsidy Political Trade-off

Daily Rockland-to-NYC commuters: 15,100

Penatration rate w/ferry: 1.7%

Approx Daily Round Trips = 15,100*1.7% = 256.7