

The Public and Private Ferry Systems of New York

Among all the public transportation modes being celebrated as the headache-free alternative to gridlock commuting, the ferry is generally not the first to come to the public's mind. High-speed rail, carpool networks, and express busses might enjoy more visibility, but ferry service is playing an increasingly important role in many big cities across the country. In fact, ferry ridership has achieved a 50-year high across the US, as 134 million riders a year take to the water to get to work and play (Weisbrod and Lawson 2003). In the New York City Metropolitan area (the five boroughs and parts of southern New Jersey) alone, nearly 40 million passengers take advantage of public and private ferry service each year. In addition to every day commuting, the dependability of ferry transit was perhaps most appreciated on and after September 11, 2001, when over 300,000 people were evacuated from the city via ferry in one day, and thereafter when ferries carried the tens of thousands of commuters diverted from the destroyed World Trade Center transit hub. Though, unsurprisingly, convenience and speed are primary factors in transportation decisions, a 1999 survey of the NYC ferry-riding public found that 19% of riders choose the ferry because it is "enjoyable." This paper will discuss the scope of New York's ferry service, recent investments in its infrastructure, and the challenge of reducing ferry emissions within the world's largest ferry system.

New York's ferry system is comprised of the public Staten Island Ferry and five private ferry operators. The Staten Island Ferry came into being when Staten Island joined New York in 1898. Seven years later, the city took over operation and the ferries have been running like clockwork ever since. Operating 24 hours a day, 7 days a week, 365 days a year, the ferry has an average on time percentage of 96% (highest of all Big Apple transit modes), although last year it dropped to 88% following implementation of stricter security requirements (MMR 2005). In 1897, fare was 5 cents, and though it increased periodically for the next century, in 1997 the fare was eliminated entirely to compete with express busses and to alleviate fare strain on Staten Islanders. Estimates vary, but every year, the Staten Island Ferry fleet carries approximately 19 million

passengers along the 5.2 mile route (see Figure 1), making it the largest ferry operation on a single route anywhere in the world (NYDOT). Seven vessels carry those passengers, with two vessels in reserve. This year, three new, state-of-the-art ships were commissioned, the Guy V. Molinari (see Figure 2), the John J. Marchi, and the Spirit of America, retiring aging vessels that had been in service for forty years. These new ferries can hold up to 4440 passengers each. On an average weekday, the fleet carries over 70,000 passengers across the harbor on 104 daily trips (www.siferry.com). This is a significant portion of the Manhattan-bound commuting public as compared to the 288,000 who ride the Long Island Railroad each day

In contrast to the steadfast, century-long tradition of the Staten Island Ferry service, private ferry companies have become an important link in the transit network of the New York/New Jersey region. There were no private ferry companies operating in the New York harbor before 1985, but in 20 years NYWaterway has become the largest private ferry venture in the country. Now there are 4 independent ferry operators carrying another 20 million passengers a year: NYWaterway, SeaStreak, New York Water Taxi, and Liberty Park Water Taxi (see Figure 3). Private ferry ridership sky-rocketed with the destruction of the World Trade Center transit hub on 9-11, and with the traffic restrictions implemented afterwards. Figure 4 shows the average weekday ridership of private ferries. In the six months that followed September 11th, 2001, NYWaterway's ridership increased from 32,000 daily passengers to 55,000. Though the daily ridership decreased significantly this year with the reopening of the PATH station in lower Manhattan, investments in new terminals and vessels are expected to draw a steadily increasing share of commuters.

The value that New York and New Jersey municipalities place on the ferry system can be inferred from the amount of money and effort being invested in improving the ferry infrastructure. Among New York DOT's twelve critical objectives outlined in its annual report, are the following:

- Expand and improve private ferry service
- Maintain and improve the Staten Island Ferry operation

Spending hundreds of millions of dollars on ferry expansion projects suggests that deputy mayor of economic development and rebuilding, Danial Doctoroff, means is when he says "Ferry service is a big priority for us... We don't, in the short term, have a lot of

options for getting people to Lower Manhattan faster than we can with ferries” (Dunlap 2002). The city has recently completed construction on the Staten Island Ferry terminals and has plans to renovate and expand terminals on both the east and west sides of Manhattan. The Whitehall St. terminal on the Manhattan side underwent an extreme facelift that will enhance the riders’ experience, and better service the growing number of ferries (see Figure 5 and 6). And on the Staten Island side, the St. Georges terminal has been transformed into a modern transit hub. The \$130 million spent on the reconstruction is a huge investment and officials expect payoffs in both the number of commuters and the number of tourists visiting the station.

In updating the 190,000 sq ft terminal, the city is making a statement by focusing on strategies to make the building “green.” The reconstruction was in large part limited to its previous footprint by existing transportation infrastructure. The terminal had to maintain two open ferry slips at all times and service 60,000 passengers each day, but contractors also could not bury pylons due to delicate sub-surface highway structures. The architects were most innovative, however, in their approach to design and technology. In fact, the building may be the first municipal transportation hub to qualify for Leadership in Energy and Environmental Design certification from the U.S. Green Building Council (ENR 2005). The certification process is a long checklist of green building practices that architects must meet, including energy conservation practices, use of eco-friendly materials, and so forth. Among the features that the St. George terminal can boast are green roof that collects rainwater to reduce runoff and distributes the collected water to a 18,000 sq ft roof garden on a nearby building. Also, the roof is slanted to maximally collect sun in the winter to aid in heating, and to shade the roof in summer to reduce cooling costs. The layout of the terminal has also been designed to facilitate intermodal transit, such that patrons will be more likely to take public transportation to the terminal (ENR 2005). All this with a stunning view of New York harbor.

In addition to the Staten Island Ferry terminals, the city is also in the process of planning, development, and/or construction on several other ferry terminals throughout the five boroughs. The federal government has committed over \$78 million to help New York repair its damaged transportation infrastructure, \$64 million of which has already

been delivered (Jacobs 2001). In August of 2004, the administration added a \$9.5 million aid package to expand ferry infrastructure on the east side of Manhattan. The money will be spent renovating the 90th Street terminal to expand ferry service to the east side. In addition, new docks and passenger areas will be built at the 34th Street terminal. On the other side of the island, a \$30 million, brand-new West Midtown Ferry Terminal (see Figure 6) is being built on Pier 79 at W. 34th St. Further downtown, a new floating terminal is being planned for the World Financial Center. On the New Jersey side, new projects are being developed in Weehawken and Hoboken. In all, nearly \$300 million has been earmarked for ferry service projects in the region (Dunlap 2002).

Despite the rising support for ferry transit, there remain challenges to the industry. Recent studies have determined that the amount of pollution coming from commercial marine vessels may offset any environmental benefits gained from the miles not driven by the ferry passengers. Until recently, there was little monitoring of ferry pollution and no regulation of their emissions. A recent inventory of emissions from all marine vessels operating in the area found that ferries contribute approximately 19% of nitrogen oxides and 12% of particulate matter, among other pollutants (see Figure 7) (Winebrake et al 2005). In fact, according to a 2002 study conducted by James Corbett and Alex Farrell, “Under all reasonable assumptions, we show that diesel-powered ferries without emissions controls will produce more nitrous oxides and PM, but less carbon monoxide per passenger-trip than if those people commuted by car under current conditions. Exposure to particulate matter can pose a serious health threat to passengers, and nitrogen oxides contribute to acid precipitation. In a study of public transportation and public health conducted in Hong Kong, ferry transit was found to be among the worst in terms of exposure to PM (Chan et al 2002). It is clear that the industry needs to address this issue, particularly if the system is to expand as the investment discussed above would suggest.

After commissioning a comprehensive survey of marine vessel emissions, New York is committed to tackling the issue the head-on. The majority of ferry vessels are relatively old and therefore do not take advantage of technological developments that make modern engines run cleaner. Replacing these older engines was part of the inspiration to buy the three new Staten Island ferries mentioned earlier. In 2003, the

Federal Transit Authority added \$5 million to a \$1.8 million new program developed by New York's DOT and the New York State Energy Research and Development Authority to investigate ways to reduce emissions by the private ferry operators (Kennedy 2003). The program aims to cut emissions by 75% to 90%. This translates to a reduction of 150 tons of nitrogen oxides and a 60 ton reduction in particulate matter per year (Kennedy 2003). Fortunately, recent research has identified ways in which municipalities might reduce emissions from ferries in the most cost-effective ways. Winebrake et al (2005) recently published an extensive paper in which they identify a suite of possible strategies to mitigate ferry emissions. They then analyze methods and costs by which an agency might employ these strategies and create a model to guide actual implementation. Regulators may either begin with a target reduction measure and predict the cost of implementation, or they may start with a limiting budget and identify a reasonable target goal. Technological strategies aside, Winebrake et al identify the political tools, including emissions taxes, emissions trading systems, and old equipment buy-out programs to achieve the desired results. Corbett and Farrell take a similar approach and identify ways in which low-emission technology applied to other modes of transit (low emission busses, for example) can be employed for ferries.

With the millions upon millions of dollars pouring into the ferry infrastructure in New York harbor, it is clear that officials see a major role for water transit in the future. The dependability and popularity of the Staten Island Ferry has sustained it for 100 years. The vital role that ferries played during and after the terrorist attacks in New York, as well as during the blackout, has reminded everyone of their worth. As NYC planners map out the future of the ferry system, Weisbrod and Lawson (2003) have identified goals for successful ferry development. Among them are:

- integrate routes into existing transportation planning;
- integrate with land-side connections;
- be designed to maximize regional economic development; and
- be designed to maximize environmental benefits.

As we have seen in the above discussions, the New York ferry system, both public and private measure up well against these goals, and will likely see continued growth and success.

Accompanying Images

Figure 1: Sat image of New York Harbor with SIF route. Source: Wikipedia.com.



Figure 2: Guy V. Molinari ferry, commissioned in 2005. Source: www.siferry.com



Figure 3: Existing private and public ferry routes. Source: NY/NJ Port Authority.



Figure 4: Weekly ridership on private ferries. Source: NYDOT.

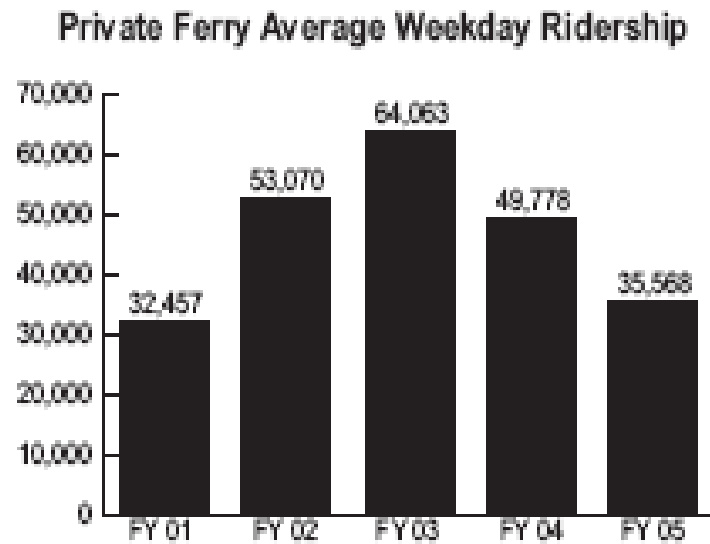


Figure 5: Renovated Whitehall terminal of SI Ferry. Source: www.siferry.com Figure 6: Same



Figure 7: West Midtown Ferry Terminal.



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