

Traffic Data Collection and Analysis

Ferry Traffic Trends

Ferry operating statistics have been reviewed to identify trends since the previous Nantucket Central Business District Study in 1977. Statistics for the year 2007 were provided by the ferry operators and compared to 1976 data. The results are summarized in Table 1, which reports trends in passenger, vehicle, and bicycle traffic. This table reports traffic carried to Nantucket. Traffic departing the island is expected to be of comparable size.

Passengers

The Steamship Authority was the only ferry operator in 1976. The Hy-Line ferry began operations in 1972, and Freedom Cruises from Harwich were initiated in 1995. Total passengers carried during the extended summer season (April – October) increased from about 148,000 in 1976 to around 404,000 in 2007, an increase of 172 percent. This can be compared to an increase in year-round population on the island of about 130 percent during that time (about 4,430 in 1976 to about 10,240 in 2006). Total passenger traffic increased by an average of 3.3 percent per year.

Passenger traffic on the Steamship Authority ferries increased by about 56 percent, or 1.4 percent annually during this period.

Another trend is that passenger traffic in the shoulder season months (April, May, and October) increased substantially more than the average. This suggests that the summer season is expanding.

**Table 1
Passengers Carried to Nantucket**

Year		April	May	June	July	August	Sept.	Oct.	Total
1976	Steamship Authority	7,186	10,968	23,223	35,959	40,363	20,186	10,451	148,336
2007	Steamship Authority	14,754	24,952	37,881	49,063	52,343	29,638	22,276	230,907
	HyLine Ferry	8,696	15,303	21,268	35,600	39,057	23,459	17,731	161,114
	Freedom Cruises	0	417	1,243	3,847	4,479	1,609	209	11,804
	Total	23,450	40,672	60,392	88,510	95,879	54,706	40,216	403,825
Percent Increase	Steamship Authority	105%	127%	63%	36%	30%	47%	113%	56%
	Total	226%	271%	160%	146%	138%	171%	285%	172%
Annual Percent Increase, 1976 - 2007							SSA Passengers		1.4%
							Total Passengers		3.3%

**Vehicles Carried to Nantucket
by the Steamship Authority**

Year		April	May	June	July	August	Sept.	Oct.	Total
1976	Cars	1,436	1,924	3,335	3,536	3,348	2,385	1,724	17,688
	Trucks	511	542	686	614	622	451	454	3,880
	Total	1,947	2,466	4,021	4,150	3,970	2,836	2,178	21,568
2007	Cars	2,486	3,583	5,395	5,625	5,277	2,792	2,174	27,332
	Trucks	2,155	2,650	2,452	2,366	2,115	1,988	1,988	15,714
	Total	4,641	6,233	7,847	7,991	7,392	4,780	4,162	43,046
Percent Increase	Cars	73%	86%	62%	59%	58%	17%	26%	55%
	Trucks	322%	389%	257%	285%	240%	341%	338%	305%
	Total	138%	153%	95%	93%	86%	69%	91%	100%
Annual Percent Increase, 1976 - 2007							Cars		1.4%
							Trucks		4.6%
							Total		2.3%

Bicycles Carried to Nantucket

Year		April	May	June	July	August	Sept.	Oct.	Total
1976	Steamship Authority	360	928	1,702	2,783	3,565	1,262	447	11,047
2007	Steamship Authority	146	611	1,396	1,895	2,534	1,016	434	8,032
	HyLine Ferry	50	263	574	1,217	1,560	537	196	4,397
	Total	196	874	1,970	3,112	4,094	1,553	630	12,429
Percent Increase	Steamship Authority	-59%	-34%	-18%	-32%	-29%	-19%	-3%	-27%
	Total	-46%	-6%	16%	12%	15%	23%	41%	13%
Annual Percent Increase, 1976 - 2007							Bicycles on SSA		-1.0%
							Total Bicycles		0.4%

Sources: 1976 - Nantucket Central Business District Circulation and Parking Study, 1977
2007 - Ferry Operators

Vehicles

The Steamship Authority remains the only carrier of vehicles to and from Nantucket. The total number of vehicles carried in the season increased from about 21,600 in 1976 to approximately 43,000 in 2007, almost exactly doubling. This corresponds to an average increase of 2.3 percent per year and is smaller than the increase in passengers. In 2007, about 6,500 vehicles, or 15 percent, of all vehicles carried by the Steamship Authority paid the excursion rate.

It is notable that patterns are different for different types of vehicles. While passenger car traffic increased by 55 percent over 31 years, truck traffic increased by 300 percent, or an average annual increase of 4.6 percent. Although car traffic increased by about half while truck volume quadrupled, it should be noted that the means of classifying vehicle types changed between 1976 and 2007. The new system categorizes vehicles such as SUVs and pick-up trucks, which have grown in market popularity since 1976, as trucks. Again, traffic in the early and late months increased faster than average. It is not clear whether this trend will continue, but it does suggest that measures to address truck traffic specifically are desirable.

The increase in vehicles transported to the island swells the summer accumulation of traffic. The 1977 study reported about 5,000 vehicles registered on the island and 9,000 to 10,000 more during the summer peak. In 2007, there were around 18,000 vehicles registered on the island and an estimated 25,000 during the summer peak. Thus, the total number of vehicles on the island in summer increased from about 15,000 in 1976 to around 43,000 in 2007, or nearly tripled.

Bicycles

Seasonal bicycle traffic has remained relatively stable in this 30-year period, increasing from about 11,000 vehicles in 1976 to around 12,400 in 2007. This corresponds to an increase of about 0.4 percent per year. In 2007, the Steamship Authority ferries carried nearly twice as

many bicycles as the Hy-Line ferries (8,032 vs. 4,397) but substantially fewer than in 1976 (11,047). The lack of growth in bicycles carried on the ferries could be explained through an increase in bicycle rentals during this period, but this has not been confirmed.

It was estimated in 1976 that there were between 8,000 to 9,000 bicycles on the island during the peak summer season based on the number carried on the ferries, at bicycle rental shops, and individually owned. It is estimated by these same methods that there could have been 21,000 to 26,000 bicycles on the island during the 2007 peak summer season.

Traffic Surveys

A program of traffic turning movement counts was undertaken to provide current data and to reveal traffic patterns in the study area. Three time periods were surveyed - weekday midday, weekday afternoon, and weekend midday. The survey periods were established in part with respect to ferry schedules in order to capture traffic approaching and departing the ferry terminals. The survey periods were 11:00 a.m. to 2:00 p.m. and 4:00 p.m. to 7:00 p.m. for midday and afternoon, respectively.

Counts were undertaken at 18 locations around the study area. Traffic volumes from these counts also enabled determination of traffic volumes by interpolation at eight additional locations. These locations are summarized in Table 1-1 and illustrated in Figure 1.

The surveys took place during the period Thursday, July 26, 2007, to Saturday, July 28, 2007. The majority of weekday surveys took place on Thursday, with two locations surveyed on Friday. All weekend surveys took place on Saturday. Traffic volumes from these surveys were summarized, and the peak hour for traffic movements in each period was determined. The weekday midday peak hour was determined to be 11:15 a.m. to 12:15 p.m. The weekday afternoon peak hour was determined to be 5:00 p.m. to 6:00 p.m. The weekend midday peak

hour was 11:30 a.m. to 12:30 p.m. The peak hour traffic volumes are illustrated in Figures 2, 3, and 4 for weekday midday, weekday afternoon, and Saturday midday, respectively.

Bicycle traffic was counted at three intersections: Easton and North/South Beach Streets; Center, Chestnut and Hussy Streets; and Washington, Coffin and Commercial Streets. Pedestrian movements were not counted, but pedestrian and bicycle activity was observed.

The peak hour traffic volumes for all three time periods were analyzed with a traffic analysis software called Synchro. In addition to traffic volumes and street layouts, account was taken of bus movements, counted or estimated bicycle and pedestrian traffic, and parking maneuvers. The output of the analysis includes indications of volume/capacity ratios, Levels of Service (LOS), vehicle queues, and delays. The results of the analyses are given in Tables 2-1 to 2-25. (Please note that the intersection of South Water Street and Chestnut Street was not analyzed as there are no conflicting vehicle movements.) See Table 1-1. Tables 2-5a, 2-6a, 2-9a, 2-18a, 2-20a, 2-21a, and 2-25a depict intersection analyses of proposed recommendations found in Section Two of this report.

Summary of Analyses

LOS are within a desirable range (C or better) in most locations. LOS are generally better on through streets than on side streets (A vs. B/C). There are two notable exceptions to this pattern:

1. The intersection of Broad Street with South Beach Street and South Beach Street Extension. The indicated LOS for the southbound approach on South Beach Street was F in all three time periods, with delays ranging from just under three minutes in the Saturday midday peak to seven minutes in the weekday afternoon peak. The delays correspond to vehicle queues ranging from 240 feet to over 500 feet. There is also a concentration of pedestrian and bicycle traffic at this location due to movements to and from the ferry, bicycle rental shops, and tourist attractions. Some of the delays and

associated vehicle queues are attributable to police direction of traffic favoring disembarking ferry traffic from Steamboat Wharf.

2. The intersection of Main, South Water, and Washington Streets. The westbound approach on Main Street shows LOS D, E, and F in the weekday midday, weekday afternoon, and Saturday midday peak hours, respectively. Saturday conditions correspond to a delay of 3.5 minutes per vehicle and queues of over 200 feet, which is long enough to back up into the upstream intersection of Candle and Easy Streets with Straight Wharf. South Water Street is a primary path for vehicles traveling to the southern and eastern ends of the island from the Steamship Authority ferry, and Main Street is the path for vehicles departing the Hy-Line ferry. This area also experiences heavy pedestrian traffic.

These findings are not surprising as the worst conditions are indicated at locations with both local and ferry-related traffic as well as substantial numbers of pedestrians and bicycle traffic.

Perspective on Existing Conditions and Possibilities for Improvements

An interesting and complex picture emerges from all of the data gathering, field inspections, and analyses. Although it was given in the brief for the study, the surveys independently confirmed that the ferry operations have a major impact on conditions downtown, suggesting that the ferry operators can be major contributors to solutions.

Perceptions of conditions downtown vary between two major groups. The first are residents and regular/seasonal visitors, who know the system and have been able to work with or around its constraints or idiosyncrasies. The other group is first-time or infrequent visitors, who are unfamiliar with the area and often confused or unclear about their choices.

It is clear from the passenger surveys that a substantial number of ferry riders have no business downtown and no particular intention to stop there. Congestion downtown occurs in part because of the mixture of local and through traffic. Ways to accommodate both sets of needs are explored in this study. Due to the pattern of one-way streets, the paths to and from the vehicle ferry are indirect and not obvious to a first timer. Various ideas to improve circulation are suggested. There are a limited number of candidates for streets that could be closed or operated in directions other than they are presently, but changes in particular locations and further detailed studies are recommended.

In addition, congestion and some traffic accidents occur because of conflicts between moving and parked vehicles. Parking regulation and enforcement take up a considerable amount of municipal resources. It is human nature to seek a parking space as close to one's destination as possible and considered good for business to provide such spaces. Improvements to parking involve not just providing more spaces but adjustments to regulation and approach.

Congestion also occurs in part because of conflicts between vehicles, bicycles, and pedestrians. Bicycles and pedestrians would use facilities separate from roads if available. Possibilities for upgrading existing facilities and possible new ones are explored. Several of the ferry passengers commented on the linkage through downtown to the established bike paths.

Finally, congestion occurs in part because most people drive rather than use other modes. While driving makes sense for many types of trips, origins, and destinations, ways to improve public transit's mode share are explored. NRTA has done a remarkable job of building a sustainable system with growing ridership and operating schedules that larger systems would envy. A complaint about the system is the lack of direct service to the ferry terminals, which is presently impractical due to existing terminal congestion. Ways to overcome this are explored. One possibility might be to consider transit use of the ground floor of the proposed new parking structure near the Grand Union. This location is closer to the ferry terminals, easily walkable from the Hy-Line terminal, and may not involve any schedule delays.

Another concern raised in the surveys was a perceived lack of information and direction. As noted above, this affects first-time visitors rather than veterans but may also deter them from coming back. Ideas for wayfinding and information distribution are suggested in cooperation with the ferry companies.

Although this study is meant to take a fresh look at downtown conditions, previous studies have been perused. A statement in one of them that the solution to challenges in downtown circulation will not include a single magic bullet rings true. The process will consist of a series of complementary and mutually supportive measures which will require cooperation and goodwill from all stakeholders, public and private. The conversation about this occurs in Section Two of this study.