

EXISTING CONDITIONS

INTRODUCTION

Greenman-Pedersen, Inc. (GPI) has conducted this Traffic Study of the Mid-Island area for the Nantucket Planning and Economic Development Commission (NP&EDC). NP&EDC prepared the *Mid-Island Area Plan* in March 2003, which identified a number of critical traffic/transportation issues, including both short-term and long-term improvement options for both isolated intersections, as well as corridor treatments within the Mid-Island area. **A primary goal of this traffic study is to quantify and evaluate the recommendations of the 2003 *Mid-Island Area Plan*, based on actual field evaluation, traffic counts and engineering standards.** The following intersections are included within the study area:

- Sparks Avenue at Pleasant Street and Hooper Farm Road
- Milestone Road at Polpis Road
- Milestone Road at Monomoy Road
- Milestone Road at Old South Road, Pleasant Street and Orange Street (Milestone Rotary)
- Orange Street at West Creek Road
- Pleasant Street at West Creek Road
- Pleasant Street at Cherry Street
- Pleasant Street at Williams Lane
- Pleasant Street at Williams Street
- Orange Street at Union Street
- Pleasant Street at York Street and Atlantic Avenue (Five Corners)
- Sparks Avenue at Prospect Street, Surfside Road and Atlantic Avenue (Four Corners)
- Surfside Road at Vesper Lane
- Surfside Road at Bartlett Road
- Surfside Road at Miacomet Avenue
- Surfside Road at Miacomet Road and Surfside Drive

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- Surfside Road at Fairgrounds Road
- Old South Road at Fairgrounds Road

Improvements to the intersection of Sparks Avenue at Pleasant Street and Hooper Farm Road are planned under a separate project to provide a single lane roundabout. This traffic study evaluated the impacts on the proposed roundabout design under improvement scenarios, i.e. the Pleasant Street one-way alternative

This study includes data collection efforts, field studies, accident analysis, capacity analysis and conceptual design of potential improvement alternatives. In addition, order of magnitude construction cost estimates have been developed for each improvement alternative recommended.

GEOMETRICS AND TRAFFIC CONTROL

The roadway network is made up of the major roadways and intersections in the study area. Figure 1 illustrates the eighteen locations included in the study. A description of the principal roadways and the intersections that are a part of the project network follows.

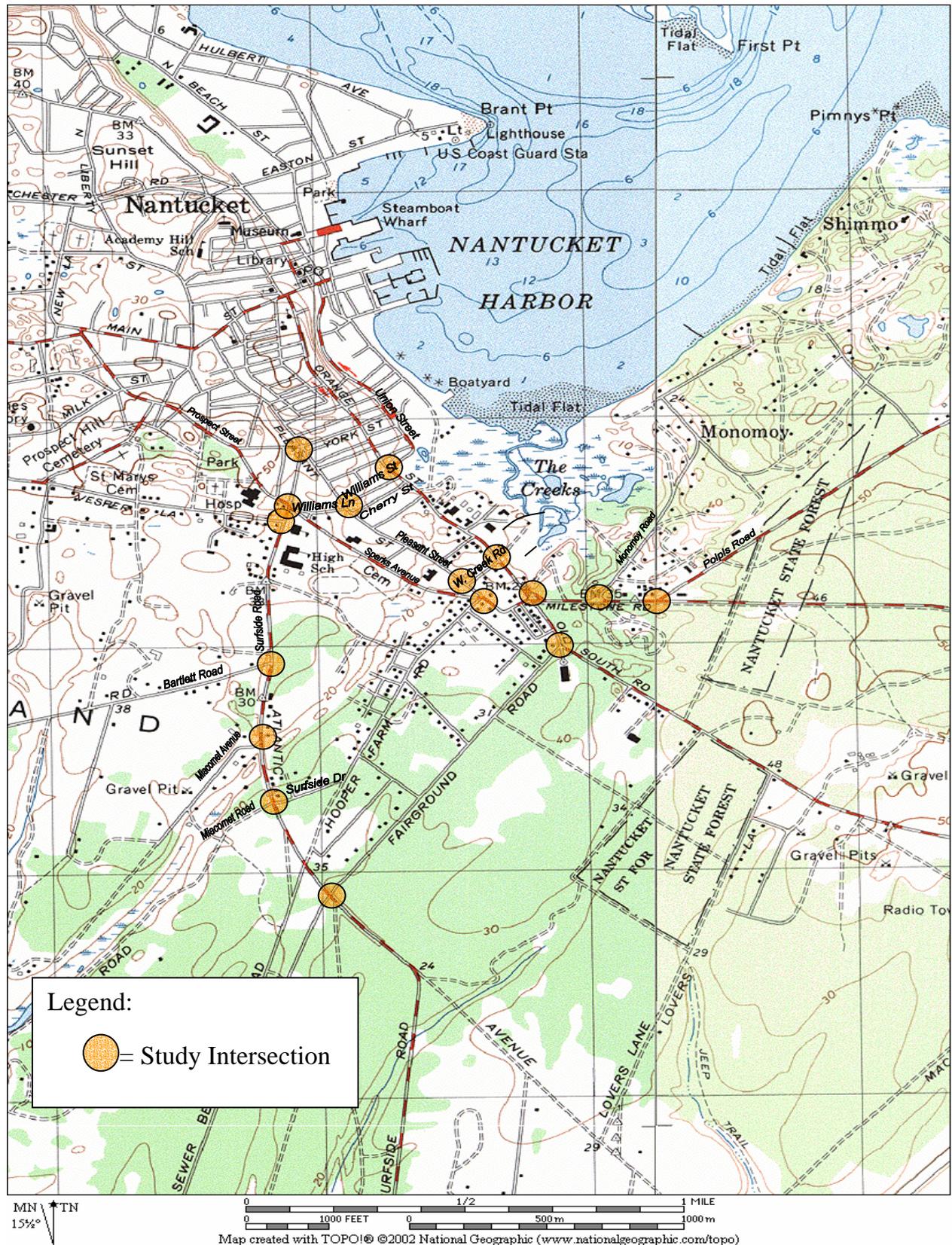
Study Area Roadways

The principal east-west roadways within the Mid-Island area are three parallel streets: Orange Street, Pleasant Street and Sparks Avenue. Each of these is a Town-maintained, two-lane two-way roadway, with the exception of Orange Street west of Union Street, which is a one-way roadway in the eastbound direction. Overall pavement widths along Orange Street, Pleasant Street and Sparks Avenue generally vary between 20 and 24 feet, with sporadic sidewalks. An informal bike route, which shares the paved travelway with motor vehicles, is present along Orange Street, connecting downtown Nantucket with the Polpis Bicycle Path. Several north-south one-way and two-way streets provide connections between these three roadways. The most significant of these streets are West Creek Road, Cherry Street and Williams Street between Orange Street and Pleasant Street and Williams Lane between Pleasant Street and Sparks Avenue. Land use along these roadways consists primarily of residential, commercial and municipal uses.

Pleasant Street converges with Sparks Avenue at its intersection with Hooper Farm Road and then continues easterly to converge at the Milestone Rotary, where the principal east-west roadway then becomes Milestone Road. Milestone Road is a State maintained, minor arterial that is orientated in an east-west direction, extending from the Milestone Rotary to the west to

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GPI Greenman-Pedersen, Inc.

Engineers, Architects, Planners, Construction Engineers & Inspectors

Figure 1

Study Intersection Map

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Siasconset to the east and is approximately 6-miles long. Milestone Road is a two-lane, two-way roadway, with an overall pavement width of approximately 25 feet. A bike route is present along the south side of Milestone Road, which is approximately 8 feet wide, extending from the Milestone Rotary to Siasconset. Milestone Road adjacent land uses within the Mid-Island study area is primarily conservation, wooded areas and residential. The Nantucket Water Company is located just to the east of the Rotary, on the south side of Milestone Road.

The principal north-south roadways within the Mid-Island area are Surfside Road/Atlantic Avenue and Old South Road. Each of these is a Town-maintained, two-lane and two-way roadway, with overall pavement widths varying generally between 22 and 24 feet. A bicycle path is present along the west side of Surfside Road, which is approximately 8 feet wide and extends from Vesper Lane to the Surfside beaches. To the north of Vesper Lane in the vicinity of Prospect Street, the bicycle path shares the paved travelway with motor vehicles. Land use along these roadways is predominately residential. Each of the Nantucket public schools is located on the easterly side of Surfside Road and the Nantucket Memorial Airport is located at the southerly end of Old South Road.

Study Area Intersections

Sparks Avenue at Pleasant Street and Hooper Farm Road

This intersection consists of the offset alignment of Hooper Farm Road and Pleasant Street. The Sparks Avenue eastbound approach, Pleasant Street and Hooper Farm Road are all under STOP-sign control, while the Sparks Avenue westbound approach is uncontrolled. There is a raised delta island along the Pleasant Street approach that defines its offset with Hooper Farm Road. The Sparks Avenue westbound through traffic merges to Pleasant Street without adequate traffic control. The pavement and travel lane width varies, with an edge-to-edge distance of approximately 25 feet along Sparks Avenue and approximately 23 feet along both Pleasant Street and Hooper Farm Road. Directional flow along each roadway is separated by a double yellow centerline. A sidewalk is provided only along Hooper Farm Road; however, there are no compliant wheelchair ramps present or sidewalks present along the remainder intersection roadways. Land use in the vicinity of this intersection is primarily retail and light commercial along Pleasant Street and on the north side of Sparks Avenue and primarily residential along Hooper Farm Road and on the south side of Sparks Avenue. Improvements to this intersection are currently planned under a separate project and include the reconstruction of the intersection to provide a modern single lane roundabout. These improvements are described in detail in the *Planned Findings/Recommendations* section of this report.

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Existing (3-Way Stop)



Proposed (Roundabout)

Milestone Road at Polpis Road and Monomoy Road

The geometric layout of these locations is quite similar. They are both wide-open “T” intersections with large sweeping turn lanes. The leg of each “T” is separated into dedicated left- and right-turn lanes, while vehicles turning from Milestone Road to the corresponding side street are channelized on the side street and must proceed to merge onto the side street. A bicycle path is present along the southerly side of Milestone Road, however there are no provisions for crossings, nor are there any sidewalks, bike paths or bike lanes along the intersecting side streets. The posted speed limit on Milestone Road is 35 miles per hour (mph), just east of Polpis Road, and is reduced to 25 mph approaching the Milestone Rotary. The posted speed limit on Monomoy Road is 30 mph and 35 mph on Polpis Road.



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Milestone Rotary (Old South Road/Milestone Road/Sparks Avenue/Orange Street)

The Old South Road northbound approach consists of one 11-foot wide lane, the Milestone Road westbound approach consists of two 12-foot wide lanes, with the outer lane delineated as a through lane (to Orange Street). The Sparks Avenue eastbound approach consists of one 15-foot wide lane and the Orange Street approach consists of two 14.5-foot wide lanes, with the outer lane delineated as a through/right-turn lane. The posted speed limits on Old South Road, Milestone Road, Sparks Avenue and Orange Street approaching the rotary are 25 mph, 25 mph, 20 mph and 30 mph, respectively. The Milestone Rotary is configured to have the Orange Street, Milestone Road and Old South Road approaching roadways intersect the traffic circle on a tangent operating under YIELD sign control and the Sparks Avenue approach intersecting at 90 degrees operating under STOP sign control. This configuration leads to faster travel speeds entering the rotary and the potential for increased conflicts. Bicycle and pedestrian access through the rotary is difficult. Bicyclists are forced to cross in crosswalks and enter sidewalks rather than proceeding through the rotary. This creates additional conflicts between bicyclists and pedestrians. Parking adjacent to the rotary contributes to congestion.



Orange Street at West Creek Road

Single approach lanes are present on all three legs of this unsignalized “T” intersection with the West Creek Road northbound approach operating under STOP sign control. A poorly delineated bike route is present along Orange Street. Pedestrian accessibility does not conform to current standards at this location.

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Pleasant Street at West Creek Road

The West Creek Road southbound approach to this unsignalized “T” intersection operates under STOP-sign control. Single approach lanes are present on all three legs. Similar to the West Creek Road and Orange Street intersection, pedestrian accessibility does not conform to current standards at this location. The head-in parking at Lucky’s Express, located on the northwest corner of the intersection, contributes to congestion at this location.



Pleasant Street at Cherry Street, Williams Lane and Williams Street

The Cherry Street, Williams Lane and Williams Street (minor street) approaches operate under STOP-sign control, while Pleasant Street (major street) operates uncontrolled. These intersections are all closely spaced, with the geometry of these intersections potentially leading to driver confusion and conflicts. While the STOP sign along the eastbound Pleasant Street approach is intended for the Williams Lane traffic, drivers on Pleasant Street may be confused and be stopping unexpectedly. The tight geometry of the Cherry Street at Pleasant Street intersection forces vehicles to encroach on approaching lanes. Sight distance is limited for vehicles exiting Cherry Street onto Pleasant Street. Furthermore, pedestrian accessibility does not conform to current standards at this location.

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Orange Street at Union Street

Single approach lanes are present on all three legs of this unsignalized “T” intersection with the Union Street southbound approach operating under STOP sign control. All intersecting roadways are two-way with the exception of the Orange Street eastbound approach. Pedestrian accessibility does not conform to current standards at this location. There are obstructions along the sidewalks, lack of continuous sidewalks and wheelchair ramps and no visible crosswalks.



Five Corners (Pleasant Street/York Street/Atlantic Avenue)

This intersection is an all-way stop controlled (AWSC) intersection, with single approach lanes present on each of the five legs. All five roadways are two-way with the exception of the York Street westbound approach, which is a one-way roadway in the southbound direction (towards Pleasant Street), forming a one-way pair with West Dover Street.

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Four Corners (Sparks Avenue/Prospect Street/Surfside Road/Atlantic Avenue)

The Four Corners intersection consists of the offset alignment of Prospect Street and Sparks Avenue. This intersection also operates under AWSC, with single approach lanes present on each of the four legs. Pedestrian accessibility does not conform to current standards at this location.



Surfside Road at Vesper Lane

The Vesper Lane eastbound approach and the Nantucket High School exit-only westbound approach to this unsignalized intersection operate under STOP-sign control. Single approach lanes are present on all four legs. The Cottage Hospital and Holdgate's Laundry abut Vesper Lane at this intersection and the Nantucket High School is located just south of this intersection on the east side of Surfside Road. Pedestrian accessibility does not conform to current standards

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at this location. The sidewalks are in poor physical condition, have obstructions and lack wheelchair ramps. Furthermore, while there is a bicycle path located on the west side of Surfside Road, it ends abruptly and does not provide any further guidance to bicyclists. Bicyclists coming to/from the north must share the Surfside Road travel ways with vehicles.



Surfside Road at Bartlett Road

Single approach lanes are present on all three legs of this unsignalized “T” intersection with the eastbound Bartlett Street approach operating under STOP-sign control. The Surfside Road Bicycle Path is located on the westerly side of Surfside Road. A crosswalk is present across the Bartlett Road approach; however, the existing crosswalk is faded and does not provide adequate pedestrian protection. The Nantucket Elementary School is located to the north of this intersection, on the east side of Surfside Road. Sight distance is limited at this intersection looking to the north from Bartlett Road due to the horizontal alignment of Surfside Road. Improvements to the sidewalk and crosswalk infrastructure are critical at this location due to the presence of the bicycle path and the Elementary School just north of the intersection.

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Surfside Road at Miacomet Avenue

Single approach lanes are present on all three legs of this unsignalized “T” intersection with the Miacomet Avenue eastbound approach operating under STOP sign control. The presence of adjacent parking and driveways along Miacomet Avenue results in a large pavement area with poorly defined right-of-way. Driveways are present immediately to the west of this intersection on both the north and south sides of Miacomet Avenue. A bicycle path is located on the westerly side of Surfside Road. With the multiple driveways and the presence of the bike path passing through this intersection, the geometry and right-of-way, particularly to/from Miacomet Avenue, is somewhat confusing.



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Surfside Road at Miacomet Road and Surfside Drive

The Miacomet Road eastbound approach and Surfside Drive westbound approach to this unsignalized intersection operate under STOP sign control. Single approach lanes are present on all four legs. The Surfside Road Bicycle Path is present on the westerly side of Surfside Road. While there are crosswalks present at this intersection, there are no accessible sidewalks on the easterly portion of Surfside Road or Surfside Drive.



Surfside Road at Fairgrounds Road

The Fairgrounds Road eastbound and westbound approaches to this unsignalized intersection operate under STOP sign control. Single approach lanes are present on all four legs. A bicycle path is present on the westerly side of Surfside Road. Similar to all the intersections along Surfside Drive, the pedestrian facilities are not visible or apparent to motorists. The existing crosswalk is faded and does not provide adequate pedestrian protection.

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Old South Road at Fairgrounds Road

Single approach lanes are present on all three legs of this unsignalized “T” intersection with the Fairgrounds Road eastbound approach operating under STOP sign control. The Nantucket Electric driveway is located on the south side of Fairgrounds Road and enters the intersection under STOP sign control. During peak periods this location has been identified as experiencing congestion due to the larger number of turning vehicles, both to and from Fairgrounds Road. This intersection has also been studied previously and the preliminary plan is to provide separate left- and right-turn lanes along the Fairgrounds Road approach. As part of the new Public Safety Building (on the Nantucket Electric property), the driveway will be relocated away from the intersection.



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TRAFFIC VOLUMES

To establish base traffic conditions within the area, automatic traffic recorder (ATR) counts, turning movement counts (TMCs) and vehicle classification counts were conducted at the study area locations. The counts were performed during the peak season weekday AM peak period (7:00 to 10:00 AM), the weekday PM peak period (3:00 to 6:00 PM) and the Saturday midday peak period (11:00 AM to 2:00 PM) in July 2004. ATR counts conducted by the Nantucket Planning and Economic Development Commission (NP&EDC) during June, July and August 2004 were used to obtain daily traffic volumes on the study area roadways for weekday and Saturday daily periods.

Evaluation of the peak period traffic counts indicates that the weekday AM peak hour occurs between 9:00 and 10:00 AM, the weekday PM peak hour occurs between 3:45 and 4:45 PM and the Saturday midday peak hour occurs between 11:15 AM and 12:15 PM. It should be noted, however, that the individual intersection peak hours were used in the analysis to provide a conservative analysis scenario. All count data are provided in the Appendix.

Traffic on a given roadway typically fluctuates throughout the year depending on the area and the type of roadway. To determine if the July traffic-volume data needed to be adjusted to account for this fluctuation, Massachusetts Highway Department (MassHighway) weekday seasonal adjustment factors were researched.¹ This information revealed that July volumes are approximately 21.0 percent higher than annual average-month conditions. Therefore, to provide a conservative analytical framework (higher than average), the collected data were used as counted. Furthermore, given the seasonal fluctuation of traffic on the island, the peak summer volumes were used for analysis. The MassHighway seasonal adjustment data are provided in the Appendix. Table 1 summarizes the existing daily and peak-hour traffic volumes on the study area roadways. The 2004 Existing traffic-flow networks for the weekday AM, weekday PM and Saturday midday peak hours are shown graphically on Figures 2, 3 and 4, respectively.

¹*MassHighway Statewide Traffic Data Collection 2003 Weekday Seasonal Factors.*

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**Table 1
EXISTING TRAFFIC VOLUME SUMMARY**

Location/Time Period	Daily Volume (vpd) ^a	Peak Hour Volume (vph) ^b	K Factor ^c	Directional Distribution ^d
Atlantic Ave south of Pleasant St:				
<i>Weekday Daily</i>	6,800			
<i>Weekday AM Peak Hour</i>		296	4.4	56% NB
<i>Weekday PM Peak Hour</i>		372	5.5	58% SB
<i>Saturday Daily</i>	6,900			
<i>Saturday Midday Peak Hour</i>		294	4.3	53% SB
Fairgrounds Rd west of Old South Rd:				
<i>Weekday Daily</i>	8,100			
<i>Weekday AM Peak Hour</i>		474	5.9	56% EB
<i>Weekday PM Peak Hour</i>		653	8.1	51% WB
<i>Saturday Daily</i>	7,000			
<i>Saturday Midday Peak Hour</i>		569	8.1	58% WB
Milestone Rd east of Orange St:				
<i>Weekday Daily</i>	20,400			
<i>Weekday AM Peak Hour</i>		1,246	6.1	55% EB
<i>Weekday PM Peak Hour</i>		1,610	7.9	54% WB
<i>Saturday Daily</i>	18,800			
<i>Saturday Midday Peak Hour</i>		1,354	7.2	52% WB
Old South Rd south of Fairgrounds Rd:				
<i>Weekday Daily</i>	15,100			
<i>Weekday AM Peak Hour</i>		1,167	7.7	50% NB
<i>Weekday PM Peak Hour</i>		1,367	9.1	52% SB
<i>Saturday Daily</i>	13,100			
<i>Saturday Midday Peak Hour</i>		1,191	9.1	51% NB
Orange St east of Union St:				
<i>Weekday Daily</i>	16,800			
<i>Weekday AM Peak Hour</i>		1,025	6.1	51% NB
<i>Weekday PM Peak Hour</i>		1,232	7.3	56% SB
<i>Saturday Daily</i>	16,600			
<i>Saturday Midday Peak Hour</i>		1,133	6.8	55% SB

^aVehicles per day. ^bVehicles per hour. ^cPercent of average daily traffic occurring during the peak hour.^dEB = eastbound; WB = westbound; NB = northbound; SB = southbound.

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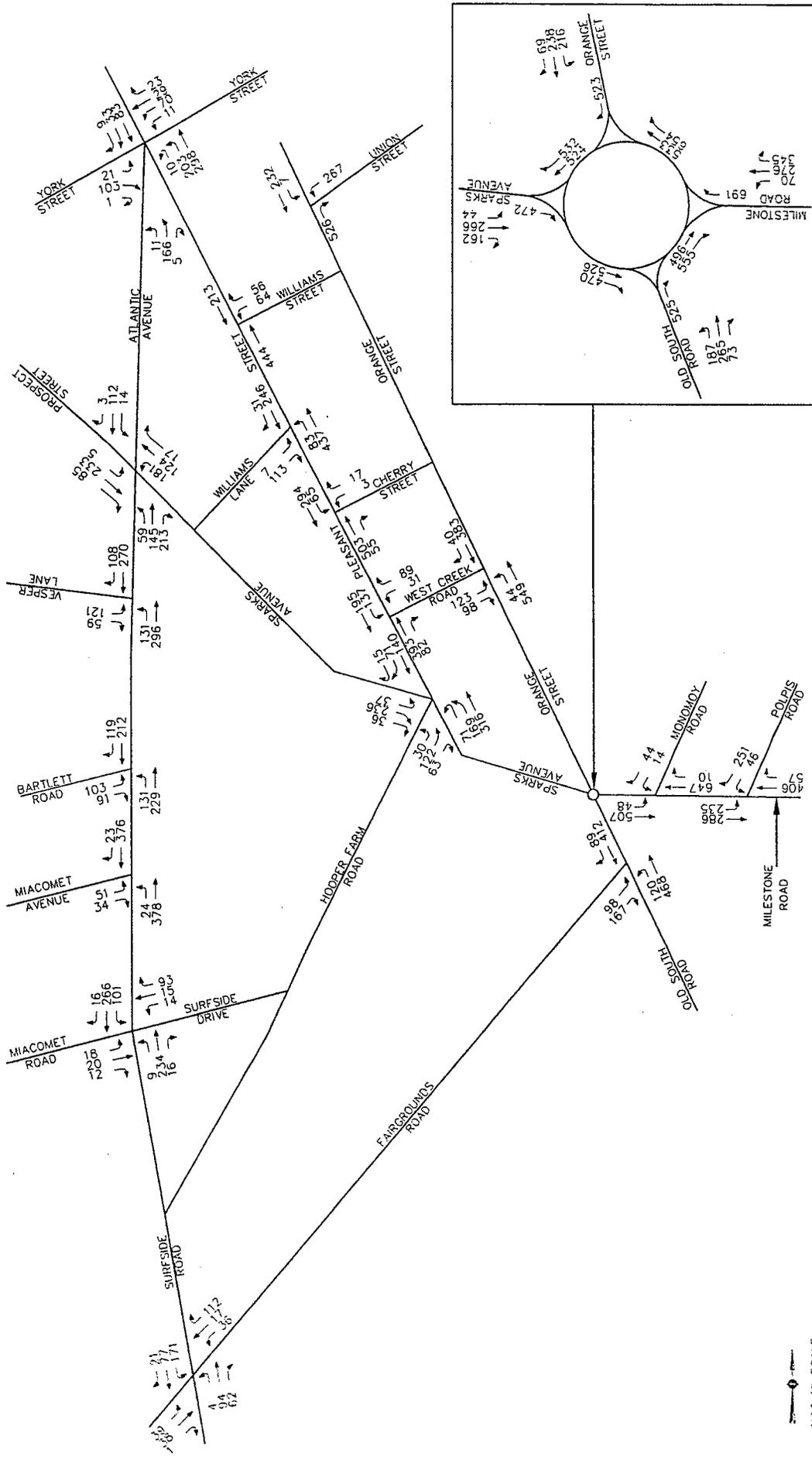
**Table 1 (continued)
EXISTING TRAFFIC VOLUME SUMMARY**

Location/Time Period	Daily Volume (vpd) ^a	Peak Hour Volume (vph) ^b	K Factor ^c	Directional Distribution ^d
Pleasant St east of Atlantic Ave:				
<i>Weekday Daily</i>	9,300			
<i>Weekday AM Peak Hour</i>		713	7.7	72% WB
<i>Weekday PM Peak Hour</i>		706	7.6	64% WB
<i>Saturday Daily</i>	8,600			
<i>Saturday Midday Peak Hour</i>		755	8.8	68% WB
Sparks Ave west of Pleasant St:				
<i>Weekday Daily</i>	10,600			
<i>Weekday AM Peak Hour</i>		523	4.9	59% EB
<i>Weekday PM Peak Hour</i>		536	5.1	69% EB
<i>Saturday Daily</i>	10,600			
<i>Saturday Midday Peak Hour</i>		571	5.4	63% EB
Surfside Rd south of Vesper Ln:				
<i>Weekday Daily</i>	13,300			
<i>Weekday AM Peak Hour</i>		756	5.7	56% NB
<i>Weekday PM Peak Hour</i>		782	5.9	59% SB
<i>Saturday Daily</i>	12,900			
<i>Saturday Midday Peak Hour</i>		724	5.6	52% SB

^aVehicles per day. ^bVehicles per hour. ^cPercent of average daily traffic occurring during the peak hour.^dEB = eastbound; WB = westbound; NB = northbound; SB = southbound.

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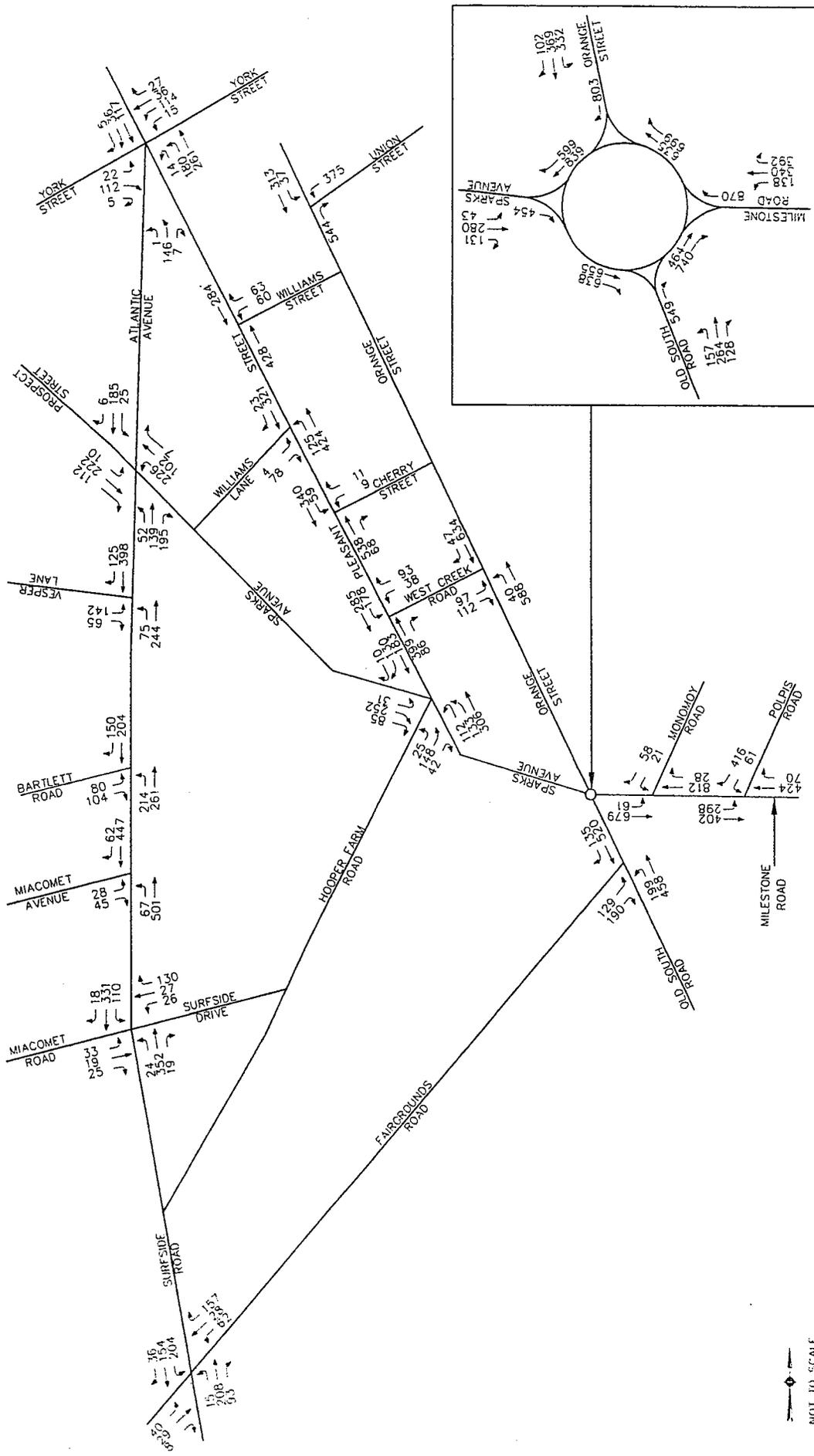


NOT TO SCALE

Figure 2
 2004 Existing
 Weekday AM
 Peak Hour Traffic Volumes

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NOT TO SCALE

Figure 3
 2004 Existing
 Weekday PM
 Peak Hour Traffic Volumes

ACCIDENTS

Accident data for the study area intersections were obtained from the Nantucket Police Department for the period between 2000 and 2003. In addition to the number of accidents, the accident occurrence was compared to the volume of traffic through a particular intersection to determine any significance. Accordingly, the accident rates were calculated for each study area intersection and compared with the statewide and district-wide averages. An intersection accident rate is a measure of the frequency of accidents compared to the volume of traffic through an intersection and is presented in accidents per million entering vehicles (acc/mev). For unsignalized intersections, the statewide average is 0.66 acc/mev and the MassHighway District 5 average is 0.61 acc/mev. A comparison of the calculated accident rate to these averages can be used to establish the significance of accident occurrence and whether or not potential safety problems exist. In order to provide a comparable analytical framework, a seasonal adjustment factor needed to be applied to the July, summer peak traffic volume data to account for the annual fluctuation in traffic. Therefore, to provide an average-month analytical framework, the collected traffic-volume data were downwardly adjusted by 21 percent to reflect an average-month analysis condition using the MassHighway weekday seasonal adjustment factors, as described in the *Traffic Volumes* section. A summary of the accident data at the study area intersections is provided in Table 2. All crash rate worksheets are provided in the Appendix.

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**Table 2
ACCIDENT SUMMARY 2000 – 2003**

Location	Number of Accidents			Severity ^b					Accident Type ^c			
	Total	Average per Year	Accident Rate	Rank ^a	PD	PI	F	MV	MP	B	Ped	Deer
Pleasant St at York St and Atlantic Ave	17	4.25	0.89	1	17	0	0	12	0	3	2	0
Pleasant St at Williams Ln	13	3.25	0.88	2	13	0	0	13	0	0	0	0
Milestone Rd at Polpis Rd	20	5	0.82	3	20	0	0	14	1	0	0	5
Surfside Rd at Fairgrounds Rd	14	3.5	0.69	4	14	0	0	10	2	0	0	2
Surfside Rd at Miacomet Ave	14	3.5	0.62	5	10	4	0	12	0	1	0	1
Old South Rd at Fairgrounds Rd	14	3.5	0.61	6	13	1	0	12	1	1	0	0
The Milestone Rotary	22	5.5	0.57	7	21	1	0	19	2	1	0	0
Surfside Rd at Bartlett Rd	11	2.75	0.56	8	10	1	0	11	0	0	0	0
Surfside Rd at Miacomet Rd and Surfside Dr	12	3	0.55	9	12	0	0	10	1	0	0	1
Surfside Rd at Atlantic Ave, Prospect St and Sparks Ave	13	3.25	0.52	10	11	2	0	11	0	1	1	0
Sparks Ave at Pleasant St and Hooper Farm Rd	15	3.75	0.51	11	15	0	0	15	0	0	0	0
Surfside Rd at Vesper Ln	10	2.5	0.49	12	9	1	0	8	0	1	0	1
Pleasant St at West Creek Rd	8	2	0.49	13	8	0	0	7	0	0	1	0
Orange St at Union St	8	2	0.40	14	8	0	0	7	0	0	1	0
Pleasant St at Cherry St	6	1.5	0.39	15	6	0	0	6	0	0	0	0
Pleasant St at Williams St	4	1	0.32	16	4	0	0	4	0	0	0	0
Milestone Rd at Monomoy Rd	5	1.25	0.21	17	4	1	0	5	0	0	0	0
Orange St at West Creek Rd	1	0.25	0.04	18	1	0	0	1	0	0	0	0

Source: Nantucket Police Department (2000-2003). ^aHighest accident rate to lowest accident rate.

^bPD = property damage only; PI = personal injury, F = fatality. ^cMV = motor vehicle; MP = Moped; B = bicycle; Ped = pedestrian.

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Based on the accident data, there were six study area intersections that experienced higher than the district-wide and/or statewide averages for unsignalized intersections. These locations are discussed below from highest to lowest accident rate and are followed by high accident locations that experienced on average five or more accidents per year.

The Five Corners intersection has experienced the highest accident rate. The accident rate for the intersection is 0.89 acc/mev, which is higher than the district-wide and statewide averages for unsignalized intersections, and therefore may be indicative of a safety problem, which may be attributed to the confusing intersection geometry, numerous approaches and vast amount of pavement. The intersection has experienced on average approximately 4 accidents per year over the four-year analysis period. One hundred percent (17 of 17) of the accidents involved property damage only. Approximately 18 percent (3 of 17) involved a bicycle and approximately 12 percent (2 of 17) involved a pedestrian. Improvements are proposed at this location that are expected to improve overall intersection operation, resulting in improved safety.

The Pleasant Street and Williams Lane intersection has experienced the second highest accident rate. The accident rate for the intersection is 0.88 acc/mev, which is higher than the district-wide and statewide averages for unsignalized intersections, and therefore may be indicative of a safety problem, which may be attributed to the confusing intersection geometry and awkward roadway alignment. There was an average of approximately 3 accidents per year at this intersection. One hundred percent (13 of 13) of the accidents involved property damage only. Improvements are proposed at this location that are expected to improve overall intersection operation, resulting in improved safety.

The Milestone at Polpis Road intersection has experienced the third highest accident rate. The accident rate for the intersection is 0.82 acc/mev, which is higher than the district-wide and statewide averages for unsignalized intersections, and therefore may be indicative of a safety problem, which may be attributed to the existing geometric issues and the numerous merging and conflict points. There was an average of 5 accidents per year over the four-year analysis period that occurred at this intersection. One hundred percent (20 of 20) of the accidents involved property damage only. Improvements are proposed at this location that are expected to improve overall intersection operation, resulting in improved safety.

The Surfside at Fairgrounds intersection has experienced the fourth highest accident rate. The accident rate for the intersection is 0.69 acc/mev, which is slightly higher than the district-wide and statewide averages for unsignalized intersections, and therefore may be indicative of a safety problem, which may be attributed to existing sight distance deficiencies. There was an average of approximately 4 accidents per year at this intersection. One hundred percent (14 of 14) of the accidents involved property damage only. Improvements are proposed at this location that are expected to improve overall intersection operation, resulting in improved safety.

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The Surfside Road at Miacomet Avenue intersection has experienced the fifth highest accident rate. The crash rate for the intersection is 0.62 accidents per million entering vehicles (acc/mev). This rate is slightly higher than the district-wide average of 0.61 and less than the statewide average of 0.66, which may be attributed to the presence of adjacent parking and driveways, large pavement areas and poorly defined right-of-way. This intersection has experienced on average approximately 4 accidents per year. Approximately 71 percent (10 of 14) of the accidents involved property damage only with approximately 7 percent (1 of 14) of the accidents involving a bicycle.

The Old South Road at Fairgrounds Road intersection has experienced the sixth highest accident rate. The crash rate for the intersection is 0.61 accidents per million entering vehicles (acc/mev). This rate is equal to the district-wide average and less than the statewide average, which may be attributed to the heavy turning volumes and poorly defined lanes. This intersection has experienced on average approximately 4 accidents per year over the four-year analysis period. Approximately 93 percent (13 of 14) of the accidents involved property damage only with approximately 7 percent (1 of 14) of the accidents involving a bicycle.

The Milestone Rotary has experienced on average approximately 6 accidents per year. Approximately 95 percent (21 of 22) of the accidents involved property damage only, with approximately 5 percent (1 of 22) of the accidents involving a bicycle. The crash rate for the intersection is 0.57 accidents per million entering vehicles (acc/mev). This rate is less than both the district-wide and statewide averages of 0.61 and 0.66, respectively.

The remaining study area intersections have experienced four accidents per year or less and the accident rate for each intersection is less than the district-wide and statewide averages for unsignalized intersections. There were no fatal accidents reported at any of the study area intersections during the time period studied.

PARKING ANALYSIS

The retail and commercial uses along Pleasant Street, Sparks Avenue and Orange Street within the Mid-Island area generate substantial parking demands. However, due to the narrow overall pavement widths of these roads, along with the connecting side streets, such as West Creek Road, on-street parking opportunities are very limited. This leads to vehicle congestion from vehicles moving in and out of parking spaces conflicting with through traffic and increased congestion due to motorists circulating to find available parking. Off-street parking within the Mid-Island area is also limited during peak times, particularly at the businesses contained within the area bounded by Sparks Avenue to the south and west, Orange Street to the east and Sanford Road and Bear Street to the north. Again, the lack of sufficient parking contributes to congestion by motorists circulating to find available parking.

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One of the goals of the *Mid-Island Area Plan* is to promote more of a downtown feel to the Mid-Island area and part of this effort is to make shared parking and longer-term parking more desirable. The Town, as part of its Zoning Bylaws, has implemented a plan for shared parking and access, with all new parking, except in extreme situations, located in the rear of buildings, with the building placed at or near the street line. Providing shared parking between multiple land uses results in fewer parking spaces and impervious surface required to meet the parking demands of the individual uses. The parking demand reduction as a result of shared parking is attributed to variation in the parking demand of the different uses over the course of the day. In addition, the proximity of the land uses encourages multi-purpose trips in which people attracted park one and visit more than one land use.

Therefore, the peak parking demand of the businesses and restaurants located in the central area of the Mid-Island area, bounded by Sparks Avenue to the south and west, Orange Street to the east and Sanford Road and Bear Street to the north, were evaluated to determine the time of day when each use requires the most parking and therefore the necessary number of parking spaces to accommodate each use. In addition, the existing parking areas were evaluated to determine where parking areas should be enhanced, while maintaining the historical character of the island.

The peak parking demand of the businesses and restaurants located in the central area of the Mid-Island area were determined by conducting parking counts at the existing facilities at fifteen minute intervals between 3:00 and 6:00 PM on a Thursday and 10:00 AM and 2:00 PM on a Saturday during August 2004. The parking study locations are shown graphically on Figure 5. Parking demand for these uses is expected to be highest during these time periods. The obtained parking demand summaries for the weekday PM peak period and the Saturday midday peak period are shown on Figures 6 and 7, respectively.

Based on the parking data, there were several parking areas that experienced at or near capacity situations during one or both of the time periods studied. These parking areas included businesses on West Creek Road, such as On-Glaze Salon, Kitty Murtaghs, Nantucket Bagel and Lucky Express and businesses along Pleasant Street, such as Trattoria, the Stop & Shop, Hen House, Bamboo and the Post Office. Conversely, the Sanford parking lot, with the exception of the Sea Grill Restaurant/Photo Express parking area, experienced very low utilization rates.

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Figure 5
Parking Study Locations

Location	Parking Spaces Occupied: Weekday PM Peak Period												Average		Maximum		Peak Hour	
	Available Parking Spaces												15-Minutes		15-Minutes		15-Minutes	
	3:00 to 3:15	3:15 to 3:30	3:30 to 3:45	3:45 to 4:00	4:00 to 4:15	4:15 to 4:30	4:30 to 4:45	4:45 to 5:00	5:00 to 5:15	5:15 to 5:30	5:30 to 5:45	5:45 to 6:00	Parked Veh.	Utilization	Parked Veh.	Utilization	Parked Veh.	Utilization
the Rotary Restaurant	13	3	3	2	4	5	3	3	3	4	3	3	3	3	3	3	3	3
Milestone Electronic/Nantucket Light	32	15	13	15	13	12	9	11	11	13	11	11	11	11	11	11	11	11
Pacific National Bank	22	12	12	16	10	8	9	10	10	8	8	8	8	8	8	8	8	8
On Gleze Salon	10	4	7	6	8	9	7	6	6	7	7	7	7	7	7	7	7	7
Kitty Marlings	21	6	4	7	7	4	3	3	3	3	3	3	3	3	3	3	3	3
Bamber Real Estate	6	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Sm. Bus. Bwin real estate & dentist	11	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Andy Hess DMD	7	3	2	4	6	6	5	2	2	2	2	2	2	2	2	2	2	2
Nantucket Bagel	15	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
West Creek Cafe	13	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Lucky Express	12	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Trailoria	8	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Hin House	14	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Island Pharmacy	25	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bambou	19	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Island Pharmacy	26	13	13	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Post Office	10	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Island Virgin Power/Law Offices/N. Office Supplies	44	22	23	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
Dee's Pharmacy & SW Freedom Sq. Parking	35	23	23	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Bayberry Court Motel/Use	90	45	44	43	49	47	39	36	32	32	32	32	32	32	32	32	32	32
Apparence Center	15	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Get Station & Liquor Store	17	8	8	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Shap to Shore	12	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Fluents/Starline Gallery/N. Kane Baskets	10	12	13	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Downy Plaza (doguand)	26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Shap & Shop	110	93	86	103	105	110	101	104	102	102	102	102	102	102	102	102	102	102
Ware & Shop (adj. to Shop & Shop)	16	12	9	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Get Station/Car Wash/Photo Express	18	18	18	13	10	11	14	15	15	15	15	15	15	15	15	15	15	15
Sea, Glass, Shell, Photo Express	51	15	12	13	23	16	16	14	8	8	8	8	8	8	8	8	8	8
Near-Use (Centennial/Plaza Station/Restaurant)	85	11	10	21	11	9	7	8	8	6	6	6	6	6	6	6	6	6

Figure 6
Nantucket - Parking Summary
Weekday PM Peak

TRANSIT SERVICES

The Nantucket Regional Transit Authority (NRTA) provides seasonal, island wide transportation, operating nine routes with 13 buses. Seven of these nine routes service the Mid-Island area and are discussed below. Therefore, the transit service through the study area plays an important role in the future viability of the region. Available NRTA historical data for the above nine bus routes were researched to determine frequency, usage and ridership. A description of each of the nine bus routes follow, while Figure 8 graphically depicts the transit routes and shuttle stops within the “central” Mid Island Area.

Mid-Island Loop

The Mid-Island Loop serves the mid-island area of Nantucket via Washington Street, Francis Street, Union Street, York Street, Atlantic Avenue, Surfside Road, Surfside Drive, Hooper Farm Road, Sparks Avenue, Orange Street, Daves Street and Pleasant Street, Dover Street and into the downtown area via Union Street, with the downtown shuttle stop at Salem Street. Park and Ride Lots are available along this route at the Nantucket Elementary School on Surfside Road, The Muse on Surfside Road and The Chicken Box on Daves Street. The shuttle runs daily from 7:00 AM to 11:30 PM and maintains a 30-minute headway from the end of May to the middle of June and from the middle of September to the end of September. From the middle of June through the middle of September a 15-minute headway is maintained between shuttles.

Miacomet Loop

The Miacomet Loop serves the mid-island and outlying area of Nantucket via Washington Street, Francis Street, Union Street, Orange Street Rotary, Old South Road, Fairgrounds Road, Surfside Road, Bartlett Road, Raceway Drive, Somerset Lane, Hummock Pond Road, Milk Street Extension, Prospect Street, and Dover Street and into the downtown area via Union Street, with the downtown shuttle stop at the corner of Washington and Salem Streets. Park and Ride Lots are available along this route at the Chicken Box Restaurant for the Landmark House stop as well as at the Faregrounds Restaurant on Fairgrounds Road, The Muse on Surfside Road and the Oddfellows Lodge on Bartlett Road. The shuttle runs daily from 7:00 AM to 11:20 PM and maintains a 30-minute headway from the end of May to the middle of June and from the middle of September to the end of September. From the middle of June until the middle of September a 20-minute headway is maintained between shuttles.

Sconset via Old South Road Route

The Sconset via Old South Road Route serves the residential areas, businesses and restaurants along Old South Road and the village of Sconset via the Sconset stop on Main Street to Milestone Road, Nobadeer Farm Road, Old South Road, Orange Street and Union Street and into downtown via Francis and Washington Streets, with the downtown shuttle stop on Washington Street. There are no direct Park and Ride Lots available along this route; however, riders may use the Park and Ride Lot at The Chicken Box on Daves Street and walk approximately 500-feet to the Landmark House stop on Orange Street. The shuttle runs daily from 7:15 AM to 11:15 PM

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and maintains an hour and fifteen minute headway between the end of May and the end of September.

Sconset via Milestone Road Route

The Sconset via Milestone Road Route serves the village of Sconset via the Sconset stop on Main Street. It proceeds via Milestone Road, Orange Street and Union Street into the downtown area via Francis and Washington Streets, with the downtown shuttle stop on Washington Street. There are also no direct Park and Ride Lots available along this route, however similar to the Sconset via Old South Road Route, riders may use the Park and Ride Lot at The Chicken Box and walk 500-feet to the Landmark House on Orange Street. The shuttle runs daily from 7:15 AM to 11:15 PM and maintains an hour stop headway between the middle of June and the middle of September.

Sconset via Polpis Road Route

The Sconset via Polpis Road Route serves the residential areas and destinations along Polpis Road and the village of Sconset via the Sconset stop on Main Street. It proceeds to School Street, West Sankaty Avenue, Coffin Street, Sankaty Road, Polpis Road, Milestone Road, Orange Street and Union Street and into downtown via Francis and Washington Streets, to the downtown shuttle stop on Washington Street. Similar to the Sconset via Old South Road and Milestone Road Routes, there are no direct Park and Ride Lots available along this route, however, riders may use the Park and Ride Lot at The Chicken Box and walk approximately 500-feet to the Landmark House stop on Orange Street. The shuttle runs daily from 10:00 AM to 6:00 PM and maintains an hour and twenty minute headway between the beginning of July and early September.

Surfside Beach Route

The Surfside Beach Route serves Surfside Beach via Surfside Road, Fairgrounds Road, Orange Street and Union Street and into downtown via Francis and Washington Streets, with the downtown shuttle stop at the corner of Washington Street and Main Street. A Park and Ride Lot is available along this route at the Faregrounds Restaurant and riders may use the Park and Ride lot at the Chicken Box Restaurant and walk to the Landmark House Stop. The shuttle runs daily from mid-June to Labor Day from 10:00 AM to 6:00 PM and maintains a forty-minute headway.

Airport Route

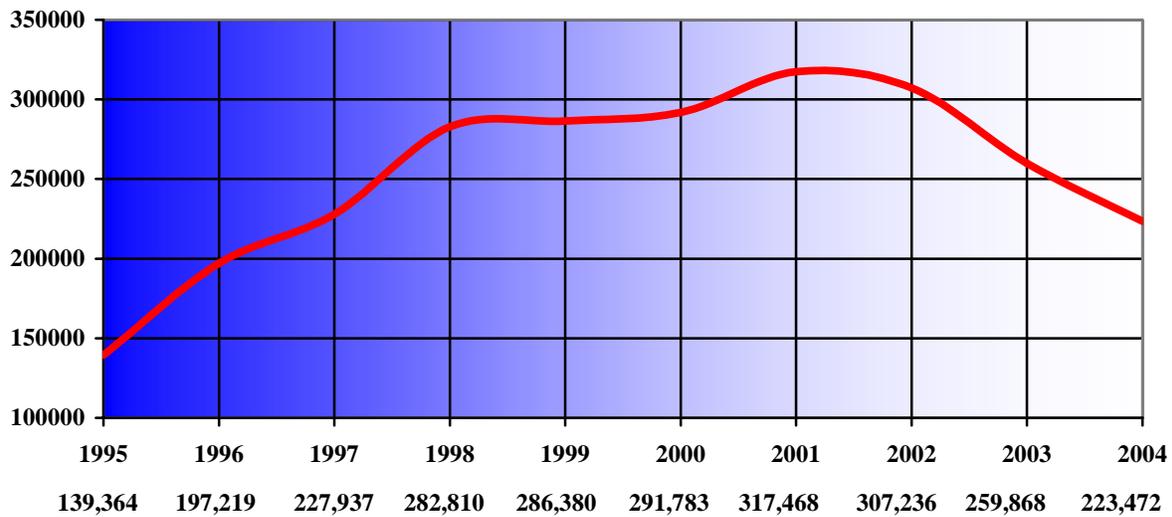
The Airport Route serves Nantucket Memorial Airport and the downtown via Macy Lane, Old South Road, Orange Street and Union Street and into downtown via Francis and Washington Streets, with the downtown shuttle stop on Washington Street. The shuttle will operate in 2005 daily from July 1st to September 5th from 9:00 AM to 6:00 PM and maintains a thirty-minute headway. There are no direct Park and Ride Lots available along this route, however riders may use the Park and Ride Lot at the Chicken Box Restaurant.

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Figure 9 depicts the passengers carried on the NRTA shuttle from 1995 to 2004. The NRTA data indicates that between 1995 and 2004, the passengers carried have increased at a rate of approximately 8.4 percent per year. However, as can be seen in this figure, there was a significant increase in passengers from 1995 to 1998 (approximately 103%), which can be attributed to its expanded services, including both additional routes and buses.

Figure 9
PASSENGERS CARRIED ON NRTA SHUTTLE, 1995 TO 2004

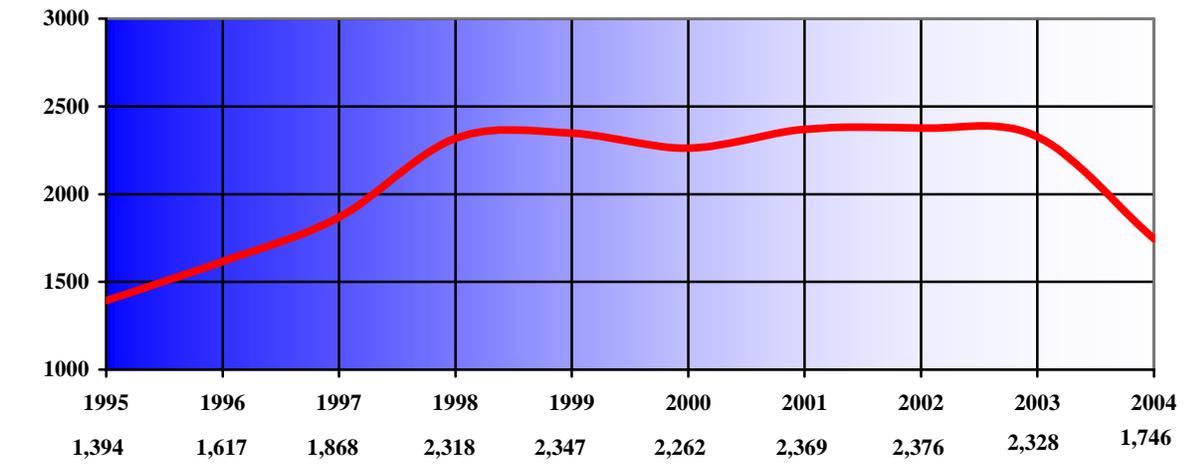


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Figure 10 graphically depicts the average daily ridership (ADR) on the NRTA shuttle from 1995 to 2004. The NRTA data indicated that between 1995 and 2004, the ADR has increased at a rate of approximately 3.9 percent per year. The greatest increase in ADR occurred between 1997 and 1998, where the ADR increased approximately 24.1 percent, which also can be attributed to the NRTA's expanded services.

Figure 10
AVERAGE DAILY RIDERSHIP ON NRTA, 1995 TO 2004

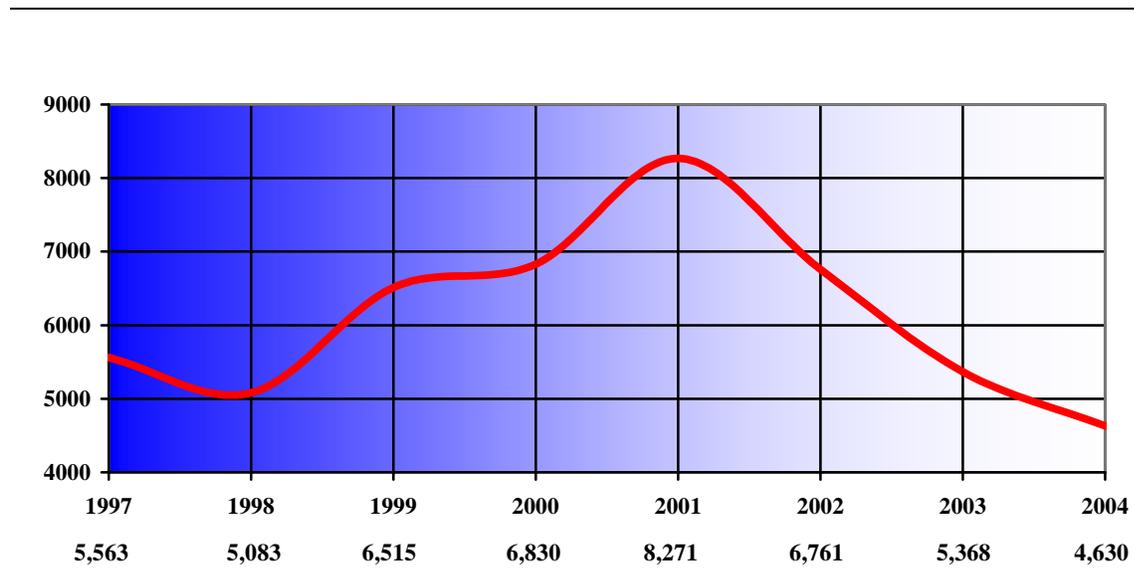


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All bicycles paths are accessible from the NRTA shuttle routes and all NRTA shuttle buses are equipped with bicycles racks mounted on the front of each bus that accommodate two bikes on a first come first serve basis. In addition, stationary bicycle racks are available at several of the NRTA shuttle stops. These bicycle racks provide both residents and visitors a better opportunity to make use of the NRTA shuttle. Figure 11 depicts the bicycles carried on the NRTA shuttle from 1997 to 2004. The NRTA data indicated that between 1997 and 2003, the total bicycles carried on the NRTA shuttle have increased approximately 2.8 percent per year.

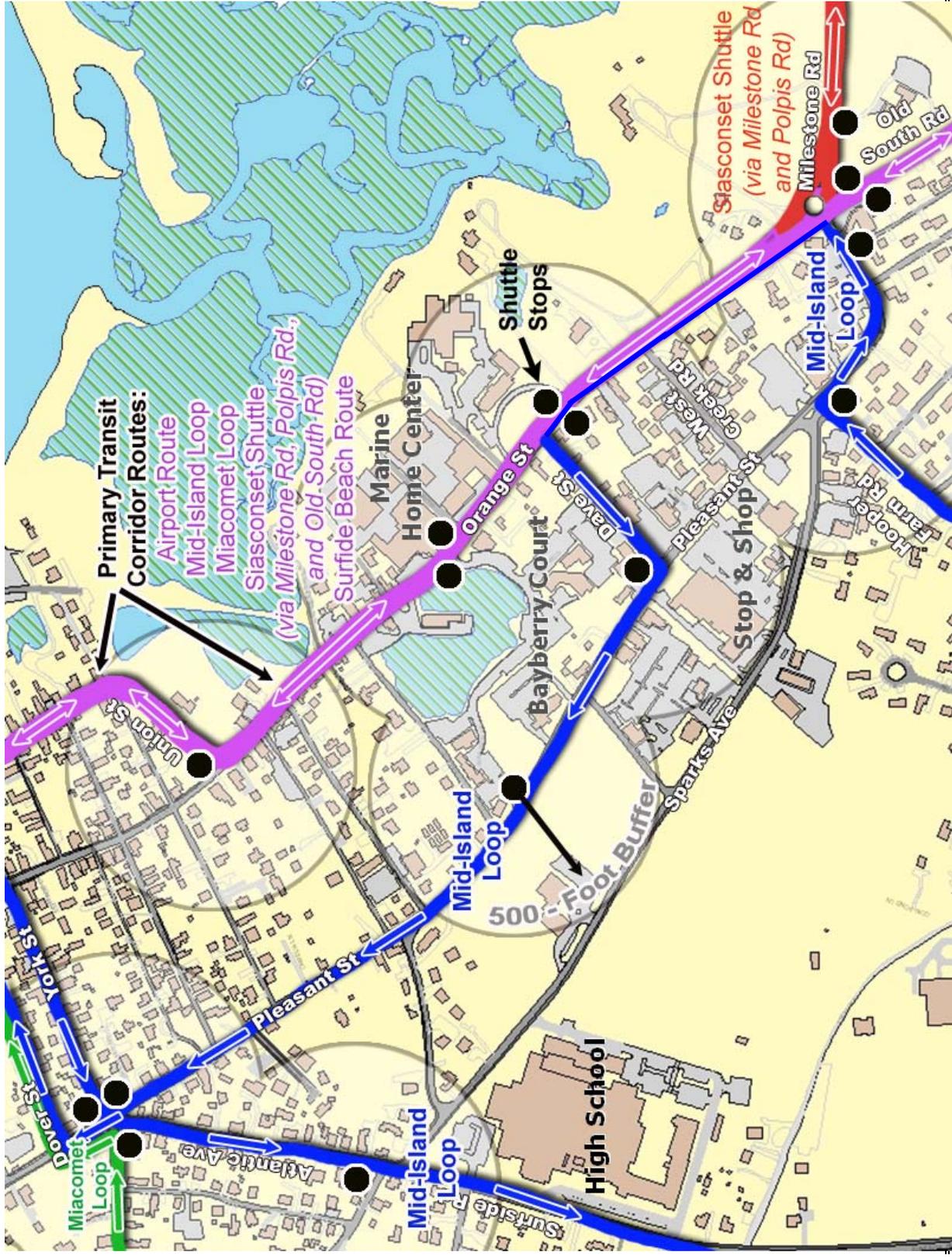
Figure 11
TOTAL BICYCLES CARRIED ON NRTA SHUTTLE, 1997 TO 2004



As can be seen from the transit data as service increased, ridership, in general, is increased, indicating a demand for transit service. Recommended improvements are discussed in the *Findings/Recommendations* section of this report.

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Figure 8

Mid-Island Transit Map

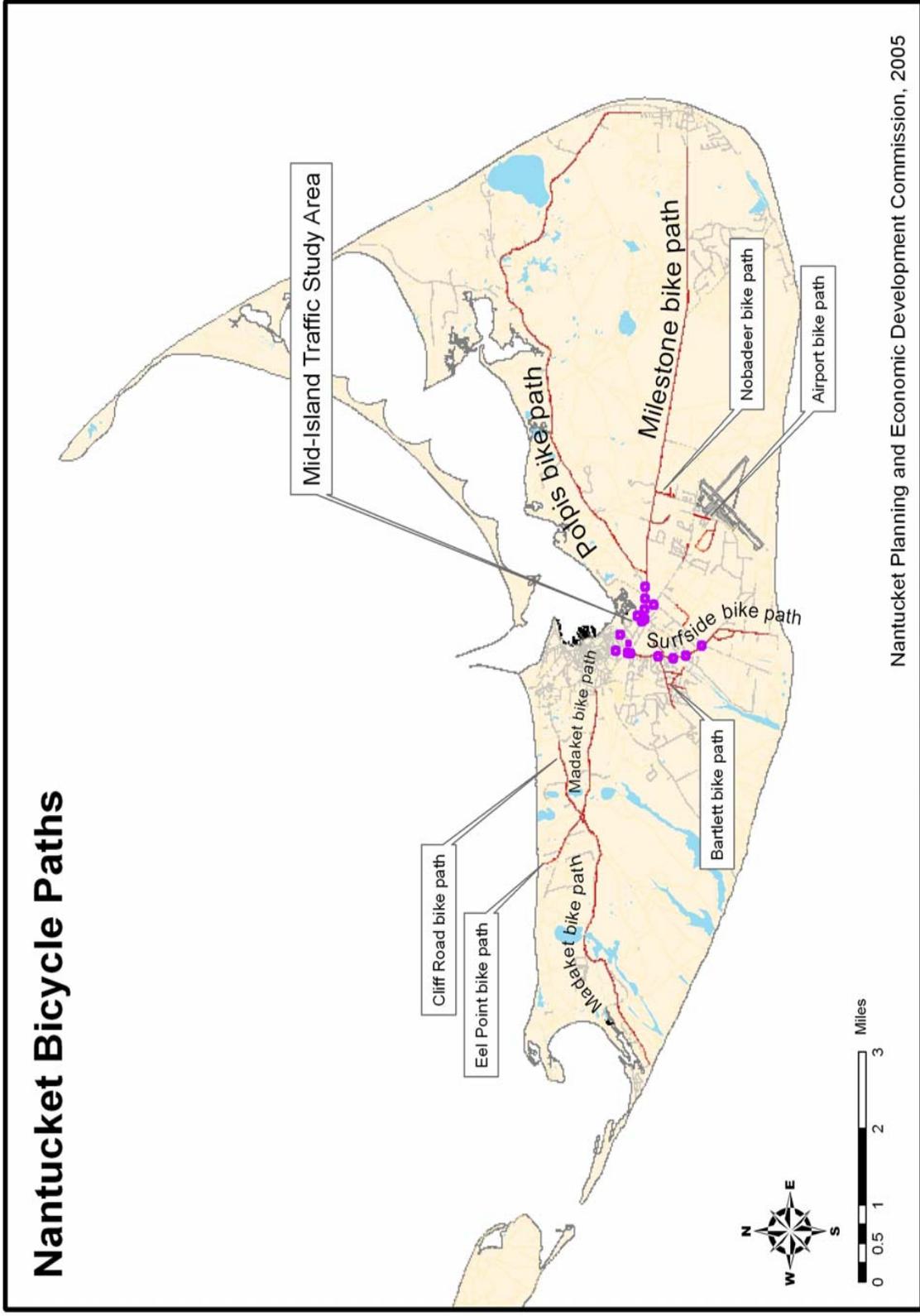
BIKEWAYS

The island of Nantucket has over 24 miles of bicycle paths comprised of six designated bicycle routes. These include the Surfside Road Bicycle Path, the Madaket Road Bicycle Path, the Milestone/Sconset Road Bicycle Path, the Cliff Road Bicycle Path, the Polpis Road Bicycle Path and the Eel Point Bicycle Path. These bicycle paths provide convenient access to many destinations/areas of the island, are generally separated from the adjacent roadways, 8 feet wide and in good condition. There are also informally designated bicycle paths along roadways such as Bartlett Road, Nobadeer Farm Road and Old South Road. The bicycle paths are illustrated on Figure 12.

While there is a bicycle path located on the west side of Surfside Road, it ends abruptly at Vesper Lane and does not provide any further guidance to bicyclists. There is currently no connecting bike path from the Surfside Bicycle Path to the Milestone/Sconset Road Bicycle Path or a bicycle path into the Downtown area. Recommended improvements are discussed in the *Findings/Recommendations* section of this report.

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Figure 12
Nantucket Bicycle Paths