

FINDINGS/RECOMMENDATIONS

Based on the evaluation of the study area roadways, intersections, transit service and bike facilities, this section of the study offers recommendations to improve the overall transportation system in the Mid-Island Area. While not every deficiency can be realistically addressed, the improvements offered in this section will result in improved safety, circulation and access to and within the Mid-Island Area, while maintained the desired “island feel and quality of life.”

This section first discusses two major roadway corridors, Pleasant Street and West Creek Road. Next, based on the accident history and intersection operations the eleven most significant intersections are discussed and conceptual improvements are provided. In addition, typical traffic calming and safety improvements are provided for the Surfside Road intersections. Finally, brief recommendations for improvements for the parking, transit and bicycle facilities are presented.

ROADWAYS

Sanford Road

In order to facilitate improvements to the Mid-Island area roadway networks and parking facilities, it is recommended that Sanford Road be converted from a private way to a public way. This will require approval from the County of Nantucket and cooperation of the current owners.

Pleasant Street Corridor

The *Mid-Island Area* Plan has recommended that Pleasant Street be converted to one-way travel in the westbound direction from its intersection with Hooper Farm Road and Sparks Avenue to the Five Corners intersection. While the conversion from two-way travel to one-way travel will ultimately require approval from the Nantucket Selectmen, the following information is provided to evaluate the potential changes in travel patterns within the Mid-Island area. By providing a

one-way travel pattern on Pleasant Street, sidewalks, bike lanes and on-street parking could be provided with minimal impacts on the adjacent land parcels, resulting in improved corridor safety. In addition, the street would be emphasized as the “Main Street” of the Mid-Island area. Therefore, the Pleasant Street corridor was evaluated to determine the ramifications of converting this roadway to one-way travel. These include the impacts on the proposed roundabout at the Sparks Avenue at Pleasant Street and Hooper Farm Road intersection, the need to establish one-way roadway pairs for the connecting streets between Pleasant Street and Orange Street, the ability to provide pedestrian, bicycle and parking facilities along the roadway and the impacts on traffic levels and circulation along the adjacent roadways and intersections. It is anticipated that the construction of the Sparks Avenue Roundabout will be completed prior to the implementation of the Pleasant Street one-way operation. Therefore, the analysis for this section evaluates the Sparks Avenue at Pleasant Street and Hooper Farm Road intersection as a roundabout. The peak hour traffic volumes, incorporating a one-way travel pattern on Pleasant Street, are shown on Figures 16 to 18 for the 2004 Existing conditions and Figures 19 to 21 for the 2014 Design Year conditions.

Level-of-service and queue analyses were conducted at the study area intersections within the “central” Mid-Island area assuming a one-way travel pattern on Pleasant Street. The impact of the one-way travel pattern on Pleasant Street on the “central” Mid-Island area intersections can be measured by comparing the 2004 Existing/2014 Design Year with Pleasant Street One-Way conditions to 2004 Existing/2014 Design Year conditions with Pleasant Street Two-Way. Tables 20 through 27 summarize the results of the analyses under both 2004 Existing and 2014 Design Year conditions with Pleasant Street one-way flow implemented. All analysis worksheets are provided in the Appendix.

Under future roadway conditions, the capacity and queue analysis shows the Pleasant Street one-way alternative has an insignificant impact on the intersections of Sparks Avenue at Hooper Farm Road and Pleasant Street (Table 20), the Milestone Rotary (Table 21) and Pleasant Street at Cherry Street, Williams Street and Williams Lane (Table 24), with minimal change in LOS and delay. Significant improvements in LOS and delay are anticipated on the West Creek Road approach at its intersection with Pleasant Street (Table 23) and at the Five Corners intersection (Table 26).

However, the intersections of Orange Street and West Creek Road (Table 22), Orange Street and Union Street (Table 25) and the Four Corners intersection (Table 27) are projected to be negatively impacted, with increased delays and degradation in LOS, as a result of the Pleasant Street one-way alternative, due to the significant amount of traffic anticipated to be diverted to Prospect Street and Orange Street in the eastbound direction. While the future improvements are described under each intersection, the following is a brief highlight of the improvements required at the critical intersection to accommodate Pleasant Street one-way flow.

- Four Corners – Realign Sparks Avenue and Prospect Street to form a standard four-way, STOP controlled intersection.
- Five Corners – A separate left-turn lane should be provided on the Pleasant Street westbound approach for vehicles turning onto York Street and Atlantic Avenue.

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

- Orange Street and Union Street – A second STOP sign should be placed on the Orange Street eastbound one-way approach.
- Williams Lane and Pleasant Street- A separate left-turn lane could also be provided on the Pleasant Street westbound approach for vehicles turning onto Williams Lane.

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

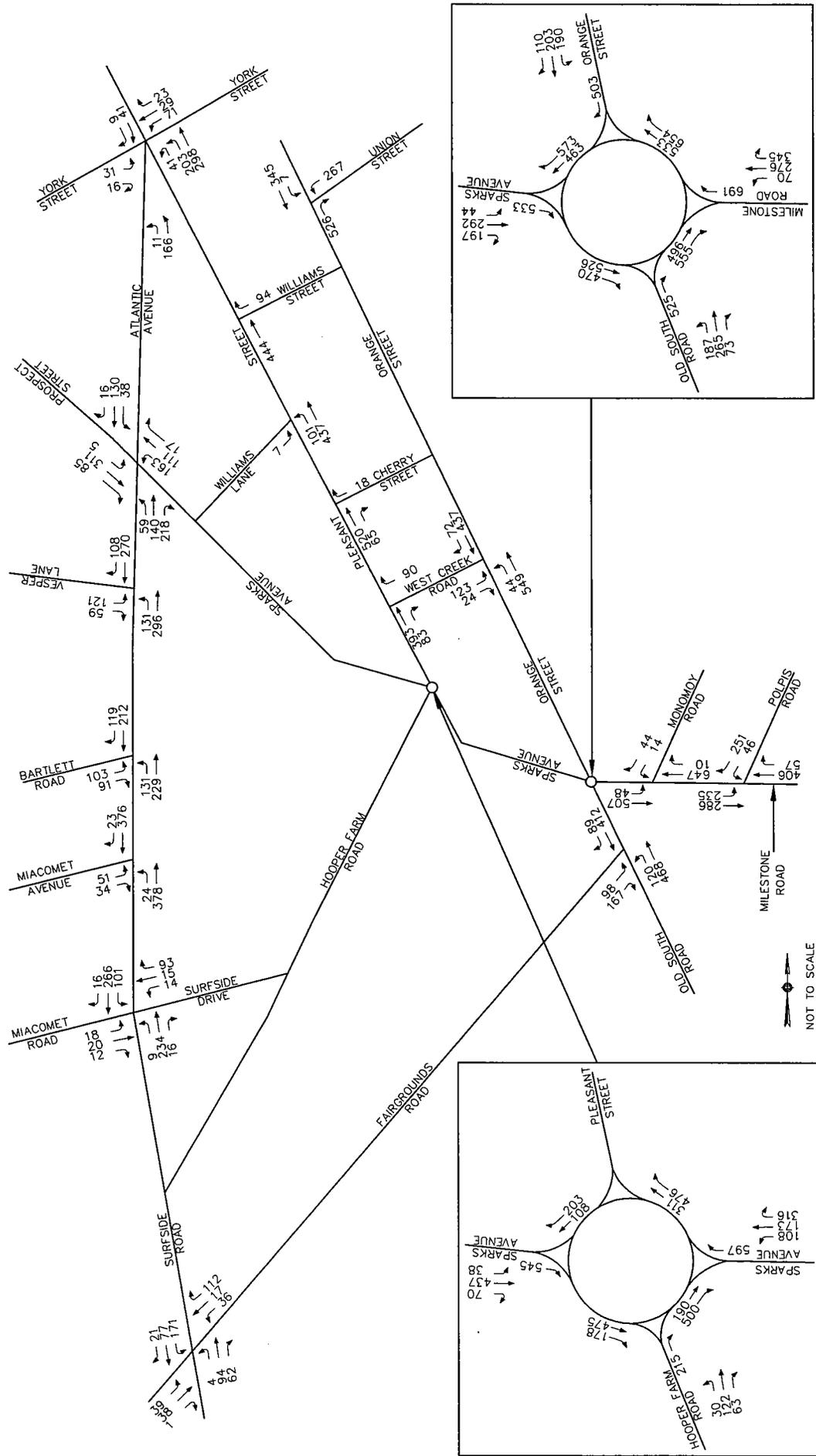


Figure 16
2004 Pleasant Street One-Way Circulation
Weekday AM
Peak Hour Traffic Volumes

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

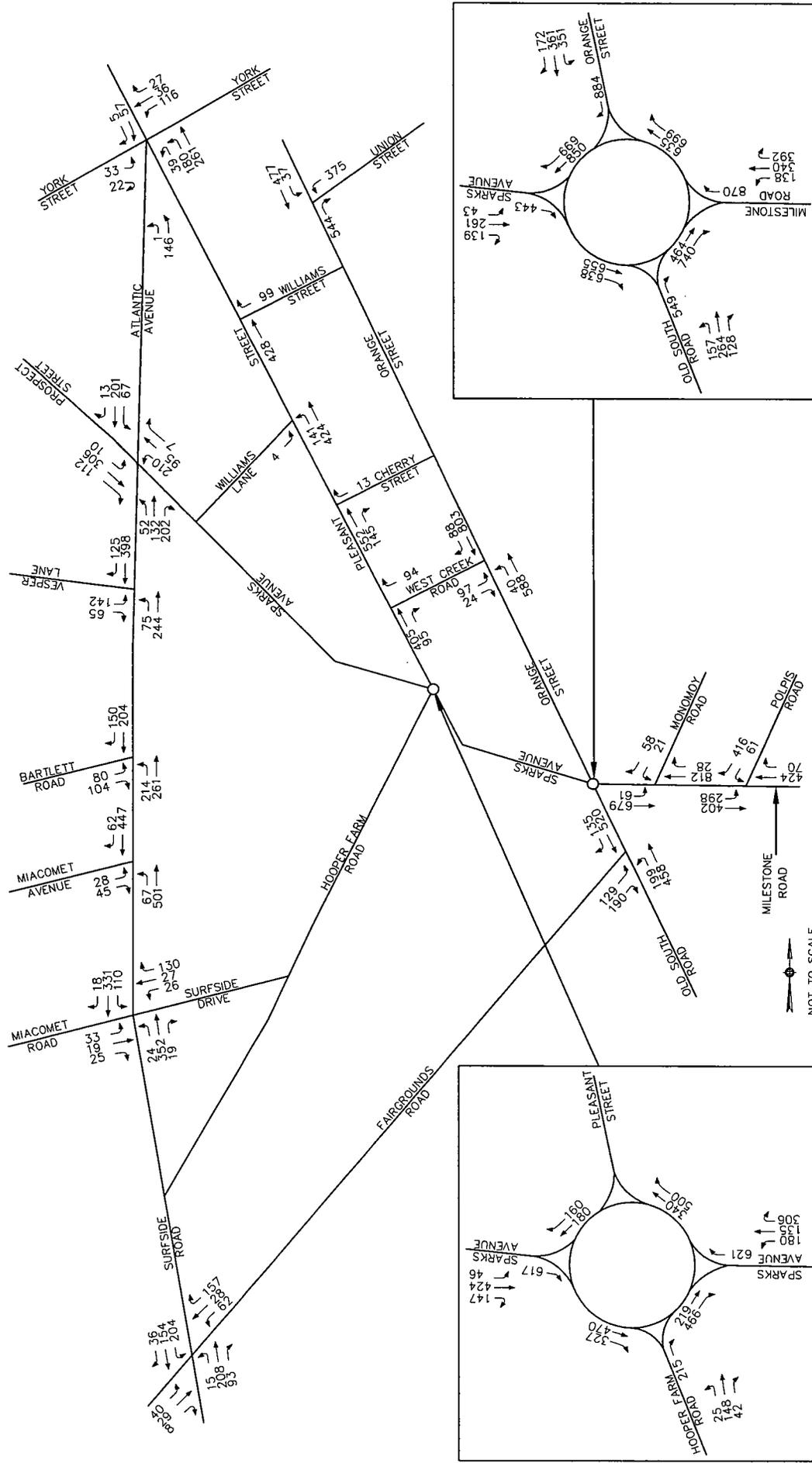


Figure 17
 2004 Pleasant Street One-Way Circulation
 Weekday PM
 Peak Hour Traffic Volumes

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

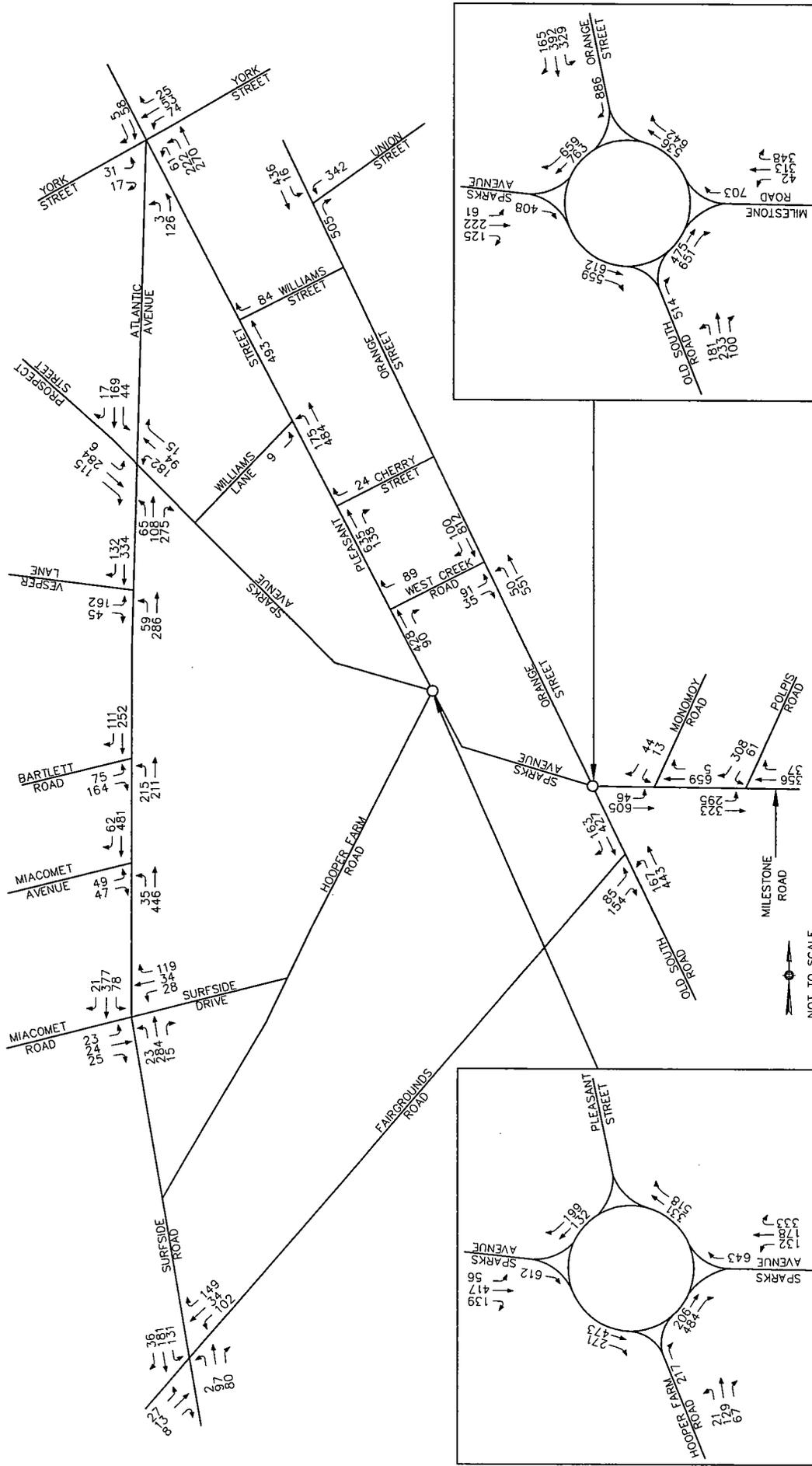


Figure 18
 2004 Pleasant Street One-Way Circulation
 Saturday Midday
 Peak Hour Traffic Volumes

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

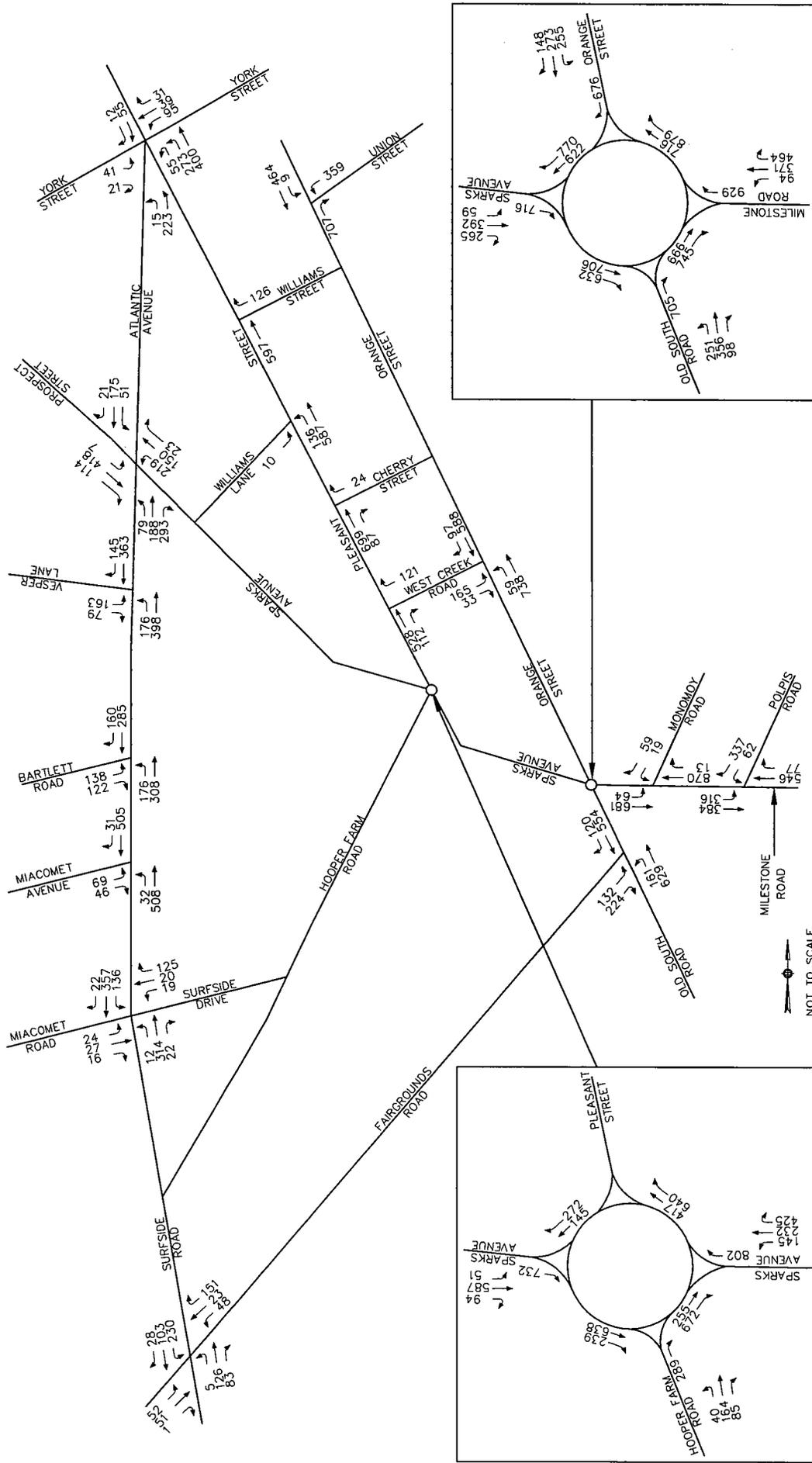


Figure 19
 2014 Pleasant Street One-Way Circulation
 Weekday AM
 Peak Hour Traffic Volumes

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

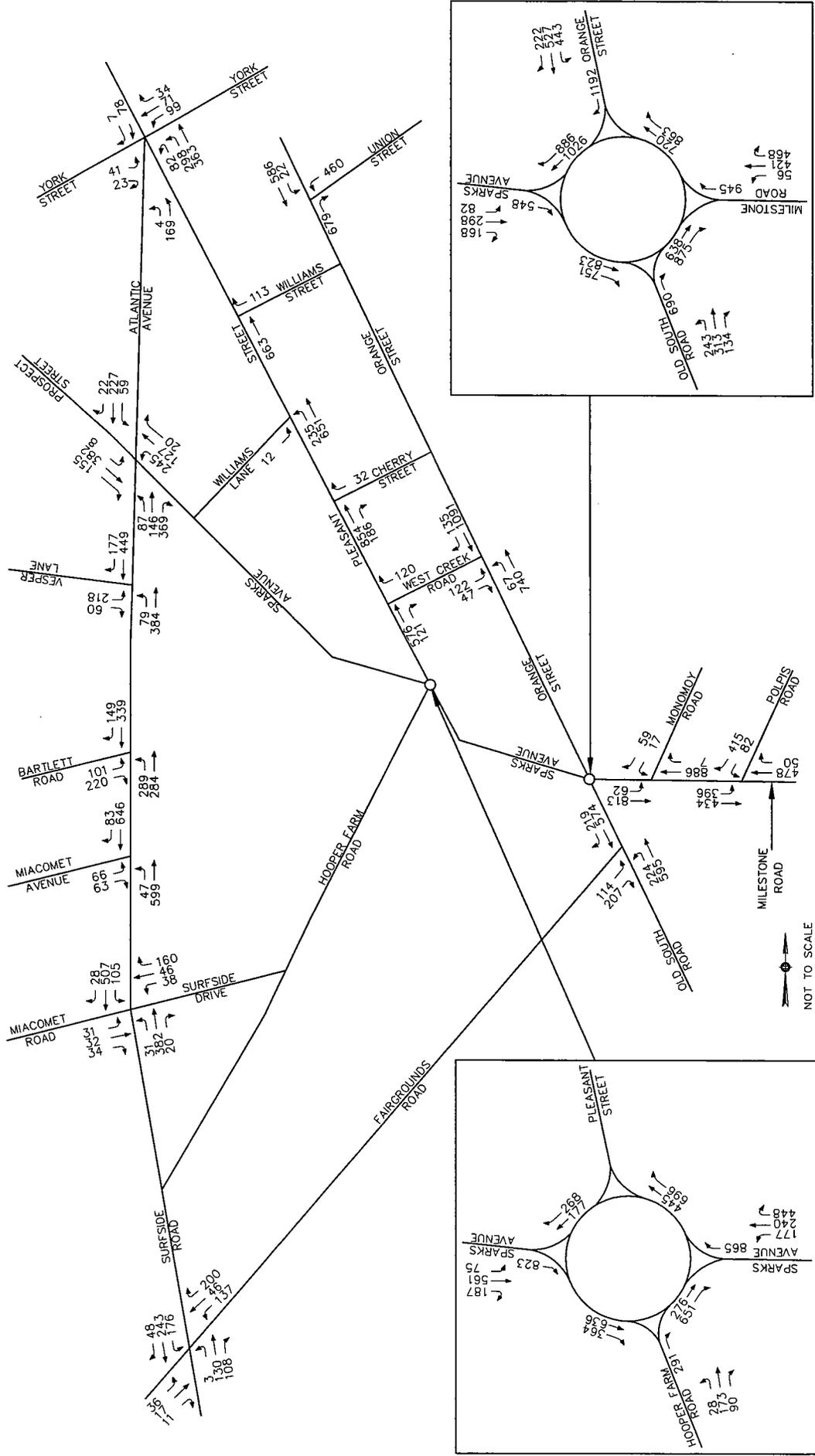


Figure 21
 2014 Pleasant Street One-Way Circulation
 Saturday MIDDAY
 Peak Hour Traffic Volumes

Based on the intersection capacity and queue analysis, along with the parking analysis, it is recommended that on-street parking be provided on both sides of Pleasant Street from West Creek Road to Cherry Street, with angle parking maintained in the vicinity of the Island Pharmacy, on one side of the roadway between Williams Street and Gardner Perry Lane and no parking from Gardner Perry Lane to the Five Corners intersection. A conceptual plan, which includes typical cross-sections for the Pleasant Street one-way alternatives for parking on both sides, one side and no parking, as discussed above, is shown on Figure 22 A&B (Options 3-6). An order of magnitude cost for the aforementioned geometric improvements along this corridor with the Pleasant Street one-way alternative would be approximately \$880,000 to \$1,100,000 with an associated engineering fee of approximately \$120,000.

Providing one-way flow along Pleasant Street will provide a number of benefits, including:

- Contributing to the “Downtown” feel of the Mid-Island Area;
- Providing increased on street parking with minimal impacts on right-of-way; and
- Improving intersection operations at some intersections along the corridor.

However, the improvements to the Four Corners intersection, the Five Corners intersection, Orange Street at Union Street, Pleasant Street at Williams Lane, along with the evaluation of the intersections of Cherry Street and Williams Street at Orange Street, will be necessary prior to the reconfiguration.

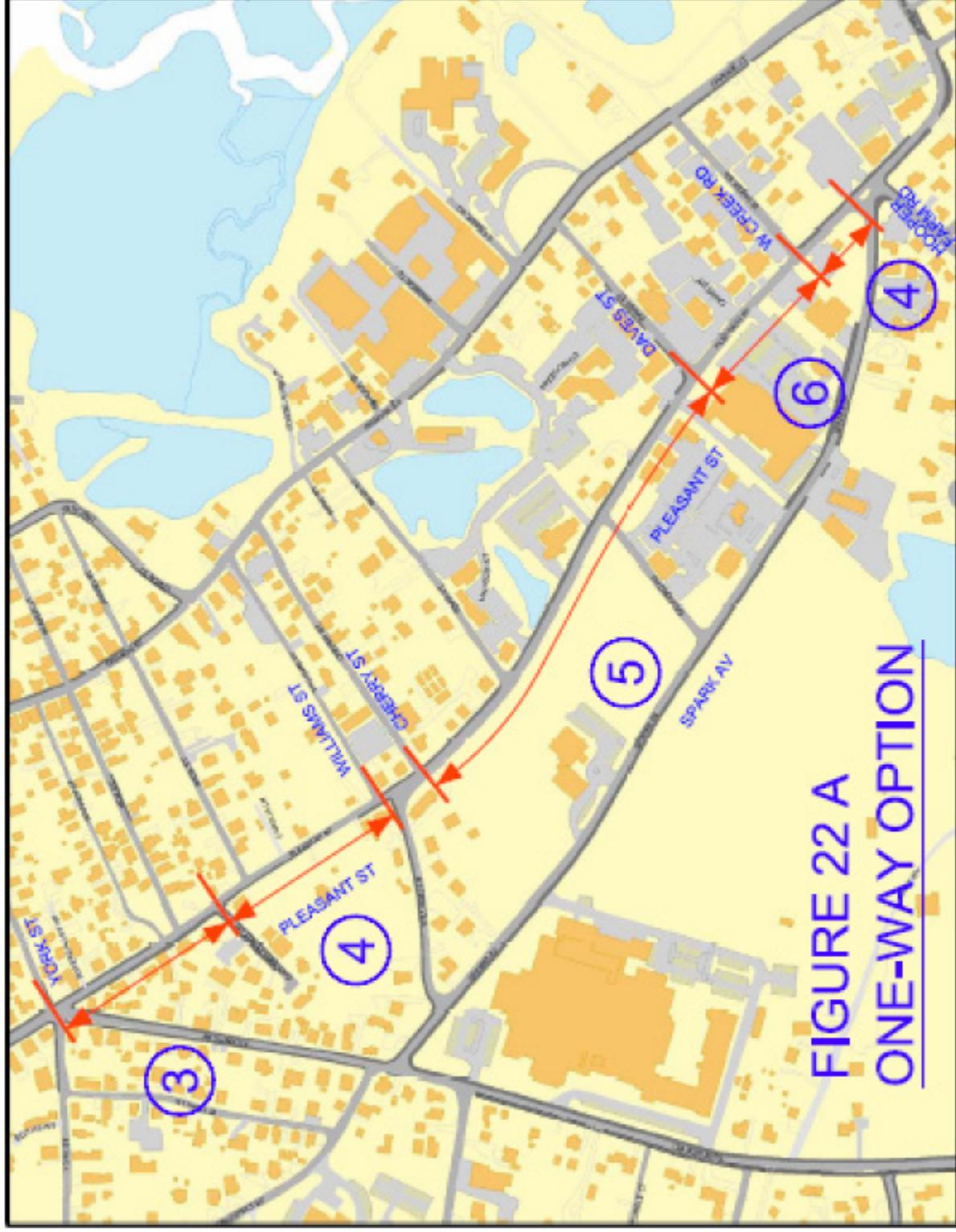
While these improvements will require design, funding and construction, improvements to the parking along Pleasant Street can be implemented with Pleasant Street remaining under two-way flow.

If two-way flow is maintained along Pleasant Street, parking should be provided as follows: on both sides of the roadway from West Creek Road to Daves Street and no parking on the remaining sections of the corridor. A conceptual plan, which includes typical cross-sections for the Pleasant Street two-way alternatives for parking on both sides and no parking, as discussed above, is shown on Figure 23 A&B (Options 1 and 2). An order of magnitude cost for the aforementioned geometric improvements along this corridor with the Pleasant Street two-way flow maintained would be approximately \$980,000 to \$1,200,000 with an associated engineering fee of approximately \$130,000.

The provision for on street parking in regards to both one-way and two-way traffic flow on Pleasant Street will require the cooperation of abutters due to right of way impacts.

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

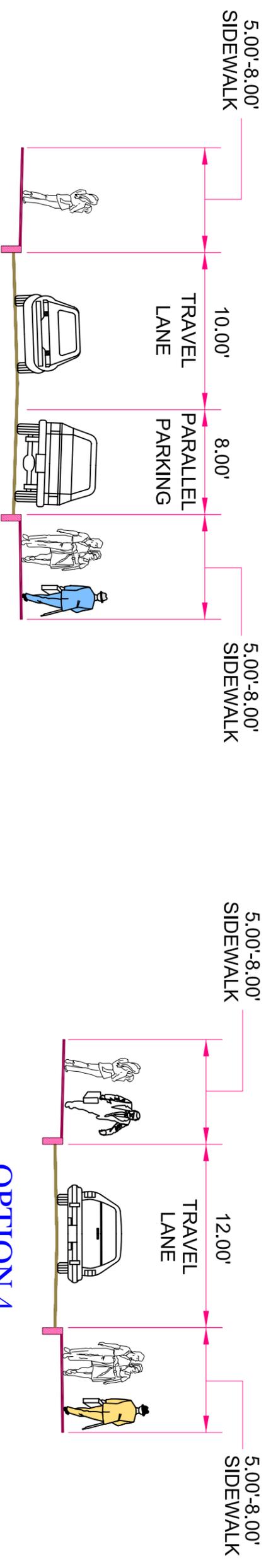


GPI Greenman-Pedersen, Inc.

Engineers, Architects, Planners, Construction Engineers & Inspectors

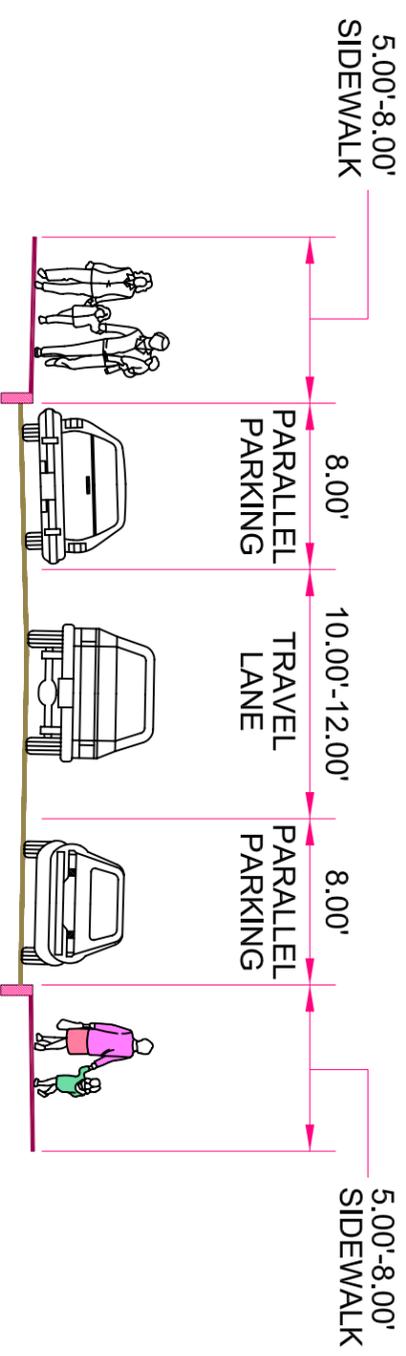
Figure 22A

Parking Study Locations

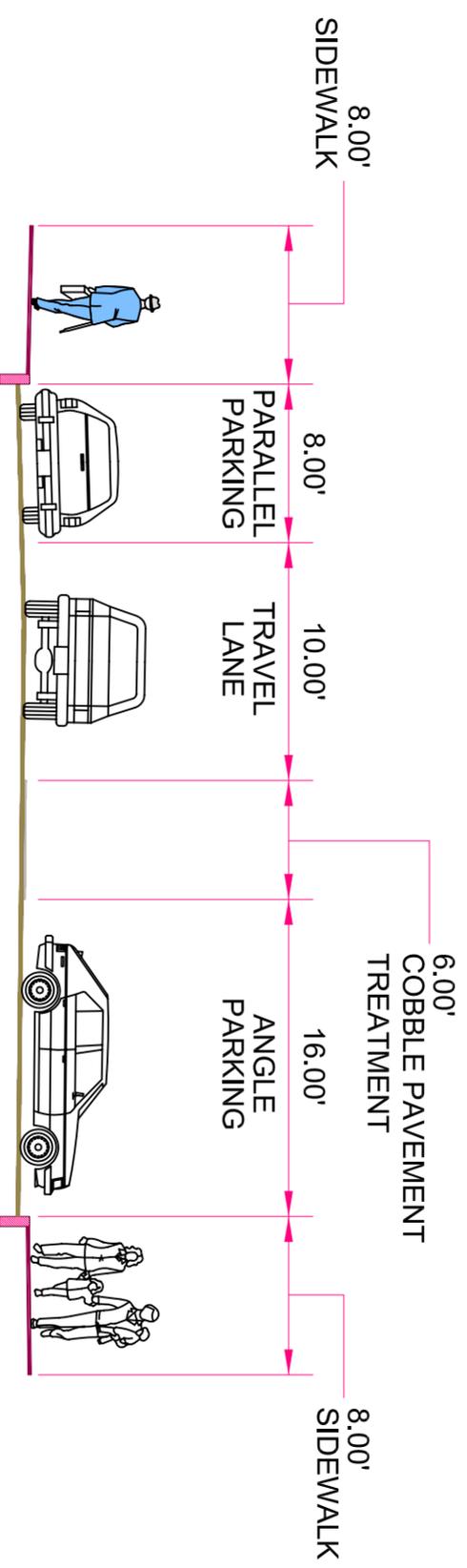


OPTION 3

OPTION 4



OPTION 5



OPTION 6



FIGURE 22 B - TYPICAL SECTIONS
PLEASANT STREET

PROJECT: INTERSECTION IMPROVEMENT PROJECT
NANTUCKET, MASSACHUSETTS

PREPARED FOR: TOWN OF NANTUCKET
16 BROAD STREET
NANTUCKET, MA 02554

ENGINEER'S STAMP
DATE

GPI Greenman-Pedersen, Inc.
Engineers, Architects, Planners, Construction Engineers & Inspectors
105 Central Street, Suite 3100, Stonham, MA 02180
Tel: (781) 279-5500 Fax: (781) 279-5501
http://www.gpined.com

NO.	REVISION	DATE	DESIGN/DRWN BY
			JMD
		4/29/04	
			SCALE: 1"=4'-0"
			JOB NO.: 04068
			FILE NAME: 04068_TIP
			DRAWING NO.: 2 OF 2

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts



GPI Greenman-Pedersen, Inc.

Engineers, Architects, Planners, Construction Engineers & Inspectors

Figure 22B

Parking Study Locations

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 20
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY – Pleasant Street One-Way Circulation Evaluation
Sparks Avenue at Pleasant Street and Hooper Farm Road**

Sparks Avenue at Pleasant Street and Hooper Farm Road	2004 Existing with Planned Intersection Improvements ^a			2004 Existing with Planned Intersection Improvements ^a & Pleasant Street 1-Way			2014 Design Year with Planned Intersection Improvements ^a			2014 Design Year with Planned Intersection Improvements ^a & Pleasant Street 1-Way		
	V/C ^b	Delay ^c	LOS ^d	Queue ^e	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>												
Pleasant St SB approach	0.28	11.4	B	55	--	--	--	88	--	--	--	--
Sparks Ave EB approach	0.36	9.5	A	68	0.40	7.4	A	128	0.58	7.8	A	130
Hooper Farm Road NB approach	0.37	12.9	B	70	0.38	12.3	B	140	0.65	21.3	C	178
Sparks Ave WB approach	0.52	9.4	A	110	0.52	9.7	A	255	0.79	13.6	B	305
<i>Weekday PM:</i>												
Pleasant St SB approach	0.32	12.0	B	65	--	--	--	105	--	--	--	--
Sparks Ave EB approach	0.45	10.4	B	88	0.45	7.9	A	235	0.67	8.8	A	168
Hooper Farm Road NB approach	0.28	11.1	B	50	0.29	11.2	B	95	0.49	15.3	B	102
Sparks Ave WB approach	0.42	9.5	A	82	0.47	10.2	B	145	0.71	12.4	B	212
<i>Saturday Midday:</i>												
Pleasant St SB approach	0.36	12.7	B	75	--	--	--	135	--	--	--	--
Sparks Ave EB approach	0.45	10.6	B	85	0.41	7.7	A	228	0.60	8.2	A	138
Hooper Farm Road NB approach	0.36	11.8	B	68	0.34	11.4	B	160	0.59	17.1	B	142
Sparks Ave WB approach	0.44	9.2	A	90	0.50	9.9	A	172	0.75	13.3	B	262

^aRoundabout.

^bVolume-to-capacity ratio.

^cAverage stopped delay in seconds per vehicle.

^dLevel of service.

^e95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 21
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY – Pleasant Street One-Way Circulation Evaluation
Milestone Rotary**

Milestone Rotary	2004 Existing				2004 Existing with Pleasant Street I-Way				2014 Design Year				2014 Design Year with Pleasant Street I-Way			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>																
Sparks Ave EB approach	0.67	11.3	B	188	0.69	10.2	B	200	1.23	136.6	F	1,500	1.19	115.5	F	1,518
Old South Rd NB approach	0.79	19.8	B	328	0.79	19.7	B	325	1.27	151.5	F	1,852	1.29	162.3	F	1,935
Milestone Rd WB approach	0.51	8.8	A	102	0.51	8.8	A	102	0.73	13.8	B	220	0.72	13.3	B	212
Orange St SB approach	0.36	6.7	A	48	0.34	6.8	A	50	0.55	9.1	A	92	0.53	8.8	A	92
<i>Weekday PM:</i>																
Sparks Ave EB approach	0.82	26.0	C	305	0.82	26.4	C	298	1.91	453.8	F	2,742	1.97	478.5	F	2,745
Old South Rd NB approach	0.89	31.8	C	495	0.89	31.2	C	488	1.23	134.5	F	1,800	1.25	146.3	F	1,900
Milestone Rd WB approach	0.58	9.3	A	128	0.58	9.3	A	128	0.80	15.4	B	288	0.79	14.6	B	275
Orange St SB approach	0.50	8.0	A	80	0.55	8.5	A	95	0.80	14.7	B	202	0.89	18.7	B	280
<i>Saturday Midday:</i>																
Sparks Ave EB approach	0.82	21.4	C	305	0.79	21.9	C	268	1.73	363.8	F	2,785	1.82	410.8	F	2,618
Old South Rd NB approach	0.92	36.1	D	542	0.90	33.2	C	510	1.23	136.7	F	1,822	1.28	156.9	F	1,992
Milestone Rd WB approach	0.49	8.4	A	92	0.49	8.4	A	92	0.68	12.3	B	185	0.66	11.4	B	172
Orange St SB approach	0.47	7.1	A	75	0.53	7.8	A	92	0.72	11.3	B	168	0.81	13.6	B	232

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 22
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY – Pleasant Street One-Way Circulation Evaluation
Orange Street at West Creek Road**

Orange Street at West Creek Road	2004 Existing			2004 Existing with Pleasant Street 1-Way			2014 Design Year			2014 Design Year with Pleasant Street 1-Way		
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>												
Orange St NB through-lefts	0.05	8.7	A	4	0.05	9.0	A	4	0.08	9.4	A	6
West Creek Rd EB approach	1.00	97.0	F	244	0.95	106.6	F	187	2.33	666.9	F	730
<i>Weekday PM:</i>												
Orange St NB through-lefts	0.05	9.3	A	4	0.06	10.2	B	4	0.08	10.4	B	6
West Creek Rd EB approach	1.06	121.2	F	259	1.10	178.1	F	202	2.61	804.2	F	729
<i>Saturday Midday:</i>												
Orange St NB through-lefts	0.06	9.5	A	5	0.08	10.5	B	6	0.11	10.8	B	9
West Creek Rd EB approach	1.08	134.3	F	258	1.22	218.3	F	235	2.82	907.9	F	709

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

NC = No capacity available.

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 23
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY – Pleasant Street One-Way Circulation Evaluation
Pleasant Street at West Creek Road**

Pleasant Street at West Creek Road	2004 Existing				2004 Existing with Pleasant Street 1-Way				2014 Design Year				2014 Design Year with Pleasant Street 1-Way			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>																
Pleasant St SB through-lefts	0.15	9.1	A	14	--	--	--	--	0.24	10.3	B	23	--	--	--	--
West Creek Rd WB approach	0.35	18.7	C	39	0.19	12.7	B	17	0.73	47.9	E	128	0.31	16.2	C	33
<i>Weekday PM:</i>																
Pleasant St SB through-lefts	0.18	9.3	A	17	--	--	--	--	0.29	10.8	B	30	--	--	--	--
West Creek Rd WB approach	0.45	23.7	C	56	0.20	12.9	B	18	1.02	117.1	F	227	0.33	16.9	C	36
<i>Saturday Midday:</i>																
Pleasant St SB through-lefts	0.18	9.3	A	16	--	--	--	--	0.28	10.8	B	28	--	--	--	--
West Creek Rd WB approach	0.45	24.4	C	56	0.20	13.3	B	19	1.02	117.4	F	222	0.34	17.7	C	38

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 24
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY – Pleasant Street One-Way Circulation Evaluation
Pleasant Street at Cherry Street, Williams Lane and Williams Street**

Intersection/Peak Hour/Movement	2004 Existing				2004 Existing with Pleasant Street I-Way				2014 Design Year				2014 Design Year with Pleasant Street I-Way			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Pleasant Street at Cherry Street																
<i>Weekday AM:</i>																
Pleasant St SB through-lefts	0.09	9.0	A	7	--	--	--	--	0.14	10.1	B	12	--	--	--	--
Cherry St Rd WB approach	0.05	13.9	B	1	0.04	12.6	B	3	0.10	18.5	C	9	0.07	15.4	C	6
<i>Weekday PM:</i>																
Pleasant St SB through-lefts	0.08	9.0	A	6	--	--	--	--	0.12	10.1	B	10	--	--	--	--
Cherry St Rd WB approach	0.07	17.7	C	6	0.03	12.8	B	2	0.17	28.5	D	15	0.06	15.8	C	5
<i>Saturday Midday:</i>																
Pleasant St SB through-lefts	0.06	9.3	A	5	--	--	--	--	0.10	10.5	B	8	--	--	--	--
Cherry St Rd WB approach	0.13	17.2	C	11	0.08	14.3	B	7	0.27	27.4	D	26	0.15	19.2	C	13
Pleasant Street at Williams Lane																
<i>Weekday AM:</i>																
Pleasant St NB through-lefts	0.07	8.1	A	6	0.07	7.4	A	6	0.11	8.6	A	9	0.09	7.4	A	8
Williams Ln EB approach	0.27	12.4	B	28	0.03	14.9	B	2	0.46	17.1	C	60	0.06	19.5	C	4
<i>Weekday PM:</i>																
Pleasant St NB through-lefts	0.11	8.5	A	10	0.09	7.4	A	8	0.17	9.3	A	16	0.12	7.5	A	10
Williams Ln EB approach	0.20	12.6	B	18	0.01	15.5	C	1	0.34	16.8	C	38	0.03	20.6	C	2
<i>Saturday Midday:</i>																
Pleasant St NB through-lefts	0.14	8.5	A	12	0.11	7.5	A	10	0.21	9.2	A	19	0.15	7.6	A	14
Williams Ln EB approach	0.23	13.2	B	23	0.04	18.3	C	3	0.43	19.7	C	52	0.08	27.1	D	7
Pleasant Street at Williams Street																
<i>Weekday AM:</i>																
Williams St WB approach	0.34	17.1	C	38	0.21	12.7	B	20	0.63	32.6	D	100	0.35	16.6	C	38
<i>Weekday PM:</i>																
Williams St WB approach	0.33	17.1	C	36	0.20	12.7	B	19	0.62	32.7	D	97	0.34	16.5	C	37
<i>Saturday Midday:</i>																
Williams St WB approach	0.32	17.6	C	34	0.19	13.2	B	18	0.61	34.1	D	93	0.33	17.5	C	36

^aVolume-to-capacity ratio. ^bAverage stopped delay in seconds per vehicle. ^cLevel of service. ^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 25
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY – Pleasant Street One-Way Circulation Evaluation
Orange Street at Union Street**

Orange Street at Union Street	2004 Existing			2004 Existing with Pleasant Street 1-Way			2014 Design Year			2014 Design Year with Pleasant Street 1-Way		
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>												
Orange St SB through-lefts	0.16	13.4	B	118	0.67	17.2	C	195	0.24	28.5	D	250
Union St WB lefts	0.73	22.8	D	225	0.90	59.0	F	348	1.35	193.9	F	1,135
<i>Weekday PM:</i>												
Orange St SB through-lefts	0.33	19.8	C	245	1.23	142.3	F	1,295	0.58	62.8	F	508
Union St WB lefts	1.26	152.1	F	1,020	1.71	368.3	F	1,630	2.54	727.1	F	2,958
<i>Saturday Midday:</i>												
Orange St SB through-lefts	0.25	12.0	B	158	1.11	95.6	F	930	0.37	28.0	D	365
Union St WB lefts	1.21	130.6	F	1,000	1.66	341.4	F	1,672	2.36	638.5	F	2,998

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

NC = No capacity available.

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 26
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY – Pleasant Street One-Way Circulation Evaluation
Pleasant Street at York Street and Atlantic Avenue**

Pleasant Street at York Street and Atlantic Avenue	2004 Existing				2004 Existing with Pleasant Street 1-Way				2014 Design Year				2014 Design Year with Pleasant Street 1-Way			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>																
York St/Atlantic Ave EB approach	0.76	27.8	D	169	0.54	16.7	C	80	1.00	101.5	F	354	0.76	27.7	D	164
York St WB approach	0.41	14.6	B	48	0.39	12.3	B	45	0.55	20.9	C	81	0.46	15.2	C	59
Pleasant St NB approach	1.00	77.5	F	370	0.97	51.4	F	352	1.00	326.9	F	428	1.00	236.5	F	441
Pleasant St SB approach	0.39	13.8	B	45	0.20	9.9	A	18	0.51	19.4	C	70	0.25	11.5	B	24
<i>Weekday PM:</i>																
York St/Atlantic Ave EB approach	0.72	22.7	C	147	0.50	14.2	B	70	1.00	92.5	F	342	0.68	23.4	C	129
York St WB approach	0.45	15.0	C	57	0.43	12.1	B	53	0.66	26.3	D	116	0.51	16.8	C	72
Pleasant St NB approach	0.91	42.2	E	271	0.82	27.9	D	217	1.00	254.7	F	395	1.00	147.3	F	406
Pleasant St SB approach	0.41	13.8	B	49	0.22	9.4	A	20	0.58	22.6	C	90	0.27	11.5	B	27
<i>Saturday Midday:</i>																
York St/Atlantic Ave EB approach	0.64	20.8	C	112	0.47	14.2	B	62	0.96	59.4	F	289	0.47	19.6	C	63
York St WB approach	0.48	16.4	C	63	0.44	12.9	B	55	0.73	30.0	D	146	0.52	16.7	C	74
Pleasant St NB approach	1.00	76.1	F	370	0.97	50.8	F	353	1.00	367.9	F	429	1.00	233.0	F	444
Pleasant St SB approach	0.40	14.0	B	48	0.21	9.7	A	20	0.59	22.4	C	91	0.27	11.3	B	27

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

Table 27

**INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY – Pleasant Street One-Way Circulation Evaluation
Sparks Avenue at Prospect Street, Surfside Road and Atlantic Avenue**

Sparks Avenue at Prospect Street, Surfside Road and Atlantic Avenue	2004 Existing				2004 Existing with Pleasant Street 1-Way				2014 Design Year				2014 Design Year with Pleasant Street 1-Way			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	Dela		LOS	Queue	Dela		LOS	Queue	Dela		LOS	Queue
					V/C	y			V/C	y			V/C	y		
<i>Weekday AM:</i>																
Prospect St EB approach	0.84	33.5	D	207	1.00	103.9	F	338	1.00	159.7	F	351	1.00	343.1	F	391
Sparks Ave WB approach	0.81	31.5	D	188	0.81	39.1	E	180	1.00	136.2	F	337	1.00	127.8	F	321
Surfside Rd NB approach	0.91	43.6	E	264	1.00	72.8	F	326	1.00	228.3	F	378	1.00	278.4	F	378
Atlantic Ave SB approach	0.44	16.5	C	53	0.61	24.9	C	95	0.59	26.1	D	90	0.84	47.7	E	191
<i>Weekday PM:</i>																
Prospect St EB approach	0.83	32.9	D	200	1.00	110.0	F	325	1.00	157.4	F	338	1.00	319.7	F	377
Sparks Ave WB approach	0.87	39.4	E	224	0.92	58.4	F	243	1.00	197.2	F	345	1.00	185.9	F	333
Surfside Rd NB approach	0.90	42.6	E	251	1.00	78.2	F	313	1.00	228.3	F	364	1.00	257.9	F	363
Atlantic Ave SB approach	0.61	20.9	C	97	0.80	40.3	E	171	0.83	46.6	E	187	1.00	103.3	F	304
<i>Saturday Midday:</i>																
Prospect St EB approach	0.81	31.7	D	189	1.00	84.7	F	322	1.00	146.9	F	340	1.00	308.5	F	373
Sparks Ave WB approach	0.79	31.0	D	175	0.78	37.6	E	165	1.00	131.2	F	328	1.00	116.3	F	308
Surfside Rd NB approach	0.95	52.2	F	297	1.00	97.9	F	334	1.00	281.0	F	387	1.00	341.0	F	387
Atlantic Ave SB approach	0.52	18.4	C	72	0.75	34.6	D	152	0.72	34.1	D	133	1.00	96.4	F	301

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

West Creek Road

The *Mid-Island Area* Plan has recommended that two-way circulation be maintained along West Creek Road. The Town attempted a temporary conversion of West Creek Road from two-way to one-way travel in 2003; however, residents and local business owners opposed the modification. However, as part of this study the benefits and detriments associated with modifying traffic circulation along West Creek Road were examined and it was concluded that two-way circulation on West Creek Road be maintained in order to accommodate a potential new transit loop and provide accessibility to Pleasant Street under the one-way Pleasant Street option. The critical issue along this road appears to be the on-street parking, in particular the 90 degree, head-in parking and its impact on traffic circulation. Alternatives to improve the parking situation along West Street and reduce conflicts between parked vehicles and pedestrians, bicyclists and motorists were examined. Based on this evaluation, it is recommended that the existing on street, head-in parking along West Creek Road be removed and the parking lots be modified to improve circulation and efficiency. Figure 24 A illustrates a potential reconfiguration of the parking areas along West Street. This option, or similar scenarios, would require the cooperation of local businesses to enhance the entire corridor.

With the modified parking discussed above, the pedestrian access and bike access along the corridor also would be enhanced. Based on the available GIS survey, it appears that the right-of-way on West Creek Road varies between approximately 34-38 feet. Two potential plans for the West Creek Road corridor are illustrated on Figure 24 B. Option 1 provides two, 10 foot travel lanes, with an 8 foot parallel parking lane and 6 foot sidewalk along the northerly side of the road. Option 2 creates two, 10 foot travel lanes with a 7 foot sidewalk along both sides (northerly and southerly) side of the road. Under Option 1, the parking is a combination of on and off-street parking, while Option 2 provides all parking off the street. Both the reconfiguration of the off-street parking areas as well as the reconfiguration of West Creek Road (sidewalks and on-street parking) will require cooperation of local businesses, residents and Town officials.

An order of magnitude cost to implement the parking modifications with the Option 1 roadway improvements is approximately \$170,000 to \$200,000 with an associated engineering fee of approximately \$20,000. To construct the parking modifications with the Option 2 roadway improvements the approximate construction cost is \$220,000 to \$270,000 with an associated engineering fee of approximately \$30,000.

FIGURE 24A

Figure 24B

INTERSECTIONS

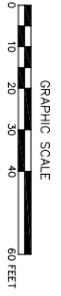
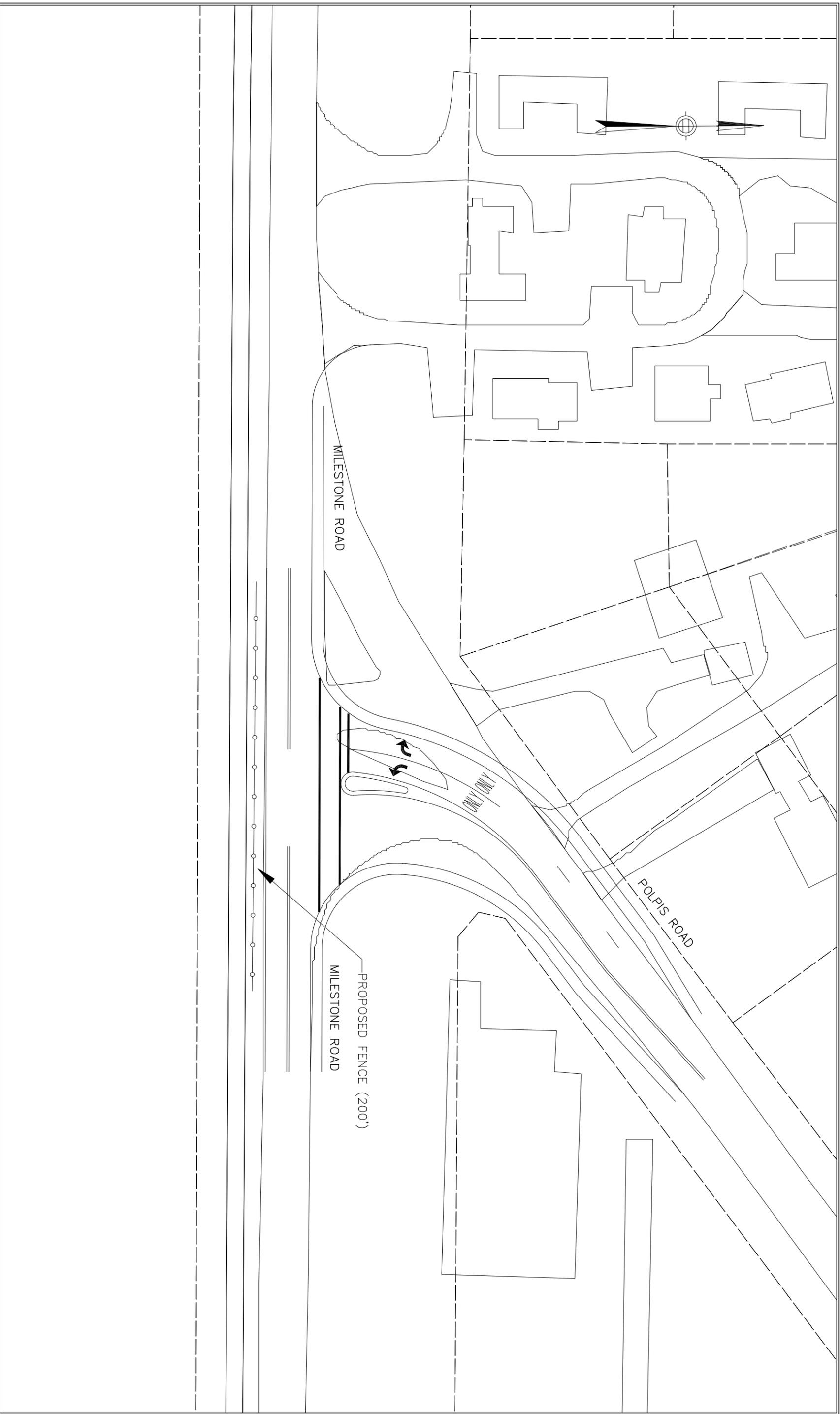
Based on both accident history and capacity issues, the following thirteen intersections were identified as critical intersection within the Mid-Island Area.

- Milestone Road at Polpis Road
- Milestone Road at Monomoy Road
- Milestone Rotary
- Fairgrounds Road at Old South Road
- Surfside Road at Miacomet Avenue
- Pleasant Street at Cherry Street
- Pleasant Street at Williams Lane
- Pleasant Street at Williams Street
- Orange Street at Cherry Street
- Orange Street at Williams Lane
- Orange Street at Union Street
- Sparks Avenue at Prospect Street, Surfside Road and Atlantic Avenue (Four Corners)
- Pleasant Street at York Street and Atlantic Avenue (Five Corners)

In addition, typical traffic calming and safety improvements are provided for the Surfside Road intersections. Where significant modification to the intersection control or lane configurations are proposed, intersection capacity and queue analysis are provided.

Milestone Road at Polpis Road and Monomoy Road

As described in the *Existing Conditions* section of this report, geometric deficiencies presently exist at the intersections of Milestone Road at Polpis Road and Monomoy Road. Improvements at these intersections include reconfiguring the intersections to form more traditional, 90-degree “T” intersections. This will slow the traffic both turning into and exiting from the side streets. This will also tighten the intersection and reduce the vast amount of pavement and travel ways currently in place. Separate left- and right-turn lanes will be maintained along the Polpis Road and Monomoy Road minor street approaches. As part of the reconstruction/realignment, pedestrian and bicycle amenities were emphasized by providing adequate crosswalks, sidewalks and signage. In addition, a fence is proposed along the southerly side of Milestone road, between the edge of pavement and the bike path, to discourage unexpected crossings of Milestone Road. Conceptual plans of the proposed intersection improvements at Polpis Road and Monomoy Road are shown on Figures 25 and 26, respectively. An order of magnitude cost for the aforementioned geometric improvements at these intersections would be approximately \$170,000 to \$200,000 for the Polpis Road intersection and \$250,000 to \$300,000 for the Monomoy Road intersection. The associated engineering fees are approximately \$20,000 and \$30,000 respectively.



**CONCEPTUAL PLAN
FIGURE 25
MILESTONE RD AT POLPIS RD**

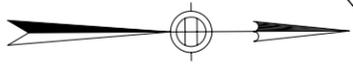
PROJECT: **INTERSECTION IMPROVEMENT PROJECT**
NANTUCKET, MASSACHUSETTS

PREPARED FOR: TOWN OF NANTUCKET
16 BROAD STREET
NANTUCKET, MA 02554

ENGINEER'S STAMP
DATE _____

GPI Greenman-Pedersen, Inc.
Engineers, Architects, Planners, Construction Engineers & Inspectors
105 Central Street, Suite 3100, Stonham, MA 02180
Tel: (781) 279-5500 Fax: (781) 279-5501
<http://www.gpinet.com>

NO.	REVISION	DATE	DESIGN/DRWN BY:	TON
			CHECK BY: JWD	
		4/28/04	DATE:	
		SCALE: 1"=20'-0"		
		JOB NO.: 04068	FILE NAME: 04068_C01	
		DRWG NO.: 1		1 OF 1

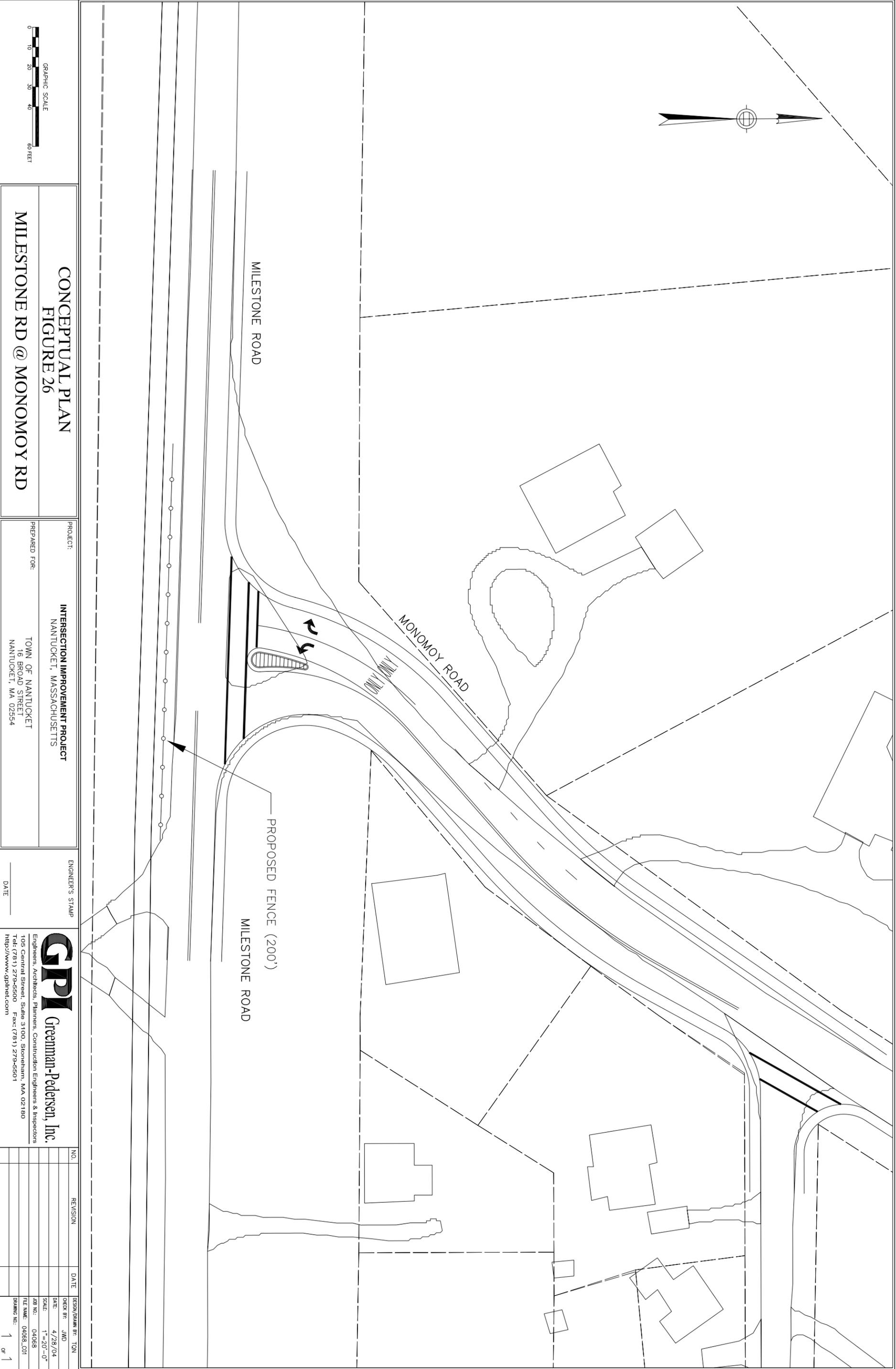


GRAPHIC SCALE

MILESTONE ROAD

MONOMOY ROAD

PROPOSED FENCE (200')
MILESTONE ROAD



CONCEPTUAL PLAN FIGURE 26

MILESTONE RD @ MONOMOY RD

PROJECT:

INTERSECTION IMPROVEMENT PROJECT
NANTUCKET, MASSACHUSETTS

PREPARED FOR:

TOWN OF NANTUCKET
16 BROAD STREET
NANTUCKET, MA 02554

ENGINEER'S STAMP

DATE



Greenman-Pedersen, Inc.

Engineers, Architects, Planners, Construction Engineers & Inspectors
105 Central Street, Suite 3100, Stonham, MA 02180
Tel: (781) 279-6500 Fax: (781) 279-5501
<http://www.gpnet.com>

NO.	REVISION	DATE	DESIGN/DRWN BY:	TON
			CHECK BY:	JWD
			DATE:	4/28/04
			SCALE:	1"=20'-0"
			JOB NO.:	04068
			FILE NAME:	04068_C01
			GRAPHIC NO.:	1 OF 1

Milestone Rotary

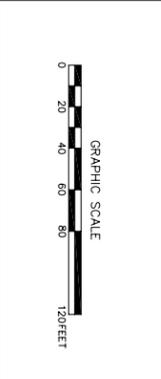
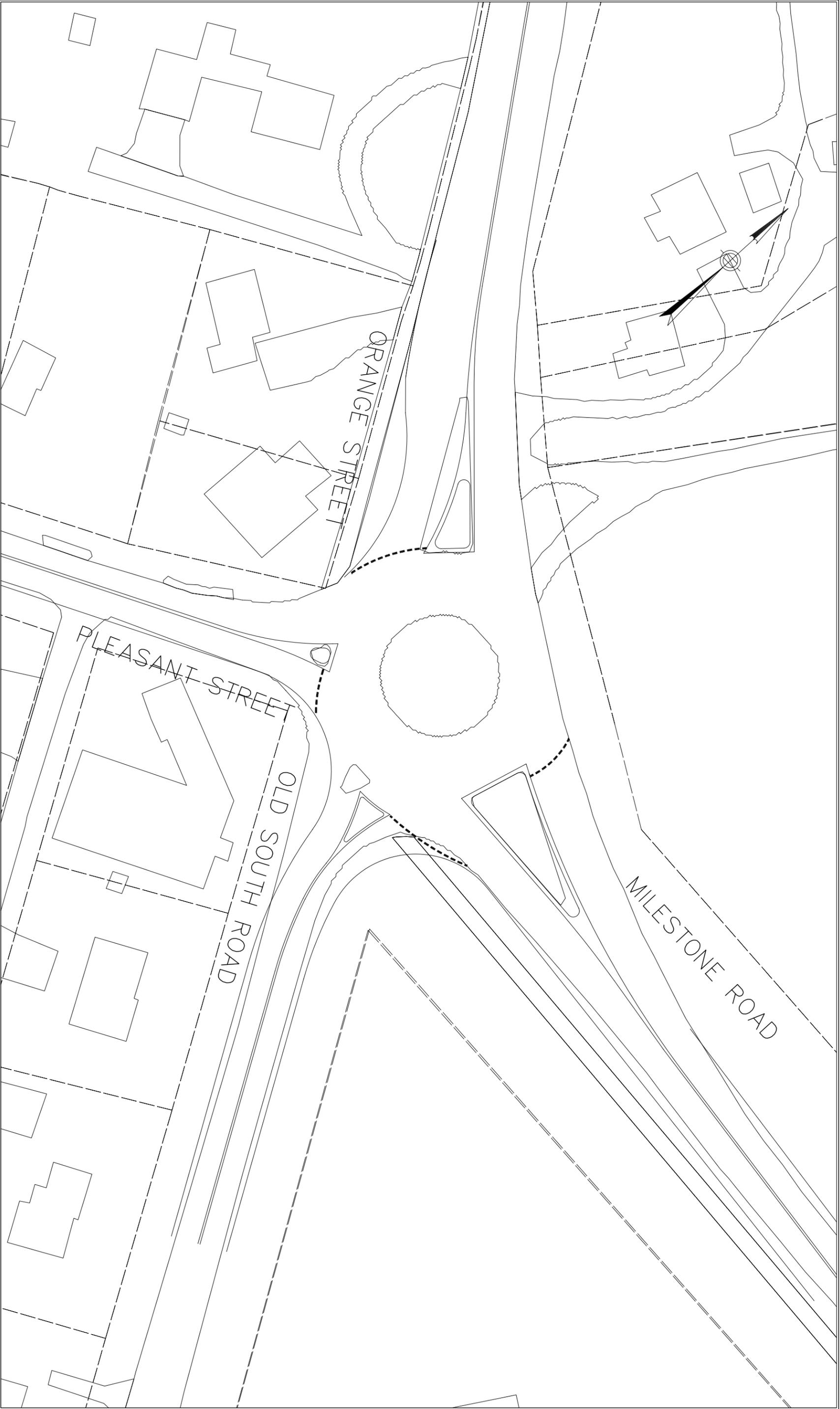
As described in the *Existing Conditions* section of this report, geometric deficiencies currently exist at the Milestone Rotary. However, due to the complexity of this location, it is recommended that any major modifications at this location be studied as part of a detailed, separate project to understand the effects on the intersection capacity based on growth and geometric changes to the intersection. As part of the future study, the traffic control, geometric alignments and number of approach lanes should be reexamined. With a traditional rotary, the law requires vehicles entering the rotary to “yield” to rotary traffic. Along Sparks Avenue, the approach is currently controlled by a STOP sign. Furthermore, the Milestone Road and Orange Street tangent approaches to the intersection encourage a high speed. Alternative parking arrangements on the southwest corner should be considered to reduce conflicts and driver confusion. One concept that was discussed in the *Mid-Island Area Plan* is to reconstruct the existing rotary as a modern roundabout. This configuration would force all vehicles to enter the roundabout at 90 degrees, eliminating the high-speed tangent approaches.

The existing critical issues at this intersection appear to be pedestrian and bicycle accessibility, in particular crossing the Sparks Avenue approach. Therefore, the possibility of providing a pedestrian refuge area on the southwest corner, at intersections of Sparks Avenue and Orange Street, was evaluated. It is recommended that this improvement be accomplished through the realignment of Old South Road and Orange Street. A conceptual plan of the potential Milestone Rotary improvements as discussed above is shown on Figure 27. An order of magnitude cost for the aforementioned geometric improvements at this intersection would be approximately \$250,000 to \$300,000 and the associated engineering fee is estimated to be approximately \$30,000.

Fairgrounds Road at Old South Road

As shown in the *Analysis* section of this report, the Fairgrounds Road approach currently operates at LOS F with high v/c ratios and long vehicle delays. The recommended plan is to provide separate left- and right-turn lanes along the Fairgrounds Road approach. The additional right turn lane will be approximately 250 feet in length to accommodate the right turning traffic and provide a “by-pass” of the left turning traffic.

In addition, the relocation of the Nantucket Electric driveway is anticipated as part of the new public safety facility. As part of the geometric alterations, pedestrian and bicycle access were emphasized by providing adequate crosswalks, sidewalks and signage. A conceptual plan of the intersection improvements, as discussed above, is shown on Figure 28. Tables 28 and 29 summarize the results of the analyses for the 2004 Existing and 2014 Design Year conditions, respectively, with improvements implemented. All analysis worksheets are provided in the Appendix. An order of magnitude cost for the aforementioned geometric improvements at this intersection would be approximately \$90,000 to \$120,000 and the associated engineering fee is estimated at approximately \$13,000.



CONCEPTUAL PLAN
FIGURE 27
MILESTONE ROTARY

PROJECT: **INTERSECTION IMPROVEMENT PROJECT**
NANTUCKET, MASSACHUSETTS

PREPARED FOR: **TOWN OF NANTUCKET**
16 BROAD STREET
NANTUCKET, MA 02554

ENGINEER'S STAMP
DATE _____

GPI Greenman-Pedersen, Inc.
Engineers, Architects, Planners, Construction Engineers & Inspectors
105 Central Street, Suite 3100, Stonham, MA 02180
Tel: (781) 279-5500 Fax: (781) 279-5501
<http://www.gpined.com>

NO.	REVISION	DATE	DESIGN/DRAWN BY:	CHECK BY:	DATE	SCALE	JOB NO.	FILE NAME	DRAWING NO.
			JFO	JWD	4/28/04	1"=40'-0"	04068	04068_C01	1 of 1

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 28
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY WITH
IMPROVEMENTS – 2004 CONDITIONS
Old South Road at Fairgrounds Road**

Old South Road at Fairgrounds Road	2004 Existing				2004 Existing with Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>								
Old South Rd NB through-lefts	0.15	9.4	A	13	0.15	9.4	A	13
Fairgrounds Rd EB approach	1.25	180.4	F	402	--	--	--	--
Fairgrounds Rd EB left turns	--	--	--	--	0.88	108.2	F	144
Fairgrounds Rd EB right turns	--	--	--	--	0.37	15.3	C	43
<i>Weekday PM:</i>								
Old South Rd NB through-lefts	0.25	10.5	B	24	0.25	10.5	B	24
Fairgrounds Rd EB approach	1.98	507.2	F	648	--	--	--	--
Fairgrounds Rd EB left turns	--	--	--	--	1.54	373.5	F	269
Fairgrounds Rd EB right turns	--	--	--	--	0.44	19.1	C	56
<i>Saturday Midday:</i>								
Old South Rd NB through-lefts	0.19	9.8	A	17	0.19	9.8	A	17
Fairgrounds Rd EB approach	1.18	156.3	F	342	--	--	--	--
Fairgrounds Rd EB left turns	--	--	--	--	0.81	100.5	F	124
Fairgrounds Rd EB right turns	--	--	--	--	0.37	15.9	C	42

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 29
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY WITH
IMPROVEMENTS – 2014 CONDITIONS
Old South Road at Fairgrounds Road**

Old South Road at Fairgrounds Road	2014 Design Year				2014 Design Year with Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>								
Old South Rd NB through-lefts	0.23	10.8	B	23	0.23	10.8	B	23
Fairgrounds Rd EB approach	3.20	NC	F	1,055	--	--	--	--
Fairgrounds Rd EB left turns	--	--	--	--	2.58	853.8	F	410
Fairgrounds Rd EB right turns	--	--	--	--	0.63	26.0	D	106
<i>Weekday PM:</i>								
Old South Rd NB through-lefts	0.41	13.7	B	51	0.41	13.7	B	51
Fairgrounds Rd EB approach	6.51	NC	F	1,289	--	--	--	--
Fairgrounds Rd EB left turns	--	--	--	--	5.75	NC	F	553
Fairgrounds Rd EB right turns	--	--	--	--	0.81	48.6	E	172
<i>Saturday Midday:</i>								
Old South Rd NB through-lefts	0.31	11.8	B	33	0.31	11.8	A	33
Fairgrounds Rd EB approach	3.15	NC	F	945	--	--	--	--
Fairgrounds Rd EB left turns	--	--	--	--	2.52	846.1	F	358
Fairgrounds Rd EB right turns	--	--	--	--	0.64	28.4	D	107

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

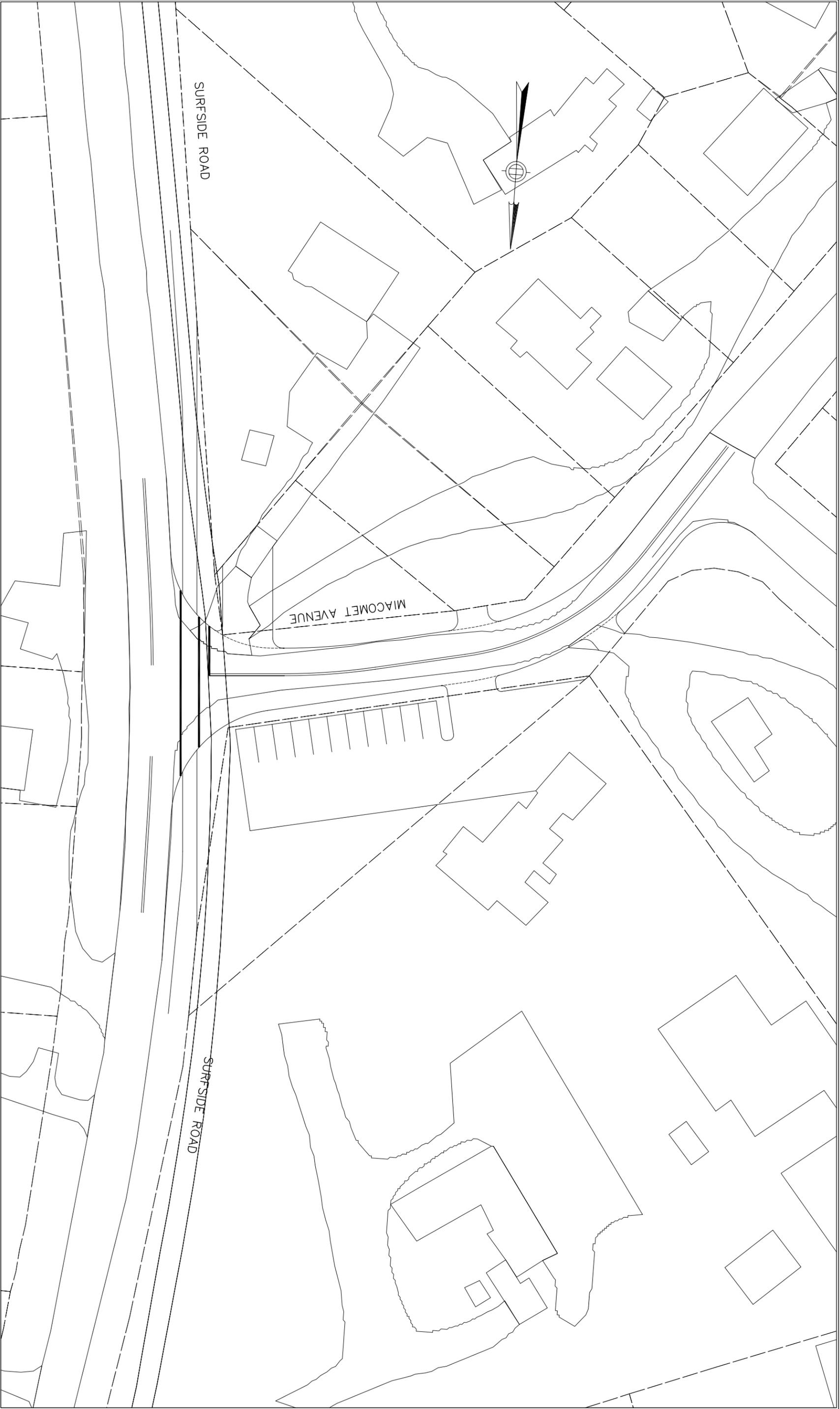
NC = No capacity available.

Surfside Road Intersections

As shown in the *Analysis* section of this report, the minor street approaches (i.e., Bartlett Road, Miacomet Road and Fairgrounds Road), currently operate with capacity constraints (LOS E/F), with high v/c ratios and long vehicle delays. However, given the heavy pedestrian and bicycle activity along Surfside Road, along with the proximity to the Nantucket Schools, the critical issues at these intersections appear to be pedestrian and bicycle accessibility. Therefore, measures to emphasize the pedestrian and bicycle activity were considered. It is recommended, where feasible in the vicinity of the intersections, the bicycle path along the west side of Surfside Road be relocated, closer to the roadway at the intersections. This results in only one stop for vehicles crossing the path prior to entering the roadway, reducing the conflicts and “blocking” of the path. In addition, sight distances along the minor streets will be improved by moving the STOP line closer to the Surfside Road major street approach. The crossing can be further emphasized by applying various surface treatments. Because the use is primarily a bike path, the surface should be relatively smooth. Therefore, treatments such as stamped pavement and/or colored pavement or painted crossings should be considered. A conceptual plan of typical traffic calming alternatives for the intersections along Surfside Drive is shown on Figure 29, using Bartlett Road and Surfside Road as an example intersection. An order of magnitude cost for the aforementioned geometric improvements at these intersections would be approximately \$45,000 to \$60,000 and the associated engineering fee is estimated to be approximately \$6,500.

Surfside Road at Miacomet Avenue

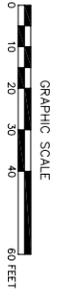
As described in the *Existing Conditions* section of this report, geometric deficiencies currently exist at the intersection of Surfside Road and Miacomet Avenue. With the multiple driveways and the presence of the bike path passing through this intersection, the geometry and right-of-way, particularly to/from Miacomet Avenue, is somewhat confusing. Therefore, it is recommended that the driveway access along Miacomet Avenue be reconfigured and the pedestrian and bicycle amenities be emphasized to provide a clearer and more defined intersection. A conceptual plan of the proposed intersection improvements is shown on Figure 30. An order of magnitude cost for the aforementioned geometric improvements at this intersection would be approximately \$75,000 to \$85,000 and the associated engineering fee is estimated to be approximately \$9,500.



SURFSIDE ROAD

MACOMET AVENUE

SURFSIDE ROAD



GRAPHIC SCALE

**CONCEPTUAL PLAN
FIGURE 30**

SURFSIDE RD AT MACOMET AVE

PROJECT: **INTERSECTION IMPROVEMENT PROJECT**
NANTUCKET, MASSACHUSETTS

PREPARED FOR: **TOWN OF NANTUCKET**
16 BROAD STREET
NANTUCKET, MA 02554

ENGINEER'S STAMP
DATE _____

GPI Greenman-Pedersen, Inc.
Engineers, Architects, Planners, Construction Engineers & Inspectors
105 Central Street, Suite 3100, Stonham, MA 02180
Tel: (781) 279-5500 Fax: (781) 279-5501
<http://www.gpinet.com>

NO.	REVISION	DATE	DESIGN/DRWN BY:	TON
			CHECK BY:	JWD
			DATE:	4/28/04
			SCALE:	1" = 20'-0"
			JOB NO.:	04068
			FILE NAME:	04068_001
			GRAPHIC NO.:	1 OF 1

Pleasant Street at Cherry Street, Williams Lane and Williams Street

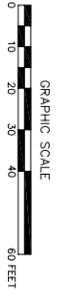
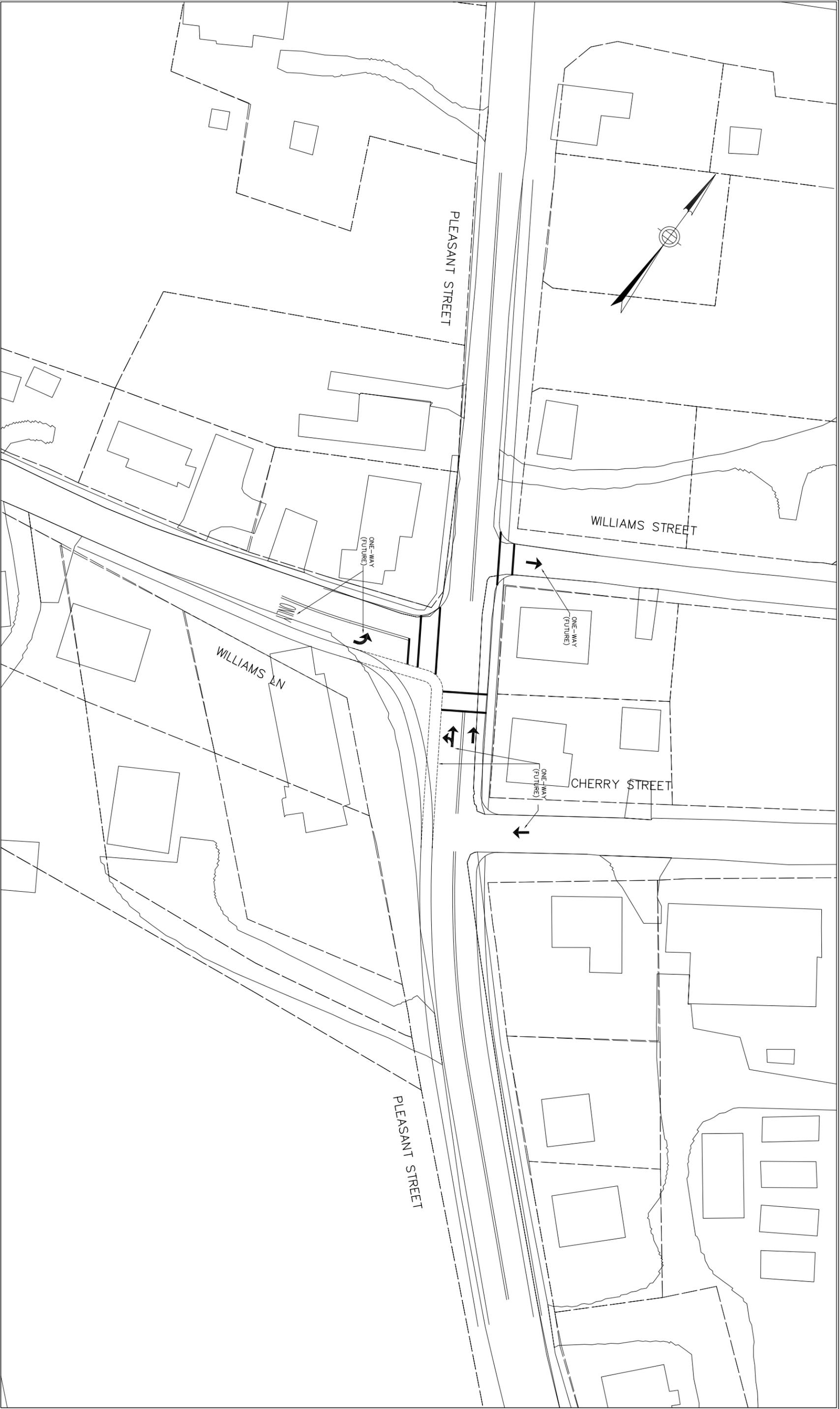
As described in the *Existing Conditions* section of this report, geometric deficiencies currently exist at the intersections of Pleasant Street and Cherry Street, Williams Lane and Williams Street. In order to eliminate the conflict between the Williams Lane traffic and Pleasant Street traffic, the intersection should be reconfigured to form a more traditional, “T” intersection. This will slow the traffic both turning into and exiting from Williams Lane. This will also tighten the intersection and reduce the vast amount of pavement and travel ways currently in place. These improvements are recommended for both one-way and two-way flow on Pleasant Street. As part of these geometric alterations, pedestrian and bicycle access should be emphasized by providing adequate crosswalks, sidewalks and signage.

As described in the aforementioned Pleasant Street Corridor evaluation, under the Pleasant Street one-way scenario, in order to enhance traffic flow along Pleasant Street, it is recommended that Cherry Street become a one-way street in the westbound direction, towards Pleasant Street. This would improve existing safety deficiencies at this intersection without major construction. In addition, a separate left-turn lane could be provided on the Pleasant Street westbound approach for vehicles turning onto Williams Lane. Tables 30 and 31 summarize the results of the analyses for the 2004 Existing and 2014 Design Year conditions, respectively, with the aforementioned left-turn lane on Pleasant Street for vehicles turning onto Williams Lane. All analysis worksheets are provided in the Appendix.

A conceptual plan of the intersection improvements at Pleasant Street and Williams Lane discussed above, with Pleasant Street both one-way and two-way is shown on Figure 31. An order of magnitude cost for the aforementioned geometric improvements at this intersection would be approximately \$90,000 to \$110,000 with Pleasant Street two-way and approximately \$95,000 to \$120,000, with Pleasant Street one-way. The estimated engineering fee associated with the design is approximately \$12,500.

Orange Street at Williams Street and Cherry Street

As discussed, in order to improve operations at the Williams Lane/Pleasant Street intersection, a one-way pair should be created with Cherry Street (westbound) and Williams Street (eastbound). However, this will impact the operations at the intersections of Cherry Street and Williams Street at Orange Street. Figure 32 illustrates a potential modification to the parking areas in the vicinity of Cumberland Farms and the parking area between Cherry Street and Williams Street. These modifications will improve circulation through the area with the new one-way pairing. It is also recommended that the Cherry Street and Williams Street intersections at Orange Street be further studied to ensure adequate operations of these intersections from both a safety and capacity standpoint. An order of magnitude cost associated with these modifications is approximately \$30,000 to \$40,000 with an associated engineering fee of approximately \$4,500.



CONCEPTUAL PLAN
FIGURE 31
PLEASANT STREET @ WILLIAMS LANE
(ONE & TWO WAYS)

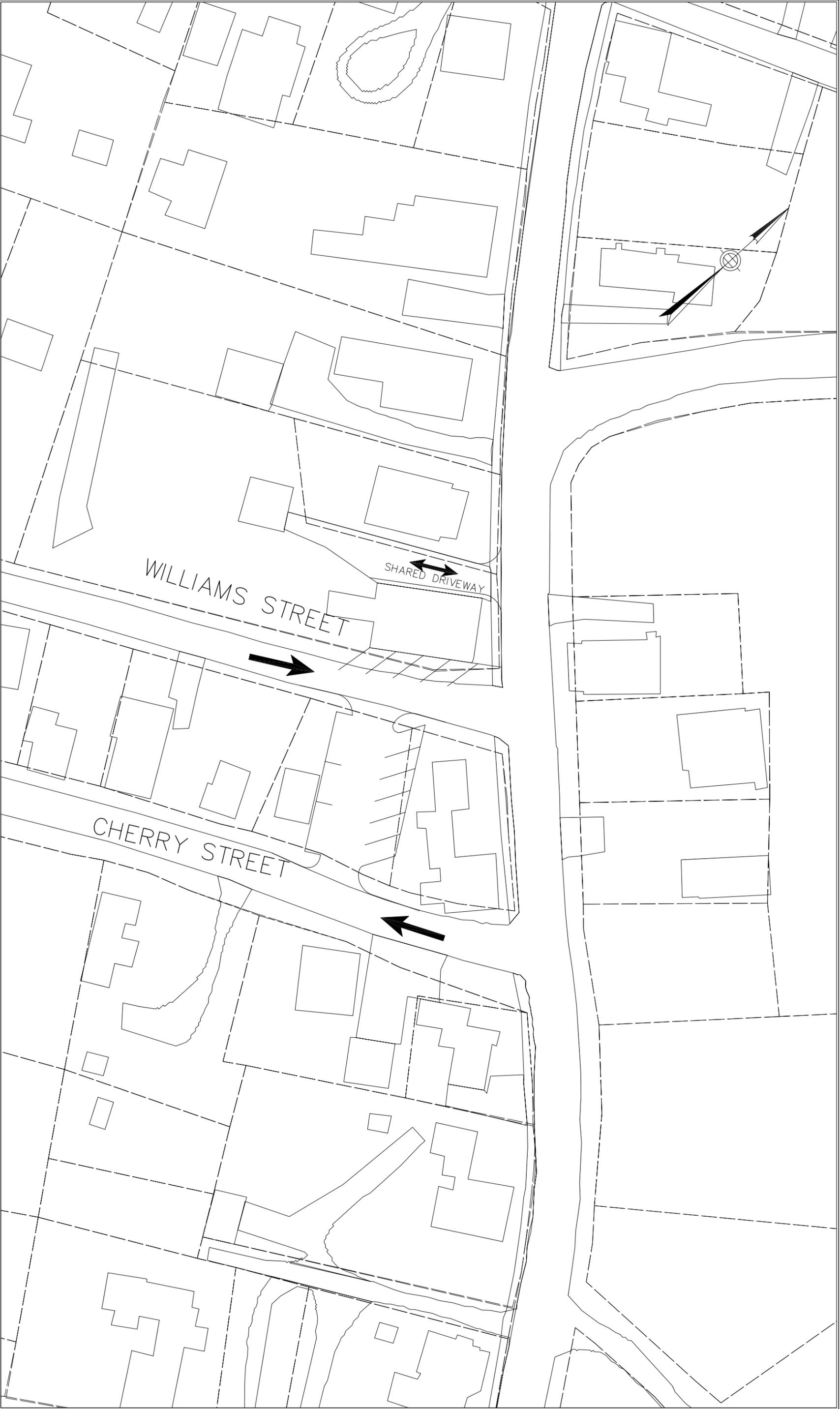
PROJECT: **INTERSECTION IMPROVEMENT PROJECT**
 NANTUCKET, MASSACHUSETTS

PREPARED FOR: **TOWN OF NANTUCKET**
 16 BROAD STREET
 NANTUCKET, MA 02554

ENGINEER'S STAMP
 DATE _____

GPI Greenman-Pedersen, Inc.
 Engineers, Architects, Planners, Construction Engineers & Inspectors
 105 Central Street, Suite 3100, Stonham, MA 02180
 Tel: (781) 279-5500 Fax: (781) 279-5501
<http://www.gpined.com>

NO.	REVISION	DATE	DESIGN/DRW BR:	TON
			CHECK BR:	JWD
			DATE:	4/28/04
			SCALE:	1"=20'-0"
			JOB NO.:	04068
			FILE NAME:	04068_C01
			GRAPHIC NO.:	1 of 1



**CONCEPTUAL PLAN
FIGURE 32**

ORANGE AT WILLIAMS

PROJECT:

INTERSECTION IMPROVEMENT PROJECT
NANTUCKET, MASSACHUSETTS

PREPARED FOR:

TOWN OF NANTUCKET
16 BROAD STREET
NANTUCKET, MA 02554

ENGINEER'S STAMP

DATE _____



Greenman-Pedersen, Inc.

Engineers, Architects, Planners, Construction Engineers & Inspectors
105 Central Street, Suite 3100, Stonham, MA 02180
Tel: (781) 279-5500 Fax: (781) 279-5501
<http://www.gpinc.com>

NO.	REVISION	DATE	DESIGNER	CHECKER	DATE	SCALE	JOB NO.	FILE NAME	GRAPHIC NO.
			JFO	JWD	4/28/04	1"=40'-0"	04068	04068_001	1 of 1

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 30
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY WITH IMPROVEMENTS – 2004 CONDITIONS
Pleasant Street at Williams Lane**

Pleasant Street at Williams Lane	2004 Existing (Pleasant Street Two-Way)				2004 Existing with Pleasant Street One-Way				2004 Existing with Pleasant Street One-Way and Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>												
Pleasant St NB through-lefts	0.07	8.1	A	6	0.07	7.4	A	6	--	--	--	--
Pleasant St NB left turns	--	--	--	--	--	--	--	--	0.07	7.4	A	6
Williams Ln EB approach	0.27	12.4	B	28	0.03	14.9	B	2	0.03	14.9	B	2
<i>Weekday PM:</i>												
Pleasant St NB through-lefts	0.11	8.5	A	10	0.09	7.4	A	8	--	--	--	--
Pleasant St NB left turns	--	--	--	--	--	--	--	--	0.09	7.4	A	8
Williams Ln EB approach	0.20	12.6	B	18	0.01	15.5	C	1	0.01	15.5	C	1
<i>Saturday Midday:</i>												
Pleasant St NB through-lefts	0.14	8.5	A	12	0.11	7.5	A	10	--	--	--	--
Pleasant St NB left turns	--	--	--	--	--	--	--	--	0.11	7.5	A	10
Williams Ln EB approach	0.23	13.2	B	23	0.04	18.3	C	3	0.04	18.3	C	3

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 31
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY WITH IMPROVEMENTS – 2014 CONDITIONS
Pleasant Street at Williams Lane**

Pleasant Street at Williams Lane	2014 Design Year (Pleasant Street Two-Way)				2014 Design Year with Pleasant Street One-Way				2014 Design Year with Pleasant Street One-Way and Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>												
Pleasant St NB through-lefts	0.11	8.6	A	9	0.09	7.4	A	8	--	--	--	--
Pleasant St NB left turns	--	--	--	--	--	--	--	--	0.09	7.4	A	8
Williams Ln EB approach	0.46	17.1	C	60	0.06	19.5	C	4	0.06	19.5	C	4
<i>Weekday PM:</i>												
Pleasant St NB through-lefts	0.17	9.3	A	16	0.12	7.5	A	10	--	--	--	--
Pleasant St NB left turns	--	--	--	--	--	--	--	--	0.12	7.5	A	10
Williams Ln EB approach	0.34	16.8	C	38	0.03	20.6	C	2	0.03	20.6	C	2
<i>Saturday Midday:</i>												
Pleasant St NB through-lefts	0.21	9.2	A	19	0.15	7.6	A	14	--	--	--	--
Pleasant St NB left turns	--	--	--	--	--	--	--	--	0.15	7.6	A	14
Williams Ln EB approach	0.43	19.7	C	52	0.08	27.1	D	7	0.08	27.1	D	7

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

Orange Street at Union Street

As shown in the *Analysis* section of this report, left-turns from Union Street onto Orange Street are project to operate with capacity constraints (LOS F), with high v/c ratios and long vehicle queues under future traffic-volume conditions. These long delays and queues will be exacerbated with the addition of traffic with Pleasant Street operating as a one-way roadway. The land bank owns the property on the southeast corner of this intersection and Legislative approval would be required for any land takings. Therefore, no major improvement geometric measures to provide a smoother curve or realignment along Orange Street are feasible at this location. This intersection has been studied previously and the recommended plan is to provide a second STOP sign on the Orange Street southwest one-way approach.

This alternative was evaluated both with and without the Pleasant Street one-way circulation alternative. Tables 32 and 33 summarize the results of the analyses for the 2004 Existing and 2014 Design Year conditions, respectively, with the aforementioned improvements implemented. Although a second STOP on the Orange Street south-westbound one-way approach results in additional delays, the control provides a clear assignment of right-of-way. In addition, additional gaps would be created in the Orange Street traffic stream to allow for improved operations at the adjacent intersections, i.e. Williams Street and Cherry Street. Therefore, it is recommended that a second STOP sign be provided on the Orange Street one-way approach. All analysis worksheets are provided in the Appendix. An order of magnitude cost for the aforementioned improvements at this intersection would be approximately \$500 to \$1,000.

It should be noted that there is a significant discrepancy between the data collected at this location as part of this study and previous data collected at this location. Therefore, the analysis provided herein should be verified by additional data collection during the summer of 2005. It is estimated that approximately \$1,500 would be required to reexamine the operations at this intersection.

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 32
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY WITH IMPROVEMENTS – 2004 CONDITIONS
Orange Street at Union Street**

Orange Street at Union Street	2004 Existing			2004 Existing, with second Stop on Orange SB			2004 Existing, with Pleasant Street 1-Way			2004 Existing, with Pleasant Street 1-Way & second Stop on Orange SB		
	V/C ^a	Delay ^b	LOS ^c Queue ^d	V/C	Delay	LOS Queue	V/C	Delay	LOS Queue	V/C	Delay	LOS Queue
<i>Weekday AM:</i>												
Orange St SB through-lefts	0.16	13.4	B 118	0.46	15.1	C 90	0.23	14.7	B 180	0.67	17.2	C 195
Union St WB lefts	0.73	22.8	D 225	0.73	32.8	D 230	0.89	45.5	F 348	0.90	59.0	F 348
<i>Weekday PM:</i>												
Orange St SB through-lefts	0.33	19.8	C 245	0.88	39.8	E 420	0.42	24.7	D 398	1.23	142.3	F 1,295
Union St WB lefts	1.26	152.1	F 1,020	1.26	278.4	F 1,655	1.71	355.7	F 1,630	1.71	368.3	F 1,630
<i>Saturday Midday:</i>												
Orange St SB through-lefts	0.25	12.0	B 158	0.79	27.9	D 280	0.35	15.1	B 305	1.11	95.6	F 930
Union St WB lefts	1.21	130.6	F 1,000	1.21	236.9	F 1,592	1.66	329.6	F 1,672	1.66	341.4	F 1,672

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 33
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY WITH IMPROVEMENTS – 2014 CONDITIONS
Orange Street at Union Street**

Orange Street at Union Street	2014 Design Year				2014 Design Year, with second Stop on Orange SB				2014 Design Year, with Pleasant Street 1-Way				2014 Design Year, with Pleasant Street 1-Way & second Stop on Orange SB			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>																
Orange St SB through-lefts	0.24	28.5	D	250	0.72	23.8	C	222	0.33	34.3	D	415	1.04	73.6	F	735
Union St WB lefts	1.35	193.9	F	1,135	1.35	361.9	F	1,910	1.79	393.6	F	1,662	1.79	406.6	F	1,662
<i>Weekday PM:</i>																
Orange St SB through-lefts	0.58	62.8	F	508	1.61	588.9	F	3,535	0.71	97.0	F	880	2.18	555.2	F	3,715
Union St WB lefts	2.54	727.1	F	2,958	2.54	NC	F	5,525	3.87	NC	F	3,660	3.87	NC	F	3,660
<i>Saturday Midday:</i>																
Orange St SB through-lefts	0.37	28.0	D	365	1.38	369.6	F	2,518	0.51	38.4	E	102	2.00	467.1	F	3,345
Union St WB lefts	2.36	638.5	F	2,998	2.36	NC	F	5,612	3.62	NC	F	3,785	3.62	NC	F	3,785

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

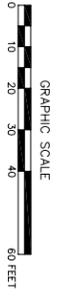
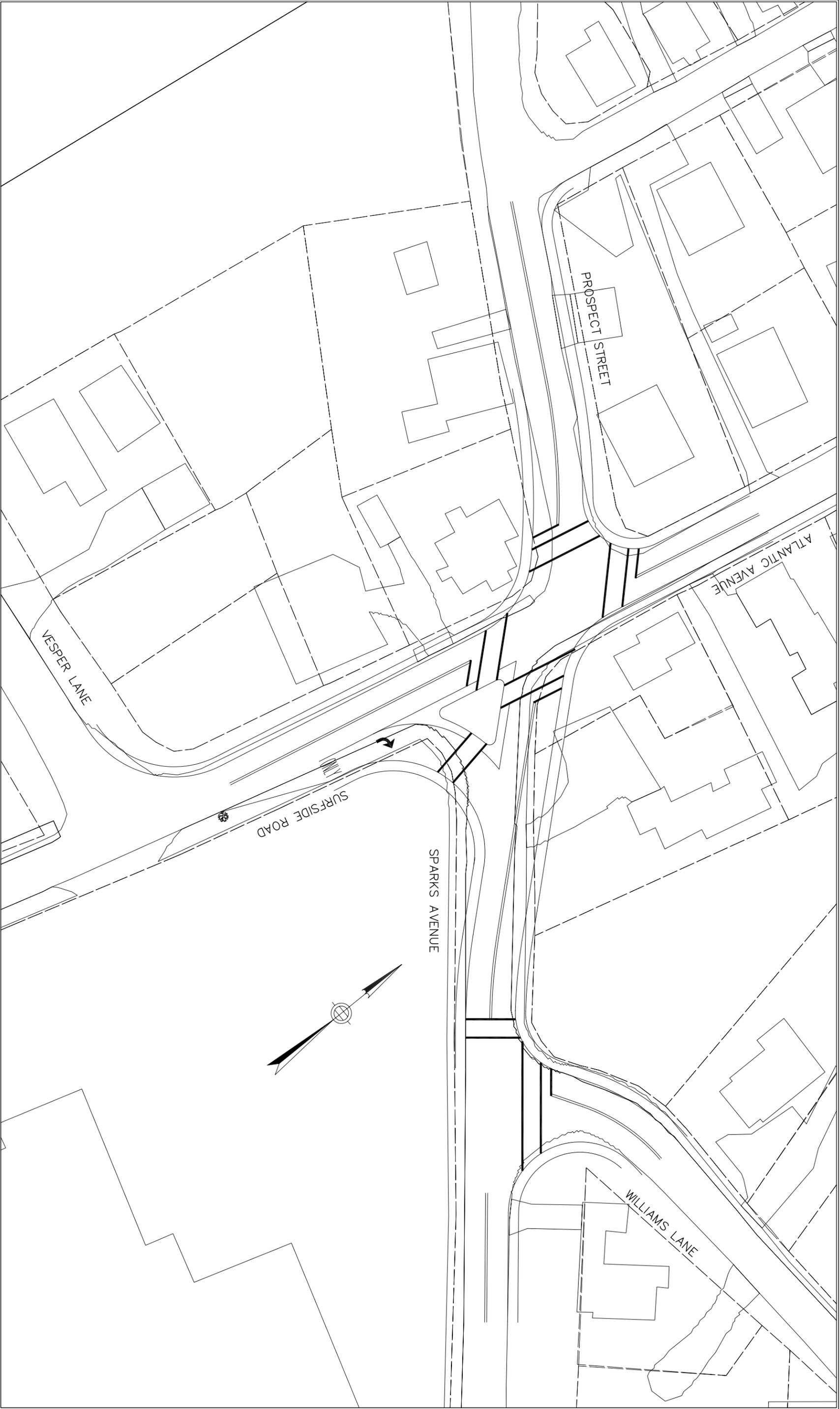
NC = No capacity available.

Sparks Avenue at Prospect Street, Surfside Road and Atlantic Avenue (Four Corners)

As described in the *Existing Conditions* section of this report, geometric deficiencies currently exist at the Four Corners intersection. This intersection has been identified in the *Mid-Island Area Plan* as a critical intersection. There have been preliminary studies to reconstruct the intersection to a modern single lane roundabout. However, due to the heavy pedestrian activity at this location given the proximity to the schools and the need for a significant amount of crossing guards, along with the necessary land takings that would be required, providing a roundabout at this location is not a viable option. As an alternative to the roundabout, realignment of Sparks Avenue and Prospect Street to form a standard four-way intersection was evaluated. As part of this reconfiguration, on the Surfside Road northbound approach a right turn slip lane onto Sparks Avenue could be provided. Land takings will be required as part of the four-way intersection alternative. However, based on early discussions with Town officials, the anticipated land takings appear to be feasible. In addition, as part of the geometric alterations, pedestrian and bicycle access were emphasized by providing adequate crosswalks, sidewalks and signage. The realignment of the intersection to form a four-way intersection with close to a ninety degree alignment will greatly reduce the conflicts between turning vehicles and eliminate the confusing geometry.

Under the current alignment there are an increased number of conflicts between pedestrians and vehicles. For example, a vehicle traveling west on Sparks Avenue continuing along Prospect Street currently conflicts with pedestrians three times. Once along the westbound Sparks Avenue approach, once during the right turn movement along Atlantic Avenue and a third time during the left turn onto Prospect Street. With a standard four-way alignment, the conflicts are reduced because the double turn movement is eliminated. Both drivers and pedestrians have better visibility of each other, and the conflicts are reduced to the crossing along the westbound Sparks Avenue approach and the crossing along Prospect Street.

A conceptual plan of the intersection improvements, as discussed above, is shown on Figure 33. Tables 34 and 35 summarize the results of the analyses for the 2004 Existing and 2014 Design Year conditions, respectively, with the aforementioned improvements implemented. All analysis worksheets are provided in the Appendix. An order of magnitude cost for the aforementioned geometric improvements at this intersection would be approximately \$245,000 to \$290,000 and the associated engineering fee is estimated to be approximately \$30,000.



CONCEPTUAL PLAN
FIGURE 33
PROSPECT ST./SPARKS AVE
@ ATLANTIC AVE./SURFSIDE RD

PROJECT: **INTERSECTION IMPROVEMENT PROJECT**
NANTUCKET, MASSACHUSETTS

PREPARED FOR: **TOWN OF NANTUCKET**
16 BROAD STREET
NANTUCKET, MA 02554

ENGINEER'S STAMP
DATE _____

GPI Greenman-Pedersen, Inc.
Engineers, Architects, Planners, Construction Engineers & Inspectors
105 Central Street, Suite 3100, Stonham, MA 02180
Tel: (781) 279-5500 Fax: (781) 279-5501
<http://www.gpined.com>

NO.	REVISION	DATE	DESIGN/DRAWN BY:	TON
			CHECK BY: JWD	
			DATE: 4/28/04	
			SCALE: 1"=20'-0"	
			JOB NO.: 04068	
			FILE NAME: 04068_001	
			GRAPHIC NO.:	
			1	1

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 34
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY WITH IMPROVEMENTS – 2004 CONDITIONS
Sparks Avenue at Prospect Street, Surfside Road and Atlantic Avenue**

Sparks Avenue at Prospect Street, Surfside Road and Atlantic Avenue	2004 Existing				2004 Existing with Improvements				2004 Existing, with Pleasant Street One-Way Improvements				2004 Existing, with Pleasant Street One-Way & Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>																
Prospect St EB approach	0.84	33.5	D	207	0.67	18.7	C	127	1.00	103.9	F	338	0.88	36.2	E	248
Sparks Ave WB approach	0.81	31.5	D	188	0.65	18.5	C	117	0.81	39.1	E	180	0.67	20.6	C	123
Surfside Rd NB approach	0.91	43.6	E	264	0.47	14.3	B	61	1.00	72.8	F	326	0.50	16.3	C	68
Atlantic Ave SB approach	0.44	16.5	C	53	0.39	12.9	B	45	0.61	24.9	C	95	0.52	16.6	C	73
<i>Weekday PM:</i>																
Prospect St EB approach	0.83	32.9	D	200	0.66	18.6	C	120	1.00	110.0	F	325	0.87	35.7	E	235
Sparks Ave WB approach	0.87	39.4	E	224	0.71	21.3	C	140	0.92	58.4	F	243	0.75	25.3	D	157
Surfside Rd NB approach	0.90	42.6	E	251	0.47	14.5	B	60	1.00	78.2	F	313	0.50	16.7	C	68
Atlantic Ave SB approach	0.61	20.9	C	97	0.49	15.0	C	67	0.80	40.3	E	171	0.67	21.4	C	121
<i>Saturday Midday:</i>																
Prospect St EB approach	0.81	31.7	D	189	0.62	16.8	C	108	1.00	84.7	F	322	0.80	27.4	D	194
Sparks Ave WB approach	0.79	31.0	D	175	0.61	17.1	C	103	0.78	37.6	E	165	0.62	18.5	C	104
Surfside Rd NB approach	0.95	52.2	F	297	0.44	13.2	B	54	1.00	97.9	F	334	0.44	14.6	B	55
Atlantic Ave SB approach	0.52	18.4	C	72	0.44	13.2	B	55	0.75	34.6	D	152	0.62	18.4	C	102

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 35
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY WITH IMPROVEMENTS – 2014 CONDITIONS
Sparks Avenue at Prospect Street, Surfside Road and Atlantic Avenue**

Sparks Avenue at Prospect Street, Surfside Road and Atlantic Avenue	2014 Design Year				2014 Design Year with Improvements				2014 Design Year, with Pleasant Street One-Way Improvements				2014 Design Year, with Pleasant Street One-Way & Improvements											
	V/C ^a		Delay ^b		LOS ^c		Queue ^d		V/C		Delay		LOS		Queue		V/C		Delay		LOS		Queue	
<i>Weekday AM:</i>																								
Prospect St EB approach	1.00	159.7	F	351	1.00	110.0	F	351	1.00	343.1	F	391	1.00	276.8	F	391								
Sparks Ave WB approach	1.00	136.2	F	337	1.00	93.0	F	337	1.00	127.8	F	321	1.00	91.4	F	321								
Surfside Rd NB approach	1.00	228.3	F	378	0.73	30.7	D	142	1.00	278.4	F	378	0.76	35.4	E	155								
Atlantic Ave SB approach	0.59	26.1	D	90	0.56	22.5	C	82	0.84	47.7	E	191	0.79	38.3	E	171								
<i>Weekday PM:</i>																								
Prospect St EB approach	1.00	157.4	F	338	1.00	108.2	F	338	1.00	319.7	F	377	1.00	266.4	F	377								
Sparks Ave WB approach	1.00	197.2	F	345	1.00	142.5	F	345	1.00	185.9	F	333	1.00	147.0	F	333								
Surfside Rd NB approach	1.00	228.3	F	364	0.73	32.4	D	140	1.00	257.9	F	363	0.74	36.1	E	142								
Atlantic Ave SB approach	0.83	46.6	E	187	0.78	36.4	E	163	1.00	103.3	F	304	1.00	77.8	F	304								
<i>Saturday Midday:</i>																								
Prospect St EB approach	1.00	146.9	F	340	1.00	89.8	F	340	1.00	308.5	F	373	1.00	237.0	F	373								
Sparks Ave WB approach	1.00	131.2	F	328	1.00	80.9	F	328	1.00	116.3	F	308	1.00	78.9	F	308								
Surfside Rd NB approach	1.00	281.0	F	387	0.66	27.1	D	115	1.00	341.0	F	387	0.68	30.9	D	119								
Atlantic Ave SB approach	0.72	34.1	D	133	0.66	26.8	D	114	1.00	96.4	F	301	0.97	67.2	F	282								

^aVolume-to-capacity ratio.

^bAverage stopped delay in seconds per vehicle.

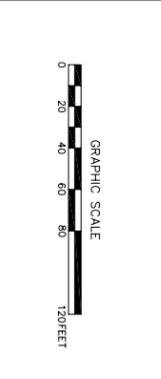
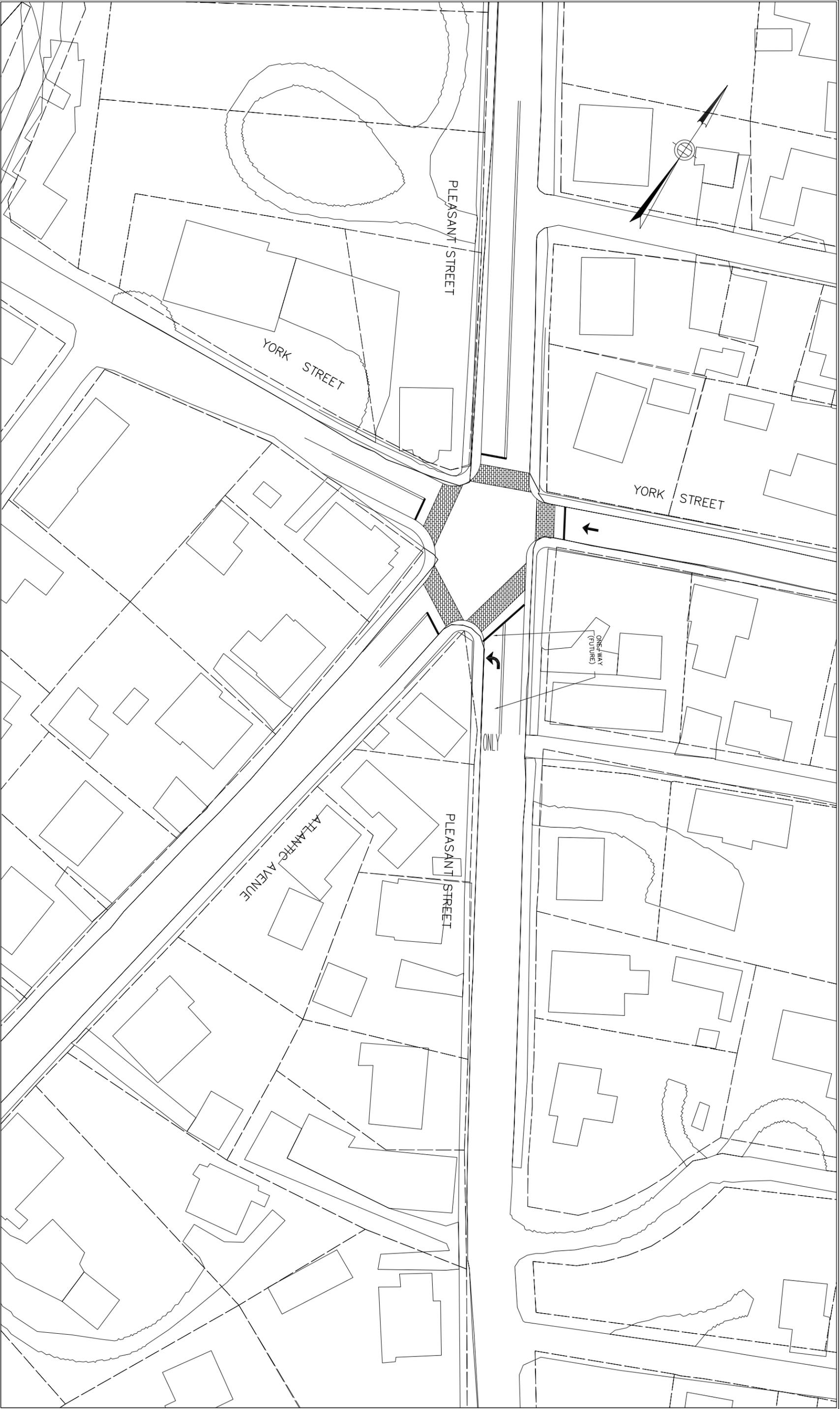
^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

Pleasant Street at York Street and Atlantic Avenue (Five Corners)

As shown in the *Analysis* section of this report, the Pleasant Street northbound approach currently operates with capacity constraints (LOS E/F), with long vehicle delays and queues. This intersection has been identified in numerous reports as being in need of improvements. However, since this intersection is located in a historic district, providing any major improvement measures, such as a roundabout or roadway realignment, would not be feasible. Therefore, only minor radii improvements, along with pedestrian and bicycle access improvements, such as crosswalks, sidewalks and signage, could be provided at this intersection.

A conceptual plan of the intersection improvements, as discussed above, is shown on Figure 34. In addition, with Pleasant Street one-way, a separate left-turn lane could be provided on the Pleasant Street northbound approach for vehicles turning onto York Street and Atlantic Avenue. Tables 36 and 37 summarize the results of the analyses for the 2004 Existing and 2014 Design Year conditions, respectively, with the aforementioned improvements implemented in conjunction with the Pleasant Street one-way alternative. All analysis worksheets are provided in the Appendix. An order of magnitude cost for the aforementioned geometric improvements at this intersection would be approximately \$100,000 to \$150,000 and the associated engineering fee is estimated to be approximately \$16,500.



CONCEPTUAL PLAN
FIGURE 34
PLEASANT STREET @ YORK STREET
& ATLANTIC AVENUE

PROJECT: **INTERSECTION IMPROVEMENT PROJECT**
 NANTUCKET, MASSACHUSETTS

PREPARED FOR: **TOWN OF NANTUCKET**
 16 BROAD STREET
 NANTUCKET, MA 02554

ENGINEER'S STAMP
 DATE _____

GPI Greenman-Pedersen, Inc.
 Engineers, Architects, Planners, Construction Engineers & Inspectors
 105 Central Street, Suite 3100, Stonham, MA 02180
 Tel: (781) 279-5500 Fax: (781) 279-5501
<http://www.gpinet.com>

NO.	REVISION	DATE	DESIGN/DRAWN BY:	TON
			CHECK BY: JWD	
			DATE: 4/28/04	
			SCALE: 1"=40'-0"	
			JOB NO.: 04068	
			FILE NAME: 04068_001	
			GRAPHIC NO.: 1	1 OF 1

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 36
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY – 2004 CONDITIONS
Pleasant Street at York Street and Atlantic Avenue**

Pleasant Street at York Street and Atlantic Avenue	2004 Existing				2004 Existing with Pleasant Street I-Way				2004 Existing with Pleasant Street I-Way & Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>												
York St/Atlantic Ave EB approach	0.76	27.8	D	169	0.54	16.7	C	80	0.54	14.6	B	79
York St WB approach	0.41	14.6	B	48	0.39	12.3	B	45	0.39	11.2	B	45
Pleasant St NB approach	1.00	77.5	F	370	0.97	51.4	F	352	--	--	--	--
Pleasant St NB left turns	--	--	--	--	--	--	--	--	0.53	15.6	C	76
Pleasant St NB thru	--	--	--	--	--	--	--	--	0.54	14.4	B	81
Pleasant St SB approach	0.39	13.8	B	45	0.20	9.9	A	18	0.20	9.4	A	18
<i>Weekday PM:</i>												
York St/Atlantic Ave EB approach	0.72	22.7	C	147	0.50	14.2	B	70	0.50	13.2	B	70
York St WB approach	0.45	15.0	C	57	0.43	12.1	B	53	0.43	11.3	B	53
Pleasant St NB approach	0.91	42.2	E	271	0.82	27.9	D	217	--	--	--	--
Pleasant St NB left turns	--	--	--	--	--	--	--	--	0.49	14.0	B	66
Pleasant St NB thru	--	--	--	--	--	--	--	--	0.51	13.1	B	72
Pleasant St SB approach	0.41	13.8	B	49	0.22	9.4	A	20	0.22	9.2	A	20
<i>Saturday Midday:</i>												
York St/Atlantic Ave EB approach	0.64	20.8	C	112	0.47	14.2	B	62	0.47	12.8	B	62
York St WB approach	0.48	16.4	C	63	0.44	12.9	B	55	0.44	11.7	B	55
Pleasant St NB approach	1.00	76.1	F	370	0.97	50.8	F	353	--	--	--	--
Pleasant St NB left turns	--	--	--	--	--	--	--	--	0.58	17.4	C	93
Pleasant St NB thru	--	--	--	--	--	--	--	--	0.52	13.2	B	74
Pleasant St SB approach	0.40	14.0	B	48	0.21	9.7	A	20	0.21	9.3	A	20

^aVolume-to-capacity ratio. ^bAverage stopped delay in seconds per vehicle. ^cLevel of service.

^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

**Table 37
INTERSECTION CAPACITY AND QUEUE ANALYSIS SUMMARY – 2014 CONDITIONS
Pleasant Street at York Street and Atlantic Avenue**

Pleasant Street at York Street and Atlantic Avenue	2014 Design Year				2014 Design Year with Pleasant Street 1-Way				2014 Design Year with Pleasant Street 1-Way & Improvements			
	V/C ^a	Delay ^b	LOS ^c	Queue ^d	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
<i>Weekday AM:</i>												
York St/Atlantic Ave EB approach	1.00	101.5	F	354	1.00	343.1	F	391	0.74	25.6	D	157
York St WB approach	0.55	20.9	C	81	1.00	127.8	F	321	0.46	14.6	B	59
Pleasant St NB approach	1.00	326.9	F	428	1.00	278.4	F	378	--	--	--	--
Pleasant St NB left turns	--	--	--	--	--	--	--	--	0.76	29.2	D	164
Pleasant St NB thru	--	--	--	--	--	--	--	--	0.75	27.0	D	164
Pleasant St SB approach	0.51	19.4	C	70	0.84	47.7	E	191	0.25	11.4	B	24
<i>Weekday PM:</i>												
York St/Atlantic Ave EB approach	1.00	92.5	F	342	1.00	319.7	F	377	0.66	20.8	C	120
York St WB approach	0.66	26.3	D	116	1.00	185.9	F	333	0.50	15.4	C	70
Pleasant St NB approach	1.00	254.7	F	395	1.00	257.9	F	363	--	--	--	--
Pleasant St NB left turns	--	--	--	--	--	--	--	--	0.66	22.4	C	117
Pleasant St NB thru	--	--	--	--	--	--	--	--	0.66	21.2	C	121
Pleasant St SB approach	0.58	22.6	C	90	1.00	103.3	F	304	0.27	11.2	B	27
<i>Saturday Midday:</i>												
York St/Atlantic Ave EB approach	0.96	59.4	F	289	1.00	308.5	F	373	0.59	18.7	C	95
York St WB approach	0.73	30.0	D	146	1.00	116.3	F	308	0.51	16.1	C	73
Pleasant St NB approach	1.00	367.9	F	429	1.00	341.0	F	387	--	--	--	--
Pleasant St NB left turns	--	--	--	--	--	--	--	--	0.86	39.2	E	227
Pleasant St NB thru	--	--	--	--	--	--	--	--	0.67	21.6	C	125
Pleasant St SB approach	0.59	22.4	C	91	1.00	96.4	F	301	0.27	11.2	B	27

^aVolume-to-capacity ratio. ^bAverage stopped delay in seconds per vehicle. ^cLevel of service. ^d95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

PARKING

To address the existing and anticipated future parking needs in the Mid-Island area, the following parking modifications are recommended:

1. On-street parking should be established along Pleasant Street, generally from West Creek Road to Bear Street, where the parking demand is greatest. The parking improvements along the Pleasant Street corridor as discussed in detail in the *Pleasant Street Corridor* section of this report.
2. The existing head-in parking on West Creek Road should be improved and/or eliminated to alleviate conflicts with through traffic on West Creek Road. The parking improvements along West Creek Road are discussed in detail in the *West Creek Road Corridor* section of this report.
3. The full build out potential of this parking area should be evaluated and a circulation plan to improve utilization and efficiency should be developed. This improvement will require cooperation between the Town & landowners.

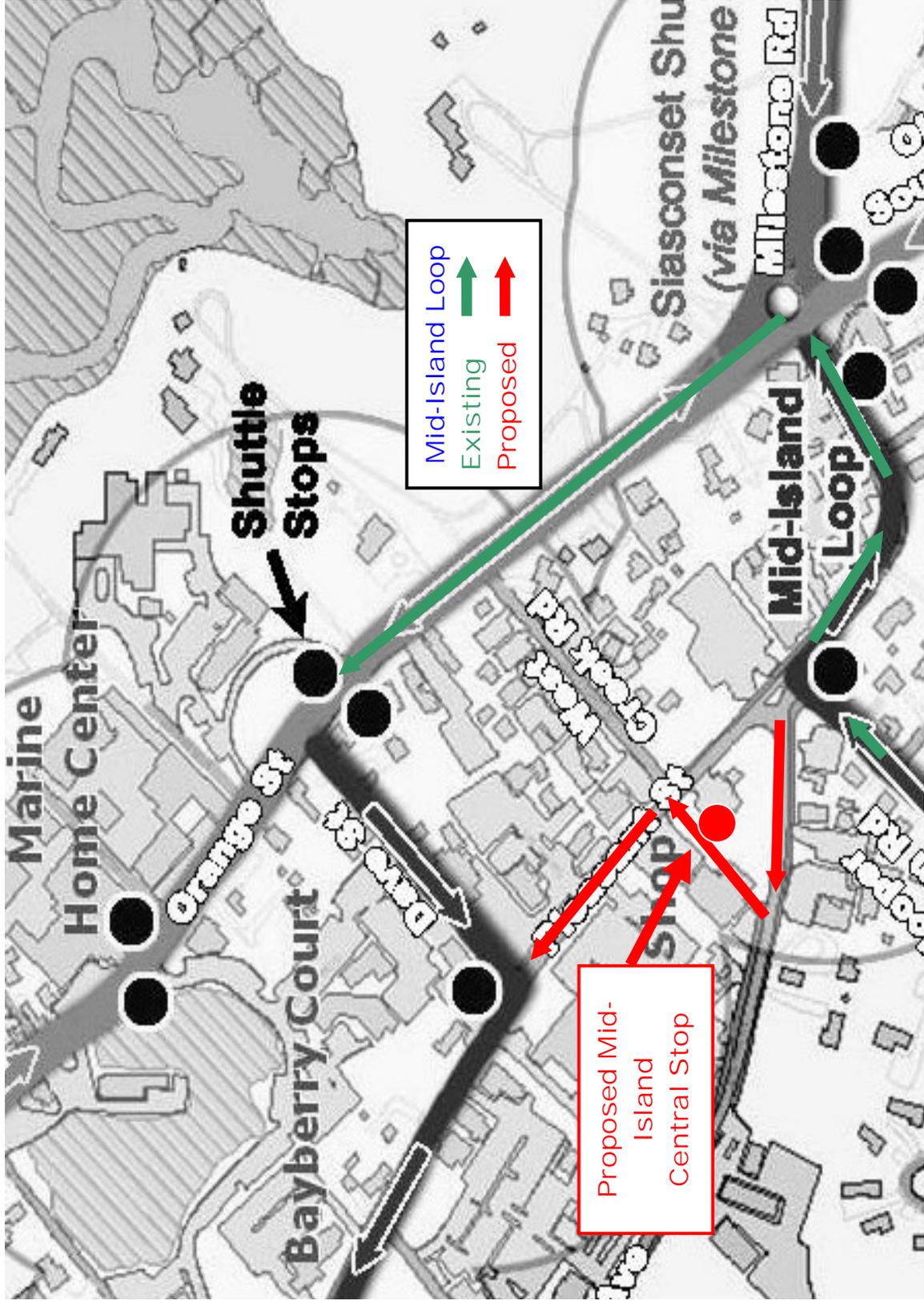
TRANSIT

To address the existing and anticipated transit needs in the Mid-Island area, a Mid-Island central stop with enhanced pedestrian access and connectors is recommended to facilitate employees and visitors to this area, along with other major destinations of the Island. Based on discussions with officials from the Town of Nantucket, the potential development of the “*Craig Property*” and/or the Stop & Shop expansion project both provide alternatives for the construction of a central stop and are described in the *Traffic Growth* section of this report. Based on discussion with officials from the Town, providing the central hub at the Stop & Shop property appears to be a more feasible and realistic alternative. Figure 35 graphically depicts how the existing transit routes within the Mid-Island area could be adjusted to provide a future central Mid-Island stop at the Stop & Shop site. The Mid-Island Loop could be modified to include a “loop” through the Stop & Shop property via Sparks Avenue. This Route would utilize the new Hooper Farm Rd roundabout to turn left rather than right on Sparks Avenue, then turn right into the Stop & Shop Lot. The service route would then continue along the existing Pleasant Street route. This option would function effectively with Pleasant Street remaining as a two-way roadway or providing one-way circulation in the northwest direction.

The existing Mid-Island Route stop at Dave Street and Pleasant Street would remain. However, because the Mid-Island Route will no longer utilize Orange Street, transfers between other routes utilizing the stop at the Orange Street/Landmark House will be more difficult. However, the other routes, including the Miacomet Route, Sconset Routes, Surfside Beach Route and Airport Route could also be modified in similar manners by either “looping” through the Stop & Shop

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts



GPI Greenman-Pedersen, Inc.

Engineers, Architects, Planners, Construction Engineers & Inspectors

Figure 35

Mid-Island Transit Map
With Modifications

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

property via, Sparks Avenue, Pleasant Street and back onto Sparks Avenue or deferring onto Sparks Avenue, through the Stop & Shop property and continuing through to West Creek Road. This would create one “central” stop that would be utilized by ALL routes through the Mid-Island area, resulting in a more convenient transit service. Table 38 illustrates the potential modifications to the roadways and stops associated with the above transit routes. It should be stressed that these adjustments are preliminary alternatives and that any modifications to the existing transit routes, including providing a central Mid-Island stop, should be studied from a financial, economic, operations, and transit headway perspective and would ultimately need to be reviewed and approved by the NRTA.

**Table 38
TRANSIT ROUTE MODIFICATIONS**

<p><i>MID-ISLAND LOOP</i></p> <p><u>Street Listing</u> Salem Street (between Union Street and Washington Street) Right onto Washington Street Right onto Francis Street Left onto Union Street Right onto York Street Bear left onto Atlantic Avenue Surfside Road Left onto Hooper Farm Road Right onto Sparks Avenue Through the Rotary onto Lower Orange Street Left onto Dave Street Right onto Pleasant Street Left on Sparks Avenue Right into Stop & Shop Left onto Pleasant Street Right onto Dover Street Left onto Union Street Right onto Salem Street</p>	<p><u>Designated Stops</u> Salem Street Francis Street/Union Street (outbound) York Street/Pleasant Street Atlantic Avenue/Prospect Street Anna Drive Nantucket Elementary School (Park & Ride) The Muse (Park & Ride) Miacomet Avenue Surfside Road/Surfside Drive Surfside Drive/Hooper Farm Road Parker Lane Trotters Lane Waydale Road Hooper Farm Road/Sparks Avenue Milestone Lane Stop & Shop Daves Street (Chicken Box (Park & Ride) Freedom Square 5 Corners West Dover Street/Orange Street East Dover Street 27 Union Street</p>
<p><i>MIACOMET LOOP</i></p> <p><u>Street Listing</u> Washington Street (on the corner of Salem Street) Right onto Francis Street Left onto Union Street Left onto Lower Orange Street Right on Dave Street or West Creek Road – through Stop & Shop Left on Sparks Ave through Roundabout to Rotary</p>	<p><u>Designated Stops</u> Washington Street (corner of Salem Street) Francis Street/Union Street (outbound) Union Street/Orange Street (outbound) Bayberry Court Orange Street/Landmark House Stop & Shop Rotary/Old South Road Fairgrounds Road/Newtown Road</p>

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

<p>Through the Rotary to Old South Road Right onto Fairgrounds Road Right onto Surfside Road Left on Bartlett Road Right onto Somerset Lane Right onto Hummock Pond Road Right onto Prospect Street Left onto Dover Street Bear left onto Pleasant Street Right onto York Street Left onto Union Street Right onto Salem Street Right onto Washington Street</p> <p><i>SCONSET ROUTE VIA POLPIS ROAD</i></p> <p><u>Street Listing</u> Out-bound - Washington Street (corner of Main Street) Right onto Francis Street Left onto Union Street Left onto Lower Orange Street Right on Dave Street or West Creek Road – through Stop & Shop Left on Sparks Ave through Roundabout to Rotary Through the Rotary to Milestone Road Bear Left onto Polpis Road Sankaty Road Right onto Coffin Street Right onto West Sankaty Avenue School Street Left onto Main Street Sconset Through the Sconset Rotary to Main Street, Sconset</p> <p>In-bound - Main Street, Sconset Hub Right onto School Street West Sankaty Avenue Right onto Coffin Street Left onto Sankaty Road Polpis Road Bear Right onto Milestone Road Through Rotary to Sparks Ave Through Roundabout to Sparks Avenue</p>	<p>Faregrounds Restaurant (Park & Ride) Parker Lane Fairgrounds Road/Surfside Road Surfside Drive The Muse (Park & Ride) Thirty Acres Cedar Circle Appleton Road Oddfellows Lodge (Park & Ride) Friendship Lane Marble Way Raceway Drive/Somerset Lane Catherine Lane Somerset Lane/Hummock Pond Road Burnt Swamp Lane Hawthorne Lane Mt. Vernon Street The Old Mill 5 Corners Washington Street/Francis Street (inbound)</p> <p><u>Designated Stops</u> Francis Street/Union Street (outbound) Francis Street/Washington Street (inbound) Orange Street/Union Street (outbound only) Bayberry Court Orange Street/Landmark House Stop & Shop Milestone Road @ Water Company (outbound) Monomoy Road (inbound) Polpis Road Shimmo Road Moors End Lane/Gardner Road North Pasture Lane Shawkemo Life Saving Museum Quaise Road/Altar Rock Road Quaise Pastures Wauwinet Road Quidnet Road 240 Polpis Road 253 Polpis Road 334 Polpis Road Hoicks Hollow Road Sankaty Head Golf Club Bayberry Lane Anne’s Lane</p>
--	---

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

<p>Right into Stop & Shop Straight on West Creek Road Left on Orange Street Through Rotary onto Lower Orange Street Right onto Union Street Right onto Francis Street Left onto Washington Street Right onto Lower Main Street Left onto Main Street Left onto Washington Street</p> <p><i>SCONSET ROUTE VIA OLD SOUTH ROAD</i></p> <p><u>Street Listing</u> Out-bound - Washington Street (corner of Main Street) Right onto Francis Street Left onto Union Street Left onto Lower Orange Street Right on Dave Street or West Creek Road – through Stop & Shop Left on Sparks Ave through Roundabout to Rotary Through the Rotary to Old South Road Left onto Nobadeer Farm Road Right onto Milestone Road Through Sconset Rotary to Main Street, Sconset Hub In-Bound - Main Street, Sconset Milestone Road Right onto Nobadeer Farm Road Left onto Old South Road Through Rotary to Sparks Ave Through Roundabout to Sparks Avenue Right into Stop & Shop Straight on West Creek Road Left on Orange Street Through Rotary onto Lower Orange Street Right onto Union Street Right onto Francis Street Left onto Washington Street Right onto Lower Main Street Left onto Main Street Left onto Washington Street</p> <p><i>SCONSET VIA MILESTONE ROAD</i></p> <p><u>Street Listing</u> Out-bound - Washington Street (corner of Main Street)</p>	<p>Sconset Avenue/Emily Street Rosaly Lane/Clifton Street Shell Street/Coffin Street School Street/New Street School Street/Main Street Main Street Rotary, Sconset</p> <p><u>Designated Stops</u> Francis Street/Union Street (outbound) Francis Street/Washington Street (inbound) Union Street/Orange Street (outbound only) Bayberry Court Orange Street/Landmark House <u>Stop & Shop</u> Rotary/Old South Road Amelia Drive Young’s Way Lovers Lane Goldfinch Drive Pine Crest Estates Mary Ann Lane (3/10 of a mile from airport terminal) Macy Lane Square Rigger Road Hinsdale Road Sun Island Road Nobadeer Farm Road/Milestone Road Tom Nevers Road Chuck Hollow Road Sconset Golf Course New Street Main Street/Morey Lane Main Street Rotary, Sconset</p> <p><u>Designated Stops</u></p>
---	--

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

<p>Right onto Francis Street Left onto Union Street Left onto Lower Orange Street Right on Dave Street or West Creek Road – through Stop & Shop Left on Sparks Ave through Roundabout to Rotary Through the Rotary to Milestone Road Through Sconset Rotary to Main Street, Sconset</p> <p>In-bound – Main Street, Sconset Milestone Road Through the Rotary onto Lower Orange Street Through Rotary to Sparks Ave Through Roundabout to Sparks Avenue Right into Stop & Shop Straight on West Creek Road Left on Orange Street Right onto Union Street Right onto Francis Street Left onto Washington Street Right onto Lower Main Street Left onto Main Street Left onto Washington Street</p> <p><i>SURFSIDE BEACH BUS</i></p> <p><u>Street Listing</u> Out-bound - Washington Street Right onto Francis Street Left onto Union Street Left onto Lower Orange Street Right on Dave Street or West Creek Road – through Stop & Shop Left on Sparks Ave through Roundabout to Rotary Through the Rotary to Old South Road Right onto Fairgrounds Road Left onto Surfside Road Surfside Beach</p> <p>In-bound - Surfside Beach Surfside Road Left onto Fairgrounds Road Through Rotary to Sparks Ave Through Roundabout to Sparks Avenue Right into Stop & Shop Straight on West Creek Road Left on Orange Street Through the Rotary to Lower Orange Street Right onto Union Street</p>	<p>Francis Street/Union Street (out-bound) Francis Street/Washington Street (in-bound) Orange Street/Union Street (out-bound only) Bayberry Court Orange Street/Landmark House Stop & Shop Milestone Road @ Water Company (out-bound) Tawpoot Road Milestone Crossing/Sheep Commons Lane Nobadeer Farm Road/Milestone Road Tom Nevers Road Chuck Hollow Road Sconset Golf Course New Street Main Street/Morey Lane Main Street Rotary, Sconset</p> <p><u>Designated Stops</u> Union Street and Orange Street Bayberry Court Stop & Shop The Rotary Faregrounds Restaurant (Park & Ride) The Boulevard Masaquet Avenue Nonantum Avenue</p>
---	--

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

<p>Left onto Francis Street Left on Washington Street Right onto Lower Main Street Left onto Main Street Left onto Washington Street</p> <p><i>AIRPORT ROUTE</i></p> <p><u>Street Listing</u> Out-bound - Washington Street Right onto Francis Street Left onto Union Street Left onto Lower Orange Street Right on Dave Street or West Creek Road – through Stop & Shop Left on Sparks Ave through Roundabout to Rotary Through the Rotary to Old South Road Right onto Macy Lane Left into Airport entrance End at Terminal by FAA tower</p> <p>In- Bound – Airport Terminal by FAA tower Right onto Macy Lane Left onto Old South Road Through Rotary to Sparks Ave Through Roundabout to Sparks Avenue Right into Stop & Shop Straight on West Creek Road Left on Orange Street Through the Rotary to Lower Orange Street Right onto Union Street Right onto Francis Street Left onto Washington Street Right onto Lower Main Street Left onto Main Street Left onto Washington Street</p>	<p><u>Designated stops</u> Francis Street/Union Street (outbound) Francis Street/Washington Street (inbound) Union Street/Orange Street (outbound only) Bayberry Court Orange Street/Landmark House Stop & Shop Rotary/Old South Road Amelia Drive Young's Way Lovers Lane Goldfinch Drive Pine Crest Estates Mary Ann Lane Macy Lane Airport Terminal</p>
--	--

BIKEWAYS

To better serve the Mid-Island area, the following modifications to the bikeway system are recommended:

1. A formal in-Town Bike Path/Route should be provided along Orange Street, connecting the Mid-Island area and Rotary with the Downtown. Based on the available GIS mapping, it appears that the Orange Street right-of-way varies between 30-35 feet. Due to the limited right-of-way, a “typical” ten-foot bicycle/multi-use path along one side of the road with a minimal sidewalk along the other will have significant impacts on right-of-way along the corridor. The minimum cross section for such an alignment would require approximately 40 feet of right-of-way. As an alternative, the sidewalk could be eliminated and simply provide a 10 foot multi-use path along one side of the road. This would require a minimum cross section of 34 feet. In addition, a four-foot bike/shared lane on Orange Street in each direction may be feasible with appropriate “SHARE THE ROAD” signing. This would require reconstructing and restriping Orange Street along with minor right-of-way impacts. Figure 36 illustrates the proposed alternative cross sections and signage. Order of magnitude costs associated with the three alternatives are approximately \$760,000 to \$1,000,000 for Option 1, \$670,000 to \$800,000 for Option 2 and \$810,000 to \$1,000,000 for Option 3. The estimated engineering fee associated with the design of the corridor is approximately \$100,000.
2. A bicycle path should be provided along Sparks Avenue, connecting the Surfside Road Bike Path with the Milestone and Old South Road Bike Paths. Similar to Option 1 for Orange Street, (Figure 36) a multi-use path adjacent to the street is anticipated. It is also anticipated that some roadway realignment, to the north, may be required as part of this alternative. These improvements are included in the current regional *Transportation Improvement Program* (TIP). An order of magnitude cost associated with such improvements would be approximately \$900,000 to \$1,100,000. It is estimated that the associated engineering fee would be approximately \$120,000.
3. A bicycle path should be provided at the termini of the existing Surfside Road bike path at Vesper Lane, connecting Surfside Road to Sparks Avenue. An alternative would be to provide the connection via the high school parking lot/property at the southeast corner of Sparks Avenue and Surfside Road. An order of magnitude cost associated with such improvements would be approximately \$35,000 to \$60,000. It is estimated that the associated engineering fee would be approximately \$6,500.
4. A bicycle path should be provided along the northerly side of Milestone Road from Orange Street to Polpis Road. This path will reduce the number of bicyclists that are forced to cross the Milestone Rotary. An order of magnitude cost associated with such improvements would be approximately \$500,000 to \$600,000. It is estimated that the associated engineering fee would be approximately \$65,000.

TRAFFIC STUDY

Mid-Island Area, Nantucket, Massachusetts

APPENDIX

**TRAFFIC COUNT DATA
MASSHIGHWAY TRAFFIC-VOLUME ADJUSTMENT DATA
CRASH RATE WORKSHEETS
GENERAL BACKGROUND GROWTH
CAPACITY AND QUEUE ANALYSIS WORKSHEETS**



www.gpinet.com