

Appendix D – Alternatives Development Technical Memorandum



NRTA Year-Round Bus Service Study

Alternatives Development

Technical Memorandum

Prepared for

Nantucket Regional Transit Authority

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TRANSIT SERVICE ALTERNATIVES

A long list of alternatives was developed and evaluated based on information provided through input from the public and by information from operational and transit market analyses.

In general, three service alternatives are presented:

Option 1 provides full off-season service on the Island. Service operates 217 days between mid-October and mid-May with service 14 hours a day, seven days a week.

Option 2 also provides full off-season service, 217 days between mid-October and mid-May. Service also operates seven days a week, however weekday service span is 14 hours and weekend service span is 11 hours. There is less service frequency than the Option 1 alternatives.

Option 3 provides service for 84 days during the extended shoulder seasons on the island. Generally, this is between the Daffodil Festival in the spring and through the Christmas Stroll in the winter.

Mid Island Loop

In Option 1, the Mid Island Loop would operate along the same alignment as it does during the summer. Service operates 14 hours on weekdays and weekends with a 30 minute headway. In Option 2, the Mid Island Loop would cover the same route as Option 1 but would operate only 11 hours on the weekends. In Option 3, the Mid Island Loop would cover the same route as Option 1 but would only operate during the extended shoulder season. On weekdays, this route would operate 14 hours a day while on weekends the route would only provide service for 11 hours.

Table 1: Mid Island Loop Alternatives

Indicator	Option 1	Option 2	Option 3
Round-trip Mileage	4.1	4.1	4.1
Cycle time (min)	30	30	30
Headway (min)	30	30	30
Weekday Service Span	14 hrs	14 hrs	14 hrs
Weekend Service Span	14 hrs	11 hrs	11 hrs
Additional Days Operated	217	217	84
Driver Requirement (FTE)	2.45	2.3	2.3
Vehicle Requirements	1	1	1
Total New Rev. Hours	3,038	2,852	1,104
Total New Rev. Miles	12,456	11,693	4,526
Projected Ridership	39,439	37,024	14,332
Projected Riders/Day	182	171	171
Operating Cost*	\$288,610	\$270,940	\$104,880

*Does not include farebox revenue

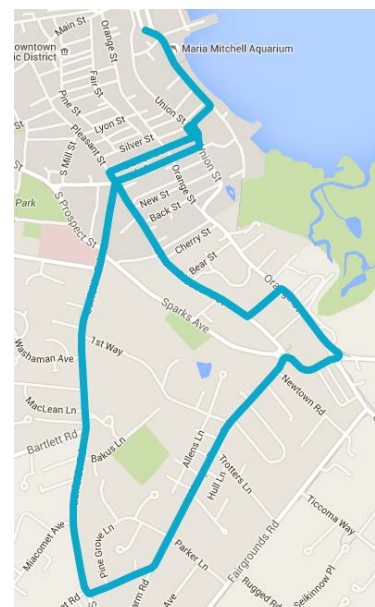


Figure 1: Mid Island Loop Map

Miacomet Loop

The Miacomet Loop would operate along the same alignment as it does during the summer, traveling in a clockwise direction. In Option 1 service would operate 14 hours a day, seven days a week with a headway of 30 minutes. Option 2, would cover the same route as Option 1 but would operate only 11 hours on the weekends. In Option 3, the Miacomet Loop would only operate during the extended shoulder season. In Option 3 on weekdays, this route would operate 14 hours a day while on weekends the route would only provide service for 11 hours.



Figure 2: Miacomet Loop Map

Table 2: Miacomet Loop Alternatives

Indicator	Option 1	Option 2	Option 3
Round-trip Mileage	7	7	7
Cycle time (min)	30	30	30
Headway (min)	30	30	30
Weekday Service Span	14 hrs	14 hrs	14 hrs
Weekend Service Span	14 hrs	11 hrs	11 hrs
Additional Days Operated	217	217	84
Driver Requirement (FTE)	2.45	2.3	2.3
Vehicle Requirements	1	1	1
Total New Rev. Hours	3,038	2,852	1,104
Total New Rev. Miles	21,266	19,964	7,728
Projected Ridership	43,084	40,447	15,657
Projected Riders/Day	199	186	186
Operating Cost*	\$288,610	\$270,940	\$104,880

*Does not include farebox revenue

Mid Island and Miacomet Loop Combination (new)

The Mid Island and Miacomet Loop Combination is a new route and is a combination of the existing Mid Island Loop and Miacomet Loop routes. This route would operate service beginning in downtown and travelling along Francis Street, Union Street, Orange Street, Sparks Avenue, Hooper Farm Road, Surfside Drive, Surfside Road, Bartlett Road, Somerset Lane, Hummock Pond Road, Joy Street, Prospect Street, York Street, W Dover Street and back towards downtown. Service operates 14 hours on weekdays and weekends with headway of 30 minutes. In Option 2, the Mid Island and Miacomet Loop Combination would cover the same route as Option 1 but would operate only 11 hours on the weekends. This route is not included in the Option 3 alternative.

Table 3: Mid Island and Miacomet Loop Combination (new) Alternative

Indicator	Option 1	Option 2
Round-trip Mileage	6.5	6.5
Cycle time (min)	30	30
Headway (min)	30	30
Weekday Service Span	14 hrs	14 hrs
Weekend Service Span	14 hrs	11 hrs
Additional Days Operated	217	217
Driver Requirement (FTE)	2.45	2.3
Vehicle Requirements	1	1
Total New Rev. Hours	3,038	2,852
Total New Rev. Miles	19,747	18,538
Projected Ridership	87,885	87,904
Projected Riders/Day	405	405
Operating Cost*	\$288,610	\$270,940

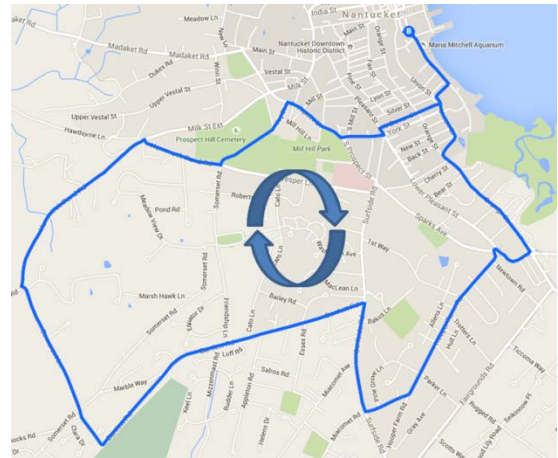


Figure 3: New Mid Island Miacomet Combination Route

*Does not include farebox revenue

Old South Rd/Turn-around (new)

The Old South Road/Nobadeer Farm Road – Turn Around is a new route proposed for NRTA WAVE year-round service. There are two variations of this route and either variation could be used for any of the options. In variation 1 service would begin in downtown and travel along Francis Street, York Street, Atlantic Avenue, Sparks Avenue, and Old South Road (servicing the Park-and-ride) to Nobadeer Farm Road where it would turn around at the athletic fields on the west side of Nobadeer Farm Road. The route then travels back from Nobadeer Farm Road along Old South Road and Orange Street back towards downtown. In Variation 2 the route would begin downtown on Broad Street by the Steamship Authority terminal and continue to S. Water Street, Washington Street, Francis Street, Union Street, Orange Street, Old South Road and Nobadeer Farm Road where it would also turn around at the athletic fields. In variation 2 the return trip would follow the same alignment. For both variations in Option 1 service would operate 14 hours on weekdays and weekends with a 30 minute headway. In Option 2, both variations are possible but they would operate with less frequency (60 minute headway) and only 11 hours on the weekends.

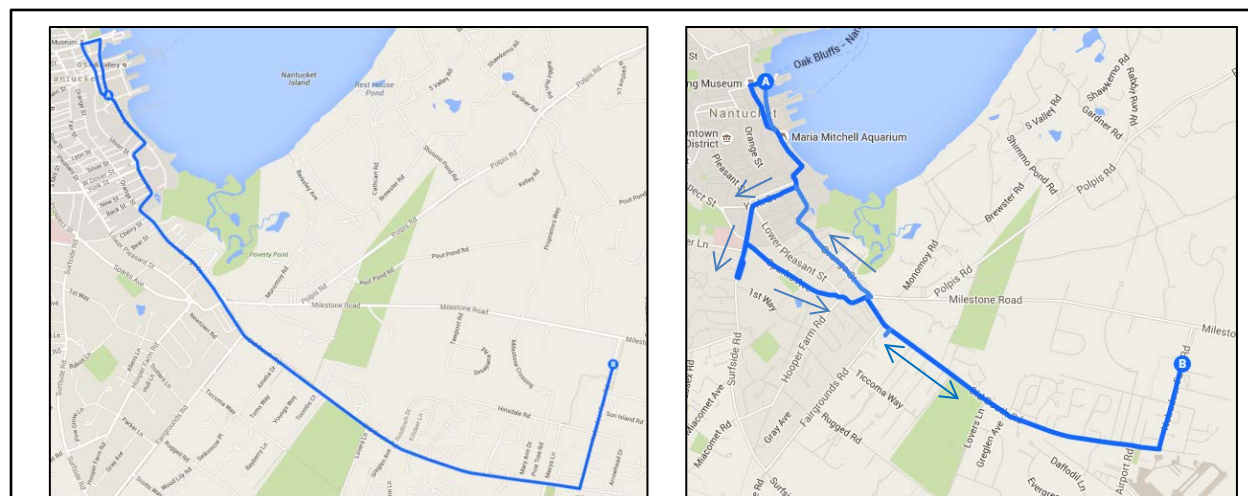


Figure 4: Left: Variation 2, Right Variation 1. Old South Road/Turn-Around Maps

Table 4: Old South Rd/Turn-Around Alternatives

Indicator	Option 1	Option 2
Round-trip Mileage	7	7
Cycle time (min)	60	60
Headway (min)	30	60
Weekday Service Span	14 hrs	14 hrs
Weekend Service Span	14 hrs	11 hrs
Additional Days Operated	217	217
Driver Requirement (FTE)	4.9	2.3
Vehicle Requirements	2	1
Total New Rev. Hours	6,076	2,852
Total New Rev. Miles	42,532	19,964
Projected Ridership	124,601	62,314
Projected Riders/Day	574	287
Operating Cost*	\$577,220	\$270,940

*Does not include farebox revenue

Old South Rd/Milestone Loop (new)

The Old South Road/Nobadeer Farm Road/Milestone Loop – Turn Around is a new bi-directional route proposed for NRTA off-season service. Service would begin in downtown and travel along Francis Street, York Street, Atlantic Avenue, and Sparks Avenue. On Milestone Road, Nobadeer Farm Road, and Old South Road service would be bidirectional with buses on the hour traveling clockwise and on the ½ hour counter clockwise. Orange Street would be used to head back downtown. Service would operate 14 hours a day, seven days a week. Between Downtown and the roundabout there would be 30 minute service and along Old South and Nobadeer Farm Road 60 minute service in either direction resulting in a cumulative level of service being every 30 minutes. This route is not proposed for Option 2 or Option 3 service alternatives.

Table 5: Old South Rd/Milestone Loop Alternative

Indicator	Option 1
Round-trip Mileage	6.3
Cycle time (min)	60
Headway (min)	60
Weekday Service Span	14 hrs
Weekend Service Span	14 hrs
Additional Days Operated	217
Driver Requirement (FTE)	4.9
Vehicle Requirements	2
Total New Rev. Hours	6,076
Total New Rev. Miles	38,279
Projected Ridership	130,851
Projected Riders/Day	603
Operating Cost*	\$577,220

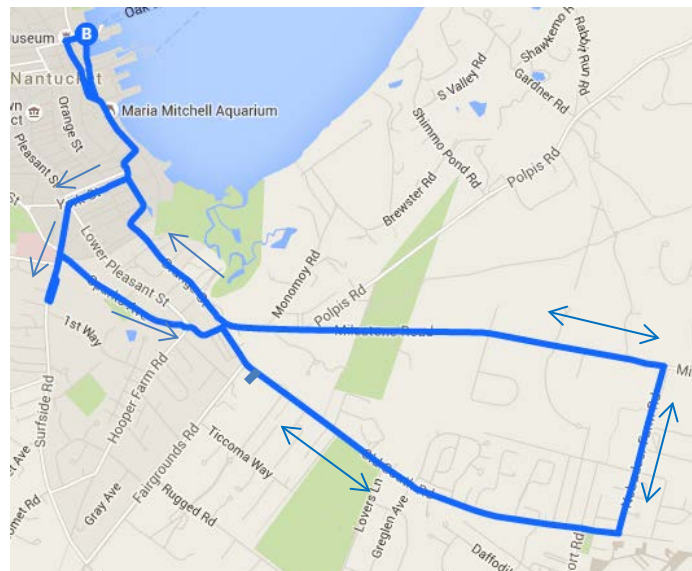


Figure 5: Old South Rd/Milestone Loop Map

Sconset via Old South Road Route

The Sconset via Old South Road Route would provide service to the eastern part of the island and would follow the existing routing of the Sconset via Old South Road Route but would also service the Park-and-ride lot. In option 1 there would be four trips a day (two AM trips, two PM trips) on weekdays and weekends. Option 2 operate with only three trips per day: one AM trip, one mid-day trip and one PM trip on weekdays and weekends. There are two Option 3 alternatives to provide service during the extended shoulder season. In Option 3A, the route operates 14 hours on weekdays and 11 hours on the weekends with a 60 minute headway. In Option 3B, the route operates on a 120 minute headway.

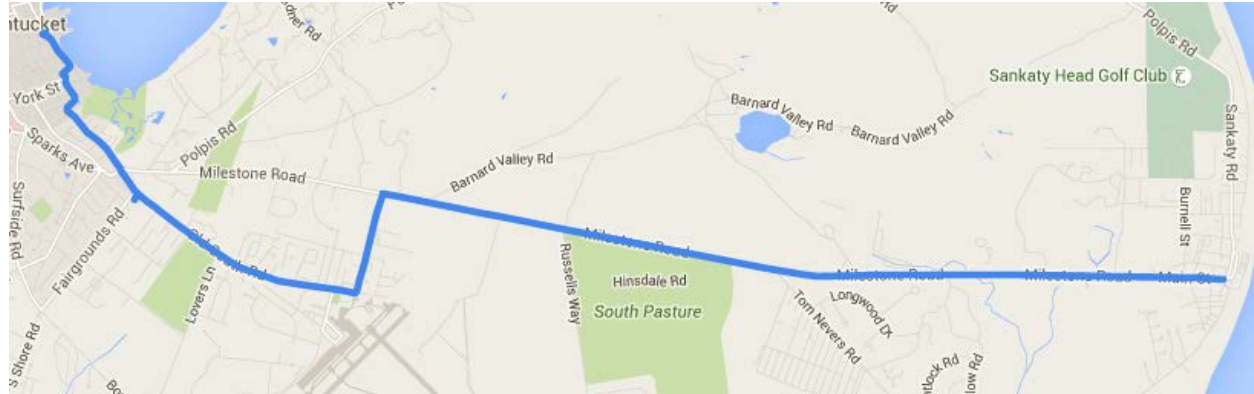


Figure 6: Sconset via Old South Road Route Map

Table 6: Sconset via Old South Road Route Alternative

Indicator	Option 1	Option 2	Option 3A	Option 3B
Round-trip Mileage	17.5	17.5	17.5	17.5
Cycle time (min)	60	60	60	60
Trips per day/ headway	4	3	60 min	120 min
Weekday Service Span	14 hrs	14 hrs	14 hrs	14 hrs
Weekend Service Span	14 hrs	11 hrs	11 hrs	11 hrs
Additional Days Operated	217	217	84	84
Driver Requirement (FTE)	0.7	0.525	2.3	1.15
Vehicle Requirements	1	1	1	0.5
Total New Rev. Hours	868	651	1,104	552
Total New Rev. Miles	15,190	11,393	19,320	9,660
Projected Ridership	14,374	10,781	18,282	9,141
Projected Riders/Day	66	50	218	109
Operating Cost*	\$82,460	\$61,845	\$104,880	\$52,440

*Does not include farebox revenue

Madaket Route

The Sconset via Old South Road Route provide service to the western part of the island would operate along the same alignment as it does during the summer. In Option 1 service operates three trips a day (one AM trip, one mid-day trip and one PM trip) on weekdays and weekends. In Option 2, service would operate with only two trips per day: one AM trip and one PM trip on weekdays and weekends. There are four Option 3 alternatives to provide service during the certain periods of the extended shoulder season. In Option 3A, service would be added to extend the spring shoulder season to begin in April with a

service span of 14 hours on weekdays and 11 hours on the weekends and a 60 minute headway. In Option 3B, service would be extended in both shoulder seasons to begin in April and end in December It would have a service span of 14 hours on weekdays and 11 hours on the weekends with a 60 minute headway. Option 3C is similar to Option 3B but would have a 120 minute headway. Lastly, Option 3D would extended the fall shoulder season until Columbus Day. In this option, extended service would run 14 hours on weekdays and 11 hours on weekends with a 60 minute cycle time.

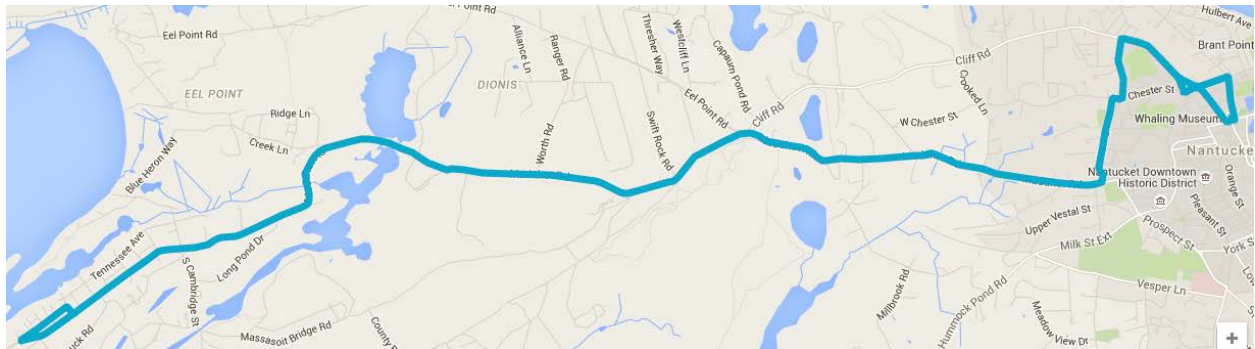


Figure 7: Madaket Route Map

Table 7: Madaket Route Alternative

Indicator	Option 1	Option 2	Option 3A	Option 3B	Option 3C	Option 3D
Round-trip Mileage	12.5	12.5	12.5	12.5	12.5	12.5
Cycle time (min)	60	60	60	60	60	60
Trips per day/ headway	3	2	60 min	60 min	120 min	60 min
Weekday Service Span	14	14	14	14	14	14
Weekend Service Span	14	11	11	11	11	11
Additional Days Operated	217	217	23	84	84	29
Driver Requirement (FTE)	.525	.35	2.3	2.3	1.15	2.3
Vehicle Requirements	1	1	1	1	.5	1
Total New Rev. Hours	651	434	368	1,564	782	368
Total New Rev. Miles	8,138	5,425	4,600	19,550	9,775	4,600
Projected Ridership	6,741	4,494	3,811	13,363	6,681	2,939
Projected Riders/Day	31	21	45	159	80	35
Operating Cost*	\$82,460	\$61,845	\$34,960	\$148,580	\$74,290	\$34,960

*Does not include farebox revenue

Ferry Connector

Service is proposed during the extended season (Option 3) for the Ferry Connector. This route operates service between the Ferry Connector Lot and the Steamship Authority. The service span for this route would be 14 hours on weekdays and 11 hours on weekends with a headway of 20 minutes. In Options 1 and 2 service between the ferry docks and the park-and-ride lot would be incorporated into the new Old South Road/Nobadeer Farm Road Routes.

Table 8: Ferry Connector Alternative

Indicator	Option 3
Round-trip Mileage	3.2
Cycle time (min)	40
Headway (min)	20
Weekday Service Span	14 hrs
Weekend Service Span	11 hrs
Additional Days Operated	84
Driver Requirement (FTE)	4.6
Vehicle Requirements	2
Total New Rev. Hours	2,208
Total New Rev. Miles	18,253
Projected Ridership	8,587
Projected Riders/Day	102
Operating Cost*	\$209,760

*Does not include farebox revenue

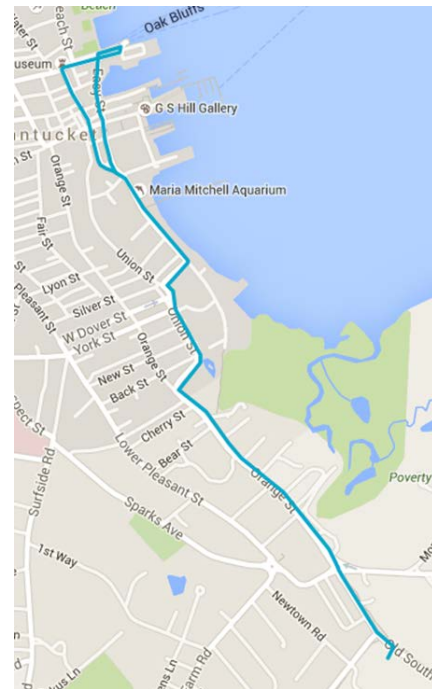


Figure 8: Ferry Connector Map