DRAFT

Traffic Impact & Access Study

Proposed YMCA Facility
Oak Bluffs, Massachusetts

prepared for:

YMCA of Martha's Vineyard
Town of Oak Bluffs
Martha's Vineyard Commission

MS Transportation Systems, Inc.

May 2007

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Prepared By

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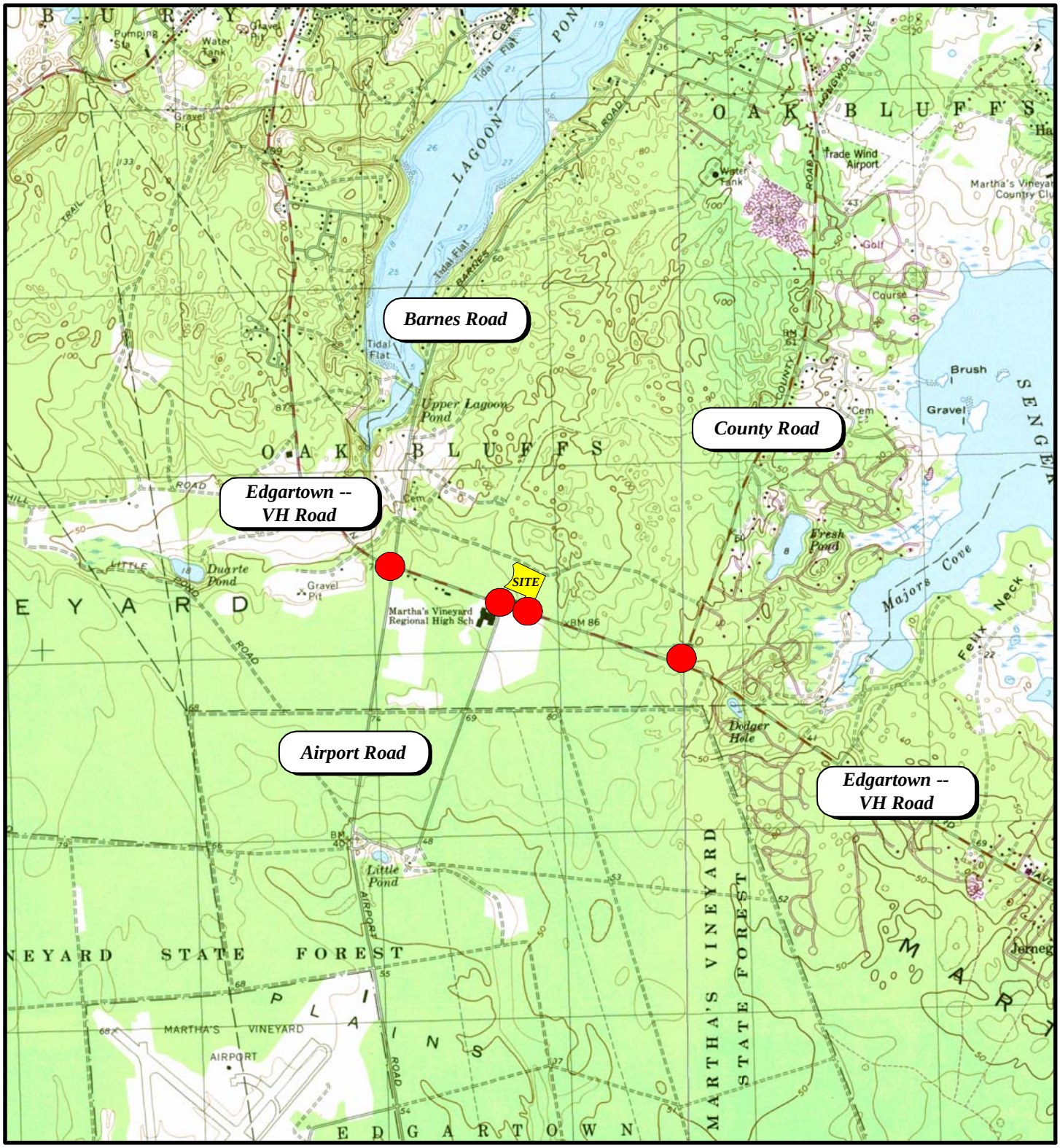
Introduction

This traffic impact and access study provides an analysis of the traffic impacts, area traffic circulation and access-egress characteristics associated with the proposed YMCA Facility located along Edgartown-Vineyard Haven Road in Oak Bluffs, Massachusetts. The project site is located off of Edgartown-Vineyard Haven Road in Oak Bluffs, Massachusetts, approximately half way between Barnes Road/ Airport Road and County Road. The project location, with respect to the area roadway system and features is shown on Figure 1.

Access/ egress for the project are proposed via two driveways. The main access driveway is proposed approximately 50 feet west of the existing Martha's Vineyard Arena driveway on Edgartown Vineyard Haven Road. The existing Martha's Vineyard Arena driveway will then be removed and internal roadway connections will be made between the MV Arena parking lots and the proposed YMCA facility. The secondary access driveway is proposed with a direct connection to Community Services Drive approximately 250 feet north of Edgartown-Vineyard Haven Road.

This study was completed in compliance with the traffic study guidelines published by the Executive Office of Environmental Affairs (EOEA) and the Executive Office of Transportation (EOT) as well as the Martha's Vineyard Commission (MVC). The study scope was developed in consultation with the MVC staff and approved by the Land Use Committee. As the following sections of the report document, the study included analysis of the existing traffic environment and future traffic impacts associated with background traffic as well as site traffic. This study includes a detailed analysis of winter/ spring season traffic volume networks.



● - Study Intersection

Project Location

Proposed YMCA Facility
Martha's Vineyard, Massachusetts

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W E
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1 : 25,000

MS Transportation Systems, Inc. Framingham, Massachusetts

FIGURE 1

Executive Summary

The project proponent proposes to develop the YMCA Facility in phases with Phase 1 to consist of approximately 35,000 square feet and the "Full Build" to consist of approximately 60,000 square feet. The future expansion (from 35,000 SF to 60,000) of the site is estimated to include a gym, expanded locker rooms, and pool expansion as well as additional programs.

Access/ egress for the project are proposed via two driveways. The main access driveway is proposed approximately 50 feet west of the existing Martha's Vineyard Arena driveway on Edgartown Vineyard Haven Road. Under the current plan, the existing Martha's Vineyard Arena driveway will then be removed and internal roadway connections will be made between the MV Arena parking lots and the proposed YMCA facility. The secondary access driveway is proposed with a direct connection to Community Services Drive approximately 250 feet north of Edgartown-Vineyard Haven Road. A third driveway with access to overflow parking will be located approximately 100 feet north of the secondary access driveway on the Community Services Driveway.

This study was completed in compliance with the traffic study guidelines published by the Executive Office of Environmental Affairs (EOEA) and the Executive Office of Transportation (EOT) as well as the Martha's Vineyard Commission (MVC). The study scope was developed in consultation with the MVC staff and approved by the Land Use Committee.

Existing Conditions

The proposed YMCA Facility site is located off of Edgartown-Vineyard Haven Road in Oak Bluffs, Massachusetts, approximately half way between Barnes Road/ Airport Road and County Road. The study area was selected based on the anticipated impact of the project and focused on the evaluation of major roadways and intersections in the vicinity of the site. The study area was reviewed and approved by the MVC. These locations included:

- Edgartown-Vineyard Haven Road and Barnes Road/Airport Road,
- Edgartown-Vineyard Haven Road and MV High School/ Community Center Drive,
- Edgartown-Vineyard Haven Road and MV Arena, and
- Edgartown-Vineyard Haven Road and County Road.

Edgartown-Vineyard Haven Road is an east-west, two-lane highway entirely under local jurisdiction (maintained by the State Highway Department), which connects Edgartown with Oak Bluffs/Tisbury to the northwest of the Island. The southeastern tip of the roadway ends at Edgartown Town Center and the northwestern tip ends at State Road in Tisbury near Vineyard Haven.

An off-road bike path approximately 8 feet wide exists along the south side of the Edgartown-Vineyard Haven Road corridor along its entire length from State Road (Vineyard Haven) to Edgartown. Within the study area, it crosses Airport Road. It also connects to the off-road bike path that runs to the west of Airport Road to the south, and to the off-road bike path that runs to the west of County Road to the north.

During the off season, Edgartown-Vineyard haven Road in the immediate project area has been observed to be carrying approximately 7,640 vehicles per day during a weekday and 6,025 vehicles per day during a Saturday. The peak hour traffic thus reflected approximately 9.4% of the weekday daily traffic and 8.3% of the Saturday daily traffic along Edgartown –Vineyard Haven Road.

Future Conditions

The analysis of the proposed YMCA Facility in Oak Bluffs, Massachusetts focused on the year 2012. Forecasts of the project were based on guidelines published in the Institute of Transportation Engineers (ITE). The YMCA Facility was estimated to generate 2,276 trips over the course of an average day (1,138 entering and 1,138 exiting trips). During a weekday evening peak hour and Saturday midday peak hour, the project was estimated to generate 171 (68 entering and 103 exiting) and 116 (57 entering and 59 exiting) vehicle trips, respectively.

The site design and other actions should be implemented to encourage alternative travel options to the site, which would reduce vehicular trips. In general, YMCA facilities usually have post school programs with van services available from local schools, which would encourage a large number of students to use a single vehicle. Several transit service routes by the MVRTA pass by the site creating opportunities for employees, members of the YMCA and visitors to use transit as an alternative mode. With the bike path or route also adjacent to the site, there is the potential for this based on an estimated trip distribution/assignment pattern determined for the area. The location of the Community Center, High School, and Arena with respect to the proposed YMCA facility provides for a high potential for pedestrian trips to and from the site. However, for purposes of this study and to remain conservative, we did not reduce the trip generation numbers to reflect a reduction in automobile traffic on that account.

The future conditions analysis takes into account background growth for the next 5 years and a site specific development project (Homes at Southern Woodlands) that is anticipated to be constructed within the timeframe of this study. Transportation related improvements in the study area that are expected to be completed within the five year Build time frame were also assumed in the No-Build conditions. This includes the intersection of Edgartown-Vineyard Haven Road and Barnes Road/ Airport Road is being re-designed as a modern roundabout. This project is currently on the Transportation Improvement Plan (TIP) for 2008.

The Level of Service (LOS) analysis under future conditions has indicated the following:

- Under “Full Build” conditions, the exiting movements onto Edgartown-Vineyard Haven Road from the YMCA Facility driveway and from County Road will operate at an acceptable level of service during the peak hours.

- At “Full Build”, the proposed intersection between the Community Center Driveway and the proposed YMCA facility will operate with minimal delay. More importantly, the intersection of Edgartown-Vineyard Haven Road and the Community Center Driveway will continue to operate with acceptable LOS under conditions with the YMCA at “Full Build”, a hockey game at the Arena and an event at the High School.

- With the re-design of the intersection of Edgartown – Vineyard Haven Road with Barnes Road/ Airport Road as a modern roundabout, this intersection has been shown to operate with acceptable levels of service under “Full Build” conditions during the winter/ spring season. Queue lengths are expected to be between two and four vehicles approaching the roundabout, which is highly acceptable.

Recommended Mitigation Plan

While the proposed project can be accommodated on area roads, a series of recommended mitigation measures have been developed to improve traffic operation and safety in the vicinity of the project as well as on-site circulation. Several of these comments were previously provided in our initial review of the site plan. The recommendations are as follows:

- Provide STOP signs (R1-1) and STOP bars on the site driveway approaches to Edgartown-Vineyard Haven Road and to Community Center Drive.

- High visibility crossings should be provided on Edgartown – Vineyard Haven Road. To increase visibility of the crosswalks several items may be installed. The use of a white fence near the crosswalk and pedestrian crossing signs would help drivers identify the location of the crosswalks from a distance. The use of flashing pedestrian signals with pedestrian crossing signs and an alternative roadway surface treatment (to reduce lane widths) may also be desirable. It should be noted that Edgartown – Vineyard Haven Road is under local jurisdiction by maintained by the State Highway Department and any changes along Edgartown Vineyard Haven Road may need to be approved by the Massachusetts Highway Department (MHD).

- Speed advisory signs and should be added to the site driveway for vehicles entering the site. An internal speed limit of 15 mph may be appropriate. To enhance crosswalk locations "pedestrian crossing" signs should be added at all crosswalks. One-way signs and marked pavement arrows should be provided on-site to improve driver awareness.

- It appears that the northern outlet to the "Future Road" can be removed and does not appear to be needed as a single access/egress should be sufficient. This should be further explored if and when the "Future Road" is built and should take into account any connections to other roads.

- Several one-way signs and painted arrow markings will need to be installed internally as several areas are currently shown as one-way flow. The one-way parking areas in the northwestern portion of the site may need to be revised. Without the "Future Road" being installed a vehicle could be stuck at a dead end and would be forced to turn around or use a one-way potion of roadway the wrong way. Therefore, the direction of the one ways should be reversed for all three roadways under the "Campus Site Plan".

- It may be desirable to make the driveway intersection with Edgartown-Vineyard Haven Road wider than 24 feet to better accommodate bus traffic. Additionally, it may be desirable to change the location of the entrance slightly to straighten the alignment of the driveway.

- Several internal curves may need larger radii in order to accommodate school buses. If no changes can be accommodated than an alternative method to larger radii throughout would be to designate an internal bus route.

- With the installation of a new driveway for the YMCA on Edgartown-Vineyard Haven Road, the driveway for the Martha's Vineyard Arena should be removed. Connections between the proposed driveway and the Arena should be made as shown in the "Campus Plan". However, it appears that a slight alteration of the "Campus Site Plan" may provide for an improved traffic flow pattern. A conceptual sketch is shown in Figure 7.

- Any grading, landscaping, and signing proposed at the site drive intersections Edgartown-Vineyard Haven Road and Community Center Drive should be designed and maintained in such a manner so as to enhance sight distances at the driveway.

In conclusion, the proposed project, as currently planned, with the above recommendations, will not have a significantly negative impact on traffic operations on roadways and intersections within the study area. It should be noted that Edgartown – Vineyard Haven Road is under local jurisdiction by maintained by the State Highway Department and any changes along Edgartown Vineyard Haven Road may need to be approved by the Massachusetts Highway Department (MHD). These recommendations do not presently exist and would be prudent for the MHD to implement with or without the project.

Existing Environment

A. STUDY AREA GEOMETRY/TRAFFIC OPERATIONS

The proposed YMCA Facility site is located off of Edgartown-Vineyard Haven Road in Oak Bluffs, Massachusetts, approximately half way between Barnes Road/ Airport Road and County Road. The study area was selected based on the anticipated impact of the project and focused on the evaluation of major roadways and intersections in the vicinity of the site. The study area was reviewed and approved by the MVC. These locations included:

- Edgartown-Vineyard Haven Road and Barnes Road/Airport Road,
- Edgartown-Vineyard Haven Road and MV High School/ Community Center Drive,
- Edgartown-Vineyard Haven Road and MV Arena, and
- Edgartown-Vineyard Haven Road and County Road.

All four intersections are located in the Town of Oak Bluffs. A general description of the study area roadways and intersections follows:

Edgartown-Vineyard Haven Road

Edgartown-Vineyard Haven Road is an east-west, two-lane highway entirely under local jurisdiction (maintained by the State Highway Department), which connects Edgartown with Oak Bluffs/Tisbury to the northwest of the Island. The southeastern tip of the roadway ends at Edgartown Town Center and the northwestern tip ends at State Road in Tisbury near Vineyard Haven. The Edgartown-Vineyard Haven Road intersection with Barnes Road/Airport Road is considered a high volume location and the minor approaches experience long delays during peak periods of travel. After a number of years with high number of accidents reported at the intersection, the intersection was changed to an All-Way STOP type intersection. Several discussions related to long range plans have taken place over the years between the Massachusetts Highway Department and the Town of Oak Bluffs selectmen. Preliminary options explored in 2001 included a traffic signal and a modern roundabout for this intersection. Currently, a modern roundabout is being designed for this location.

The Edgartown-Vineyard Haven Road varies within the study area and between 26 feet and 32 feet wide with 12-foot lanes in each direction separated by double yellow centerlines along most of its length. The roadway is in good condition and has clearly marked white edgelines as well as imbedded reflectors along the centerline. The posted speed limit on Edgartown-Vineyard Haven Road is 35 mph near its intersection with Barnes Road/Airport Road and its intersection with County Road. Passing is prohibited along the roadway within the study area, though it is permitted at other specific locations. Similarly, separate turn lanes are not generally provided along the roadway. The roadway is relatively straight and has minimal vertical curves.

An off-road bike path approximately 8 feet wide exists along the south side of the Edgartown-Vineyard Haven Road corridor along its entire length from State Road (Vineyard Haven) to Edgartown. Within the study area, it crosses Airport Road. It also connects to the off-road bike path that runs to the west of Airport Road to the south, and to the off-road bike path that runs to the west of County Road to the north. A photograph of Edgartown-Vineyard Haven Road near the project site is shown below, which shows the roadway layout, bike path on the southern side of Edgartown-Vineyard Haven Road and a crosswalk between the MV High School and Community Center Drive.

Photograph: Edgartown-Vineyard Haven Road at MV High School/Community Center Drive looking east

Edgartown-Vineyard Haven Road at Barnes Road/ Airport Road

The northbound approach to the intersection is Airport Road, the southbound is Barnes Road and the eastbound/westbound approaches are Edgartown-Vineyard Haven Road. All approached to this intersection are under STOP sign control (four-way STOP). The STOP signs are supplemented with flashing red beacons. The flashing red beacons that are directed toward the Barnes Road/Airport Road approaches and are placed on channelizing islands on the approaches to the intersection. These islands are approximately 25 feet long. The red flashing beacons that are directed along Edgartown-Vineyard Haven Road are placed to the southeastern corner of the intersection. Below is a photograph of the intersection with the all way STOP.

Photograph: Edgartown-Vineyard Haven Road at Barnes Road/ Airport Road looking east

Edgartown-Vineyard Haven Road at County Road

The intersection of County Road with Edgartown-Vineyard Haven Road is a 'T' type intersection with the directional flow on County Road separated by a median island at the intersection. The southbound County Road approach to the intersection is under STOP sign controlled.

Land uses along Edgartown-Vineyard Haven Road in the area include a mix of land uses. The Goodales's gravel pit and the Windfarm Golf driving range are located along the roadway to the west of Barnes Road/ Airport Road. An equipment rental facility/residence is located just east of Barnes Road/ Airport Road. The Martha's Vineyard Regional High School, the Martha's Vineyard Community Services, the Woodside Village elderly housing facility, and the Martha's Vineyard ice rink are located along Edgartown-Vineyard Haven Road in the immediate project area. The Jardin Mahoney Garden Center is located further to the east near County Road.

Photograph: Edgartown-Vineyard Haven Road at County Road looking west

Barnes Road

Barnes Road is a local roadway that provides an important north-south connection within the Island. Its northern tip ends at County Road in Oak Bluffs, becoming Wing Road. To the south, it runs somewhat parallel to County Road and ends at Edgartown-Vineyard Haven Road. Further south of the intersection, the roadway is called Airport Road. Its northern and southern approaches to the major roads are STOP sign controlled. The roadway functions as both a collector and a minor arterial. Barnes Road, in general, has a gently curving horizontal alignment and a rolling vertical alignment.

At its intersection with Edgartown-Vineyard Haven Road, Barnes Road is approximately 18 feet wide with 9-foot lanes in either direction separated by double yellow centerlines. The edges of the roadway are marked with white edgelines. Minimal paved shoulders exist along the roadway. Wide grass shoulders exist along the approaches to the intersection. To the north of the intersection Barnes Road is approximately 22 feet wide with minimal grass shoulders. The roadway is in good condition. Passing is generally prohibited along the roadway within the study area except at clearly marked locations. Posted

speed limit along Barnes Road approaching Edgartown-Vineyard Haven Road is 35 mph. The posted speed limit is reduced to 30 mph to the north near County Road. Land use along Barnes Road is almost entirely residential.

Airport Road

Airport Road is a relatively straight, level north-south roadway that runs between Edgartown-Vineyard Haven Road in Oak Bluffs and Edgartown-West Tisbury Road in Edgartown. As described earlier, at its northern end, it has STOP sign control at Edgartown-Vineyard Haven Road supplemented with a flashing red beacon. At its southern end, Airport Road intersects with Edgartown-West Tisbury Road. Passing is permitted along Airport Road at specific locations along the roadway.

At its intersection with Edgartown-Vineyard Haven Road, Airport Road is approximately 18 feet wide with 9-foot lanes in either direction separated by double yellow centerlines. South of the above intersection, the roadway is approximately 24-26 feet wide with 12 foot lanes separate by double yellow centerlines. The edges of the roadway are clearly marked with white edgelines. The roadway and the roadway markings are in good condition. Minimal paved shoulders and wide grass shoulders exist along the roadway. A separate off-road bike path, approximately 8 feet wide, runs along the west side of Airport Road and through the State Forest. The bike path connects those bike paths along Edgartown-Vineyard Haven Road and Edgartown-West Tisbury Road.

Near its northern end, Airport Road provides access to residential uses and the Vineyard Youth Tennis Center which was constructed in early 2000's. Further south, the roadway runs through the State Forest and to the east of Martha's Vineyard Airport/Airport Business Park. The Airport Business Park has direct access to Airport Road and currently houses a cross-section of businesses, including a gas station.

County Road

County Road is a two lane roadway that runs in a north-south orientation and abuts the site on the east side. The roadway connects Edgartown-Vineyard Haven Road with the center of Oak Bluffs. In the project area, County Road is a relatively straight, level road. The roadway is approximately 24 feet in width with the two travel lanes separated by a double yellow centerline. An off-road bike path exists along County Road. The posted speed limit near the Edgartown-Vineyard Haven Road intersection is 35 mph

Land use along County Road in the near its intersection with Edgartown-Vineyard Haven Road include the Jardin Mahoney Garden Center scattered residential housing and undeveloped land.

B. TRAFFIC VOLUMES

Base traffic volume data for the study intersections and roadways were collected in April 2007. Data collected at the intersections consisted of weekday afternoon peak period (2:00-6:00 PM) and Saturday midday peak period (11:00AM-2:00PM) manual turning movement counts (TMC) as well as an Automatic Traffic Recorder (ATR) vehicle classification count. The daily traffic data was collected on Edgartown-Vineyard Haven Road near the Martha's Vineyard Arena and included a Saturday through Wednesday count (120 hours). These count time period/hours were chosen to cover the busiest hours of activity in the study area roadways/intersections.

While individual intersections within a study network may experience peak traffic flow at different time periods, review of TMC's at the individual intersections indicated that the weekday evening peak hour generally occurred between 4:30-5:30 PM and the Saturday midday peak hour generally occurred

between 11:30AM -12:30 PM. The peak hours of each individual intersection were used as a starting point for the study. The TMC and ATR data collected as a part of this traffic study are included in the Appendix.

IN addition to the new data, historical data was compiled and reviewed as well. Table 1 summarizes the ATR data that was collected as part of this study as well as some historical traffic volume data.

TABLE 1
SUMMARY OF OBSERVED TRAFFIC VOLUMES

Location		ADT		Peak Hours Weekday Evening		Saturday Midday	
	Month/Year	Weekday (vpd)	Saturday (vpd)	Vol. (vehs)	K (%)	Vol. (vehs)	K (%)
EVH Road west of MV Arena[1]	April 2007	7,640[1]	6,025	715	9.4	500	8.3
EVH Road west of Barnes Road	August 2002	15,430	-	1,379	8.9	-	-
EVH Road west of County Road	August 2001	10,056	-	797	7.9	-	-
Airport Road south of Deer Run	August 2002	8,476	-	731	8.6	-	-
Barnes Road north of EVH Road	August 2001	7,143	-	658	9.2	-	-

Note: Data has been rounded. Based on Automatic Traffic Recorder (ATR) data-not seasonally adjusted.
[1]Weekday volume show is for April 24, 2007 (Tuesday).

As seen in Table 1:

- During the off season, Edgartown-Vineyard haven Road in the immediate project area has been observed to be carrying approximately 7,640 vehicles per day during a weekday and 6,025 vehicles per day during a Saturday.

- The peak hour traffic thus reflected approximately 9.4% of the weekday daily traffic and 8.3% of the Saturday daily traffic along Edgartown –Vineyard Haven Road.

Table 2 summarizes the observed speed data collected as part of the ATR counts on Edgartown-Vineyard Haven Road.

TABLE 2
SUMMARY OF SPEED DATA

Location	Direction of Travel	50th Percentile Speed (mph)	85th Percentile Speed (mph)	Posted Speed (mph)
Edgartown VH Road near MV Arena.	Eastbound	36	43	35
	Westbound	36	43	35

Notes: Data was collected on April 21-25 2007.
The post speed limit on Edgartown-VH Road is reduced from 45mph to 35 mph just east of the MV Arena driveway.
The speed limit is reduced to 20 mph (school zone) during school hours.

As can be seen, average speeds on Edgartown-Vineyard Haven Road near the project site is 36 mph, and the 85th percentile speeds is 43. The average and 85th percentile speeds collected on Edgartown-Vineyard

Haven Road are in line with the posted speed limits in the area, but are much higher than the 20 mph school zone speed limits.

Seasonal Adjustments

Information on seasonal traffic volumes from the Martha's Vineyard Commission (MVC) Regional Transportation Plan[1] were reviewed for traffic related activity on the Island. The data indicated that while traffic volumes during the month of April are lower than typical peak season months (July and August) they are higher than typical winter/spring months when hockey season is underway, which is the season that is analyzed in this report.

For this study, traffic networks were set up to analyze conditions under winter/spring conditions including when hockey season is underway given the rink location. This winter/spring season will have the greatest chance for overlapping demands at the existing Martha's Vineyard Arena, the proposed YMCA and the Martha's Vineyard High School.

The high school hockey season had ended on Martha's Vineyard prior to the initiation of the traffic study. Given the concerns of the YMCA operations occurring when the rink activity is taking place, volumes related to rink activity were estimated. To estimate traffic conditions at the Martha's Vineyard Ice Arena during a high school hockey game data from several ice arena locations in Massachusetts were observed. The specific locations were at rinks in Winchendon, North Andover and Franklin. Data has been compiled for this analysis and traffic estimated for a hockey game at the Arena have been added to the existing traffic volume networks. It should be noted that during the weekday turning movement counts there was a girl's softball game at the Martha's Vineyard High School (4/25/2007 at 4:00PM). Therefore, traffic counts used in this study would represent a condition with simultaneous activity at the High School and Arena (estimated activity) during the weekday evening peak hour.

Figure 2 illustrates the existing weekday evening and Saturday midday winter/spring season traffic volume networks.

C. ACCIDENT DATA REVIEW

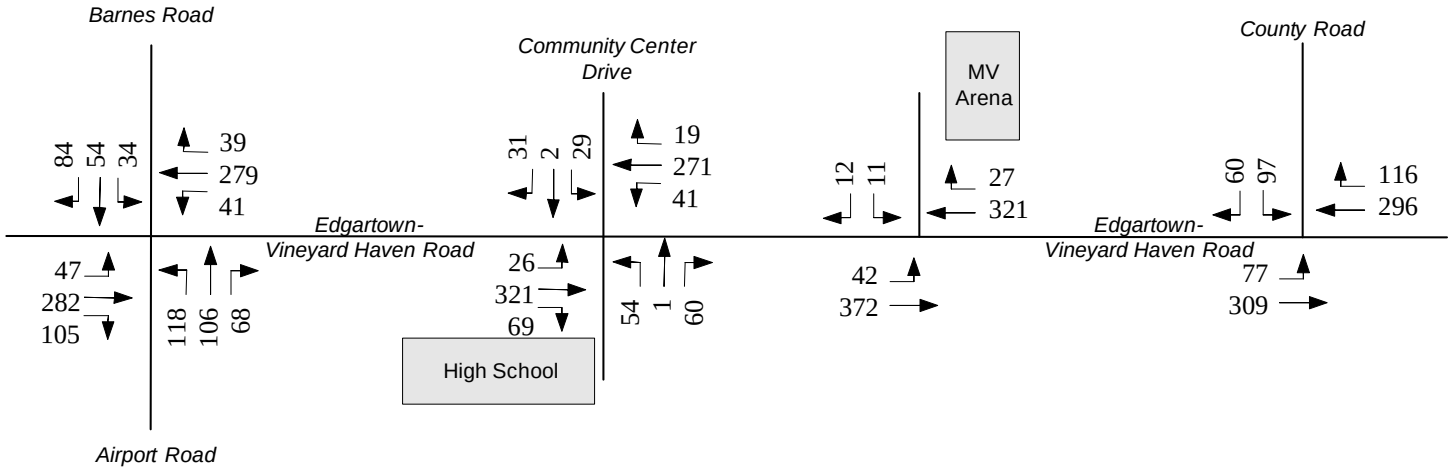
A review of the most recent accident history (2003-2005) at the study intersections was completed through accident data from the Massachusetts Highway Department's (MHD) Accident Record System (ARS). The accident data were reviewed to identify locations within the study area with high accident incidence and to perform a safety assessment. Table 3 summarizes accident history at the study intersections based on the above data for the years 2003-2005.

As shown in Table 3:

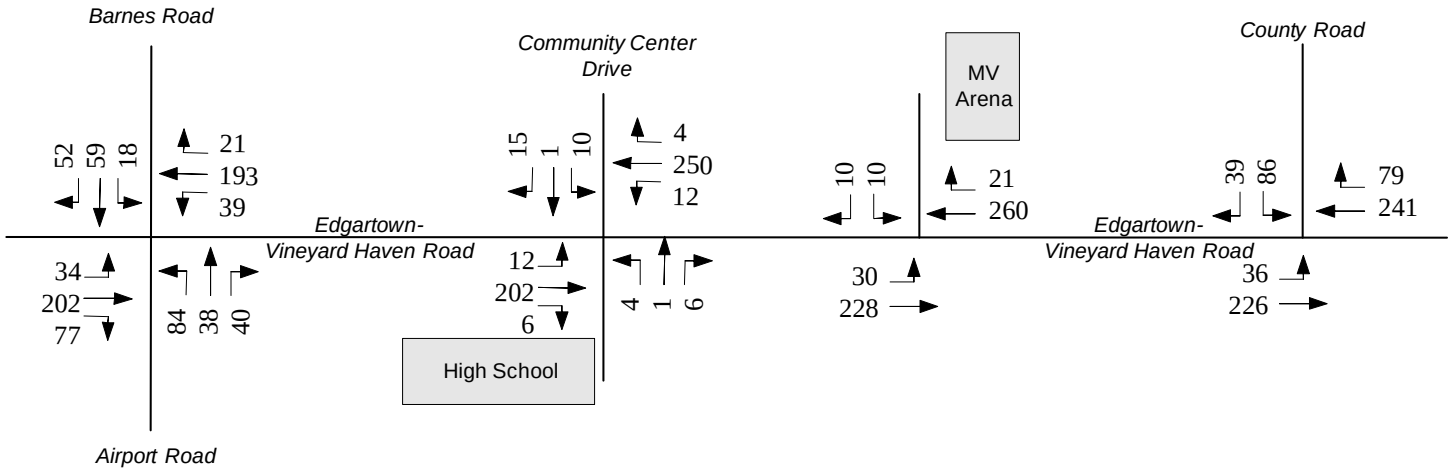
- Eleven (11) accidents were reported at the intersection of Edgartown-Vineyard Haven Road at Barnes Road/ Airport Road over the three year analysis period which included 6 angle type accidents (approximately 55%), 4 rear-end type accidents (approximately 36%), and 1 single vehicle accident. The majority of the accidents were property damage type accident (7 out of 11 or 64%)

[1] Martha's Vineyard Commission. Regional Transportation Plan, 2006 Draft. Martha's Vineyard, Massachusetts.

Weekday PM Peak Hour



Saturday Midday Peak Hour



2007 Existing Traffic Volumes

Winter/Spring Season

Proposed YMCA Facility

Martha's Vineyard, Massachusetts

NORTH

NOT TO SCALE

MS Transportation Systems, Inc. Framingham, Massachusetts

FIGURE 2

TABLE 3
SUMMARY OF ACCIDENT DATA (2003-2005)

Year	# of Acc.	Accident Type				Accident Severity			Pavement Condition		Weather Condition			Peak Season?	
		AC[a]	RE[b]	HO[c]	U/O[d]	PD[e]	PI[f]	F[g]	Wet[h]	Dry	Clear	Snow	Rain[i]	Y	N
Edgartown-Vineyard Haven Road and Barnes Road/Airport Road															
2003	6	2	4	0	0	5	1	0	2	4	4	0	2	0	6
2004	2	0	1	0	1[j]	0	2	0	1	1	1	0	1	2	0
2005	3	2	1	0	0	2	1	0	1	2	1	1	1	1	2
Edgartown-Vineyard Haven Road and Martha's Vineyard Arena															
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Edgartown-Vineyard Haven Road and Martha's Vineyard High School/ Community Services Drive															
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Edgartown-Vineyard Haven Road and County Road															
2003	2	0	1	0	1[j]	2	0	0	0	2	2	0	0	1	1
2004	5	0	1	0	4[j]	2	3	0	4	1	2	1	2	2	3
2005	4	1	0	0	3[j]	4	0	0	1	3	2	1	1	2	2

Data Sources: Massachusetts Highway Department (MHD)
Note: Peak season months were June, July and August
[a] Angle Collision [b] Rear-End [c] Head On [d] Unknown/Other [e] Property Damage Only [f] Personal Injury [g] Fatality
[h] Wet, Snowy or Icy [i] Rain, Cloudy or Foggy [j] Single vehicle Accident

- Eleven (11) accidents were reported near the intersection of Edgartown-Vineyard Haven Road at County Road over the three year analysis period which included 8 single vehicle type accidents (approximately 73%), 2 rear-end type accidents (approximately 18%), and 1 angle type accident. The majority of the accidents were property damage type accident (8 out of 11 or 73%)

- There were no reported accidents at the intersections of Edgartown-Vineyard Haven Road with the Martha's Vineyard Arena or with the Martha's Vineyard High School/ Community Services Driveway.

As part of this safety review, "crash rate" at the study intersections was also determined. Crash rate accounts for the amount of traffic that enters the intersection, and relates the number of accidents at a location to the amount of traffic through that location. Thus, it becomes a more accurate measure for identifying potentially hazardous locations. The current statewide crash rate[2] for unsignalized intersections is 0.66 per Million Entering Vehicles (MEV). The MHD District 5, which Oak Bluffs is part of, has an average crash rate of 0.59 crashes per MEV for unsignalized intersections. Intersections experiencing crash rates greater than the above averages are potentially experiencing an unusually high number or higher than expected number of accidents relative to traffic volumes at that particular location and may warrant further investigation or improvements. A summary of the MHD crash rate analysis for the study intersections are shown in Table 4.

[2] Massachusetts Highway Department. Based on 2005 data.

TABLE 4
SUMMARY OF INTERSECTION CRASH RATE (2003-2005)

Intersection	Type of Control	Total No. of Accidents (3 Years)	Average No. of Accidents/Year	Crash Rate (per MEV)
Edgartown-VH Road and Barnes Rd/Airport Rd	Unsignalized	11	3.7	0.55
Edgartown-VH Road and High School	Unsignalized	0	0.0	0.00
Edgartown-VH Road and MV Arena	Unsignalized	0	0.0	0.00
Edgartown-VH Road and County Road	Unsignalized	11	3.7	0.73

Note: Unsignalized intersections: MHD statewide average crash rate: 0.66; MHD District 5 average crash rate: 0.59.

As shown in Table 4, the Edgartown-Vineyard Haven Road/ County Road intersection experienced a crash rate of 0.73. This intersection experienced a slightly higher crash rate compared to statewide and MHD District 5 averages. This indicated that the intersections experienced a higher than expected number of crashes given the traffic volumes through the intersections. It also indicated that safety deficiencies may have existed at the above locations during the study period.

Accident data obtained as a part of this study from the MHD and detailed intersection crash rate worksheets are included in the Appendix.

After field review near the intersection of Edgartown-Vineyard Haven Road and County Road and a discussion with the Oak Bluff police department, it was determined that driver unfamiliarity, the installation of a new median island, and an abundance of wildlife near the intersection may be contributing factors in the high number of single vehicle accidents reported near this location. Furthermore, the police department indicated that crash experience at this location have been declining over the last several years. A photograph of the County Road approach to Edgartown-Vineyard Haven Road is shown below. Updated signage appears to have recently been installed, on County Road, which should enhance safety on this approach.

Photograph: County Road approach to

D. TRANSIT NETWORK

Public ground transportation provided on the Island can be categorized into three general modes: fixed route services, demand responsive services and special services catered for the transportation of the elderly and disabled. Fixed route services provide service to the general public and run buses based on published schedules. These services provide fairly good coverage on the island. The Martha's Vineyard Transit Authority (VTA) and Island Transport, Inc., a privately owned company provides these fixed services on the island during the peak summer and shoulder seasons. The VTA operates a three bus system (Buses #1, 2 and 3) consisting of 12 routes. The bus routes generally have headway of one hour during the peak season. Children (6 and under) and senior citizens (65 and older) ride free on the VTA buses.

The Martha's Vineyard Transit Authority (VTA) has transit buses that travel through the study area along Edgartown-Vineyard Haven Road, County Road, Barnes Road, Airport Road and Edgartown-West Tisbury Road. Along the routes that these buses run, formal stops exist at MV Regional High School/ Woodside Village along Edgartown-Vineyard Haven Road and at the Martha's Vineyard Airport. Within the study area, there are no other formal bus stops – though patrons could "flag" down buses along these routes between stops. In general, the buses used on the island are 25-30 foot long and have the ability to transport bicycles as well.

E. BIKEWAYS

Within the project area, separate 8 feet wide off-road bike paths exist on the south side of Edgartown-Vineyard Haven Road, on the north side of Edgartown-West Tisbury Road and along the west side of Airport Road and County Road. These bike paths provide good interconnection between other bike paths/routes in Edgartown, Oak Bluffs, Tisbury/Vineyard Haven and West Tisbury as well as coverage through the island. They appear to be in good physical condition. The bike path along the Edgartown-Vineyard Haven Road corridor extends along its entire length from State Road (Vineyard Haven) to Edgartown. Within the study area, it crosses Airport Road. It also connects to the off-road bike path that runs along Airport Road to County Road. The bike path along Edgartown-West Tisbury Road to the east extends into Edgartown Town Center to meet with Main Street. To the west, it crosses Airport Road and extends into State Forest and West Tisbury. Pedestrian crossings on Edgartown-Vineyard Haven Road in the study area currently exist at both the High School/ Community Center Drive intersection and at County Road.

F. PLANNED TRANSPORTATION/ROADWAY IMPROVEMENTS

Over the years, the Town of Oak Bluffs identified the intersection of Edgartown-Vineyard Haven Road/ Barnes Road/Airport Road as being in need of safety, geometric and operational improvements. The comprehensive traffic study/Functional Design Report (FDR)[3] that was completed for the intersection identified several potential improvement actions, including minor short-term safety improvements as well as long-term improvements such as a full traffic signal control or a roundabout. At this time, as part of a short term action the traffic control at the intersection has been changed to a four-way STOP control. The intersection is on the Transportation Improvement Plan (TIP) for Fiscal Year 2008 for the installation of a modern roundabout at this location.

[3] MS Transportation Systems, Inc. Comprehensive Traffic Study/Functional Design Report, Edgartown-Vineyard Haven Road/ Barnes Road/Airport Road Intersection, Oak Bluffs, MA. September 2001.

Probable Impacts of the Project

In this section of the report, traffic impacts associated with the proposed YMCA Facility to the existing roadways within the study area under future (No-Build and Build) conditions are presented. The Build analysis year was selected five (5) years into the future (to year 2012) to comply with local regulations as well as other standard practices.

As presented in the previous section, base traffic volumes for the study intersections were developed for the year 2007. Before developing the respective future Build traffic conditions, No-Build traffic conditions were developed for the study intersections considering a combination of existing traffic volumes, average annual traffic growth and traffic from site-specific (background) developments. The No-Build scenario represents the traffic situation at the study intersections prior to the initiation of the proposed project. To assess future Build conditions, traffic associated with the proposed project was estimated and assigned to the study area network based on a trip distribution/trip assignment pattern determined for the study area/site. The addition of project generated traffic volume to the No-Build traffic volume networks resulted in the Build traffic volume networks.

The analysis and impact of No-Build and Build traffic network conditions during both average season and summer season are presented below.

A. NO-BUILD TRAFFIC VOLUMES

In general, traffic volumes in an area are generally expected to increase over the long term, due to general growth trends (i.e. increase in population, auto ownership, changes to land use, etc.) and/or new site-specific developments. In developing the future traffic conditions, examinations of each of these potential growth elements, area demographics, historical socioeconomic factors, as well as area traffic volumes for Martha's Vineyard was completed. Historical transportation studies within the area were also reviewed and provided some of this information.

1. Background Growth

In determining a background growth rate for this analysis, the historic population and traffic volume trends were reviewed. Population growth in Dukes County, for year round residents, between the 2000 census 2005 (5 years) has show to be approximately 1.3% per year. Population growth for the same time period for Oak Bluffs has show to be approximately 0.6 % per year. Traffic volumes between 2002 and 2007 at the intersection of Edgartown-Vineyard Haven Road have shown an increase in traffic of approximately 1.7% per year

After reviewing the data a 1.5% this rate was chosen for the purpose of evaluating the proposed MV YMCA Facility.

2. Site Specific Developments

In developing the No-Build traffic conditions, additional site specific projects that are either currently approved, planned, possible or anticipated within the build-out time frame of five (5) years in the vicinity of the proposed project/within study area that could impact the analysis intersections were also identified. Based on this, the following site-specific development was identified:

- The Homes at Southern Woodland is a single family residential development that has been approved for approximately 20 single family homes. The project will have direct access to Barnes Road.

The weekday evening peak hour and Saturday midday peak hour trips associated with this site-specific [4]development were assigned based on information from the Homes at Southern Woodland traffic study. Other long range plans include ongoing development at the Airport Business Park, additional units at the Woodside Village elderly housing facility, several potential commercial developments to the west of the project site on Edgartown-Vineyard Haven Road and its intersection with Barnes Road/ Airport Road and a potential future residential project and associated roadway just east of the MV Arena. However, no formal plans have been submitted at this time, therefore, traffic from these potential developments has not been included in this study. Detailed trip generation calculations and background for the above is included in the Appendix.

3. No-Build Traffic Volumes

Based on the above, the 2012 No-Build weekday evening peak hour and Saturday midday peak hour traffic volume networks were developed for the winter/spring season. The No-Build traffic volumes consisted of an average annual traffic volume growth rate of 1.5 percent per year for five years (applied cumulatively to the 2007 traffic volumes) as well as traffic associated with the Homes at Southern Woodlands development.

The 2012 No-Build traffic volumes projected for the weekday evening peak hour and Saturday Midday peak hour at the analysis intersections for winter/spring season are presented in Figure 3.

B. BUILD TRAFFIC VOLUMES

In this section, traffic for the proposed YMCA Facility is described/estimated and assigned to intersections within the study area and added to the 2012 No-Build traffic volume networks to develop the 2012 Build traffic conditions. In deriving the trip distribution applicable to the site, Island population statistics, as well as observed traffic flow patterns at area intersections/roadways were reviewed.

1. Proposed Project

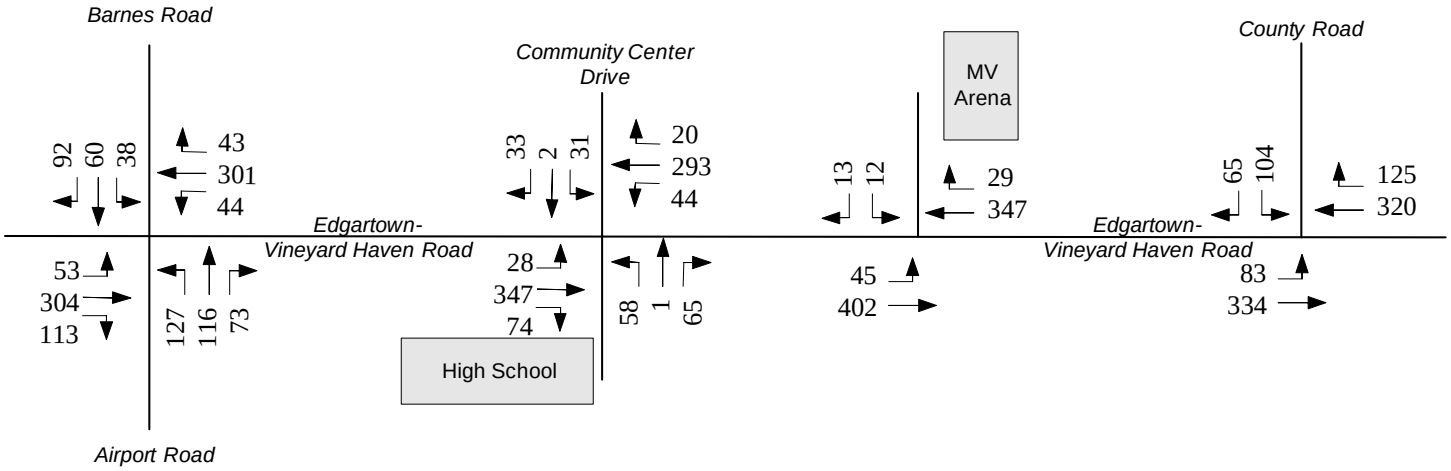
The project site is currently undeveloped land located between the existing MV Arena and Community Center Drive. An existing skate park and bus shelter will sit between the proposed site and Edgartown-Vineyard Haven Road. The Martha's Vineyard High School is located directly across Edgartown-Vineyard Haven Road.

The project proponent proposes to develop the YMCA Facility in phases with Phase 1 to consist of approximately 35,000 square feet and the "Full Build" to consist of approximately 60,000 square feet. The future expansion (from 35,000 SF to 60,000) of the site is estimated to include a gym, expanded locker rooms, and pool expansion as well as additional programs.

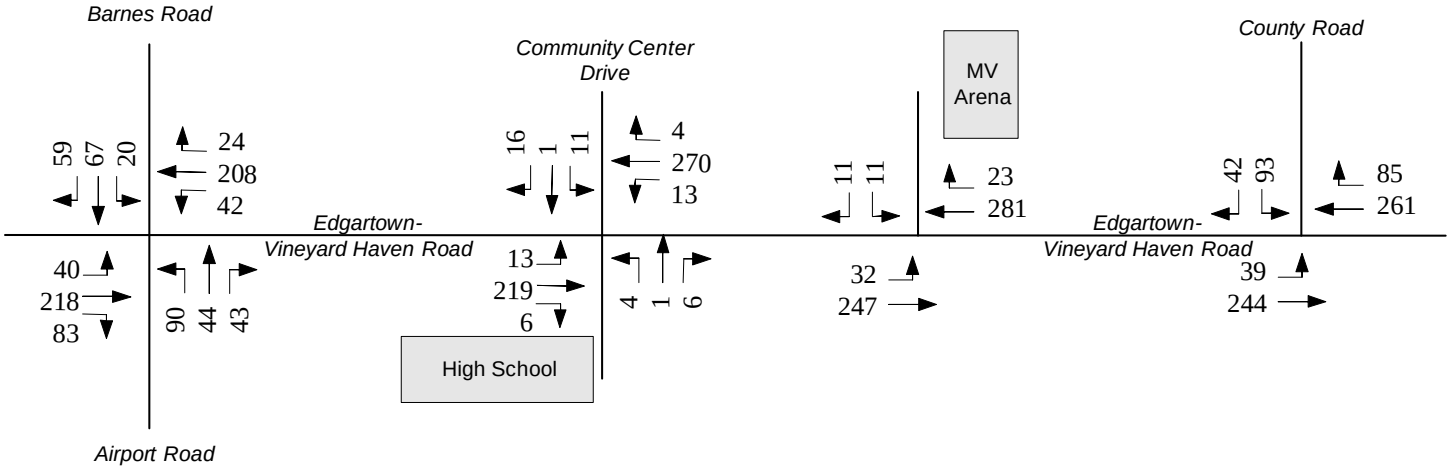
Access/ egress for the project are proposed via two driveways. The main access driveway is proposed approximately 50 feet west of the existing Martha's Vineyard Arena driveway on Edgartown Vineyard Haven Road. Under the current plan, the existing Martha's Vineyard Arena driveway will then be removed and internal roadway connections will be made between the MV Arena parking lots and the proposed YMCA facility. The secondary access driveway is proposed with a direct connection to Community Services Drive approximately 250 feet north of Edgartown-Vineyard Haven Road. A third driveway with access to overflow parking will be located approximately 100 feet north of the secondary access driveway on the Community Services Driveway.

[4] MS Transportation Systems, Inc. Proposed Homes at Southern Woodland, Oak Bluffs, MA. October 2001.

Weekday PM Peak Hour



Saturday Midday Peak Hour



2012 No-Build Traffic Volumes

Winter/Spring Season

Proposed YMCA Facility

Martha's Vineyard, Massachusetts

NORTH

NOT TO SCALE

MS Transportation Systems, Inc. Framingham, Massachusetts

FIGURE 3

Surface parking will be provided on-site with approximately 68 paved parking spaces and 32 additional parking spaces on a porous surface for a total of 100 parking spaces shown on the conceptual plan that was provided by Amsler Mashek MacLean, Architects. Internal connections to the Martha's Vineyard Arena will provide for the ability for shared parking between the sites. The conceptual campus site plan is shown in Figure 4.

2. Site Trip Generation

In order to estimate the number of trips that will be generated by the proposed YMCA Facility at "Full Build" (60,000 square feet) statistics published by the Institute of Transportation Engineers (ITE)[5] were researched as a starting point. The database does include information on land uses similar to the proposed project such as Health/ Fitness Club – Land Use Code 492 and Recreational Community Center– Land Use Code 495. The data contained in Trip Generation for these type facilities were derived from sites throughout the US and included data from a variety of developments characterized by its size and location.

Using the independent variable of "thousand square feet", trips for the 60,000 square foot YMCA Facility were projected for the site based on the average of LUC 492 and LUC 495 and are presented in Table 5.

TABLE 5
SUMMARY OF TRIP GENERATION
YMCA Facility– 60,000 SF

Time Period	Estimated Trips		
	In	Out	Total
Weekday Daily	1,138	1,138	2,276
Evening Peak Hour	68	103	171
Saturday Daily	450	450	900
Midday Peak Hour	57	59	116

Source: ITE Trip Generation 7th Edition – average of Land Use Code 492 & 495

As shown in Table 5, the YMCA Facility was estimated based on ITE to generate 2,276 trips over the course of an average day (1,138 entering and 1,138 exiting trips). During a weekday evening peak hour and Saturday midday peak hour, the project was estimated to generate 171 (68 entering and 103 exiting) and 116 (57 entering and 59 exiting) vehicle trips, respectively. Detailed trip generation calculation for the project is included in the Appendix. In our opinion, it appears that the ITE based estimates result in conservatively high vehicle estimates (particularly weekday daily) given the year round population in the service area. However, the analysis was based on these forecasts without adjustments.

Other factors exist that should serve to reduce the vehicle trip generation. The site design and other actions should be implemented to encourage alternative travel options to the site, which would reduce vehicular trips. In general, YMCA facilities typically have post-school programs with van bus services available from local schools, which would encourage a large number of students to use a single vehicle. Several transit service routes by the MVRTA pass by the site creating opportunities for employees, members of the YMCA and visitors to use transit as an alternative mode. With the bike path or route also adjacent to the site, there is the potential for this based on an estimated trip distribution/assignment

[5] Institute of Transportation Engineers, Trip Generation, Washington D.C., 7th Edition, 2003

NOTE:
ARCHITECTURAL SITE PLAN FOR GENERAL CONFIGURATION ONLY; USE C/VIL SITE PLAN FOR EXACT LAYOUT OF SITE

Old Holmes Hole Road

LEASE LOT LINE

50' OFFSET BUFFER FROM C.L. OF OLD HOLMES HOLE ROAD

RE-ROUTE EX'G DIRT PATH

LIMITS OF WORK

YMCA Lease Lot 5.0 acres +/-

APPROXIMATE PROPOSED TREELINE, TYP.

3 C.Y. DUMPSTER

FUTURE POOL EXPANSION

OUTDOOR PLAY AREA

FUTURE LOCKER ROOMS EXPANSION

FUTURE GYM

FUTURE PROGRAM EXPANSION

YMCA

FF = 98.5'

ALTERNATE BUS PARKING (-24 SPACES)

OUTLET TO FUTURE ROAD

OUTLET TO FUTURE ROAD

BUS DROP OFF

DROP OFF

40 FT. WIDE ACCESS EASEMENT

EDGE OF PAVEMENT

LIMITS OF WORK

ASPHALT

M.V. Community Services

ASPHALT

FENCE

ASPHALT

ASPHALT

ASPHALT

LEASE LOT LINE

LEASE LOT LINE

LEASE LOT LINE

LIMITS OF WORK

LIMITS OF WORK

LIMITS OF WORK

ICE ARENA

FUTURE ROAD

Skate Park

EDGARTOWN - VINEYARD HAVEN ROAD

EDGE OF PAVEMENT

BIKE PATH

GRAPHIC SCALE – FEET
50 0 50 100 150

DRI #600

YMCA OF MARTHA'S VINEYARD

111 EDGARTOWN - VINEYARD HAVEN ROAD
OAK BLUFFS, MA

Amsler Mashek MacLean, Architects Inc.
65 Long Wharf
Boston, Massachusetts 02110

tel. 617-523-0442
fax 617-523-3452

CAMPUS SITE PLAN

SCALE: 1" = 40'
DRAWN BY: LD, JKB, JL
ISSUE DATE: 4.9.07
PROJECT NO. 05354

A2

ARCHITECTURAL SHEET

pattern determined for the area. The location of the Community Center, High School, and Arena with respect to the proposed YMCA facility provides for a high potential for pedestrian trips to and from the site. However, for purposes of this study and to remain conservative, we did not reduce the trip generation numbers to reflect a reduction in automobile traffic on that account.

3. Site Trip Distribution/Assignment

Once the number of trips projected to be generated by the proposed project was determined, these trips are assigned to the site driveway and the study area roadways and intersections. Based on an analysis population statistics for the various Towns located on the island and existing traffic flow patterns within the study area a trip distribution pattern was estimated for the site. Figure 5 represents the trip distribution pattern for the proposed YMCA facility.

The population data analyzed as part of this study is included in the Appendix.

4. Build Traffic Volumes

Peak hour site generated traffic volumes, assigned as shown in Figure 5, were added to the No-Build traffic volumes to establish the Build traffic volume networks. Figure 6 presents weekday evening peak hour and Saturday midday peak hour Build traffic volume networks for the winter/spring season.

C. ANALYSIS

This traffic and transportation study focused on the analysis of roadways and intersections that are impacted by the development of the proposed project. Previous sections of this report developed the No-Build and Build traffic volume networks considering annual traffic growth, potential traffic from background developments and projected site traffic.

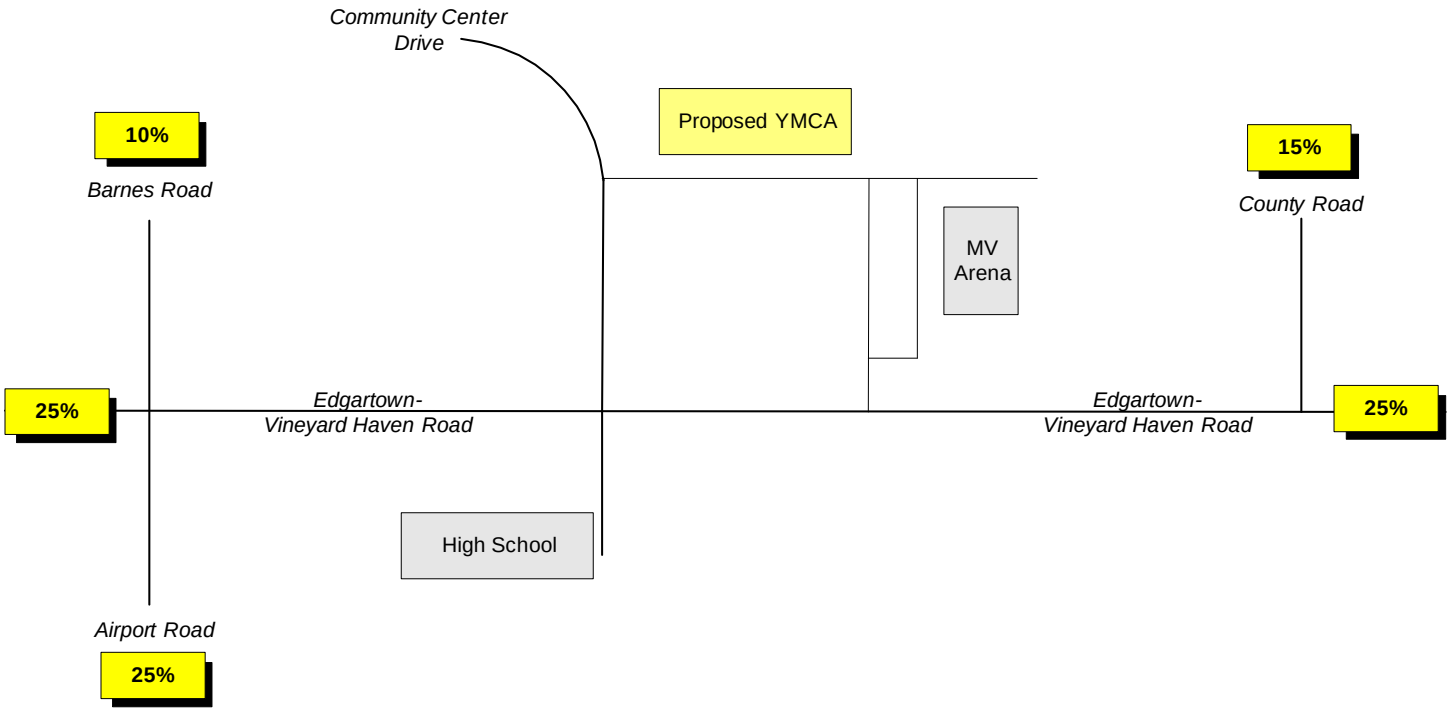
Included in this section is an examination of the traffic increases expected on study area roadways under Build conditions compared to No-Build conditions, capacity/Level of Service (LOS) analysis for the study roadways/intersections, alternative travel options, and site access.

1. Traffic Volume Increases

In general, study area roadways and intersections will experience low "directional" traffic volume increases during the peak hours and the increased level of volumes will be within the capacity of the area roadways. Farther away from the site, project-related traffic would disperse to a larger regional roadway network, reducing the overall project impact. Table 6 summarizes the increases in midday traffic volumes for the peak season conditions.

As shown in Table 6:

- The estimated traffic increases have been estimated to be between 4.2% and 8.1% during the weekday evening peak hour and between 4.2% and 7.9% during the Saturday midday peak hour.
- The largest volume increases due to the project have been estimated to occur on Edgartown-Vineyard Haven Road to the west of Barnes Road/ Airport Road, east of County Road and on Airport Road south of Edgartown-Vineyard Haven Road. This is due to the existing travel routes from various Towns on the Island.



Trip Distribution Pattern

Winter/Spring Season

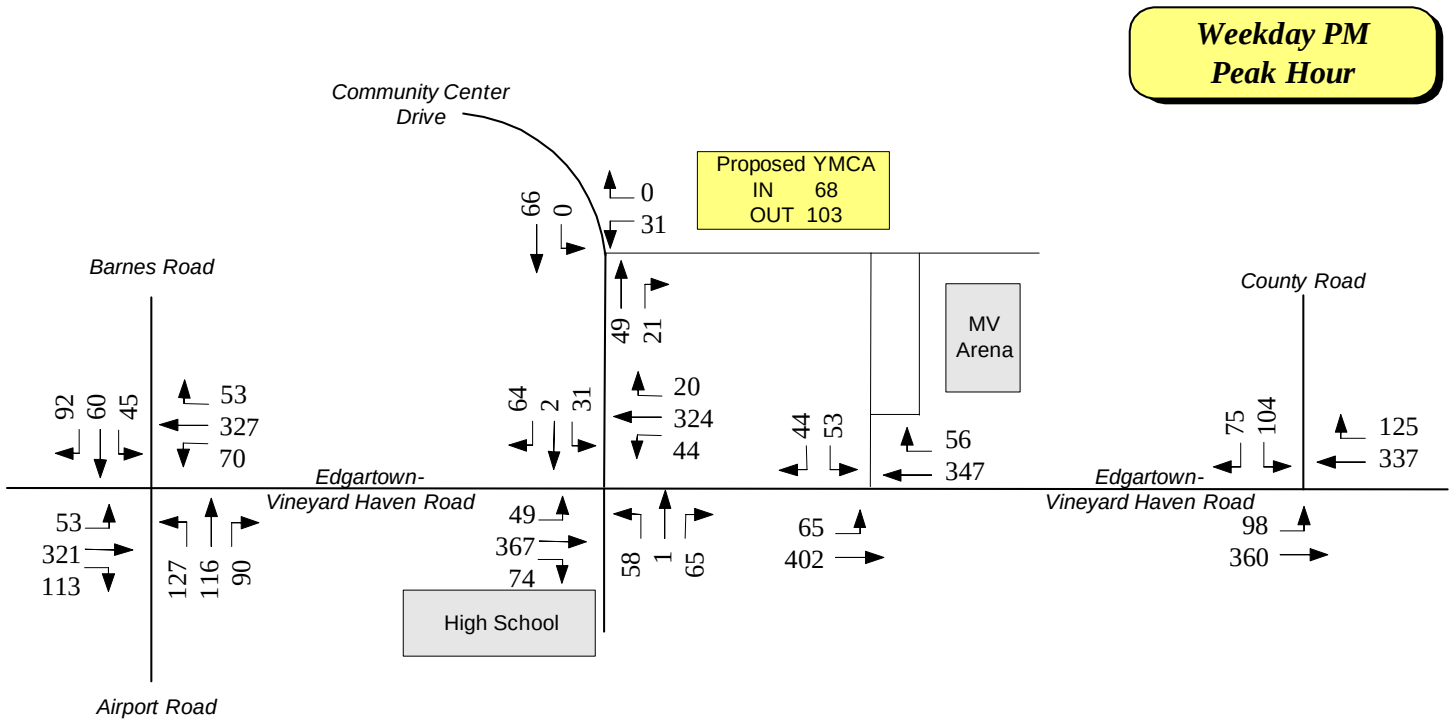
Proposed YMCA Facility
Martha's Vineyard, Massachusetts

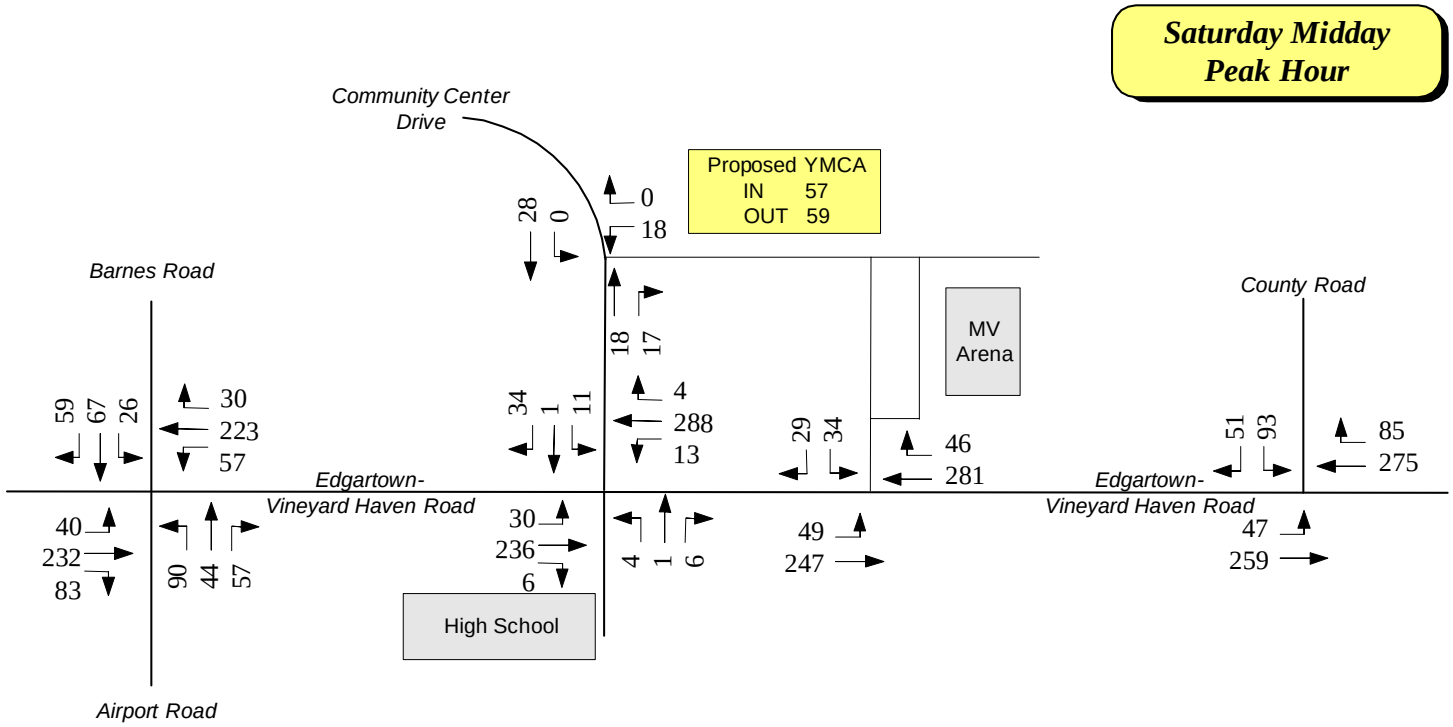
NORTH

NOT TO SCALE

MS Transportation Systems, Inc. Framingham, Massachusetts

FIGURE 5





2012 Build Conditions

Winter/Spring Season

Proposed YMCA Facility

Martha's Vineyard, Massachusetts

NORTH

NOT TO SCALE

MS Transportation Systems, Inc. Framingham, Massachusetts

FIGURE 6

TABLE 6
SUMMARY OF ESTIMATED ROADWAY TRAFFIC INCREASE
Winter/Spring Season

	Weekday PM Peak Hour				Saturday Midday Peak Hour			
	No-Build	Build	Δ Volume	Δ %	No-Build	Build	Δ Volume	Δ %
Edgartown VH Road								
East of County Road	883	926	43	4.9	683	712	29	4.2
West of Airport/ Barnes Road	990	1,033	43	4.3	698	727	29	4.2
Airport Road								
South of Edgartown-VH Road	533	576	43	8.1	369	398	29	7.9
Barnes Road								
North of Edgartown-VH Road	402	419	17	4.2	254	266	12	4.7
County Road								
North of Edgartown-VH Road	377	402	25	6.6	259	276	17	6.6

In general, the increased levels of roadway volume will be within the capacity of the affected roadways. The roadways in the project area generally carry low to moderate traffic volume, during the winter/ spring season and can accommodate the increase in traffic from the proposed project.

2. Capacity/Level of Service (LOS) Analysis

As part of this study, the study intersections were examined with regard to flow rates, capacity and delay characteristics to determine the Level of Service (LOS) provided under existing and future (No-Build and Build) traffic conditions. Level of Service is an indicator of operating conditions which occur on a given roadway feature while accommodating varying levels of traffic volumes. It is a qualitative measure that accounts for a number of operational factors including roadway geometry, speed, traffic composition, peak hour factors, travel delay, freedom to maneuver and driver expectation. When all of these measures are assessed and a Level of Service is assigned to a roadway or intersection, it is equivalent to presenting an "index" to the operational qualities of the section under study. Level of Service is classified in the 2000 Highway Capacity Manual (2000 HCM)[6] into six levels that are designated 'A' through 'F' based on the control delay ranges they fall under. These are presented in Table 7 for unsignalized intersections.

TABLE 7
LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS

Level of Service	Unsignalized Intersections Control Delay Range (sec)
A	<= 10
B	> 10 and <= 15
C	> 15 and <= 25
D	> 25 and <= 35
E	> 35 and <= 50
F	> 50

[6] Transportation Research Board. 2000 Highway Capacity Manual,Washington, D.C. 2000.

In practice, any given roadway/intersection may operate at a wide LOS range depending upon time of day, day of week or period of year. It should be noted that for unsignalized intersections, the Level of Service is not computed for the intersection as a whole. Instead the level of service is determined by the computed or measured control delay for each individual critical movement.

The study intersections were evaluated as per techniques published in the 2000 Highway Capacity Manual (HCM). The Synchro computer model that follow the procedures established in the HCM, were used to analyze the study intersections. Using existing roadway features and intersection controls, traffic operations at the study area intersections were evaluated for existing as well as future conditions. Future conditions analysis at the Edgartown-Vineyard Haven Road and Barnes Road/ Airport Road intersection took into account the implementation of the re-designed for safety improvements through the Massachusetts Highway Department (MHD) that are on the TIP for 2008. The intersection is being re-designed as a modern roundabout. Analysis results are presented in Table 8 for the study intersections.

The Level of Service (LOS) analysis indicated that:

- Under "Full Build" conditions, the southbound exiting movement from the YMCA Facility driveway onto Edgartown Vineyard Haven Road will operate at an acceptable LOS "D" or better and "C" during the weekday evening peak hour and Saturday midday peak hour, respectively. The increase in delay from No-Build to Build conditions has been shown to be between 1 and 6 seconds.

- At "Full Build", the proposed intersection between the Community Center Driveway and the proposed YMCA facility will operate with minimal delay. More importantly, the intersection of Edgartown-Vineyard Haven Road and the Community Center Driveway will continue to operate with acceptable LOS under conditions with the YMCA at "Full Build", a hockey game at the Arena and an event at the High School. As can be seen in the traffic networks during the weekday evening peak hour activity at the high school during the traffic counts was relatively high.

- Under Build conditions, all movements from Edgartown-Vineyard Haven Road at the study intersections will operate with minimal delay (LOS of "A"). There will be minimal increases in delay between No-Build and Build conditions.

- The intersection of Edgartown – Vineyard Haven Road with Barnes Road/ Airport Road, will operate at a LOS "B" or better during both the weekday evening peak hour and Saturday midday peak hour. Increases in delay have been show to be minimal for all approaches (less than 1 second). Under Build conditions, queue lengths are expected to be between two and four vehicles approaching the roundabout, which is highly acceptable.

In summary, as with any development there will be increases in delay in the study area network. However, the project will not significantly change operating conditions on Edgartown-Vineyard Haven Road or at the study intersections.

TABLE 9
SUMMARY OF LEVEL OF SERVICE ANALYSIS
YMCA OF MARTHA'S VINEYARD

	2007 EXISTING CONDITIONS								FUTURE 2012 NO-BUILD CONDITIONS								FUTURE 2012 BUILD CONDITIONS							
	Weekday PM Peak Hour				Saturday Midday Peak Hour				Weekday PM Peak Hour				Saturday Midday Peak Hour				Weekday PM Peak Hour				Saturday Midday Peak Hour			
Intersection/ Movement	Delay	LOS	v/c	95% Q	Delay	LOS	v/c	95% Q	Delay	LOS	v/c	95% Q	Delay	LOS	v/c	95% Q	Delay	LOS	v/c	95% Q	Delay	LOS	v/c	95% Q
Edgartown-Vineyard Haven Road at Barnes Road/ Airport Road [1]																								
EB Left/Thru/Right	42.8	E	0.89	-	12.7	B	0.47	-	7.1	A	0.38	91	6.9	A	0.28	58	7.3	A	0.41	99	7.0	A	0.29	62
WB Left Thru Right	29.5	D	0.76	-	11.8	B	0.40	-	8.1	A	0.39	88	7.3	A	0.24	47	8.5	A	0.44	107	7.5	A	0.27	55
NB Left/Thru/Right	23.7	C	0.66	-	10.9	B	0.27	-	10.9	B	0.34	75	10.5	B	0.17	32	11.1	B	0.37	83	10.5	B	0.19	36
SB Left/Thru/Right	16.0	C	0.40	-	10.2	B	0.21	-	10.0	B	0.22	46	8.4	A	0.15	27	10.7	B	0.24	52	8.8	A	0.16	30
Edgartown-Vineyard Haven Road at MV High School/ Community Center Drive																								
EB Left/Thru/Right	0.7	A	0.02	2	0.5	A	0.01	1	0.7	A	0.02	2	0.5	A	0.04	1	1.3	A	0.04	3	1.1	A	0.03	2
WB Left Thru Right	1.4	A	0.04	3	0.4	A	0.01	1	1.4	A	0.04	3	0.4	A	0.01	1	1.4	A	0.04	3	0.4	A	0.01	1
NB Exit	19.3	C	0.33	36	11.3	B	0.02	2	22.2	C	0.39	45	11.7	B	0.02	2	29.8	D	0.49	62	12.5	B	0.02	2
SB Exit	17.7	C	0.19	17	11.5	B	0.05	4	19.7	C	0.23	21	11.9	B	0.05	4	20.4	C	0.31	32	11.8	B	0.09	7
Edgartown-Vineyard Haven Road at MV Arena (Proposed YMCA Facility Driveway)																								
EB Left/Thru	1.2	A	0.04	3	1.1	A	0.03	2	1.2	A	0.04	3	1.1	A	0.03	2	1.7	A	0.06	5	1.7	A	0.04	3
SB Exit	13.2	B	0.05	4	11.6	B	0.04	3	13.9	B	0.06	5	12.1	B	0.04	3	17.8	C	0.26	26	13.4	B	0.14	12
Edgartown-Vineyard Haven Road at MV Arena (Proposed YMCA Facility Driveway)																								
EB Left/Thru	2.3	A	0.07	6	1.4	A	0.30	2	2.4	A	0.08	7	1.4	A	0.04	3	2.7	A	0.10	8	1.6	A	0.04	3
SB Exit	22.3	C	0.45	57	14.9	B	0.27	27	26.8	D	0.53	74	16.2	C	0.31	33	32.4	D	0.61	93	17.2	C	0.35	38
Community Center Drive at Proposed YMCA Facility																								
WB Exit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.3	A	0.04	3	8.9	A	0.02	2
SB Left/Thru	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
Delay in seconds
LOS - Level of Service
v/c - Volume to Capacity Ratio
95th Q - 95 Percentile Queue Length in feet
[1] Assumes installation of modern roundabout under future conditions (Existing Conditions = 4-Way STOP

3. Alternative Travel Options

Transportation Demand Management (TDM) strategy proposed for the Island emphasizes management of traffic growth and efficient use of the existing regional transportation system to reduce vehicle trips. Several transit service routes by the MVRTA pass by the site creating opportunities for employees, members of the YMCA and visitors to use transit as an alternative mode. With the bike path or route also adjacent to the site, there is the potential for this alternative mode. The location of the Community Center, High School, and Arena with respect to the proposed YMCA facility provides for a high potential for pedestrian trips to and from the site. For purposes of this study and to remain conservative, we did not reduce the trip generation numbers to reflect a reduction in automobile traffic on that account. Nevertheless, the proposed YMCA site is well served by transit and by the bicycle path network described on page 16 in the Existing Environment section of the report. The site design and other actions should be implemented to encourage alternative travel options to the site, which would reduce vehicular trips. In general, YMCA facilities usually have post school programs with van services available from local schools, which would encourage a large number of students to use a single vehicle.

4. Sight Distance Analysis

Adequate sight distance is an important safety consideration at intersections. As part of this study, a sight distance analysis was conducted at the proposed YMCA Facility driveways relative to Edgartown-Vineyard Haven Road and Community Center Drive. The study examined stopping sight distance (SSD) and corner sight distance (CSD).

SSD, which is the more important of the two, is the distance required for an approaching driver at a height of 3.5 feet to perceive and react accordingly to an object 2 feet high at the driveway. The values are based on a perception and reaction time of 2.5 seconds and braking distance required under wet, level pavements. Corner or intersection sight distance (CSD) is based on the time required to perceive, react, and complete desired exiting maneuver from a driveway once the driver decides to execute the maneuver. Values for exiting sight distance represent the time to (1) turn left or right, in addition to accelerating to the operating speed of the roadway, without causing approaching vehicles to reduce speed by more than 10 mph, and (2) upon turning left, to clear the near half of the intersection without conflicting with the vehicles approaching from the left. Corner sight distance is more related to operations and to some degree, the convenience or inconvenience of on-coming motorists. When the roadway is either on an upgrade or downgrade, grade correction factors may be applied. Minimum criteria are defined by the American Association of State and Highway and Transportation Officials (AASHTO)[7]. SSD relates specifically to safety. As indicated by AASHTO, if CSD meets or exceeds the SSD criteria, then there is adequate safe sight distance available for motorists to avoid collisions.

Speed data collected on Edgartown-Vineyard Haven Road near the project indicated vehicles are traveling an average speed of 36 mph and an 85th percentile speed of approximately 43 mph. For analysis purposes, speed criteria for 35 mph and 45 mph were selected. AASHTO recommended minimum approach stopping sight distance (SSD) requirement for vehicles traveling at these speeds are 250 feet and 360 feet, respectively. Based on the posted speed limit, character and geometric characteristics along Community Center Drive, it was assumed that the travel speeds would be in the 15 mph range. AASHTO recommended minimum SSD required for vehicles traveling at this speed is 80 feet. Table 9 presents a summary of the sight distance analysis for the proposed YMCA Facility site driveways.

[7] American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets, Washington, D.C., 2004.

TABLE 9
SUMMARY OF SIGHT DISTANCE ANALYSIS

Sight Distance	Criteria for 35 mph (ft)	Criteria for 45 mph (ft)	Measured Distance[1] (ft)	Criteria Satisfied at 35 mph	Criteria Satisfied at 45 mph
Proposed Driveway at Edgartown-Vineyard Haven Road					
Stopping Sight Distance					
Approaching from East	250	360	600+	Yes	Yes
Approaching from West	250	360	800+	Yes	Yes
Corner Sight Distance – Left Turn from STOP					
Looking East	390	500	600+	Yes	Yes
Looking West	390	500	800+	Yes	Yes
Corner Sight Distance – Right Turn from STOP					
Looking East	335	430	600+	Yes	Yes
Looking West	335	430	800+	Yes	Yes

Sight Distance	Criteria for 15 mph (ft)	Measured Distance[1] (ft)	Criteria Satisfied at 15 mph
Proposed Driveway at Community Center Drive			
Approaching from North	80	250	Yes
Approaching from South	80	280	Yes
Corner Sight Distance – Left Turn from STOP			
Looking North	170	265	Yes
Looking South	170	250	Yes
Corner Sight Distance – Right Turn from STOP/ Crossing Maneuver			
Looking North	145	265	Yes
Looking South	145	250	Yes

Note: The YMCA site driveway will approach Edgartown-Vineyard Haven Road from the north. The secondary driveway will approach Community Center Drive from the east.
Source: Based on AASHTO 2004.
[1]Measured Distances were based on field measurement and the site plan for the YMCA Facility and assumed all clearing within sight triangles

As shown in Table 9, stopping sight distances and corner sight distances are expected to be satisfied with regard to the average speed limit of 35 mph and with regard to the 85th percentile speed of 45 mph on Edgartown-Vineyard Haven Road. Likewise, both stopping sight distances and corner sight distances are expected to be satisfied with respect to the Community Center Drive.

Furthermore, the more important criteria as it relates to safety, all distances (SSD and CSD) exceed the minimum safety criteria for stopping sight distance for the higher 85th percentile speed of 50 mph. The vegetation at the intersections should be cleared within the appropriate sight triangles to allow for adequate sight distances.

Conclusions/Recommendations

The previous sections of this traffic report detailed the analysis procedures and results of this traffic study. The roadways and intersections within the study area were seen to have the ability to accommodate the proposed YMCA Facility. The following summarize this traffic analysis:

- The project is estimated to generate 2,276 trips over a 24 hour period on a weekday (1,138 entering and 1,138 exiting) and 900 trips over a 24 hour period on a Saturday (450 entering and 450 exiting). During the weekday evening peak hour and Saturday midday peak hour, the project was estimated to generate 171 trips (68 entering and 103 exiting) and 116 trips (57 entering and 59 exiting), respectively. It should be noted that actual vehicle trips may be lower do to the potential for transit based trips, bike path/route trips and pedestrian related trips to and from the site. Currently, several transit routes provide service to the proposed project area.

- In general, the increased levels of roadway volume will be within the capacity of the affected roadways. The roadways in the project area generally carry low to moderate traffic volumes during the winter/ spring season and can accommodate the increase in traffic from the proposed project.

- Field review of sight distances at the site driveway intersection with Edgartown-Vineyard Haven Road indicated that both stopping sight distances and corner sight distances would exceed AASHTO criteria for the 85th percentile speed of 43 mph. The intersection of Edgartown-Vineyard Haven Road with Community Center Drive/ MV High School also exceeds AASHTO criteria.

While the proposed project can be accommodated on area roads, a series of recommended mitigation measures have been developed to improve traffic operation and safety in the vicinity of the project as well as on-site circulation. Several of these comments were previously provided in our initial review of the site plan. The recommendations are as follows:

- Provide STOP signs (R1-1) and STOP bars on the site driveway approaches to Edgartown-Vineyard Haven Road and to Community Center Drive.

- High visibility crossings should be provided on Edgartown – Vineyard Haven Road. To increase visibility of the crosswalks several items may be installed. The use of a white fence near the crosswalk and pedestrian crossing signs would help drivers identify the location of the crosswalks from a distance. The use of flashing pedestrian signals with pedestrian crossing signs and an alternative roadway surface treatment (to reduce lane widths) may also be desirable. It should be noted that Edgartown – Vineyard Haven Road is under local jurisdiction by maintained by the State Highway Department and any changes along Edgartown Vineyard Haven Road may need to be approved by the Massachusetts Highway Department (MHD).

- Speed advisory signs and should be added to the site driveway for vehicles entering the site. An internal speed limit of 15 mph may be appropriate. To enhance crosswalk locations "pedestrian crossing" signs should be added at all crosswalks. One-way signs and marked pavement arrows should be provided on-site to improve driver awareness.

- It appears that the northern outlet to the "Future Road" can be removed and does not appear to be needed as a single access/egress should be sufficient. This should be further explored if and when the "Future Road" is built and should take into account any connections to other roads.

- Several one-way signs and painted arrow markings will need to be installed internally as several areas are currently shown as one-way flow. The one-way parking areas in the northwestern portion of the site may need to be revised. Without the "Future Road" being installed a vehicle could be stuck at a dead end and would be forced to turn around or use a one-way potion of roadway the wrong way. Therefore, the direction of the one ways should be reversed for all three roadways under the "Campus Site Plan".

- It may be desirable to make the driveway intersection with Edgartown-Vineyard Haven Road wider than 24 feet to better accommodate bus traffic. Additionally, it may be desirable to change the location of the entrance slightly to straighten the alignment of the driveway.

- Several internal curves may need larger radii in order to accommodate school buses. If no changes can be accommodated than an alternative method to larger radii throughout would be to designate an internal bus route.

- With the installation of a driveway for the YMCA on Edgartown-Vineyard Haven Road, the driveway for the Martha's Vineyard Arena should be removed. Connections between the proposed driveway and the Arena should be made as shown in the "Campus Plan". However, it appears that a slight alteration of the "Campus Site Plan" may provide for an improved traffic flow pattern. A conceptual sketch is shown in Figure 7.

- Any grading, landscaping, and signing proposed at the site drive intersections Edgartown-Vineyard Haven Road and Community Center Drive should be designed and maintained in such a manner so as to enhance sight distances at the driveway.

In conclusion, the proposed project, as currently planned, with the above recommendations, will not have a significantly negative impact on traffic operations on roadways and intersections within the study area. It should be noted that Edgartown – Vineyard Haven Road is under local jurisdiction by maintained by the State Highway Department and any changes along Edgartown Vineyard Haven Road may need to be approved by the Massachusetts Highway Department (MHD). These recommendations do not presently exist and would be prudent for the MHD to implement with or without the project.

NOTE:
ARCHITECTURAL SITE PLAN FOR GENERAL CONFIGURATION ONLY; USE CIVIL SITE PLAN FOR EXACT LAYOUT OF SITE

Old Holmes Hole Road

LEASE LOT LINE

50' OFFSET BUFFER FROM C.L. OF OLD HOLMES HOLE ROAD

RE-ROUTE EXIST. DIRT PATH

LIMITS OF WORK

YMCA
Lease Lot
5.0 acres +/-

APPROXIMATE PROPOSED TREELINE, TYP.

3 C.Y. DUMPSTER

ALTERNATE BUS PARKING (+24 SPACES)

OUTLET TO FUTURE ROAD

OUTLET TO FUTURE ROAD

40 FT. WIDE ACCESS EASEMENT

EDGE OF PAVEMENT

LIMITS OF WORK

M.V. Community Services

ASPHALT

FENCE

LEASE LOT LINE

OUTDOOR PLAY AREA

FUTURE POOL EXPANSION

FUTURE LOCKER ROOMS EXPANSION

FUTURE GYM

YMCA

FUTURE PROGRAM EXPANSION

DROP OFF

LIMITS OF WORK

BUS DROP OFF

ICE ARENA

FUTURE ROAD

LEASE LOT LINE

LIMITS OF WORK

State Park

EDGE OF PAVEMENT

BIKE PATH

EDGARTOWN - VINEYARD HAVEN ROAD

50 0 50 100 150
GRAPHIC SCALE – FEET

DRI #600

YMCA OF MARTHA'S VINEYARD

111 EDGARTOWN - VINEYARD HAVEN ROAD
OAK BLUFFS, MA

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CAMPUS SITE PLAN

SCALE: 1" = 40'
DRAWN BY: LD, JKB, JL
ISSUE DATE: 4.9.07
PROJECT NO. 06354

A2

ARCHITECTURAL SHEET

Appendix

- **TMC data**
- **ATR data**
- **Seasonal Adjustment Data**
- **Accident Data**
- **MHD Crash Rate Worksheets**
- **Population Data**
- **Project Trip Generation Summary**
- **LOS Analysis**