

TRAFFIC IMPACT REPORT
FOR
SISTERS & BROTHERS PARTNERSHIP



SITE

**BARBER ROAD
ST. GEORGE, VERMONT**

May 4, 2005

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**TRUDELL
CONSULTING
ENGINEERS (TCE)**

1.0 INTRODUCTION

On behalf of Sisters and Brothers Partnership, Trudell Consulting Engineers has prepared this Traffic Impact Report for a proposed gas station, convenience store, and Dunkin' Donuts drive-through on the corner of VT Route 2A and Barber Road in St. George, Vermont. The project site is located on the northwest corner of the unsignalized intersection (See Figure 1: Project Location). The purpose of this report is to analyze the potential traffic congestion and safety impacts that the project will have on the surrounding roadway network. The procedures and methodologies used in this study are suggested in publications by the Institute of Transportation Engineers (ITE) and the Vermont Agency of Transportation (VTrans).

The project consists of the development of a gas station with eight fueling positions, a convenience store, and a Dunkin' Donuts drive-through (See attached Site Plan). For purposes of this report, it is assumed that the project will be occupied in the year 2005. Vehicle delay, level of service, volume to capacity ration, and queue length are analyzed for the intersection of VT 2A and Barber Road for the build year, 2005 and for the horizon year, 2010.



Figure 1: Location Map

The land use permit for the original seven-lot St. George Town Center subdivision (4C0159-1) stated that the project generated traffic in 1993 for partial development (convenience store, Kinderhaus, and 1 light industrial building) is 90 AM peak hour trips and 102 PM peak hour trips. The estimated traffic for full build-out of the park would be 188 AM and 208 PM peak hour trips. The analysis suggested that a left turn lane on VT 2A would be warranted when 60 left turn movements per hour occur from the northbound lane at peak hour traffic.

Presently, only the light industrial building (36,000 sq. ft.) and the Town office building exist or are permitted in the Town Center subdivision. Several of the projects that had been anticipated in the original full build-out analysis have not been built. The current proposal is for fueling station with a 4,500 square foot convenience store and Dunkin' Donuts drive-thru. Although the subdivision has not yet met the number of allocated trips, the original traffic analysis projected traffic to the year 2003. The following table outlines the existing trip generation figures and the proposed trip generation figures according to the ITE Trip Generation Manual, 7th Edition:

Table 1: Land Use Permit Trip Allocation

	Use	Size	AM Peak	PM Peak
Total Allocation 4C0159-1			188	208
Existing	Light Industrial	36,000 ft ²	33	36
	Municipal Building	1,200 ft ²	2	2
Remaining trips (total allocation less existing)			153	170
Proposed	Gas/Convenience	8 fueling positions	81	108
	Dunkin' Donuts	900 ft ²	9	8
Total Proposed Trips			* 90	116
Remaining trips (total allocation less proposed & existing)			63	54

2.0 BACKGROUND

The northwest corner of the intersection of VT 2A is currently vacant. The St. George town offices sit on the southwest corner. The project access will consist of an entrance-only driveway located near VT 2A on Barber Road, and two two-way access points located further west on Barber Road. The sight distance to the north of the project entrance is 450 feet, and 750 feet to the south. The focus of the traffic analysis is the intersection of VT 2A and Barber Road.

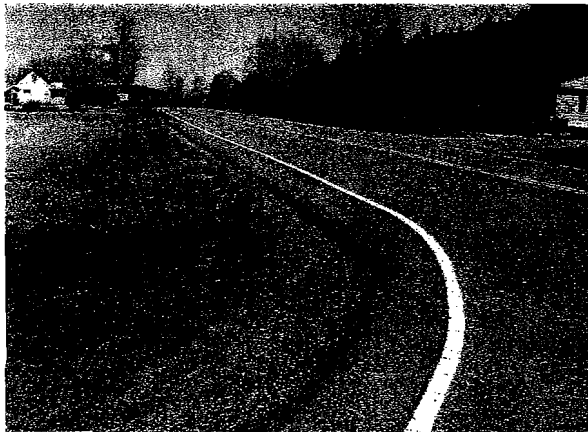


Figure 2: From Barber Road toward North

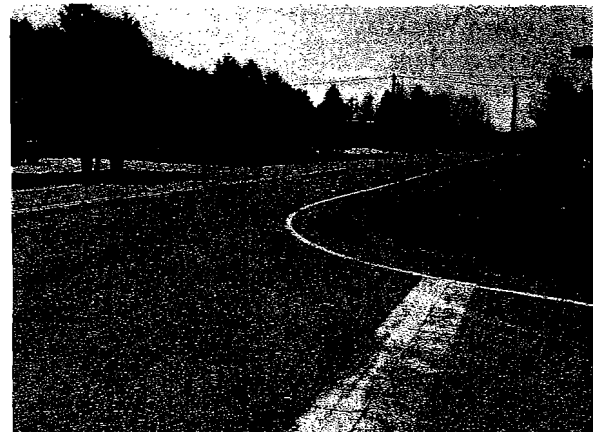


Figure 3: From Barber Road toward South

Background traffic volumes were determined using data from VTrans automated traffic counters. Station S6D128 located north of the VT 2A/ Barber Road intersection saw an Annual Average Daily Traffic (AADT) of 5,200 vehicles per day (vpd) in the year 2002. The VTrans growth factor for Rural Primary and Secondary highways was added to intersection traffic to adjust the 2005 turning movements to the horizon year, 2010. A factor of 1.08 was used for the 2005-2010. These growth factors are similar to local growth rate factors calculated using ATR station S6D128 growth data.

Directional distribution for the intersection of VT 2A and Barber Road during the AM and PM peak hours was determined using a peak hour turning movement count performed by Trudell Consulting Engineers (TCE) on April 27, 2005. This short count was then adjusted to reflect the

corresponding design hour volumes (DHVs) for the intersection. The DHVs were determined using the VTrans DHV Determination Based on AADT and Highway Class (General) table. According to the table, an AADT of 5,200 vpd has a corresponding DHV of 610 vehicles per hour.

3.0 PROJECT GENERATED TRAFFIC

The peak hour traffic generated by the project was estimated using the Institute of Transportation Engineers (ITE) Trip Generation, 7th Edition and the appropriate land use categories for the proposed building. Land Use Code 945: Gas Station with Convenience Market was selected for estimating traffic for the 8-fueling position gas station/convenience store portion of the project. Additional trips are included for the Dunkin’ Donuts drive-thru portion of the proposed project that is to be located within the convenience store. The trip generation rate for a drive-thru was calculated by taking the difference between Land Use Code 933: Restaurant and 934: Restaurant w/ Drive-Thru. The estimated project generated trip calculations and results are located in tables 1 through 3 below.

Table 2: Project Generated Traffic – Gas Station

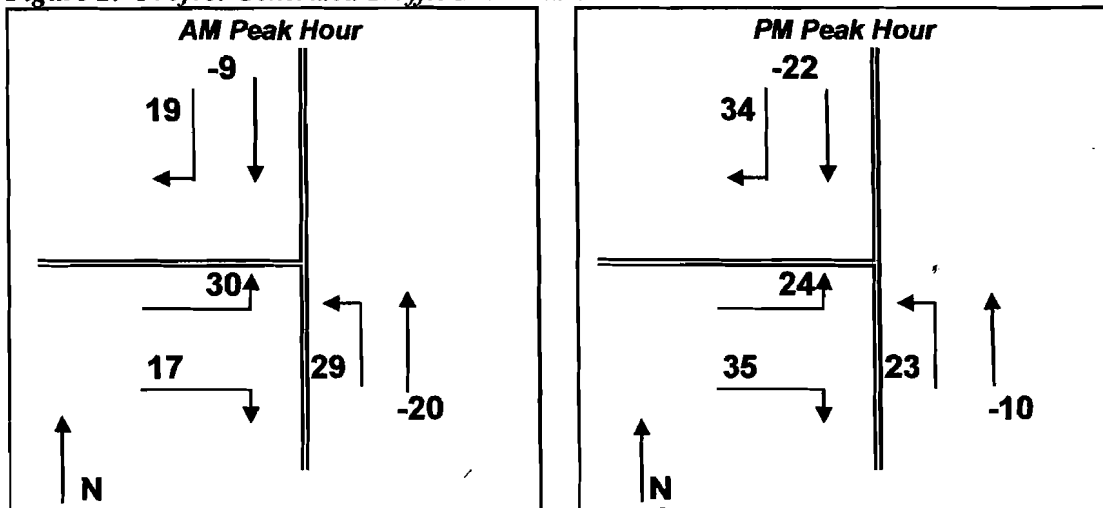
	Fueling Positions	Trips Per Fueling Position	Total Trips	Enter	Exit
Average Weekday	8	162.78	1302	651	651
AM Peak Hour		10.06	81	41	40
PM Peak Hour		13.38	108	54	54

Table 3: Project Generated Traffic – Dunkin’ Donuts Drive-Thru

	Trip Generation Rate (veh/ 1000 sq. ft)			Dunkin’ Donuts Floor Area	Total Trips (50/50 enter/exit)
	933 Restaurant	934 Restaurant w/ Drive-Thru	Drive-Thru only		
AM Peak	43.87	53.11	9.24	900 sq. ft.	9
PM Peak	26.15	34.64	8.49		8

Not all trips generated by this project will be new traffic. “Pass-by” trips are those already on the road, but the travel pattern changes due to a visit to the project. The percentage of pass-by trips is 62% for the AM Peak hour and 56% for the PM peak hour. These figures were taken from ITE Trip Generation Handbook Tables for Land Use Code 945 and are based on average values from studies from similar projects nationwide. Pass-by vehicles account for 50% of traffic generated from the drive-thru for the AM and PM peak hour. The project-generated trips designated as “Pass-By” trips were distributed based on analogy to the directional distribution of the short count traffic. Project generated trip distribution for the AM and PM peak hours are shown in Figures 4 and 5 below. The negative numbers denote existing turning movements that are reduced due to pass-by trips.

Figure 2: Project Generated Traffic Distribution



4.0 LEVELS-OF-SERVICE

Vehicle delay, level of service (LOS), volume to capacity ratio (v/c ratio), and 95% queue length were calculated for the signalized intersection using Highway Capacity intersection analysis software. A peak hour factor of 1.0 with a 60 minute analysis period was used for the analysis, as recommended by VTrans. The analysis was performed for the following eight scenarios:

- 2005 AM No-Build
- 2005 AM Build
- 2005 PM No-Build
- 2005 PM Build

- 2010 AM No-Build
- 2010 AM Build
- 2010 PM No-Build
- 2010 PM Build

For 2005, both morning (7:00 to 8:00 AM) and evening (4:45 to 5:45 PM) peak hours were analyzed using background traffic (No-Build) and background plus project generated traffic (Build). The same scenario was also analyzed for the year 2010, after applying a growth rate factor to the traffic volumes. According to the VTrans Traffic Impact Evaluation, Study and Review Guide, a 5-year horizon is used for intersection analysis. Approach delay and level of service are shown on Tables 5 – 8 below.

Table 4: 2005 AM Peak Hour Intersection Analysis

	No Build				Build			
	Approach Delay (s)	LOS	v/c ratio	Queue	Approach Delay (s)	LOS	v/c ratio	Queue
Eastbound	11.5	B	0.02	0.07	13.4	B	0.13	0.45
Northbound	7.7	A	0.00	0.00	7.8	A	0.02	0.08

Table 5: 2010 AM Peak Hour Intersection Analysis

	No Build				Build			
	Approach Delay (s)	LOS	w/c ratio	Queue	Approach Delay (s)	LOS	w/c ratio	Queue
Eastbound	11.8	B	0.03	0.08	14.0	B	0.14	0.49
Northbound	7.7	A	0.00	0.00	7.8	A	0.03	0.08

Table 6: 2005 PM Peak Hour Intersection Analysis

	No Build				Build			
	Approach Delay (s)	LOS	w/c ratio	Queue	Approach Delay (s)	LOS	w/c ratio	Queue
Eastbound	11.2	B	0.01	0.03	12.6	B	0.12	0.43
Northbound	8.2	A	0.01	0.01	8.3	A	0.02	0.07

Table 7: 2010 PM Peak Hour Intersection Analysis

	No Build				Build			
	Approach Delay (s)	LOS	w/c ratio	Queue	Approach Delay (s)	LOS	w/c ratio	Queue
Eastbound	11.5	B	0.01	0.03	13.1	B	0.13	0.45
Northbound	8.3	A	0.00	0.01	8.4	A	0.02	0.08

The HCM levels of service used in the analysis are based on control delay of critical movements and are summarized in the table below. Level of Service at the intersection does not drop below a B for any turning movement through the year 2010 under No-Build or Build scenarios.

Table 8: Level-of-Service Designation Summary – Unsignalized Intersections

LEVEL OF SERVICE	CONTROL DELAY (sec/veh)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

5.0 PEDESTRIAN SAFETY

The proposed project will be located directly across from a large residential development. In order for potential pedestrians to access the proposed convenience store from the residential development, they would have to cross VT Route 2A. VT 2A is a State highway and therefore all improvements performed within the Right of Way (R.O.W.) fall under the jurisdiction of the Vermont Agency of Transportation (AOT). The AOT uses the *Guideline for the Installation of Crosswalk Markings and Pedestrian Signing at Marked and Unmarked Crossings, Revised July 2004* to ensure pedestrian crossings are treated consistently throughout the state by providing

guidance on the location of marked and unmarked crossings and the associated pavement markings and signs.

According to the *Guideline*, the criteria for installing a mid-block marked crosswalk include:

- a speed limit of 40 mph or less; and
- 20 or more pedestrians using the crossing per hour during the AM and PM peak hours; and
- an annual average daily traffic (AADT) exceeding 3000 vehicles per day; and
- a sidewalk or adequate shoulder for use by pedestrians or other pedestrian destination; and
- a determination has been made that the pedestrian shall have the right of way over the vehicular traffic; and
- adequate sight distance (equal to or exceeding the stopping sight distance for the posted speed) is available in both directions.

While the posted speed limit in the general location of a potential crosswalk does not exceed 40 miles per hour, the actual speed of vehicles passing the project site generally does exceed 40 miles per hour. VT 2A had an AADT of 5200 vehicles per day (vpd) in 2002 in the vicinity of the project. The stopping sight distance for a design speed of 40 mph is 305 feet and 425 feet for a design speed of 50 mph. The available stopping sight distance in the proposed crosswalk location is approximately 430 feet from the north and over 600 feet from the south, which is adequate according to the guidelines.

The criterion that is not yet met is the minimum pedestrian activity (20+ per hour). When the criteria for a marked crosswalk are not met, pedestrian warning signs may be installed to alert road users to locations where unexpected entries into the roadway by pedestrians might occur (also known as an “unmarked” crossing). There does not have to be a specific volume of pedestrians, just crossing activity. The unmarked crossing does not give the pedestrian the right of way over vehicular traffic, but serve as warning devices. Another reason to have an unmarked crossing is so that a pedestrian does not have a false sense of safety while in the crosswalk, especially in a rural location such as this. In the future, if it is determined that a significant number of pedestrians are using the VT 2A crossing, the crosswalk would have the potential to become marked.

Pedestrian warning signs (W11-2) with supplemental “AHEAD” (W16-7P) plaque will be installed as advance warning at a location 500 feet ahead of the crossing location in both the north and southbound directions. Pedestrian crossing signs with a supplemental arrow plaque will be installed on either side of the pedestrian crossing location. By positioning the crosswalk on the south side of Barber Road, there is approximately 430 feet between the high point to the north and the crosswalk location, which is slightly greater than the minimum required stopping sight distance for a vehicle traveling 50 miles per hour. Sight distance from the south toward the crosswalk is also greater than the 425 ft minimum.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the review and analysis of the existing and projected traffic conditions in the area of the site, the following conclusions are presented. Where appropriate, recommendations are also provided to mitigate potential project impacts.

1. The project is expected to generate approximately 48 new vehicles entering and 44 vehicles exiting the site during the afternoon (AM) peak hour. During the morning (PM) the estimated trips are 57 new vehicles entering and 59 vehicles exiting.
2. 56% of the gas station/convenience store traffic during the PM peak hour and 62% during the AM peak hour will come from "Pass-By" trips; the remaining trips will be new. Pass-by trips account for roughly 50% of the drive-thru generated traffic for the AM and PM peak hour.
3. Vehicle access will be via two access driveways located on the low-volume Barber Road. Barber Road meets VT Route 2A at a 3-way unsignalized intersection. This driveway configuration allows for safe and efficient circulation between the site and the existing roadway network.
4. Level of service for all approaches at the intersection is currently a B or better for the AM and PM Peak hour and will be under "Build" conditions. Level of service for all approaches remains a B or better through the horizon year 2010. Volume to capacity ratios and 95% queue lengths are acceptable for the intersection and do not indicate significant congestion or geometric problems under full build-out conditions. No additional turn lanes are warranted at this time.
5. It is estimated that there will be high pedestrian activity between the residential development on the east side of VT 2A and the proposed project and therefore an unmarked pedestrian crossing is proposed across VT 2A. Advanced warning signs will be placed 500 feet to the north and the south of the crossing and there is adequate stopping sight distance from the north and the south toward the proposed crossing location.

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	AAL	Intersection	
Agency/Co.	Trudell Consulting Engineers	Jurisdiction	
Date Performed	5/4/2005	Analysis Year	2005 No-Build
Analysis Time Period	AM Peak Hour		
Project Description <i>Sisters & Brothers - St. George, VT 2005026</i>			
East/West Street: <i>Barber Road</i>		North/South Street: <i>VT Route 2A</i>	
Intersection Orientation: <i>North-South</i>		Study Period (hrs): <i>1.00</i>	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
	1	2	3	4	5	6
Movement	L	T	R	L	T	R
Volume	1	454	0	0	226	2
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	1	454	0	0	226	2
Percent Heavy Vehicles	2	-	-	0	-	-
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
	7	8	9	10	11	12
Movement	L	T	R	L	T	R
Volume	0	0	0	6	0	7
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	0	0	6	0	7
Percent Heavy Vehicles	0	0	0	2	0	2
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
			7	8	9	10	11	12
Movement	1	4						
Lane Configuration	LT						LR	
v (vph)	1						13	
C (m) (vph)	1340						563	
v/c	0.00						0.02	
95% queue length	0.00						0.07	
Control Delay	7.7						11.5	
LOS	A						B	
Approach Delay	-	-					11.5	
Approach LOS	-	-					B	

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TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	AAL			Intersection				
Agency/Co.	Trudell Consulting Engineers			Jurisdiction				
Date Performed	5/4/2005			Analysis Year				
Analysis Time Period	AM Peak Hour			2005 Build				
Project Description <i>Sisters & Brothers - St. George, VT 2005026</i>								
East/West Street: <i>Barber Road</i>				North/South Street: <i>VT Route 2A</i>				
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>1.00</i>				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	33	434	0	0	217	22		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00		
Hourly Flow Rate, HFR	33	434	0	0	217	22		
Percent Heavy Vehicles	2	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0				0	
Lanes	0	1	0	0	1	0		
Configuration	LT						TR	
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	37	0	27		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00		
Hourly Flow Rate, HFR	0	0	0	37	0	27		
Percent Heavy Vehicles	0	0	0	2	0	2		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0				0	
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	33						64	
C (m) (vph)	1328						490	
v/c	0.02						0.13	
95% queue length	0.08						0.45	
Control Delay	7.8						13.4	
LOS	A						B	
Approach Delay	--	--					13.4	
Approach LOS	--	--					B	

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TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	AAL			Intersection				
Agency/Co.	Trudell Consulting Engineers			Jurisdiction				
Date Performed	5/4/2005			Analysis Year				
Analysis Time Period	AM Peak Hour			2010 No-Build				
Project Description <i>Sisters & Brothers - St. George, VT 2005026</i>								
East/West Street: <i>Barber Road</i>				North/South Street: <i>VT Route 2A</i>				
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>1.00</i>				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	1	490	0	0	244	2		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00		
Hourly Flow Rate, HFR	1	490	0	0	244	2		
Percent Heavy Vehicles	2	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0				0	
Lanes	0	1	0	0	1	0		
Configuration	LT						TR	
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	6	0	8		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00		
Hourly Flow Rate, HFR	0	0	0	6	0	8		
Percent Heavy Vehicles	0	0	0	2	0	2		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0				0	
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	1						14	
C (m) (vph)	1320						546	
v/c	0.00						0.03	
95% queue length	0.00						0.08	
Control Delay	7.7						11.8	
LOS	A						B	
Approach Delay	--	--					11.8	
Approach LOS	--	--					B	

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TWO-WAY STOP CONTROL SUMMARY

General Information				Site Information			
Analyst	AAL	Agency/Co.		Intersection			
Date Performed	5/4/2005	Trudell Consulting Engineers		Jurisdiction			
Analysis Time Period	AM Peak Hour			Analysis Year			
		2010 Build					
Project Description <i>Sisters & Brothers - St. George, VT 2005026</i>							
East/West Street: <i>Barber Road</i>				North/South Street: <i>VT Route 2A</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>1.00</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume	33	470	0	0	235	22	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR	33	470	0	0	235	22	
Percent Heavy Vehicles	2	--	--	0	--	--	
Median Type	<i>Undivided</i>						
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration	LT					TR	
Upstream Signal		0			0		
Minor Street	Westbound			Eastbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume	0	0	0	37	0	28	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	
Hourly Flow Rate, HFR	0	0	0	37	0	28	
Percent Heavy Vehicles	0	0	0	2	0	2	
Percent Grade (%)	0			0			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	NB	SB	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LT						LR
v (vph)	33						65
C (m) (vph)	1308						465
v/c	0.03						0.14
95% queue length	0.08						0.49
Control Delay	7.8						14.0
LOS	A						B
Approach Delay	--	--					14.0
Approach LOS	--	--					B

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TWO-WAY STOP CONTROL SUMMARY

General Information				Site Information				
Analyst	AAL			Intersection				
Agency/Co.	Trudell Consulting Engineers			Jurisdiction				
Date Performed	5/4/2005			Analysis Year				
Analysis Time Period	PM Peak Hour			2005 No-Build				
Project Description <i>Sisters & Brothers - St. George, VT 2005026</i>								
East/West Street: <i>Barber Road</i>				North/South Street: <i>VT Route 2A</i>				
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>1.00</i>				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	2	181	0	0	411	14		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00		
Hourly Flow Rate, HFR	2	181	0	0	411	14		
Percent Heavy Vehicles	2	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LT					TR		
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	1	0	4		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00		
Hourly Flow Rate, HFR	0	0	0	1	0	4		
Percent Heavy Vehicles	0	0	0	2	0	2		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	2						5	
C (m) (vph)	1134						590	
v/c	0.00						0.01	
95% queue length	0.01						0.03	
Control Delay	8.2						11.2	
LOS	A						B	
Approach Delay	--	--					11.2	
Approach LOS	--	--					B	

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TWO-WAY STOP CONTROL SUMMARY								
General Information					Site Information			
Analyst	AAL				Intersection			
Agency/Co.	Trudell Consulting Engineers				Jurisdiction			
Date Performed	5/4/2005				Analysis Year			
Analysis Time Period	PM Peak Hour				2005 Build			
Project Description <i>Sisters & Brothers - St. George, VT 2005026</i>								
East/West Street: <i>Barber Road</i>					North/South Street: <i>VT Route 2A</i>			
Intersection Orientation: <i>North-South</i>					Study Period (hrs): <i>1.00</i>			
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	27	165	0	0	389	49		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00		
Hourly Flow Rate, HFR	27	165	0	0	389	49		
Percent Heavy Vehicles	2	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0				0	
Lanes	0	1	0	0	1	0		
Configuration	LT						TR	
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	0	0	0	26	0	41		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00		
Hourly Flow Rate, HFR	0	0	0	26	0	41		
Percent Heavy Vehicles	0	0	0	2	0	2		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	27						67	
C (m) (vph)	1122						539	
v/c	0.02						0.12	
95% queue length	0.07						0.43	
Control Delay	8.3						12.6	
LOS	A						B	
Approach Delay	--	--					12.6	
Approach LOS	--	--					B	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	AAL	Intersection	
Agency/Co.	Trudell Consulting Engineers	Jurisdiction	
Date Performed	5/4/2005	Analysis Year	2010 No-Build
Analysis Time Period	PM Peak Hour		
Project Description <i>Sisters & Brothers - St. George, VT 2005026</i>			
East/West Street: <i>Barber Road</i>		North/South Street: <i>VT Route 2A</i>	
Intersection Orientation: <i>North-South</i>		Study Period (hrs): <i>1.00</i>	

Vehicle Volumes and Adjustments						
Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	2	195	0	0	444	15
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	2	195	0	0	444	15
Percent Heavy Vehicles	2	--	--	0	--	--
Median Type	<i>Undivided</i>					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	<i>LT</i>					<i>TR</i>
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	1	0	4
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR	0	0	0	1	0	4
Percent Heavy Vehicles	0	0	0	2	0	2
Percent Grade (%)		0			0	
Flared Approach		<i>N</i>			<i>N</i>	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					<i>LR</i>	

Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	<i>LT</i>						<i>LR</i>	
v (vph)	2						5	
C (m) (vph)	1102						562	
v/c	0.00						0.01	
95% queue length	0.01						0.03	
Control Delay	8.3						11.5	
LOS	<i>A</i>						<i>B</i>	
Approach Delay	--	--					11.5	
Approach LOS	--	--					<i>B</i>	

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TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information		
Analyst	AAL		Intersection		
Agency/Co.	Trudell Consulting Engineers		Jurisdiction		
Date Performed	5/4/2005		Analysis Year	2010 Build	
Analysis Time Period	PM Peak Hour				
Project Description <i>Sisters & Brothers - St. George, VT 2005026</i>					
East/West Street: <i>Barber Road</i>			North/South Street: <i>VT Route 2A</i>		
Intersection Orientation: <i>North-South</i>			Study Period (hrs): <i>1.00</i>		

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound			
	Movement	1	2	3	4	5	6
		L	T	R	L	T	R
Volume		27	179	0	0	422	50
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR		27	179	0	0	422	50
Percent Heavy Vehicles		2	--	--	0	--	--
Median Type	Undivided						
RT Channelized				0			0
Lanes		0	1	0	0	1	0
Configuration		LT					TR
Upstream Signal			0			0	

Minor Street	Westbound			Eastbound			
	Movement	7	8	9	10	11	12
		L	T	R	L	T	R
Volume		0	0	0	26	0	41
Peak-Hour Factor, PHF		1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR		0	0	0	26	0	41
Percent Heavy Vehicles		0	0	0	2	0	2
Percent Grade (%)		0			0		
Flared Approach			N			N	
Storage			0			0	
RT Channelized				0			0
Lanes		0	0	0	0	0	0
Configuration						LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound			
	Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT						LR	
v (vph)		27						67	
C (m) (vph)		1090						512	
v/c		0.02						0.13	
95% queue length		0.08						0.45	
Control Delay		8.4						13.1	
LOS		A						B	
Approach Delay		--	--					13.1	
Approach LOS		--	--					B	

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