TRAFFIC IMPACT & ACCESS STUDY

Proposed Residential Development Project

CENTURY MILL ESTATES

Bolton, Massachusetts

Applicant

CENTURY MILL ESTATES, LIMITED PARTNERSHIP

September 8, 2005

prepared by

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EXECUTIVE SUMMARY

Dermot J. Kelly Associates, Inc. (DJK) has conducted a Traffic Impact and Access Study for a proposed residential development project to be known as Century Mill Estates located between and adjacent to Century Mill Road and Spectacle Hill Road in Bolton, Massachusetts. Figure 1 graphically presents the site location in relation to the local and regional roadway network. This report identifies existing traffic operating parameters on the adjacent roadway system, evaluates the potential traffic-related impacts associated with the proposed project and provides traffic-related recommendations, which would minimize the potential impacts of the proposed project.

Based on the traffic analysis as presented in this study, there is sufficient capacity throughout the study area to accommodate the proposed residential development project. The overall traffic-related impacts will not create any adverse impacts on traffic operations that would require offsite roadway improvements.

PROJECT DESCRIPTION

The project proponent presently is planning for the construction of 78 single family homes. Current project planning calls for the site to be accessed at two locations, one along Century Mill Road and one along Spectacle Hill Road. The North Site Drive would intersect Century Mill Road at a right angle forming a "T" type intersection. Similarly, the West Site Drive would intersect Spectacle Hill Road at a right angle.

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ALTERNATIVE STUDIES

For the purposes of this report, the following alternatives were evaluated:

- *No-Build* - The No-Build alternative was examined to establish the 2010 baseline traffic-volume conditions. The incremental impacts of the proposed project may be determined by making comparisons to the No-Build alternative. The No-Build alternative assumes that the project is not built.

- *Build* - The Build alternative includes the development of the proposed project. The Build alternative is evaluated in this report and is compared to the No-Build analysis conditions. The Build condition represents the increase in traffic from the previous condition to the proposed condition (i.e., the delta impact). The Build condition includes the construction of the proposed residential development project.

STUDY AREA

The study area includes the following intersections:

- Century Mill Road at proposed North Site Drive,
- Spectacle Hill Road at the proposed West Site Drive, and
- Hudson Road (Route 85) at Century Mill Road.

EXISTING TRAFFIC VOLUME CONDITIONS

Analysis of the recent traffic counts indicates that an average of 767 vehicles per day (vpd) were observed along Century Mill Road adjacent to the site during January 2004. During the two peak travel demand periods, which generally occurred between 7 and 9 AM and between 4 and 6 PM, an average of 107 and 95 vehicles per hour (vph) were observed along Century Mill Road during the weekday morning and evening peak hours, respectively. Similarly, along Spectacle Hill Road the observed average daily traffic was 243 vpd with 21 vph observed during the morning peak hour and 25 vph observed during the evening peak hour.

FUTURE TRAFFIC VOLUME CONDITIONS

Background Traffic Growth

To represent future 2010 No-Build traffic-volume conditions, the existing traffic volumes were increased to account for two other development projects in Hudson and general background traffic growth. The two other projects are located along Central Street and include 150 apartments and 30 single family homes. The existing traffic volumes were increased by +2.0 percent per year up through 2010.

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Site-Generated Traffic

Based on the Institute of Transportation Engineers (ITE) trip generation rates for single family homes, it is anticipated that 78 single family homes would generate approximately 828 vehicle-trips per day (vpd). This daily volume would be split evenly with 414 vehicle-trips entering and 414 vehicle-trips exiting the site over the course of the entire 24-hour day.

More importantly, during the weekday morning peak hour, 78 residences would generate a total of 64 vehicle-trips with 16 vehicle-trips entering and 48 vehicle-trips exiting the project site. Similarly, during the evening peak hour, it is anticipated that 86 vehicle-trips would be generated. The 86 vehicle-trips would consist of 54 vehicle-trips entering and 32 vehicle-trips exiting the project parcel during the peak 60-minute period. The remaining vehicle-trips would occur over the course of the day.

Trip Distribution

Trip-distribution patterns were developed specifically for this study and are summarized as follows:

At the North Drive:	
• Century Mill Road to/from the East	55%
• Century Mill Road to/from the West	15%
At the West Drive:	
• Spectacle Hill Road to/from the North	10%
• Spectacle Hill Road to/from the South	20%
TOTAL	100%

TRAFFIC OPERATION ANALYSIS

Unsignalized intersection capacity analysis was performed for the study area intersection. The capacity analysis is summarized below by location.

Century Mill Road at the Proposed North Site Drive

Under 2010 Build with development traffic volume conditions, the left- and right-turns exiting the site and the left-turns entering the site would operate at Level of Service (LOS) A during both the morning and evening peak hours.

Spectacle Hill Road at the Proposed West Site Drive

Similar to the Proposed North Site Drive intersection, the left-turns entering the site and the left- and right-turns exiting the site would operate at LOS A during both the morning and evening peak hours under 2010 Build with development traffic volume conditions.

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Hudson Road at Century Mill Road

The left-turns movement on Hudson Road will operate at LOS A up through the 2010 Build traffic volume conditions. The left- and right-turns on Century Mill Road will operate at LOS B during both the morning and evening peak hours up through 2010 Build with development traffic volume conditions.

RECOMMENDATIONS

The final phase of the analysis process is to make traffic-related recommendations that would minimize the impact of the project on the adjacent transportation system. *The proponent has made a commitment to implement all recommendations listed below subject to approval, construction and the eventual occupation of the proposed project:*

- The Proposed North and West Site Drive intersections at Century Mill Road and Spectacle Hill Road are suggested to consist of a minimum 20-foot wide cross section. Intersection corner radii are suggested to be 5- to 30-foot radius. The current proposal for the North and West Site Drives meets or exceeds the above recommendation.

- It is suggested that the North Site Drive and the West Site Drive approaches to Century Mill Road and Spectacle Hill Road be placed under STOP sign control with a painted stop line, respectively. All internal intersections are suggested to be appropriately placed under stop sign control.

- In order to enhance the available safety sight lines at the Proposed Site Drive intersections with both Century Mill Road and Spectacle Hill Road, topographic ground elevations, landscaping, signage (if any), etc. are suggested to be maintained such that adequate sight distances are available throughout the life of the project. The sight distance maintenance triangular area along the property frontage should extend 14.4 feet (4.4 meters) back into the site drives from the existing edge of the roadway (representing an exiting vehicle) and extend to a maximum possible location (338 feet minimum along Century Mill Road to the east; 349 feet to the west along Century Mill Road; and 305 feet minimum to the north and south along Spectacle Hill Road) representing an approaching vehicle in each direction along Century Mill Road and Spectacle Hill Road, respectively.

- Intersection advanced warning signs are suggested to be placed along both Century Mill Road and Spectacle Hill Road in advance of the proposed access/egress driveways.

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SUMMARY/CONCLUSION

Based on the traffic analysis as presented in this study, there is sufficient capacity throughout the study area to accommodate the proposed residential development project. The overall traffic-related impacts will not create any adverse impacts on traffic operations that would require offsite roadway improvements.

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PROJECT DESCRIPTION

PROPOSAL

The project proponent presently is planning for the construction of 78 single family homes. Current project planning calls for the site to be accessed at two locations, one along Century Mill Road and one along Spectacle Hill Road. The North Site Drive would intersect Century Mill Road at a right angle forming a "T" type intersection. Similarly, the West Site Drive would intersect Spectacle Hill Road at a right angle.

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ALTERNATIVES TO THE PROJECT

For the purposes of this report, the following alternatives were evaluated:

- *No-Build* - The No-Build alternative was examined to establish the 2010 baseline traffic-volume conditions. The incremental impacts of the proposed project may be determined by making comparisons to the No-Build alternative. The No-Build alternative assumes that the project is not built.

- *Build* - The Build alternative includes the development of the proposed project. The Build alternative is evaluated in this report and is compared to the No-Build analysis condition. The Build condition represents the increase in traffic from the previous condition to the proposed condition (i.e., the delta impact). The Build condition includes the construction of the proposed residential development project.

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THE EXISTING CONDITIONS

FIELD SURVEY

A comprehensive field inventory of the adjacent roadway system was conducted during December 2003 and January 2004. The field inventory included collection of existing roadway geometrics, traffic volumes, and safety data for the adjacent roadways in the vicinity of the site.

Traffic volumes were measured by means of two Automatic Traffic Recorder (ATR) counters and two manual intersection Turning Movement Counts. Safety inventories included vehicle speed observations and a detailed evaluation of the safety sight lines at the proposed site drive locations along Century Mill Road and Spectacle Hill Road.

GEOMETRICS

Century Mill Road

Century Mill Road is generally a two-way, east/west roadway connecting Hudson Road to the east with South Bolton Road to the west. Century Mill Road is approximately 16 feet wide in the immediate vicinity of the site with no pavement markings or speed limit signs noted during the field inventory period. Century Mill Road approaches the proposed site drive over a relatively level/tangent alignment with a winding alignment to the east and west.

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Spectacle Hill Road

Spectacle Hill Road is generally a north/south roadway connecting South Bolton Road and Century Mill Road to the north with Bolton Street and Central Street to the south. Spectacle Hill Road is a bi-directional roadway approximately 17 feet wide. No pavement markings or speed limit signs were noted during the field inventory period. The roadway alignment is generally tangent in the immediate vicinity of the Proposed West Site Drive. To the south of the Proposed West Site Drive, Spectacle Hill Road slopes down in the northbound direction at a rate of approximately 6% with a large radius curve located to the south. To the north, Spectacle Hill Road is generally level.

Century Mill Road at Hudson Road

Century Mill Road intersects Hudson Road at a right angle forming a "T" type intersection. The Century Mill Road approach to the intersection is under stop sign control with both a painted stop line and the painted word "STOP." Hudson Road is painted with a double yellow centerline located to the north and south with a single yellow centerline located opposite Century Mill Road.

TRAFFIC VOLUMES

Existing traffic volumes were recorded mechanically by Automatic Traffic Recorder (ATR) counters over a 48-hour period during Wednesday and Thursday, January 7 and 8, 2004. The ATR data was substantiated by actual manual intersection Turning Movement Counts (TMC) conducted on Wednesday, January 7, 2004. All traffic volume data is reproduced in the Appendix of this study. These traffic volumes were reviewed to determine average daily and peak-hour traffic volumes along Century Mill Road and Spectacle Hill Road for this study. Table 1 summarizes the 2004 ATR traffic-volume data collected for this study.

Analysis of the recent traffic counts indicates that an average of 767 vehicles per day (vpd) were observed along Century Mill Road adjacent to the site during January 2004. During the two peak travel demand periods, which generally occurred between 7 and 9 AM and between 4 and 6 PM, an average of 107 and 95 vehicles per hour (vph) were observed along Century Mill Road during the weekday morning and evening peak hours, respectively. Similarly, along Spectacle Hill Road the observed average daily traffic was 243 vpd with 21 vph observed during the morning peak hour and 25 vph observed during the evening peak hour.

The Century Mill Road traffic volumes represent a composite result of the ATR and TMC data. The Spectacle Hill Road traffic volumes represent the results of the ATR data.

To represent 2005 existing traffic volume conditions, the 2004 traffic volumes were increased by 2% to reflect traffic growth between 2004 and 2005. Figures 2 and 3 graphically present the results of the traffic volume inventory for the weekday morning and evening peak hours.

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Figure 2: 2005 Existing
Weekday Morning
Peak Hour Traffic Volumes

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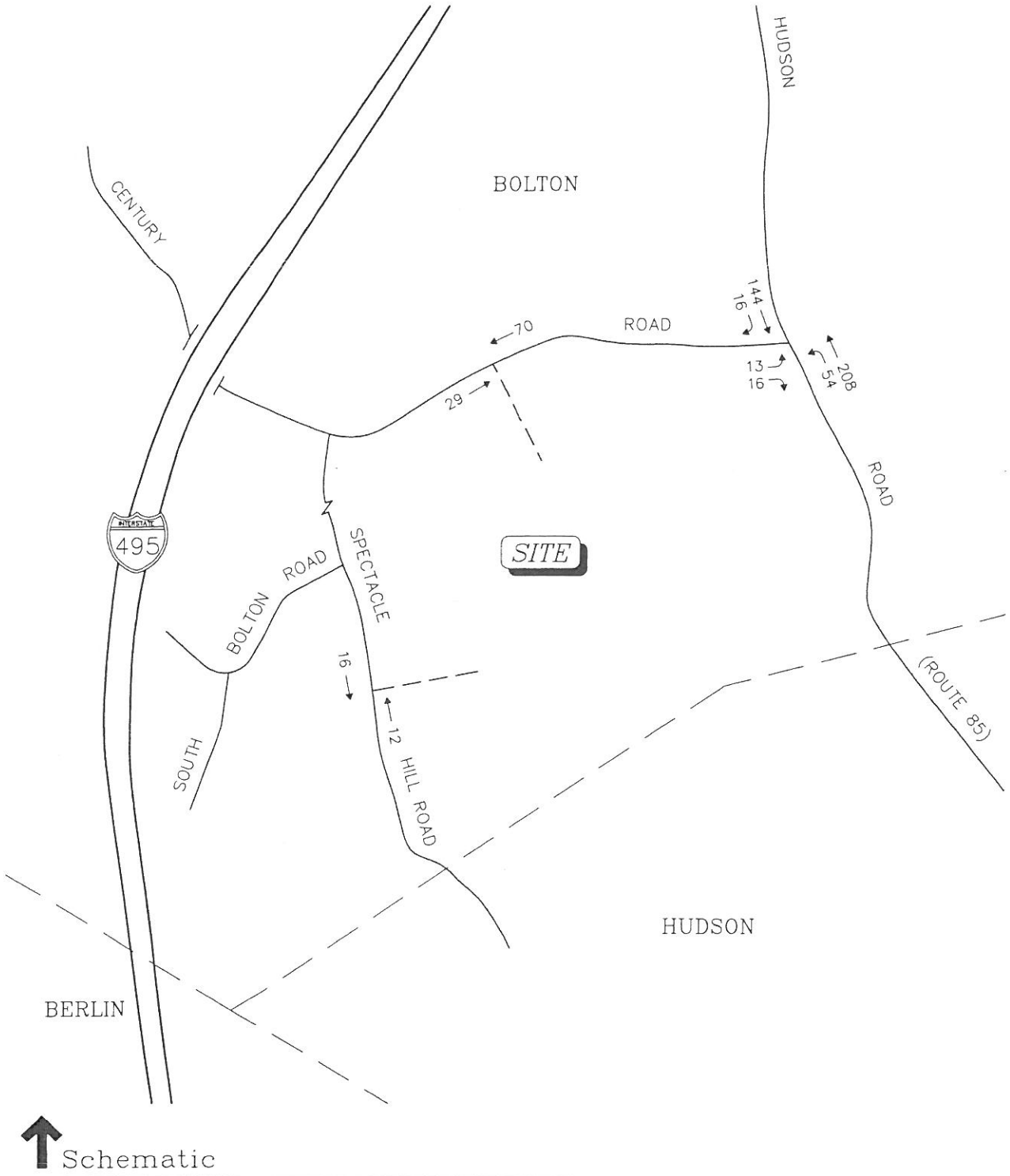
Figure 3: 2005 Existing
Weekday Evening
Peak Hour Traffic Volumes



Schematic

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TABLE 1
EXISTING TRAFFIC VOLUME SUMMARY

Location/ Time Period	Daily Traffic (24 hour) (vpd)[a]	Peak Hour	Peak-Hour Traffic Volume (vph)[b]	K Factor[c]
Century Mill Road adjacent to the Proposed North Site Drive:				
Wednesday 1/7/04	799	7:15-8:15 AM	104	13.0
		5:00-6:00 PM	97	12.1
Thursday 1/8/04	735	7:15-8:15 AM	78	15.0
		4:30-5:30 PM	92	12.5
Average Weekday	767	Morning Peak	107	14.0
		Evening Peak	95	12.0
Spectacle Hill Road adjacent to the Proposed West Site Drive:				
Wednesday 1/7/04	262	7:15-8:15 AM	21	8.0
		5:00-6:00 PM	22	8.4
Thursday 1/8/04	224	7:30-8:30 AM	21	9.4
		4:00-5:00 PM	28	12.5
Average Weekday	243	Morning Peak	21	8.6
		Evening Peak	25	10.3

[a]Vehicles per day.
[b]Vehicles per hour.
[c]Percent of daily traffic occurring during the peak hour.

VEHICLE SPEEDS

Spot speeds were recorded by automatic traffic recorders (ATR) placed along Century Mill Road and Spectacle Hill Road over a 48-hour period. The results of the speed measurements are summarized in Table 2. As shown, the mean speed along Century Mill Road varied between is 36 and 38 mph. The 85th percentile speed was recorded at 42, 43 and 44 mph. The 10 mph pace speed was generally recorded at 35-44 mph for both the eastbound and westbound direction of travel. Along Spectacle Hill Road, the mean speed varied between 28 and 32 mph with the 85th percentile speed recorded at 35 mph northbound and between 38 and 39 mph southbound. The pace speed was recorded at 25-34 mph for the northbound direction and between 26-35 mph and 30-39 mph southbound. The actual data is reproduced in the appendix of this report.

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TABLE 2
VEHICLE SPEED SUMMARY

Location/ Direction of Travel	Official Speed Limit[a] (mph)[b]	Mean 50th Percentile Speed (mph)	85th Percentile Speed (mph)	10 mph Pace Speed (mph)	Total Number of Observations
Century Mill Road adjacent to the Proposed North Site Drive:					
Eastbound					
Wednesday, 1/7/04	40	36	42	30-39	398
Thursday, 1/8/04	40	38	44	35-44	363
Total	--	--	--	--	761
Westbound					
Wednesday, 1/7/04	40	37	43	35-44	401
Thursday, 1/8/04	40	37	43	35-44	372
Total	--	--	--	--	773
Spectacle Hill Road adjacent to the Proposed West Site Drive:					
Northbound					
Wednesday, 1/7/04	40	30	35	25-34	126
Thursday, 1/8/04	40	28	35	25-34	96
Total	--	--	--	--	222
Southbound					
Wednesday, 1/7/04	40	31	38	30-39	136
Thursday, 1/8/04	40	32	39	26-35	128
Total	--	--	--	--	264

[a]Based on information provided by the Bolton Police Department.
[b]mph = miles per hour.

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FUTURE TRAFFIC VOLUME CONDITIONS

INTRODUCTION

This section of the report determines the future traffic volume levels along the study area roadways and intersections. To determine the impact of site-generated traffic volumes on the roadway network under future conditions, the existing traffic volumes in the study area were projected to the year 2010 to be consistent with Massachusetts State guidelines for Traffic Impact Assessments. Traffic volumes on the roadway network at that time would include all existing traffic, background traffic growth, and the site-generated traffic volumes.

BACKGROUND TRAFFIC GROWTH

Traffic growth on area roadways is a function of the expected land development in the immediate area as well as the surrounding region. Several methods can be used to estimate this growth. A procedure frequently employed is to identify the location and type of new developments planned to occur during the designated planning horizon, estimate the traffic to be generated and assign it to the area roadway network. This method usually produces a realistic estimate of growth for local traffic.

The Planning Office for the Town of Bolton was consulted during the preparation of this Study to identify existing and projected development projects anticipated to occur by 2010. Based on this information and other background information, the existing traffic volumes were increased to account for 150 apartments and 30 single family homes to be located along Central Street in Hudson and by +2.0 percent per year up through 2010.

Figures 4 and 5 graphically present the 2010 No Build weekday morning and evening peak-hour traffic volumes.

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Figure 4: 2010 No Build
Weekday Morning
Peak Hour Traffic Volumes

Schematic

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Figure 5: 2010 No Build
Weekday Evening
Peak Hour Traffic Volumes

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VEHICLE-TRIP GENERATION

Traffic volumes generated by residential developments normally follow well-established patterns with respect to magnitude and temporal distribution. Measurements of numerous such developments published by the Institute of Transportation Engineers (ITE) have established trip generation rates, which have been standardized for analysis purposes. The rate at which residential projects generate vehicle-trips depends on the type of residential project; i.e., single-family homes, duplexes versus condominiums, age-restricted residences, etc.

Based on the Institute of Transportation Engineers (ITE) trip generation rates for single family homes, it is anticipated that 78 residences would generate approximately 828 vehicle-trips per day (vpd). This daily volume would be split evenly with 414 vehicle-trips entering and 414 vehicle-trips exiting the site over the course of the entire 24-hour day.

More importantly, during the weekday morning peak hour, the proposed project would generate a total of 64 vehicle-trips with 16 vehicle-trips entering and 48 vehicle-trips exiting the project site. Similarly, during the evening peak hour, it is anticipated that 86 vehicle-trips would be generated. The 86 vehicle-trips would consist of 54 vehicle-trips entering and 32 vehicle-trips exiting the project parcel during the peak 60-minute period. The remaining vehicle-trips would occur over the course of the day.

Table 3 summarizes the peak-hour and daily project-generated traffic volumes for the proposed 78 single family homes.

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TABLE 3
VEHICLE-TRIP GENERATION SUMMARY [a]

Time Period/ Direction of Travel	78 Single Family Homes
Weekday Morning Peak Hour	
Entering (vph)[b]	16
Exiting (vph)	48
Total (vph)	64
Weekday Evening Peak Hour	
Entering (vph)	54
Exiting (vph)	32
Total (vph)	86
Average Weekday	
Entering (vpd)[c]	414
Exiting (vpd)	414
Total (vpd)	828

[a]Source: Institute of Transportation Engineers (ITE) *Trip Generation*, 7th Edition, 2003, Land Use Code 210 Single Family Homes.
[b]vph = vehicle-trips per hour.
[c]vpd = vehicle-trips per day.

TRAFFIC DISTRIBUTION/ASSIGNMENT

Directional distribution of generated trips to and from the proposed development is expected to follow existing traffic patterns which, in turn, is a function of population densities, shopping opportunities, areas of employment and recreational activities. Accordingly, the directional split of the new trips originating from, or destined to, the development was based on existing traffic patterns as observed for this study. Table 4 summarizes the traffic distribution and assignment of site-generated trips.

The site-generated traffic volumes were superimposed onto the 2010 No Build traffic volume networks creating the 2010 Build traffic volume networks. Figures 6 and 7 graphically present the 2010 Build weekday morning and evening peak-hour traffic volume networks.

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Figure 6: 2010 Build
Weekday Morning
Peak Hour Traffic Volumes

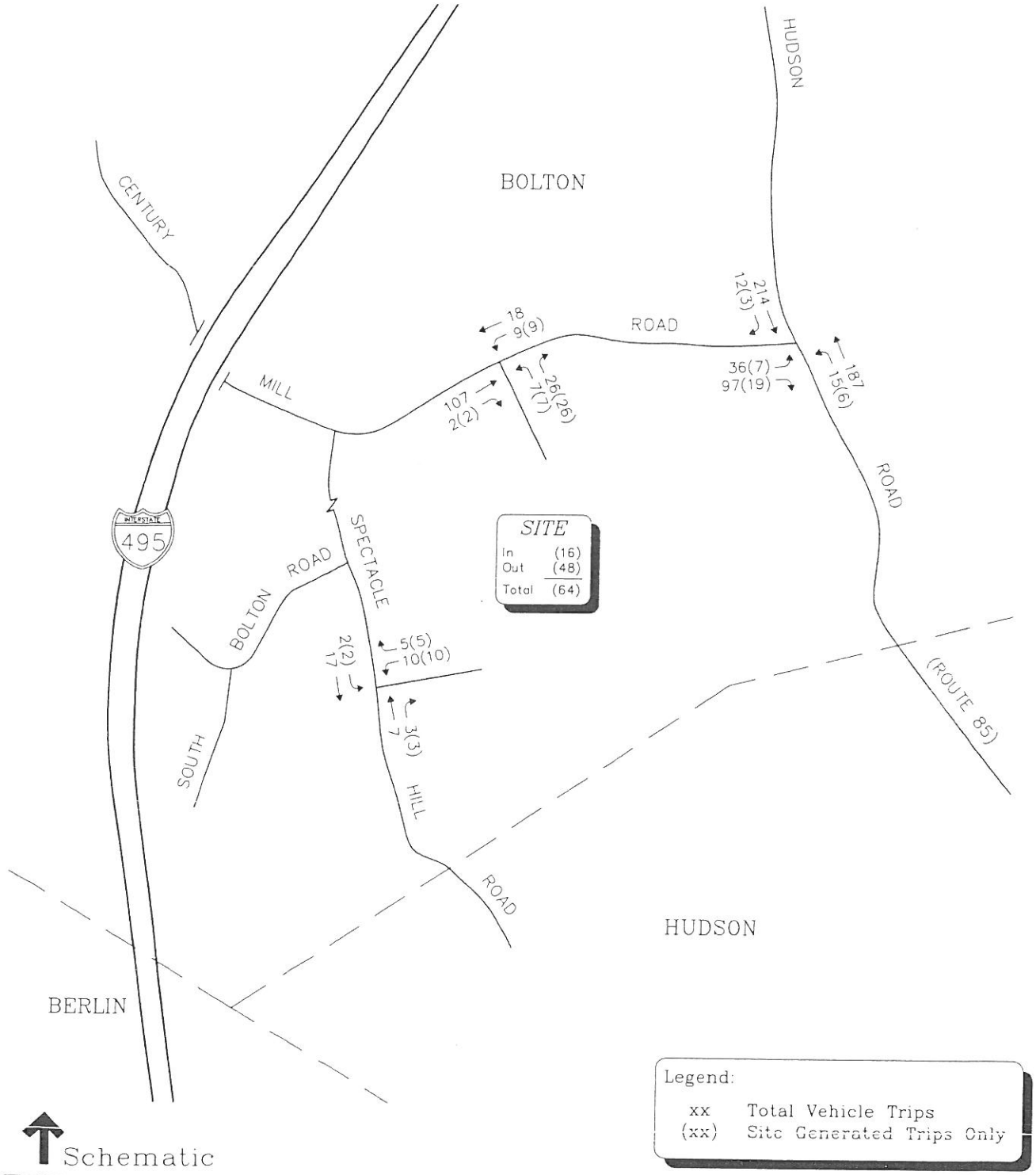

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TABLE 4
PROJECT-GENERATED VEHICLE-TRIP ASSIGNMENT

Time Period/ Direction of Travel	Site Driveway Total 100%	To/From East Via Century Mill Road (55%)	To/From West Via Century Mill Road (15%)	To/From North via Spectacle Hill Road (10%)	To/From South Via Spectacle Hill Road (20%)
Weekday Morning Peak Hour					
Entering (vph)[a]	16	9	2	2	3
Exiting (vph)	48	26	7	5	10
Total (vph)	64	35	9	7	13
Weekday Evening Peak Hour					
Entering (vph)	54	30	8	5	11
Exiting (vph)	32	18	5	3	6
Total (vph)	86	48	13	8	17
Average Weekday					
Entering (vpd)[b]	414	228	62	41	83
Exiting (vpd)	414	228	62	41	83
Total (vpd)	828	456	124	82	166

[a]vph = vehicle-trips per hour.
[b]vpd = vehicle-trips per day.

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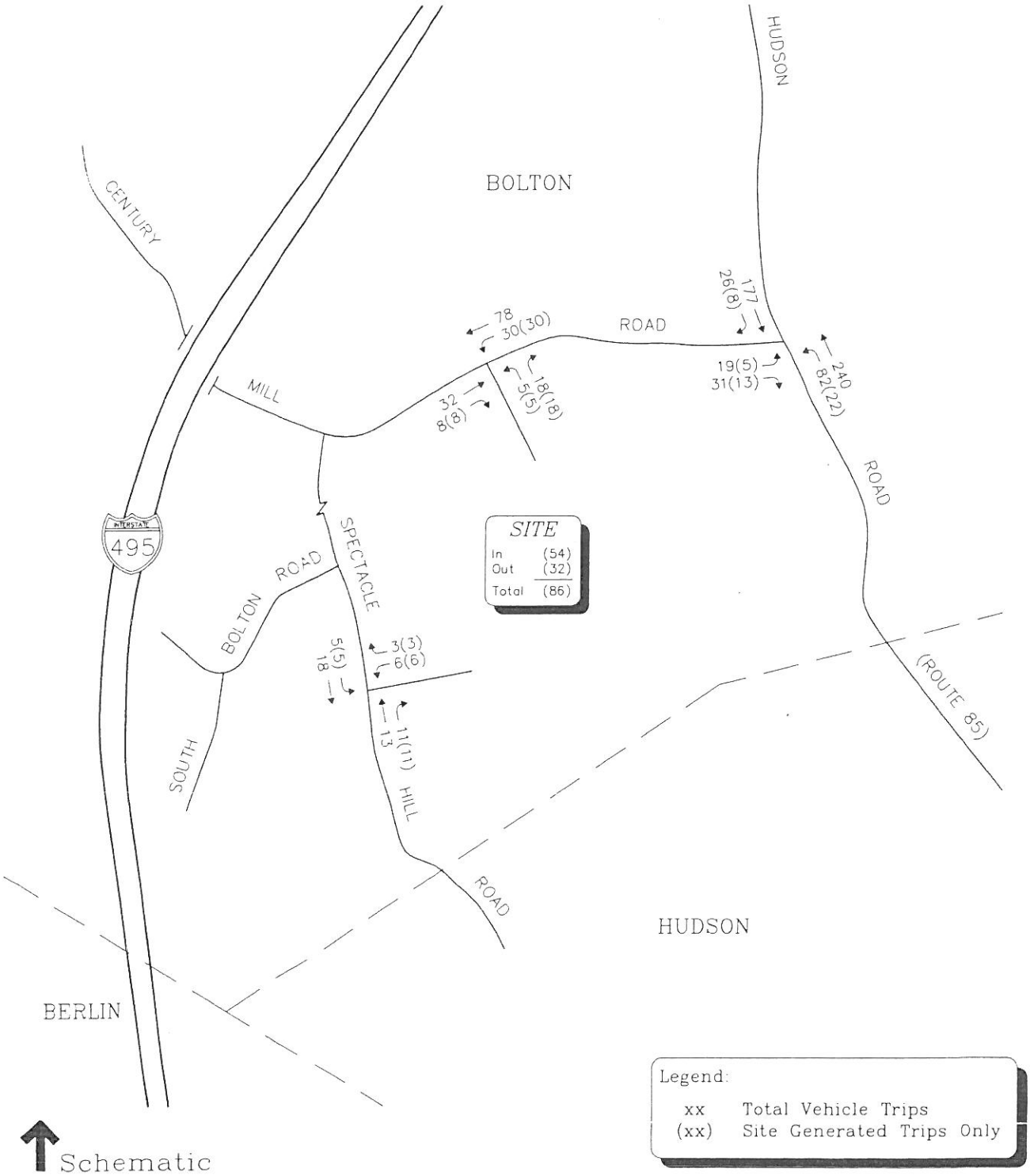
Figure 7: 2010 Build
Weekday Evening
Peak Hour Traffic Volumes



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TRAFFIC ANALYSIS

To assess quality of flow along the study area roadways and intersections, an Intersection Level of Service (LOS) Analysis was conducted under the following analysis conditions:

- 2005 Existing Traffic Volume Conditions
- 2010 No Build Traffic Volume Conditions
- 2010 Build Traffic Volume Conditions

The LOS Analysis will provide an indication of how well the roadway facilities serve the traffic demands placed upon them.

METHODOLOGY

Level of Service

The primary result of capacity analysis is the assignment of level of service to traffic facilities under various traffic-flow conditions.[1] The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, safety, and convenience.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst.

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[1] *Highway Capacity Manual* (HCM 2000): Transportation Research Board, Washington, DC, 2000.

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Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

Unsignalized Intersections

The levels of service for unsignalized intersections are determined by application of a procedure described in the HCM 2000 *Highway Capacity Manual.*[2] The procedure accounts for lane configuration on both the minor and major approaches, conflicting traffic stream volumes, and type of intersection control (STOP versus YIELD). First, theoretical maximum or capacity flow of vehicles for each minor approach lane is calculated. The capacities are then compared to the demand at the respective minor approaches. The delay is then calculated based on the critical gap time, move-up time as well as other various factors. Table 5 summarizes the relationship between level of service and expected delay to minor street traffic.

TABLE 5
LEVEL-OF-SERVICE CRITERIA FOR STOP-CONTROLLED INTERSECTIONS[a]

Level of Service	Average Control Delay (Seconds/Vehicle)
A	≤ 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50

[a]Source: *Highway Capacity Manual,* (HCM 2000): Transportation Research Board, Washington, DC, 2000.

TRAFFIC ANALYSIS RESULTS

Capacity analyses have been conducted at the study area intersections. Results of these analyses are summarized below by intersection and are tabulated in Table 6.

Century Mill Road at the Proposed North Site Drive

Under 2010 Build with development traffic volume conditions, the left- and right-turns exiting the site and the left-turns entering the site would operate at LOS A during both the morning and evening peak hours.

[2]*Highway Capacity Manual,* (HCM 2000): Transportation Research Board, Washington, DC, 2000.

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Spectacle Hill Road at the Proposed West Site Drive

Similar to the Proposed North Site Drive intersection, the left-turns entering the site and the left- and right-turns exiting the site would operate at LOS A during both the morning and evening peak hours under 2010 Build with development traffic volume conditions.

Hudson Road at Century Mill Road

The left-turns movement on Hudson Road will operate at LOS A up through the 2010 Build traffic volume conditions. The left- and right-turns on Century Mill Road will operate at LOS B during both the morning and evening peak hours up through 2010 Build with development traffic volume conditions.

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TABLE 6
UNSIGNALIZED INTERSECTION LEVEL-OF- SERVICE SUMMARY

Location/Peak Hour/ Turning Movement	2005 Existing			2010 No-Build			2010 Build		
	LOS[a]	ACD[b]	Demand[c]	LOS	ACD	Demand	LOS	ACD	Demand
Century Mill Road at the Proposed North Site Drive									
Morning Peak Hour									
Westbound Left-Turns Entering	-	---	--	-	---	--	A	7.6	9
Northbound All Movements Exiting	-	---	--	-	---	--	A	9.5	35
Evening Peak Hour									
Westbound Left-Turns Entering	-	---	--	-	---	--	A	7.3	32
Northbound All Movements Exiting	-	---	--	-	---	--	A	8.8	24
Spectacle Hill Road at the Proposed West Site Drive									
Morning Peak Hour									
Southbound Left Turns Entering	-	---	--	-	---	--	A	7.2	2
Westbound All Movements Exiting	-	---	--	-	---	--	A	8.6	15
Evening Peak Hour									
Southbound Left Turns Entering	-	---	--	-	---	--	A	7.3	5
Westbound All Movements Exiting	-	---	--	-	---	--	A	8.7	9
Century Mill Road at Hudson Road									
Morning Peak Hour									
Northbound Left Turns	A	7.6	8	A	7.7	9	A	7.7	16
Eastbound Left & Right Turns	B	10.5	105	B	10.9	115	B	11.3	144
Evening Peak Hour									
Northbound Left Turns	A	7.7	58	A	7.8	65	A	7.8	89
Westbound Left & Right Turns	B	10.7	31	B	11.3	34	B	11.5	53

[a]Level of service.
[b]Average Control Delay (seconds/vehicle).
[c]Demand approach volumes expressed in vehicles per hour.

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SIGHT DISTANCE

Century Mill Road approaches the Proposed North Site Drive over a general level/tangent alignment with a large radius curve located to the east. The roadway alignment is generally tangent in the immediate vicinity of the Proposed West Site Drive. To the south of the Proposed West Site Drive, Spectacle Hill Road slopes down in the northbound direction at a rate of approximately 6% with a large radius curve located to the south. To the north, Spectacle Hill Road is generally level. Detailed Sight Distance measurements were conducted with respect to the Century Mill Road and Spectacle Hill Road approaches to the proposed new intersections to identify any potential mitigation measures, which would enhance the available Sight Distance.

Sight Distance considerations are basically divided into two criteria: (1) Stopping Sight Distance (SSD) and (2) Intersection Sight Distance (ISD).

STOPPING SIGHT DISTANCE (SSD)

SSD is the distance required for an approaching vehicle to perceive and react accordingly to an exiting or entering vehicle. The values are based upon a perception and reaction time of 2.5 seconds and a braking distance calculated for wet level pavement. When the roadway is either on an upgrade or downgrade greater than 3 percent, grade correction factors are applied.

INTERSECTION SIGHT DISTANCE (ISD)

ISD is based upon a perception and reaction time and the time required to complete a desired exiting maneuver after the decision to do so has been made. Values for ISD represent the time required to: (1) turn left or right and to accelerate to the operating speed of the street without causing approaching vehicles to reduce speed by more than 70% of the initial/design speed and (2) upon turning left, or crossing the major roadway, to clear the roadway without causing approaching vehicles to reduce speed by more than 70% of the initial/design speed.

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SSD is far more important as it represents the minimum distance required for stopping, while the ISD criteria is based only upon acceptable speed reductions to the approaching traffic stream.

Table 7 compares the measured SSD with the minimum SSD requirements for both the 85th percentile observed vehicle speeds as well as the official speed limit along both Century Mill Road and Spectacle Hill Road in the vicinity of the proposed new intersections. As can be seen in Table 7 the available SSD along both Century Mill Road and Spectacle Hill Road exceeds the minimum SSD requirements for the official speed limit of 30 mph as well as the observed 85th percentile speed of up to 44 mph.

TABLE 7
SUMMARY OF STOPPING SIGHT DISTANCE ANALYSIS

Location/ Direction of Travel	Official Speed Limit (mph)[a]	85th Percentile Observed Speed (mph)	Measured SSD[b] (feet)	SSD Requirements (feet) for Design Speed Condition[c] (mph)				
				35	39	40	43	44
Century Mill Road at the Proposed North Site Drive Intersection:								
East of the North Site Drive								
Vehicle B Approaching Looking West	40	43 WB	+338	---	---	305	338	---
Vehicle A Exiting Looking East	40	43 WB	+338	---	---	305	338	---
West of the North Site Drive								
Vehicle A Exiting Looking West	40	44 EB	+349	---	---	305	---	349
Vehicle B Approaching Looking East	40	44 EB	+349	---	---	305	---	349
Spectacle Hill Road at the Proposed West Site Drive Intersection:								
North of the West Site Drive								
Vehicle B Approaching Looking South	40	39 SB	+305	---	294	305	---	---
Vehicle A Exiting Looking North	40	39 SB	+305	---	294	305	---	---
South of the West Site Drive[d]								
Vehicle A Exiting Looking South	40	35 NB	+305	271	---	305	---	---
Vehicle B Approaching Looking North	40	35 NB	+305	271	---	305	---	---

[a]*Miles per hour.*
[b]*SSD measurements occurred on December 22, 2003 and assumes the recommendations contained in this report are implemented.*
[c]*Source: A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials (AASHTO): 4th Edition, 2001.*
[d]*SSD was increased to account for a downslope of 6.0%. The existing downslope ranged between 5.5 to 6.0%.*

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APPENDIX

- TRAFFIC VOLUME AND VEHICLE SPEED DATA
- CAPACITY ANALYSIS

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TRAFFIC VOLUME AND VEHICLE SPEED DATA

TDC
Transportation Data Corporation
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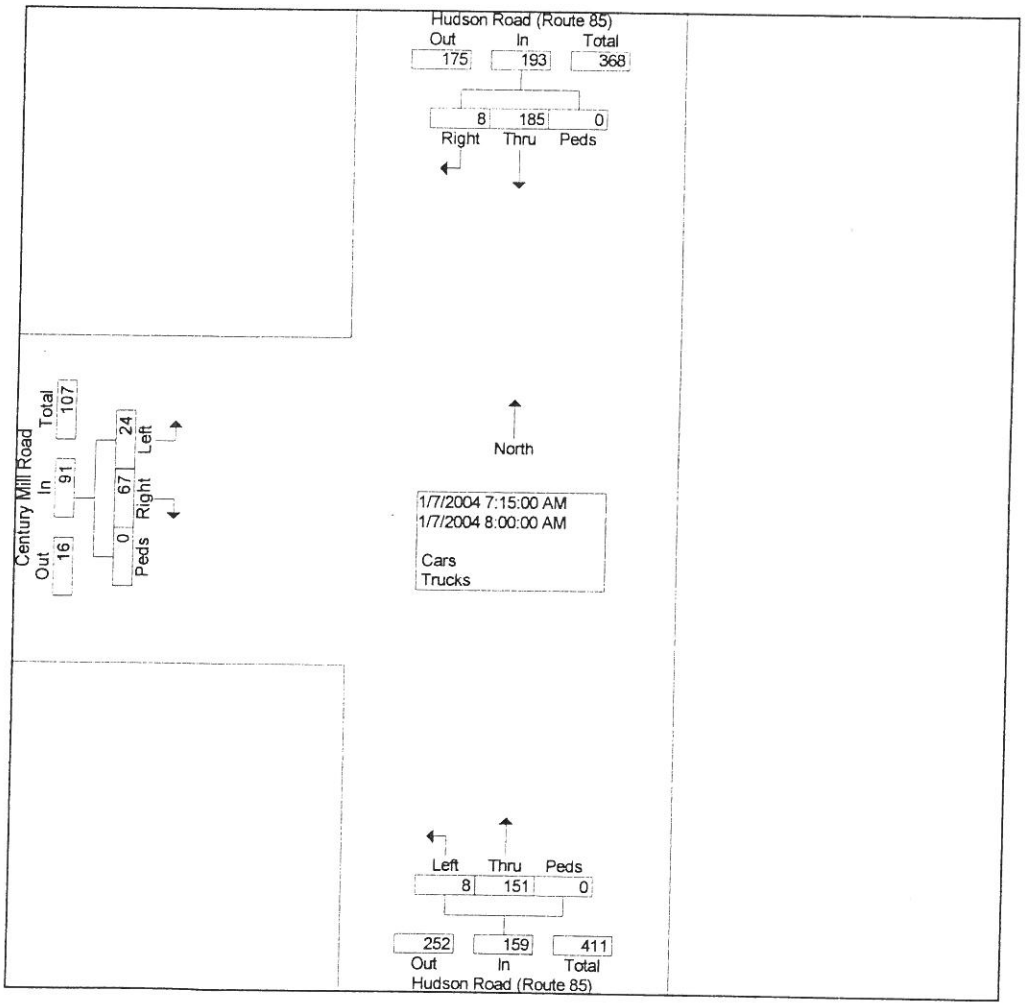
7

N/S: Hudson Road (Route 85)
W: Century Mill Road
City, State: Bolton, MA
Client: DJK/D. Kelly

File Name : 02797A
Site Code : 00000657
Start Date : 01/07/2004
Page No : 1

	Hudson Road (Route 85) From North					Hudson Road (Route 85) From South					Century Mill Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
eak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																
Intersection	07:15 AM															
Volume	8	185	0	0	193	0	151	8	0	159	67	0	24	0	91	443
Percent	4.1	95.9	0.0	0.0		0.0	95.0	5.0	0.0		73.6	0.0	26.4	0.0		
07:30 Volume	1	49	0	0	50	0	46	1	0	47	19	0	3	0	22	119
Peak Factor																0.931
High Int.	08:00 AM					07:30 AM					07:45 AM					
Volume	3	48	0	0	51	0	46	1	0	47	17	0	8	0	25	
Peak Factor					0.946					0.846					0.910	



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Hudson Road (Route 85)
entury Mill Road
State: Bolton, MA
: DJK/D. Kelly

File Name : 02797A
Site Code : 00000657
Start Date : 01/07/2004
Page No : 1

Groups Printed- Cars - Trucks

	Hudson Road (Route 85) From North				Hudson Road (Route 85) From South				Century Mill Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	1	39	0	0	0	33	2	0	17	0	5	0	97
07:15 AM	2	45	0	0	0	42	4	0	15	0	7	0	115
07:30 AM	1	49	0	0	0	46	1	0	19	0	3	0	119
07:45 AM	2	43	0	0	0	37	2	0	17	0	8	0	109
Total	6	176	0	0	0	158	9	0	68	0	23	0	440
08:00 AM	3	48	0	0	0	26	1	0	16	0	6	0	100
08:15 AM	1	43	0	0	0	46	2	0	8	0	8	0	108
08:30 AM	3	24	0	0	0	33	1	0	7	0	4	0	72
08:45 AM	4	38	0	0	0	24	4	0	8	0	4	0	82
Total	11	153	0	0	0	129	8	0	39	0	22	0	362
Grand Total	17	329	0	0	0	287	17	0	107	0	45	0	802
Apprch %	4.9	95.1	0.0	0.0	0.0	94.4	5.6	0.0	70.4	0.0	29.6	0.0	
Total %	2.1	41.0	0.0	0.0	0.0	35.8	2.1	0.0	13.3	0.0	5.6	0.0	

	Hudson Road (Route 85) From North					Hudson Road (Route 85) From South					Century Mill Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
r From 07:00 AM to 08:45 AM - Peak 1 of 1																
rsection	07:15 AM															
Volume	8	185	0	0	193	0	151	8	0	159	67	0	24	0	91	443
Percent	4.1	95.9	0.0	0.0		0.0	95.0	5.0	0.0		73.6	0.0	26.4	0.0		
Volume	1	49	0	0	50	0	46	1	0	47	19	0	3	0	22	119
‹ Factor																0.931
High Int.	08:00 AM					07:30 AM					07:45 AM					
Volume	3	48	0	0	51	0	46	1	0	47	17	0	8	0	25	
‹ Factor					0.946					0.846					0.910	

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Hudson Road (Route 85)
entury Mill Road
State: Bolton, MA
: DJK/D. Kelly

File Name : 02797A
Site Code : 00000657
Start Date : 01/07/2004
Page No : 1

Groups Printed- Cars

	Hudson Road (Route 85) From North				Hudson Road (Route 85) From South				Century Mill Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	1	37	0	0	0	32	2	0	17	0	5	0	94
07:15 AM	2	43	0	0	0	41	3	0	15	0	7	0	111
07:30 AM	1	48	0	0	0	44	1	0	19	0	3	0	116
07:45 AM	2	42	0	0	0	36	2	0	17	0	8	0	107
Total	6	170	0	0	0	153	8	0	68	0	23	0	428
08:00 AM	3	47	0	0	0	23	1	0	16	0	6	0	96
08:15 AM	1	43	0	0	0	45	2	0	8	0	8	0	107
08:30 AM	3	21	0	0	0	31	1	0	7	0	4	0	67
08:45 AM	4	38	0	0	0	24	4	0	8	0	4	0	82
Total	11	149	0	0	0	123	8	0	39	0	22	0	352
Grand Total	17	319	0	0	0	276	16	0	107	0	45	0	780
Apprch %	5.1	94.9	0.0	0.0	0.0	94.5	5.5	0.0	70.4	0.0	29.6	0.0	
Total %	2.2	40.9	0.0	0.0	0.0	35.4	2.1	0.0	13.7	0.0	5.8	0.0	

	Hudson Road (Route 85) From North					Hudson Road (Route 85) From South					Century Mill Road From West					
tart Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
r From 07:00 AM to 08:45 AM - Peak 1 of 1																
rsection	07:15 AM															
Volume	8	180	0	0	188	0	144	7	0	151	67	0	24	0	91	430
Percent	4.3	95.7	0.0	0.0		0.0	95.4	4.6	0.0		73.6	0.0	26.4	0.0		
Volume	1	48	0	0	49	0	44	1	0	45	19	0	3	0	22	116
‹ Factor																0.927
High Int.	08:00 AM					07:30 AM					07:45 AM					
Volume	3	47	0	0	50	0	44	1	0	45	17	0	8	0	25	
‹ Factor					0.940					0.839					0.910	

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Hudson Road (Route 85)
ntury Mill Road
State: Bolton, MA
: DJK/D. Kelly

File Name : 02797A
Site Code : 00000657
Start Date : 01/07/2004
Page No : 1

Groups Printed- Trucks

	Hudson Road (Route 85) From North				Hudson Road (Route 85) From South				Century Mill Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	2	0	0	0	1	0	0	0	0	0	0	3
07:15 AM	0	2	0	0	0	1	1	0	0	0	0	0	4
07:30 AM	0	1	0	0	0	2	0	0	0	0	0	0	3
07:45 AM	0	1	0	0	0	1	0	0	0	0	0	0	2
Total	0	6	0	0	0	5	1	0	0	0	0	0	12
08:00 AM	0	1	0	0	0	3	0	0	0	0	0	0	4
08:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
08:30 AM	0	3	0	0	0	2	0	0	0	0	0	0	5
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	4	0	0	0	6	0	0	0	0	0	0	10
Grand Total	0	10	0	0	0	11	1	0	0	0	0	0	22
Apprch %	0.0	100.0	0.0	0.0	0.0	91.7	8.3	0.0	0.0	0.0	0.0	0.0	
Total %	0.0	45.5	0.0	0.0	0.0	50.0	4.5	0.0	0.0	0.0	0.0	0.0	

	Hudson Road (Route 85) From North					Hudson Road (Route 85) From South					Century Mill Road From West					
tart Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
r From 07:00 AM to 08:45 AM - Peak 1 of 1																
rsection	07:15 AM															
Volume	0	5	0	0	5	0	7	1	0	8	0	0	0	0	0	13
Percent	0.0	100.0	0.0	0.0		0.0	87.5	12.5	0.0		0.0	0.0	0.0	0.0		
Volume	0	1	0	0	1	0	3	0	0	3	0	0	0	0	0	4
Factor																0.813
high Int.	07:15 AM					08:00 AM					6:45:00 AM					
Volume	0	2	0	0	2	0	3	0	0	3						
Factor					0.625					0.667						

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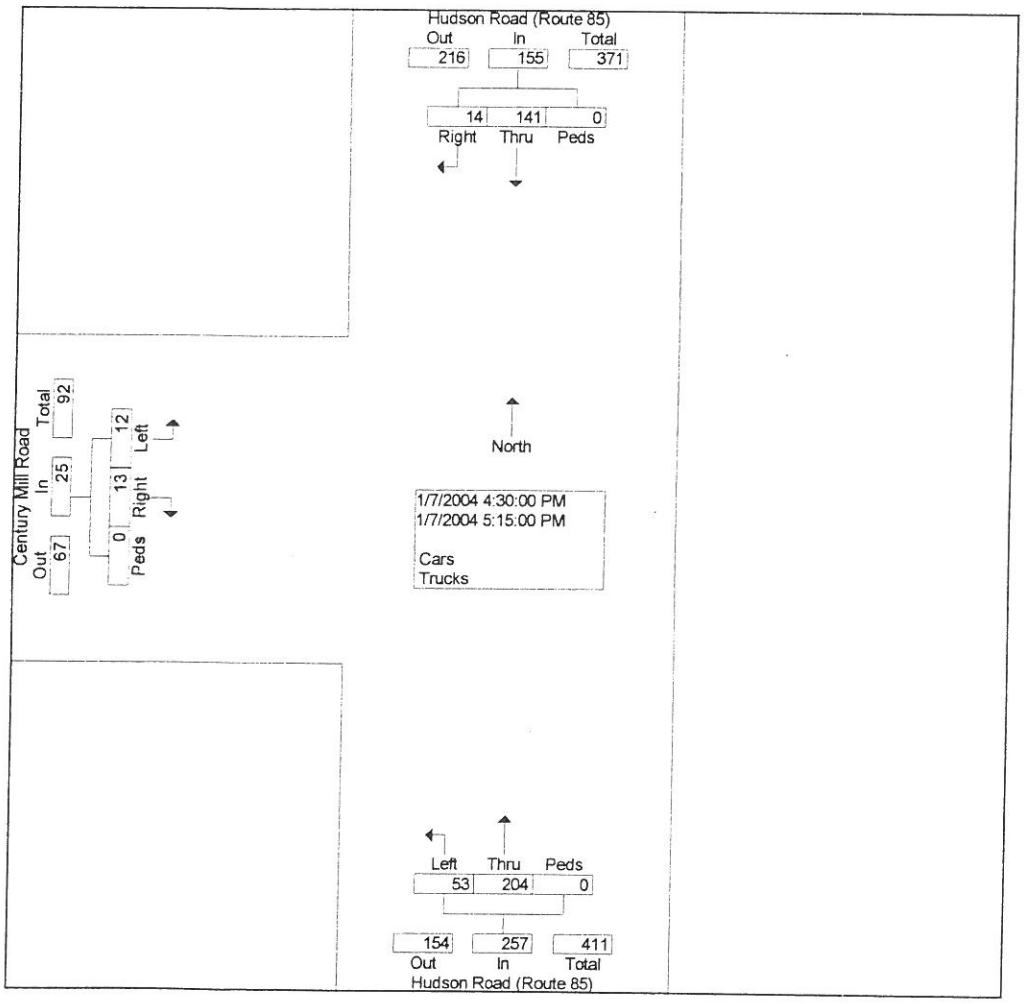
V: Century Mill Road
City, State: Bolton, MA
Client: DJK/D. Kelly

File Name : 02797AA
Site Code : 00000657
Start Date : 01/07/2004
Page No : 1

	Hudson Road (Route 85) From North					Hudson Road (Route 85) From South					Century Mill Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
eak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																
Intersection	04:30 PM															
Volume	14	141	0	0	155	0	204	53	0	257	13	0	12	0	25	437
Percent	9.0	91.0	0.0	0.0		0.0	79.4	20.6	0.0		52.0	0.0	48.0	0.0		
05:15 Volume	3	35	0	0	38	0	53	17	0	70	5	0	2	0	7	115
Peak Factor																0.950
High Int.	04:30 PM					05:15 PM					04:30 PM					
Volume	7	36	0	0	43	0	53	17	0	70	4	0	5	0	9	
Peak Factor					0.901					0.918					0.694	



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Hudson Road (Route 85)
ntury Mill Road
State: Bolton, MA
: DJK/D. Kelly

File Name : 02797AA
Site Code : 00000657
Start Date : 01/07/2004
Page No : 1

Groups Printed- Cars - Trucks

	Hudson Road (Route 85) From North				Hudson Road (Route 85) From South				Century Mill Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	2	34	0	0	0	45	9	0	1	0	0	0	91
04:15 PM	6	39	0	0	0	39	8	0	3	0	1	0	96
04:30 PM	7	36	0	0	0	48	11	0	4	0	5	0	111
04:45 PM	2	31	0	0	0	49	10	0	1	0	3	0	96
Total	17	140	0	0	0	181	38	0	9	0	9	0	394
05:00 PM	2	39	0	0	0	54	15	0	3	0	2	0	115
05:15 PM	3	35	0	0	0	53	17	0	5	0	2	0	115
05:30 PM	6	30	0	0	0	39	17	0	5	0	4	0	101
05:45 PM	7	45	0	0	0	35	7	0	5	0	2	0	101
Total	18	149	0	0	0	181	56	0	18	0	10	0	432
Grand Total	35	289	0	0	0	362	94	0	27	0	19	0	826
Apprch %	10.8	89.2	0.0	0.0	0.0	79.4	20.6	0.0	58.7	0.0	41.3	0.0	
Total %	4.2	35.0	0.0	0.0	0.0	43.8	11.4	0.0	3.3	0.0	2.3	0.0	

	Hudson Road (Route 85) From North					Hudson Road (Route 85) From South					Century Mill Road From West					
tart Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
r From 04:00 PM to 05:45 PM - Peak 1 of 1																
rsection	04:30 PM															
Volume	14	141	0	0	155	0	204	53	0	257	13	0	12	0	25	437
Percent	9.0	91.0	0.0	0.0		0.0	79.4	20.6	0.0		52.0	0.0	48.0	0.0		
Volume	3	35	0	0	38	0	53	17	0	70	5	0	2	0	7	115
Factor																0.950
High Int.	04:30 PM					05:15 PM					04:30 PM					
Volume	7	36	0	0	43	0	53	17	0	70	4	0	5	0	9	
Factor					0.901					0.918					0.694	

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ntury Mill Road
State: Bolton, MA
: DJK/D. Kelly

File Name : 02797AA
Site Code : 00000657
Start Date : 01/07/2004
Page No : 1

Groups Printed- Cars

	Hudson Road (Route 85) From North				Hudson Road (Route 85) From South				Century Mill Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	2	34	0	0	0	43	9	0	1	0	0	0	89
04:15 PM	6	39	0	0	0	38	8	0	3	0	1	0	95
04:30 PM	7	36	0	0	0	46	11	0	4	0	4	0	108
04:45 PM	2	31	0	0	0	49	10	0	1	0	3	0	96
Total	17	140	0	0	0	176	38	0	9	0	8	0	388
05:00 PM	2	39	0	0	0	54	15	0	3	0	2	0	115
05:15 PM	3	35	0	0	0	53	17	0	5	0	2	0	115
05:30 PM	6	30	0	0	0	39	17	0	5	0	4	0	101
05:45 PM	7	45	0	0	0	35	7	0	5	0	2	0	101
Total	18	149	0	0	0	181	56	0	18	0	10	0	432
Grand Total	35	289	0	0	0	357	94	0	27	0	18	0	820
Apprch %	10.8	89.2	0.0	0.0	0.0	79.2	20.8	0.0	60.0	0.0	40.0	0.0	
Total %	4.3	35.2	0.0	0.0	0.0	43.5	11.5	0.0	3.3	0.0	2.2	0.0	

	Hudson Road (Route 85) From North					Hudson Road (Route 85) From South					Century Mill Road From West					
tart Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
r From 04:00 PM to 05:45 PM - Peak 1 of 1																
rsection	04:30 PM															
Volume	14	141	0	0	155	0	202	53	0	255	13	0	11	0	24	434
Percent	9.0	91.0	0.0	0.0		0.0	79.2	20.8	0.0		54.2	0.0	45.8	0.0		
Volume	3	35	0	0	38	0	53	17	0	70	5	0	2	0	7	115
(Factor																0.943
High Int.	04:30 PM					05:15 PM					04:30 PM					
Volume	7	36	0	0	43	0	53	17	0	70	4	0	4	0	8	
(Factor					0.901					0.911					0.750	

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6/

Hudson Road (Route 85)
ntury Mill Road
tate: Bolton, MA
DJK/D. Kelly

File Name : 02797AA
Site Code : 00000657
Start Date : 01/07/2004
Page No : 1

Groups Printed- Trucks

	Hudson Road (Route 85) From North				Hudson Road (Route 85) From South				Century Mill Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
04:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	2	0	0	0	0	1	0	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	5	0	0	0	0	1	0	6
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	5	0	0	0	0	1	0	6
Apprch %	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	100.0	0.0	
Total %	0.0	0.0	0.0	0.0	0.0	83.3	0.0	0.0	0.0	0.0	16.7	0.0	

	Hudson Road (Route 85) From North					Hudson Road (Route 85) From South					Century Mill Road From West					
:art Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
From 04:00 PM to 05:45 PM - Peak 1 of 1																
section	04:00 PM															
Volume	0	0	0	0	0	0	5	0	0	5	0	0	1	0	1	6
Percent	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	100.0	0.0		
Volume	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	3
Factor																0.500
ligh Int.	3:45:00 PM					04:00 PM					04:30 PM					
Volume	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	
Factor										0.625					0.250	

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entury Mill Road
west of Site Driveway
City, State: Bolton, MA
lient: DJK/D. Kelly

Site Code: 65
02797Bvolum

07-Jan-04
Wed

Start Time	EB A.M.		EB P.M.		WB A.M.		WB P.M.		Combined A.M.		Combined P.M.	
12:00	1		4		0		6		1		10	
12:15	1		6		0		5		1		11	
12:30	2		2		0		4		2		6	
12:45	0	4	4	16	2	2	6	21	2	6	10	37
01:00	0		7		1		2		1		9	
01:15	1		3		1		4		2		7	
01:30	0		2		0		4		0		6	
01:45	0	1	10	22	0	2	5	15	0	3	15	37
02:00	0		4		0		6		0		10	
02:15	0		5		0		7		0		12	
02:30	0		6		0		5		0		11	
02:45	0	0	4	19	0	0	7	25	0	0	11	44
03:00	1		2		0		10		1		12	
03:15	0		5		0		9		0		14	
03:30	0		7		0		6		0		13	
03:45	0	1	5	19	1	1	16	41	1	2	21	60
04:00	0		0		0		12		0		12	
04:15	0		6		0		12		0		18	
04:30	1		4		0		18		1		22	
04:45	2	3	4	14	0	0	9	51	2	3	13	65
05:00	1		6		1		16		2		22	
05:15	0		8		0		17		0		25	
05:30	1		6		0		22		1		28	
05:45	0	2	8	28	0	1	14	69	0	3	22	97
06:00	4		3		0		14		4		17	
06:15	2		2		1		7		3		9	
06:30	13		3		1		13		14		16	
06:45	14	33	1	9	3	5	12	46	17	38	13	55
07:00	16		3		1		6		17		9	
07:15	26		2		3		9		29		11	
07:30	19		8		2		4		21		12	
07:45	26	87	2	15	4	10	4	23	30	97	6	38
08:00	20		3		4		4		24		7	
08:15	14		5		2		2		16		7	
08:30	12		3		3		3		15		6	
08:45	8	54	0	11	6	15	1	10	14	69	1	21
09:00	9		3		6		2		15		5	
09:15	3		1		1		7		4		8	
09:30	6		0		1		1		7		1	
09:45	6	24	0	4	5	13	3	13	11	37	3	17
10:00	4		1		2		6		6		7	
10:15	6		0		3		4		9		4	
10:30	1		0		1		1		2		1	
10:45	5	16	1	2	3	9	1	12	8	25	2	14
11:00	1		0		2		1		3		1	
11:15	2		0		5		0		7		0	
11:30	8		1		4		0		12		1	
11:45	2	13	0	1	5	16	0	1	7	29	0	2
Total	238		160		74		327		312		487	
ercent	76.3%		32.9%		23.7%		67.1%					
Day Total		398				401				799		
Peak	07:15		05:00		08:15		05:00		07:15		05:00	
olume	91		28		17		69		104		97	
.H.F.	0.875		0.700		0.708		0.784		0.867		0.866	

TDC
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Office: 508-651-1610 Fax: 508-651-1229

10/

entury Mill Road
west of Site Driveway
City, State: Bolton, MA
lient: DJK/D. Kelly

Site Code: 657
02797Bvolume

Start Time	EB A.M.		EB P.M.		WB A.M.		WB P.M.		Combined A.M.		Combined P.M.		08-Jan-04 Thu
12:00	0		6		0		8		0		14		
12:15	0		7		0		8		0		15		
12:30	0		2		2		6		2		8		
12:45	0	0	3	18	0	2	2	24	0	2	5	42	
01:00	0		1		2		4		2		5		
01:15	0		4		0		5		0		9		
01:30	0		3		0		1		0		4		
01:45	0	0	2	10	0	2	1	11	0	2	3	21	
02:00	0		2		0		3		0		5		
02:15	0		1		0		5		0		6		
02:30	0		3		0		4		0		7		
02:45	0	0	5	11	0	0	8	20	0	0	13	31	
03:00	0		1		0		12		0		13		
03:15	0		5		0		12		0		17		
03:30	0		5		0		2		0		7		
03:45	0	0	3	14	0	0	8	34	0	0	11	48	
04:00	0		5		0		12		0		17		
04:15	0		4		0		10		0		14		
04:30	0		6		0		18		0		24		
04:45	1	1	4	19	1	1	12	52	2	2	16	71	
05:00	0		3		0		23		0		26		
05:15	0		4		0		22		0		26		
05:30	2		4		0		15		2		19		
05:45	3	5	4	15	0	0	17	77	3	5	21	92	
06:00	2		1		0		8		2		9		
06:15	4		0		2		8		6		8		
06:30	9		4		1		5		10		9		
06:45	18	33	4	9	2	5	6	27	20	38	10	36	
07:00	13		3		1		10		14		13		
07:15	22		3		4		3		26		6		
07:30	21		2		2		3		23		5		
07:45	28	84	1	9	3	10	4	20	31	94	5	29	
08:00	24		0		6		2		30		2		
08:15	13		1		4		4		17		5		
08:30	16		4		4		4		20		8		
08:45	9	62	1	6	3	17	2	12	12	79	3	18	
09:00	5		1		2		5		7		6		
09:15	8		1		2		0		10		1		
09:30	6		1		2		2		8		3		
09:45	3	22	1	4	3	9	3	10	6	31	4	14	
10:00	6		1		2		3		8		4		
10:15	7		2		4		0		11		2		
10:30	6		0		3		0		9		0		
10:45	3	22	1	4	4	13	2	5	7	35	3	9	
11:00	2		0		3		1		5		1		
11:15	3		0		8		0		11		0		
11:30	5		0		3		0		8		0		
11:45	5	15	0	0	6	20	0	1	11	35	0	1	
Total	244		119		79		293		323		412		
Percent	75.5%		28.9%		24.5%		71.1%						
Day Total		363				372				735			
Peak	07:15		04:00		11:00		05:00		07:15		04:30		
Volume	95		19		20		77		110		92		
P.H.F.	0.848		0.679		0.625		0.837		0.887		0.885		

11/

TDC
Transportation Data Corporation
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Office: 508-651-1610 Fax: 508-651-1229

pectacle Hill Road
north of Site Driveway
City, State: Bolton, MA
Client: DJK/D. Kelly

Site Code: 657
02797Avolume

Start Time	NB A.M.		NB P.M.		SB A.M.		SB P.M.		Combined A.M.		Combined P.M.	07-Jan-04 Wed
12:00	0		4		0		3		0		7	
12:15	1		2		0		2		1		4	
12:30	0		7		0		3		0		10	
12:45	0	1	2	15	0	0	3	11	0	1	5	26
01:00	0		8		0		0		0		8	
01:15	0		1		1		2		1		3	
01:30	0		1		0		5		0		6	
01:45	0	0	2	12	0	1	4	11	0	1	6	23
02:00	0		1		0		2		0		3	
02:15	0		3		0		0		0		3	
02:30	0		2		0		3		0		5	
02:45	0	0	3	9	0	0	2	7	0	0	5	16
03:00	0		1		0		1		0		2	
03:15	0		4		0		3		0		7	
03:30	0		0		0		0		0		0	
03:45	0	0	3	8	0	0	2	6	0	0	5	14
04:00	0		1		0		2		0		3	
04:15	0		2		0		2		0		4	
04:30	0		1		0		3		0		4	
04:45	0	0	2	6	0	0	2	9	0	0	4	15
05:00	1		4		0		3		1		7	19
05:15	0		1		0		3		0		4	19
05:30	0		1		1		3		1		4	19
05:45	0	1	1	7	1	2	6	15	1	3	7	22 *
06:00	0		3		1		1		1		4	
06:15	0		1		1		3		1		4	
06:30	2		1		0		1		2		2	
06:45	3	5	0	5	3	5	0	5	6	10	0	10
07:00	0		3		1		4		1		7	
07:15	1		3		3		2		4		5	
07:30	4		3		3		1		7		4	
07:45	1	6	3	12	3	10	1	8	4	16	4	20
08:00	2		2		4		0		6	21 *	2	
08:15	0		2		3		3		3	20	5	
08:30	1		1		4		1		5	18	2	
08:45	3	6	0	5	3	14	1	5	6	20	1	10
09:00	4		1		4		1		8		2	
09:15	2		0		2		0		4		0	
09:30	1		2		1		1		2		3	
09:45	2	9	1	4	3	10	3	5	5	19	4	9
10:00	5		1		1		0		6		1	
10:15	3		0		2		1		5		1	
10:30	2		0		0		1		2		1	
10:45	0	10	0	1	1	4	0	2	1	14	0	3
11:00	0		0		1		0		1		0	
11:15	0		0		0		0		0		0	
11:30	3		0		3		0		6		0	
11:45	1	4	0	0	2	6	0	0	3	10	0	0
Total	42		84		52		84		94		168	
Percent	44.7%		50.0%		55.3%		50.0%					
Day Total		126				136				262		
Peak	09:45		00:15		07:45		05:00		08:30		00:15	
Volume	12		19		14		15		23		27	
P.H.F.	0.600		0.594		0.875		0.625		0.719		0.675	

12/

TDC
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acle Hill Road
n of Site Driveway
State: Bolton, MA
: DJK/D. Kelly

Site Code: 657
02797Avolume

08-Jan-04
Thu

rt	NB				SB				Combined			
.e	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
2:00	0		4		0		2		0		6	
2:15	0		3		0		3		0		6	
:30	0		0		0		1		0		1	
:45	0	0	0	7	0	0	4	10	0	0	4	17
1:00	0		1		0		2		0		3	
1:15	0		3		1		3		1		6	
:30	0		2		0		0		0		2	
:45	0	0	1	7	0	1	3	8	0		4	15
2:00	0		1		0		2		0		3	
2:15	0		2		0		1		0		3	
:30	0		2		0		3		0		5	
:45	0	0	1	6	0	0	3	9	0	0	4	15
3:00	0		1		0		1		0		2	
3:15	0		1		0		3		0		4	
3:30	0		1		0		3		0		4	
45	0	0	3	6	0	0	4	11	0	0	7	17
00	0		4		0		4		0		8	
4:15	0		4		0		2		0		6	
4:30	0		2		0		6		0		8	
45	0	0	2	12	0	0	4	16	0	0	6	28 *
00	0		3		1		1		1		4	24
5:15	1		2		2		3		3		5	23
5:30	0		0		0		4		0		4	19
45	0	1	1	6	2	5	4	12	2	6	5	18
00	0		1		0		0		0		1	
6.15	0		3		0		1		0		4	
6:30	3		1		1		3		4		4	
45	3	6	1	6	3	4	0	4	6	10	1	10
00	2		2		3		3		5		5	
.15	1		1		2		1		3		2	
7:30	3		1		3		1		6		2	
7:45	1	7	2	6	3	11	1	6	4	18	3	12
00	1		1		6		4		7		5	
15	1		0		3		0		4		0	
8:30	0		0		0		0		0		0	
8:45	5	7	2	3	0	9	0	4	5	16	2	7
00	1		1		2		2		3		3	
15	3		1		1		0		4		1	
9:30	0		0		1		0		1		0	
9:45	0	4	0	2	0	4	0	2	0	8	0	4
00	0		0		2		0		2		0	
5	3		2		3		0		6		2	
.30	0		0		1		0		1		0	
0:45	0	3	0	2	0	6	0	0	0	9	0	2
1:00	2		0		2		0		4		0	
5	0		0		0		0		0		0	
0	1		0		2		0		3		0	
1:45	2	5	0	0	2	6	0	0	4	11	0	0
Total	33		63		46		82		79		145	
nt	41.8%		43.4%		58.2%		56.6%					
Day Total		96				128				224		
eak	06:30		03:45		07:30		03:45		07:30		03:45	
ume	9		13		15		16		21		29	
.F.	0.450		0.813		0.625		0.667		0.750		0.906	

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TDC
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13/

Century Mill Road
west of Site Driveway
City, Sate: Bolton, MA
Client: DJK/D. Kelly
EB

Site Code: 657
02797BSPEED

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 999	Total	Ave. Speed
01/07/04	0	0	0	1	0	3	0	0	0	0	0	0	0	4	33
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	30
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	30
04:00	0	0	0	0	1	2	0	0	0	0	0	0	0	3	35
05:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	34
06:00	0	0	0	1	14	12	6	0	0	0	0	0	0	33	35
07:00	0	0	1	9	13	43	18	3	0	0	0	0	0	87	36
08:00	0	0	0	3	10	21	14	6	0	0	0	0	0	54	38
09:00	0	0	0	2	12	7	3	0	0	0	0	0	0	24	34
10:00	0	0	0	1	5	5	4	1	0	0	0	0	0	16	37
11:00	0	0	3	1	1	6	2	0	0	0	0	0	0	13	33
12 PM	0	0	0	0	3	5	7	1	0	0	0	0	0	16	39
13:00	0	0	2	4	8	3	4	1	0	0	0	0	0	22	33
14:00	0	0	0	2	8	4	4	1	0	0	0	0	0	19	35
15:00	0	0	0	2	4	10	3	0	0	0	0	0	0	19	36
16:00	0	0	0	0	5	4	4	1	0	0	0	0	0	14	37
17:00	0	0	0	6	11	10	1	0	0	0	0	0	0	28	33
18:00	0	0	0	0	4	4	1	0	0	0	0	0	0	9	35
19:00	0	0	2	1	6	2	3	1	0	0	0	0	0	15	34
20:00	0	0	1	0	4	4	1	1	0	0	0	0	0	11	35
21:00	0	0	0	1	0	2	1	0	0	0	0	0	0	4	34
22:00	0	0	0	0	1	0	1	0	0	0	0	0	0	2	35
23:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	35
Total	0	0	9	34	113	149	77	16	0	0	0	0	0	398	
Percent	0.0%	0.0%	2.3%	8.5%	28.4%	37.4%	19.3%	4.0%	0.0%	0.0%	0.0%	0.0%	0.0%		

%ile Speed

15th Percentile :	30 MPH
50th Percentile :	36 MPH
85th Percentile :	42 MPH
95th Percentile :	44 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	262
Percent in Pace :	65.8%
Number of Vehicles > 35 MPH :	212
Percent of Vehicles > 35 MPH :	53.3%
Mean Speed(Average) :	36 MPH

TDC
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14/

Century Mill Road
vest of Site Driveway
City, Sate: Bolton, MA
Client: DJK/D. Kelly
EB

Site Code: 657
02797BSPEED

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 999	Total	Ave. Speed
01/08/04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
04:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1	40
05:00	0	0	0	0	0	2	3	0	0	0	0	0	0	5	40
06:00	0	0	0	1	7	11	10	2	1	1	0	0	0	33	39
07:00	0	0	0	0	10	26	38	8	1	1	0	0	0	84	40
08:00	0	0	0	0	6	22	20	11	3	0	0	0	0	62	41
09:00	0	0	0	1	6	6	5	3	1	0	0	0	0	22	38
10:00	0	0	0	2	9	6	2	3	0	0	0	0	0	22	36
11:00	0	0	0	1	1	7	5	1	0	0	0	0	0	15	38
12 PM	0	0	1	2	2	5	6	2	0	0	0	0	0	18	37
13:00	1	0	0	2	0	4	3	0	0	0	0	0	0	10	32
14:00	0	0	0	0	4	5	1	0	1	0	0	0	0	11	37
15:00	0	0	0	0	0	7	6	1	0	0	0	0	0	14	39
16:00	0	0	0	0	8	8	3	0	0	0	0	0	0	19	36
17:00	0	1	0	5	3	3	3	0	0	0	0	0	0	15	32
18:00	1	1	0	1	5	1	0	0	0	0	0	0	0	9	28
19:00	0	2	1	1	1	4	0	0	0	0	0	0	0	9	29
20:00	0	0	0	2	3	1	0	0	0	0	0	0	0	6	31
21:00	1	0	0	0	2	1	0	0	0	0	0	0	0	4	24
22:00	0	0	0	2	1	1	0	0	0	0	0	0	0	4	30
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Total	3	4	2	20	68	120	106	31	7	2	0	0	0	363	
Percent	0.8%	1.1%	0.6%	5.5%	18.7%	33.1%	29.2%	8.5%	1.9%	0.6%	0.0%	0.0%	0.0%		

%ile Speed

15th Percentile :	31 MPH
50th Percentile :	38 MPH
85th Percentile :	44 MPH
95th Percentile :	48 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	226
Percent in Pace :	62.3%
Number of Vehicles > 35 MPH :	242
Percent of Vehicles > 35 MPH :	66.7%
Mean Speed(Average) :	38 MPH

TDC
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15/

Century Mill Road
west of Site Driveway
City, Sate: Bolton, MA
Client: DJK/D. Kelly
WB

Site Code: 657
02797BSPEED

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 999	Total	Ave. Speed
01/07/04	0	0	0	0	0	1	1	0	0	0	0	0	0	2	40
01:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2	30
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	35
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
05:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	30
06:00	1	0	0	0	0	3	1	0	0	0	0	0	0	5	30
07:00	0	0	3	1	5	1	0	0	0	0	0	0	0	10	29
08:00	0	0	0	2	1	7	3	2	0	0	0	0	0	15	37
09:00	0	0	1	1	3	1	7	0	0	0	0	0	0	13	37
10:00	0	0	1	0	1	3	3	1	0	0	0	0	0	9	37
11:00	0	0	1	0	4	5	5	1	0	0	0	0	0	16	37
12 PM	1	1	0	2	3	7	6	1	0	0	0	0	0	21	35
13:00	0	0	2	3	5	4	0	1	0	0	0	0	0	15	32
14:00	0	0	0	1	5	8	6	4	1	0	0	0	0	25	39
15:00	0	0	1	2	7	20	8	3	0	0	0	0	0	41	37
16:00	0	1	0	2	6	22	13	6	0	1	0	0	0	51	38
17:00	0	0	0	1	12	36	15	5	0	0	0	0	0	69	38
18:00	0	0	0	1	8	18	17	2	0	0	0	0	0	46	38
19:00	0	0	0	1	2	12	5	2	1	0	0	0	0	23	39
20:00	0	0	1	1	2	2	3	1	0	0	0	0	0	10	36
21:00	0	0	0	2	5	5	1	0	0	0	0	0	0	13	34
22:00	0	0	0	1	3	2	6	0	0	0	0	0	0	12	37
23:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	35
Total	2	2	10	22	74	159	100	29	2	1	0	0	0	401	
Percent	0.5%	0.5%	2.5%	5.5%	18.5%	39.7%	24.9%	7.2%	0.5%	0.2%	0.0%	0.0%	0.0%		

%ile Speed

15th Percentile :	31 MPH
50th Percentile :	37 MPH
85th Percentile :	43 MPH
95th Percentile :	46 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	259
Percent in Pace :	64.6%
Number of Vehicles > 35 MPH :	259
Percent of Vehicles > 35 MPH :	64.6%
Mean Speed(Average) :	37 MPH

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16/

Century Mill Road
west of Site Driveway
City, Sate: Bolton, MA
Client: DJK/D. Kelly
WB

Site Code: 657
02797BSPEED

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 999	Total	Ave. Speed
01/08/04	0	0	0	0	0	0	2	0	0	0	0	0	0	2	40
01:00	0	0	0	0	0	1	1	0	0	0	0	0	0	2	40
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
04:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	35
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
06:00	0	0	0	0	2	2	0	1	0	0	0	0	0	5	37
07:00	0	0	1	2	3	2	2	0	0	0	0	0	0	10	33
08:00	0	0	1	0	1	9	5	1	0	0	0	0	0	17	38
09:00	0	0	0	1	0	6	1	1	0	0	0	0	0	9	37
10:00	0	0	0	1	2	5	2	2	1	0	0	0	0	13	39
11:00	0	0	0	0	1	6	10	2	0	1	0	0	0	20	41
12 PM	0	1	0	3	3	8	7	2	0	0	0	0	0	24	36
13:00	0	0	0	1	2	3	4	1	0	0	0	0	0	11	38
14:00	0	1	1	1	3	9	3	2	0	0	0	0	0	20	36
15:00	0	0	2	2	0	12	15	3	0	0	0	0	0	34	39
16:00	0	0	0	1	10	17	21	3	0	0	0	0	0	52	38
17:00	0	0	4	1	15	29	19	8	1	0	0	0	0	77	37
18:00	0	1	2	5	15	4	0	0	0	0	0	0	0	27	31
19:00	1	0	1	3	8	6	1	0	0	0	0	0	0	20	31
20:00	0	0	1	1	3	6	1	0	0	0	0	0	0	12	34
21:00	0	0	0	0	7	2	1	0	0	0	0	0	0	10	33
22:00	0	0	0	0	1	2	2	0	0	0	0	0	0	5	38
23:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	25
Total	1	3	13	23	76	130	97	26	2	1	0	0	0	372	
Percent	0.3%	0.8%	3.5%	6.2%	20.4%	34.9%	26.1%	7.0%	0.5%	0.3%	0.0%	0.0%	0.0%		

%ile Speed

15th Percentile :	31 MPH
50th Percentile :	37 MPH
85th Percentile :	43 MPH
95th Percentile :	46 MPH

Stats

10 MPH Pace Speed :	35-44 MPH
Number in Pace :	227
Percent in Pace :	61.0%
Number of Vehicles > 35 MPH :	230
Percent of Vehicles > 35 MPH :	61.8%
Mean Speed(Average) :	37 MPH

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17/

Spectacle Hill Road
north of Site Driveway
City, State: Bolton, MA
Client: DJK/D. Kelly
NB

Site Code: 657
02797ASPEED

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 999	Total	Ave. Speed
01/07/04															
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	30
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
06:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	*
07:00	0	0	2	1	2	0	0	0	0	0	0	0	0	1	20
08:00	0	0	0	3	2	1	0	0	0	0	0	0	0	5	26
09:00	0	0	2	0	4	0	0	0	0	0	0	0	0	6	29
10:00	0	2	1	5	1	0	0	0	0	0	0	0	0	6	28
11:00	0	0	1	4	2	3	0	0	0	0	0	0	0	9	24
12 PM	7	0	1	0	2	0	1	0	0	0	0	0	0	10	30
13:00	0	0	0	3	4	1	0	0	0	0	0	0	0	4	30
14:00	1	2	1	3	2	4	0	0	0	0	0	0	0	15	18
15:00	0	1	0	1	5	1	0	0	0	0	0	0	0	12	29
16:00	0	0	0	3	4	0	1	0	0	0	0	0	0	9	28
17:00	0	0	0	1	4	1	0	0	0	0	0	0	0	8	31
18:00	0	0	0	2	3	1	1	0	0	0	0	0	0	6	32
19:00	0	0	0	3	2	0	0	0	0	0	0	0	0	7	33
20:00	0	0	1	1	4	6	0	0	0	0	0	0	0	5	28
21:00	0	0	0	2	1	2	0	0	0	0	0	0	0	12	34
22:00	0	1	0	3	0	0	0	0	0	0	0	0	0	5	31
23:00	0	0	0	0	1	0	0	0	0	0	0	0	0	4	23
Total	8	6	10	35	44	20	3	0	0	0	0	0	0	1	30
Percent	6.3%	4.8%	7.9%	27.8%	34.9%	15.9%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0	*
														126	

%ile Speed

15th Percentile :	22 MPH
50th Percentile :	30 MPH
85th Percentile :	35 MPH
95th Percentile :	39 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	79
Percent in Pace :	62.7%
Number of Vehicles > 30 MPH :	58
Percent of Vehicles > 30 MPH :	46.0%
Mean Speed(Average) :	28 MPH

Spectacle Hill Road
north of Site Driveway
City, State: Bolton, MA
Client: DJK/D. Kelly
NB

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18/

Site Code: 657
02797ASPEED

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 999	Total	Ave. Speed
01/08/04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
05:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	25
06:00	0	0	1	2	3	1	0	0	0	0	0	0	0	6	31
07:00	0	0	1	2	3	1	0	0	0	0	0	0	0	7	30
08:00	0	0	0	2	4	0	0	0	0	0	0	0	0	7	30
09:00	0	0	2	1	1	1	0	0	0	0	0	0	0	4	30
10:00	0	0	1	1	0	0	0	0	0	0	0	0	0	3	22
11:00	0	1	1	2	2	1	0	0	0	0	0	0	0	5	30
12 PM	0	0	1	1	0	3	0	0	0	0	0	0	0	7	29
13:00	0	0	0	2	2	3	0	0	0	0	0	0	0	7	33
14:00	0	0	3	1	1	3	0	0	0	0	0	0	0	6	32
15:00	0	0	2	4	2	0	0	0	0	0	0	0	0	6	26
16:00	0	0	1	2	4	1	1	0	0	0	0	0	0	12	30
17:00	0	1	0	5	1	1	1	0	0	0	0	0	0	6	31
18:00	0	2	1	2	0	0	0	0	0	0	0	0	0	6	25
19:00	0	0	2	1	1	0	0	0	0	0	0	0	0	6	23
20:00	0	0	1	0	0	0	0	0	0	0	0	0	0	3	22
21:00	0	0	1	1	1	0	0	0	0	0	0	0	0	2	25
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	2	24
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Total	0	4	18	32	25	15	2	0	0	0	0	0	0	96	
Percent	0.0%	4.2%	18.8%	33.3%	26.0%	15.6%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		

%ile Speed

15th Percentile :	22 MPH
50th Percentile :	28 MPH
85th Percentile :	35 MPH
95th Percentile :	38 MPH

Stats

10 MPH Pace Speed :	25-34 MPH
Number in Pace :	57
Percent in Pace :	59.4%
Number of Vehicles > 30 MPH :	37
Percent of Vehicles > 30 MPH :	38.5%
Mean Speed(Average) :	29 MPH

Spectacle Hill Road
north of Site Driveway
City, State: Bolton, MA
Client: DJK/D. Kelly
SB

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19/

Site Code: 657
02797ASPEED

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 999	Total	Ave. Speed
01/07/04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
01:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	25
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
05:00	0	0	1	0	0	0	1	0	0	0	0	0	0	2	30
06:00	0	0	1	3	0	1	0	0	0	0	0	0	0	5	27
07:00	0	0	1	2	1	4	2	0	0	0	0	0	0	10	34
08:00	0	0	2	1	8	2	1	0	0	0	0	0	0	14	31
09:00	0	1	0	1	2	5	1	0	0	0	0	0	0	10	34
10:00	0	0	0	2	1	1	0	0	0	0	0	0	0	4	30
11:00	1	0	0	1	1	0	3	0	0	0	0	0	0	6	30
12 PM	3	0	2	0	4	2	0	0	0	0	0	0	0	11	22
13:00	0	1	2	1	1	5	1	0	0	0	0	0	0	11	32
14:00	1	0	1	1	2	2	0	0	0	0	0	0	0	7	27
15:00	0	0	1	1	1	3	0	0	0	0	0	0	0	6	32
16:00	0	0	0	4	2	2	0	1	0	0	0	0	0	9	32
17:00	0	0	4	3	4	4	0	0	0	0	0	0	0	15	30
18:00	0	0	0	2	1	2	0	0	0	0	0	0	0	5	31
19:00	2	0	1	2	2	1	0	0	0	0	0	0	0	8	22
20:00	0	0	0	4	0	1	0	0	0	0	0	0	0	5	28
21:00	0	0	1	1	0	3	0	0	0	0	0	0	0	5	31
22:00	0	0	0	1	0	1	0	0	0	0	0	0	0	2	30
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Total	7	2	17	31	30	39	9	1	0	0	0	0	0	136	
Percent	5.1%	1.5%	12.5%	22.8%	22.1%	28.7%	6.6%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%		

%ile Speed

15th Percentile :	23 MPH
50th Percentile :	31 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	69
Percent in Pace :	50.7%
Number of Vehicles > 30 MPH :	73
Percent of Vehicles > 30 MPH :	53.7%
Mean Speed(Average) :	30 MPH

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20/

Spectacle Hill Road
north of Site Driveway
City, State: Bolton, MA
Client: DJK/D. Kelly
SB

Site Code: 657
02797ASPEED

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 999	Total	Ave. Speed
01/08/04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	30
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
05:00	0	0	0	1	0	1	3	0	0	0	0	0	0	5	37
06:00	0	0	0	1	2	1	0	0	0	0	0	0	0	4	31
07:00	0	0	2	1	2	4	1	0	1	0	0	0	0	11	34
08:00	0	1	0	0	2	3	3	0	0	0	0	0	0	9	35
09:00	0	0	0	0	2	1	1	0	0	0	0	0	0	4	35
10:00	0	0	0	1	3	2	0	0	0	0	0	0	0	6	32
11:00	0	1	1	1	2	0	1	0	0	0	0	0	0	6	29
12 PM	1	0	2	3	3	1	0	0	0	0	0	0	0	10	26
13:00	0	0	0	3	1	4	0	0	0	0	0	0	0	8	32
14:00	0	0	1	2	3	2	1	0	0	0	0	0	0	9	32
15:00	0	1	2	2	1	4	0	1	0	0	0	0	0	11	31
16:00	0	0	1	4	5	4	2	0	0	0	0	0	0	16	33
17:00	0	0	1	5	1	3	2	0	0	0	0	0	0	12	32
18:00	0	0	1	2	1	0	0	0	0	0	0	0	0	4	26
19:00	0	0	0	3	3	0	0	0	0	0	0	0	0	6	30
20:00	0	0	2	0	2	0	0	0	0	0	0	0	0	4	26
21:00	1	0	1	0	0	0	0	0	0	0	0	0	0	2	10
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Total	2	3	14	29	34	30	14	1	1	0	0	0	0	128	
Percent	1.6%	2.3%	10.9%	22.7%	26.6%	23.4%	10.9%	0.8%	0.8%	0.0%	0.0%	0.0%	0.0%		

%ile Speed	15th Percentile :	24 MPH
	50th Percentile :	32 MPH
	85th Percentile :	39 MPH
	95th Percentile :	43 MPH
Stats	10 MPH Pace Speed :	26-35 MPH
	Number in Pace :	64
	Percent in Pace :	50.0%
	Number of Vehicles > 30 MPH :	73
	Percent of Vehicles > 30 MPH :	57.0%
	Mean Speed(Average) :	32 MPH

CAPACITY ANALYSIS

TWO-WAY STOP CONTROL SUMMARY

1/10

eneral Information		Site Information	
nalyst	*Dermot Kelly, PE, PTOE*	Intersection	*Century Mill at Hudson Road*
gency/Co.	*DJK Associates, Inc.*	Jurisdiction	*Bolton, MA*
te Performed		Analysis Year	*2005 Existing*
alysis Time Period	*Morning Peak Hour*		

Project Description *657 GCG, Bolton, MA*

st/West Street: *Century Mill Road*	North/South Street: *Hudson Road*
ersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

ajor Street	Northbound			Southbound		
ovement	1	2	3	4	5	6
	L	T	R	L	T	R
olume	8	154	0	0	189	8
ak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
ourly Flow Rate, HFR	8	167	0	0	205	8
ercent Heavy Vehicles	0	--	--	0	--	--
edian Type	Undivided					
RT Channelized			0			0
anes	0	1	0	0	1	0
onfiguration	LT					TR
pstream Signal		0			0	

inor Street	Westbound			Eastbound		
ovement	7	8	9	10	11	12
	L	T	R	L	T	R
olume	0	0	0	26	0	71
eak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
ourly Flow Rate, HFR	0	0	0	28	0	77
ercent Heavy Vehicles	0	0	0	0	0	0
ercent Grade (%)		0			0	
lared Approach		N			N	
torage		0			0	
T Channelized			0			0
anes	0	0	0	0	0	0
onfiguration					LR	

elay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
ovement	1	4	7	8	9	10	11	12
ane Configuration	LT						LR	
(vph)	8						105	
(m) (vph)	1369						762	
/c	0.01						0.14	
5% queue length	0.02						0.48	
ontrol Delay	7.6						10.5	
OS	A						B	
pproach Delay	--	--				10.5		
pproach LOS	--	--				B		

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TWO-WAY STOP CONTROL SUMMARY

2/10

eneral Information

alyst	Dermot Kelly, PE, PTOE
ency/Co.	DJK Associates, Inc.
te Performed	8/25/05
alysis Time Period	Evening Peak Hour

Site Information

Intersection	Century Mill at Hudson Road
Jurisdiction	Bolton, MA
Analysis Year	2005 Existing

oject Description 657 GCG, Bolton, MA

st/West Street: Century Mill Road | North/South Street: Hudson Road

ersection Orientation: North-South | Study Period (hrs): 0.25

ehicle Volumes and Adjustments

jor Street	Northbound			Southbound		
vement	1	2	3	4	5	6
	L	T	R	L	T	R
lume	54	208	0	0	144	16
ak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
ourly Flow Rate, HFR	58	226	0	0	156	17
rcent Heavy Vehicles	0	--	--	0	--	--
dian Type	Undivided					
Channelized			0			0
nes	0	1	0	0	1	0
nfiguration	LT					TR
pstream Signal		0			0	

nor Street	Westbound			Eastbound		
vement	7	8	9	10	11	12
	L	T	R	L	T	R
lume	0	0	0	13	0	16
ak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
ourly Flow Rate, HFR	0	0	0	14	0	17
rcent Heavy Vehicles	0	0	0	0	0	0
rcent Grade (%)		0			0	
ared Approach		N			N	
orage		0			0	
Channelized			0			0
anes	0	0	0	0	0	0
onfiguration					LR	

elay, Queue Length, and Level of Service

pproach	NB	SB	Westbound			Eastbound		
vement	1	4	7	8	9	10	11	12
ane Configuration	LT						LR	
(vph)	58						31	
(m) (vph)	1416						663	
c	0.04						0.05	
5% queue length	0.13						0.15	
ontrol Delay	7.7						10.7	
OS	A						B	
pproach Delay	--	--	10.7					
pproach LOS	--	--	B					

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TWO-WAY STOP CONTROL SUMMARY

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General Information		Site Information	
Analyst	*Dermot Kelly, PE, PTOE*	Intersection	*Century Mill at Hudson Road*
Agency/Co.	*DJK Associates, Inc.*	Jurisdiction	*Bolton, MA*
Date Performed	*8/26/05*	Analysis Year	*2010 No Build*
Analysis Time Period	*Morning Peak Hour*		

Project Description *657 GCG, Bolton, MA*

East/West Street: *Century Mill Road*	North/South Street: *Hudson Road*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*9*	*187*	*0*	*0*	*214*	*9*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*9*	*203*	*0*	*0*	*232*	*9*
Percent Heavy Vehicles	*0*	--	--	*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*	*29*	*0*	*78*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*31*	*0*	*84*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
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)	*9*						*115*	
c (m) (vph)	*1337*						*722*	
v/c	*0.01*						*0.16*	
95% queue length	*0.02*						*0.56*	
Control Delay	*7.7*						*10.9*	
LOS	*A*						*B*	
Approach Delay	--	--				*10.9*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

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General Information		Site Information	
Analyst	*Dermot Kelly, PE, PTOE*	Intersection	*Century Mill at Hudson Road*
Agency/Co.	*DJK Associates, Inc.*	Jurisdiction	*Bolton, MA*
Date Performed	*8/26/05*	Analysis Year	*2010 No Build*
Analysis Time Period	*Evening Peak Hour*		

Project Description *657 GCG, Bolton, MA*

East/West Street: *Century Mill Road*	North/South Street: *Hudson Road*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*60*	*240*	*0*	*0*	*177*	*18*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*65*	*260*	*0*	*0*	*192*	*19*
Percent Heavy Vehicles	*0*	--	--	*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*	*14*	*0*	*18*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*15*	*0*	*19*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
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)	*65*						*34*	
c (m) (vph)	*1372*						*609*	
v/c	*0.05*						*0.06*	
95% queue length	*0.15*						*0.18*	
Control Delay	*7.8*						*11.3*	
LOS	*A*						*B*	
Approach Delay	--	--				*11.3*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

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eneral Information		Site Information	
Analyst	*Dermot Kelly, PE, PTOE*	Intersection	*Century Mill at Hudson Road*
Agency/Co.	*DJK Associates, Inc.*	Jurisdiction	*Bolton, MA*
ate Performed	*9/6/05*	Analysis Year	*2010 Build*
alysis Time Period	*Morning Peak Hour*		
Project Description	*657 GCG, Bolton, MA*		
ast/West Street:	*Century Mill Road*	North/South Street:	*Hudson Road*
ersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

ajor Street	Northbound			Southbound		
ovement	1	2	3	4	5	6
	L	T	R	L	T	R
olume	*15*	*187*	*0*	*0*	*214*	*12*
eak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*16*	*203*	*0*	*0*	*232*	*13*
ercent Heavy Vehicles	*0*	--	--	*0*	--	--
edian Type	*Undivided*					
RT Channelized			*0*			*0*
anes	*0*	*1*	*0*	*0*	*1*	*0*
onfiguration	*LT*					*TR*
pstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
ovement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*36*	*0*	*97*
eak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
hourly Flow Rate, HFR	*0*	*0*	*0*	*39*	*0*	*105*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
ercent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
T Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

elay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
ovement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*16*						*144*	
c (m) (vph)	*1333*						*714*	
v/c	*0.01*						*0.20*	
95% queue length	*0.04*						*0.75*	
ontrol Delay	*7.7*						*11.3*	
LOS	*A*						*B*	
pproach Delay	--	--				*11.3*		
pproach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

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eneral Information		Site Information	
Analyst	*Dermot Kelly, PE, PTOE*	Intersection	*Century Mill at Hudson Road*
Agency/Co.	*DJK Associates, Inc.*	Jurisdiction	*Bolton, MA*
ate Performed	*9/6/05*	Analysis Year	*2010 Build*
alysis Time Period	*Evening Peak Hour*		

Project Description *657 GCG, Bolton, MA*

st/West Street: *Century Mill Road*	North/South Street: *Hudson Road*
ersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

ajor Street	Northbound			Southbound		
ovement	1	2	3	4	5	6
	L	T	R	L	T	R
olume	82	240	0	0	177	26
eak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	89	260	0	0	192	28
ercent Heavy Vehicles	0	--	--	0	--	--
edian Type	Undivided					
RT Channelized			0			0
anes	0	1	0	0	1	0
onfiguration	LT					TR
Upstream Signal		0			0	

inor Street	Westbound			Eastbound		
ovement	7	8	9	10	11	12
	L	T	R	L	T	R
olume	0	0	0	19	0	31
eak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	0	0	0	20	0	33
ercent Heavy Vehicles	0	0	0	0	0	0
ercent Grade (%)		0			0	
Flared Approach		N			N	
torage		0			0	
T Channelized			0			0
anes	0	0	0	0	0	0
onfiguration					LR	

elay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
ovement	1	4	7	8	9	10	11	12
ane Configuration	LT						LR	
(vph)	89						53	
(m) (vph)	1361						603	
/c	0.07						0.09	
5% queue length	0.21						0.29	
ontrol Delay	7.8						11.5	
OS	A						B	
pproach Delay	--	--				11.5		
pproach LOS	--	--				B		

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TWO-WAY STOP CONTROL SUMMARY

7/10

eneral Information		Site Information	
Analyst	Dermot Kelly, PE, PTOE	Intersection	Century Mill at North Site Dr.
Agency/Co.	DJK Associates, Inc.	Jurisdiction	Bolton, MA
ate Performed	9/6/05	Analysis Year	2010 Build
Analysis Time Period	Morning Peak Hour		

Project Description 657 GCG, Bolton, MA

st/West Street: Century Mill Road	North/South Street: North Site Drive
ntersection Orientation: East-West	Study Period (hrs): 0.25

ehicle Volumes and Adjustments

ajor Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
olume (veh/h)	0	170	2	9	18	0
eak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate (veh/h)	0	184	2	9	19	0
oportion of heavy hicles, P_{HV}	0	--	--	0	--	--
Median type	Undivided					
T Channelized?			0			0
anes	0	1	0	0	1	0
Configuration			TR	LT		
ostream Signal		0			0	

inor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
olume (veh/h)	7	0	26	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
ourly Flow Rate (veh/h)	7	0	28	0	0	0
oportion of heavy ehicles, P_{HV}	0	0	0	0	0	0
ercent grade (%)	0			0		
hared approach		N			N	
Storage		0			0	
T Channelized?			0			0
anes	0	0	0	0	0	0
onfiguration		LR				

ontrol Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
ane Configuration		LT		LR				
Volume, v (vph)		9		35				
apacity, c_m (vph)		1401		841				
/c ratio		0.01		0.04				
Queue length (95%)		0.02		0.13				
ontrol Delay (s/veh)		7.6		9.5				
OS		A		A				
pproach delay (s/veh)	--	--	9.5					
pproach LOS	--	--	A					

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TWO-WAY STOP CONTROL SUMMARY

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eneral Information

Analyst	*Dermot Kelly, PE, PTOE*
Agency/Co.	*DJK Associates, Inc.*
ate Performed	*9/6/05*
Analysis Time Period	*Evening Peak Hour*

Site Information

Intersection	*Century Mill at North Site Dr.*
Jurisdiction	*Bolton, MA*
Analysis Year	*2010 Build*

Project Description *657 GCG, Bolton, MA*

ast/West Street: *Century Mill Road*	North/South Street: *North Site Drive*
ntersection Orientation: *East-West*	Study Period (hrs): *0.25*

ehicle Volumes and Adjustments

ajor Street	Eastbound			Westbound		
ovement	1	2	3	4	5	6
	L	T	R	L	T	R
olume (veh/h)	0	32	8	30	78	0
eak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate (veh/h)	0	34	8	32	84	0
oportion of heavy hicles, P_{HV}	0	--	--	0	--	--
Median type	Undivided					
T Channelized?			0			0
anes	0	1	0	0	1	0
Configuration			TR	LT		
ostream Signal		0			0	

inor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
olume (veh/h)	5	0	18	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
ourly Flow Rate (veh/h)	5	0	19	0	0	0
oportion of heavy ehicles, P_{HV}	0	0	0	0	0	0
ercent grade (%)	0			0		
ared approach		N			N	
Storage		0			0	
T Channelized?			0			0
anes	0	0	0	0	0	0
onfiguration		LR				

ontrol Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
ovement	1	4	7	8	9	10	11	12
ane Configuration		LT		LR				
olume, v (vph)		32		24				
apacity, c_m (vph)		1580		976				
c ratio		0.02		0.02				
ueue length (95%)		0.06		0.08				
ontrol Delay (s/veh)		7.3		8.8				
OS		A		A				
pproach delay (s/veh)	--	--	8.8					
pproach LOS	--	--	A					

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TWO-WAY STOP CONTROL SUMMARY

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eneral Information		Site Information	
Analyst	*Dermot Kelly, PE, PTOE*	Intersection	*Spectacle Hill at W. Site Dr.*
Agency/Co.	*DJK Associates, Inc.*	Jurisdiction	*Bolton, MA*
ate Performed	*9/6/05*	Analysis Year	*2010 Build*
alysis Time Period	*Weekday Morning Peak Hour*		
Project Description	*657 GCG, Bolton, MA*		
st/West Street:	*West Site Drive*	North/South Street:	*Spectacle Hill Road*
ersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

ajor Street	Northbound			Southbound		
ovement	1	2	3	4	5	6
	L	T	R	L	T	R
olume	0	7	3	2	17	0
eak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
ourly Flow Rate, HFR	0	7	3	2	18	0
ercent Heavy Vehicles	0	--	--	0	--	--
edian Type	Undivided					
T Channelized			0			0
anes	0	1	0	0	1	0
onfiguration			TR	LT		
pstream Signal		0			0	

inor Street	Westbound			Eastbound		
ovement	7	8	9	10	11	12
	L	T	R	L	T	R
olume	10	0	5	0	0	0
eak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
ourly Flow Rate, HFR	10	0	5	0	0	0
ercent Heavy Vehicles	0	0	0	0	0	0
ercent Grade (%)		0			0	
ared Approach		N			N	
torage		0			0	
T Channelized			0			0
anes	0	0	0	0	0	0
onfiguration		LR				

elay, Queue Length, and Level of Service

pproach	NB	SB	Westbound			Eastbound		
ovement	1	4	7	8	9	10	11	12
ane Configuration		LT		LR				
(vph)		2		15				
(m) (vph)		1623		1017				
c		0.00		0.01				
5% queue length		0.00		0.04				
ontrol Delay		7.2		8.6				
OS		A		A				
pproach Delay	--	--	8.6					
pproach LOS	--	--	A					

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TWO-WAY STOP CONTROL SUMMARY

10/10

eneral Information		Site Information	
Analyst	*Dermot Kelly, PE, PTOE*	Intersection	*Spectacle Hill at W. Site Dr.*
Agency/Co.	*DJK Associates, Inc.*	Jurisdiction	*Bolton, MA*
ate Performed	*9/6/05*	Analysis Year	*2010 Build*
alysis Time Period	*Weekday Evening Peak Hour*		

Project Description *657 GCG, Bolton, MA*

ast/West Street: *West Site Drive*	North/South Street: *Spectacle Hill Road*
ersection Orientation: *North-South*	Study Period (hrs): *0.25*

/ehicle Volumes and Adjustments

ajor Street	Northbound			Southbound		
ovement	1	2	3	4	5	6
	L	T	R	L	T	R
olume	0	13	11	5	18	0
eak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR	0	14	11	5	19	0
ercent Heavy Vehicles	0	--	--	0	--	--
edian Type	Undivided					
RT Channelized			0			0
anes	0	1	0	0	1	0
onfiguration			TR	LT		
Upstream Signal		0			0	

inor Street	Westbound			Eastbound		
ovement	7	8	9	10	11	12
	L	T	R	L	T	R
olume	6	0	3	0	0	0
eak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
hourly Flow Rate, HFR	6	0	3	0	0	0
ercent Heavy Vehicles	0	0	0	0	0	0
ercent Grade (%)	0			0		
lared Approach		N			N	
torage		0			0	
T Channelized			0			0
anes	0	0	0	0	0	0
onfiguration		LR				

elay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
ovement	1	4	7	8	9	10	11	12
ane Configuration		LT		LR				
(vph)		5		9				
(m) (vph)		1603		994				
/c		0.00		0.01				
5% queue length		0.01		0.03				
ontrol Delay		7.3		8.7				
OS		A		A				
pproach Delay	--	--	8.7					
pproach LOS	--	--	A					

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