MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

PRINCIPALS
Robert J. Michaud, P.E.
Ronald D. Desrosiers, P.E., PTOE
Daniel J. Mills, P.E., PTOE

MEMORANDUM

DATE: May 31, 2016

TO: Chris Claussen
Sudbury Station LLC
2134 Sevilla Way
Naples, FL 34109

FROM: Robert J. Michaud, P.E. – Managing Principal
Daniel A. Dumais, P.E. – Senior Project Manager

RE: **Supplemental Transportation Responses**
The Village at Sudbury Station – 30 Hudson Road Sudbury, Massachusetts

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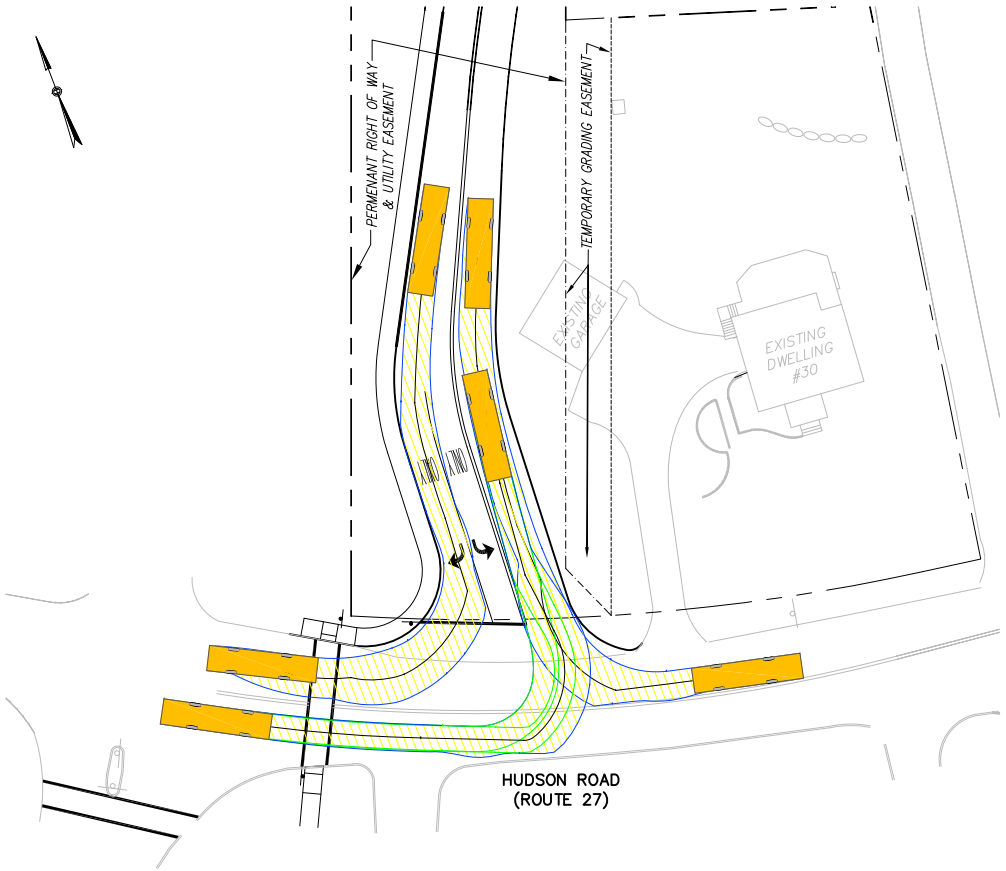
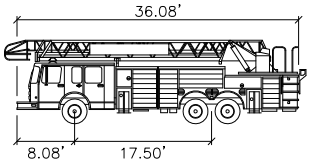
MDM Transportation Consultants, Inc. (MDM) prepared a response to transportation-related peer review comments on March 15, 2016 for the above-referenced project, as issued in a letter by the Town's peer review consultant, Vanasse and Associates, Inc. (VAI), dated March 3, 2016. The peer review comments received to date have all been resolved; however, the Sudbury Zoning Board of Appeals (ZBA) at its March 2016 hearing requested clarification of certain responses and supplemental analysis which is the subject of this memorandum. Specifically, this memorandum provides supplemental transportation responses and clarification for the following topics:

(1) Fire apparatus accessibility at Hudson Road Driveway;
(2) Measures to reduce potential for Site "cut-through" traffic;
(3) Candy Hill Road impacts; and
(4) Pedestrian route inventories and count data

(1) Fire apparatus accessibility at Hudson Road Driveway

The ZBA requested supplemental AutoTurn® analysis for the largest fire apparatus (ladder truck) entering the proposed site driveways along Hudson Road and Concord Road via left-turn entry movements. Supplemental AutoTurn® analysis was prepared using the Sudbury Ladder truck and is shown in **Figure 1**. The analysis indicates that adequate geometry is proposed to accommodate the left turn entry and right turn exit movements along both Hudson Road and Concord Road.





Sudbury Ladder

Width	: 8.33 FT.
Track	: 8.33 FT.
Lock to Lock Time	: 6.0 SEC.
Steering Angle	: 40.6°

Site Plan Source: Sullivan, Connors & Associates

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers
28 Lord Road, Suite 280
Marlborough, MA 01752

Scale: As Noted
DWG No. 814 Autoturn(5-19-2016).dwg

Date: May 2016
Project No. 814

Proposed Residential Devlopment
Sudbury, Massachusetts

SCALE
0 10 20 40 80 FEET

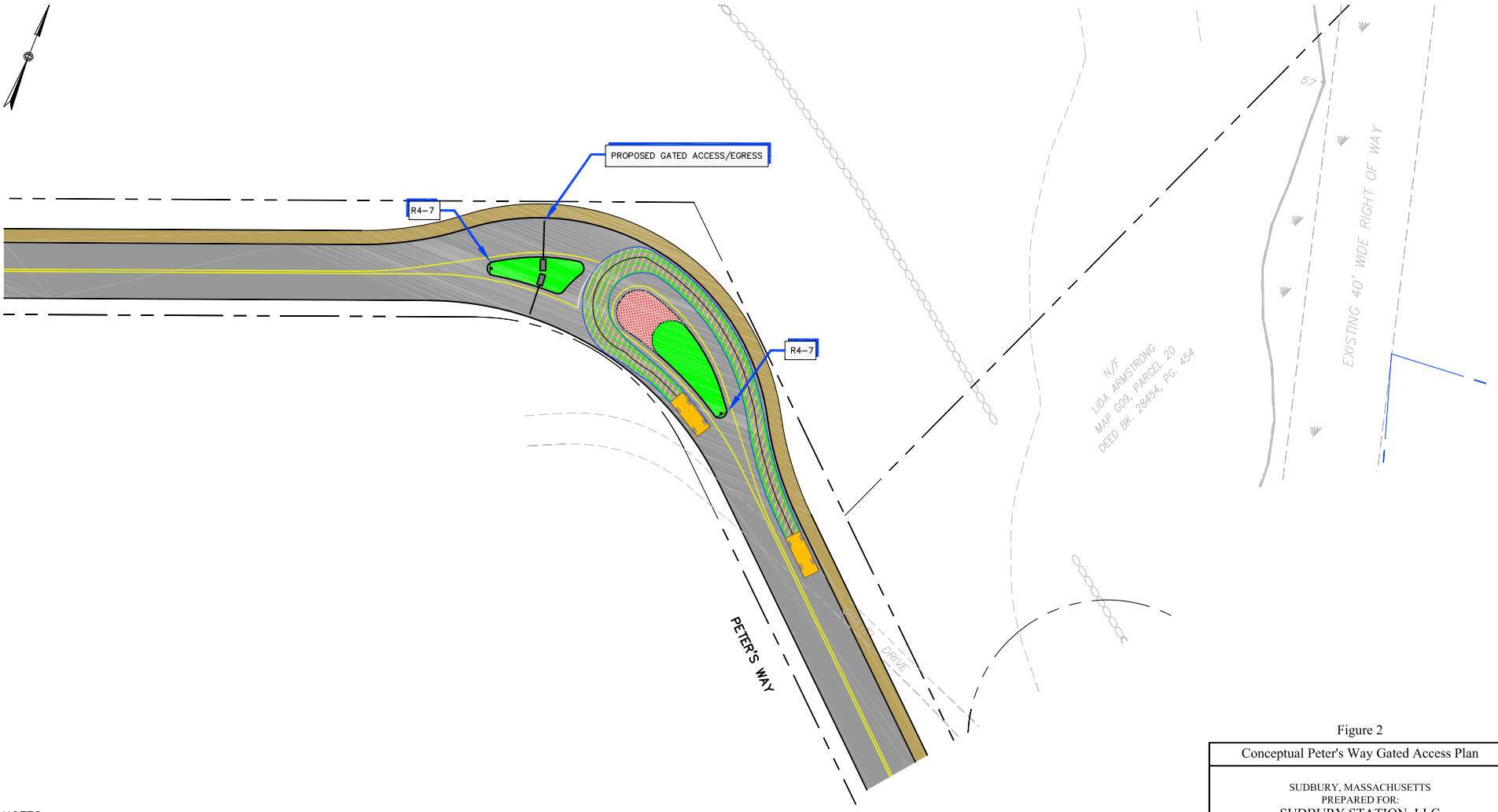
Figure 1
AutoTurn Analysis
Sudbury Ladder Truck

(2) Measures to Reduce Potential For Site "Cut-Through" Traffic

The ZBA expressed concern that the Site may be used as a "cut-through" to avoid the Town Center traffic signal when travelling south on Concord Road. Under the proposed (and ongoing) Town Center roadway improvements this southbound approach will continue to experience long delays and vehicle queues during peak commute hours (particularly evening peak hours), potentially prompting some motorists to use Peter's Way to access Route 27 west. As described below, the Proponent will place gates on Peter's Way that will address this issue by restricting access to the Site to residents, Fire, Police and authorized visitors only.

As a point of reference, Town Center improvements include traffic signal enhancements that will reduce average delays and vehicle queuing relative to existing conditions – thereby reducing the likelihood that the Site will provide a convenient cut-through route during commute periods. In addition, site design features are intended to reduce the potential for cut-through including a roundabout, and the comparatively longer travel distance and travel times based on field time trials it is unlikely that a significant cut-through phenomenon would result. However, to further discourage cut-through traffic, the Proponent has re-worked the Peter's Way driveway to include a restricted entry/exit system as shown in **Figure 2**. The system will require a keyless entry system ("FOB" transmitter or passcode/swipe card) for entry and will have an automated gated system (vehicle loop detection) to control exit movements which will require vehicles to a "STOP" prior to entering or exiting the Site via Peter's Way. In the event a vehicle approaches the system from the south without a pass-code/card entry, the errant vehicle will have the ability to reverse direction via a U-turn area. The U-turn area has been designed to accommodate a passenger vehicle and single unit truck as shown in the AutoTurn® provided in the **Attachments**. The restricted entry will also be designed to allow emergency vehicle access either by remote activation or flexible/breakaway gate (or both).

To further promote the use of Peter's Way as a secondary low-volume driveway and to discourage cut-through, the Peter's Way approach to Concord Road has also been redesigned to restrict left-turn exiting movements as shown depicted in **Figure 3** by means of a channelizing island, pavement markings and signs. This restriction will result in the diversion of a modest number of vehicles from the Concord Road driveway to the Hudson Road driveway during the peak hours (estimated at 15 during peak hours per the originally submitted traffic study).



NOTES

1. THIS PLAN INTENDED FOR DISCUSSION PURPOSES ONLY; IT IS NOT FOR CONSTRUCTION.
2. FINAL DESIGN IS SUBJECT TO FIELD SURVEY BY OTHERS.
3. PROPERTY LINES AND ACCESS LINE LOCATIONS ARE APPROXIMATE ONLY AND ARE SUBJECT TO DEED AND TITLE RECORDS.
4. BASE PLAN SOURCE: SULLIVAN, CONNORS & ASSOCIATES AND USGS COLOR ORTHO IMAGERY.

PROPOSED SIGNS

R4-7

SCALE
0 10 20 40 80 FEET

Figure 2

Conceptual Peter's Way Gated Access Plan

SUDBURY, MASSACHUSETTS
PREPARED FOR:
SUDBURY STATION, LLC
2134 SEVILLA WAY
NAPLES, FLORIDA 34109

MDM TRANSPORTATION CONSULTANTS, INC.
PLANNERS & ENGINEERS
28 Lord Road, Suite 280
Marlborough, MA 01752
Tel: (508) 303-0370
Fax: (508) 303-0371

DATE: May 18, 2016 | SCALE: As Noted
PROJECT No. 814 | File: 814 Concept Plan (5-18-2016).dwg | Sheet 1 of 1

NOTES

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PROPOSED SIGNS


R3-2

R1-1


W11-2


W16-7P

W16-9P

SCALE
0 10 20 40 80 FEET

Figure 3

Concord Road/Peter's Way Improvements

CONCORD ROAD
SUDBURY, MASSACHUSETTS
PREPARED FOR:
SUDBURY STATION, LLC
2134 SEVILLA WAY
NAPLES, FLORIDA 34109

MDM TRANSPORTATION CONSULTANTS, INC.
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Tel: (508) 303-0370
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DATE: May 19, 2016 | SCALE: As Noted
PROJECT No. 814 | File: 814 Concept Plan (5-19-2016).dwg | Sheet 1 of 1

(3) Candy Hill Road Impacts

Candy Hill Road has been described in public testimony as a "bypass" to the Town Center with potential for increased traffic due to the project. MDM has inventoried traffic volumes and patterns for Candy Hill Road to provide a baseline understanding of existing activity as described below that confirms Candy Hill Road is classified as a "very low volume local roadway" as defined by the American Association of State Highway Transportation Officials (AASHTO). The inventoried volumes and patterns also confirm that Candy Hill Road is not characterized as a notable "cut-through" as suggested by public testimony. To ensure that Candy Hill Road does not provide a principal bypass to the Town Center and to discourage use of Candy Hill Road by residents of Sudbury Station, the Proponent proposes restricted access at Peter's Way and redesign of the Peter's Way intersection at Concord Road to allow "right-turn-only" movements.

Traffic Volume Data

Supplemental traffic data were collected for Candy Hill Road in March 2016 including daily and hourly traffic volumes using a radar-based automatic traffic recorder (ATR). The results of the counts are summarized in **Table 1**. In addition, peak commuter hour traffic volumes were collected at the Concord Road/Candy Hill Road and Concord Road/Plympton Road intersections in March 2016 to identify travel patterns which are summarized in **Figure 4**.

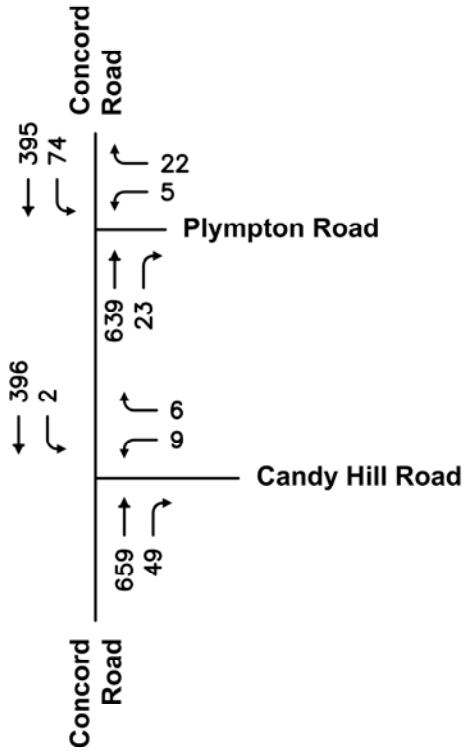
TABLE 1
EXISTING TRAFFIC VOLUME SUMMARY
CANDY HILL ROAD EAST OF CONCORD ROAD

Time Period	Daily Volume (vpd)[1]	Percent Daily Traffic[2]	Peak Hour Volume (vph)[3]	Peak Flow Direction[4]	Peak Hour Directional Volume (vph)
Weekday Morning Peak Hour	320	9%	30	73% EB	22
Weekday Evening Peak Hour	320	13%	40	58% EB	23

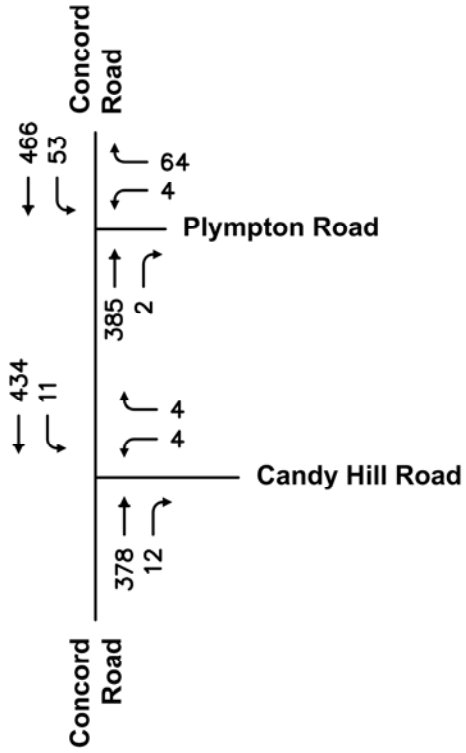
[1]Two-way daily traffic expressed in vehicles per day without seasonal adjustment.
[2]The percent of daily traffic that occurs during the peak hour.
[3]Two-way peak-hour volume expressed in vehicles per hour.
[4]EB = Eastbound, WB = Westbound

As summarized in **Table 1**, Candy Hill Road currently carries approximately 320 vehicles per day (vpd) on a weekday with travel patterns slightly directional eastbound both during the weekday morning and weekday evening peak hours. Peak hour traffic flow on Candy Hill Road is approximately 30 to 40 vehicles per hour (vph) during the weekday morning and weekday evening peak hours representing 9 to 13 percent of daily traffic flow. Based on this level of trip activity, AASHTO[1] classifies Candy Hill Road as a very low volume local roadway (which includes roadways that carry less than 400 average daily trips).

[1] *AASHTO Guidelines for Geometric Design of Very Low Volume Local Roads (ADT≤ 400)*, Washington DC 2001.



Weekday Morning Peak Hour



Weekday Evening Peak Hour

Scale: Not to Scale

Figure 4

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

2016 Baseline Conditions
Peak Hour Traffic Volumes

Date: May 2016
Dwg No. 814 - Traffic Volume Diagram.dwg

Based on peak hour traffic volume patterns identified in **Figure 4**, MDM finds the following:

- *Plympton Road.* The traffic patterns indicate that a modest number of vehicles are using Plympton Road to by-pass the Town Center to/from the east along Route 27. The peak hour traffic counts suggest 50 to 75 directional trips per hour along Plympton Road with the majority likely using Plympton as an alternative route between Concord Road and Route 27 (i.e., trips that bypass the Town Center).

- *Candy Hill Road.* The traffic data indicate fewer than 10 vehicles per hour (per travel direction) use Candy Hill Road to bypass the Town Center from the north on Concord Road. However, a notable trend is that right-turns onto Candy Hill Road from Concord Road approach 50 vehicles which is likely associated with the morning drop-off activity at the nearby Peter Noyes School where left-turns onto Concord Road are regularly blocked and subject to delay.

In summary, Candy Hill Road is a very low volume local roadway, exhibits hourly traffic volumes that are generally less than 40 vehicles per hour and is not characterized as a roadway that serves as a primary bypass route to the Town Center. Vehicles associated with the Noyes School during the AM drop-off period appear to use Candy Hill Road as a bypass to the Town Center; however, this trend does not occur during any other hours of the day.

Travel Time Data

To gauge the desirability for Candy Hill Road as a by-pass of the Town Center by Sudbury Station residents during the morning peak period (independent of any controls on Peter's Way), MDM collected travel time run data during the weekday morning peak period (7:00 am to 9:00 am) on Wednesday, March 9, 2016. The various travel routes are depicted in **Figure 5**. Projected travel times from the Site are estimated based on a travel speed of 15 miles per hour (mph) from a point central to the Site and intersection delays calculated using Synchro model runs to calculate a total travel time. The results of the travel time runs for the three travel route options are summarized in **Table 2**.

TABLE 2
TRAVEL TIME RESULTS

Route	Route Travel Distance	Route Travel Time
A (Route 27)	1.7 miles[1]	5 minutes
B (Candy Hill Road)	2.1 miles[2]	5 minutes, 36 seconds
C (Concord Road & Route 27)	2.0 miles[2]	5 minutes, 1second

[1]Observed travel time plus 710-foot internal distance at 15 mph and 27 second delay for a left turn onto Route 27.
[2]Observed travel time plus 2,100-foot internal distance at 15 mph and a 7 second delay for a turn onto Concord Road.

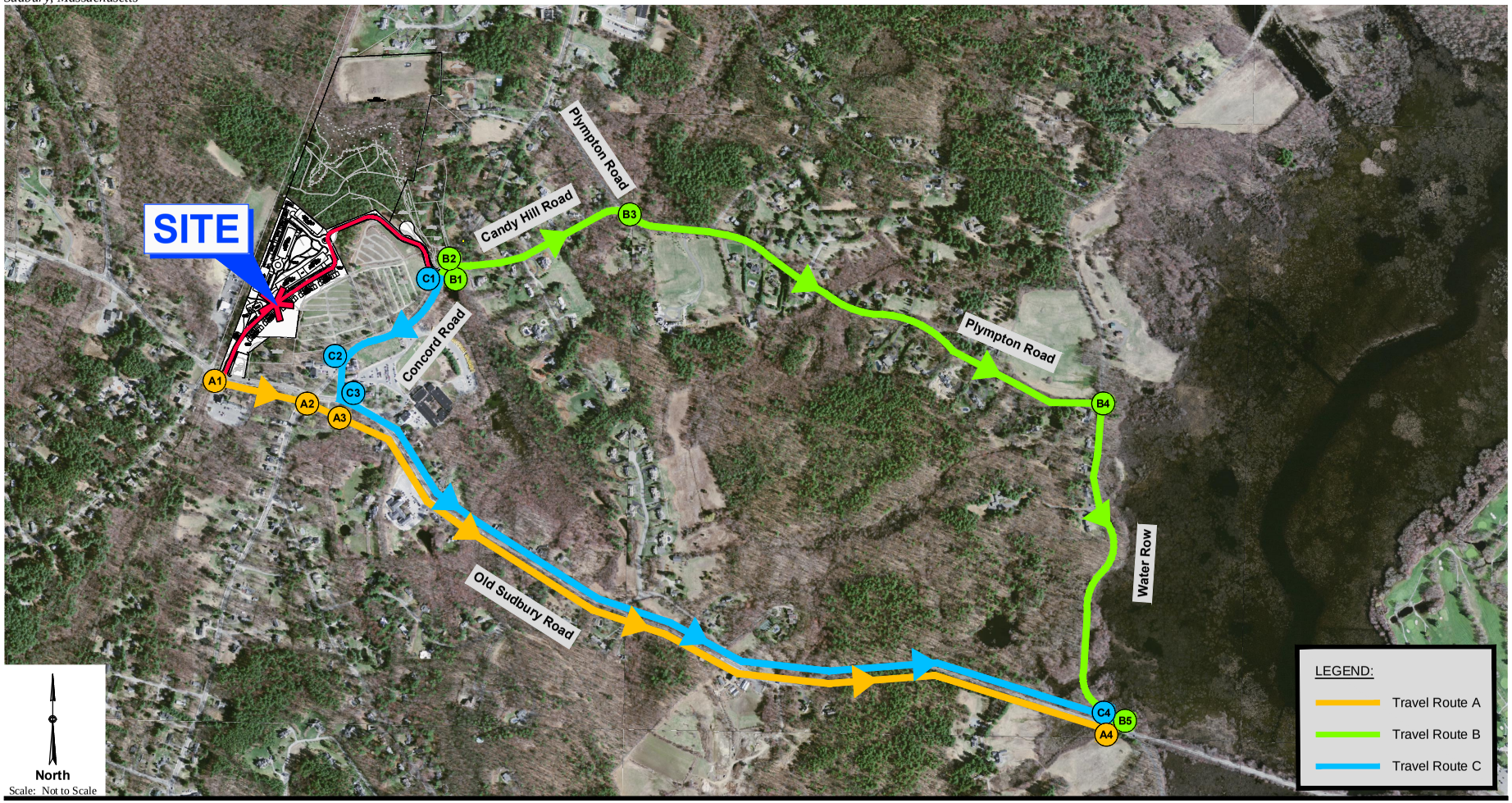


Figure 5

Travel Routes Assessment

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Date: May 2016
Dwg No. 814 Travel Routes (alt2).dwg

As summarized in **Table 2**,

- *Shortest Travel Distance.* The shortest travel route based on travel distance to destinations to the east is along Route 27 (Route A). The travel distance along Routes B and C are approximately 20% longer.

- *Shortest Travel Time.* The shortest travel route based on travel time to destinations to the east is virtually the same along Route 27 (Route A) and Concord Road (Route C). The travel time along B is approximately 20% longer.

In summary, the shortest route by distance and time will be to use the primary site driveway along Route 27 and travel directly along Route 27 (Route A). The secondary route option from the Site will be a right turn from the Concord Road driveway towards Route 27.

Summary

Independent of specific controls on Peter's Way, MDM finds that using the Site as a bypass to the Town Center has limited time-savings value or perhaps even a longer delay when compared to using public way travel routes including Candy Hill Road. Regardless of this finding, the Proponent will implement a gate system along Peter's Way shown in **Figure 2** and left-turn restriction at the Concord Road and Peter's Way intersection as shown in **Figure 3** to restrict the use of the Candy Hill Road option (Route B) and to ensure that the Site does not present a viable or convenient bypass to the Town Center.

(4) Pedestrian Route Inventory

At the request of the ZBA the Proponent has conducted an inventory of existing pedestrian routes including school crossings that connect the Site to nearby schools (Noyes and Nixon elementary). These routes are inventories to identify width and condition of sidewalks and crosswalks, compliance with ADA requirements for accessibility and to quantify pedestrian volumes during peak school periods. This information provides a basis for ensuring that safe routes to school destinations are provided. The outcome of this inventory is an additional commitment by the Proponent to augment the Town's ongoing initiative to improve several pedestrian crosswalks and sidewalks in the Town Center vicinity; specifically this includes a crossing improvement near Peter's Way that was found to be inconsistent with ADA requirements. The outcome of Town improvements at the Town Center and Proponent-sponsored improvements at Peter's Way is a system of pedestrian ways and crossings that provide safe routes to school for the nearby elementary schools.

Improvement initiatives by the Town within the Town Center include the following:

- Installing a sidewalk segment along the southern side of Hudson Road between Peakham Road and Concord Road;
- Installing a new marked pedestrian crosswalk with ADA compliant ramps across Old Sudbury Road at the Noyes Elementary School.
- Installing pedestrian advanced warning signage on the Town Center crosswalk locations where missing;
- Installing a sidewalk segment along the northern side of Old Sudbury Road between Concord Road and the Noyes Elementary School property; and
- New pedestrian equipment, signage and markings at the signalized intersection of Hudson Road and Concord Road to include:
    - Marked pedestrian crosswalks and ADA compliant ramps.
    - New pedestrian traffic signal indications and push buttons.
    - Implementing an exclusive pedestrian crossing phase.

An overview of inventoried pedestrian routes and crossings is presented in **Figure 6.** The routes reviewed relate specifically to the various walking routes to the two nearby elementary schools (Peter Noyes and General John Nixon) relative to the Site. As presented in **Figure 6**, the routes include existing as well as proposed sidewalk and crosswalk segments to be constructed as part of the proposed Sudbury Station development. A detailed summary of the pedestrian route segments and crosswalks with associated widths, length, condition and traffic controls are provided in **Table 3**.

TABLE 3
PEDESTRIAN ROUTE SUMMARY

Route / Crossing	Width (feet)[1]	Length (feet)[2]	Condition	Controls
Route A	6′ Proposed	2,030′	Proposed	n/a
Route B	6′ Proposed	820′	Proposed	n/a
Route C	5′ Existing	1,665′	Excellent/Good	n/a
Route D	4′-5′ Existing	1,040′	Good	n/a
Route E	4′-6′ Existing	2,750′	Good	n/a
Crosswalk 1	7′-6″ Marked (9′ Proposed)	27′	Proposed	Unsignalized
Crosswalk 2	9′ Proposed	40′	Proposed	Unsignalized
Crosswalk 3	8′ Marked	75′	New	Signalized
Crosswalk 4	8′ Marked	30′	New	Crossing Guard
Crosswalk 5	6′-6″ Marked	45′	Existing	Crossing Guard

[1]Width of the sidewalk segment or crosswalk in feet.
[2]Length of the sidewalk segment or crosswalk in feet.

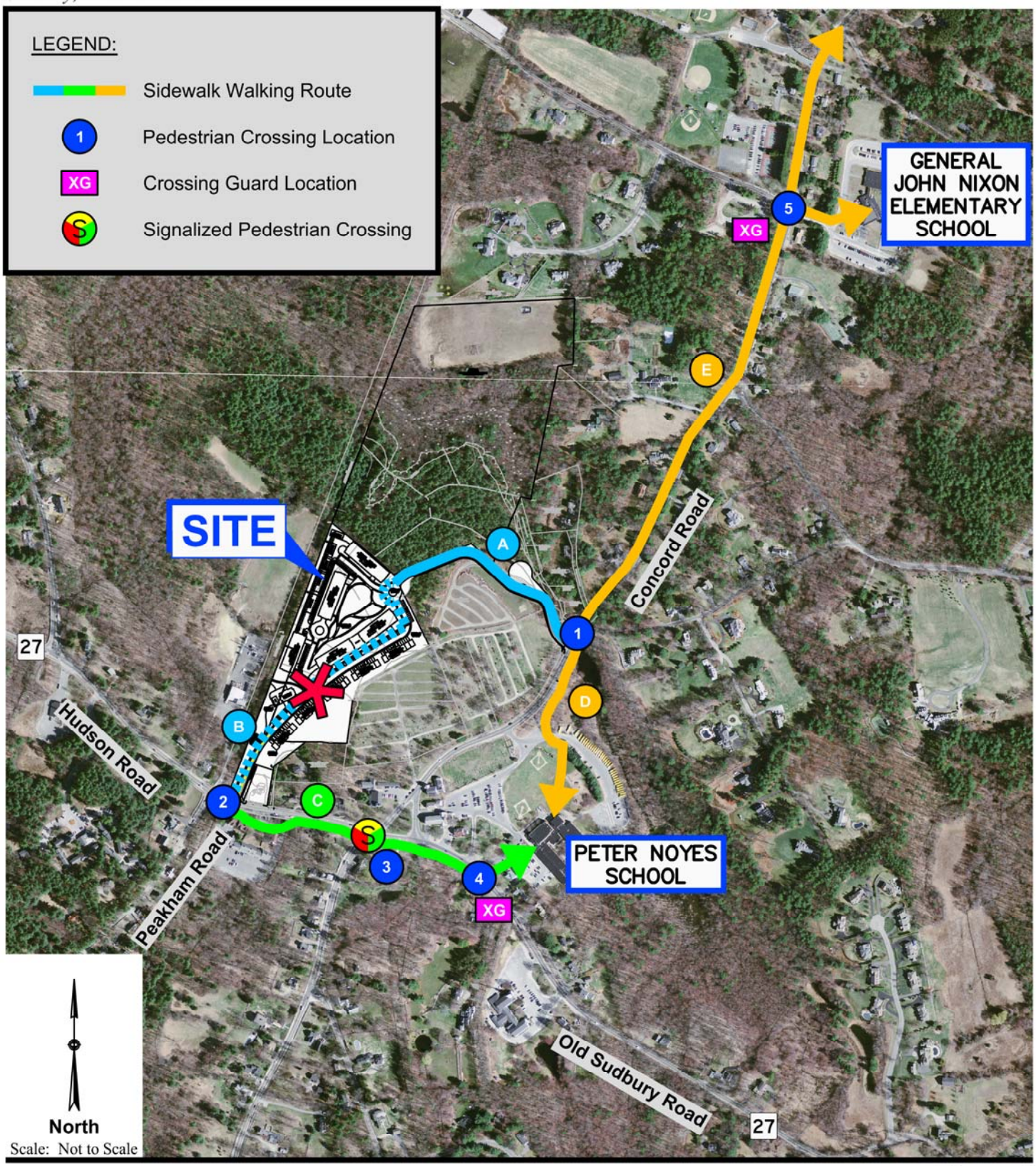


Figure 6

Sidewalk and Crosss-walk Widths

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

Date: May 2016
Dwg No. 814 Sidewalk Study.dwg

As summarized in **Table 3**,

- *Pedestrian Routes.* The Proponent will construct an internal sidewalk system along Route A and Route B. The remaining existing sidewalk system along Route C, Route D, and Route E are in good to excellent condition and ranged from 4 to 6 feet wide in conformance with ADA requirements.

- *Crosswalks.* The Proponent will construct a new crosswalk at the Hudson Road intersection with Peakham Road and will re-construct the crosswalk and handicap ramps to be ADA compliant at the Concord Road intersection with Candy Hill Road. The remaining area crosswalks are 6'6" to 8 feet wide with ADA compliant ramps and in good or excellent condition. Crossing Guards are currently provided at the main crosswalk for each school during the morning drop-off and afternoon pick-up periods.

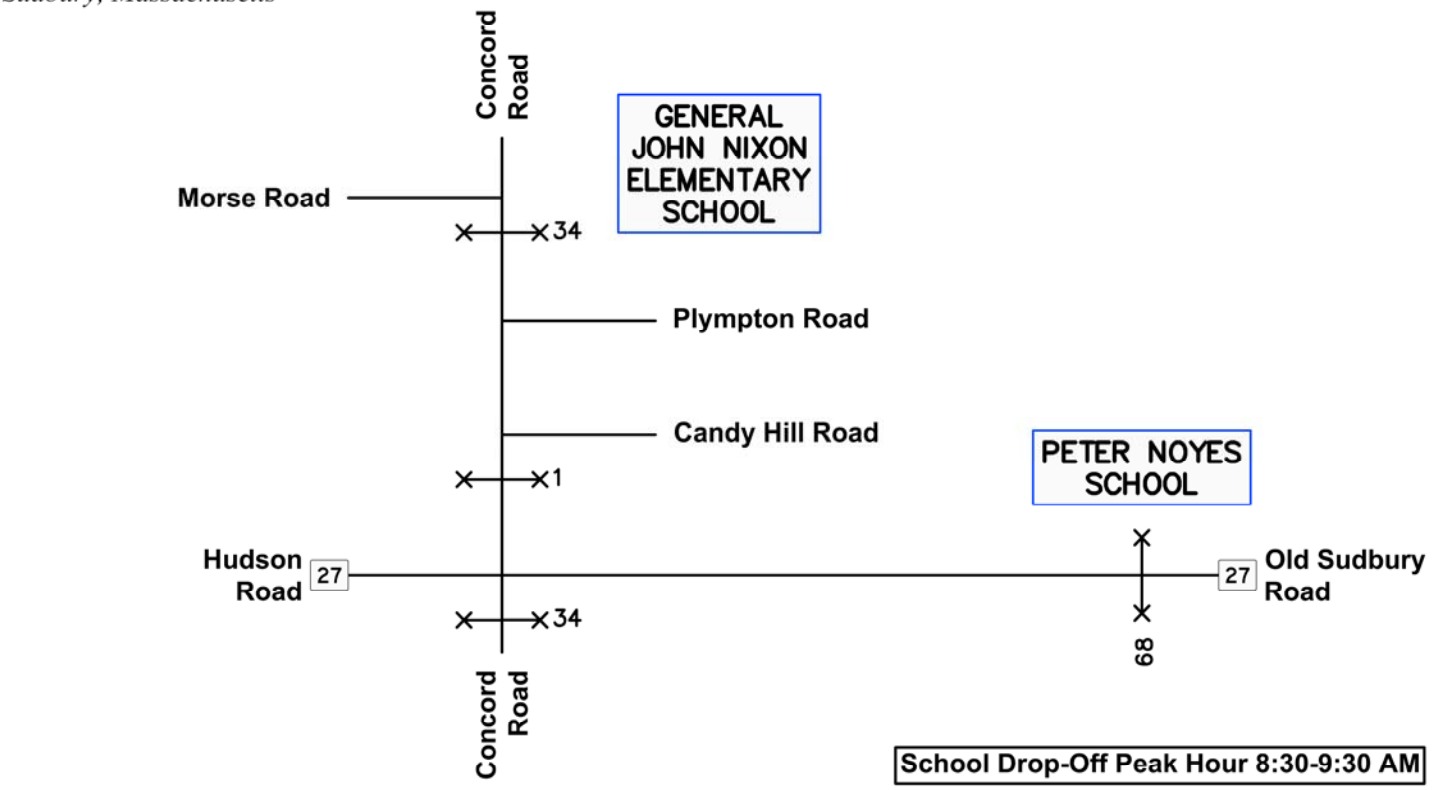
Pedestrian Volumes

Pedestrian counts were conducted in March 2016 at primary crossing points in the Town Center that provide access to nearby schools as shown in **Figure 6**. The results of the pedestrian counts are summarized in **Figure 7** with detailed count sheets provided in the **Attachments**. The counts indicate that up to 70 pedestrians per hour use the crosswalk along Old Sudbury Road at the Peter Noyes School and up to 50 pedestrians per hour us the crosswalk along Concord Road at Morse Road during the drop-off/pick up periods for the two nearby elementary schools. Field observations indicate crossing guards are currently provided at the two locations immediately adjacent to the elementary schools and that the majority if not all of the students are walked to/from school by a parent or guardian.

Proponent-Sponsored Pedestrian Route Improvements

The Proponent proposes sidewalk and pedestrian crossing improvements that will augment initiatives currently underway by the Town as part of the Town Center roadway improvement project as follows:

- *Hudson Road at Peakham Road*: A new ADA-compliant pedestrian crossing with MUTCD-compliant warning signs is proposed at the Site Driveway vicinity that generally aligns with the future rail-trail crossing at Peakham Road as presented in Exhibit 10 of the submitted March 15, 2016 Response to Peer Review Comments (included in the **Attachments** for reference). During public testimony, the question of visibility to this proposed crossing from Peakham Road was raised. Upon further field review, the sight lines from a vehicle in a stopped position on Peakham Road will be able to clearly see the entire proposed crosswalk. Photographs of the sight lines to this proposed crossing location are provided in the **Attachments**.



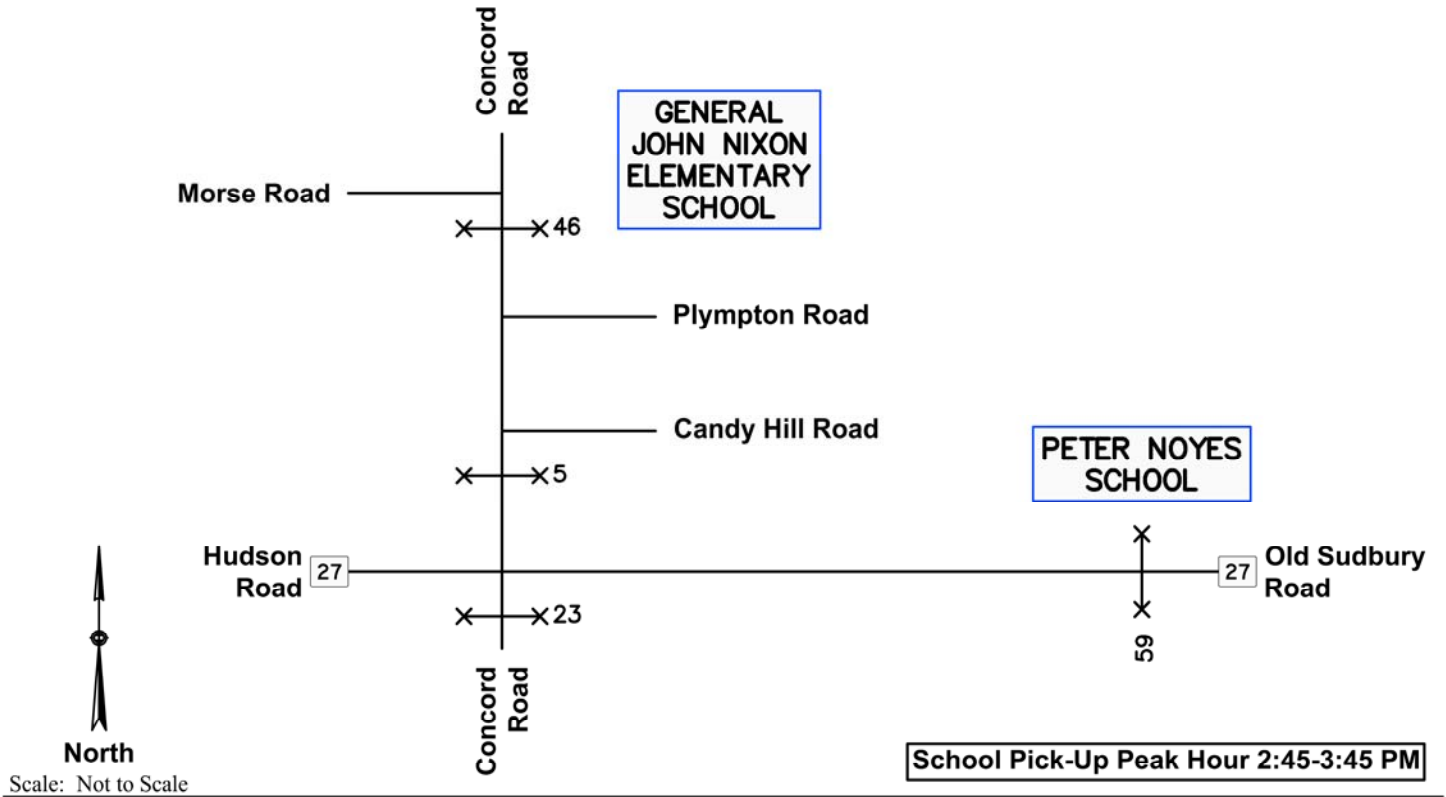


Figure 7

Pedestrian Peak Hour Volumes

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers

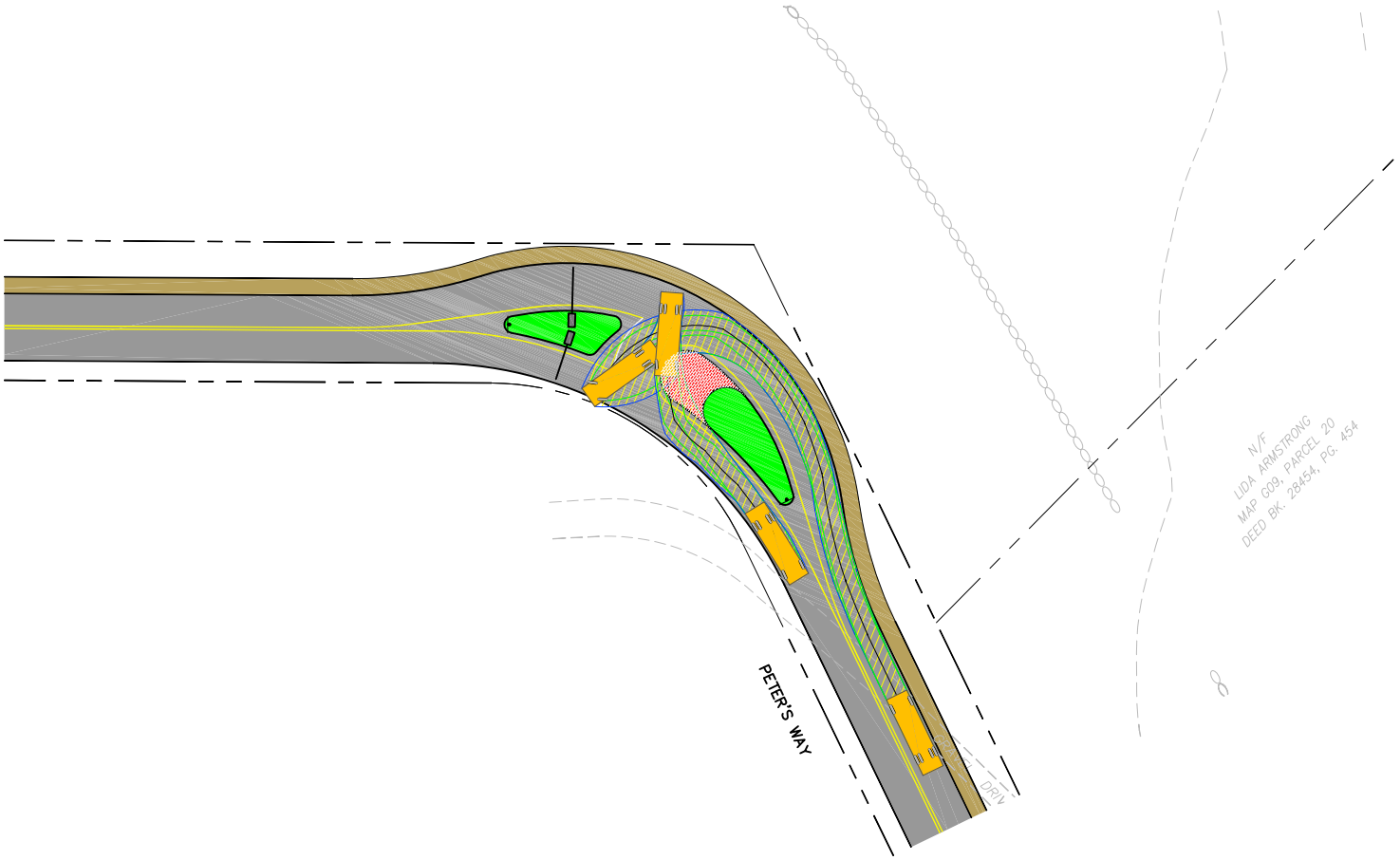
Date: May 2016
Dwg No. 814 Sidewalk Study.dwg

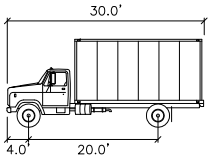
- *Concord Road at Candy Hill Road*: The existing Concord Road pedestrian crossing near Candy Hill Road is not ADA compliant and is not readily visible to approaching vehicles. The Proponent has expanded its design of the Peter's Way intersection improvements to include upgrades to this crossing including sidewalk modifications for an ADA-compliant access ramp and tactile panel, re-striping the crossing to a perpendicular alignment with Concord Road using highly reflective markings and MUTCD-compliant advance warning signs as depicted on **Figure 3**.

Attachments

- □ Autoturn® Analysis
- □ Traffic Volume Data
- □ Travel Route Times
- □ Pedestrian Volume Data
- □ Peakham Road Crosswalk

□ Autoturn® Analysis





SU

Width	: 8.0 FT.
Track	: 8.0 FT.
Lock to Lock Time	: 6.0 SEC.
Steering Angle	: 31.8°

Site Plan Source: Sullivan, Connors & Associates

MDM TRANSPORTATION CONSULTANTS, INC.
Planners & Engineers
28 Lord Road, Suite 280
Marlborough, MA 01752

Scale: As Noted
DWG No. 814 Concept Plan (5-18-2016).dwg

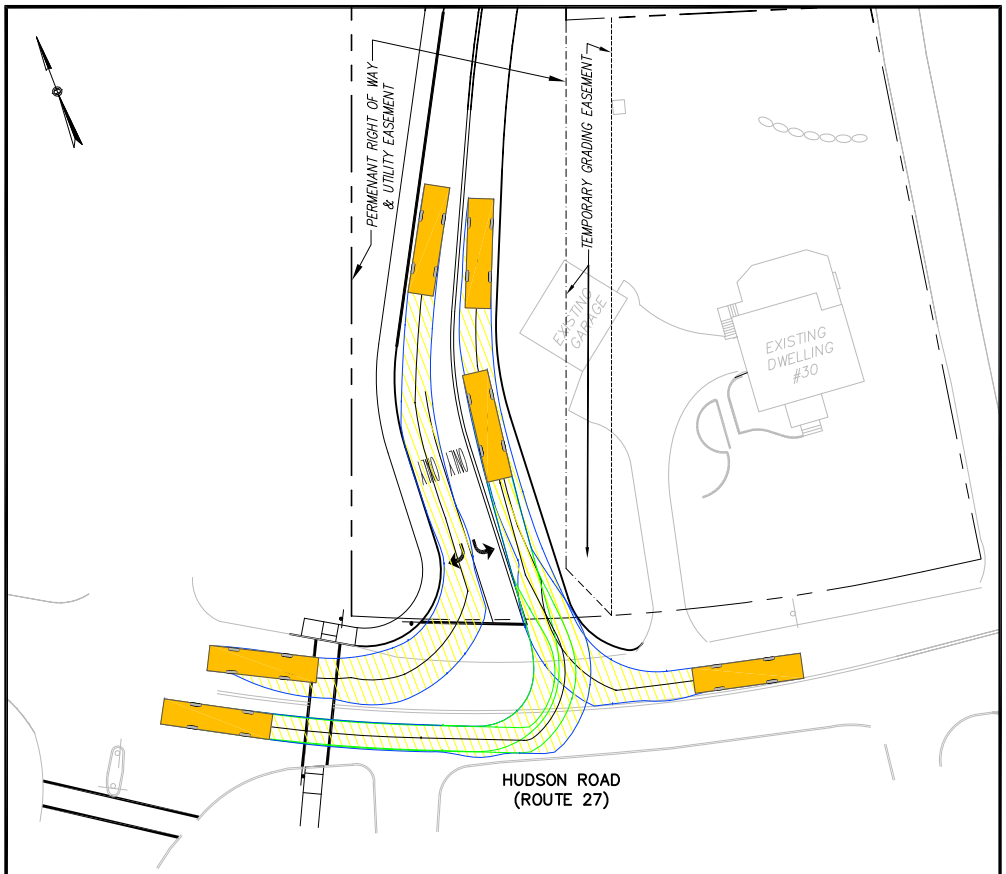
Date: May 2016
Project No. 814

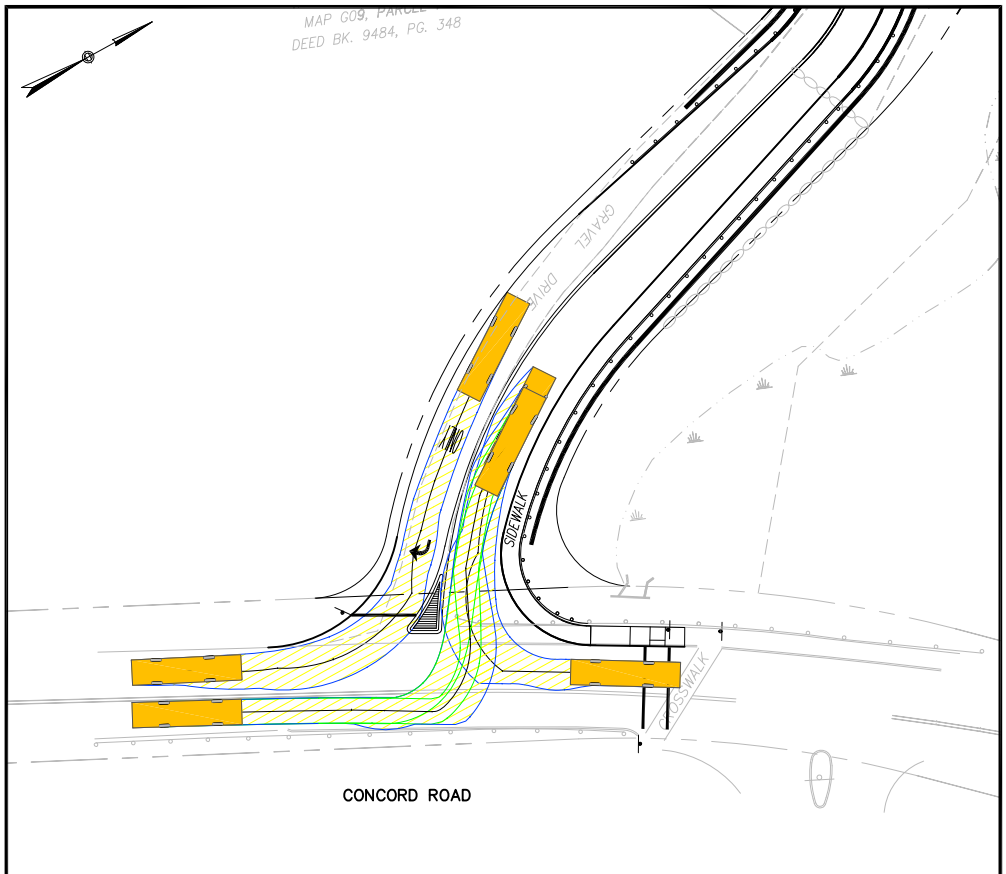
Proposed Residential Devlopment

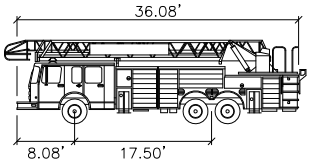
Sudbury, Massachusetts

SCALE
0 10 20 40 80 FEET

Exhibit A1
AutoTurn Analysis
SU Truck







Sudbury Ladder

Width	: 8.33 FT.
Track	: 8.33 FT.
Lock to Lock Time	: 6.0 SEC.
Steering Angle	: 40.6°

Site Plan Source: Sullivan, Connors & Associates

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28 Lord Road, Suite 280
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DWG No. 814 Autoturn(5-19-2016).dwg

Date: May 2016
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Proposed Residential Devlopment

Sudbury, Massachusetts

SCALE
0 10 20 40 80 FEET

Exhibit A2
AutoTurn Analysis
Sudbury Ladder Truck

□ Traffic Volume Data

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA 01752

Candyhill Road
East of Concord Road
Sudbury, MA

Site Code: 814

814 CANDYHILL RD - VOLUME

Start Time	22-Mar-16 Tue	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		0	3			0	1				
12:15		0	4			0	7				
12:30		0	2			0	1				
12:45		0	3	0	12	0	3	0	12	0	24
01:00		0	2			0	6				
01:15		0	1			0	6				
01:30		0	2			0	2				
01:45		0	1	0	6	0	1	0	15	0	21
02:00		0	7			0	4				
02:15		0	0			0	1				
02:30		0	3			0	3				
02:45		0	2	0	12	0	3	0	11	0	23
03:00		0	3			0	7				
03:15		0	3			0	3				
03:30		0	5			0	4				
03:45		0	4	0	15	0	6	0	20	0	35
04:00		0	4			0	2				
04:15		0	7			0	2				
04:30		0	6			0	5				
04:45		0	1	0	18	1	1	1	10	1	28
05:00		0	3			0	4				
05:15		0	4			0	5				
05:30		0	6			0	12				
05:45		0	5	0	18	0	2	0	23	0	41
06:00		1	4			0	4				
06:15		0	1			1	2				
06:30		1	2			0	2				
06:45		1	1	3	8	2	0	3	8	6	16
07:00		3	2			2	4				
07:15		2	1			3	0				
07:30		3	1			5	3				
07:45		2	1	10	5	12	0	22	7	32	12
08:00		1	0			3	1				
08:15		1	1			1	1				
08:30		1	1			2	3				
08:45		5	0	8	2	2	3	8	8	16	10
09:00		3	2			2	4				
09:15		3	1			6	2				
09:30		1	0			2	0				
09:45		1	0	8	3	2	1	12	7	20	10
10:00		2	0			1	0				
10:15		0	0			3	0				
10:30		1	3			2	1				
10:45		2	0	5	3	1	0	7	1	12	4
11:00		1	0			1	0				
11:15		2	0			1	0				
11:30		2	0			2	0				
11:45		1	1	6	1	0	0	4	0	10	1
Total		40	103			57	122			97	225
Percent		28.0%	72.0%			31.8%	68.2%			30.1%	69.9%
Combined Total		143				179				322	

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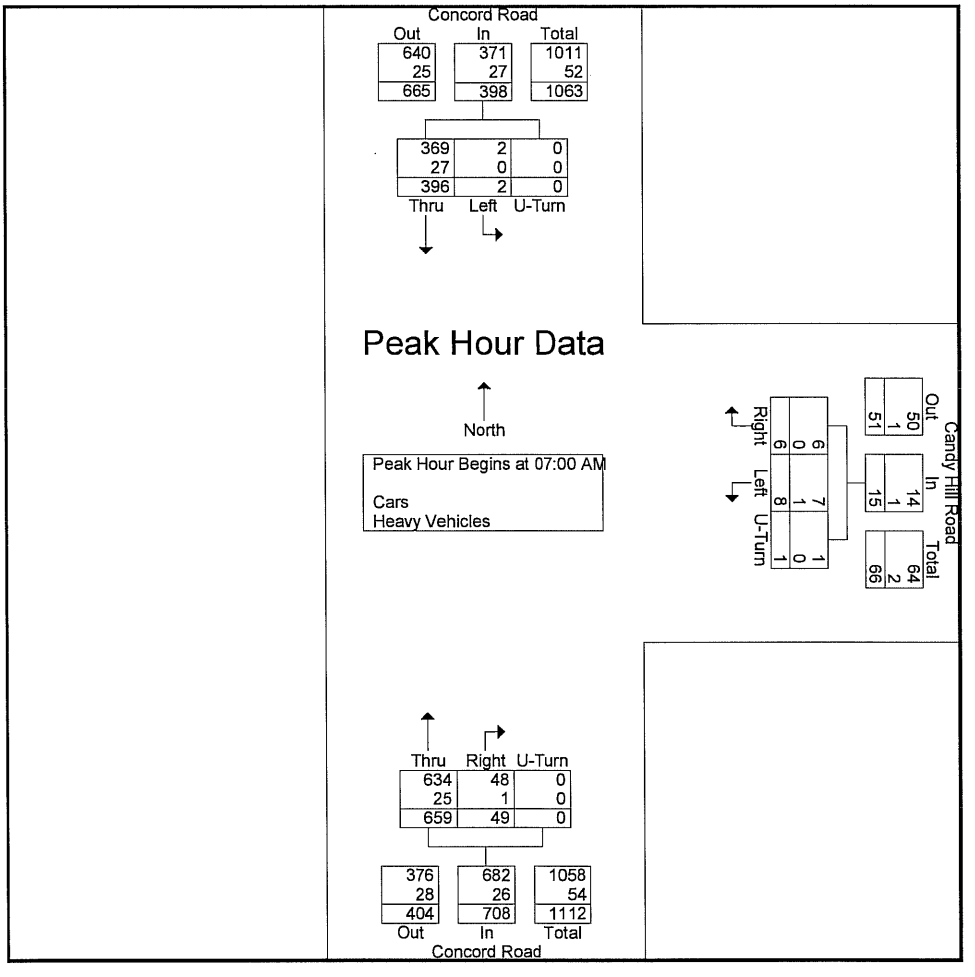
N/S: Concord Road
E: Candy Hill Road
City, State: Sudbury, MA
Client: MDM/ M. Houle

File Name : 164982 G
Site Code : 814
Start Date : 3/9/2016
Page No : 1

	Concord Road From North				Candy Hill Road From East				Concord Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	78	0	0	78	1	1	0	2	5	170	0	175	255
07:15 AM	121	0	0	121	0	2	0	2	9	222	0	231	354
07:30 AM	102	2	0	104	3	2	1	6	29	157	0	186	296
07:45 AM	95	0	0	95	2	3	0	5	6	110	0	116	216
Total Volume	396	2	0	398	6	8	1	15	49	659	0	708	1121
% App. Total	99.5	0.5	0		40	53.3	6.7		6.9	93.1	0		
PHF	.818	.250	.000	.822	.500	.667	.250	.625	.422	.742	.000	.766	.792
Cars	369	2	0	371	6	7	1	14	48	634	0	682	1067
% Cars	93.2	100	0	93.2	100	87.5	100	93.3	98.0	96.2	0	96.3	95.2
Heavy Vehicles	27	0	0	27	0	1	0	1	1	25	0	26	54
% Heavy Vehicles	6.8	0	0	6.8	0	12.5	0	6.7	2.0	3.8	0	3.7	4.8



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File Name : 164982 G
Site Code : 814
Start Date : 3/9/2016
Page No : 1

Groups Printed- Cars

	Concord Road From North			Candy Hill Road From East			Concord Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
07:00 AM	68	0	0	1	1	0	4	155	0	229
07:15 AM	114	0	0	0	2	0	9	217	0	342
07:30 AM	97	2	0	3	1	1	29	156	0	289
07:45 AM	90	0	0	2	3	0	6	106	0	207
Total	369	2	0	6	7	1	48	634	0	1067
08:00 AM	75	0	0	0	6	0	1	105	0	187
08:15 AM	84	0	0	0	3	0	2	126	0	215
08:30 AM	83	0	0	0	0	0	1	100	0	184
08:45 AM	104	0	0	4	2	0	1	125	0	236
Total	346	0	0	4	11	0	5	456	0	822
Grand Total	715	2	0	10	18	1	53	1090	0	1889
Apprch %	99.7	0.3	0	34.5	62.1	3.4	4.6	95.4	0	
Total %	37.9	0.1	0	0.5	1	0.1	2.8	57.7	0	

	Concord Road From North				Candy Hill Road From East				Concord Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	68	0	0	68	1	1	0	2	4	155	0	159	229
07:15 AM	114	0	0	114	0	2	0	2	9	217	0	226	342
07:30 AM	97	2	0	99	3	1	1	5	29	156	0	185	289
07:45 AM	90	0	0	90	2	3	0	5	6	106	0	112	207
Total Volume	369	2	0	371	6	7	1	14	48	634	0	682	1067
% App. Total	99.5	0.5	0		42.9	50	7.1		7	93	0		
PHF	.809	.250	.000	.814	.500	.583	.250	.700	.414	.730	.000	.754	.780

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N/S: Concord Road
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Client: MDM/ M. Houle

File Name : 164982 G
Site Code : 814
Start Date : 3/9/2016
Page No : 1

Groups Printed- Heavy Vehicles

	Concord Road From North			Candy Hill Road From East			Concord Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
07:00 AM	10	0	0	0	0	0	1	15	0	26
07:15 AM	7	0	0	0	0	0	0	5	0	12
07:30 AM	5	0	0	0	1	0	0	1	0	7
07:45 AM	5	0	0	0	0	0	0	4	0	9
Total	27	0	0	0	1	0	1	25	0	54
08:00 AM	2	0	0	0	0	0	0	2	0	4
08:15 AM	2	0	0	0	0	0	0	8	0	10
08:30 AM	0	0	0	0	0	0	0	5	0	5
08:45 AM	15	0	0	0	0	0	0	4	0	19
Total	19	0	0	0	0	0	0	19	0	38
Grand Total	46	0	0	0	1	0	1	44	0	92
Apprch %	100	0	0	0	100	0	2.2	97.8	0	
Total %	50	0	0	0	1.1	0	1.1	47.8	0	

	Concord Road From North				Candy Hill Road From East				Concord Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	10	0	0	10	0	0	0	0	1	15	0	16	26
07:15 AM	7	0	0	7	0	0	0	0	0	5	0	5	12
07:30 AM	5	0	0	5	0	1	0	1	0	1	0	1	7
07:45 AM	5	0	0	5	0	0	0	0	0	4	0	4	9
Total Volume	27	0	0	27	0	1	0	1	1	25	0	26	54
% App. Total	100	0	0		0	100	0		3.8	96.2	0		
PHF	.675	.000	.000	.675	.000	.250	.000	.250	.250	.417	.000	.406	.519

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City, State: Sudbury, MA
Client: MDM/ M. Houle

File Name : 164982 G
Site Code : 814
Start Date : 3/9/2016
Page No : 1

Groups Printed- Peds and Bikes

	Concord Road From North				Candy Hill Road From East				Concord Road From South				
Start Time	Thru	Left	Peds EB	Peds WB	Right	Left	Peds SB	Peds NB	Right	Thru	Peds WB	Peds EB	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	1
07:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
07:45 AM	1	0	0	0	0	0	0	0	0	0	1	0	2
Total	2	0	0	0	0	0	0	0	0	1	3	0	6
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	0	0	0	1	0	1
Grand Total	2	0	0	0	0	0	0	0	0	1	4	0	7
Apprch %	100	0	0	0	0	0	0	0	0	20	80	0	
Total %	28.6	0	0	0	0	0	0	0	0	14.3	57.1	0	

	Concord Road From North					Candy Hill Road From East					Concord Road From South					
Start Time	Thru	Left	Peds EB	Peds WB	App. Total	Right	Left	Peds SB	Peds NB	App. Total	Right	Thru	Peds WB	Peds EB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 07:00 AM																
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
07:15 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
07:45 AM	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	2
Total Volume	2	0	0	0	2	0	0	0	0	0	0	1	3	0	4	6
% App. Total	100	0	0	0		0	0	0	0		0	25	75	0		
PHF	.500	.000	.000	.000	.500	.000	.000	.000	.000	.000	.000	.250	.375	.000	.500	.750

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City, State: Sudbury, MA
Client: MDM/ M. Houle

File Name : 164982 H
Site Code : 814
Start Date : 3/9/2016
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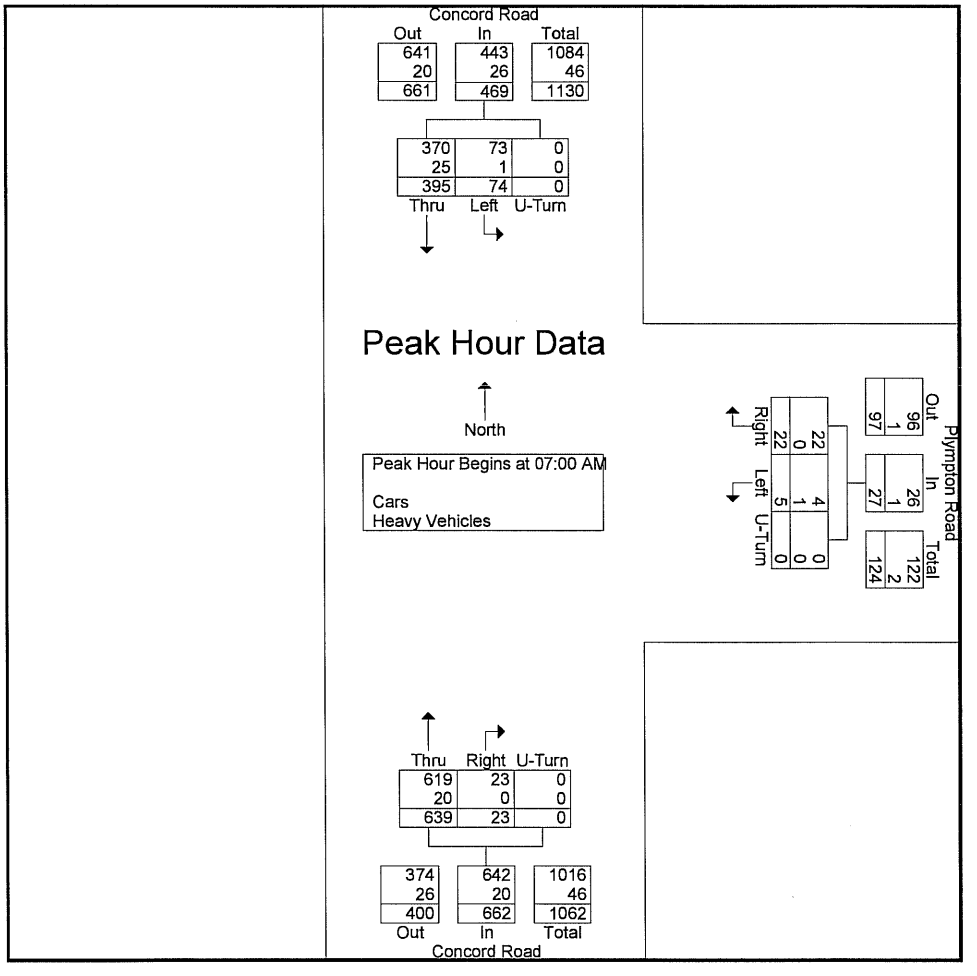
	Concord Road From North				Plympton Road From East				Concord Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	78	11	0	89	9	1	0	10	2	167	0	169	268
07:15 AM	122	18	0	140	6	2	0	8	1	223	0	224	372
07:30 AM	97	25	0	122	7	2	0	9	19	144	0	163	294
07:45 AM	98	20	0	118	0	0	0	0	1	105	0	106	224
Total Volume	395	74	0	469	22	5	0	27	23	639	0	662	1158
% App. Total	84.2	15.8	0		81.5	18.5	0		3.5	96.5	0		
PHF	.809	.740	.000	.838	.611	.625	.000	.675	.303	.716	.000	.739	.778
Cars	370	73	0	443	22	4	0	26	23	619	0	642	1111
% Cars	93.7	98.6	0	94.5	100	80.0	0	96.3	100	96.9	0	97.0	95.9
Heavy Vehicles	25	1	0	26	0	1	0	1	0	20	0	20	47
% Heavy Vehicles	6.3	1.4	0	5.5	0	20.0	0	3.7	0	3.1	0	3.0	4.1



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Client: MDM/ M. Houle

File Name : 164982 H
Site Code : 814
Start Date : 3/9/2016
Page No : 1

Groups Printed- Cars

	Concord Road From North			Plympton Road From East			Concord Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
07:00 AM	67	11	0	9	1	0	2	154	0	244
07:15 AM	117	18	0	6	1	0	1	219	0	362
07:30 AM	92	24	0	7	2	0	19	143	0	287
07:45 AM	94	20	0	0	0	0	1	103	0	218
Total	370	73	0	22	4	0	23	619	0	1111
08:00 AM	74	27	0	5	0	0	1	110	0	217
08:15 AM	81	16	0	3	0	0	1	128	0	229
08:30 AM	77	26	0	6	0	0	0	98	0	207
08:45 AM	116	23	0	7	0	0	1	126	0	273
Total	348	92	0	21	0	0	3	462	0	926
Grand Total	718	165	0	43	4	0	26	1081	0	2037
Apprch %	81.3	18.7	0	91.5	8.5	0	2.3	97.7	0	
Total %	35.2	8.1	0	2.1	0.2	0	1.3	53.1	0	

	Concord Road From North				Plympton Road From East				Concord Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	67	11	0	78	9	1	0	10	2	154	0	156	244
07:15 AM	117	18	0	135	6	1	0	7	1	219	0	220	362
07:30 AM	92	24	0	116	7	2	0	9	19	143	0	162	287
07:45 AM	94	20	0	114	0	0	0	0	1	103	0	104	218
Total Volume	370	73	0	443	22	4	0	26	23	619	0	642	1111
% App. Total	83.5	16.5	0		84.6	15.4	0		3.6	96.4	0		
PHF	.791	.760	.000	.820	.611	.500	.000	.650	.303	.707	.000	.730	.767

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Groups Printed- Heavy Vehicles

	Concord Road From North			Plympton Road From East			Concord Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
07:00 AM	11	0	0	0	0	0	0	13	0	24
07:15 AM	5	0	0	0	1	0	0	4	0	10
07:30 AM	5	1	0	0	0	0	0	1	0	7
07:45 AM	4	0	0	0	0	0	0	2	0	6
Total	25	1	0	0	1	0	0	20	0	47
08:00 AM	2	1	0	1	0	0	0	3	0	7
08:15 AM	4	0	0	0	0	0	0	7	0	11
08:30 AM	4	1	0	3	0	0	0	6	0	14
08:45 AM	16	0	0	1	0	0	0	4	0	21
Total	26	2	0	5	0	0	0	20	0	53
Grand Total	51	3	0	5	1	0	0	40	0	100
Apprch %	94.4	5.6	0	83.3	16.7	0	0	100	0	
Total %	51	3	0	5	1	0	0	40	0	

	Concord Road From North				Plympton Road From East				Concord Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	2	1	0	3	1	0	0	1	0	3	0	3	7
08:15 AM	4	0	0	4	0	0	0	0	0	7	0	7	11
08:30 AM	4	1	0	5	3	0	0	3	0	6	0	6	14
08:45 AM	16	0	0	16	1	0	0	1	0	4	0	4	21
Total Volume	26	2	0	28	5	0	0	5	0	20	0	20	53
% App. Total	92.9	7.1	0		100	0	0		0	100	0		
PHF	.406	.500	.000	.438	.417	.000	.000	.417	.000	.714	.000	.714	.631

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Groups Printed- Peds and Bikes

	Concord Road From North				Plympton Road From East				Concord Road From South				
Start Time	Thru	Left	Peds EB	Peds WB	Right	Left	Peds SB	Peds NB	Right	Thru	Peds WB	Peds EB	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	1
07:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
07:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	1	0	0	0	1	0	0	3
08:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	0	0	2	1	0	0	0	0	0	0	0	0	3
Grand Total	1	0	2	1	0	1	0	0	0	1	0	0	6
Apprch %	25	0	50	25	0	100	0	0	0	100	0	0	
Total %	16.7	0	33.3	16.7	0	16.7	0	0	0	16.7	0	0	

	Concord Road From North					Plympton Road From East					Concord Road From South					
Start Time	Thru	Left	Peds EB	Peds WB	App. Total	Right	Left	Peds SB	Peds NB	App. Total	Right	Thru	Peds WB	Peds EB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 07:00 AM																
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
07:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
07:30 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	0	1	0	1	0	0	1	0	1	0	0	1	3
% App. Total	100	0	0	0		0	100	0	0		0	100	0	0		
PHF	.250	.000	.000	.000	.250	.000	.250	.000	.000	.250	.000	.250	.000	.000	.250	.750

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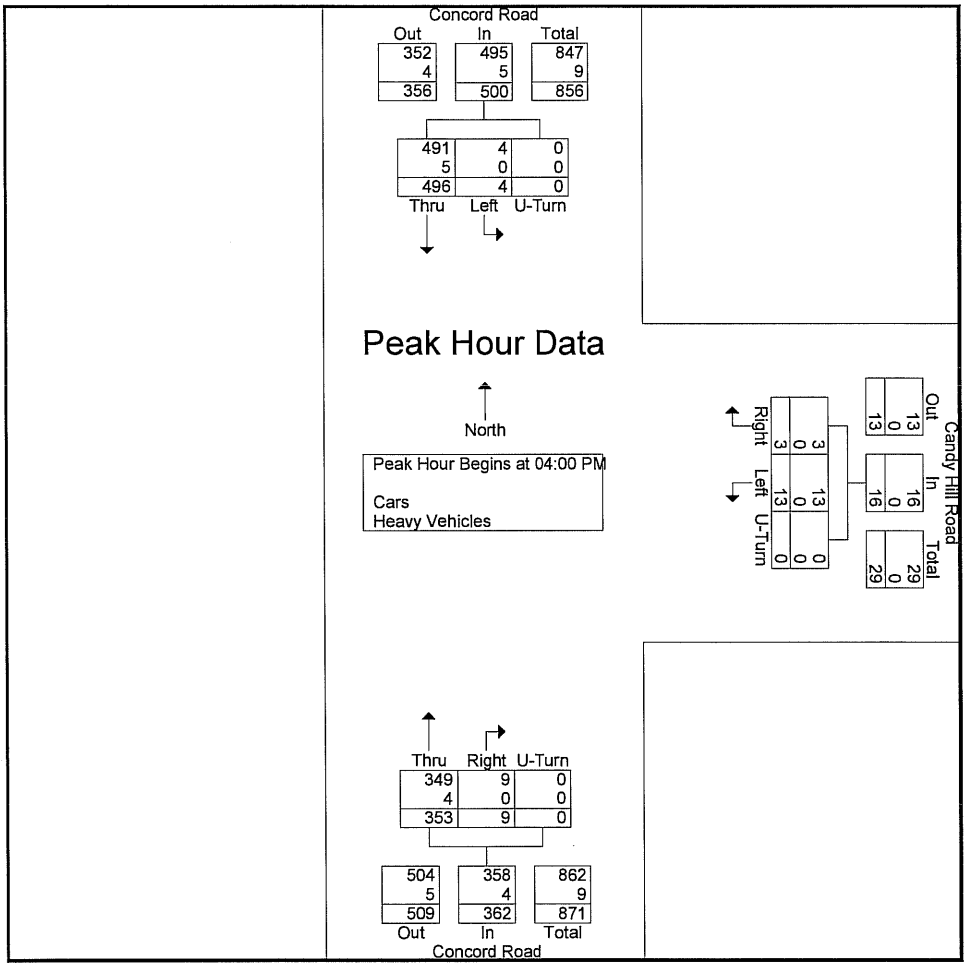
Page No : 1

	Concord Road From North				Candy Hill Road From East				Concord Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	115	2	0	117	0	3	0	3	3	98	0	101	221
04:15 PM	112	0	0	112	2	2	0	4	1	93	0	94	210
04:30 PM	119	2	0	121	1	3	0	4	1	73	0	74	199
04:45 PM	150	0	0	150	0	5	0	5	4	89	0	93	248
Total Volume	496	4	0	500	3	13	0	16	9	353	0	362	878
% App. Total	99.2	0.8	0		18.8	81.2	0		2.5	97.5	0		
PHF	.827	.500	.000	.833	.375	.650	.000	.800	.563	.901	.000	.896	.885
Cars	491	4	0	495	3	13	0	16	9	349	0	358	869
% Cars	99.0	100	0	99.0	100	100	0	100	100	98.9	0	98.9	99.0
Heavy Vehicles	5	0	0	5	0	0	0	0	0	4	0	4	9
% Heavy Vehicles	1.0	0	0	1.0	0	0	0	0	0	1.1	0	1.1	1.0



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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Concord Road
E: Candy Hill Road
City, State: Sudbury, MA
Client: MDM/ M. Houle

File Name : 164982 GG
Site Code : 814
Start Date : 3/9/2016
Page No : 1

Groups Printed- Cars

	Concord Road From North			Candy Hill Road From East			Concord Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
04:00 PM	114	2	0	0	3	0	3	97	0	219
04:15 PM	111	0	0	2	2	0	1	91	0	207
04:30 PM	118	2	0	1	3	0	1	72	0	197
04:45 PM	148	0	0	0	5	0	4	89	0	246
Total	491	4	0	3	13	0	9	349	0	869
05:00 PM	108	0	0	2	1	0	2	92	0	205
05:15 PM	108	1	0	0	1	0	4	80	0	194
05:30 PM	126	3	0	1	0	0	3	88	0	221
05:45 PM	91	4	3	1	2	0	3	117	0	221
Total	433	8	3	4	4	0	12	377	0	841
Grand Total	924	12	3	7	17	0	21	726	0	1710
Apprch %	98.4	1.3	0.3	29.2	70.8	0	2.8	97.2	0	
Total %	54	0.7	0.2	0.4	1	0	1.2	42.5	0	

	Concord Road From North				Candy Hill Road From East				Concord Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	114	2	0	116	0	3	0	3	3	97	0	100	219
04:15 PM	111	0	0	111	2	2	0	4	1	91	0	92	207
04:30 PM	118	2	0	120	1	3	0	4	1	72	0	73	197
04:45 PM	148	0	0	148	0	5	0	5	4	89	0	93	246
Total Volume	491	4	0	495	3	13	0	16	9	349	0	358	869
% App. Total	99.2	0.8	0		18.8	81.2	0		2.5	97.5	0		
PHF	.829	.500	.000	.836	.375	.650	.000	.800	.563	.899	.000	.895	.883

PRECISION
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File Name : 164982 GG
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Page No : 1

Groups Printed- Heavy Vehicles

	Concord Road From North			Candy Hill Road From East			Concord Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
04:00 PM	1	0	0	0	0	0	0	1	0	2
04:15 PM	1	0	0	0	0	0	0	2	0	3
04:30 PM	1	0	0	0	0	0	0	1	0	2
04:45 PM	2	0	0	0	0	0	0	0	0	2
Total	5	0	0	0	0	0	0	4	0	9
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	1	0	0	0	0	0	0	1	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	1	0	2
Grand Total	6	0	0	0	0	0	0	5	0	11
Apprch %	100	0	0	0	0	0	0	100	0	
Total %	54.5	0	0	0	0	0	0	45.5	0	

	Concord Road From North				Candy Hill Road From East				Concord Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
04:15 PM	1	0	0	1	0	0	0	0	0	2	0	2	3
04:30 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
04:45 PM	2	0	0	2	0	0	0	0	0	0	0	0	2
Total Volume	5	0	0	5	0	0	0	0	0	4	0	4	9
% App. Total	100	0	0		0	0	0		0	100	0		
PHF	.625	.000	.000	.625	.000	.000	.000	.000	.000	.500	.000	.500	.750

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File Name : 164982 GG
Site Code : 814
Start Date : 3/9/2016
Page No : 1

Groups Printed- Peds and Bikes

	Concord Road From North				Candy Hill Road From East				Concord Road From South				
Start Time	Thru	Left	Peds EB	Peds WB	Right	Left	Peds SB	Peds NB	Right	Thru	Peds WB	Peds EB	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
04:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	1	2	0	0	3
Total	1	0	0	0	0	0	0	0	1	2	2	0	6
05:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	2
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	1	1
Total	0	0	0	2	0	0	0	1	0	0	0	2	5
Grand Total	1	0	0	2	0	0	0	1	1	2	2	2	11
Apprch %	33.3	0	0	66.7	0	0	0	100	14.3	28.6	28.6	28.6	
Total %	9.1	0	0	18.2	0	0	0	9.1	9.1	18.2	18.2	18.2	

	Concord Road From North					Candy Hill Road From East					Concord Road From South					
Start Time	Thru	Left	Peds EB	Peds WB	App. Total	Right	Left	Peds SB	Peds NB	App. Total	Right	Thru	Peds WB	Peds EB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 04:30 PM																
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	3
05:00 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	2
Total Volume	0	0	0	2	2	0	0	0	1	1	1	2	0	1	4	7
% App. Total	0	0	0	100		0	0	0	100		25	50	0	25		
PHF	.000	.000	.000	.250	.250	.000	.000	.000	.250	.250	.250	.250	.000	.250	.333	.583

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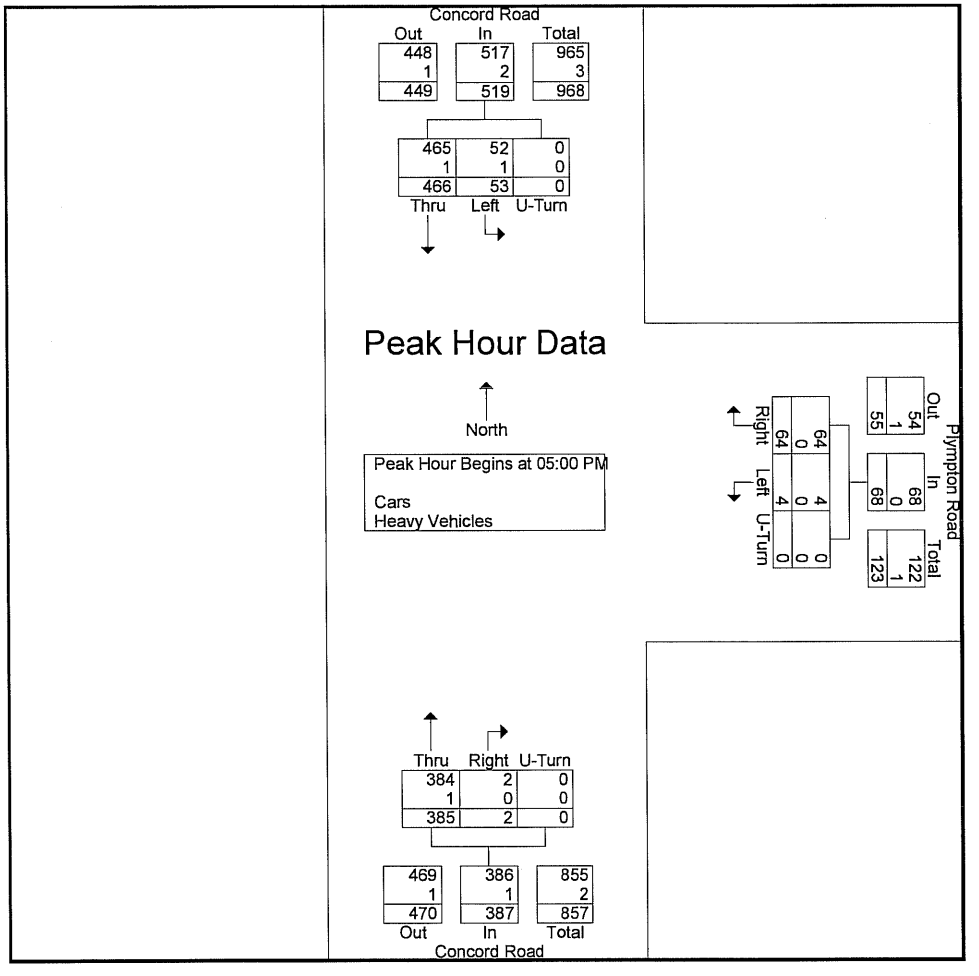
City, State: Sudbury, MA
Client: MDM/ M. Houle

File Name : 164982 HH
Site Code : 814
Start Date : 3/9/2016
Page No : 1

	Concord Road From North				Plympton Road From East				Concord Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	114	12	0	126	10	0	0	10	1	90	0	91	227
05:15 PM	104	16	0	120	11	1	0	12	1	82	0	83	215
05:30 PM	130	11	0	141	24	2	0	26	0	91	0	91	258
05:45 PM	118	14	0	132	19	1	0	20	0	122	0	122	274
Total Volume	466	53	0	519	64	4	0	68	2	385	0	387	974
% App. Total	89.8	10.2	0		94.1	5.9	0		0.5	99.5	0		
PHF	.896	.828	.000	.920	.667	.500	.000	.654	.500	.789	.000	.793	.889
Cars	465	52	0	517	64	4	0	68	2	384	0	386	971
% Cars	99.8	98.1	0	99.6	100	100	0	100	100	99.7	0	99.7	99.7
Heavy Vehicles	1	1	0	2	0	0	0	0	0	1	0	1	3
% Heavy Vehicles	0.2	1.9	0	0.4	0	0	0	0	0	0.3	0	0.3	0.3



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File Name : 164982 HH
Site Code : 814
Start Date : 3/9/2016
Page No : 1

Groups Printed- Cars

	Concord Road From North			Plympton Road From East			Concord Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
04:00 PM	117	8	0	8	2	0	0	96	0	231
04:15 PM	113	9	0	14	0	0	0	95	0	231
04:30 PM	118	12	0	9	0	0	0	73	0	212
04:45 PM	151	9	0	8	0	0	1	89	0	258
Total	499	38	0	39	2	0	1	353	0	932
05:00 PM	114	12	0	10	0	0	1	90	0	227
05:15 PM	103	16	0	11	1	0	1	81	0	213
05:30 PM	130	11	0	24	2	0	0	91	0	258
05:45 PM	118	13	0	19	1	0	0	122	0	273
Total	465	52	0	64	4	0	2	384	0	971
Grand Total	964	90	0	103	6	0	3	737	0	1903
Apprch %	91.5	8.5	0	94.5	5.5	0	0.4	99.6	0	
Total %	50.7	4.7	0	5.4	0.3	0	0.2	38.7	0	

	Concord Road From North				Plympton Road From East				Concord Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	114	12	0	126	10	0	0	10	1	90	0	91	227
05:15 PM	103	16	0	119	11	1	0	12	1	81	0	82	213
05:30 PM	130	11	0	141	24	2	0	26	0	91	0	91	258
05:45 PM	118	13	0	131	19	1	0	20	0	122	0	122	273
Total Volume	465	52	0	517	64	4	0	68	2	384	0	386	971
% App. Total	89.9	10.1	0		94.1	5.9	0		0.5	99.5	0		
PHF	.894	.813	.000	.917	.667	.500	.000	.654	.500	.787	.000	.791	.889

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File Name : 164982 HH
Site Code : 814
Start Date : 3/9/2016
Page No : 1

Groups Printed- Heavy Vehicles

	Concord Road From North			Plympton Road From East			Concord Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
04:00 PM	1	0	0	0	0	0	0	1	0	2
04:15 PM	1	0	0	0	0	0	0	2	0	3
04:30 PM	1	0	0	0	0	0	0	1	0	2
04:45 PM	2	0	0	0	0	0	0	0	0	2
Total	5	0	0	0	0	0	0	4	0	9
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	1	0	0	0	0	0	0	1	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	1	0	0	0	0	0	0	0	1
Total	1	1	0	0	0	0	0	1	0	3
Grand Total	6	1	0	0	0	0	0	5	0	12
Apprch %	85.7	14.3	0	0	0	0	0	100	0	
Total %	50	8.3	0	0	0	0	0	41.7	0	

	Concord Road From North				Plympton Road From East				Concord Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
04:15 PM	1	0	0	1	0	0	0	0	0	2	0	2	3
04:30 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
04:45 PM	2	0	0	2	0	0	0	0	0	0	0	0	2
Total Volume	5	0	0	5	0	0	0	0	0	4	0	4	9
% App. Total	100	0	0		0	0	0		0	100	0		
PHF	.625	.000	.000	.625	.000	.000	.000	.000	.000	.500	.000	.500	.750

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File Name : 164982 HH
Site Code : 814
Start Date : 3/9/2016
Page No : 1

Groups Printed- Peds and Bikes

	Concord Road From North				Plympton Road From East				Concord Road From South				
Start Time	Thru	Left	Peds EB	Peds WB	Right	Left	Peds SB	Peds NB	Right	Thru	Peds WB	Peds EB	Int. Total
04:00 PM	0	1	1	0	0	0	0	0	0	0	0	0	2
04:15 PM	1	1	0	0	0	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	2
Total	1	2	1	0	1	0	0	0	0	2	0	0	7
05:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	3	0	0	0	0	0	0	0	4
Grand Total	1	3	1	0	4	0	0	0	0	2	0	0	11
Apprch %	20	60	20	0	100	0	0	0	0	100	0	0	
Total %	9.1	27.3	9.1	0	36.4	0	0	0	0	18.2	0	0	

	Concord Road From North					Plympton Road From East					Concord Road From South					
Start Time	Thru	Left	Peds EB	Peds WB	App. Total	Right	Left	Peds SB	Peds NB	App. Total	Right	Thru	Peds WB	Peds EB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 04:00 PM																
04:00 PM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
Total Volume	1	2	1	0	4	1	0	0	0	1	0	2	0	0	2	7
% App. Total	25	50	25	0		100	0	0	0		0	100	0	0		
PHF	.250	.500	.250	.000	.500	.250	.000	.000	.000	.250	.000	.250	.000	.000	.250	.875

□ Travel Route Times

Route A										
		Stopwatch Lap Time								
	Intersection	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8	Run #9	Run #10
1	South Site Drive at Hudson Road (Rt 27)	02:45.9	00:00.0	03:23.6	00:00.0	02:46.3	00:00.0				
2	*Hudson Road (Rt 27) at Concord Road	00:13.3	00:08.1	01:02.9	00:09.3	01:01.0	00:05.8				
3	*Hudson Road (Rt 27) at Connector Road	02:11.0	01:19.7	01:54.4	02:06.6	00:04.5	01:23.6				
4	Old Sudbury Road (Rt 27) at Water Row	00:00.0	03:50.2	00:00.0	04:50.9	00:00.0	03:36.9				
	Condition at Old Sudbury @ Concord Road		approx. 20 vehicle queue	approx. 15 vehicle queue							

* Dependent on direction - these values represent lap times of either stopping at queue of vehicles or entering intersection of Hudson at Concord. The difference between consecutive values indicates intersection delay.

Signal Delay (2)	01:57.7	01:11.6	00:51.5	01:57.3	00:56.5	01:17.7			
Average Travel Time	02:58.6	04:06.0							

Route B											
	Intersection	Stopwatch Lap Time									
		Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8	Run #9	Run #10
1	North Site Drive at Concord Road	03:26.2	00:00.0	03:43.8	00:00.0	03:59.6	00:00.0				
2	Concord road at Candy Hill Road	00:55.6	00:20.3	00:42.5	00:18.8	00:50.2	00:18.7				
3	Candy Hill Road at Plympton Road	01:32.6	00:40.4	01:32.9	00:41.6	01:33.9	00:42.1				
4	Plympton Road at Water Row	00:55.6	01:33.7	01:00.5	01:43.9	01:13.4	01:41.8				
5	Water Row at Old Sudbury Road (Rt 27)	00:00.0	03:51.9	00:00.0	03:55.3	00:00.0	03:54.4				
	Average Travel Time	03:43.2	03:53.9								

Route C											
	Intersection	Stopwatch Lap Time									
		Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8	Run #9	Run #10
1	North Site Drive at Concord Road	00:00.0	02:37.3	00:00.0	02:45.3	00:00.0	03:00.1				
2	*Concord Road at Connector Road	00:15.4	00:11.4	00:17.5	00:15.3	00:20.1	00:19.0				
		00:57.6		00:45.7		00:50.9					
3	*Connector Road at Old Sudbury Road (Rt 27)	00:09.8	02:03.2	00:15.8	01:58.0	00:11.2	02:00.0				
		00:05.9		00:02.1		00:09.1					
4	Water Row at Old Sudbury Road (Rt 27)	03:22.1	00:00.0	03:15.2	00:00.0	03:20.1	00:00.0				
	Condition at Old Sudbury @ Concord Road	approx. 20 vehicle queue									

* Multiple values in the designated rows represent intersection delay. Dependent on direction - these values represent lap times of either stopping at queue of vehicles or entering intersection of Hudson at Concord. The difference between consecutive values indicates intersection delay.

Signal Delay (2)	00:42.2	00:11.4	00:28.2	00:15.3	00:30.8	00:19.0
Signal Delay (3)	00:03.9	02:03.2	00:13.7	01:58.0	00:02.0	02:00.0
Average Travel Time	03:19.1	02:47.6				

□ Pedestrian Volume Data

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA

Crosswalk (Pedestrians)
Route 27

File Name : Rte 27 Crosswalk (Peds)
Site Code : 814
Start Date : 4/14/2016
Page No : 2

	From North		
Start Time	Peds	App. Total	Int. Total
Peak Hour Analysis From 8:00:00 AM to 10:45:00 AM - Peak 1 of 1			
Peak Hour for Entire Intersection Begins at 8:30:00 AM			
8:30:00 AM	10	10	10
8:45:00 AM	19	19	19
9:00:00 AM	**29**	**29**	**29**
9:15:00 AM	10	10	10
Total Volume	68	68	68
% App. Total	100		
PHF	.586	.586	.586

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA

Crosswalk (Pedestrians)
Route 27

File Name : Rte 27 Crosswalk (Peds)
Site Code : 814
Start Date : 4/14/2016
Page No : 1

Groups Printed- Pedestrians

	From North		
Start Time	Peds	App. Total	Int. Total
08:30 AM	10	10	10
08:45 AM	19	19	19
Total	29	29	29
09:00 AM	29	29	29
09:15 AM	10	10	10
09:30 AM	3	3	3
09:45 AM	25	25	25
Total	67	67	67
10:00 AM	22	22	22
10:15 AM	1	1	1
10:30 AM	16	16	16
Total	39	39	39
Grand Total	135	135	135
Apprch %	100		
Total %	100	100	

MDM Transportation Consultants, Inc.

28 Lord Road, Suite 280
Marlborough, MA

Crosswalk (Pedestrians)
Concord Road
at Morse Road

File Name : Concord Road at Morse Road Crosswalk (Peds)
Site Code : 814
Start Date : 4/14/2016
Page No : 2

	From North		
Start Time	Peds	App. Total	Int. Total
Peak Hour Analysis From 8:00:00 AM to 10:45:00 AM - Peak 1 of 1			
Peak Hour for Entire Intersection Begins at 8:00:00 AM			
8:00:00 AM	0	0	0
8:15:00 AM	0	0	0
8:30:00 AM	9	9	9
8:45:00 AM	**25**	**25**	**25**
Total Volume	34	34	34
% App. Total	100		
PHF	.340	.340	.340

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28 Lord Road, Suite 280
Marlborough, MA

Crosswalk (Pedestrians)
Concord Road
at Morse Road

File Name : Concord Road at Morse Road Crosswalk (Peds)
Site Code : 814
Start Date : 4/14/2016
Page No : 1

Groups Printed- Pedestrians

	From North		
Start Time	Peds	App. Total	Int. Total
08:30 AM	9	9	9
08:45 AM	25	25	25
Total	34	34	34
09:45 AM	3	3	3
Total	3	3	3
10:00 AM	1	1	1
10:15 AM	2	2	2
Total	3	3	3
Grand Total	40	40	40
Apprch %	100		
Total %	100	100	

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

N/S: Concord Road
E: Candy Hill Road
City, State: Sudbury, MA
Client: MDM/ M. Houle

File Name : 164982 G
Site Code : 814
Start Date : 3/9/2016
Page No : 1

Groups Printed- Peds and Bikes

	Concord Road From North				Candy Hill Road From East				Concord Road From South				
Start Time	Thru	Left	Peds EB	Peds WB	Right	Left	Peds SB	Peds NB	Right	Thru	Peds WB	Peds EB	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	1
07:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
07:45 AM	1	0	0	0	0	0	0	0	0	0	1	0	2
Total	2	0	0	0	0	0	0	0	0	1	3	0	6
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	0	0	0	1	0	1
Grand Total	2	0	0	0	0	0	0	0	0	1	4	0	7
Apprch %	100	0	0	0	0	0	0	0	0	20	80	0	
Total %	28.6	0	0	0	0	0	0	0	0	14.3	57.1	0	

	Concord Road From North					Candy Hill Road From East					Concord Road From South					
Start Time	Thru	Left	Peds EB	Peds WB	App. Total	Right	Left	Peds SB	Peds NB	App. Total	Right	Thru	Peds WB	Peds EB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 07:00 AM																
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
07:15 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
07:45 AM	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	2
Total Volume	2	0	0	0	2	0	0	0	0	0	0	1	3	0	4	6
% App. Total	100	0	0	0		0	0	0	0		0	25	75	0		
PHF	.500	.000	.000	.000	.500	.000	.000	.000	.000	.000	.000	.250	.375	.000	.500	.750

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Crosswalk (Pedestrians)
Route 27

File Name : 814 Rte 27 Crosswalk (Peds)
Site Code : 814
Start Date : 4/14/2016
Page No : 2

	From North		
Start Time	Peds	App. Total	Int. Total
Peak Hour Analysis From 2:00:00 PM to 4:45:00 PM - Peak 1 of 1			
Peak Hour for Entire Intersection Begins at 2:45:00 PM			
2:45:00 PM	1	1	1
3:00:00 PM	4	4	4
3:15:00 PM	25	25	25
3:30:00 PM	**29**	**29**	**29**
Total Volume	59	59	59
% App. Total	100		
PHF	.509	.509	.509

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28 Lord Road, Suite 280
Marlborough, MA

Crosswalk (Pedestrians)
Route 27

File Name : 814 Rte 27 Crosswalk (Peds)
Site Code : 814
Start Date : 4/14/2016
Page No : 1

Groups Printed- Pedestrians

	From North		
Start Time	Peds	App. Total	Int. Total
02:45 PM	1	1	1
Total	1	1	1
03:00 PM	4	4	4
03:15 PM	25	25	25
03:30 PM	29	29	29
Total	58	58	58
04:15 PM	29	29	29
04:45 PM	29	29	29
Total	58	58	58
Grand Total	117	117	117
Apprch %	100		
Total %	100	100	

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28 Lord Road, Suite 280
Marlborough, MA

Crosswalk (Pedestrians)
Concord Road
at Morse Road

File Name : 814 Concord Road at Morse Road Crosswalk (Peds)
Site Code : 814
Start Date : 4/14/2016
Page No : 2

	From North		
Start Time	Peds	App. Total	Int. Total
Peak Hour Analysis From 2:00:00 PM to 4:45:00 PM - Peak 1 of 1			
Peak Hour for Entire Intersection Begins at 3:00:00 PM			
3:00:00 PM	0	0	0
3:15:00 PM	**43**	**43**	**43**
3:30:00 PM	1	1	1
3:45:00 PM	2	2	2
Total Volume	46	46	46
% App. Total	100		
PHF	.267	.267	.267

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28 Lord Road, Suite 280
Marlborough, MA

Crosswalk (Pedestrians)
Concord Road
at Morse Road

File Name : 814 Concord Road at Morse Road Crosswalk (Peds)
Site Code : 814
Start Date : 4/14/2016
Page No : 1

Groups Printed- Pedestrians

	From North		
Start Time	Peds	App. Total	Int. Total
02:00 PM	2	2	2
02:15 PM	1	1	1
02:45 PM	1	1	1
Total	4	4	4
03:15 PM	43	43	43
03:30 PM	1	1	1
03:45 PM	2	2	2
Total	46	46	46
Grand Total	50	50	50
Apprch %	100		
Total %	100	100	

814 Sudbury

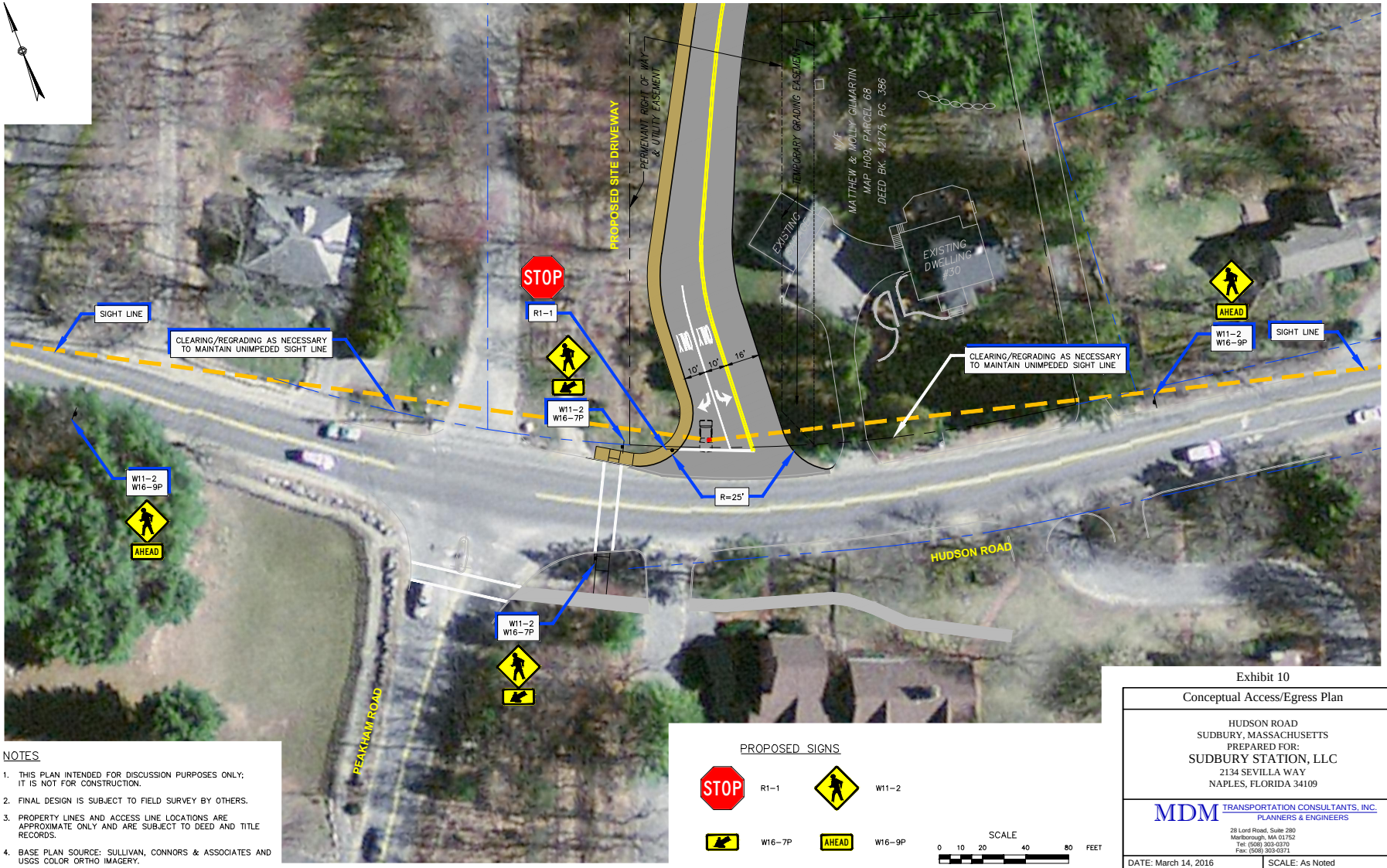
Pedestrian Count

Candy Hill Road at Concord Road Crosswalk

Time		# Peds	
3:30 PM		1	* runner
3:31 PM			
3:32 PM			
3:33 PM			
3:34 PM			
3:35 PM			
3:36 PM		2	* 2 student walking south
3:37 PM			
3:38 PM			
3:39 PM			
3:40 PM			
3:41 PM			
3:42 PM			
3:43 PM			
3:44 PM			
3:45 PM			
3:46 PM			
3:47 PM			
3:48 PM			
3:49 PM			
3:50 PM		2	* couple walking
3:51 PM			
3:52 PM			
3:53 PM			
3:54 PM			
3:55 PM			
3:56 PM			
3:57 PM			
3:58 PM			
3:59 PM			
4:00 PM			
4:01 PM			
4:02 PM			
4:03 PM			
4:04 PM			
4:05 PM			
4:06 PM			
4:07 PM			
4:08 PM			
4:09 PM			
4:10 PM			
4:11 PM			

4:12 PM		
4:13 PM		
4:14 PM		
4:15 PM		
4:16 PM		
4:17 PM		
4:18 PM		
4:19 PM		
4:20 PM		
4:21 PM		
4:22 PM		
4:23 PM		
4:24 PM		
4:25 PM		
4:26 PM		
4:27 PM		
4:28 PM		
4:29 PM		
4:30 PM		

□ Peakham Road Crosswalk



NOTES

1. THIS PLAN INTENDED FOR DISCUSSION PURPOSES ONLY; IT IS NOT FOR CONSTRUCTION.
2. FINAL DESIGN IS SUBJECT TO FIELD SURVEY BY OTHERS.
3. PROPERTY LINES AND ACCESS LINE LOCATIONS ARE APPROXIMATE ONLY AND ARE SUBJECT TO DEED AND TITLE RECORDS.
4. BASE PLAN SOURCE: SULLIVAN, CONNORS & ASSOCIATES AND USGS COLOR ORTHO IMAGERY.

PROPOSED SIGNS

STOP R1-1 | W11-2 | W16-7P | AHEAD W16-9P

SCALE
0 10 20 40 80 FEET

Exhibit 10

Conceptual Access/Egress Plan

HUDSON ROAD
SUDBURY, MASSACHUSETTS
PREPARED FOR:
SUDBURY STATION, LLC
2134 SEVILLA WAY
NAPLES, FLORIDA 34109

MDM TRANSPORTATION CONSULTANTS, INC.
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Tel: (508) 303-0370
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DATE: March 14, 2016 | SCALE: As Noted
PROJECT No. 814 | File: 814 Concept Plan (3-14-2016).dwg | Sheet 1 of 1

Peakham Road Crosswalk Looking East

Proposed Crosswalk Looking at Peakham Road

At Site Looking West

At Proposed Crosswalk Looking South