

MEMORANDUM

Ref: 1790A

To: Reggie Moreau – DAR Builders, LLC
Eric C. Mitchell – ECM & Associates, Inc.

From: Stephen G. Pernaw, P.E., PTOE

Subject: Proposed Residential Subdivision – Response to Comments
Candia & Chester, New Hampshire

Date: March 20, 2018

On September 13, 2017 our office prepared the “*Traffic Impact and Site Access Study*” for the residential subdivision. We are now in receipt of review comments from the SNHPC dated October 11, 2017. The purpose of this memorandum is to provide responses to their comments, as follows:

SNHPC Comment 1: “*We find that the TIAS for the “Tanglewood” (Crowley Woods) Subdivision has been developed in accordance with generally accepted traffic engineering practice.*”

SGP Response: Comment acknowledged; no response required.

SNHPC Comment 2: “*We recommend that a section be added at the beginning of the TIAS explaining the process to develop the scope of work for the study. This section should include a discussion about any consultative feedback received from the Town of Chester, Town of Candia, and NHDOT District 5 in the development of the scope of work and underlying assumptions used in the TIAS.*”

SGP Response: The traffic study was completed, printed, and distributed in September 2017; therefore the more appropriate manner to address these comments is to do so by this “Response To Comments” memorandum. The scope of the submitted study was based on a meeting with ECM & Associates, Inc. which had previously received input from the various communities and the NHDOT. In our view, the size of the study area is generous for a development project that generates fewer than 100 vehicle-trips during the peak hour periods. As evidence that there was no attempt to “skimp” on the data collection effort, Figure 2 and Figure 3 show that the intersection counts were conducted on two consecutive weekdays. Common practice is to collect data on one typical weekday.

SNHPC Comment 3: “*The TIAS does not address whether there is approved or pending development that could affect the “Tanglewood” (Crowley Woods) study area. We recommend that a section be added to the TIAS that explicitly addresses approved and pending development, including but not limited to the proposed “Meadows” project of 172 townhouses located on Chester Road in the Town of Raymond. Town staff in both Candia and Chester should be consulted to ensure comprehensive consideration of approved and pending development. If the “Meadows” development (or any other applicable development) is found not to impact the “Tanglewood” (Crowley Woods) study area, that conclusion should be explicitly detailed in the TIAS.*”

SGP Response: According to generally accepted traffic engineering practice in New Hampshire, the only “other development” projects that are reflected in the No Build traffic projections are those that have been approved at the local level (with an attendant traffic study), but were not operational at the time that data was collected for the pending traffic study. In the case of the “Meadows” project, it was not approved in September 2017 when our study was completed, nor has it been approved as of this date.

Upon review of the traffic study for the “Meadows” project, we note that it is located on New Hampshire 102/107 in Raymond, New Hampshire. This means that traffic from this development will utilize NH Route 101 and Interchanges #4 and #5 for access to the regional system. As an aside, the impact from the “Meadows” project on the Tanglewood study area intersections will be de minimis.

SNHPC Comment 4: *“In our correspondence dated July 12, 2017, we recommended that a total of seven intersections be included in the scope of the study. The TIAS as presented includes five of those seven recommended intersections. The TIS does not include the intersection of NH Route 43/Main Street or the intersection of NH Route 101/NH Route 43/Old Manchester Road in Candia. We reiterate our comments from July 12, 2017 that these two intersections should be included in the scope of the study. It is important to quantify the impacts of this development on these intersections as the NH Route 101 corridor will provide access to the Crowley Woods site.”*

SGP Response: As stated previously, these two intersections were not included in the study area based on input ECM received from the NHDOT. Nevertheless, the diagrams in Appendix G of the traffic study indicate that the impact of the proposed subdivision at these two intersections will be on the order of +20 (AM) and +27 (PM) trips during the peak hour periods. Further research at the NHDOT revealed that traffic counts were conducted at the NH Route 101/NH 43/Old Manchester Road intersection in 2012 (see Attachments 1 through 4). This somewhat antiquated data indicates that the proposed subdivision will increase the traffic volume at this intersection by approximately +2% during the peak hour periods. Impacts of this order of magnitude will not significantly alter the prevailing traffic operations at that intersection.

SNHPC Comment 5: *“The Trip Distribution Analysis provided in Appendix G of the report appears to rely on antiquated work destination data from the 2000 U.S. Census as a basis for estimating trip distribution to/from the site. In their “On The Map” online application, the U.S. Census Bureau provides more current data on work destinations, and this data is available at the town level. Based on 2015 work destination data from the U.S. Census “On The Map” application, approximately 4.5% of workers who live in the Town of Chester have their primary job in the Town of Chester. The Trip Distribution Analysis provided in the TIAS is based on a much higher percentage of workers who live in the Town of Chester having their primary job in the Town of Chester. As such, the trip distribution assumed in the TIAS may be systematically overestimating trips via Lane Road (south) and Candia Road (south) while underestimating trips to/from NH Route 101 via Main Street (west).”*

SGP Response: Supplemental “Site Generated Traffic Volume” exhibits based on the newer travel pattern information provided by the SNHPC have been prepared and are attached (see Attachments 4 & 5). A comparison between these exhibits and those found in Appendix G of the traffic study revealed that the net differences range from 1-13 vehicles per hour, depending upon location and time period. Changes of this magnitude will not materially affect the capacity and Level of Service analyses in the traffic study, nor the finding and recommendations contained therein.

SNHPC Comment 6: *"The Automatic Traffic Recorder (ATR) data collected by the Stephen G. Pernaw Company on Crowley Road in July 2017 is consistent with ATR data collected by the SNHPC on Crowley Road in June 2017."*

SGP Response: Comment acknowledged; no response required.

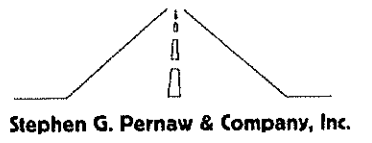
SNHPC Comment 7: *"In our correspondence dated July 12, 2017, we expressed concerns about sight distance at the Crowley Road/Chester Road, Crowley Road/Lane Road, and the Chester Road/Main Street intersections. In the correspondence, we recommended that as part of the traffic impact study, these conditions be verified and options be presented for sight distance improvements at these intersections. While the TIAS addresses sight distance of the two proposed site intersections, there appears to be no consideration or discussion of sight distance concerns at any other intersections including those cited above and the TIAS."*

SGP Response: The traffic study address the sight distance where new intersections are being created. ECM has been working with the town of Candia on existing intersections of local concern. It is our understanding that sight distance improvements at the Crowley Road approach to the Chester Road/Candia Road/Brown Road intersection are being proposed as part of the development project.

SNHPC Comment 8: *"The TIAS confirms the concerns expressed in our July 12, 2017 letter related to the existing geometry of Crowley Road. We reiterate that this geometry presents significant challenges for emergency vehicle and school bus access. We recommend that Crowley Road be upgraded to a paved travel width of 20 feet as part of a mitigation package for the "Tanglewood" (Crowley Woods) development."*

SGP Response: Providing a traveled way width of 20 feet on Crowley Road as recommended by SNHPC is consistent with the recommendations in the submitted traffic study.

Attachments



ATTACHMENTS

Peak Hour Data for Intersection

Int ID: 882
 Community: -
 Road 1: NH 43 at Old Manchester Rd. & Old Candia Rd.
 Road 2:

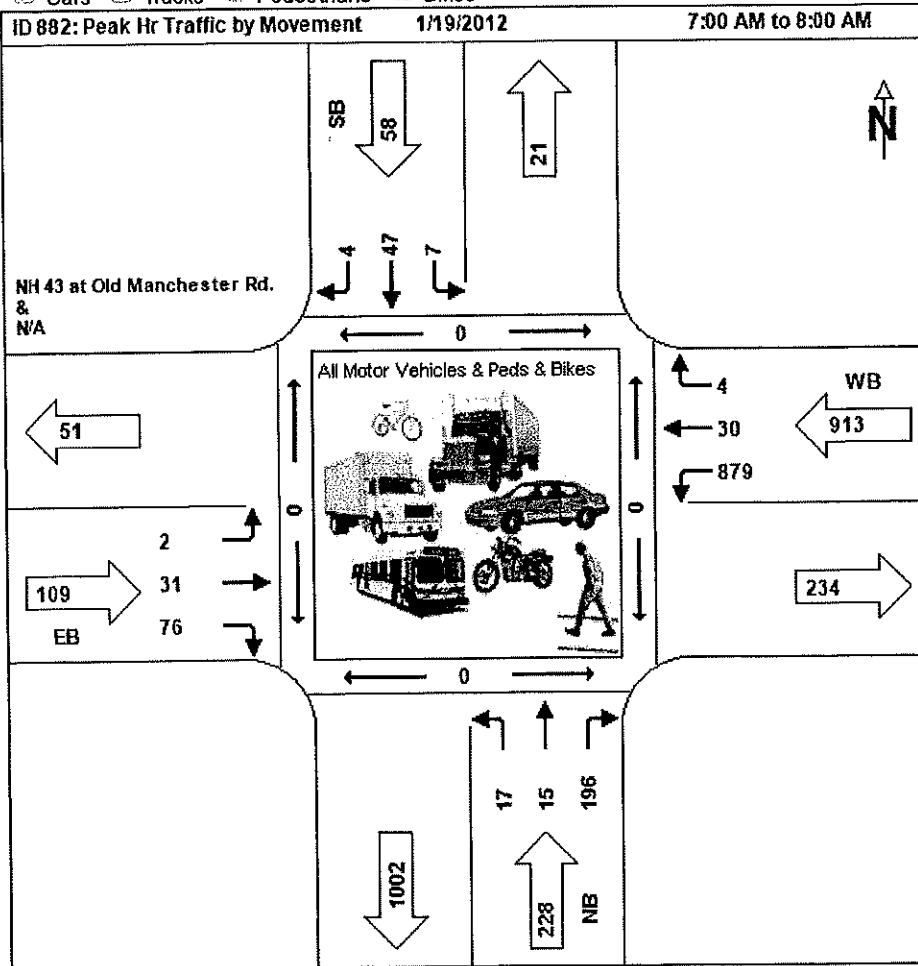
Corridor: NA
 Road 3:
 Road 4:

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AM Peak Hour
 01/19/2012

NB					EB					SB					WB										
Start Time	Left	Thru	Right	Ped	App		Left	Thru	Right	Ped	App		Left	Thru	Right	Ped	App		Left	Thru	Right	Ped	App		Int
					Total	Total					Total	Total					Total	Total							
7:00 AM	4	3	30	0	37		0	5	24	0	29		1	10	2	0	13		179	5	1	0	185		264
7:15 AM	4	2	48	0	54		0	1	17	0	18		2	17	1	0	20		254	2	0	0	256		348
7:30 AM	5	7	47	0	59		1	10	20	0	31		2	11	1	0	14		256	6	2	0	264		368
7:45 AM	4	3	71	0	78		1	15	15	0	31		2	9	0	0	11		190	17	1	0	208		328
Total	17	15	196	0	228		2	31	76	0	109		7	47	4	0	58		879	30	4	0	913		1308
PHF	0.85	0.54	0.69		0.73		0.50	0.52	0.79		0.88		0.88	0.69	0.50		0.73		0.86	0.44	0.50		0.86		
HV %	18	7	10				0	6	9				0	0	0				2	0	0				
<div><input checked="" type="checkbox"/> Cars <input checked="" type="checkbox"/> Trucks <input checked="" type="checkbox"/> Pedestrians <input checked="" type="checkbox"/> Bikes</div>																									

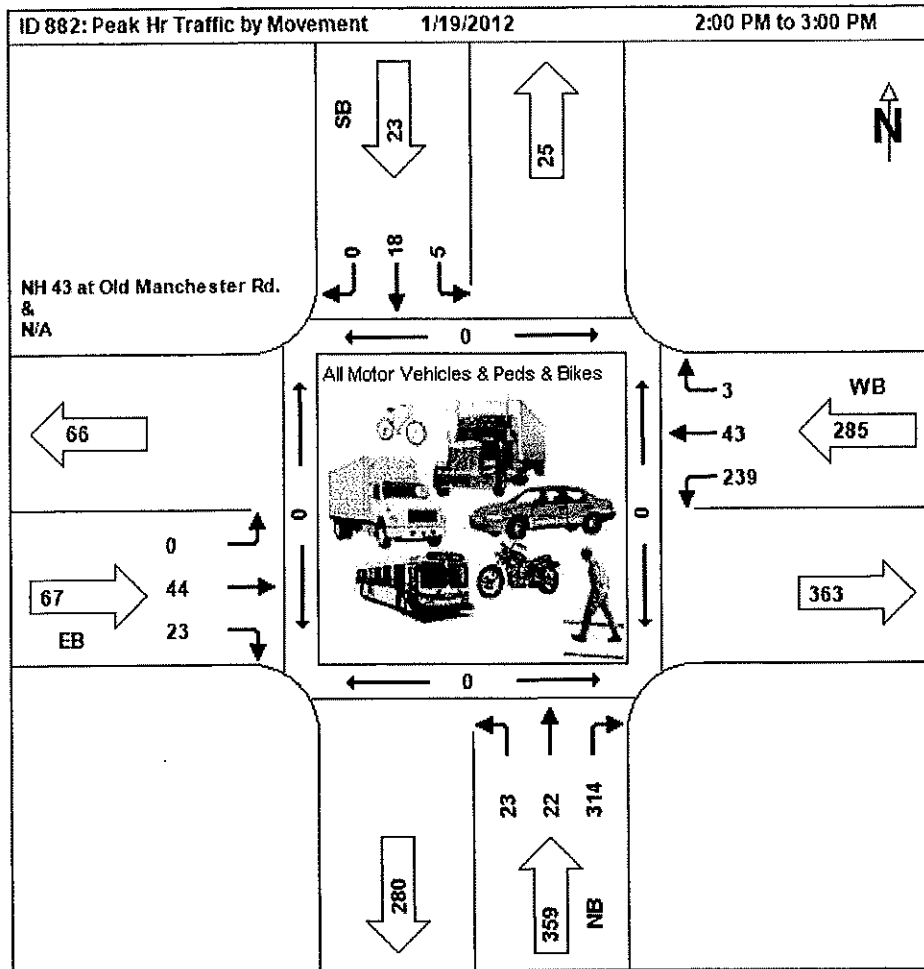
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Midday Peak Hour
 01/19/2012

NB					EB					SB					WB					App	Int
Start	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Left	Thru	Right	Ped	App	Total
2:00 PM	3	7	66	0	76	0	12	6	0	18	2	9	0	0	11	53	10	2	0	65	170
2:15 PM	6	3	81	0	90	0	12	7	0	19	0	4	0	0	4	58	12	1	0	71	184
2:30 PM	6	6	84	0	96	0	10	3	0	13	1	3	0	0	4	62	6	0	0	68	181
2:45 PM	8	6	83	0	97	0	10	7	0	17	2	2	0	0	4	66	15	0	0	81	199
Total	23	22	314	0	359	0	44	23	0	67	5	18	0	0	23	239	43	3	0	285	734
PHF	0.72	0.79	0.93		0.93	0.92	0.82			0.88	0.63	0.50			0.52	0.91	0.72	0.38		0.88	
HV %	9	5	4			11	13				0	0				5	12	0			

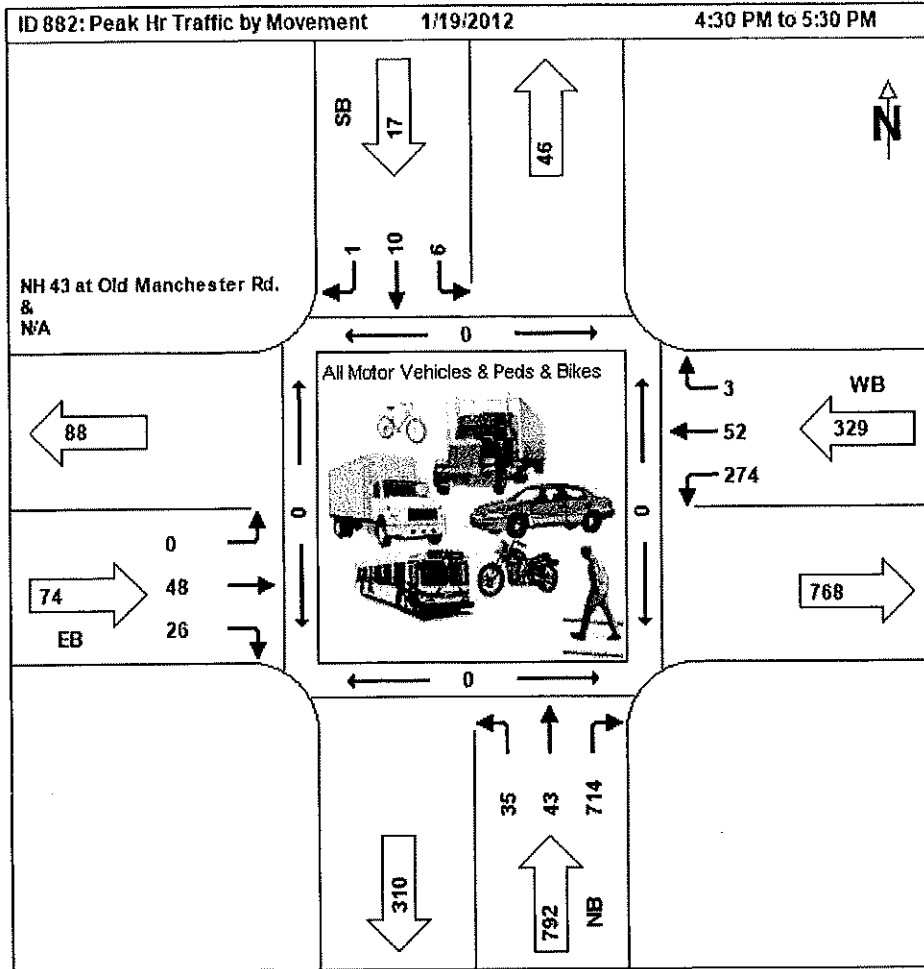
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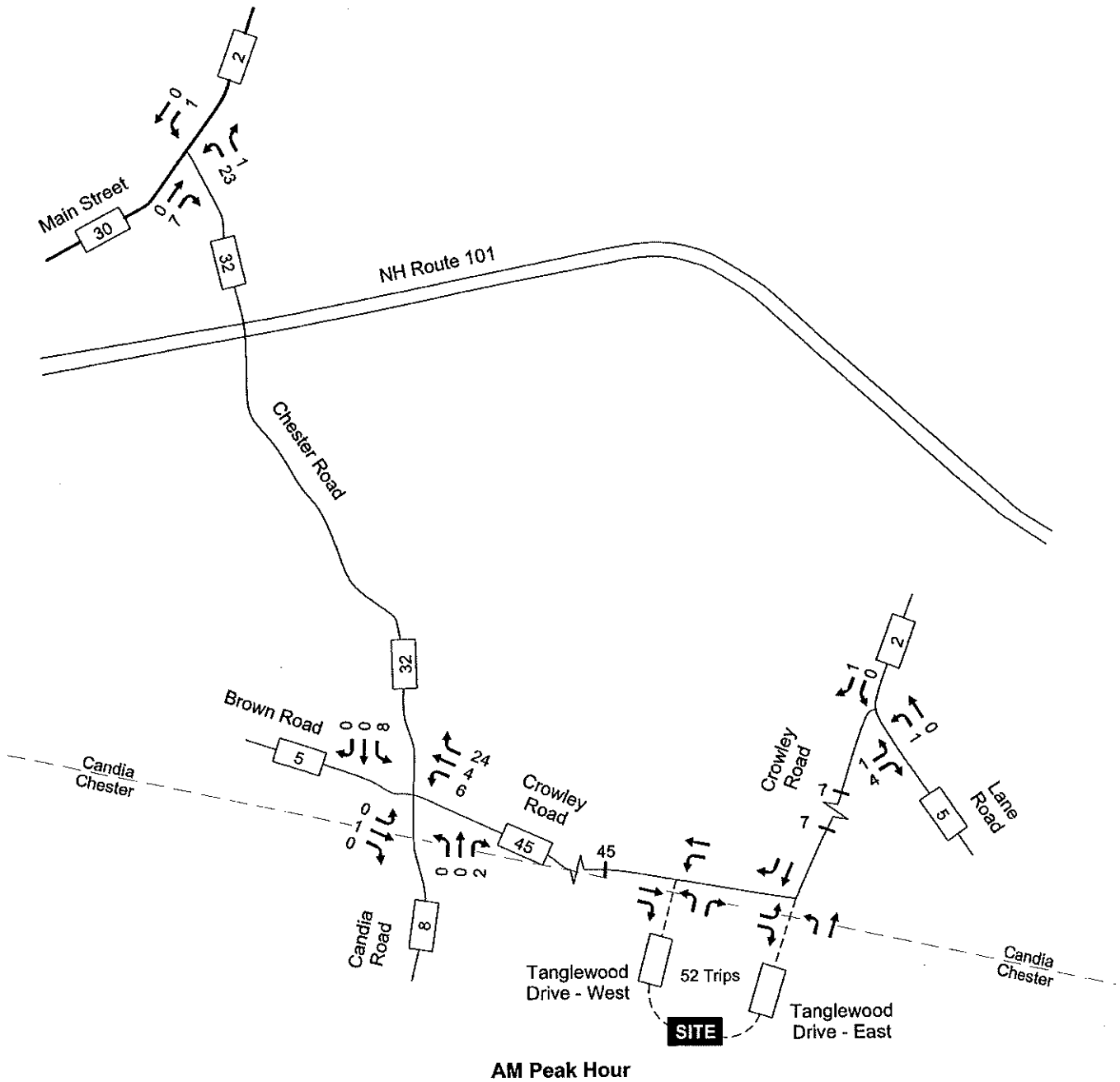
PM Peak Hour
01/19/2012

	NB					EB					SB					WB					App	Int
Start Time	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Left	Thru	Right	Ped	App Total	Total	
4:30 PM	10	9	155	0	174	0	10	10	0	20	1	8	0	0	9	84	15	2	0	101	304	
4:45 PM	6	7	166	0	179	0	16	8	0	24	1	1	1	0	3	62	15	0	0	77	283	
5:00 PM	9	14	174	0	197	0	11	6	0	17	1	1	0	0	2	63	15	1	0	79	295	
5:15 PM	10	13	219	0	242	0	11	2	0	13	3	0	0	0	3	65	7	0	0	72	330	
Total	35	43	714	0	792	0	48	26	0	74	6	10	1	0	17	274	52	3	0	329	1212	
PHF	0.880.77 0.82				0.82	0.75 0.65					0.77 0.500.31 0.25					0.47 0.820.87 0.38				0.81		
HV %	11	2	1			2 0					0 0 0					1 2 33						

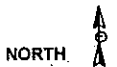
☒ Cars ☒ Trucks ☒ Pedestrians ☒ Bikes



Pernaw & Company, Inc



AM Peak Hour

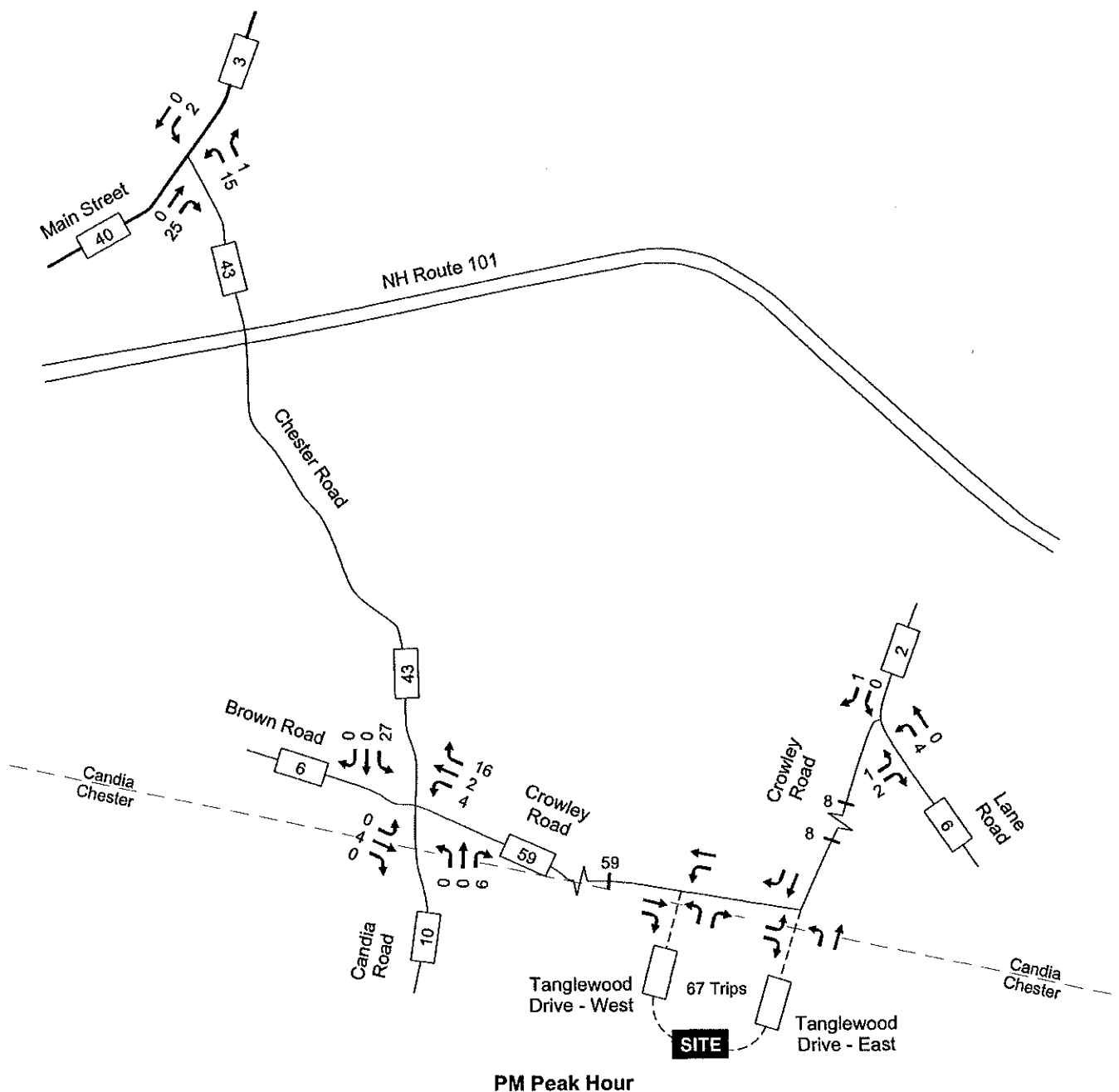


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Attachment

Site Generated Traffic Volumes - AM Peak Hour (w/SNHPC Distribution)
 Traffic Impact and Site Access Study, Proposed Residential Subdivision, Chester/Candia, New Hampshire

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PM Peak Hour

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NORTH



Attachment

Site Generated Traffic Volumes - PM Peak Hour (w/SNHPC Distribution)

Traffic Impact and Site Access Study, Proposed Residential Subdivision, Chester/Candia, New Hampshire