

-  = AUTOMATIC TRAFFIC RECORDER LOCATION (PERNAW & CO., INC.)
-  = INTERSECTION TURNING MOVEMENT COUNT LOCATION (PERNAW & CO., INC.)



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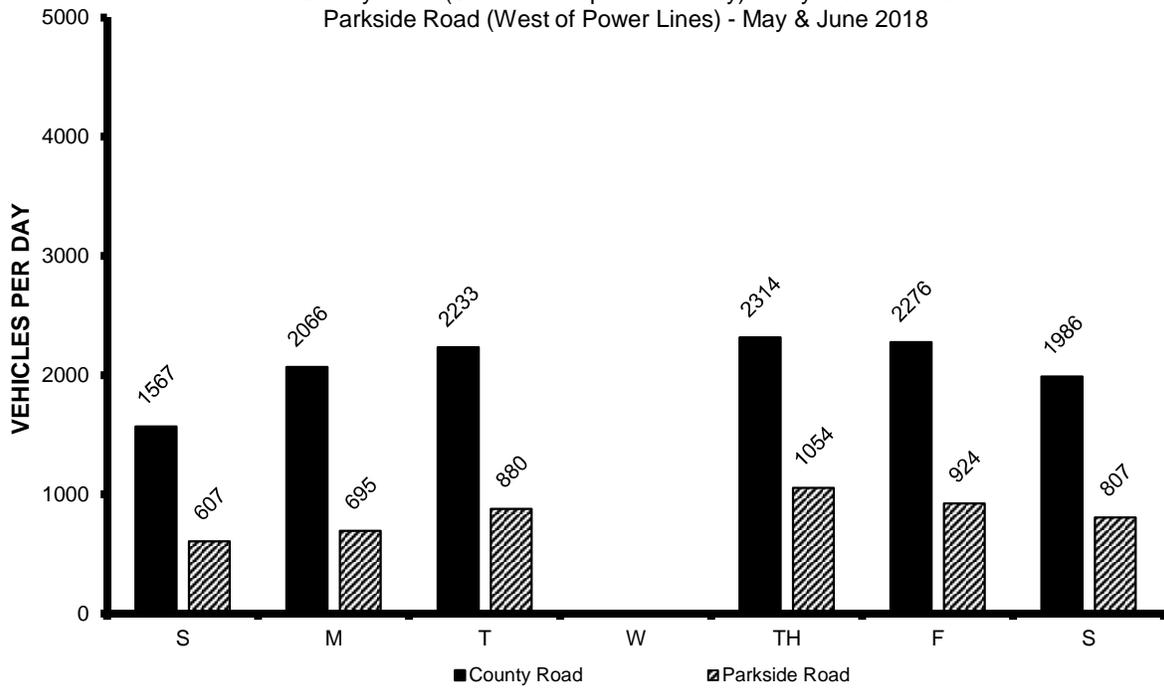
**Figure 1**

**Site Location**

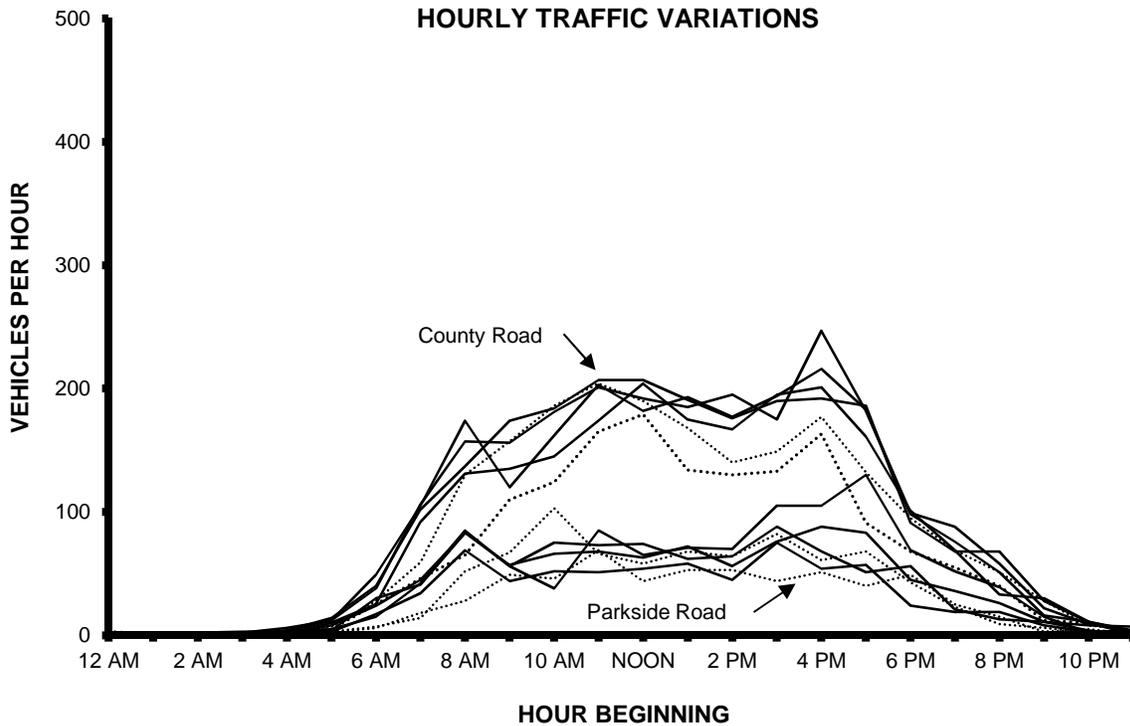
*Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH*

### DAILY TRAFFIC VARIATIONS

County Road (South of Hospital Driveway) - May & June 2018  
 Parkside Road (West of Power Lines) - May & June 2018

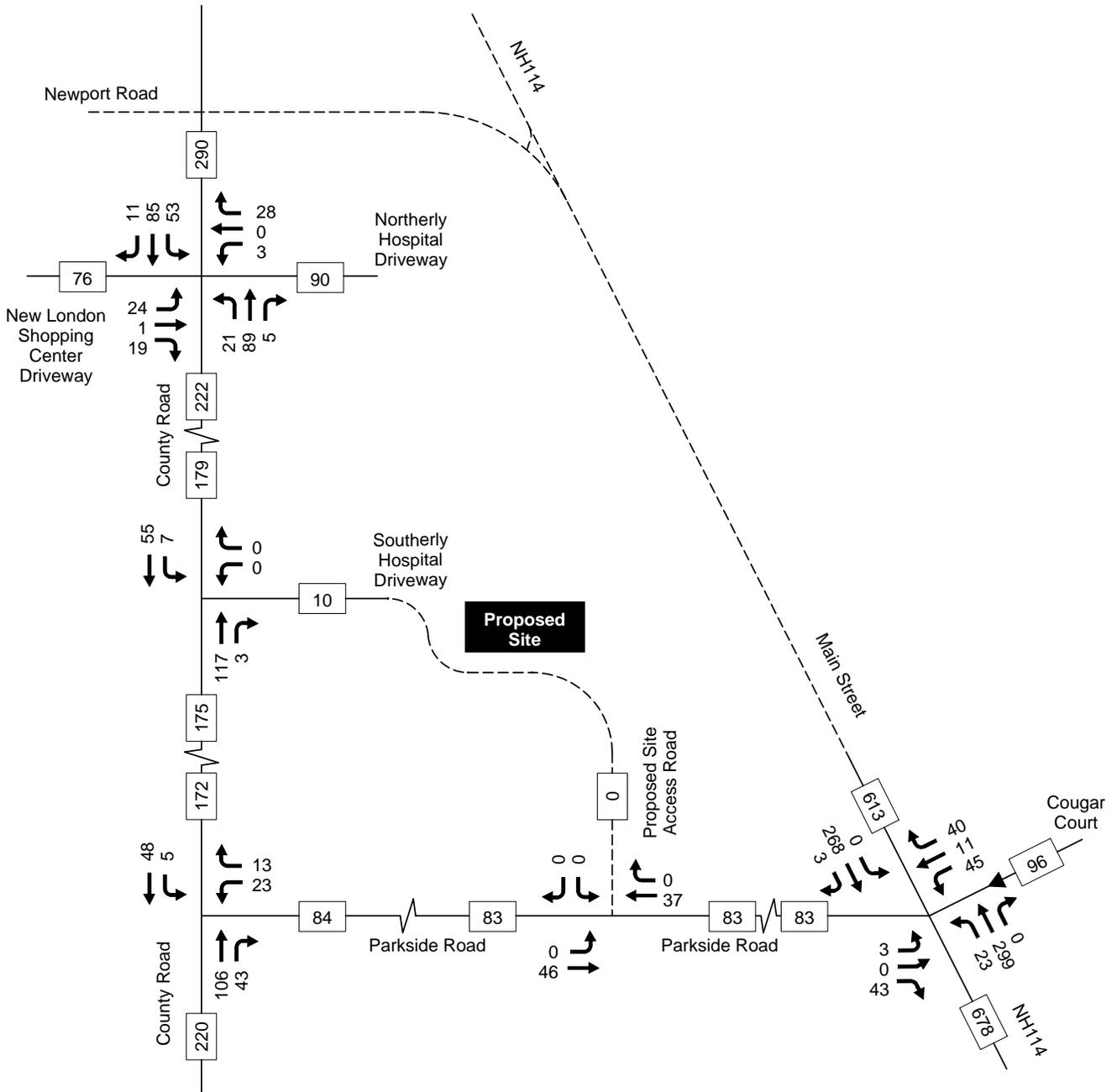


### HOURLY TRAFFIC VARIATIONS





2018-06-05 11:00:01 AM



AM PEAK HOUR  
 Tuesday, June 5, 2018  
 8:00 to 9:00 AM

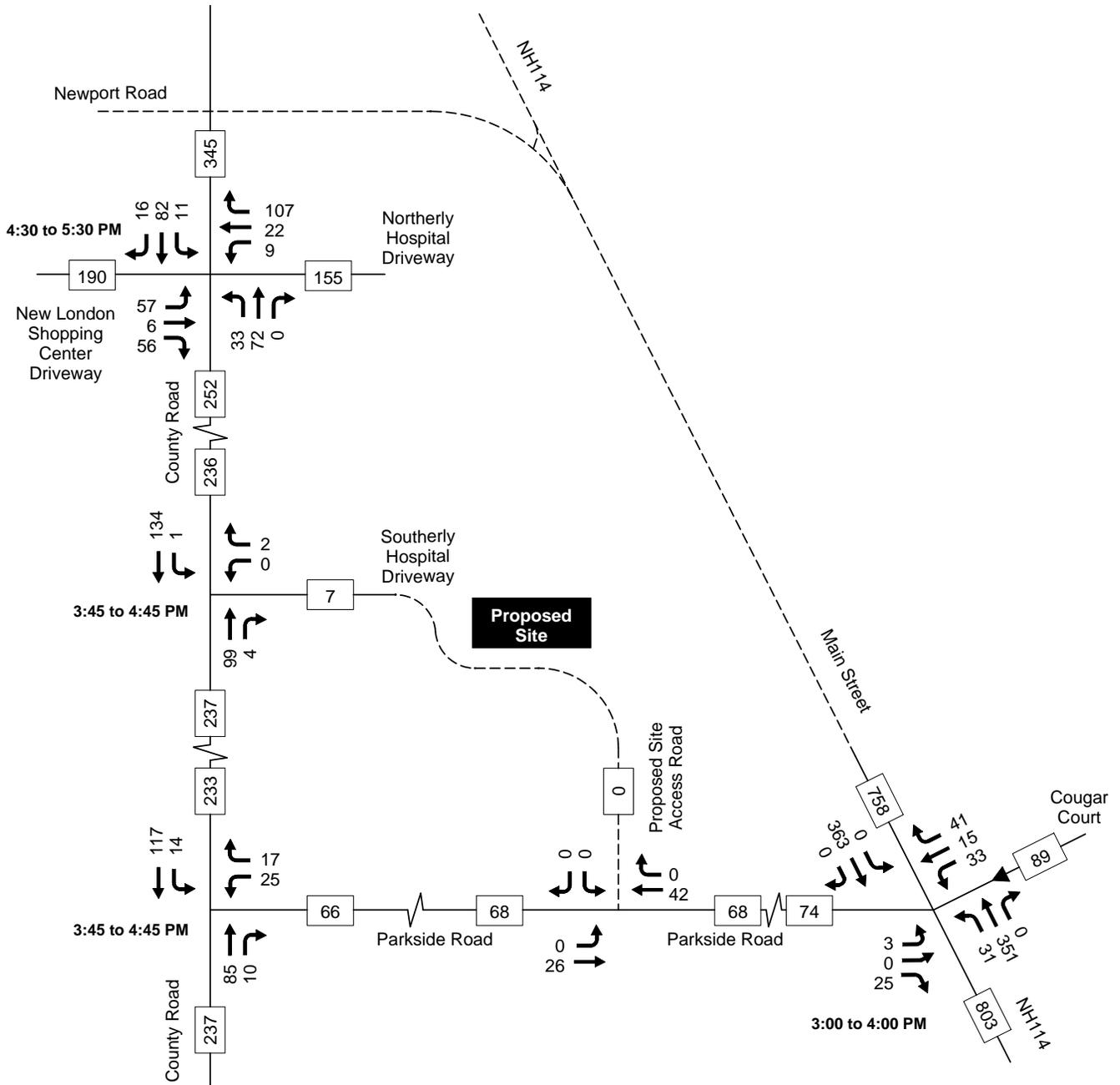


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Figure 2

2018 Existing Traffic Volumes - AM Peak Hour

Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH



**PM PEAK HOUR**  
 Tuesday, June 5, 2018  
 3:00 to 4:00 PM  
 3:45 to 4:45 PM  
 4:30 to 5:30 PM

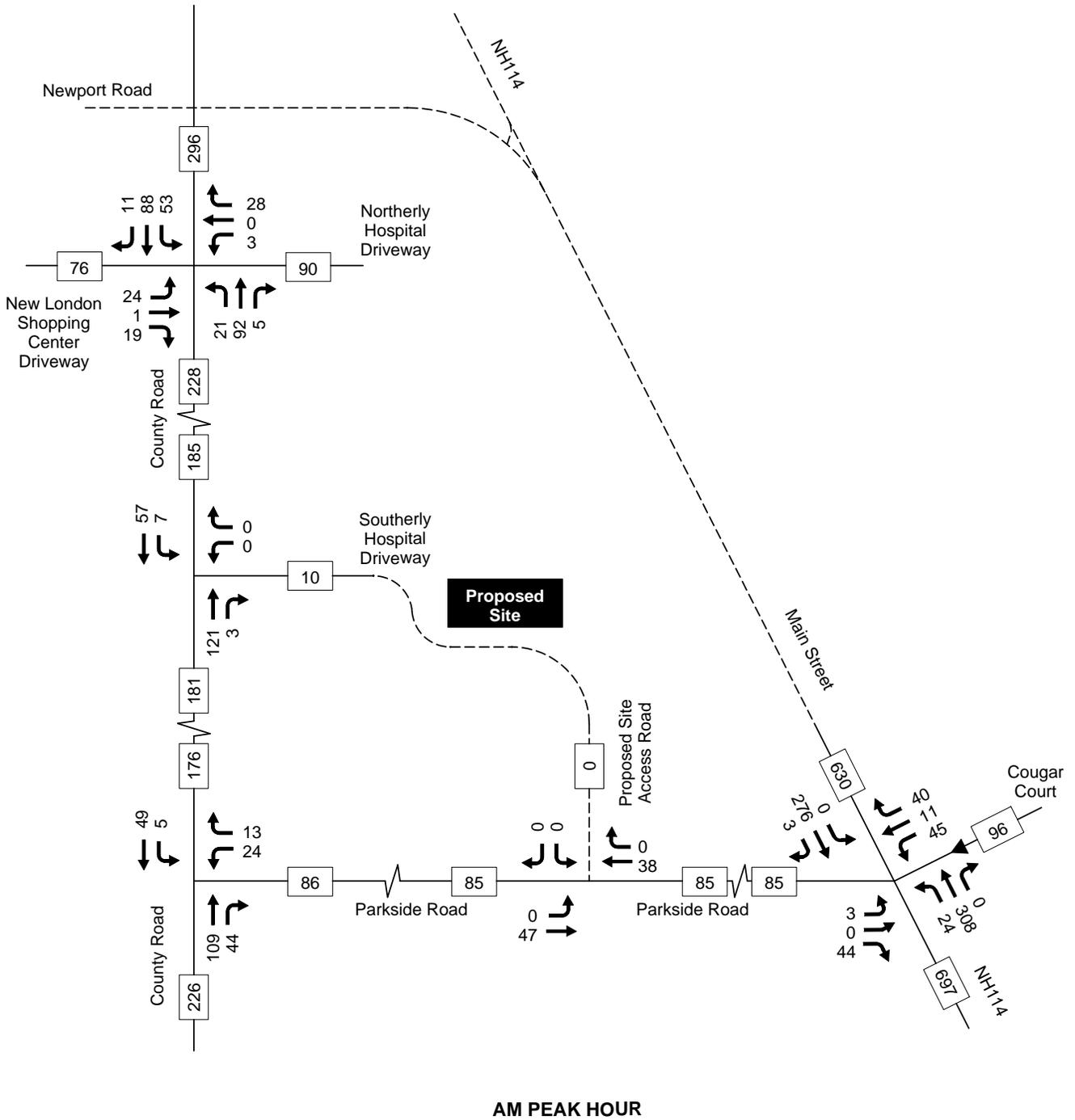


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**Figure 3**

**2018 Existing Traffic Volumes - PM Peak Hour**

*Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH*

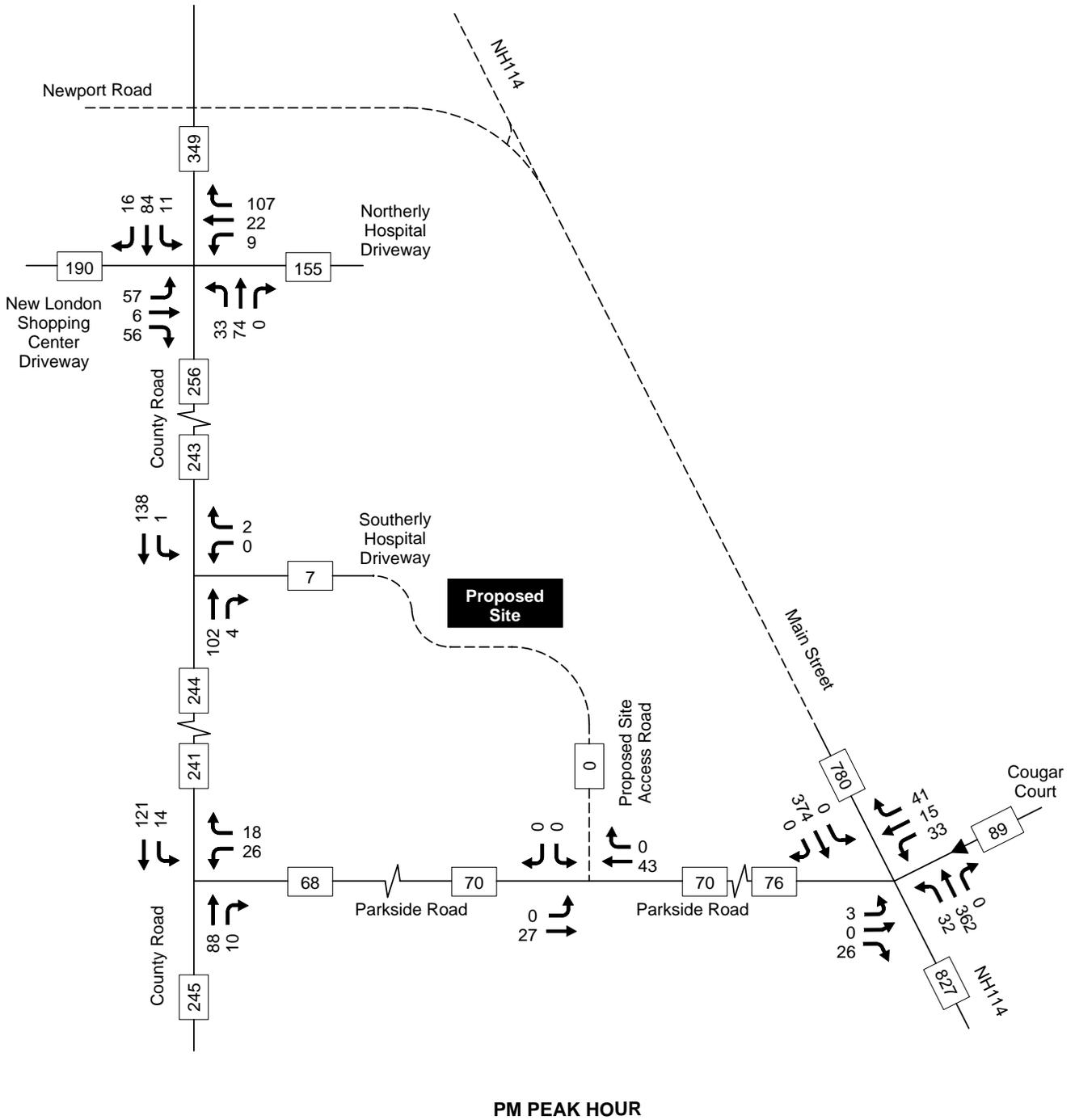


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**Figure 4**

**2020 No-Build Traffic Volumes - AM Peak Hour**

*Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH*

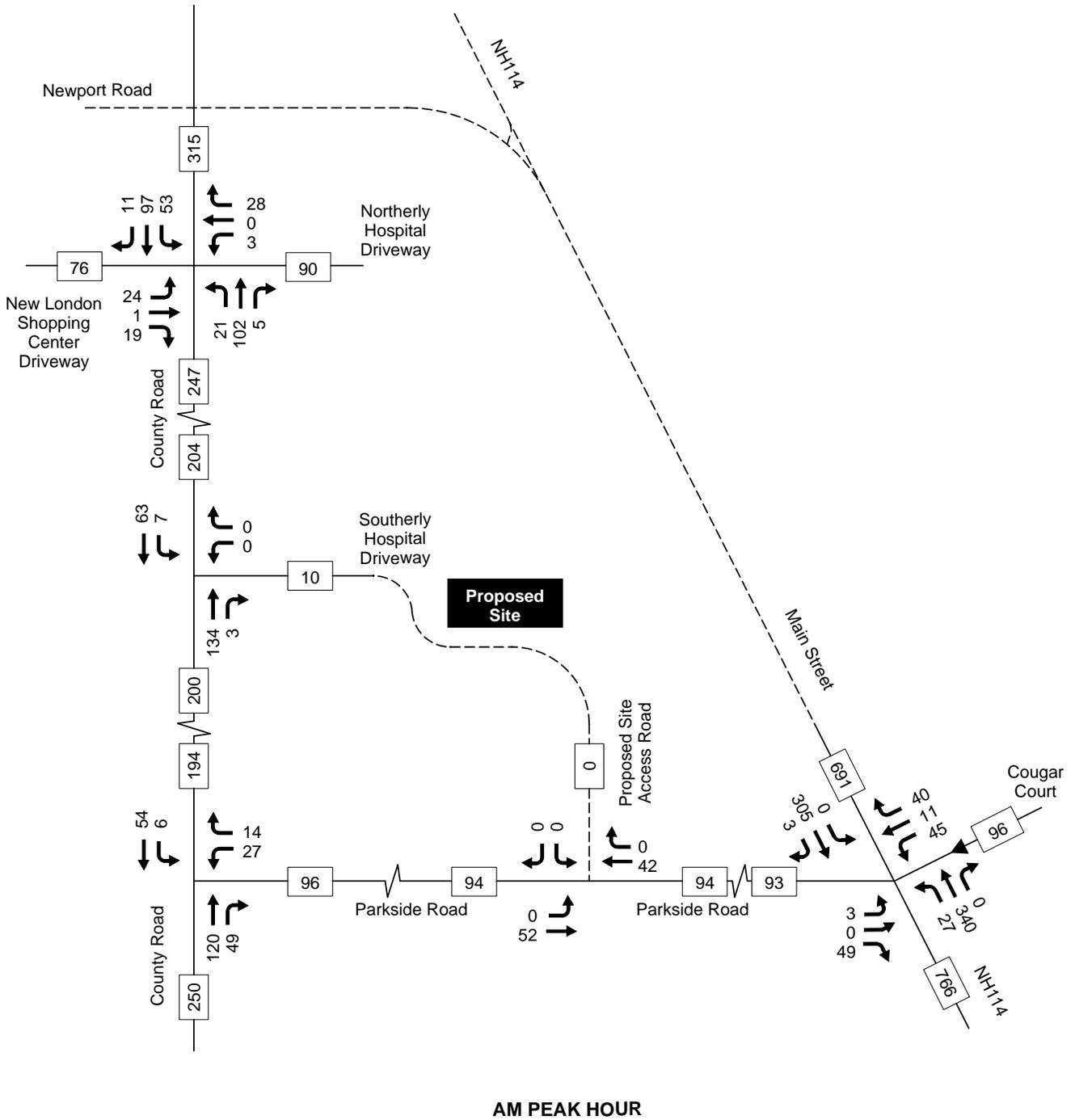


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Figure 5

2020 No-Build Traffic Volumes - PM Peak Hour

Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH

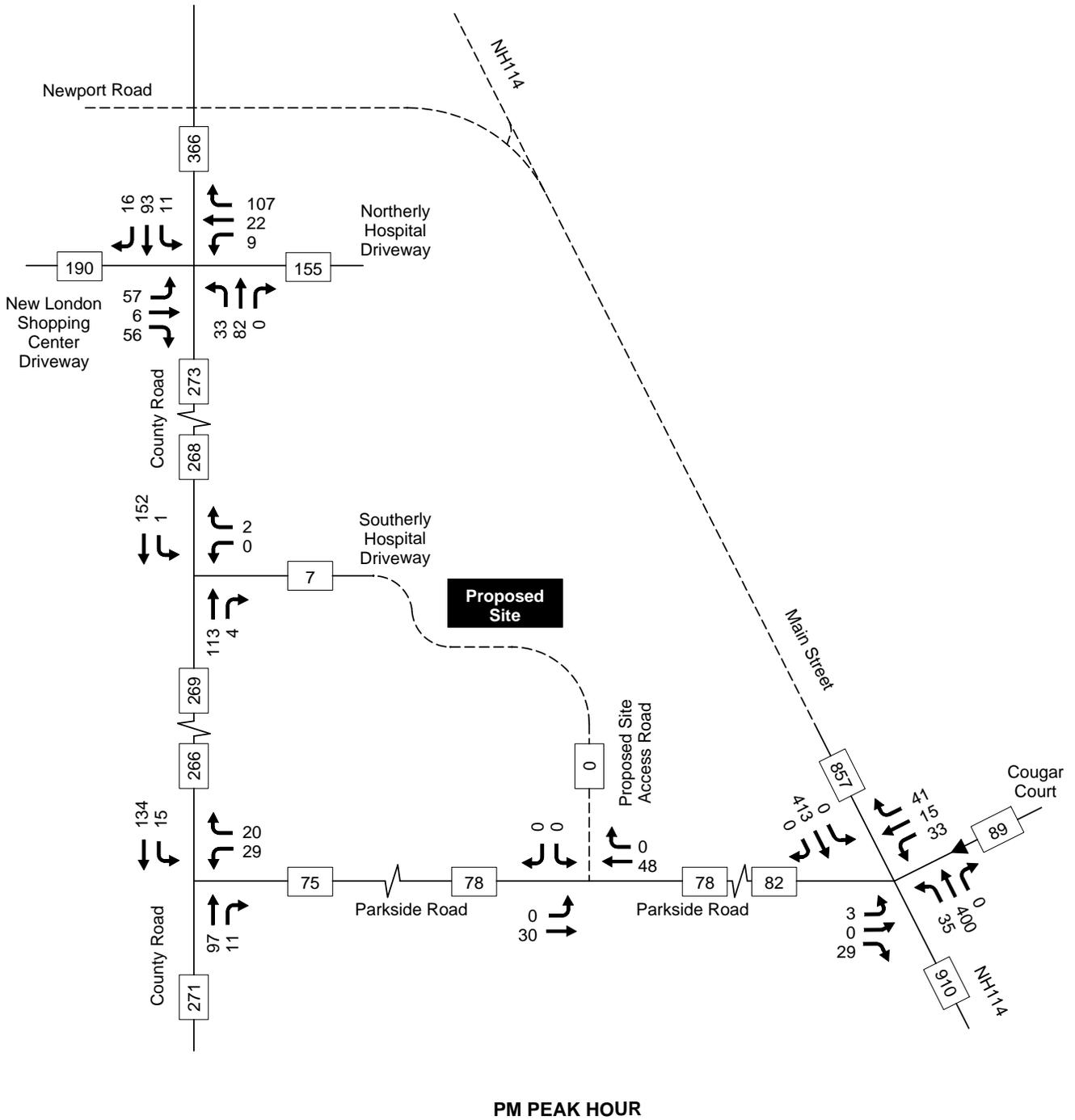


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**Figure 6**

**2030 No-Build Traffic Volumes - AM Peak Hour**

*Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH*



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**Figure 7**

**2030 No-Build Traffic Volumes - PM Peak Hour**

*Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH*

No-Build Traffic Volumes – The weekday peak hour traffic volume projections without the proposed CCRC for 2020 (opening year) and 2030 (horizon year) were derived from the June 2018 traffic count data using peak-month seasonal adjustment factors of 1.01 and an annual background growth rate of 1.0% per year, compounded annually (see Attachments 12 & 13). The No-Build traffic projections for 2020 and 2030 are summarized on Figure 4 through Figure 7.

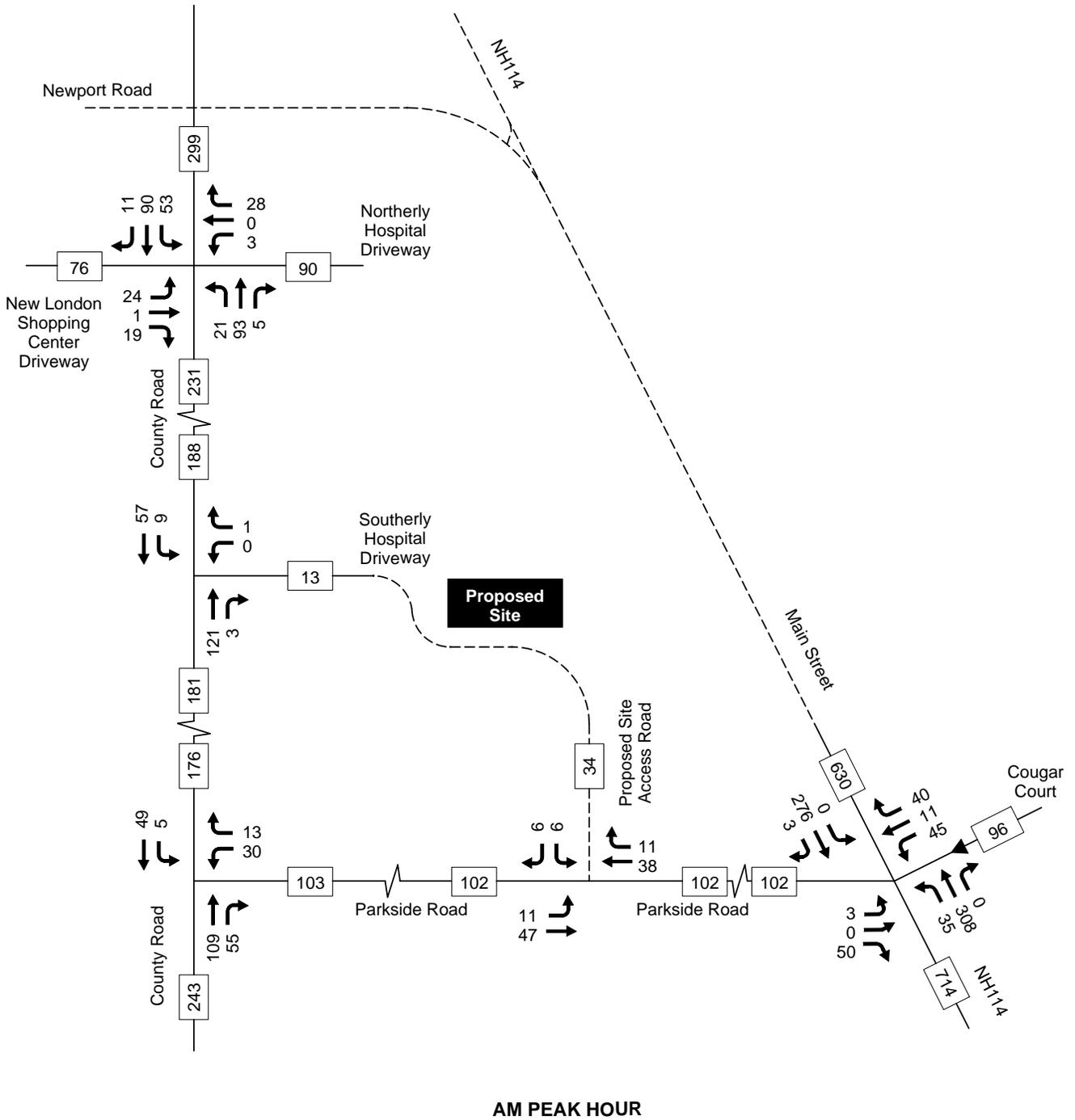
Trip Generation - To estimate the quantity of vehicle-trips that will be produced by the proposed CCRC, Pernaw & Company, Inc. utilized the standard trip generation rates and equations published by the Institute of Transportation Engineers (ITE)<sup>1</sup>. More specifically, the trip generation rates and equations for Land Use Code 255 – Continuing Care Retirement Community were selected, using the total number of occupied units as the independent variable (see previous Pernaw trip generation memorandum dated 12/21/17).

**Table 1**                      **Trip Generation Summary - 120 CCRC Units**

	<b>Estimate A</b> ITE Trip Rate Method <sup>1</sup>	<b>Estimate B</b> ITE Trip Equation Method <sup>1</sup>
Weekday AM Peak Hour		
Entering	12 veh	24 veh
Exiting	<u>6 veh</u>	<u>13 veh</u>
Total	18 trips	37 trips
Weekday PM Peak Hour		
Entering	10 veh	30 veh
Exiting	<u>14 veh</u>	<u>45 veh</u>
Total	24 trips	75 trips
Weekday Total		
Entering	150 veh	228 veh
Exiting	<u>150 veh</u>	<u>228 veh</u>
Total	300 trips	456 trips

<sup>1</sup>ITE Land Use Code 255 - Continuing Care Retirement Community

This table shows that the proposed CCRC will generate approximately 37 vehicle-trips (24 arrivals, 13 departures) during the AM peak hour period and 75 vehicle-trips (30 arrivals, 45 departures) during the PM peak hour period when fully occupied. This type of use generates “primary” trips which constitute new trips to the study area.

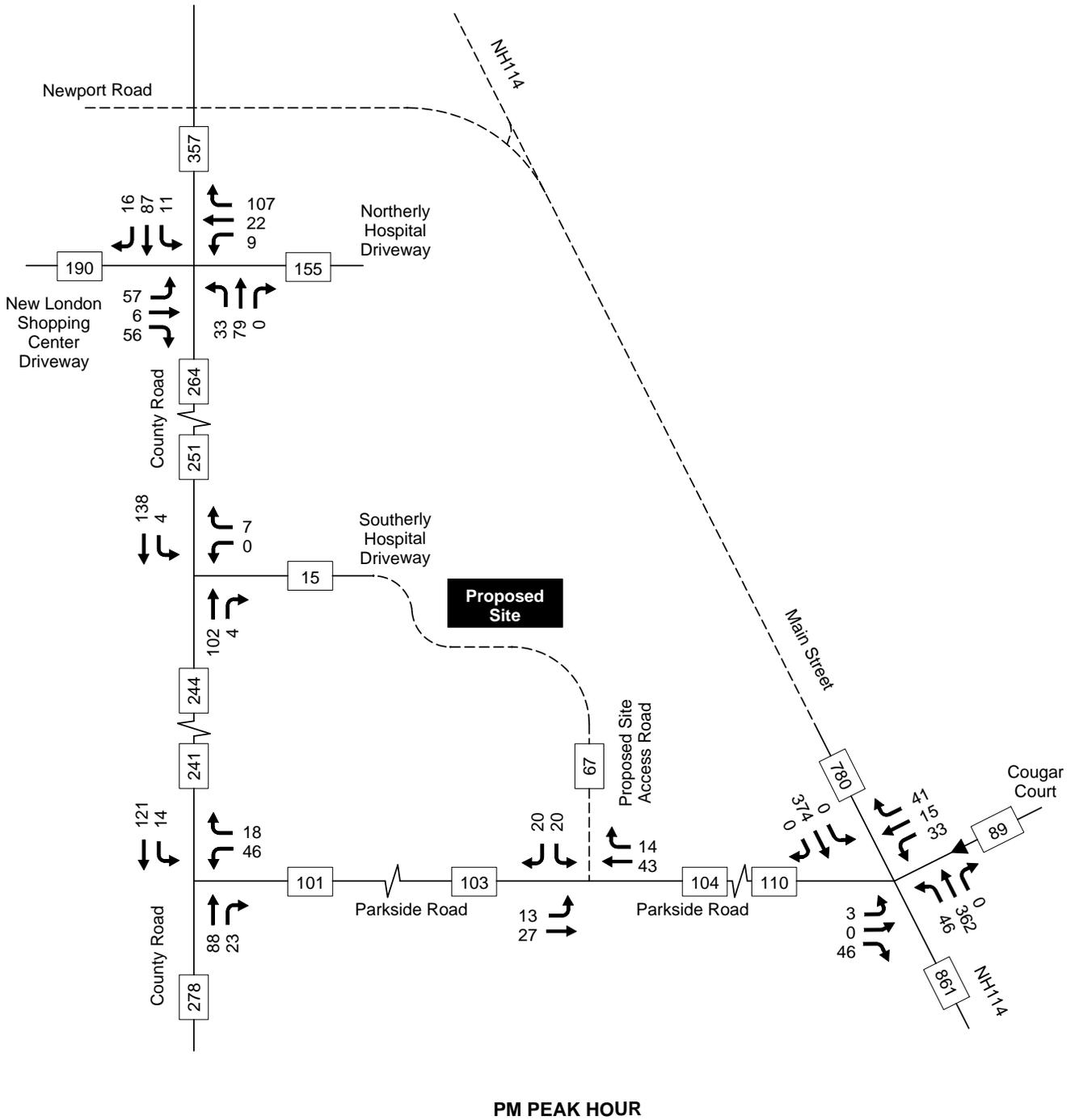


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Figure 8

2020 Build Traffic Volumes - AM Peak Hour

Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH



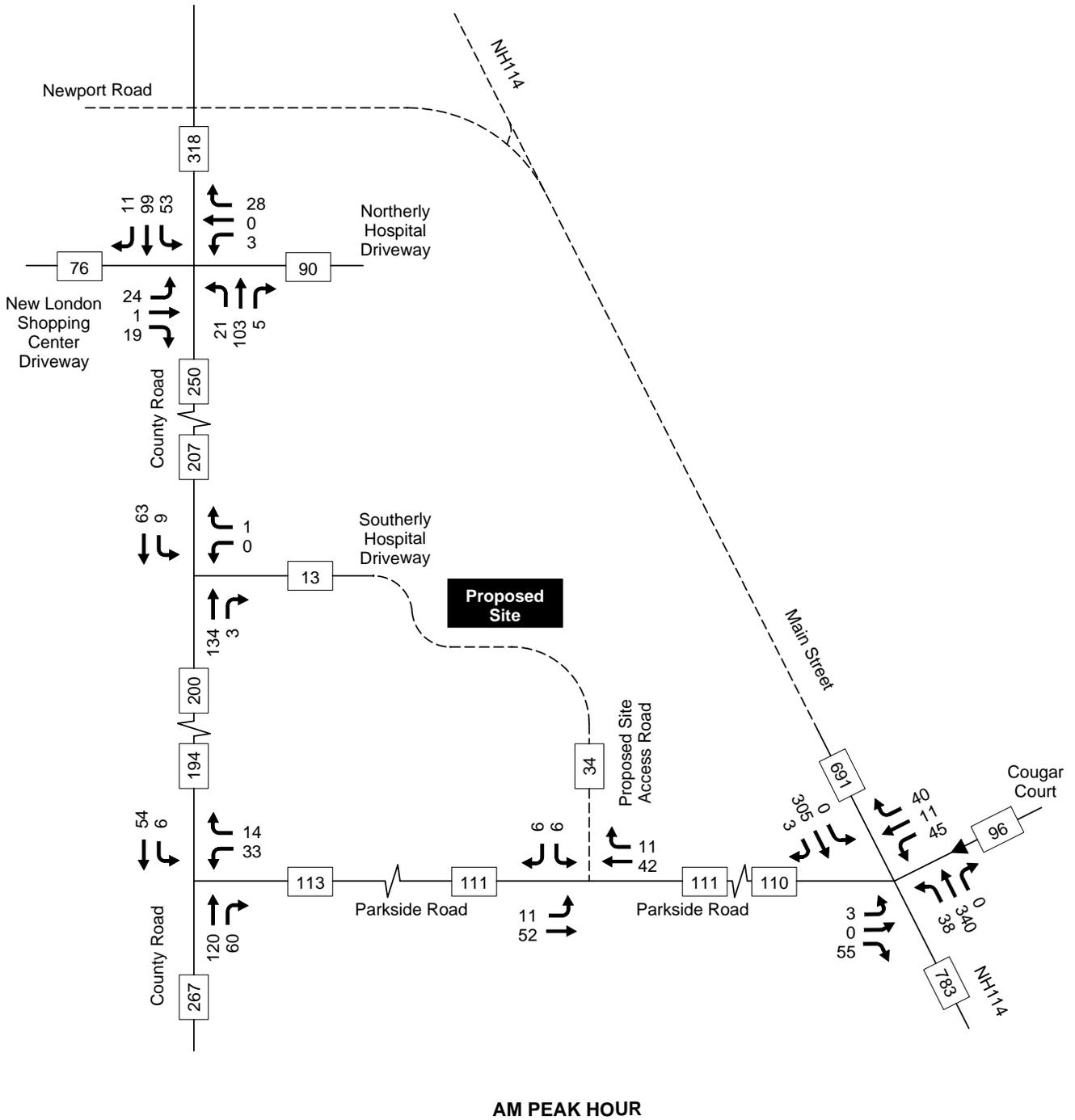
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**Figure 9**

**2020 Build Traffic Volumes - PM Peak Hour**

*Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH*

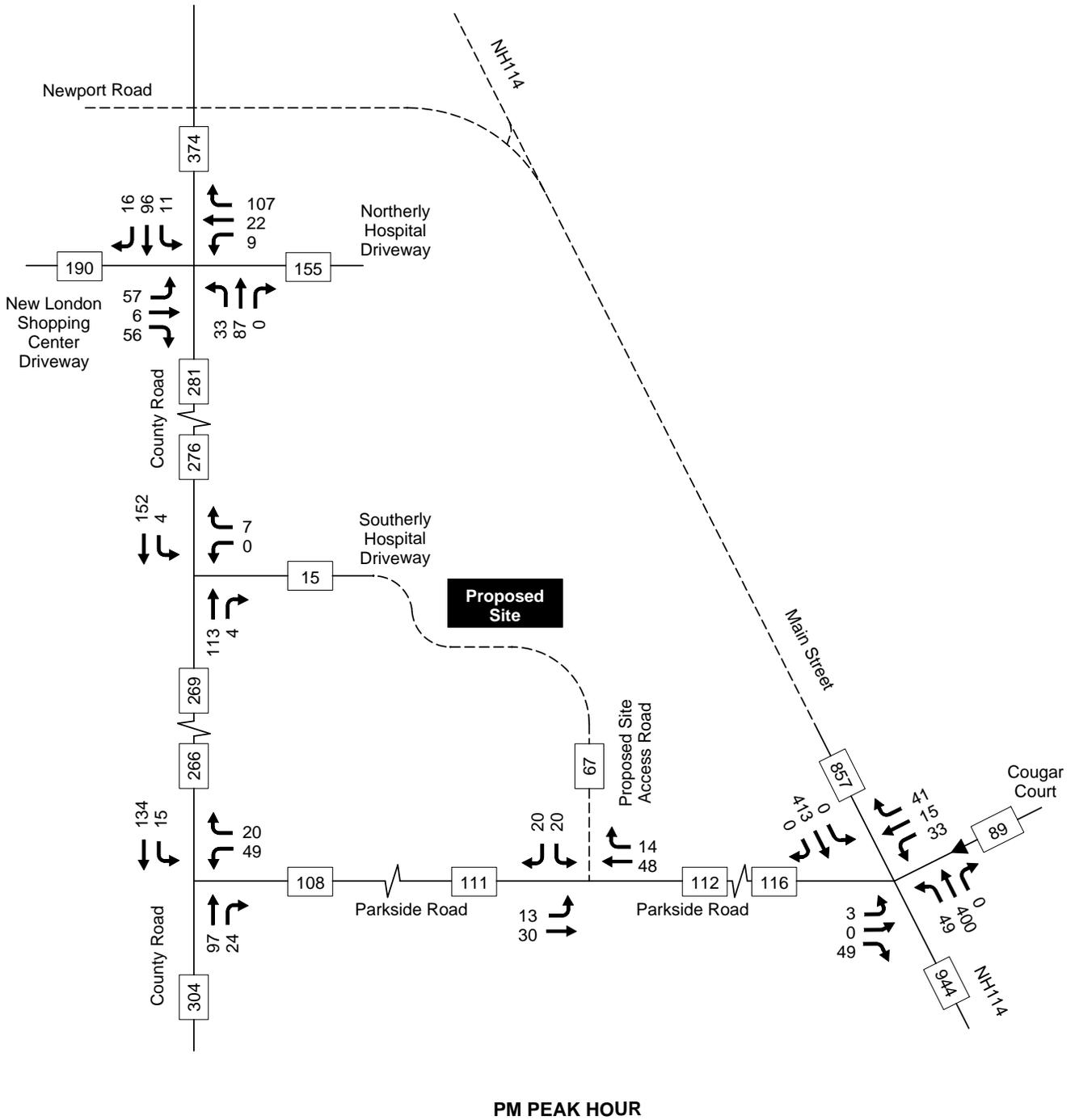


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**Figure 10**

**2030 Build Traffic Volumes - AM Peak Hour**

*Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH*



PM PEAK HOUR



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Figure 11

2030 Build Traffic Volumes - PM Peak Hour

Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH

**Table 3**

**STOP-Controlled Intersection Capacity Analysis  
Parkside Road / Proposed Site Driveway**

	Weekday AM Peak Hour				Weekday PM Peak Hour			
	<u>Delay</u> <sup>1</sup>	<u>V/C</u> <sup>2</sup>	<u>LOS</u> <sup>3</sup>	<u>Queue</u> <sup>4</sup>	<u>Delay</u> <sup>1</sup>	<u>V/C</u> <sup>2</sup>	<u>LOS</u> <sup>3</sup>	<u>Queue</u> <sup>4</sup>
Parkside Road - Left-Turn Arrivals								
2020 Build	7.4	0.02	A	<1	7.4	0.01	A	<1
2030 Build	7.4	0.02	A	<1	7.4	0.01	A	<1
Site Driveway - Right-Turn Departures								
2020 Build	9.2	0.02	A	<1	9.1	0.05	A	<1
2030 Build	9.2	0.02	A	<1	9.2	0.05	A	<1

<sup>1</sup> HCM Control Delay (seconds per vehicle), <sup>2</sup> HCM Volume to Capacity Ratio, <sup>3</sup> HCM Level of Service, <sup>4</sup> HCM 95th Percentile Queue (vehicles)

**Table 4**

**STOP-Controlled Intersection Capacity Analysis  
County Road / Parkside Road**

	Weekday AM Peak Hour				Weekday PM Peak Hour			
	<u>Delay</u> <sup>1</sup>	<u>V/C</u> <sup>2</sup>	<u>LOS</u> <sup>3</sup>	<u>Queue</u> <sup>4</sup>	<u>Delay</u> <sup>1</sup>	<u>V/C</u> <sup>2</sup>	<u>LOS</u> <sup>3</sup>	<u>Queue</u> <sup>4</sup>
Parkside Road - WB Left & Right-Turn Departures								
2018 Existing	10.0	0.06	B	<1	10.0	0.07	B	<1
2020 No Build	10.0	0.06	B	<1	10.0	0.07	B	<1
2020 Build	10.2	0.08	B	<1	10.5	0.11	B	<1
2030 No Build	10.3	0.07	B	<1	10.2	0.08	B	<1
2030 Build	10.4	0.09	B	<1	10.7	0.12	B	<1
County Road - SB Left-Turn Arrivals								
2018 Existing	7.6	0.01	A	<1	7.5	0.01	A	<1
2020 No Build	7.6	0.01	A	<1	7.5	0.01	A	<1
2020 Build	7.6	0.01	A	<1	7.5	0.01	A	<1
2030 No Build	7.6	0.01	A	<1	7.5	0.01	A	<1
2030 Build	7.7	0.01	A	<1	7.5	0.01	A	<1

<sup>1</sup> HCM Control Delay (seconds per vehicle), <sup>2</sup> HCM Volume to Capacity Ratio, <sup>3</sup> HCM Level of Service, <sup>4</sup> HCM 95th Percentile Queue (vehicles)

**Table 5**

**STOP-Controlled Intersection Capacity Analysis  
County Road / South Hospital Driveway**

	Weekday AM Peak Hour				Weekday PM Peak Hour			
	Delay <sup>1</sup>	V/C <sup>2</sup>	LOS <sup>3</sup>	Queue <sup>4</sup>	Delay <sup>1</sup>	V/C <sup>2</sup>	LOS <sup>3</sup>	Queue <sup>4</sup>
South Hospital Driveway - WB Left & Right-Turn Departures								
2018 Existing	0.0	0.00	A	0	8.9	0.00	A	<1
2020 No Build	0.0	0.00	A	0	8.9	0.00	A	<1
2020 Build	8.9	0.00	A	<1	8.9	0.02	A	<1
2030 No Build	0.0	0.00	A	0	9.0	0.00	A	<1
2030 Build	9.0	0.00	A	<1	9.0	0.02	A	<1
County Road - SB Left-Turn Arrivals								
2018 Existing	7.5	0.01	A	<1	7.4	0.00	A	<1
2020 No Build	7.5	0.01	A	<1	7.5	0.00	A	<1
2020 Build	7.5	0.01	A	<1	7.5	0.00	A	<1
2030 No Build	7.5	0.01	A	<1	7.5	0.00	A	<1
2030 Build	7.5	0.01	A	<1	7.5	0.00	A	<1

<sup>1</sup> HCM Control Delay (seconds per vehicle), <sup>2</sup> HCM Volume to Capacity Ratio, <sup>3</sup> HCM Level of Service, <sup>4</sup> HCM 95th Percentile Queue (vehicles)

**Table 6**

**STOP-Controlled Intersection Capacity Analysis  
County Road / Shopping Center Driveway / North Hospital Driveway**

	Weekday AM Peak Hour				Weekday PM Peak Hour			
	Delay <sup>1</sup>	V/C <sup>2</sup>	LOS <sup>3</sup>	Queue <sup>4</sup>	Delay <sup>1</sup>	V/C <sup>2</sup>	LOS <sup>3</sup>	Queue <sup>4</sup>
<b>County Road - NB Left Turns</b>								
2018 Existing	7.4	0.02	A	<1	7.5	0.03	A	<1
2020 No Build	7.4	0.02	A	<1	7.5	0.03	A	<1
2020 Build	7.5	0.02	A	<1	7.5	0.03	A	<1
2030 No Build	7.5	0.02	A	<1	7.5	0.03	A	<1
2030 Build	7.5	0.02	A	<1	7.5	0.03	A	<1
<b>Shopping Center Driveway - EB Left, Through &amp; Right-Turns</b>								
2018 Existing	11.2	0.10	B	<1	13.1	0.24	B	1
2020 No Build	11.3	0.11	B	<1	13.2	0.25	B	1
2020 Build	11.3	0.11	B	<1	13.3	0.25	B	1
2030 No Build	11.5	0.11	B	<1	13.5	0.25	B	1
2030 Build	11.5	0.11	B	<1	13.7	0.26	B	1
<b>North Hospital Driveway - WB Left, Through &amp; Right-Turns</b>								
2018 Existing	9.4	0.05	A	<1	10.7	0.22	B	1
2020 No Build	9.4	0.05	A	<1	10.7	0.22	B	1
2020 Build	9.4	0.05	A	<1	10.8	0.22	B	1
2030 No Build	9.5	0.05	A	<1	10.8	0.23	B	1
2030 Build	9.5	0.05	A	<1	10.9	0.23	B	1
<b>County Road - SB Left Turns</b>								
2018 Existing	7.5	0.04	A	<1	7.4	0.01	A	<1
2020 No Build	7.5	0.04	A	<1	7.4	0.01	A	<1
2020 Build	7.5	0.04	A	<1	7.4	0.01	A	<1
2030 No Build	7.5	0.04	A	<1	7.5	0.01	A	<1
2030 Build	7.5	0.04	A	<1	7.5	0.01	A	<1

<sup>1</sup> HCM Control Delay (seconds per vehicle), <sup>2</sup> HCM Volume to Capacity Ratio, <sup>3</sup> HCM Level of Service, <sup>4</sup> HCM 95th Percentile Queue (vehicles)

**Table 7**

**STOP-Controlled Intersection Capacity Analysis  
NH Route 114 / Parkside Road / Cougar Court**

	Weekday AM Peak Hour				Weekday PM Peak Hour			
	Delay <sup>1</sup>	V/C <sup>2</sup>	LOS <sup>3</sup>	Queue <sup>4</sup>	Delay <sup>1</sup>	V/C <sup>2</sup>	LOS <sup>3</sup>	Queue <sup>4</sup>
NH Route 114 - NB Left Turns								
2018 Existing	7.9	0.02	A	<1	8.2	0.03	A	<1
2020 No Build	8.0	0.02	A	<1	8.2	0.03	A	<1
2020 Build	8.0	0.03	A	<1	8.2	0.05	A	<1
2030 No Build	8.1	0.03	A	<1	8.3	0.04	A	<1
2030 Build	8.1	0.04	A	<1	8.4	0.05	A	<1
Parkside Road - EB Left & Right-Turns								
2018 Existing	11.5	0.15	B	1	12.5	0.06	B	<1
2020 No Build	11.6	0.15	B	1	12.6	0.07	B	<1
2020 Build	11.7	0.17	B	1	12.3	0.10	B	<1
2030 No Build	12.1	0.18	B	1	13.3	0.08	B	<1
2030 Build	12.3	0.20	B	1	13.0	0.12	B	<1
Cougar Court - WB Left-Turns								
2018 Existing	25.3	0.34	D	1	28.5	0.33	D	1
2020 No Build	26.6	0.35	D	2	30.3	0.34	D	1
2020 Build	29.4	0.38	D	2	35.6	0.39	E	2
2030 No Build	32.7	0.41	D	2	37.8	0.41	E	2
2030 Build	36.7	0.45	E	2	45.7	0.46	E	2
Cougar Court - WB Through & Right-Turns								
2018 Existing	12.6	0.18	B	1	15.9	0.27	C	1
2020 No Build	12.8	0.18	B	1	16.2	0.28	C	1
2020 Build	13.0	0.18	B	1	16.8	0.29	C	1
2030 No Build	13.5	0.20	B	1	17.9	0.31	C	1
2030 Build	13.7	0.20	B	1	18.6	0.32	C	1
NH Route 114 - SB Left Turns								
2018 Existing	0	0.00	A	0	0	0.00	A	0
2020 No Build	0	0.00	A	0	0	0.00	A	0
2020 Build	0	0.00	A	0	0	0.00	A	0
2030 No Build	0	0.00	A	0	0	0.00	A	0
2030 Build	0	0.00	A	0	0	0.00	A	0

<sup>1</sup> HCM Control Delay (seconds per vehicle), <sup>2</sup> HCM Volume to Capacity Ratio, <sup>3</sup> HCM Level of Service, <sup>4</sup> HCM 95th Percentile Queue (vehicles)

Looking Left



Looking Right

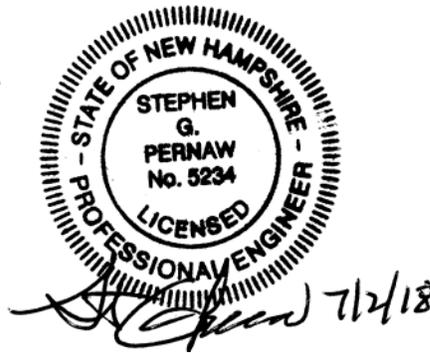


## Findings & Recommendations

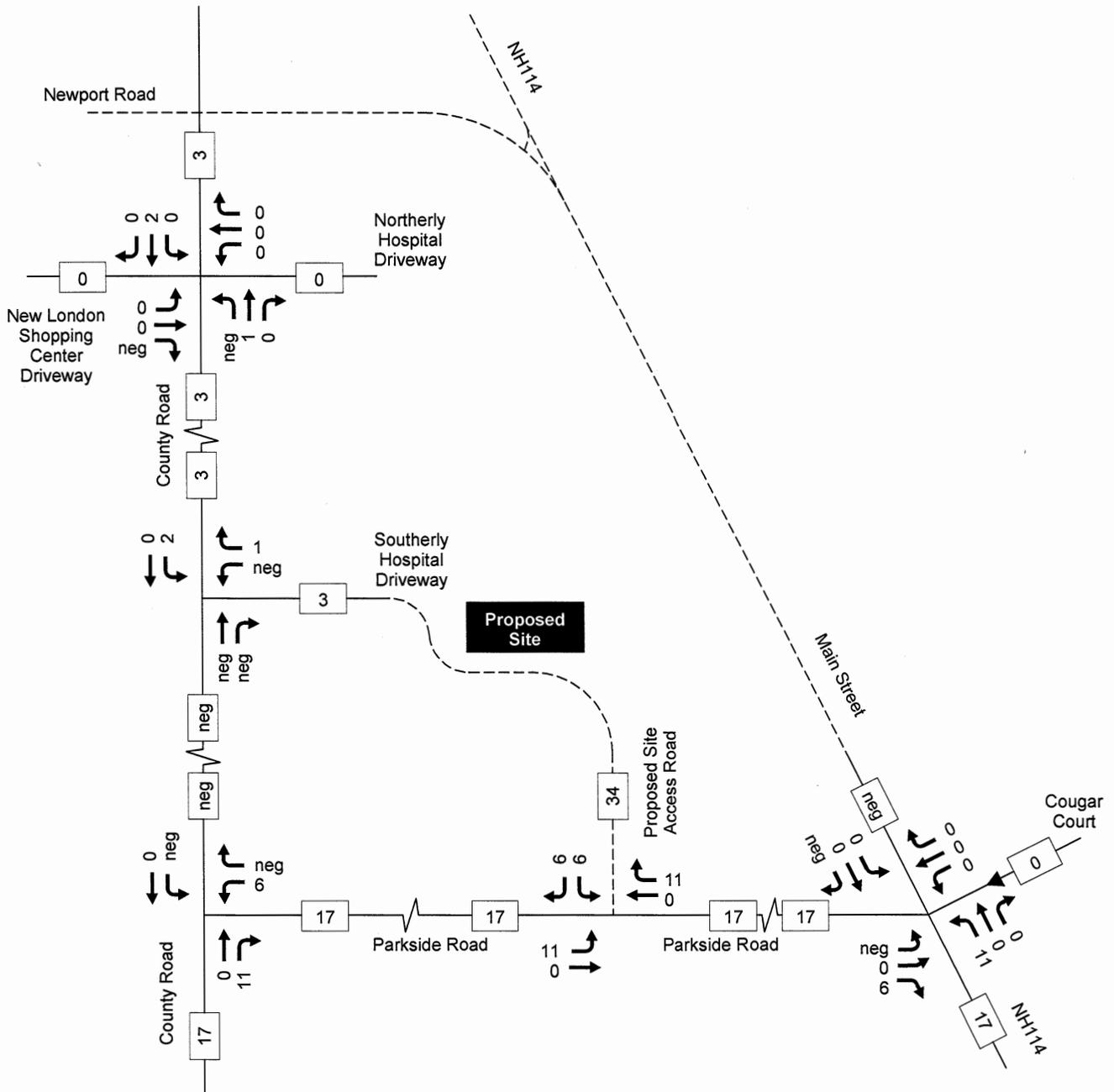
1. According to the automatic traffic recorder count conducted on County Road in May-June 2018, the section south of the hospital site carried an average weekday volume of 2,222 vehicles per day (vpd). Similarly, the recorder on Parkside Drive (west of the power lines) indicates that it carried 888 vpd. The hourly rate of traffic flow reached peak levels during the typical morning and evening commuter periods. The two-way traffic volume on Parkside Road in the vicinity of the proposed site driveway location totaled 83 (AM) and 68 (PM) vehicles during the peak hour periods.
2. According to the intersection turning movement count that were conducted on June 5, 2018 at the four existing study area intersections, the hourly traffic volume on County Road ranged from 172-290 vehicles during the AM peak hour, depending upon location, and from 233-345 vehicles during the PM peak hour. Parkside Road accommodated approximately 84 (AM) and 74 (PM) vehicles during the peak hour periods. NH 114 carried the highest traffic volumes in the study area with 678 (AM) and 803 (PM) vehicles (total both directions) observed south of the Parkside Road intersection. The Southerly Hospital Driveway, which will provide access to the proposed development, was found to accommodate only 10 (AM) and 7 (PM) vehicles during the peak hour periods.
3. The trip generation analysis indicates that the proposed CCRC will generate approximately 37 vehicles-trips (24 arrivals, 13 departures) during the AM peak hour period and 75 vehicle-trips (30 arrivals, 45 departures) during the PM peak hour period. The majority of these trips are expected to travel to and from points south/east via County Road and NH 114.
4. The traffic generated by the proposed CCRC will increase the two-way traffic volume on Parkside Road by approximately +34 vehicles during the worst-case PM peak hour period, when fully occupied.
5. The intersection capacity and Level of Service analyses confirmed that all five study area intersections will operate well below capacity during all hours of the day through 2030 with the proposed development fully occupied. Except for the Cougar Court approach to NH 114, all applicable turning movements at the study area intersections will operate at Level of Service A or B during all hours of the day. This means vehicle delays and queues will be short, and traffic congestion will not result. The left-turn departure movement from Cougar Court is expected to operate at Level of Service E the during the 2030 PM peak hour, regardless of the proposed CCRC.
6. The 2030 traffic volumes at the Parkside Road/Proposed Site Access Road and at the County Road/Southerly Hospital Driveway do not satisfy the NCHRP guidelines for auxiliary turn lanes for vehicle arrivals. A single shared lane on each approach to these intersections is sufficient for the anticipated volumes.
7. The appropriate forms of traffic control at the Parkside Road/Proposed Site Access Road intersection include the installation of STOP sign control (MUTCD R1-1) on the minor approach and an 18-inch white stop line. Providing a short section of four-inch double-

yellow center line on minor leg to separate inbound and outbound vehicles is optional, but advisable. The same recommendation applies to the County Road/Southerly Hospital Driveway intersection.

8. Clear sight distance triangles should be established on both sides of the Proposed Site Access Road intersection on Parkside Road to ensure that signs, plantings, and roadside vegetation do not restrict the line of sight looking left and right from the site driveway.



Pernaw & Company, Inc.



AM PEAK HOUR



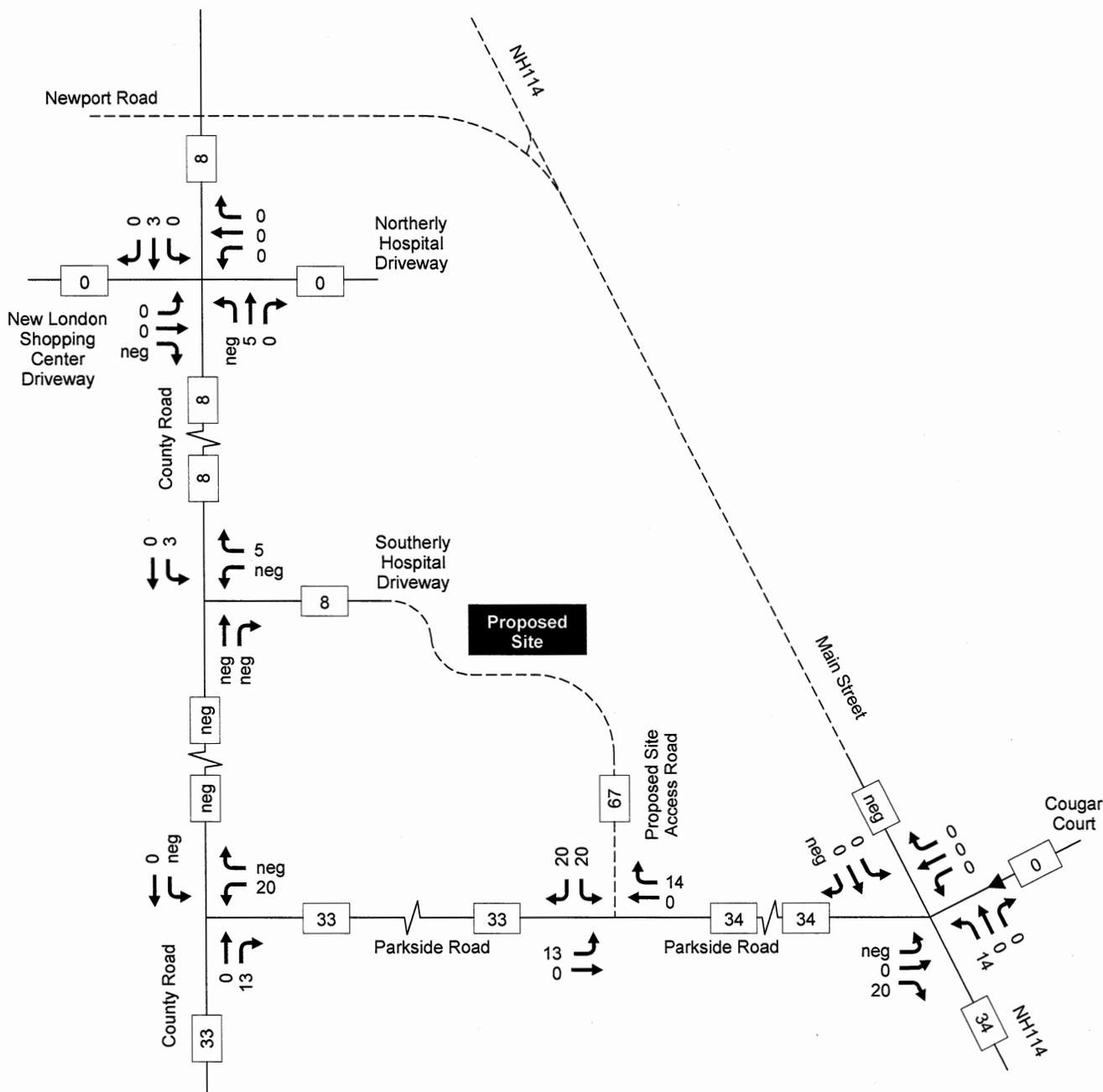
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Attachment

Site Generated Traffic Volumes - AM Peak Hour

Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH

Pernaw & Company, Inc.



PM PEAK HOUR



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Attachment

Site Generated Traffic Volumes - PM Peak Hour

Traffic Impact Assessment, Proposed Continuing Care Retirement Community, New London, NH



2018-06-05 12:00:01 PM





2018-06-05 4:00:01 PM