AMHERST VILLAGE TRAFFIC CIRCULATION STUDY

Prepared by the

Nashua Regional Planning Commission

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INTRODUCTION

The Town of Amherst in August 2021 requested that the Nashua Regional Planning Commission undertake a study of existing and projected future traffic conditions in the Amherst Village Area. This request stemmed from the findings of a traffic consultant study for a proposed subdivision which concluded that several intersections within the Village Area were likely to experience operational failure by 2031 even without the additional traffic from new residential development.

The study is focused on the following areas of concern:

- The traffic impact of future regional growth on the Village Center, including four new potential planned residential developments in Amherst.
- An evaluation of the potential to modify intersection control in the Village Center, particularly with respect to modifying some of the many stop signs throughout the area.
- Evaluate the impact of potential relocation of Clark Elementary school operations to the Wilkins School. The primary impact location would be the intersection of Boston Post Road and New Boston Road.

EXISTING CONDITIONS ANALYSIS

Weekday Traffic Counts

NRPC conducts about 145 regional counts on a three-year schedule, of which three are in the vicinity of Amherst Village: Boston Post Road north of New Boston Road, Amherst Street west of Baboosic Lake Road and NH 122 north of Courthouse Road. These regular counts establish growth trends throughout the region. Additionally, a number of Amherst Village locations for which weekday counts were conducted in 2021 were previously counted in 2012/2013 for the Amherst Middle Street Traffic Study prepared by NRPC for the Town.

As Table 1 shows, trends do not indicate robust growth over the past decade in the Village Area. NH 101, the principal arterial route which feeds traffic into the town center from the east and west but is primarily an arterial for through traffic, has declined 1.1% annually in one location since 2012 and increased about 0.4% per year for three other locations combined. NH 122 Amherst Street funnels traffic into the Village Area from the east via the NH 101/Baboosic Lake Road interchange. Traffic here has declined 1.6% per year since 2013. From the south, NH 122 Boston Post Road links to NH 101 at an interchange 0.8 miles south of the Village. There has been virtually no change in traffic over the past eight years at this location.

Amherst Street and Boston Post Road intersect at the Village's only signalized intersection. Traffic on both streets has been trending downward since 2013, at just over 2% per year. Of all traffic locations recently counted, only Main Street has experienced substantial growth over the years at over 8% annually; however, this is a low volume location with just over 1,000 vehicles per day.

Figure 1 – Amherst Village Transportation Study Area

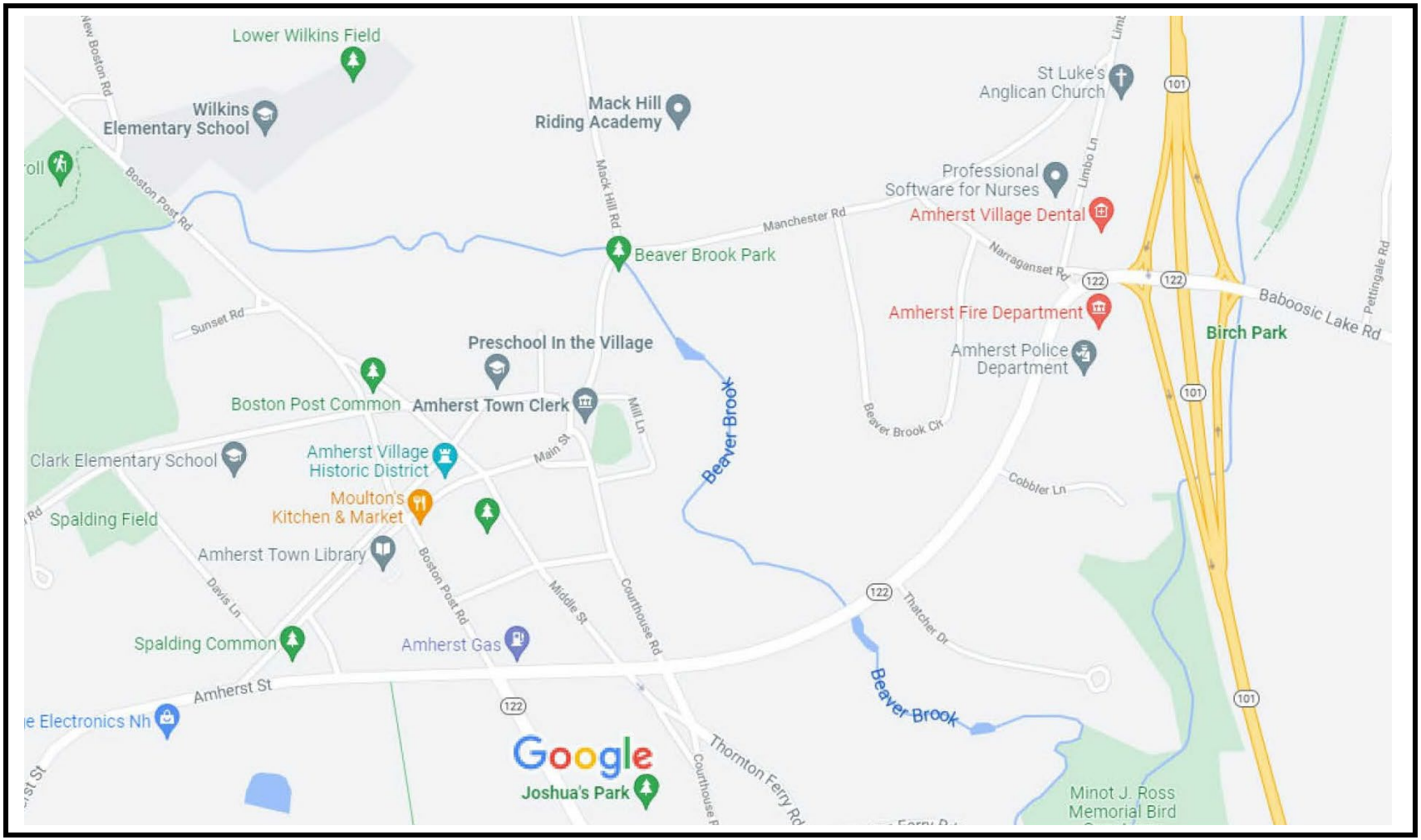


Table 1 - Amherst Village Weekday & Peak Hour Traffic Counts

Automatic Traffic Recorder Location		Year	AWDT	AM Peak	PM Peak	Previous Count Yr	Yearly % Change
Boston Post Rd	N. of New Boston Rd	2019	3,015	250	281	2010	1.0%
Boston Post Rd	N of Church St	2021	4,250	436	467	--	--
Boston Post Rd	N of Amherst St	2021	5,165	582	559	2013	-2.2%
Main St	E of Boston Post Rd	2021	1,020	98	98	2013	8.3%
Amherst St (NH 122)	W of Baboosic Lk Rd	2020	6,760	448	584	2011	-1.6%
Amherst St	W of Boston Post Rd	2021	4,030	318	410	2013	-2.1%
Foundry St	W of Boston Post Rd	2021	875	181	142	--	--
New Boston Rd	S. of Brookwood Dr	2018	1,980	156	209	--	--
NH 101	N of Baboosic Lk Rd	2021	21,790	1,605	1,830	2012	0.7%
NH 101	Over Boston Post Rd	2021	14,230	1,060	1,216	2012	-1.1%
NH 101	Milford/Amherst TL	2021	16,700	1,238	1,447	2012	0.5%
Boston Post Rd(NH 122)	N of Courthouse Rd	2021	5,690	500	475	2012	0.1%

COVID Impacts on Regional Traffic

Although the long-term count trends can largely be attributed to low regional growth in population and employment, there have been short term impacts brought on by the COVID outbreak in early 2020. A review of month-by-month changes in traffic at permanent count stations provides information on the traffic impacts of the pandemic and where we stand in terms of recovery of volume.

There are two permanent count stations in the region which have recorded continuous counts since the onset of the pandemic. The first location is on the FEE Turnpike at the Bedford toll station which borders Merrimack. Over the past several months, comparison of 2019 to 2021 by month double digit declines until December, when the two-year change had narrowed to just under 6%. Since the turnpike carries a large number of longer-distance commuters, a number of whom now telecommute during at least a portion of the work week, this drop from pre-pandemic levels is likely to overstate impacts on lower level at-grade facilities, such as characterized in the Village Study street network.

The other permanent count station is on US 3 Daniel Webster Highway north of Bedford Road in Merrimack. This at-grade arterial is likely representative of the COVID-induced traffic declines that have occurred along Amherst Street and Boston Post Road into the town center. Through November 2021, the month-to-month change from 2019 has varied between 4.8% and 7.7% and actually turned slightly positive in December. Continued monitoring through the Spring should indicate whether traffic is returning to close to pre-pandemic conditions.

Table 2 – Traffic Count Trends Since COVID Pandemic

F.E. Everett Turnpike AWDT at Bedford Toll

			% Change		% Change
	2019	2020	2019-20	2021	2019-21
Jan	48,703	50,759	4.2%	36,955	-24.1%
Feb	49,853	50,019	0.3%	36,655	-26.5%
Mar	51,219	37,868	-26.1%	40,048	-21.8%
Apr	51,134	23,661	-53.7%	41,591	-18.7%
May	53,981	31,533	-41.6%	44,945	-16.7%
Jun	55,980	39,631	-29.2%	48,269	-13.8%
Jul	56,643	43,826	-22.6%	50,888	-10.2%
Aug	58,446	45,750	-21.7%	50,771	-13.1%
Sep	55,016	44,671	-18.8%	48,625	-11.6%
Oct	54,775	43,354	-20.9%	48,940	-10.7%
Nov	52,255	39,107	-25.2%	45,985	-12.0%
Dec	47,526	37,219	-21.7%	44,701	-5.9%

US 3 AWDT, North of Bedford Rd, Merrimack

	Average Weekday				% Change
	2019	2020	Change	2021	2019-21
Jan	16,273	16,247	-0.2%	13,606	-16.4%
Feb	15,972	15,743	-1.4%	13,232	-17.2%
Mar	16,687	13,257	-20.6%	14,835	-11.1%
Apr	17,054	9,882	-42.1%	15,512	-9.0%
May	17,472	12,678	-27.4%	16,648	-4.7%
Jun	17,949	14,398	-19.8%	16,947	-5.6%
Jul	17,104	14,801	-13.5%	16,313	-4.6%
Aug	17,550	14,980	-14.6%	16,205	-7.7%
Sep	17,494	15,421	-11.8%	16,443	-6.0%
Oct	17,103	14,770	-13.6%	16,282	-4.8%
Nov	16,728	14,368	-14.1%	15,774	-5.7%
Dec	15,470	13,853	-10.5%	15,519	0.3%

Intersection Turning Movements

Turning movement counts (TMCs) provide the basis for analysis of operational conditions at intersections, which is most commonly conducted for morning and afternoon peak hours. NRPC intended to conduct these counts during October 2021, but it was necessary to postpone them to November, as a major construction project on Amherst Street from NH 122 south toward Milford resulted in disruption to normal traffic flow. On average, November counts for at-grade roadways are about 2.5% below October counts (which generally represent peak traffic conditions for the year). The volume differential is derived from month-to-month changes at permanent count stations in the region. This differential is not significant in terms of evaluating operational conditions in the Amherst Village.

Counts were conducted at the following locations between 7:15 am to 8:45 am and 4:15 to 5:45 pm to establish peak hours for each period.

- Amherst St Street/Main Street
- Amherst Street/Boston Post Road
- Amherst Street/Middle Street
- Boston Post Road/Main Street
- Main Street/Middle Street
- Boston Post Road/Foundry Street
- Boston Post Road/Middle Street
- Boston Post Road/New Boston Road
- Foundry Street/Clark School parking lot entrances/exits

Figures 2 and 3 present the morning and afternoon peak hour volumes for Village traffic.

Figure 2 – Amherst Village AM Peak Hour Turning Movement Counts

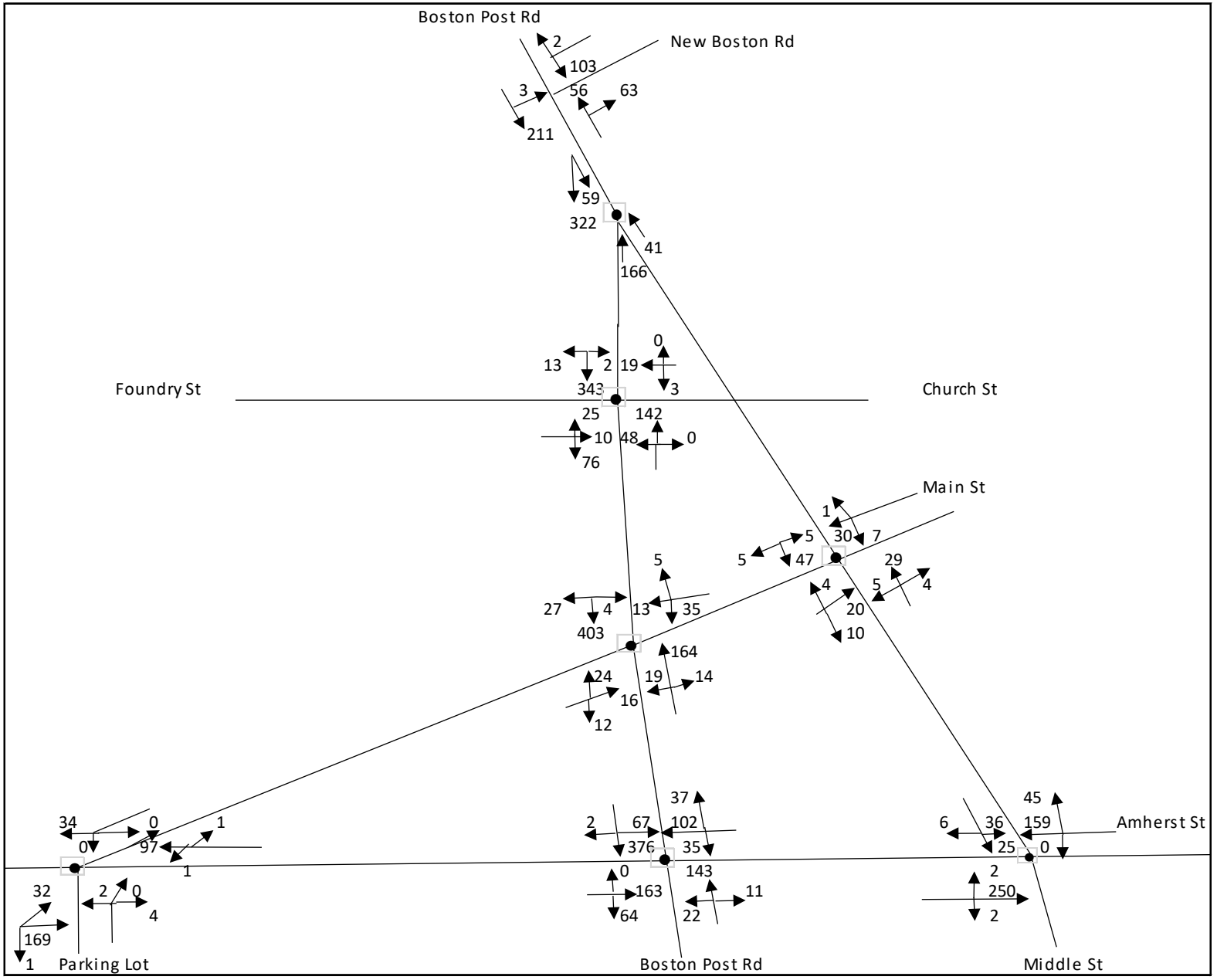
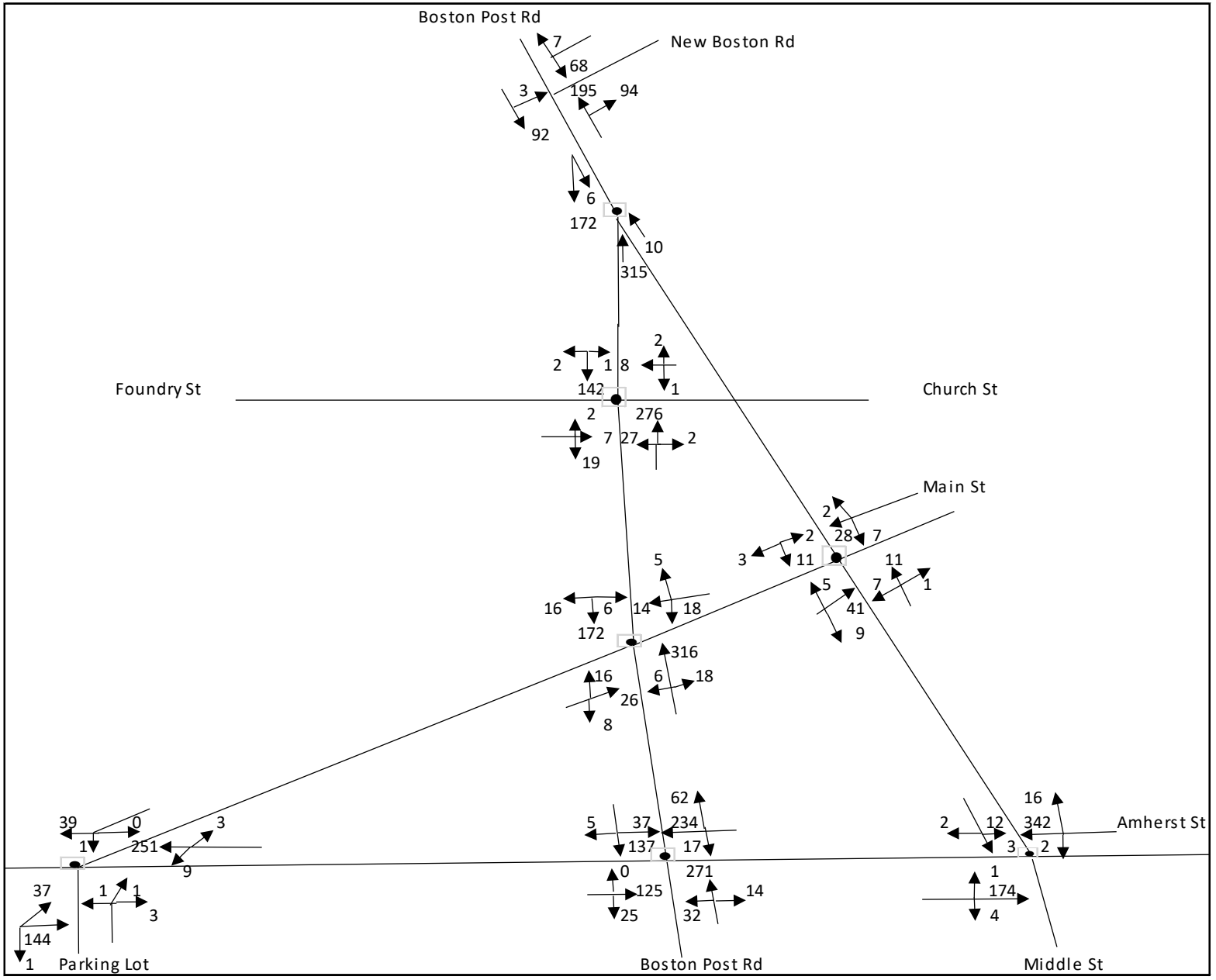


Figure 3 – Amherst Village PM Peak Hour Turning Movement Counts



Intersection Capacity Analysis

Intersection capacity analysis was conducted for one signalized intersection (Boston Post Road/Amherst Street) and seven unsignalized intersections in the Village Area utilizing the methods of the *Highway Capacity Manual 2003* as replicated by the *Synchro Traffic Signal Timing Software.* A traffic flow rate, capacity, Level of Service (LOS), and delay estimate was determined for each critical traffic movement, lane group, and for the overall intersection. Levels of Service (LOS) are letter grades (A-F), which categorize the vehicle delays associated with specific turning maneuvers. LOS A represents little to no delay, LOS B represents only minor delay, LOS C is an average delay condition, LOS D characterizes noticeable congestion and long delay, LOS E represents heavy congestion with lengthy delay and LOS F is a forced flow condition with bottlenecks present through much of the period. For a small town area such as Amherst Village, maintaining LOS C is the acceptable standard.

The following table describes the criteria used in this analysis.

Table 3 - Intersection Level of Service Ranges

LOS		Signalized Intersection Delay	Stop Controlled Intersection Delay
A		≤10 sec	≤10 sec
B		10-20 sec	10-15 sec
C		20-35 sec	15-25 sec
D		35-55 sec	25-35 sec
E		55-80 sec	35-50 sec
F		≥80 sec	≥50 sec

Tables 4 and 5 provide the results of intersection capacity analysis and change in volumes from 2013 for locations that were counted in the 2013 Middle Street Study. Table 4 displays the analysis for the Village Area's only signalized intersection at Amherst Street and Boston Post Road. The AM peak total intersection volume nearly matched the October 2013 level, while the PM peak was off by 15%. Intersection LOS is unchanged from B. Traffic operates without any significant delay and all queued vehicles are able to clear the intersection during a single cycle. It was noted that the signal operates from a 45 second base cycle; however, actuation reduces this to as low as 32 seconds when demand is low from an approach and reduces the approach cycle time. It was observed that some drivers, familiar with the intersection cycle characteristics and, therefore, aware of the pending short cycle, drive aggressively toward the intersection in anticipation of a shortened phase. Operating a fixed-cycle of 45 seconds without actuation likely would reduce aggressive driving, although it would slightly increase stopped wait times. Even without actuation, the intersection would continue to operate comfortably at LOS B.

Of the seven unsignalized intersections evaluated in Table 5, only the Boston Post Road/Main Street intersection operates below LOS A, with LOS C prevailing during the morning peak. The primary backup is on Boston Post Road in the southbound direction. This approach contributes 434 vehicles for the hour, which comprises 59% of the hourly total volume. The northbound and southbound approaches combined for 85% of the total intersection volume. It is not common for an intersection to be controlled

by a four-way stop where one of the streets contributes such a disproportionate share of the total traffic. Although Boston Post Road southbound traffic scores in the midpoint of the LOS C range, there were times during the morning period where queue lengths appeared to be more indicative of LOS D. NRPC reran the intersection capacity analysis with two-way stop control. This would enable Boston Road Post traffic to operate at LOS A from both directions and the much lower volume Main Street to operate at LOS C. Operationally the intersection traffic flow would be significantly improved but continuous higher speed traffic would create a greater degree of inconvenience for pedestrians crossing Boston Post Road and possibly reduce the level of safety for non-motorized traffic.

Table 4 - Amherst Village Signalized Intersection Capacity Analysis, Existing Conditions

				AM Peak		
	Intersection Volume					
	2013	2021	% Chng	Delay	V/C	AM LOS
Amherst St & Boston Post Rd	**1036**	**1022**	**-1%**	**14.2**		**B**
Amherst St EB All	301	227	-25%	12.8	0.54	B
Amherst St WB All	163	174	7%	11.1	0.41	B
Boston Post Rd NB All	141	176	25%	8.8	0.31	A
Boston Post Rd SB All	431	445	3%	18.3	0.73	B
				PM Peak		
	1130	**959**	**-15%**	**11.7**		**B**
Amherst St EB All	194	150	-23%	9.9	0.28	B
Amherst St WB All	361	313	-13%	15.4	0.61	B
Boston Post Rd NB All	388	317	-18%	10.4	0.42	B
Boston Post Rd SB All	187	179	-4%	9.5	0.31	B

Table 5 - Amherst Village Unsignalized Intersection Capacity Analysis, Existing Conditions

Intersection	AM Peak Intersection Volume						PM Peak Intersection Volume					
	2013	2021	% Chng	Delay	V/C	AM LOS	2013	2021	% Chng	Delay	V/C	AM LOS
Boston Post Rd & Main St	**691**	**736**	**7%**	**16.2**		C	**718**	**621**	**-14%**	**11.9**		B
Boston Post Rd NB All	188	197	5%	11.1	0.39	B	373	340	-9%	13.5	0.57	B
Boston Post Rd SB All	384	434	13%	20.0	0.75	C	219	194	-11%	10.4	0.37	B
Main St EB All	73	52	-29%	9.7	0.10	A	81	50	-38%	9.3	0.09	A
Main St WB All	46	53	15%	9.9	0.11	A	45	37	-18%	9.2	0.08	A
Amherst St & Middle St	**553**	**525**	**-5%**	**2.6**		**A**	**625**	**556**	**-11%**	**0.8**		**A**
Amherst St EB All	285	254	-11%	<1	0.13	A	232	179	-23%	<1	0.09	A
Amherst St WB All	230	204	-11%	<1	0.11	A	378	360	-5%	<1	0.19	A
Middle St SB All	38	67	76%	14.3	0.23	B	15	17	13%	13.7	0.08	B
Amherst St & Main St	**--**	**335**	--	**2.0**		**A**	**--**	**485**	--	**2.1**		**A**
Amherst St EB All	--	202	--	1.4	0.11	A	--	182	--	1.8	0.10	A
Amherst St WB All	--	99	--	<1	0.05	A	--	263	--	<1	0.14	A
Main St SW All	--	34	--	9.1	0.05	A	--	40	--	10.3	0.09	B
Main St & Middle St	**146**	**167**	14%	**7.8**		**A**	**103**	**127**	23%	**7.4**		**A**
Main St EB All	42	34	-19%	7.6	0.07	A	27	55	104%	7.4	0.08	A
Main St WB All	18	38	111%	7.8	0.09	A	22	37	68%	7.4	0.06	A
Middle St NB All	40	38	-5%	7.7	0.08	A	22	19	-14%	7.4	0.04	A
Middle St SB All	46	57	24%	7.9	0.12	A	32	16	-50%	7.3	0.03	A
Boston Post Rd & Foundry St	**584**	**681**	17%	**4.5**		**A**	**585**	**489**	-16%	**1.4**		**A**
Boston Post Rd NB All	181	190	5%	2.5	0.1	A	377	305	-19%	<1	0.161	A
Boston Post Rd SB All	324	358	10%	<1	0.19	A	167	145	-13%	<1	0.08	A
Foundry St EB All	77	111	44%	16.2	0.31	C	35	28	-20%	10.2	0.05	B
Foundry St WB All	2	22	1000%	19.2	0.15	C	6	11	83%	11.4	0.03	B
Boston Post Rd & Middle St	**--**	**588**	--	**2.1**		**A**	**--**	**503**	**--**	**<1**		**A**
Boston Post Rd NB All	--	166	--	<1	0.09	A	--	315	--	<1	0.17	A
Boston Post Rd SB All	--	381	--	1.8	0.20	A	--	178	--	<1	0.09	A
Middle St NWB All	--	41	--	10.4	0.12	B	--	10	--	10.5	0.03	B
Boston Post Rd & New Boston Rd	**--**	**436**	--	**3.5**		**A**	**--**	**459**	**--**	**2.2**		**A**
Boston Post Rd NB All	--	119	--	<1	0.06	A	--	289	--	<1	0.15	A
Boston Post Rd SB All	--	214	--	<1	0.11	A	--	95	--	<1	0.05	A
New Boston Rod SB All	--	103	--	12	0.22	B	--	75	--	12.2	0.17	B

Traffic Impact from Relocating Clark Elementary Students to Wilkins School

The Town requested that NRPC conduct a traffic analysis of the impact of combining Clark Elementary School located on Foundry Street with the Wilkins Elementary School located on New Boston Road just off the Boston Post Road intersection. The primary impact of the school consolidation would be on the AM peak hour at the Boston Post Road/New Boston Road intersection, since most school activity has ceased by the PM peak hour of 4:30 to 5:30 PM.

Figures 4 and 5 show arrivals and departures at the Clark Elementary School. There are a total 64 vehicles entering and 55 leaving the facility during the morning arrival period and these totals are assigned to the Wilkins location. Since the intersection capacity analysis has indicated that the intersection operates at LOS A at present, with the highest level of conflict being left turns onto Boston Post Road occurring at LOS B, it was determined that a ballpark estimate of traffic relocation would be sufficient, rather than conducting a more detailed path analysis that would require obtaining student residence origins.

Table 6 presents the morning intersection capacity analysis for the consolidated school scenario. Overall intersection delay is only expected to increase by one second for the morning peak hour and continue to operate at LOS B. Approximately the same margin of change for left turns from New Boston Road is expected and that movement will continue to operate at LOS B. Therefore, the overall impact of the school consolidation on this intersection is forecasted to be marginal.

Figure 4 – Clark School Arrivals & Departures, 7:15 – 7:45 AM

Figure 5 – Clark School Arrivals & Departures, 2:00 – 2:30 PM

Figure 6 - Change in AM Peak Hour Traffic from School Traffic Rerouting

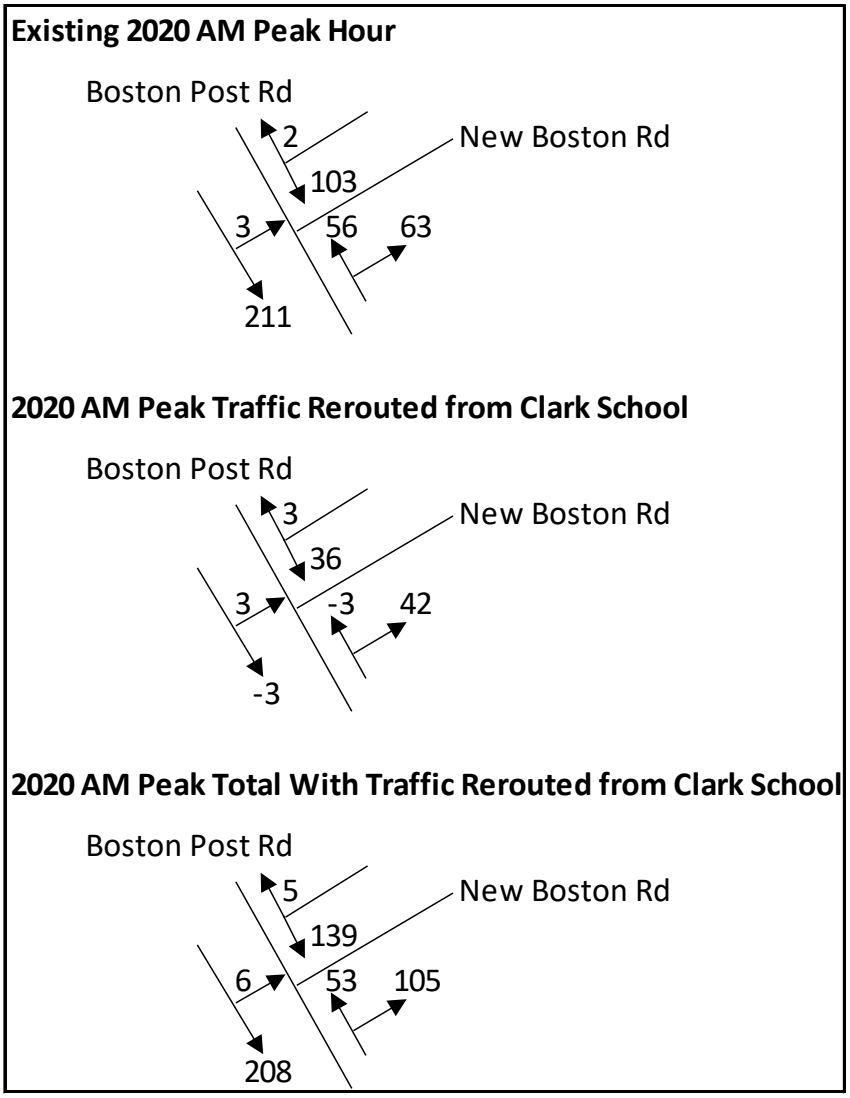


Table 6 - Intersection Analysis for Traffic Rerouted from Clark to Wilkins School, AM Peak

	Intersection Volume			Capacity Analysis		
	Existing	Relocated School	% Chng	Delay	V/C	AM LOS
Boston Post Rd & New Boston Rd	**436**	**516**	80	**4.5**		**A**
Boston Post Rd NB All	119	158	39	<1	0.08	A
Boston Post Rd SB All	214	214	0	<1	0.11	A
New Boston Rod SB All	103	144	41	13.3	0.32	B

Review of Amherst Village Traffic Control

The Town of Amherst requested that a review of the numerous stop signs in the village area be reviewed to determine whether changes might be considered, either the modification of four-way to two-way stop control or from stop to yield. Intersection traffic control standards are governed by the Manual on Uniform Traffic Control Devlces (MUTCD), which provides the following guidance:

Engineering judgment should be used to establish intersection control. The following factors should be considered:

- Vehicular, bicycle, and pedestrian traffic volumes on all approaches;
- Number and angle of approaches;
- Approach speeds;
- Sight distance available on each approach; and
- Reported crash experience.

YIELD or STOP signs should be used at an intersection if one or more of the following conditions exist:

- An intersection of a less important road with a main road where application of the normal right-of-way rule would not be expected to provide reasonable compliance with the law;
- A street entering a designated through highway or street; and/or
- An unsignalized intersection in a signalized area.

In addition, the use of YIELD or STOP signs should be considered at the intersection of two minor streets or local roads where the intersection has more than three approaches and where one or more of the following conditions exist:

- The combined vehicular, bicycle, and pedestrian volume entering the intersection from all approaches averages more than 2,000 units per day;
- The ability to see conflicting traffic on an approach is not sufficient to allow a road user to stop or yield in compliance with the normal right-of-way rule if such stopping or yielding is necessary; and/or,
- Crash records indicate that five or more crashes that involve the failure to yield the right-of-way at the intersection under the normal right-of-way rule have been reported within a 3-year period, or that three or more such crashes have been reported within a 2-year period.

YIELD or STOP signs should not be used for speed control.

Once the decision has been made to control an intersection, the decision regarding the appropriate roadway to control should be based on engineering judgment. In most cases, the roadway carrying the lowest volume of traffic should be controlled.

A YIELD or STOP sign should not be installed on the higher volume roadway unless justified by an engineering study.

The following are considerations that might influence the decision regarding the appropriate roadway upon which to install a YIELD or STOP sign where two roadways with relatively equal volumes and/or characteristics intersect:

- Controlling the direction that conflicts the most with established pedestrian crossing activity or school walking routes;
- Controlling the direction that has obscured vision, dips, or bumps that already require drivers to use lower operating speeds; and
- Controlling the direction that has the best sight distance from a controlled position to observe conflicting traffic/walking routes;

NRPC's data collection within the Amherst Village took place during mid to late November 2021, as counts were delayed due to Amherst Street reconstruction. As this data collection period was significantly past the peak season for pedestrian activity, we were unable to collect walking and bicycle counts that would be an important input into the decision to modify intersection control. NRPC identifies the following intersections as candidates for modification, however, it would be advisable to conduct non-motorized counts at these locations prior to implementing modified traffic control. It is also strongly recommended that the Town hold a public informational forum to solicit public input on any proposed changes to intersection control. This will facilitate a complete discussion of all variables to be considered, including motorist convenience, speed impacts on roadway safety and facilitating bicycle and pedestrian travel in the Village Area.

Thornton Ferry Road/Courthouse Road – Thornton Ferry Road northbound meets Courthouse Road at an oblique angle and can only turn right or left onto Courthouse Road but cannot proceed through as Thornton Ferry opposite is one-way southbound. Conversion of stop to yield control for Thornton Ferry Road in the northbound direction may be considered; however, a peak hour directional count should be conducted to ensure that the vast majority of approaches turn right at the obtuse angle, which is more amenable to yield control.

Cross Road/Middle Street – The Cross Road approaches are controlled by stop signs. As both streets are low-volume (Middle Street AWDT was 530 in 2013), modification to yield is an option for the lower volume Cross Street approaches.

Main Street/Middle Street - – The intersection is under four-way stop control. In 2013 the streets carried the same amount of traffic, Main Street at 540 vehicles per day (vpd) and Middle Street 530. Based on the change in peak period intersection counts from 2013 to 2021, Main Street has increased to about 800 vph, while Middle Street remains around 500. This intersection can be converted to a two-way stop or yield controlling Middle Street traffic.

Middle Street/School Street – This four-way stop intersection can be converted to a two-way controlling Middle Street traffic. Yield control is possible due to low traffic volume.

Middle Street/Foundry Street/Church Street – This is another intersection that could be converted from four-way to two-way or yield control for Middle Street traffic.

Middle Street/Boston Post Road – Traffic from Middle Street turns right onto Boston Post Road at an obtuse angle conducive to yield control. There were no left turns from Middle Street observed at this intersection for the peak hours counted.

Boston Post Road/Main Street – As noted in the intersection capacity analysis, conversion of this intersection to a two-way stop for Main Street traffic is important for maintaining acceptable

operational conditions. This will be demonstrated to be even more critical in the future conditions analysis.

Evaluation of Proposed Closure of Middle Street from Middle Street to Main Street

In 2013 NRPC conducted a study to assess the potential impacts of closing the section of Middle Street between Main Street and School Street. The Town requested this study to address the perception that Middle Street was increasingly being used as an alternative path to avoid the signalized intersection at Boston Post Road and Amherst Street. The study presented the following conclusions and recommendations:

> Intersection analyses comparing existing conditions (with Middle Street open) to proposed conditions (Middle Street closed between School Street and Main Street) show there would be a slight increase in delay at the intersections along Boston Post Road, where through traffic from Middle Street and turning traffic from School Street and Middle Street was redistributed. No intersections showed a decrease in Level of Service. The analysis for the proposed scenario assumed that the southbound through traffic on Middle Street at its intersection with Main Street was originating at Boston Post Road and the northbound through traffic was originating at Amherst Street. This was to represent the reported concept that the traffic on Middle Street was primarily cut-through traffic avoiding Boston Post Road, which has a crossing guard controlling traffic during school hours, fewer stops but more vehicle and pedestrian traffic at its intersections, and a signalized intersection (with an actuated control) at Amherst Street. This cut-through traffic concept was supported by collected and observed data, however, the volumes on Boston Post Road were still over ten times that of Middle Street over an average weekday, and five to seven times higher during the peak hours. In addition to vehicle volumes, there were much higher volumes of pedestrians along Boston Post Road, both near Moulton's Market and at Foundry Street. Closing a section of Middle Street to through traffic would likely increase volumes on Boston Post Road and therefore, increase the ratio of vehicles to pedestrians along Boston Post Road. More frequent stops are required on Middle Street, and this appears to have a traffic calming effect, as a higher percentage of drivers currently exceed the speed limit on Boston Post Road, which requires stopping at two intersections (Main Street and Amherst Street) versus four stops on Middle Street (Church Street, School Street, Main Street, and Amherst Street). While discontinuing Middle Street between Main Street and School Street may address one issue, it may create issues on other roads within the Village Green area, especially Boston Post Road. Whether operating under existing conditions or with the proposed closure, the town common may benefit from enhancing and/or expanding pedestrian amenities, upgrading stop controls, implementing traffic calming techniques, or increasing enforcement activities.

Middle Street traffic has remained essentially unchanged since the conduct of the 2013 study. It can then be concluded that Middle Street has not evolved as a popular cut-through option to traveling through the town's only signalized intersection. The comment to potentially upgrade stop controls and implement traffic calming techniques seems to go counter to circulation concerns which prompted the present study, i.e., the slowing of traffic by the myriad of stop signs throughout the Village Area. It is the opinion of NRPC that Middle Street can continue to function as a low-volume street in conjunction with the intersection control modifications identified in this study.

FUTURE CONDITIONS ANALYSIS

The future conditions analysis provides a forecast of traffic volumes and operation conditions for 2045, which is the time horizon selected for travel forecasts used in the NRPC Region Metropolitan Transportation Plan, a document that serves as the blueprint for developing future transportation projects and programs.

The future conditions analysis done for the Amherst Village Study is unique for the NRPC forecasting methodology, as it combines the usual regional traffic model forecast with a specific manual analysis conducted for the several proposed new developments in town. It was determined that for evaluating traffic flows through a small area such as the Amherst Village, the manual technique, based on U.S. Census origin-destination data in conjunction with Google Maps path finder, would complement the macro analysis of the regional model.

Regional Traffic Modeling

The Nashua Regional Planning Commission maintains a regional travel demand model for the general purposes of transportation planning and air quality analysis. To maintain and run the model, NRPC uses TransCAD, a leading traffic modeling and GIS software package produced by the Caliper Corporation. The main inputs of employment and household data are summarized by Traffic Analysis Zone (TAZ). There are 2,034 TAZs in the NRPC model, including around 50 external zones. Each TAZ contains totals of households, residents, and employees, which are assigned an industry classification, based on Census data. Industry classes include retail, manufacturing, professional services, finance and real estate, and others. In addition, each household is coded with the number of vehicles available to it, also derived from Census data. The NRPC travel demand model is the most complex model maintained by MPO staff in the state. The base year of the model was calibrated to traffic counts through 2019 and uses U.S. Census data and employment data from the State of New Hampshire.

NRPC's model network consists of all arterials, collectors, and some local roads in the region (over 800 total miles of segments) and certain major routes outside of the region to account for external trips. Each road segment is coded with certain attributes needed to run the model which include direction, length, posted speed and roadway capacity.

The model uses a traditional three-step modeling process: trip generation, trip distribution, and traffic assignment. A fourth step, mode choice, is not used by the NRPC model as means of travel other than the automobile represent an extremely small fraction of the total traffic on the regional road network.

In step one, trip generation, the model uses Institute of Transportation Engineers trip generation rates and Census data to determine how many trips of various purposes will be produced by each TAZ, based on the associated socioeconomic data.

In step two, trip distribution, the model takes the expected number of trips produced and attracted by each zone and matches them with destinations. NRPC uses a "gravity model" to distribute the trips, meaning that a trip is more likely to travel to a nearby zone that matches the trip purpose. The model uses average journey to work time to determine the appropriate percentage of trips distributed between the zones. For example, if survey and census data show that 60% of all work trips take between 20 and 30 minutes, the model will attempt to match that ratio.

Once the model determines the origins and destinations of the trips, it finds the paths on which to assign them. The model begins by sending every trip via the shortest path possible (in terms of travel time). Then, because of capacity constraints, it uses an iterative process to reassign certain trips along alternate routes.

The three step process results in future traffic forecasts that are based on anticipated future land use patterns, population projections, projected housing units, employment, and school enrollment. The projected growth in land use, presented in Table 7, was made in consultation with local planners from the Nashua Region, and through a review of present and proposed zoning, physical constraints, and assumptions made regarding future area-wide growth rates.

Table 7 – Nashua Region Projected Population & Employment, 2045

	Population				Employment			
	2020	2045	Growth	Pct. Change	2020	2045	Growth	Pct. Change
Amherst	11,753	12,059	306	2.6%	4,507	4,941	434	9.6%
Brookline	5,639	6,479	840	14.9%	487	707	220	45.2%
Hollis	8,342	9,260	918	11.0%	2,067	2,282	215	10.4%
Hudson	25,394	27,908	2,514	9.9%	10,191	18,873	8,682	85.2%
Litchfield	8,478	9,097	619	7.3%	915	1,316	401	43.8%
Lyndeborough	1,702	2,095	393	23.1%	98	119	21	21.4%
Mason	1,448	1,480	32	2.2%	181	200	19	10.5%
Merrimack	26,632	29,455	2,823	10.6%	17,202	19,243	2,041	11.9%
Milford	16,131	18,647	2,516	15.6%	6,097	7,234	1,137	18.6%
Mt. Vernon	2,584	2,667	83	3.2%	138	181	43	31.2%
Nashua	91,322	95,523	4,201	4.6%	51,192	56,093	4,901	9.6%
Pelham	14,222	16,057	1,835	12.9%	2,363	2,505	142	6.0%
Wilton	3,896	4,177	281	7.2%	1,208	1,336	128	10.6%
NRPC Region	**217,543**	**234,904**	**17,361**	**8.0%**	**96,646**	**115,030**	**18,384**	**19.0%**

The population forecasts for Amherst do not include the three residential developments that have been recently put forward for consideration by the Town. These include:

- Clearview Development – The original proposal was for 31 dwelling units on the west side of New Boston Road and 35 on the east side of Boston Post Road. The two proposed access roads would terminate at a cul-de-sac turning area with no connection between the two development sites. The project was later revised to construction of 43 units in total.

- Woodlands at Amherst – This development was proposed as a 38 unit Planned Residential Development off Brook Road north of the junction with Horace Greeley Road. The project has since been reduced in scope to 18 units.

- Hazen Subdivision – The original proposal submitted in September 2021 was for a Planned Residential Development of 109 lots on 224.3 acres on property bounded by Spring, County and Upham Roads. It is located about 1.5 miles from the Amherst town center. The development proposal has since been scaled back to 49 units.

- Transfarmations – This development proposal calls for 60 residential units using a combination of individual driveways, shared driveways and a new site access road connecting to Christian Hill Road. The proposed development has been tabled for the present; however, it was decided through discussion with the Community Development Director to retain this project in the town village traffic analysis, in order to evaluate a full development scenario for future residential development in the Town.

While trip generation and distribution for the new residential developments is traditionally done by adding the land use inputs to the trip generation module of the regional traffic model, running the traffic distribution and finally trip assignment, NRPC decided to manually generate (using the process just described) and distribute the trips, rather than running the model processes, as the study is focused on a small study impact area, and the model is better suited to identify regional macro impacts rather than a highly focused impact of small changes to land use on a specific area such as the town center.

Trip generation from these developments was estimated based on empirical data. NRPC conducted traffic counts along three cul-de-sac streets which serve residential areas. These yielded daily and peak period trip generation rates for the highest hour of generator rates (AM & PM), as well as the rate of trips generated during a typical peak hour of traffic. The latter takes the highest hourly rate for the 7 to 9 AM and 4 to 6 PM periods, and is the data we are primarily interested in, since the traffic analysis is conducted for peak commuting hours.

The trip rate observed for Juniper Drive residences was somewhat higher than that for Bloody Brook Road, so the higher 0.85 rate per housing unit was applied for the estimation of peak hour trip generation for the new developments for both the morning and afternoon hours.

Table 8 – Trip Generation Rates Recorded on Amherst Residential Cul-de-Sac Roads

	Balsam Lane	Bloody Brook Rd	Juniper Drive
Number of Residential Units	25	27	33
Weekday Trips	122	217	239
Weekday Trips/Unit	4.88	8.04	7.24
AM Generator	8	16	28
AM Trips/Unit	0.32	0.59	0.85
AM Adjacent St (7-9 AM)	7	16	28
AM Trips/Unit	0.28	0.59	0.85
PM Generator	15	21	28
PM Trips/Unit	0.60	0.78	0.85
PM Adjacent St (4-6 PM)	15	21	28
PM Trips/Unit	0.43	0.78	0.85

Trip distribution of the estimated new trips from development was conducted in a similar manner as was done by the traffic consultant for the Clearview Development proposal that used Census journey-to-work data to identify directional flows and, therefore, impacts on study area intersections. NRPC utilized the most recent data from the U.S. Census LEHD Origin-Destination Employment Statistics (LODES) for 2019 (as this provides the most recent pre-COVID data, after which commuting patterns may be temporarily skewed). Table 9 provides commuter destinations for Amherst residents, and it is assumed that residents of the new developments will have similar travel patterns. While not all trips made during peak periods are commute trips, the vast majority are of this type and therefore the commute patterns are determined to provide the best estimate of trip paths during these hours of the day.

Google Maps was used to identify the paths that would be taken by residents from each of the new developments. The resulting trips by path are presented in Table 10.

Projected 2045 Traffic Volumes

Table 11 provides the results of 2045 model runs on study area roadways. These numbers represent total weekday volumes produced by the regional model plus the estimate from new developments on a daily basis. While the main arterial, NH 101 is only moderately impacted by regional growth and PRD development, Boston Post Road and Foundry Streets are estimated to experience more significant rates of growth.

Table 9 – Amherst Resident Commute Destinations

Work Destination	Total
Amherst CDP (village)	102
Amherst North	126
Amherst South	420
Nashua Central	395
Nashua NE	154
Nashua NW	245
Nashua South	195
Merrimack North	120
Merrimack South	362
Milford East	134
Milford West	123
Hudson/Litchfield/Pelham	166
Hollis/NRPC West	105
Manchester	633
Bedford	250
Londonderry	127
Other Manchester Area	204
Concord & North NH	228
NH West	146
NH East	267
Subtotal	4,502
Massachusetts	
Andover	47
Bedford	26
Billerica	14
Boston	104
Boston Metro	153
Lowell Area	187
Burlington	40
Montachusett Area & West	87
Northeast Mass	25
Subtotal	683
Total	5,185

Table 10 – Estimated Peak Hour Traffic Volumes Through Amherst Village from New Residential Developments

Clearview Development 59 Boston Post Rd			**Woodlands @ Amherst Brook Rd.**			**Hazen Subdivision County/Spring Rds**			**Transfarmations Christian Hill/Bloody Brook Rd**		
Original Units Proposed		66	Original Units Proposed		38	Original Units Proposed		109			
Revised Units Proposed		43	Revised Units Proposed		18	Revised Units Proposed		49	Potential New Unit Construction		60
Peak Hour Trip Rate		0.85	Peak Hour Trip Rate		0.85	Peak Hour Trip Rate		0.85	Peak Hour Trip Rate		0.85
Peak Hour Trips		**37**	Peak Hour Trips		**15**	Peak Hour Trips		**42**	Peak Hour Trips		**51**
Routes thru Village	% Ttl	No.		% Ttl	No.		% Ttl	No.		% Ttl	No.
Bos Post Rd & NH 122 SB	52%	**19**	NH 122 & Amherst St SB	10%	**2**	NH 122/Courthouse Rd SB	9%	**4**	Foundry/Bos Post & NH 122 SB	64%	**32**
Bos Post Rd & NH 122 NB	35%	**13**	NH 122 SB/Bos Post Rd NB	2%	**0**	NH 122 NB	7%	**3**	Foundry/Bos Post & NH 122 NE	36%	**19**
Bos Post Rd & Main St WB	5%	**2**				NH 122 SB & Bos Post NB	3%	**1**			

Table 11 - Amherst Village Estimated Weekday 2045 Traffic Volume

Automatic Traffic Recorder Location		2021 AWDT	2045 Est AWDT	Pct. Change
Boston Post Rd	N. of New Boston Rd	3,015	4,090	35.7%
Boston Post Rd	N of Church St	4,250	5,540	30.4%
Boston Post Rd	N of Amherst St	5,165	6,600	27.8%
Main St	E of Boston Post Rd	1,020	1,200	17.6%
Amherst St (NH 122)	W of Baboosic Lk Rd	6,760	7,580	12.1%
Amherst St	W of Boston Post Rd	4,030	4,870	20.8%
Foundry St	W of Boston Post Rd	875	1,230	40.6%
New Boston Rd	S. of Brookwood Dr	1,980	2,220	12.1%
Boston Post Rd(NH 122)	N of Courthouse Rd	5,690	7,280	27.9%
NH 101	N of Baboosic Lk Rd	21,790	24,150	10.8%
NH 101	Over Boston Post Rd	14,230	16,320	14.7%
NH 101	Milford/Amherst TL	16,700	18,300	9.6%

Future Intersection Turning Movements

From the link volume growth estimated by the regional model for 2045 and the additional growth along study area streets from residential development, future intersection volumes were estimated developing a spreadsheet that added base growth and PRD growth. The process and results are shown in Tables 12 and 13 for both the AM and PM peak hours.

Figures 7 and 8 provide a visual illustration of the estimated future intersection volumes.

Table 12 – 2045 AM Peak Hour Estimated Intersection Turning Movements

				AM PEAK											
	TransCAD Link Volumes			2020 Existing			Base Growth			Add Res Dev			2045 Estimate		
Amherst St/Boston Post Rd	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Amherst St EB	2,772	2,964	7%	0	163	64	0	174	68	0	0	0	0	174	68
Amherst St WB	2,422	2,696	11%	35	102	37	39	114	41	0	5	1	39	119	42
Boston Post Rd NB	2,527	2,933	16%	22	143	11	26	166	13	0	0	0	26	166	13
Boston Post Rd SB	2,313	2,747	19%	67	376	2	80	446	2	13	51	0	93	497	2
Boston Post Rd/Main St	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Boston Post Rd NB	2,296	2,712	18%	19	164	14	22	194	17	0	1	0	22	195	17
Boston Post Rd SB	2,503	2,956	18%	4	403	27	5	476	32	0	64	2	5	540	34
Main St EB	948	1,061	12%	24	16	12	27	18	13	0	0	0	27	18	13
Main St WB	705	826	17%	35	13	5	41	15	6	0	0	0	41	15	6
Amherst St/Middle St	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Amherst St EB	2,485	2,691	8%	2	250	2	2	271	2	0	13	0	2	284	2
Amherst St WB	2,473	2,749	11%	0	159	45	0	177	50	0	6	0	0	183	50
Middle St SB	50	55	10%	36	25	6	40	28	7	0	0	0	40	28	7
Amherst St/Main St	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Amherst St EB	3,575	3,849	8%	32	169	1	34	182	1	0	0	0	34	182	1
Amherst St WB	2,698	2,963	10%	1	97	1	1	107	1	0	5	0	1	112	1
Main St SB	1,289	1,469	14%	0	0	34	0	0	39	0	0	2	0	0	41
Main St/Middle St	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Main St EB	772	874	13%	4	20	10	5	23	11	0	0	0	5	23	11
Main St WB	1,137	1,346	18%	7	30	1	8	36	1	0	0	0	8	36	1
Middle St NB	61	66	9%	5	29	4	5	32	4	0	0	0	5	32	4
Middle St SB	412	497	21%	5	47	5	6	57	6	0	0	0	6	57	6
Boston Post Rd/Foundry St	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Boston Post Rd NB	2,393	2,821	18%	48	142	0	57	167	0	0	1	0	57	168	0
Boston Post Rd SB	2,392	2,842	19%	2	343	13	2	408	15	0	34	0	2	442	15
Foundry St EB	534	591	11%	25	10	76	28	11	84	19	0	32	47	11	116
Foundry St WB	399	447	12%	3	19	0	3	21	0	0	0	0	3	21	0
Boston Post Rd/Middle St	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Boston Post Rd NB	2,384	2,814	18%	--	166	0	--	196	--	0	20	0	--	216	--
Boston Post Rd SB	2,853	3,301	16%	59	322	--	68	373	--	0	34	0	68	407	--
Middle St NWB	459	528	15%	--	--	41	--	--	47	0	0	0	--	--	47
Boston Post Rd/New Bos Rd	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Boston Post Rd NB	2,466	3,011	22%	--	56	63	--	68	77	0	20	0	--	88	77
Boston Post Rd SB	1,497	1,778	19%	3	211	--	4	251	--	0	34	0	4	285	--
New Boston Rd WB	1,497	1,674	12%	103	--	2	115	--	2	0	--	0	115	--	2

Table 13 – 2045 PM Peak Hour Estimated Intersection Turning Movements

				PM PEAK											
	TransCAD Link Volumes			2020 Existing			Base Growth			Add Res Dev			2045 Estimate		
Amherst St/Boston Post Rd	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Amherst St EB	2,772	2,964	7%	0	125	25	0	134	27	0	5	0	0	139	27
Amherst St WB	2,422	2,696	11%	17	234	62	19	260	69	0	0	13	19	260	82
Boston Post Rd NB	2,527	2,933	16%	32	271	14	37	315	16	0	51	0	37	366	16
Boston Post Rd SB	2,313	2,747	19%	37	137	5	44	163	6	1	0	0	45	163	6
Boston Post Rd/Main St	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Boston Post Rd NB	2,296	2,712	18%	6	316	18	7	373	21	0	64	0	7	437	21
Boston Post Rd SB	2,503	2,956	18%	6	172	16	7	203	19	0	1	0	7	204	19
Main St EB	948	1,061	12%	16	26	8	18	29	9	2	0	0	20	29	9
Main St WB	705	826	17%	18	14	5	21	16	6	0	0	0	21	16	6
Amherst St/Middle St	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Amherst St EB	2,485	2,691	8%	1	174	4	1	188	4	0	6	0	1	194	4
Amherst St WB	2,473	2,749	11%	2	342	16	2	380	18	0	13	0	2	393	18
Middle St SB	50	55	10%	12	3	2	13	3	2	0	0	0	13	3	2
Amherst St/Main St	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Amherst St EB	3,575	3,849	8%	37	144	1	40	155	1	2	5	0	42	160	1
Amherst St WB	2,698	2,963	10%	9	251	3	10	276	3	0	0	0	10	276	3
Main St SB	1,289	1,469	14%	0	1	39	0	1	44	0	0	0	0	1	44
Main St/Middle St	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Main St EB	772	874	13%	5	41	9	6	46	10	0	0	0	6	46	10
Main St WB	1,137	1,346	18%	7	28	2	8	33	2	0	0	0	8	33	2
Middle St NB	61	66	9%	7	11	1	8	12	1	0	0	0	8	12	1
Middle St SB	412	497	21%	2	11	3	2	13	4	0	0	0	2	13	4
Boston Post Rd/Foundry St	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Boston Post Rd NB	2,393	2,821	18%	27	276	2	32	325	2	32	34	0	64	359	2
Boston Post Rd SB	2,392	2,842	19%	1	142	2	1	169	2	0	1	19	1	170	21
Foundry St EB	534	591	11%	2	7	19	2	8	21	0	0	0	2	8	21
Foundry St WB	399	447	12%	1	8	2	1	9	2	0	0	0	1	9	2
Boston Post Rd/Middle St	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Boston Post Rd NB	2,384	2,814	18%	--	315	0	--	372	--	--	34	0	--	406	--
Boston Post Rd SB	2,853	3,301	16%	6	172	--	7	199	--	0	20	--	7	219	--
Middle St NWB	459	528	15%	--	--	10	--	--	11	--	--	0	--	--	11
Boston Post Rd/New Bos Rd	2020	2045		L	T	R	L	T	R	L	T	R	L	T	R
Boston Post Rd NB	2,466	3,011	22%	--	195	94	--	238	115	--	34	0	--	272	115
Boston Post Rd SB	1,497	1,778	19%	3	92	--	4	109	--	0	20	--	4	129	--
New Boston Rd WB	1,497	1,674	12%	68	--	7	76	--	8	0	--	0	76	--	8

Figure 7 – Amherst Village 2045 AM Peak Hour Turning Movement Counts

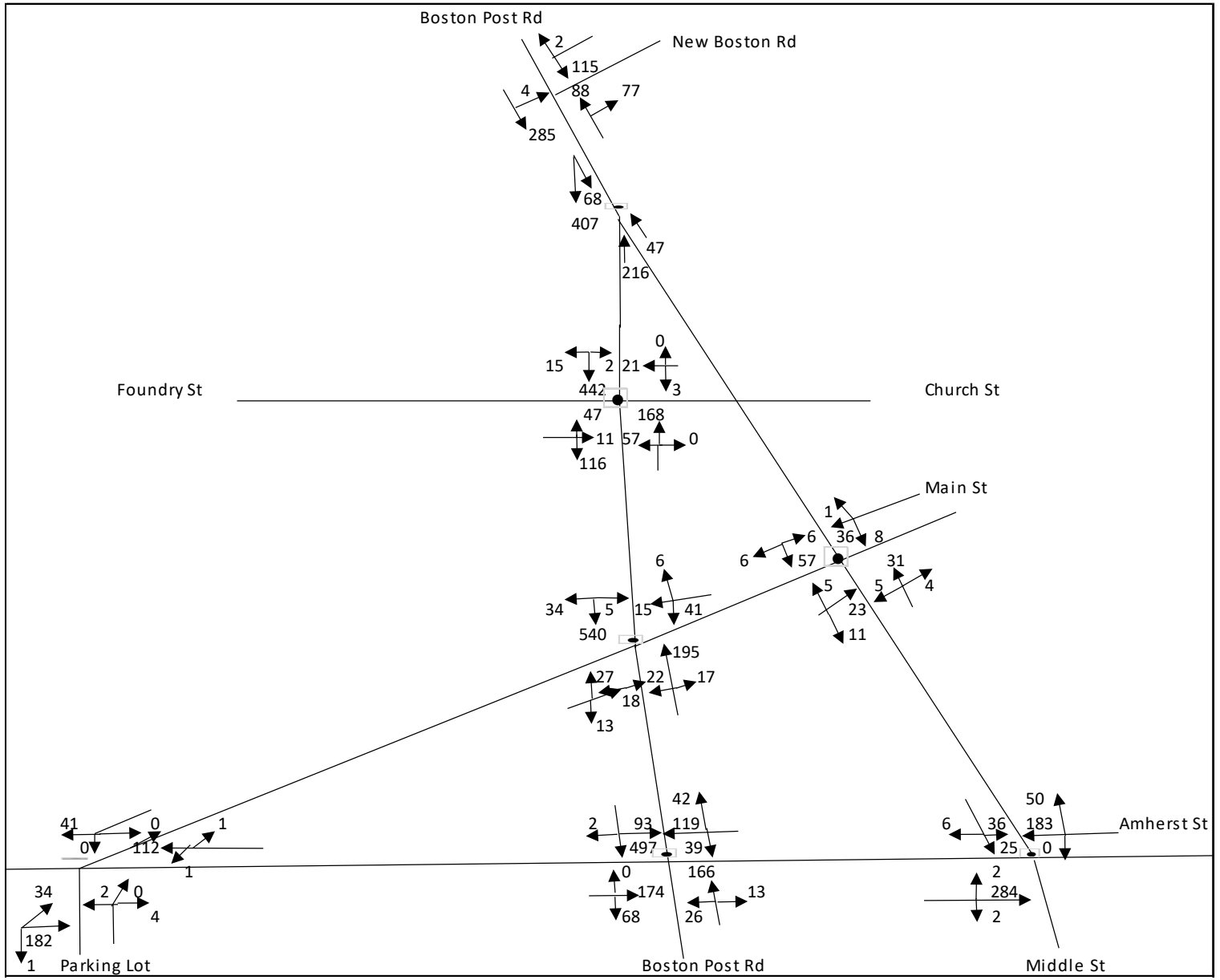
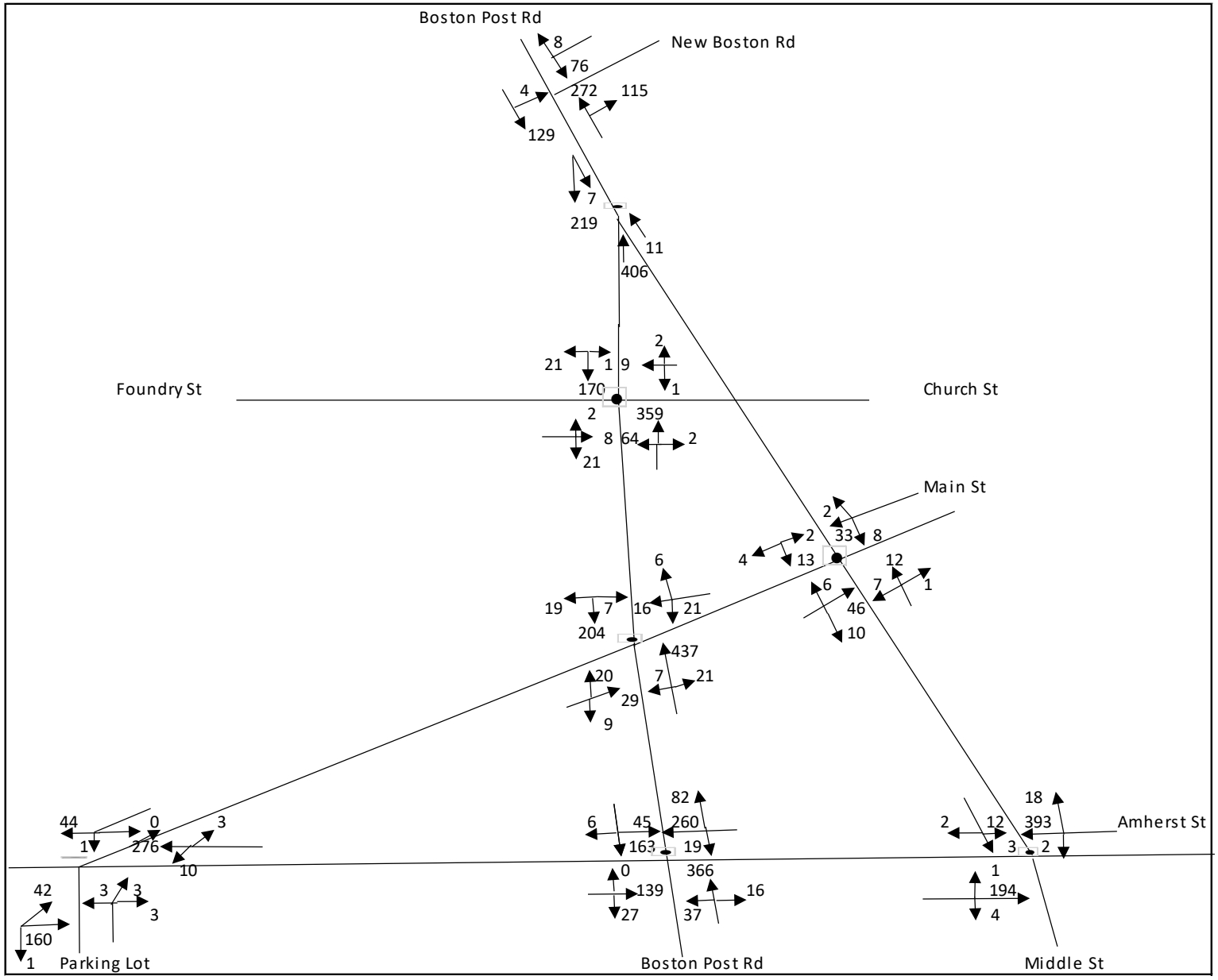


Figure 8 – Amherst Village 2045 PM Peak Hour Turning Movement Counts



Intersection Capacity Analysis

Table 14 provides the results of intersection capacity analysis and forecasted change in volumes from 2021 for the signalized intersection at Amherst Street and Boston Post Road. The peak total intersection volumes are forecasted to increase by 21% overall for both peak hours. For the AM peak delay is expected to increase by 5 seconds from 2021 for the intersection overall. Level of service is calculated to decline from B to C for both Amherst Street approaches and delay approximately doubles in both directions. This increase does not warrant any changes to intersection geometry to increase capacity but the increased delay in the AM period will be of some significance in terms of maintaining the rural character of village travel. During the PM peak the intersection delay increases only marginally, and all approaches continue to function at LOS B.

Of the seven unsignalized intersections evaluated in Table 15, only the Boston Post Road/Main Street intersection operates below LOS A in the future year, however the degradation in operational conditions is substantial during the AM peak. At present the four-way stop intersection operates at the upper end LOS C during the AM peak, with the Boston Post Road southbound approach at 75% of capacity and mid-level LOS C. In 2045 the intersection is forecasted to operate overall at a 45.6 second average delay (LOS E), which is a 30 second addition from existing conditions and a decline in two service levels. The Boston Post Road southbound approach is forecasted to reach LOS F at 104% of capacity and a 65.8 second average delay. As was the case for existing conditions, however, the intersection can be largely mitigated implementing a two-way stop for minor street traffic, which is shown in Table 16. This would eliminate the forecasted lengthy queue on Boston Post Road and restore LOS A for the intersection overall. Main Street eastbound would decline from LOS B to D during the AM and westbound from B to E; however, these are low-volume approaches which typically bear the increased delay in order to improve operations for the major street traffic flow. The traffic relief in the PM period would also be significant, with Boston Post Road northbound traffic improving from LOS D to A and delay reduced from 25.5 seconds to less than 1 second. Main Street LOS would decline from B to C eastbound and B to D westbound, again for much lower volumes of traffic compared to the Boston Post Road approaches.

Overall, with the minor traffic improvement noted, the Amherst Village area is forecasted to operate at low congestion conditions well into the future.

One of the premises for conducting this study, the traffic consultant's forecast of failure conditions at a number of Village Area intersections, needs to be addressed. This analyst has conducted reviews of traffic impact studies such as that done for the Clearview Development for a period of nearly forty years. Among the many traffic studies reviewed, one recurring theme is prevalent – the tendency for future forecasted traffic conditions to degenerate to failure or unacceptable operational conditions "even without the proposed development." In some instances, this is true, although the usual accompanying corollary that the proposed development will not make conditions worse, is not. Level of service F can be characterized by a queue length of 20 or 100. It is not logical to conclude that the latter LOS F is no more intolerable than the former.

The assumptions made in the Transfarmations-Clearview Traffic Study followed this traditional line of analysis. A seasonal factor of 1.15 for the peak month was applied to the future No-Build scenario. Also, a 2% per year background growth rate was applied, indicative of growth in the NRPC region that has not been present for the past twenty years. However, the monthly peak factor was not applied to the 2019

base when conducting intersection capacity analysis. This, in conjunction with the high background growth rate, resulted in a high variance between existing and future No-Build conditions. Consequently, the additional degradation of intersection operations resulting from the new developments was de-emphasized.

NRPC concludes that future projected regional land use growth and that specific to the recently proposed new developments in Amherst, will not significantly degrade traffic operational conditions in the Amherst Village Area, provided that the Town address the one four-way stop that results in moderately long queues at present and is expected to further degrade in the future. Otherwise, the various changes that have been considered to intersection traffic control are to be determined through a public participation process that considers the desire of motorists to travel through the Village Area without excessive stoppages versus the need to maintain a safe and convenient environment for non-motorized travel.

Table 14 - Amherst Village 2045 Signalized Intersection Capacity Analysis

Intersection	AM Peak						PM Peak					
	Intersection Volume						Intersection Volume					
	2021	2045	% Chng	Delay	V/C	AM LOS	2021	2045	% Chng	Delay	V/C	AM LOS
Amherst St & Boston Post Rd	**1022**	**1239**	**21%**	**19.0**		**B**	**959**	**1159**	**21%**	**13.2**		**B**
Amherst St EB All	227	243	7%	24.5	0.68	C	150	165	10%	9.9	0.30	B
Amherst St WB All	174	200	15%	25.7	0.64	C	313	361	15%	16.5	0.66	B
Boston Post Rd NB All	176	204	16%	7.5	0.31	A	317	419	32%	13.2	0.57	B
Boston Post Rd SB All	445	592	33%	19.1	0.80	B	179	214	19%	10.9	0.39	B

Table 15 - Amherst Village 2045 Unsignalized Intersection Capacity Analysis

Intersection	AM Peak Intersection Volume						PM Peak Intersection Volume					
	2021	2045	% Chng	Delay	V/C	AM LOS	2021	2045	% Chng	Delay	V/C	AM LOS
Boston Post Rd & Main St	**736**	**933**	**27%**	**45.6**		**E**	**621**	**797**	**28%**	**19.7**		**C**
Boston Post Rd NB All	197	234	19%	13.3	0.49	B	340	466	37%	25.5	0.82	D
Boston Post Rd SB All	434	579	33%	65.8	1.04	F	194	230	19%	12.4	0.46	B
Main St EB All	52	58	12%	10.5	0.12	B	50	58	16%	10.2	0.12	B
Main St WB All	53	62	17%	10.8	0.14	B	37	43	17%	10.1	0.20	B
Amherst St & Middle St	**525**	**596**	**14%**	**2.8**		**A**	**556**	**630**	**13%**	**0.8**		**A**
Amherst St EB All	254	288	13%	<1	0.15	A	179	199	11%	<1	0.10	A
Amherst St WB All	204	233	14%	<1	0.12	A	360	413	15%	<1	0.22	A
Middle St SB All	67	75	12%	16	0.04	C	17	18	6%	14.9	0.09	B
Amherst St & Main St	**335**	**372**	**11%**	**2.1**		**A**	**485**	**537**	11%	**2.2**		**A**
Amherst St EB All	202	217	8%	1.4	0.11	A	182	203	12%	1.9	0.07	A
Amherst St WB All	99	114	15%	<1	0.06	A	263	289	10%	<1	0.15	A
Main St SW All	34	41	20%	9.2	0.05	A	40	46	14%	10.6	0.10	B
Main St & Middle St	**167**	**193**	16%	**7.9**		**A**	**127**	**146**	15%	**7.4**		**A**
Main St EB All	34	38	13%	7.7	0.08	A	55	62	13%	7.5	0.09	A
Main St WB All	38	45	18%	8.0	0.10	A	37	44	18%	7.5	0.07	A
Middle St NB All	38	41	8%	7.8	0.09	A	19	21	11%	7.5	0.04	A
Middle St SB All	57	69	21%	8.1	0.15	A	16	19	21%	7.3	0.04	A
Boston Post Rd & Foundry St	**681**	**883**	30%	**8.3**		**A**	**489**	**661**	35%	**1.8**		**A**
Boston Post Rd NB All	190	225	18%	<1	0.12	A	305	426	40%	1.7	0.22	A
Boston Post Rd SB All	358	459	28%	2.8	0.24	A	145	192	33%	<1	0.10	A
Foundry St EB All	111	174	57%	31.6	0.64	D	28	31	11%	11	0.06	B
Foundry St WB All	22	25	12%	26.1	0.21	D	11	12	12%	13.1	0.04	B
Boston Post Rd & Middle St	**588**	**738**	25%	**2.2**		**A**	**503**	**643**	**28%**	**<1**		**A**
Boston Post Rd NB All	166	216	30%	<1	0.11	A	315	406	29%	<1	0.21	A
Boston Post Rd SB All	381	475	25%	2	0.25	A	178	226	27%	<1	0.12	A
Middle St NWB All	41	47	15%	11.3	0.15	B	10	11	15%	11.3	0.03	B
Boston Post Rd & New Boston Rd	**438**	**571**	30%	**3.6**		**A**	**459**	**604**	**31%**	**2.2**		**A**
Boston Post Rd NB All	119	165	39%	<1	0.10	A	289	387	34%	<1	0.27	A
Boston Post Rd SB All	214	288	35%	<1	0.15	A	95	133	40%	<1	0.07	A
New Boston Rod SB All	105	117	12%	14.3	0.30	B	75	84	12%	14.4	0.23	B

Table 16 - Intersection Control Modified to Two-Way Stop for Main Street

Intersection	AM Peak Intersection Volume						PM Peak Intersection Volume					
	2021	2045	% Chng	Delay	V/C	AM LOS	2021	2045	% Chng	Delay	V/C	AM LOS
Boston Post Rd & Main St	**736**	**933**	**27%**	**4.7**		**A**	**621**	**797**	**28%**	**19.7**		**A**
Boston Post Rd NB All	197	234	19%	1.3	0.12	A	340	466	37%	<1	0.25	A
Boston Post Rd SB All	434	579	33%	<1	0.30	A	194	230	19%	<1	0.12	A
Main St EB All	52	58	12%	34.2	0.35	D	50	58	16%	24.7	0.28	C
Main St WB All	53	62	17%	42.5	0.44	E	37	43	17%	26.3	0.25	D