MEMORANDUM

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FROM: F. Giles Ham, P.E.
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DATE: April 2, 2013

RE: 6237

SUBJECT: Traffic and Parking Study
Proposed Winthrop High School/Middle High School
Winthrop, Massachusetts

INTRODUCTION

Vanasse & Associates, Inc. (VAI) has prepared this Traffic and Parking Study to evaluate the anticipated traffic impacts associated with the development of a new Middle School and High School off Main Street in Winthrop, Massachusetts. The proposed school would replace the existing high school located at 400 Main Street, as well as the existing middle school located at 151 Pauline Street, with activities for both schools consolidated at the property that houses the existing high school.

This study includes observations of existing traffic and parking conditions in the vicinity of the project site, an analysis of the anticipated increase and traffic and parking demand associated with the project, and makes recommendations to enhance future traffic operations and parking in the vicinity of the school.

The study area for this report includes portions of the Main Street, Cross Street, Payson Street and Franklin Street corridors, including the following locations:

- Main Street at Cross Street and Golf Course
- Main Street at Payson Street and South Main Street
- Franklin Street at Cross Street
- Franklin Street at Payson Street and Harvard Street
- Payson Street at Central Street and High School driveway
- Cross Street at High School driveway

PROJECT DESCRIPTION

The proposed project entails the consolidation of the existing Winthrop High School and Winthrop Middle School to a single campus located off Main Street, at the site of the current high school. The High School currently accommodates approximately 510 students and 72 staff, while the Middle School accommodates 460 students and 61 staff. Access to the consolidated campus would continue to be provided via Main Street, Cross Street and Payson Street, the primary roadway corridors serving the project site.

STUDY METHODOLOGY

This study was generally performed in accordance with guidelines for the preparation of traffic studies and was conducted in three distinct stages. The first stage involved an assessment of existing traffic conditions in the study area and included an inventory of roadway geometrics, observations of traffic flow, and collection of peak-period traffic counts during hours of school arrivals and departures. In the second stage of the study, an assessment of the anticipated impact of new traffic associated with the relocated middle school was completed. The third stage of the study presents and evaluates measures to address traffic and safety issues, if any, identified in stage two of the study.

EXISTING CONDITIONS

A comprehensive field inventory of existing traffic conditions on the study area roadways was conducted in March of 2013. The field investigation consisted of an inventory of existing roadway geometrics, traffic volumes, and operating characteristics, as well as posted speed limits and land use information within the study area. The study area for the project was selected to contain the major roadways providing access to the project site including the Main Street, Payson Street and Cross Street corridors. Specifically, the study area includes the following intersections located along these roadways which are expected to accommodate the majority of project-related traffic.

- Main Street at Cross Street and Golf Course
- Main Street at Payson Street and South Main Street
- Franklin Street at Cross Street
- Franklin Street at Payson Street and Harvard Street
- Payson Street at Central Street and High School driveway
- Cross Street at High School driveway

Geometry

Roadways

- **Main Street**

Main Street is a local roadway under the jurisdiction of the Town of Winthrop that traverses the study area in a general east-west orientation, providing connections between the Saratoga Street (Route 145) corridor to the west and the Cross Street corridor to the east. Within the study area, Main Street is approximately 40 feet in width, providing an approximate 12-foot travel lane in each direction, separated by a painted double-yellow centerline. An approximate 8-foot shoulder is provided along both sides of the corridor and is utilized as on-street parallel parking. In the vicinity of the high school, a concrete sidewalk is provided along the entire northern edge of the corridor. On the southern side of the corridor, a concrete sidewalk is provided west of the main entrance to the school, with on-street perpendicular parking provided between the school's main entrance and Cross Street, adjacent to the high school tennis courts. Lighting along the corridor is provided by overhead street lights mounted to utility poles on the southern side of the corridor. Land use along the corridor includes a mix of residential and institutional uses.

- **Cross Street**

Cross Street is a local roadway under the jurisdiction of the Town of Winthrop that traverses the study area in a general north-south orientation, providing connections between the River Road corridor to the south and Locust Street corridor to the north. Within the vicinity of the high school, Cross Street accommodates an approximate 12-foot travel lane in each direction, with on-street parallel parking provided along both sides of the corridor. Directional travel along the Cross Street corridor is separated by a double-yellow centerline. North of the high school, perpendicular parking is provided for the baseball fields, near the intersection of Cross Street with Franklin Street. Lighting along the corridor is provided by overhead street lights mounted to utility poles along the eastern side of the roadway. Land use along the corridor consists of a mix of institutional, residential and commercial uses including the Winthrop Golf Club.

- **Payson Street**

Payson Street is a local roadway under the jurisdiction of the Town of Winthrop that traverses the study area in a general north-south orientation, providing connections between the Main Street and South Main Street corridors to the south and the Shirley Street corridor to the north. Between Main Street and Franklin Street, Payson Street accommodates traffic flow in both the northbound and southbound directions. North of Franklin Street, Payson Street is a one-way roadway in the southbound direction. In the vicinity of the high school, Payson Street provides a single lane of travel in each direction with a concrete sidewalk provided along both sides of the corridor. North of the high school, in the vicinity of the baseball fields, sidewalk is provided only on the western side of the corridor. Lighting along the corridor is provided by overhead street lights mounted to utility poles on the western side of the roadway. Land use along the corridor consists of a mix of residential and institutional uses.

Intersections

Main Street at Payson Street and South Main Street

Payson Street and South Main Street intersect Main Street from the north and south, respectively to form a four-way intersection that operates under STOP control. The Main Street eastbound approach to this intersection provides an approximate 12-foot wide general purpose travel lane that operates under STOP-sign control. The Main Street westbound approach provides an approximate 12-foot wide general purpose travel lane that is uncontrolled. The South Main Street northbound approach provides an approximate 12-foot wide general purpose travel lane that operates under STOP control. The Payson Street southbound approach to this intersection provides an approximate 16-foot wide general purpose travel lane that operates under STOP-sign control. Directional flow of traffic on Main Street is separated by a painted double-yellow centerline. Sidewalk is provided along both sides of all four intersection approaches at this location, with a painted crosswalk provided across the Payson Street southbound approach to this intersection. Land use in the vicinity of this intersection consists of a mix of residential and institutional properties.

Main Street at Cross Street and Golf Course

Cross Street intersects Main Street and the Winthrop Golf Club driveway from the north and south to form a four-way intersection that operates under STOP control. The Main Street eastbound approach to this intersection provides an approximate 20-foot wide general purpose travel lane that operates under STOP-sign control. The Winthrop Golf Club westbound approach provides an approximate 12-foot wide general purpose travel lane that is operates under STOP-sign control. The Cross Street northbound approach provides an approximate 12-foot wide general purpose travel lane with on-street parallel parking provided adjacent to the travel lane. The Cross Street southbound approach to this intersection provides an approximate 12-foot wide general purpose travel lane with on-street parallel parking provided adjacent to the travel lane. Directional flow of traffic on Main Street and Cross Street are separated by a painted double-yellow centerline. Sidewalk is provided along both sides of Cross Street and the northern side of Main Street at this location. Land use in the vicinity of this intersection consists of a mix of institutional and commercial properties including the Winthrop Golf Club.

Franklin Street and Harvard Street at Payson Street

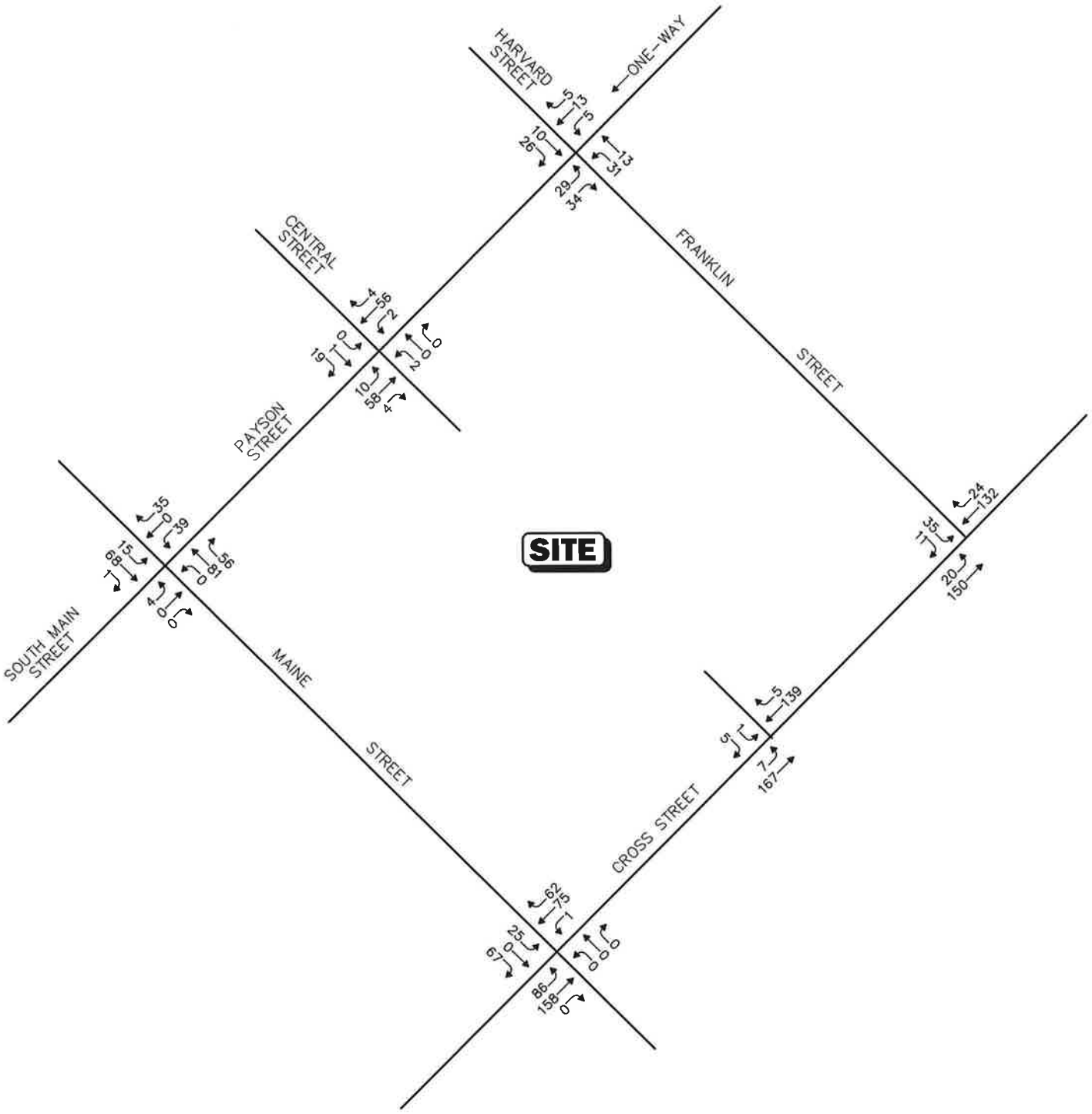
Franklin Street and Harvard Street intersect Payson Street from the east and west, respectively, to form a four-way intersection that operates under four-way STOP control. The Harvard Street eastbound approach provides a single approximate 12-foot travel lane that operates under STOP-sign control. The Franklin Street westbound approach provides an approximate 14-foot wide general purpose travel lane that operates under STOP-sign control. The Payson Street northbound approach provides an approximate 14-foot wide general purpose travel lane that operates under STOP-sign control. The Payson Street southbound approach provides an approximate 20-foot wide approach that operates one-way in the southbound direction under STOP-sign control.

Cross Street at Franklin Street

Cross Street and Franklin Street intersect to form a T-type intersection that operates under STOP control. The Franklin Street southbound approach to this intersection provides an approximate 12-foot wide general purpose travel lane that operates under STOP-sign control on Franklin Street. The Cross Street east and westbound approaches provide one lane per direction. Perpendicular parking exists along Franklin Street and Cross Street in the northwest corner of the intersection. Sidewalks are provided along the other approaches. Land use in the vicinity of this intersection consists of a mix of residential and institutional properties.

EXISTING TRAFFIC VOLUMES

In order to establish existing traffic-volume demands and flow patterns within the study area, manual turning movement counts (TMCs) and vehicle classification counts were completed in March of 2013 during the weekday morning (6:30 to 8:30 AM) and weekday afternoon (1:30 to 3:30 PM) time periods at each of the study area intersections. These time periods correspond to the peak hours of school arrivals and departures. A summary of the peak hour traffic volumes are depicted in Figures 1 and 2. In general, the morning peak hour occurs between 7:30 and 8:30 AM and the afternoon peak hour occurs between 2:15 and 3:15 PM. Overall, the busiest area street is Cross Street which accommodates over 300 vehicles during the morning peak hour. Main Street accommodates close to 250 morning trips which accommodates on-street parking and drop-offs. Morning drop-offs and evening pick-ups are not significant for the High School.



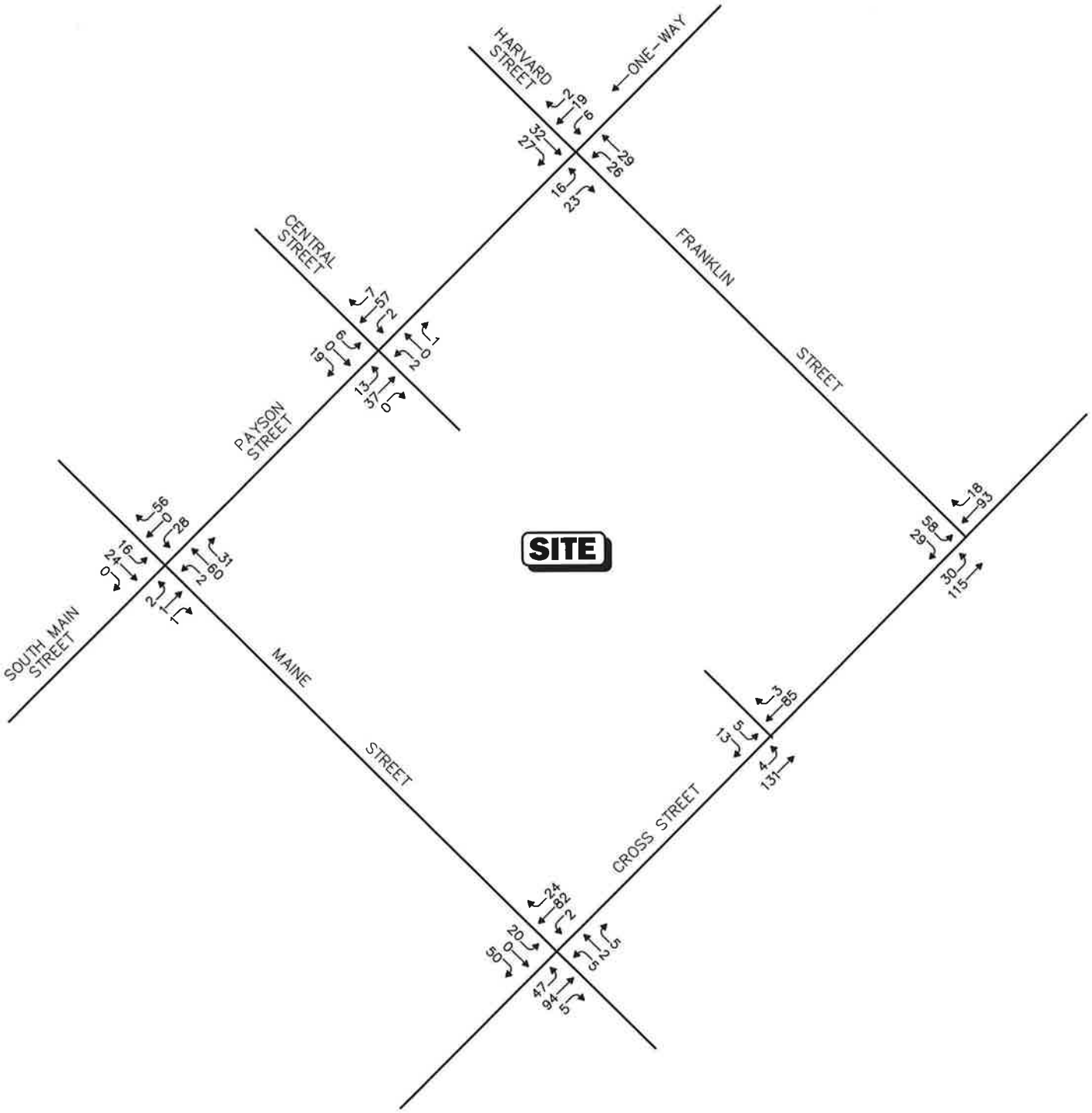
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 1

2013 Existing
Weekday Morning
Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 2

2013 Existing
Weekday Afternoon
Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners

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Pedestrian activity was heaviest along the Main Street area with crossing at the Main Street and Payson Street intersection ranging between 33 and 73 crossing (morning/afternoon) over the 1.5 hour period. Main Street and Cross Street crossing ranged between 87 and 152 (morning/afternoon).

Winthrop Middle School

Observations at the Winthrop Middle School were conducted to determine the staff traffic generation and the level of drop-off activity. School hours are between 7:45 AM and 2:30 PM, and observations were conducted between 6:45 AM and 8:45 AM and between 2:15 PM and 4:00 PM. A summary of these observations is summarized in Table 1.

Table 1
WINTHROP MIDDLE SCHOOL OBSERVATION

	Parking Lot		Pauline Street Drop-Off/Pick Ups	
	In	Out	In	Out
Morning				
6:30 – 6:45	2	0	0	0
6:45 – 7:00	2	0	0	0
7:00 – 7:15	10	1	5	5
7:15 – 7:30	8	1	21	21
7:30 – 7:45	14	3	5	5
7:45 – 8:00	6	1	72	72
8:00 – 8:15	0	0	2	2
8:15 – 8:30	0	0	0	0
Afternoon				
2:00 – 2:15	2	0	0	0
2:15 – 2:30	9	4	0	0
2:30 – 2:45	18	24	41	41
2:45 – 3:00	19	11	11	11
3:00 – 3:15	7	8	2	2
3:15 – 3:30	12	16	9	9
3:30 – 3:45	15	19	0	0
3:45 – 4:00	12	12	1	1

As shown in the above table, the busiest time in the morning is between 7:00 and 8:00 AM with 44 vehicle trips at the parking lot and 103 drop-off trips. During the afternoon busiest hour between 2:30 and 3:30 PM at a total of 115 vehicle trips were observed in the parking lot (combination of teachers, and pick-ups and rink users) and 63 on-street pick-ups were observed. A total of 40 vehicles are typically parked in the parking lot after 9:00 AM.

Combined School Traffic Conditions

Overall, the area around the high school experiences low traffic volumes and a peak condition occurs in the half-hour period before school beginning and a half hour after school ending. The morning period is busiest and is more notable. The Middle School has a similar traffic pattern, but has greater drop-off activity during the morning period with close to 100 drop-offs during a 45-minute period. In order to minimize this combined peaking it is recommended that at a minimum a 30-minute start time difference between the High School and Middle School be implemented.

Parking Analysis

Existing parking demand at the High School was observed during the morning and afternoon periods. The peak observed demand was as follows:

WINTHROP HIGH SCHOOL OBSERVATION

Lot	8:30 AM Morning Period	2:15 PM Afternoon Period
Tennis Court Lot	42	51*
Main Street	24	30
Cross Street	21	23
Payson Street (On-Street)	5	7
Payson Street (Perpendicular Lots)	16	16
Teachers Lots	34	38
Total	142	165

*Includes live parking for pick-ups.

With the addition of the Middle School parking which was observed to be approximately 40 vehicles, this brings the peak demand in the afternoon period to a minimum of 205 spaces. Since some staff (61 total) at the Middle School park on-street, the likely demand will be in the order of 225 vehicles.

RECOMMENDATIONS

School Hours

In order to minimize peak traffic times and drop-off and pick-up activities, it is recommended that start times for the High School and Middle School be off-set by a minimum of 30 minutes, with 45 minutes more desirable.

Drop-Off

As with all middle schools, the drop-off activity is most critical and the afternoon pick-ups experience is lighter. This is the case at the Winthrop Middle School. In order to provide a smooth drop-off transition, it is recommended that the Main Street frontage adjacent to the school be exclusive for drop-off and pick-up activity (See attached plan). Drop-off activity will occur in the westbound direction and will require two staff during the Middle School periods to ensure safe conditions. The High School activity will not need staffing. Parents should be notified of the drop-off procedures implemented by the school.

Parking

Sufficient parking is provided with the new site plan layout. With new on-street stripping to delineate the most frequently utilized spaces, a more definitive parking layout will be apparent. The parking supply is as follows.

Location	Spaces
• New Off-Street Lot	89
• Tennis Court Lot Area	44
• Payson Street - Perpendicular	25
• Cross Street Stripped	9
• Main Street Stripped	9
• Payson Street Stripped	10
Subtotal	186
Over-Flow Areas	
• Cross Street	22
• Franklin Street	52
Subtotal	74
TOTAL	260 Spaces

The parking supply is depicted on the attached plan.

It is recommended that at a minimum, teacher parking areas be designated. In addition, designated visitor spaces should also be established and could be the 9 spaces on Main Street with a one-hour limit.

Signage

It is recommended that the intersections of Cross Street/Main Street/Golf Course, Main Street/ Payson Street/South Main Street and Franklin Street/Payson Street/Harvard Street be all-way STOP intersections with appropriate signage. School Zone signs and Crosswalk signs should all be implemented as depicted on the attached plan.

Pedestrian Safety

Two mid-block crosswalks are recommended along Cross Street which will require signage to designate the locations. Also, pavement treatment could also be implemented to further enhance safety. Crosswalks have been recommended at the following intersections:

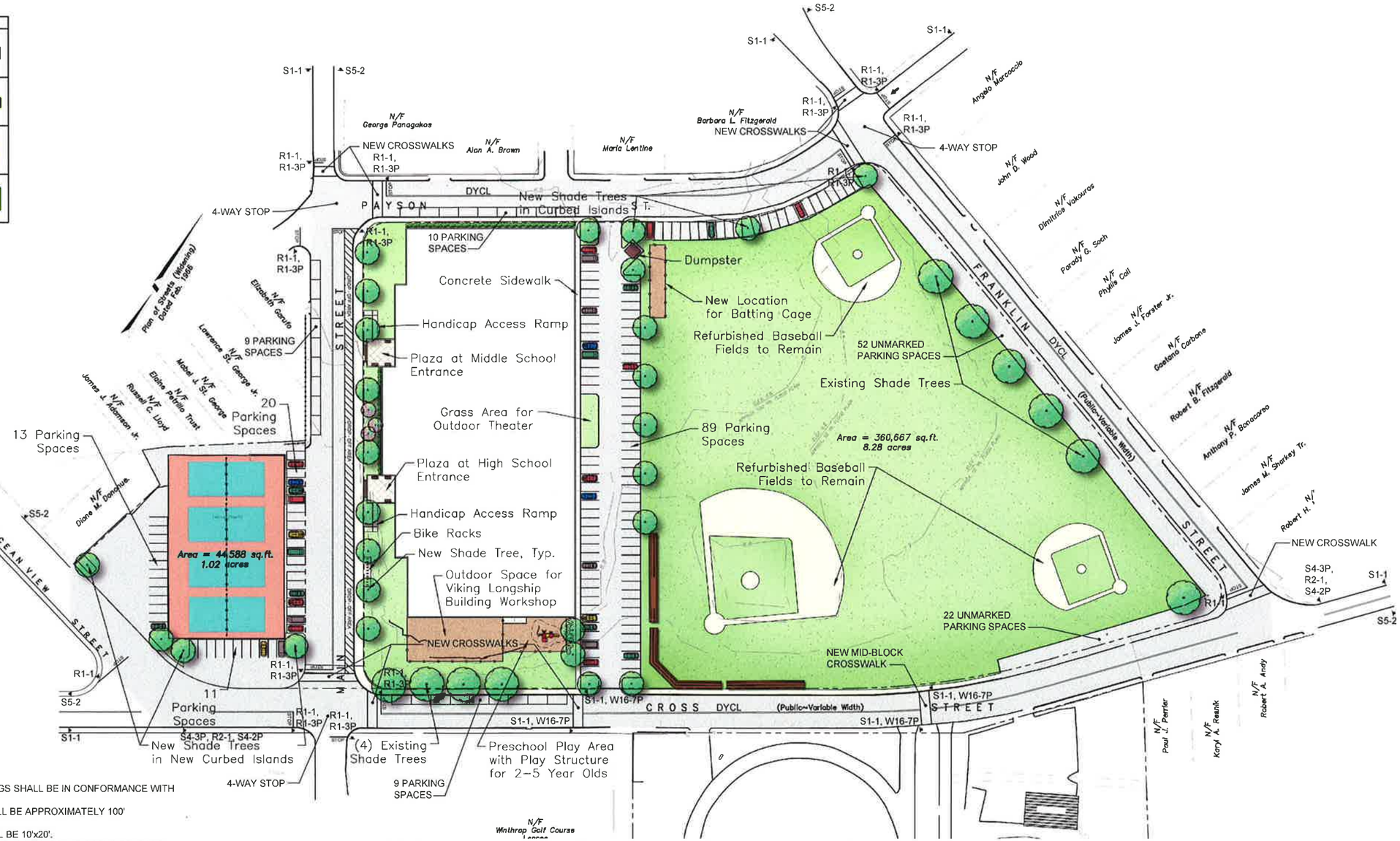
1. Franklin Street/Cross Street
2. Payson Street/Franklin Street/Harvard Street
3. Main Street/South Main Street/Payson Street
4. Main Street/Cross Street

The crosswalks are depicted on the attached plan.

In summary, recommendations that provide safe conditions at the combined Middle/High School have been designed with respect to traffic operations, pedestrian flow and parking. With these measures implemented, overall traffic impacts will be minimized with the combined Schools and safe conditions in the area will be maintained.

Traffic, Signage and Parking Plan

SIGN LEGEND			
R1-1	STOP	S4-2P	AREA CHILDREN ARE PRESENT
R1-3P	4-WAY	S4-3P	SCHOOL
R2-1	SPEED LIMIT 20	S5-2	END SCHOOL ZONE
S1-1		W16-7P	



NOTES:
1. ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN CONFORMANCE WITH MUTCD STANDARDS.
2. ALL APPROACHING S1-1 SIGNS SHALL BE APPROXIMATELY 100' FROM ADJACENT INTERSECTION.
3. ALL NEW ON-STREET SPACES SHALL BE 10'x20'.
4. BASE CONDITIONS OBTAINED FROM CBA LANDSCAPE ARCHITECTS LLC.
5. DYCL = DOUBLE YELLOW CENTER LINE.

0 50 100 Scale in Feet

Traffic and Parking Study Summary
Proposed High School / Middle School - Winthrop, Massachusetts

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