

SHEET LIST TABLE		
SHEET TITLE	DRAWING	SHEET NUMBER
LOCATION PLAN	C1.1	1
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CONSTRUCTION DETAILS PLAN	C8.3	10

**ZONING DISTRICT: GENERAL RESIDENCE (GR)**

CATEGORY	REQUIRED/ALLOWED	PROVIDED
MINIMUM LOT AREA	8,000 ft <sup>2</sup>	26,475 ft <sup>2</sup>
MAXIMUM DENSITY	NA	NA
FRONTAGE & WIDTH	80 ft.	165.0 ft.
FLOOR AREA RATIO	NA	NA
MINIMUM FRONT SETBACK	15 ft.	16.0 ft.
MINIMUM SIDE SETBACK	10 ft.	8.7 ft.
MINIMUM REAR SETBACK	20 ft.	49.0 ft.
MAXIMUM NUMBER OF STORIES	3	3
MAXIMUM HEIGHT	35 ft.	ft.
MAXIMUM BUILDING COVERAGE	35%	33.9%
MINIMUM OPEN AREA	30%	%
DISTANCE BETWEEN BUILDINGS	NA	NA

OWNER OF RECORD:  
32 NAHANT STREET, LLC  
9A MELVIN STREET  
WAKEFIELD, MA 01880

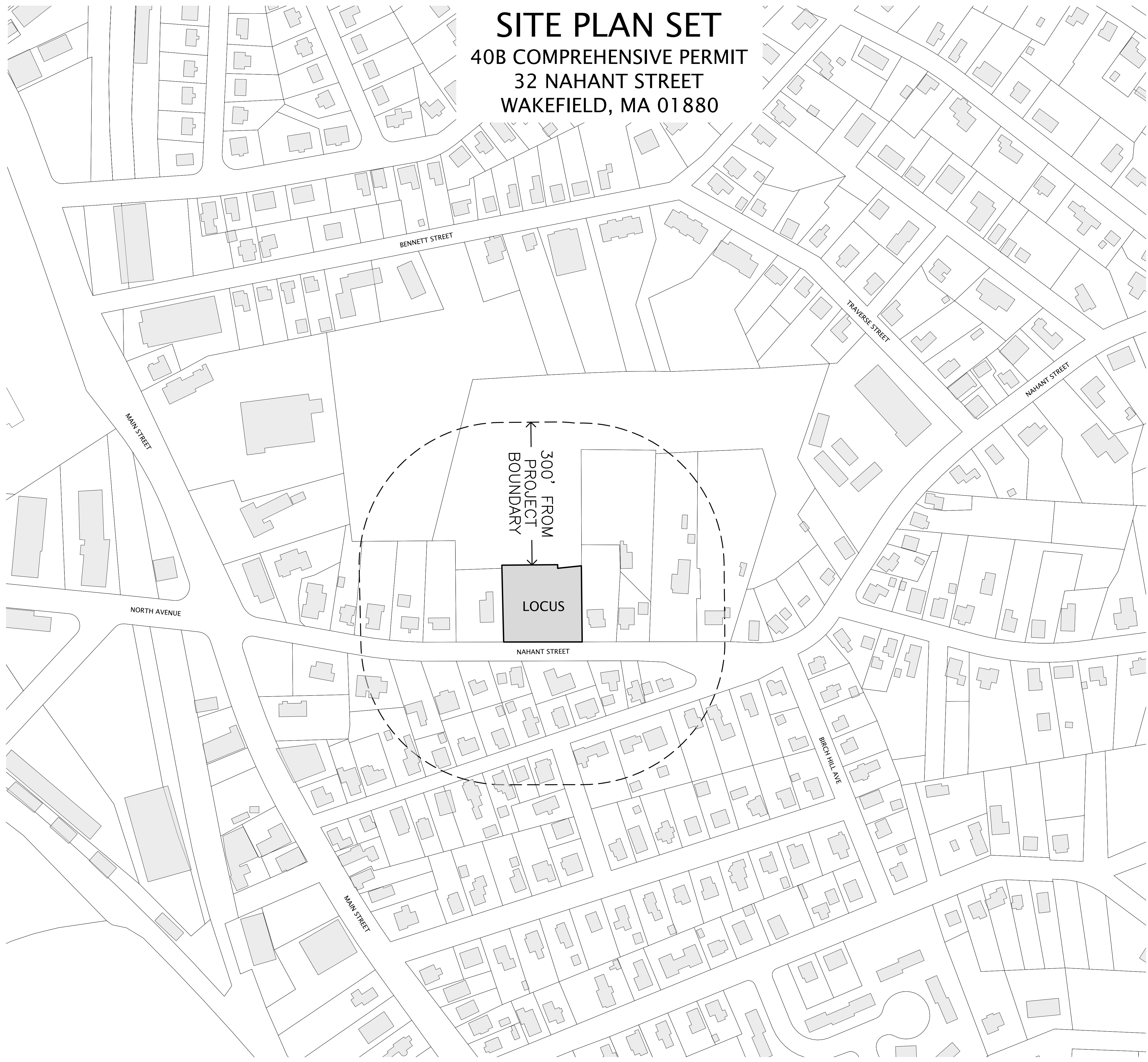
LOCUS PARCEL #1  
32-32A NAHANT STREET  
ASSESSORS ID: 19-162-01A  
DEED BOOK 79892 PAGE 311

LOCUS PARCEL #2  
36 NAHANT STREET  
ASSESSORS ID: 19-163-003  
DEED BOOK 80784 PAGE 434

PLAN REFERENCES:  
1. 1894 COUNTY LAYOUT OF NAHANT STREET  
2. PLAN 167 OF 1981  
3. PLAN 81 OF 2020  
4. PLAN 278 OF 2015

DEED AND PLAN REFERENCES ARE AS RECORDED AT THE MIDDLESEX REGISTRY OF DEEDS, SOUTHERN DISTRICT UNLESS OTHERWISE NOTED.

- PROJECT NOTES:**
- TOPOGRAPHIC INFORMATION SHOWN IS THE RESULT OF AN ACTUAL INSTRUMENT FIELD SURVEY CONDUCTED BY WILLIAMS & SPARAGES, LLC IN JANUARY 2022 AND MAY 2023.
  - VERTICAL DATUM REFERENCES THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND IS DERIVED FROM GPS OBSERVATION.
  - HORIZONTAL DATUM REFERENCES THE MASSACHUSETTS MAINLAND STATE PLANE COORDINATE SYSTEM.
  - PROPERTY IS LOCATED IN A ZONE X: AREA OF MINIMAL FLOOD HAZARD ABOVE THE 500-YEAR FLOOD LEVEL AS ILLUSTRATED ON THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL NO. 25017C0427E, EFFECTIVE DATE JUNE 4, 2010.
  - WETLANDS DELINEATED BY WILLIAMS & SPARAGES, LLC IN JANUARY 2022.
  - EXISTING UTILITIES SHOWN ARE THE RESULT OF AN ACTUAL INSTRUMENT SURVEY PERFORMED BY WILLIAMS & SPARAGES LLC. NO REPRESENTATION OR WARRANTY IS MADE REGARDING THE ACCURACY OF THE LOCATION OR PRESENCE OF SUBSURFACE UTILITIES AND THOSE UTILITIES SHOWN SHOULD BE CONSIDERED APPROXIMATE.
  - ALL UTILITIES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION AND SHALL NOTIFY THE OWNER'S REPRESENTATIVE IF EXISTING CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLAN THAT WILL PREVENT THE PROPOSED WORK FROM BEING COMPLETED AS INTENDED.
  - IF DURING CONSTRUCTION A CONFLICT SHOULD ARISE BETWEEN AN EXISTING UTILITY AND PROPOSED WORK THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE IN WRITING FOR RESOLUTION OF THE CONFLICT.
  - CONTRACTOR TO CALL DIGSAFE PRIOR TO CONSTRUCTION (411), TO UPDATE TICKET AND/OR VERIFY TICKET VALIDATION. DIGSAFE TICKET IS VALID 30 DAYS FROM THE DATE OF ISSUE. BEYOND THIS POINT, TICKETS ARE VALID INDEFINITELY, PROVIDED THAT 1) THE MARKS ARE MAINTAINED, AND 2) THE WORK IS CONTINUOUS.
  - THE PROPOSED WATER CONNECTION SIZE, TYPE & LOCATION ARE TO BE DESIGNED IN ACCORDANCE WITH 248 CMR 10.00: UNIFORM STATE PLUMBING CODE.
  - ALL PROPOSED DRAIN PIPES ARE TO BE HDPE OR APPROVED EQUIVALENT UNLESS OTHERWISE SPECIFIED.
  - THE INSTALLATION OF DRAINAGE STRUCTURES, ESPECIALLY THE HDPE PIPE AND UNDERGROUND DETENTION SYSTEM, SHALL ADHERE STRICTLY TO THE MANUFACTURERS INSTALLATION REQUIREMENTS TO MEET ASHSTO LOADING REQUIREMENTS.
  - WHEREVER FEASIBLE, SEWERS WILL BE LAID AT A MINIMUM OF 10 FEET, HORIZONTALLY, FROM ANY EXISTING OR PROPOSED WATER MAIN. SHOULD LOCAL CONDITIONS PREVENT A LATERAL SEPARATION OF 10 FEET TO A WATER MAIN THE SEWER MAIN WILL BE LAID IN A SEPARATE TRENCH AND THE ELEVATION OF THE CROWN OF THE SEWER PLACED AT LEAST 18 INCHES BELOW THE INVERT OF THE WATER MAIN. WHENEVER SEWERS MUST CROSS UNDER WATER MAINS, THE SEWER SHALL BE LAID AT SUCH AN ELEVATION THAT THE CROWN OF THE SEWER IS AT LEAST 18 INCHES BELOW THE WATER MAIN. WHEN IT IS IMPOSSIBLE TO OBTAIN HORIZONTAL OR VERTICAL SEPARATION AS STIPULATED ABOVE, BOTH THE WATER MAIN AND SEWER SHOULD BE ENCASED IN CONCRETE FOR 10 FEET EITHER SIDE OF THE CROSSING.
  - THE APPLICANT SHALL COORDINATE WITH THE WAKEFIELD DEPARTMENT OF PUBLIC WORKS WATER DIVISION TO ENSURE PROPER DOMESTIC AND FIRE FLOWS PRIOR TO BUILDING PERMIT.
  - PROPOSED CATCH BASINS TO BE FITTED WITH SILT SACK OR APPROVED EQUAL WHEN INSTALLED AND REMOVED AFTER FINAL PAVEMENT COURSE IS LAID.
  - ALL PROPOSED ELECTRICAL CONNECTIONS SHALL BE UNDERGROUND.



# SITE PLAN SET

## 40B COMPREHENSIVE PERMIT

### 32 NAHANT STREET

### WAKEFIELD, MA 01880



Owner / Applicant:  
32 Nahant Street, LLC  
9A Melvin Street  
Wakefield, MA 01880

Designed By: MEM  
Drawn By: MEM  
Reviewed By: CPS  
Project Manager: CPS  
Job File Number: WAKE-0081  
Drawing File Folder: WAKE-0081

Drawing Issued for Review  
 Drawing Issued for Permit  
 Drawing Issued for Construction

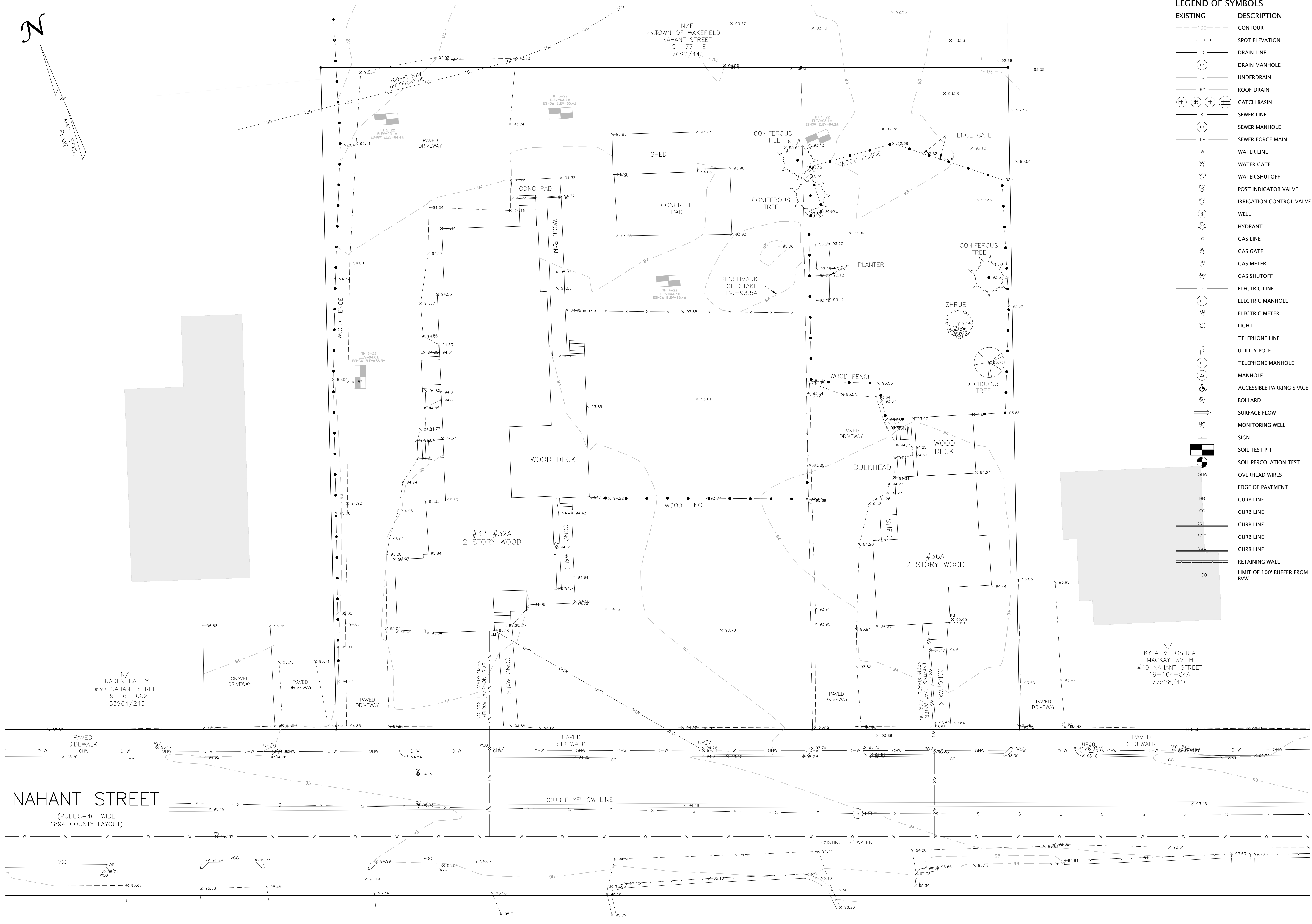
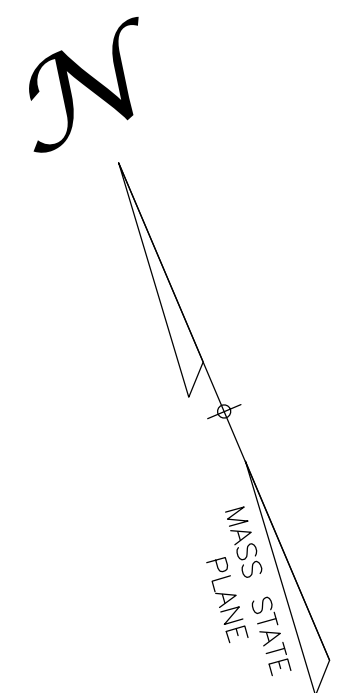
SEAL

**LOCATION PLAN**  
**NAHANT STREET APARTMENTS**  
32-32A & 36 NAHANT STREET, WAKEFIELD, MA

6	12
5	11
4	10
3	9
2	8
1	7

1 BUILDING UNITS AND LAYOUT 2-8-2024 7

DRAWING: C1.1  
SHEET 1 OF 10  
JANUARY 5, 2024



**LEGEND OF SYMBOLS**

EXISTING	DESCRIPTION
---	CONTOUR
x 100.00	SPOT ELEVATION
D	DRAIN LINE
⊙	DRAIN MANHOLE
U	UNDERDRAIN
RD	ROOF DRAIN
⊕	CATCH BASIN
S	SEWER LINE
⊖	SEWER MANHOLE
FM	SEWER FORCE MAIN
W	WATER LINE
WG	WATER GATE
WSO	WATER SHUTOFF
⊕	POST INDICATOR VALVE
⊕	IRRIGATION CONTROL VALVE
⊕	WELL
⊕	HYDRANT
G	GAS LINE
⊕	GAS GATE
⊕	GAS METER
⊕	GAS SHUTOFF
E	ELECTRIC LINE
⊕	ELECTRIC MANHOLE
⊕	ELECTRIC METER
⊕	LIGHT
T	TELEPHONE LINE
⊕	UTILITY POLE
⊕	TELEPHONE MANHOLE
⊕	MANHOLE
⊕	ACCESSIBLE PARKING SPACE
⊕	BOLLARD
→	SURFACE FLOW
⊕	MONITORING WELL
⊕	SIGN
⊕	SOIL TEST PIT
⊕	SOIL PERCOLATION TEST
OHW	OVERHEAD WIRES
---	EDGE OF PAVEMENT
BB	CURB LINE
CC	CURB LINE
CCB	CURB LINE
SGC	CURB LINE
VGC	CURB LINE
---	RETAINING WALL
---	LIMIT OF 100' BUFFER FROM BWV



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SEAL

**EXISTING CONDITION PLAN**  
**NAHANT STREET APARTMENTS**  
32-32A & 36 NAHANT STREET, WAKEFIELD, MA

6						
5						
4						
3						
2						
1	BUILDING UNITS AND LAYOUT	2-8-2024	7			

DRAWING: C2.1  
SHEET 2 OF 10

**NAHANT STREET**  
(PUBLIC-40' WIDE  
1894 COUNTY LAYOUT)

SCALE: 1" = 10'  
JANUARY 5, 2024

N/F  
KAREN BAILEY  
#30 NAHANT STREET  
19-161-002  
53964/245

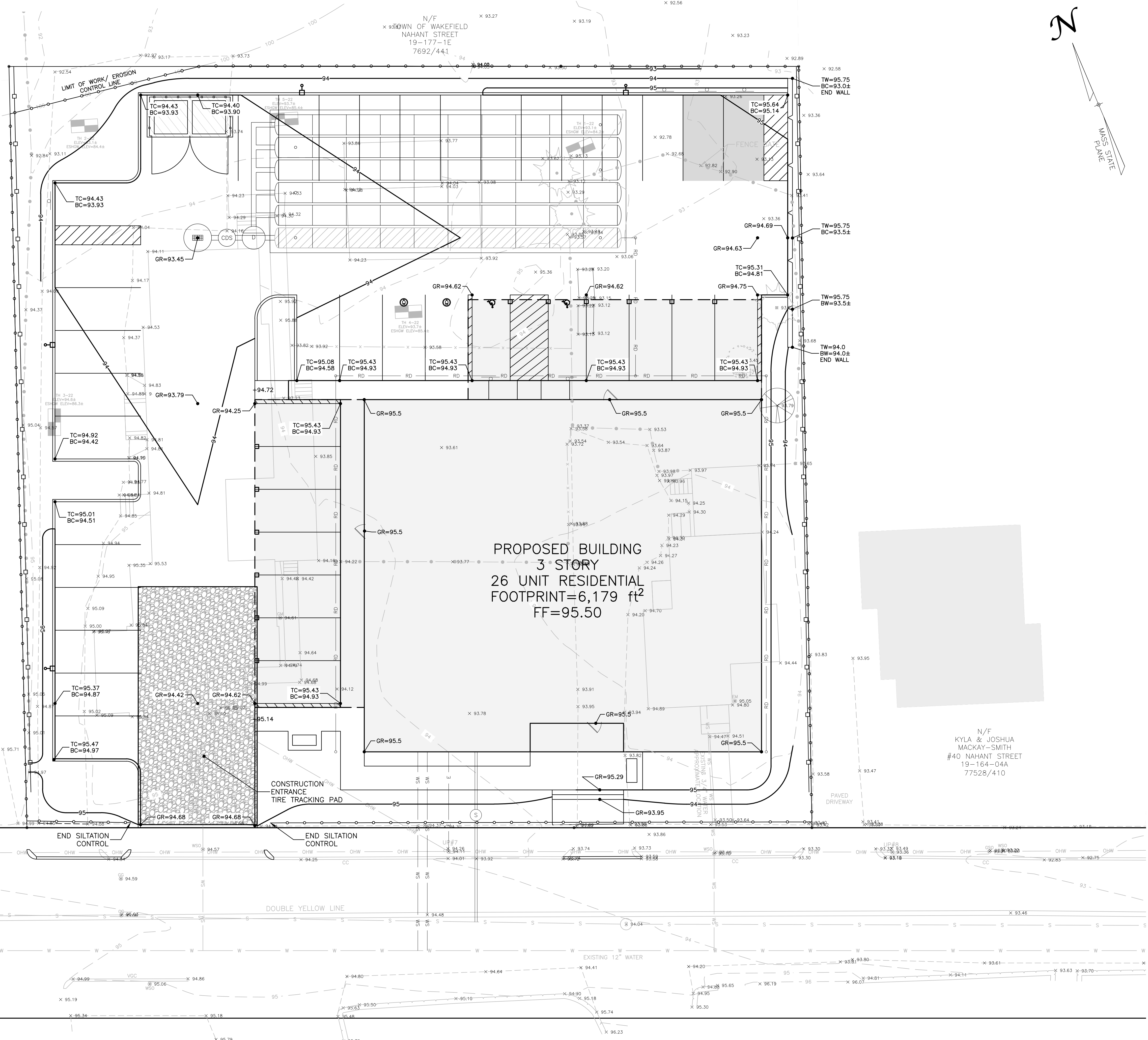
N/F  
KYLA & JOSHUA  
MACKAY-SMITH  
#40 NAHANT STREET  
19-164-04A  
77528/410

**LEGEND OF SYMBOLS**

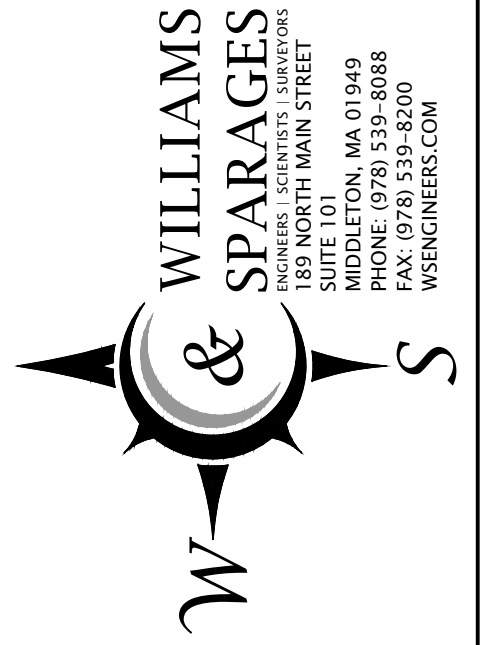
PROPOSED	DESCRIPTION
—+100.00—	CONTOUR
○	SPOT ELEVATION
—○—	DRAIN LINE
○	DRAIN MANHOLE
—U—	UNDERDRAIN
—RD—	ROOF DRAIN
⊕	CATCH BASIN
—S—	SEWER LINE
○	SEWER MANHOLE
—FM—	SEWER FORCE MAIN
—WS—	WATER SERVICE
—WG—	WATER GATE
—WSD—	WATER SHUTOFF
—PIV—	POST INDICATOR VALVE
—ICV—	IRRIGATION CONTROL VALVE
—W—	WELL
—H—	HYDRANT
—G—	GAS LINE
—G—	GAS GATE
—G—	GAS METER
—G—	GAS SHUTOFF
—E—	ELECTRIC LINE
—E—	ELECTRIC MANHOLE
—E—	ELECTRIC METER
—L—	LIGHT
—T—	TELEPHONE LINE
—T—	UTILITY POLE
—T—	TELEPHONE MANHOLE
—M—	MANHOLE
—M—	ACCESSIBLE PARKING SPACE
—M—	BOLLARD
→	SURFACE FLOW
—M—	MONITORING WELL
—S—	SIGN
—	EDGE OF PAVEMENT
—	CURB LINE
—	RETAINING WALL
—	RIP RAP
—	STONE WALL
—	TREELINE
—	SILTATION CONTROL
—LOW—	LIMIT OF WORK

**LEGEND OF ABBREVIATIONS**

ABBREVIATION	DESCRIPTION
TF	TOP OF FOUNDATION GRADE
CF	CELLAR FLOOR GRADE
GF	GARAGE FLOOR GRADE
FF	FIRST FLOOR GRADE
TC	TOP OF CURB GRADE
BC	BOTTOM OF CURB GRADE
TW	TOP OF WALL GRADE
BW	BOTTOM OF WALL GRADE
FG	FINISHED GRADE
AC	AIR CONDITIONING UNIT
CONC	CONCRETE
CLF	CHAIN LINK FENCE
BVW	BORDERING VEGETATED WETLAND
WCR	WHEEL CHAIR RAMP
UP	UTILITY POLE
CC	CONCRETE CURB
SGC	SLOPED GRANITE CURB
VGC	VERTICAL GRANITE CURB
CCB	CAPE COD BERM
BB	BITUMINOUS BERM
EP	EDGE OF PAVEMENT
CB	CATCH BASIN
DMH	DRAIN MANHOLE
SMH	SEWER MANHOLE
TMH	TELEPHONE MANHOLE
EMH	ELECTRIC MANHOLE
CMP	CORRUGATED METAL PIPE
RCP	REINFORCED CONCRETE PIPE
HDPE	HIGH DENSITY POLYETHYLENE
DI	DUCTILE IRON
CLDI	CEMENT LINED DUCTILE IRON
DICL	DUCTILE IRON CEMENT LINED
PVC	POLYVINYL CHLORIDE
AC	ASBESTOS CEMENT
CI	CAST IRON



**NAHANT STREET**  
(PUBLIC-40' WIDE  
1894 COUNTY LAYOUT)



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Wakefield, MA 01880

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Project Manager: CPS  
Job File Number: WAKE-0081  
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SEAL

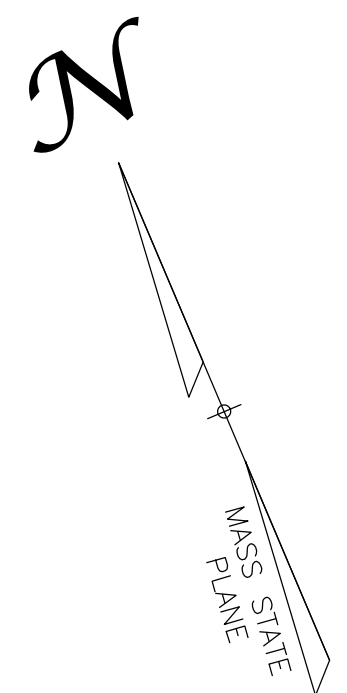
NO.	DATE	REVISION
6		
5		
4		
3		
2		
1		

BUILDING UNITS AND LAYOUT 2-8-2024 7

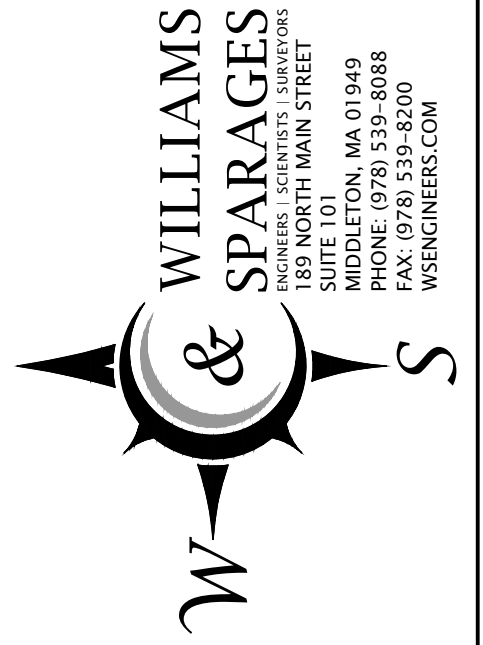
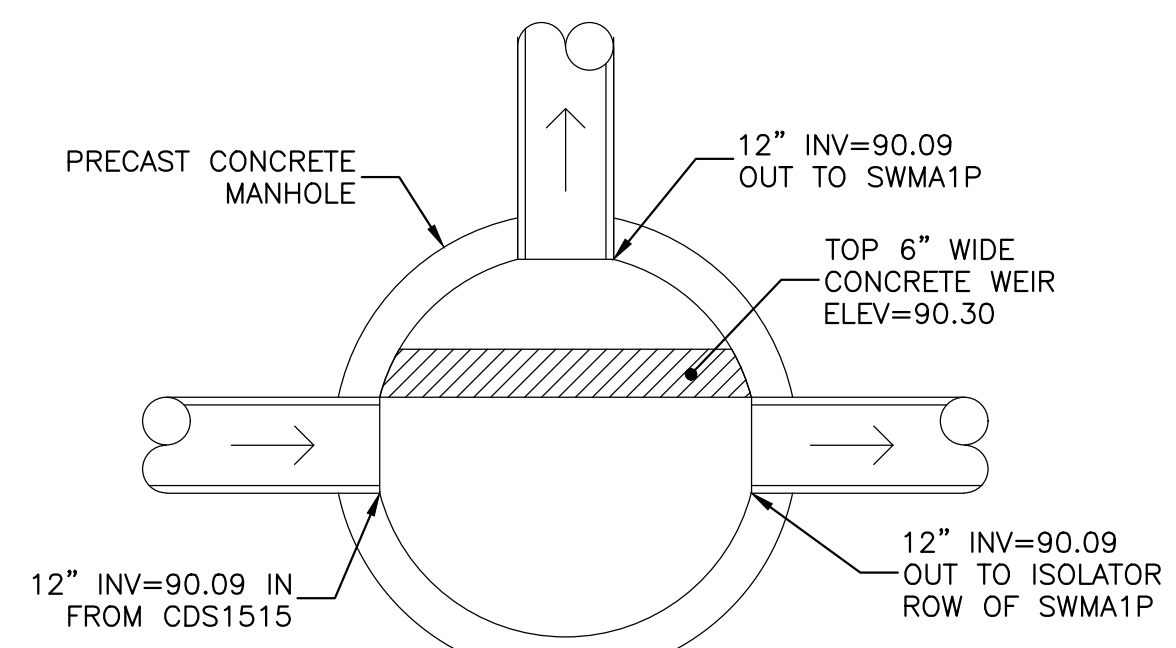
**GRADING & DRAINAGE PLAN**  
**NAHANT STREET APARTMENTS**  
32-32A & 36 NAHANT STREET, WAKEFIELD, MA

SCALE: 1" = 10'  
JANUARY 5, 2024

DRAWING: C3.1  
SHEET 3 OF 10



N/F  
TOWN OF WAKEFIELD  
NAHANT STREET  
19-177-1E  
7692/441



Owner/ Applicant:  
32 Nahant Street, LLC  
9A Melvin Street  
Wakefield, MA 01880

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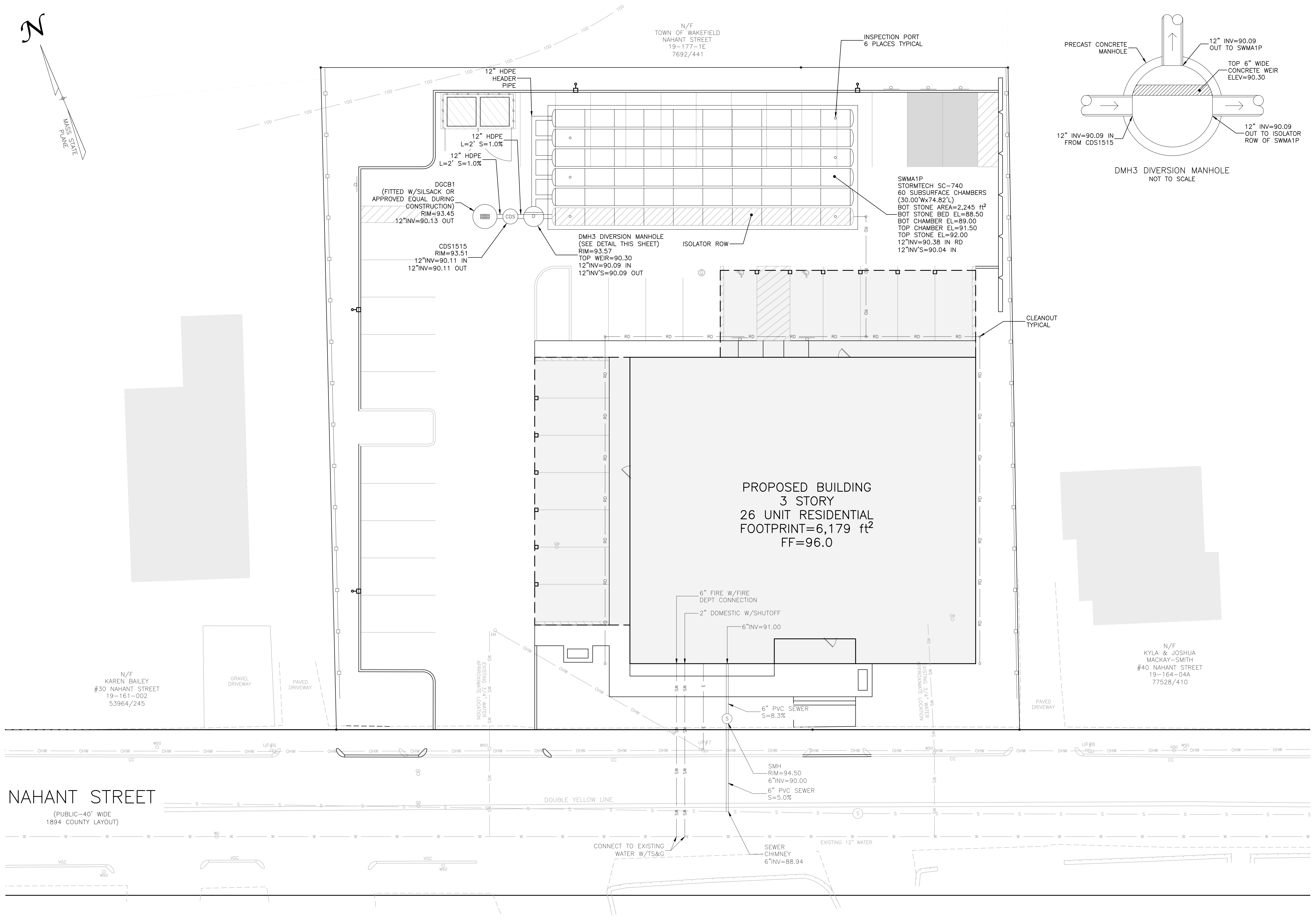
SEAL

UTILITY PLAN  
NAHANT STREET APARTMENTS  
32-32A & 36 NAHANT STREET, WAKEFIELD, MA

6	12
5	11
4	10
3	9
2	8
1	7

SCALE: 1" = 10'  
JANUARY 5, 2024

DRAWING: C4.1  
SHEET 4 OF 10



NAHANT STREET  
(PUBLIC-40' WIDE  
1894 COUNTY LAYOUT)

N/F  
KAREN BAILEY  
#30 NAHANT STREET  
19-161-002  
53964/245

N/F  
KYLA & JOSHUA  
MACKAY-SMITH  
#40 NAHANT STREET  
19-164-04A  
77528/410

PROPOSED BUILDING  
3 STORY  
26 UNIT RESIDENTIAL  
FOOTPRINT=6,179 ft<sup>2</sup>  
FF=96.0

CONNECT TO EXISTING  
WATER W/TS&G  
SEWER  
CHIMNEY  
6" INV=88.94

SMH  
RIM=94.50  
6" INV=90.00  
6" PVC SEWER  
S=5.0%

6" PVC SEWER  
S=8.3%

6" FIRE W/FIRE  
DEPT CONNECTION  
2" DOMESTIC W/SHUTOFF  
6" INV=91.00

DGCB1  
(FITTED W/SILSACK OR  
APPROVED EQUAL DURING  
CONSTRUCTION)  
RIM=93.45  
12" INV=90.13 OUT

CDS1515  
RIM=93.51  
12" INV=90.11 IN  
12" INV=90.11 OUT

DMH3 DIVERSION MANHOLE  
(SEE DETAIL THIS SHEET)  
RIM=93.57  
TOP WEIR=90.30  
12" INV=90.09 IN  
12" INV=90.09 OUT

SWMA1P  
STORMTECH SC-740  
60 SUBSURFACE CHAMBERS  
(30.00' Wx74.82' L)  
BOT STONE AREA=2,245 ft<sup>2</sup>  
BOT STONE BED EL=88.50  
BOT CHAMBER EL=89.00  
TOP CHAMBER EL=91.50  
TOP STONE EL=92.00  
12" INV=90.38 IN RD  
12" INV=90.04 IN

CLEANOUT  
TYPICAL

INSPECTION PORT  
6 PLACES TYPICAL

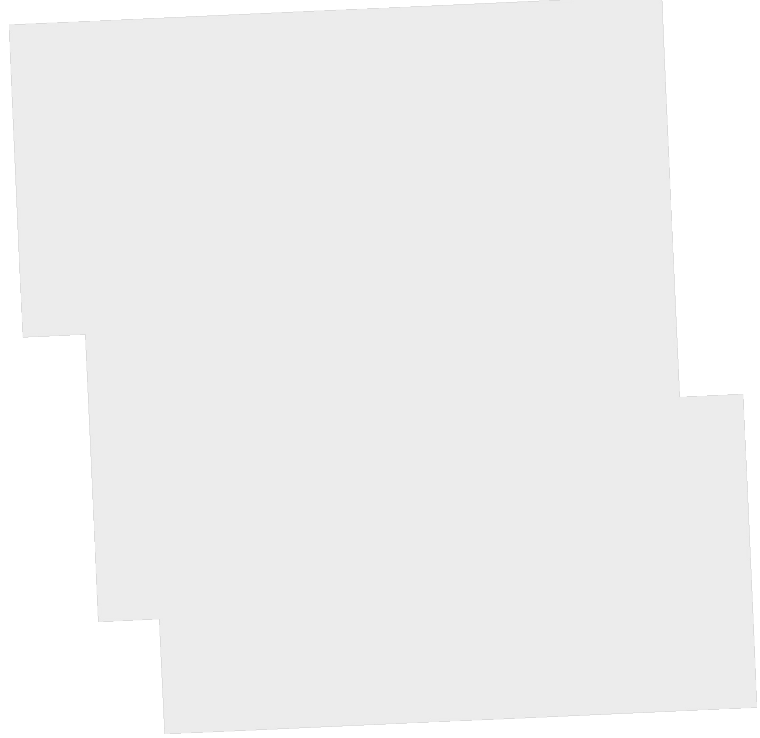
ISOLATOR ROW

GRAVEL DRIVEWAY

PAVED DRIVEWAY



PAVED DRIVEWAY



EXISTING 3/4" WATER  
APPROXIMATE LOCATION

EXISTING 12" WATER  
APPROXIMATE LOCATION

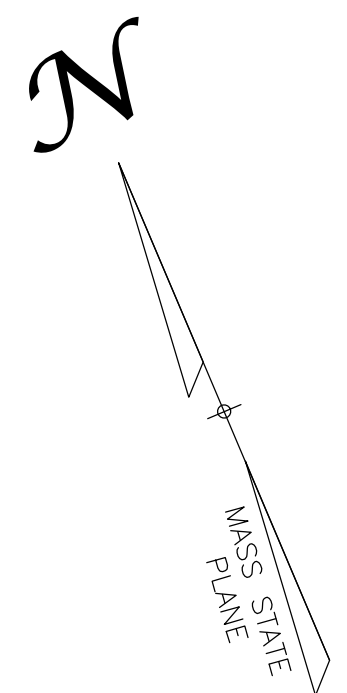
DOUBLE YELLOW LINE

VGC

VGC

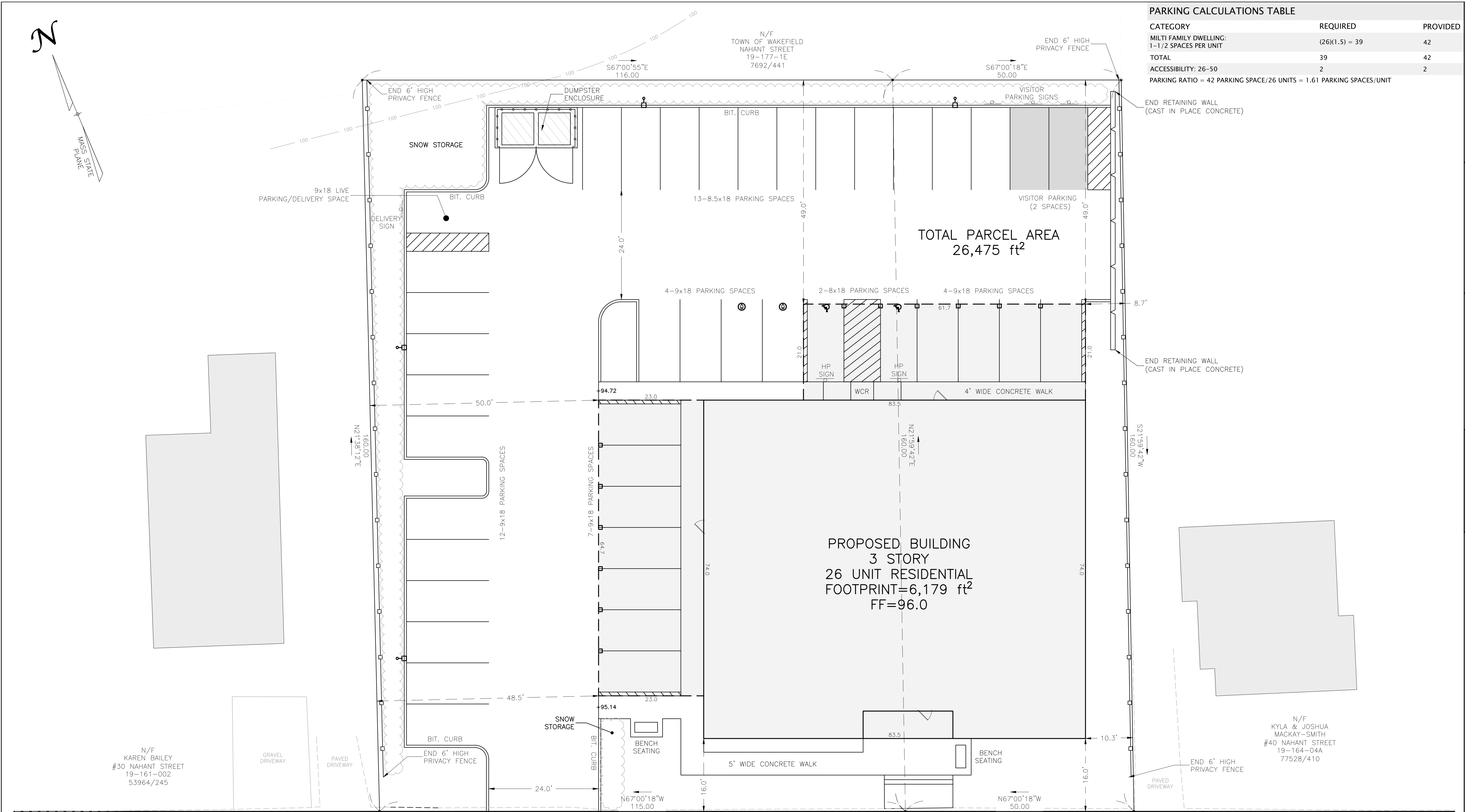
VGC

EXISTING 12" WATER



**PARKING CALCULATIONS TABLE**

CATEGORY	REQUIRED	PROVIDED
MULTI FAMILY DWELLING: 1-1/2 SPACES PER UNIT	(26)(1.5) = 39	42
<b>TOTAL</b>	<b>39</b>	<b>42</b>
ACCESSIBILITY: 26-50	2	2
PARKING RATIO = 42 PARKING SPACE/26 UNITS = 1.61 PARKING SPACES/UNIT		



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SEAL

**LAYOUT PLAN**  
**NAHANT STREET APARTMENTS**  
32-32A & 36 NAHANT STREET, WAKEFIELD, MA

6	12
5	11
4	10
3	9
2	8
1	7

2-8-2024

SCALE: 1" = 10'  
JANUARY 5, 2024

DRAWING: C5.1  
SHEET 5 OF 10

**PLANT SCHEDULE**

ABBREVIATION	QUANTITY	BOTANICAL NAME	COMMON NAME	PLANTING SIZE	NOTES	SYMBOL
BFP		PYRUS CALLERYANNA 'NEW BRADFORD'	NEW BRADFORD FLOWERING PEAR	3" CAL	B&B, 6' CLEAR BRANCHING	
ORM		ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE	3" CAL	B&B, 6' CLEAR BRANCHING	
POK		QUERCUS PALUSTRIS	PIN OAK	3" CAL	B&B, 6' CLEAR BRANCHING	
SOK		QUERCUS COCCINEA	SCARLET OAK	3" CAL	B&B, 6' CLEAR BRANCHING	
BTO		NYSSA SYLVATICA	BLACK TUPELO	3" CAL	B&B, 6' CLEAR BRANCHING	
SMP		ACER SACCHARUM	SUGAR MAPLE	3" CAL	B&B, 6' CLEAR BRANCHING	
ROK		QUERCUS RUBRA	RED OAK	3" CAL	B&B, 6' CLEAR BRANCHING	
AEM		ULMUS AMERICANA	AMERICAN ELM	3" CAL	B&B, 6' CLEAR BRANCHING	

ORNAMENTAL TREES						
ABBREVIATION	QUANTITY	BOTANICAL NAME	COMMON NAME	PLANTING SIZE	NOTES	SYMBOL
RBC		BETULA NIGRA	RIVER BIRCH	10'-12' TALL	B&B, MULTI STEM	
SBY		AMELANCHIER X GRANDIFLORA	SERVICEBERRY	8'-10' TALL	B&B, MULTI STEM	
ERB		CERCIS CANADENSIS	EASTERN REDBUD	8'-10' TALL	B&B, SINGLE/MULTI STEM	
ABC		FAGUS GRANDIFOLIA	AMERICAN BEECH	8'-10' TALL	B&B, SPECIMEN	
CCH		PRUNUS VIRGINIANA	CHOKO CHERRY	8'-10' TALL	B&B, SPECIMEN	

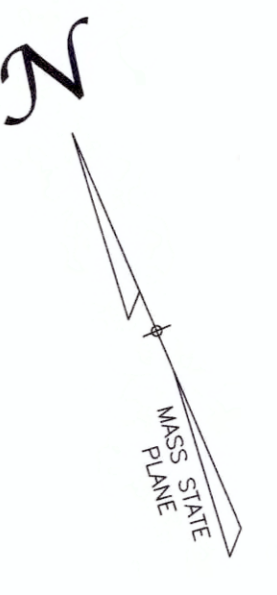
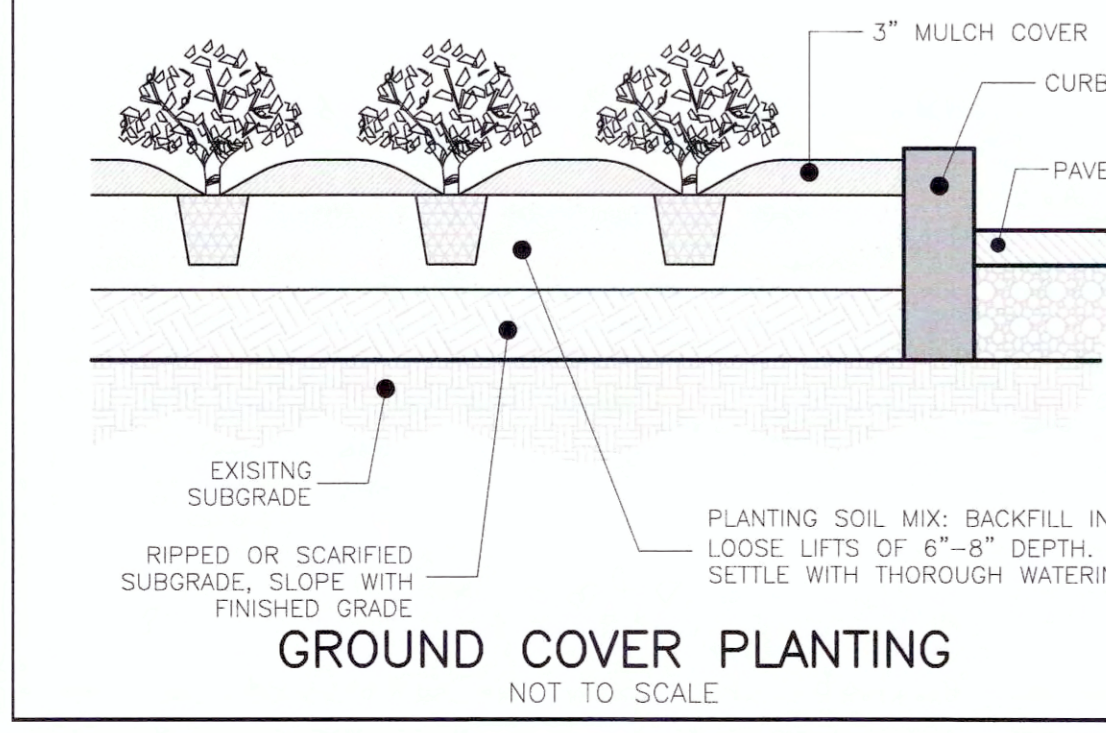
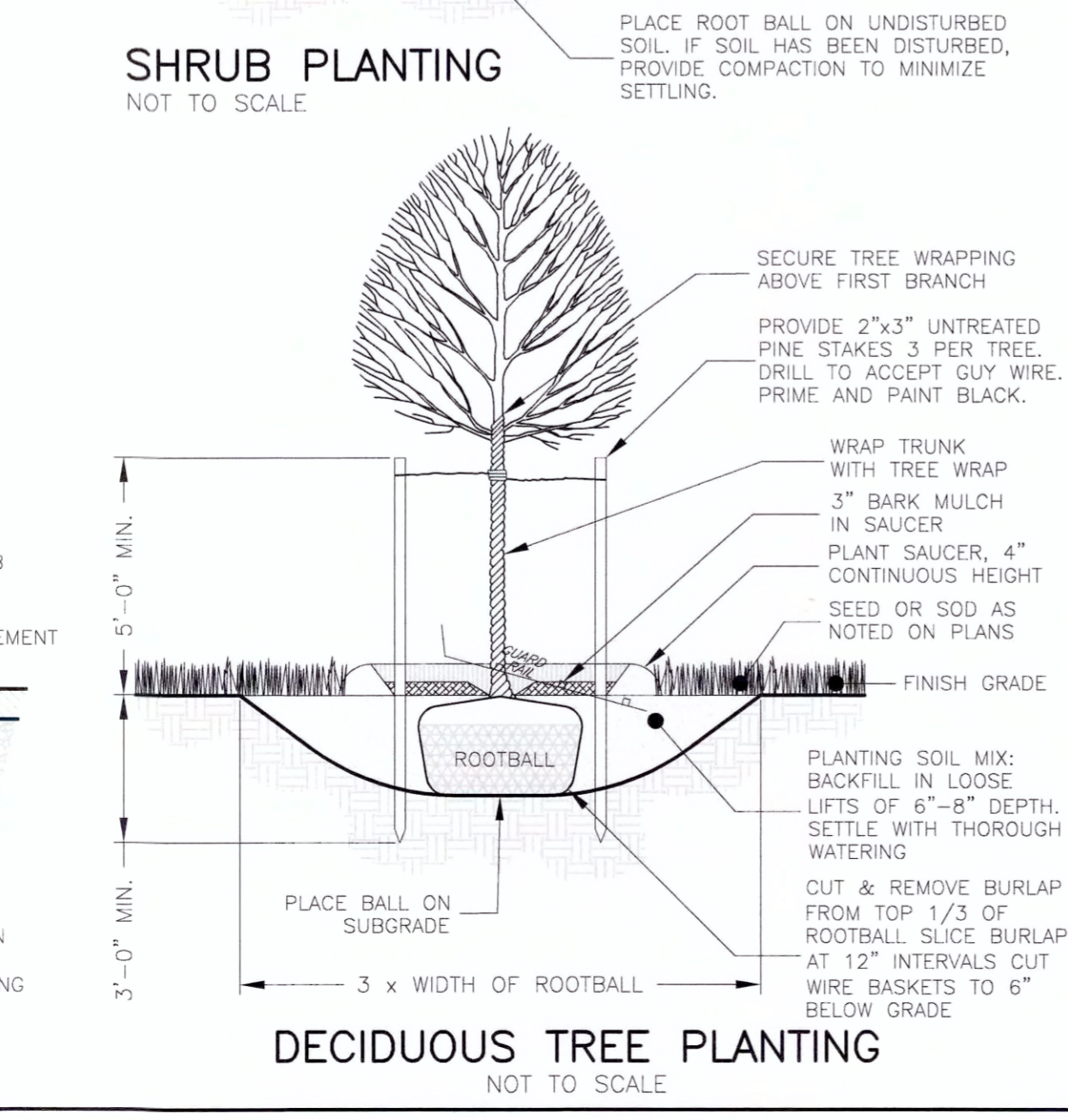
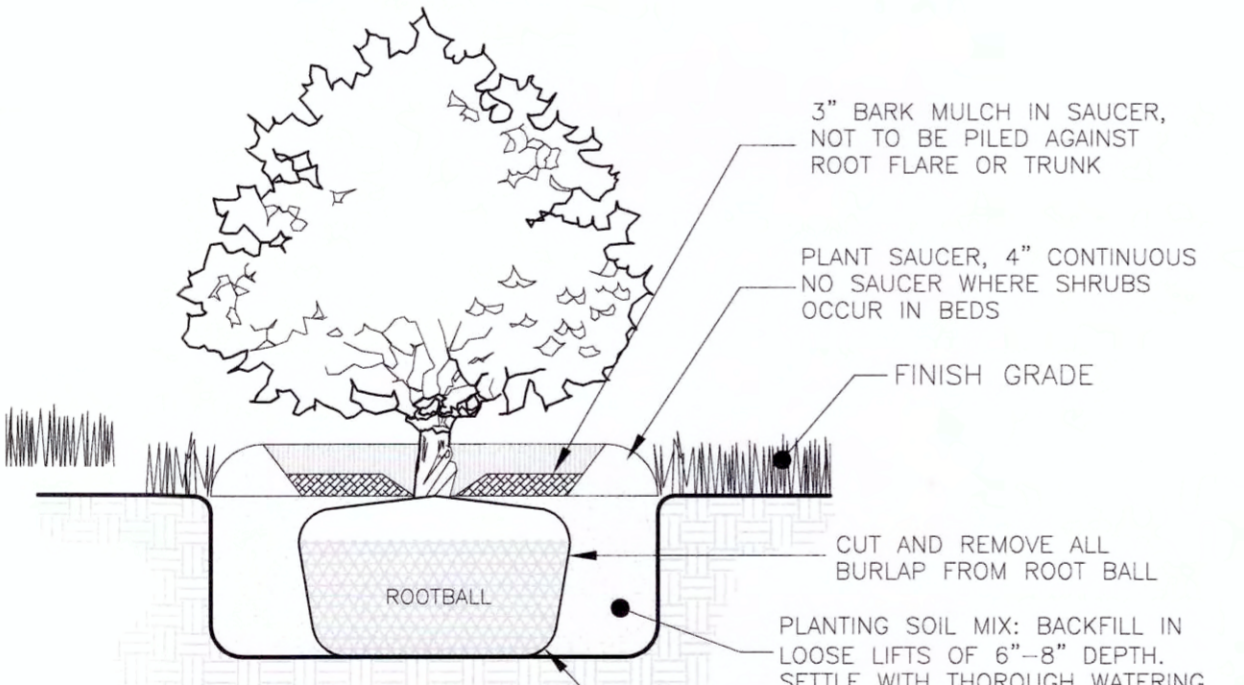
EVERGREEN TREES						
ABBREVIATION	QUANTITY	BOTANICAL NAME	COMMON NAME	PLANTING SIZE	NOTES	SYMBOL
WFR		ABIES CONCOLOR	WHITE FIR	12'-14' TALL		
GGA		THUJA STANDISHII X PLICATA	GREEN GIANT ARBORVITAE	12'-14' TALL		
BFR		ALBIES BALSAMEA	BALSAM FIR	10'-12' TALL		
SSP		PICEA RUBENS	RED SPRUCE	10'-12' TALL		

SHRUBS						
ABBREVIATION	QUANTITY	BOTANICAL NAME	COMMON NAME	PLANTING SIZE	NOTES	SYMBOL
RTD	TBD	CORNUS SERICEA 'ARTIC FIRE'	RED TWIG DOGWOOD	3.5' TALL	B&B, PLANT 36" O.C.	
INX	TBD	ILEX GLABRA	INKBERRY	3' TALL	B&B, PLANT 36" O.C.	
NBB	TBD	MORELLA PENNSYLVANICA	NORTHERN BAYBERRY	3.5' TALL	B&B, PLANT 36" O.C.	
GLS	TBD	RHUS AROMATICA	GRO-LOW SUMAC	3 GALLON	B&B, PLANT 36" O.C.	
WHD	TBD	HYDRANGEA ARBORESCENS	WILD HYDRANGEA	3' TALL	B&B, PLANT 36" O.C.	
WBY	TBD	ILEX VERTICILLATA	WINTERBERRY	3' TALL	B&B, PLANT 36" O.C.	
BBY	TBD	BERBERIS	BARBERRY	3' TALL	B&B, PLANT 36" O.C.	
CYW	TBD	TAXUS CANADENSIS	CANADA YEW	5 GALLON	B&B, PLANT 36" O.C.	

PERENNIALS						
ABBREVIATION	QUANTITY	BOTANICAL NAME	COMMON NAME	PLANTING SIZE	NOTES	SYMBOL
PCF	TBD	ECHINACEA MOENCH	PURPLE CONEFLOWER	1 GALLON	PLANT 18" O.C.	
VHM	TBD	RUDBECKIA HIRTA	BLACK-EYED SUSAN	1 GALLON	PLANT 18" O.C.	
BSB	TBD	ARTEMISIA TRIDENTATA	BIG SAGEBRUSH	1 GALLON	PLANT 18" O.C.	

ORNAMENTAL GRASS						
ABBREVIATION	QUANTITY	BOTANICAL NAME	COMMON NAME	PLANTING SIZE	NOTES	SYMBOL
SGR	TBD	PANICUM VIRGATUM 'SHENANDOAH'	SWITCH GRASS	2 GALLON	PLANT 36" O.C.	
LBS	TBD	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	2 GALLON	PLANT 36" O.C.	

- PLANTING NOTES**
- DURING CONSTRUCTION CONTRACTOR SHALL PROTECT AND SAVE ALL VEGETATION BEYOND THE LIMIT OF GRADING ACTIVITIES.
  - ALL PROPOSED PLANTINGS SHALL BE ADJUSTED TO ACCOMMODATE UNDERGROUND UTILITIES.
  - ALL PLANTING METHODS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN ASSOCIATION OF NURSERYMEN.
  - IN THE EVENT OF DISCREPANCIES BETWEEN THE QUANTITIES OF PLANTS IN THE PLANT LIST AND THE DRAWINGS, THE DEPICTION OF THE PLANTS ON THE DRAWINGS SHALL GOVERN.
  - ALL TREES AND SHRUBS SHALL BE NURSERY GROWN WITHIN A U.S.D.A. PLANT HARDINESS ZONE WHICH IS THE SAME AS, OR COLDER THAN, THE ZONE IN WHICH THE PROJECT IS LOCATED.
  - ALL PLANTS 3' OR GREATER IN HEIGHT OR SPREAD TO BE BALLED AND BURLAPED.
  - ALL LOAM AREAS FOR PLANT BEDS SHALL BE UNIFORM IN COMPOSITION AND FREE FROM SUBSOIL, STONES LARGER THAN 1" AND NOXIOUS MATERIALS.
  - ALL PLANT SHALL BE WATERED IMMEDIATELY AFTER PLANTING.
  - ALL DISTURBED AREAS SHALL BE STABILIZED WITH LOAM AND SEED AND/OR BARK MULCH. BEGINNING AND ENDING POINTS OF GRASS AND MULCH TO BE DETERMINED IN FIELD WITH OWNER AUTHORIZATION.
  - POSITIVE DRAINAGE SHALL BE MAINTAINED AWAY FROM AND AROUND BUILDING PER BUILDING CODE.
  - ALL WORK TO COMPLY COMPREHENSIVE PERMIT ISSUED FOR PROJECT. SEE CONDITIONS PRIOR TO LANDSCAPE WORK.
  - ALL PLANT MATERIAL SHALL BE GUARANTEED FOR ONE FULL YEAR AFTER INSTALLATION.
  - NO PLANTING PRIOR TO OWNER APPROVAL OF FINISHED GRADE.
  - CONTRACTOR SHALL REMOVE DEAD TREES AND SCRUB BRUSH. EXISTING TREES TO REMAIN SHALL ALSO BE PRUNED WITH THE ADVICE OF A LANDSCAPE CONTRACTOR TO REMOVE DEAD LIMBS TO IMPROVE THE HEALTH OF THE REMAINING TREES.
  - ALL LOAM AND SEED AREAS TO BE SEEDED WITH A TURF GRASS SEED MIX.
  - AREA NEAR PROJECT SIGN SHALL BE CLEARED TO IMPROVE SIGHT LINE AT ENTRANCE.



Owner / Applicant:  
32 Nahant Street, LLC  
9A Melvin Street  
Wakefield, MA 01880

Designed By: MEM  
Drawn By: MEM  
Reviewed By: CPS  
Project Manager: CPS  
Job File Number: WAKE-0081  
Drawing File Folder: WAKE81

Drawing Issued for Review  
 Drawing Issued for Permit  
 Drawing Issued for Construction

SEAL

**LANDSCAPE PLAN**  
**NAHANT STREET APARTMENTS**  
32-32A & 36 NAHANT STREET, WAKEFIELD, MA

12	11	10	9	8	7
6	5	4	3	2	1

SCALE: 1" = 10'  
JANUARY 5, 2024

DRAWING: C6.1  
SHEET 6 OF 10

NOTE: TREE SHALL BEAR SAME RELATIONSHIP TO FINISHED GRADE AS IT DID TO NURSERY OR FIELD GRADE.

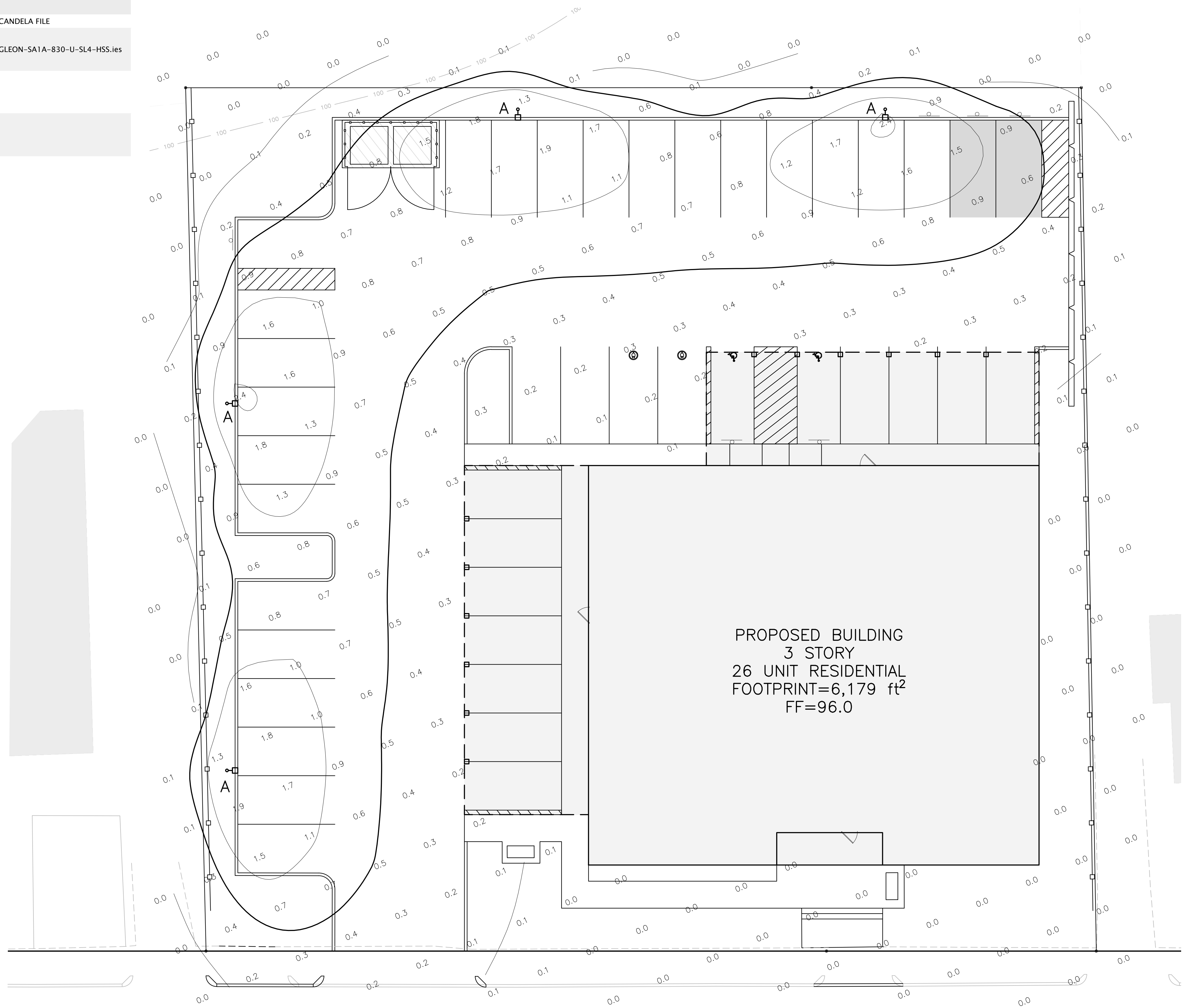
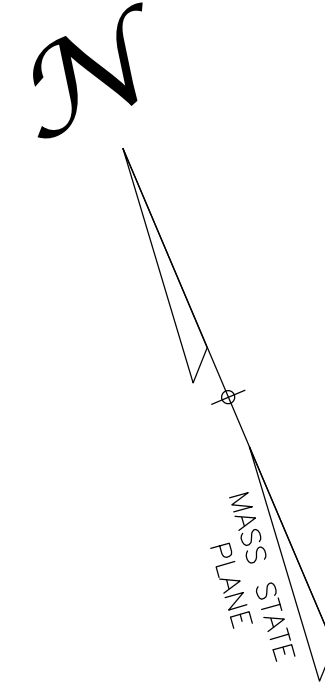
LUMINAIRE SCHEDULE								
SYMBOL	LABEL	QUANTITY	CATALOG NUMBER	DESCRIPTION	LAMP	TILT	LLF	CANDELA FILE
A		4	GALLEON LED GLEON-SA1A-830-U-SL4-HSS (FINISH & ELECTRICAL BY OTHERS)	TYPE IV WIDE OPTICS 80 CRI 15' MOUNTING HEIGHT (POLE MOUNTED)	3000K 3147 LUMENS PER LAMP	0°	0.9	GLEON-SA1A-830-U-SL4-HSS.ies

**PHOTOMETRIC SCHEDULE**

AVERAGE FOOTCANDLES	0.4
MAXIMUM FOOTCANDLES	2.0
MINIMUM FOOTCANDLES	0.0

**NOTES**

- SECURITY LIGHTING TO BE DETERMINED.
- ILLUMINANCE VALUES CREATED FROM MANUFACTURERS PHOTOMETRIC DATA.
- ILLUMINANCE VALUES SHOWN REPRESENT HORIZONTAL FOOTCANDLES AT GROUND LEVEL.
- FOOT CANDLE VALUES SHOWN DO NOT ACCOUNT FOR LIGHT REFLECTION, EXISTING LIGHT SOURCES, SLOPING GRADE OR EXISTING OR PROPOSED THREE DIMENSIONAL OBJECTS.



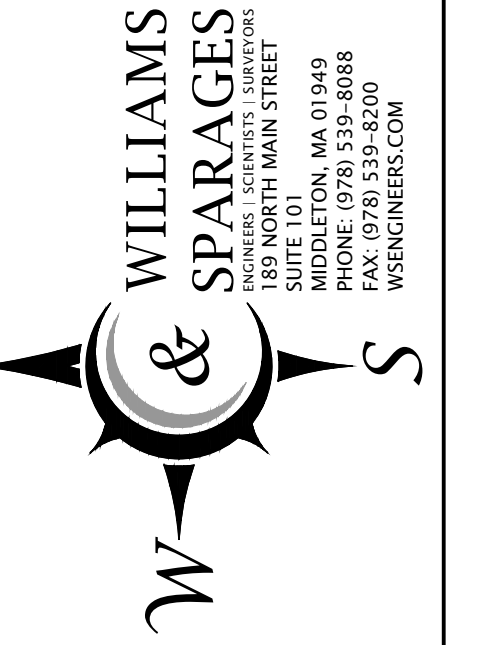
PROPOSED BUILDING  
3 STORY  
26 UNIT RESIDENTIAL  
FOOTPRINT=6,179 ft<sup>2</sup>  
FF=96.0

NAHANT STREET

(PUBLIC-40' WIDE  
1894 COUNTY LAYOUT)



GALLEON SERIES  
NOT TO SCALE



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Wakefield, MA 01880

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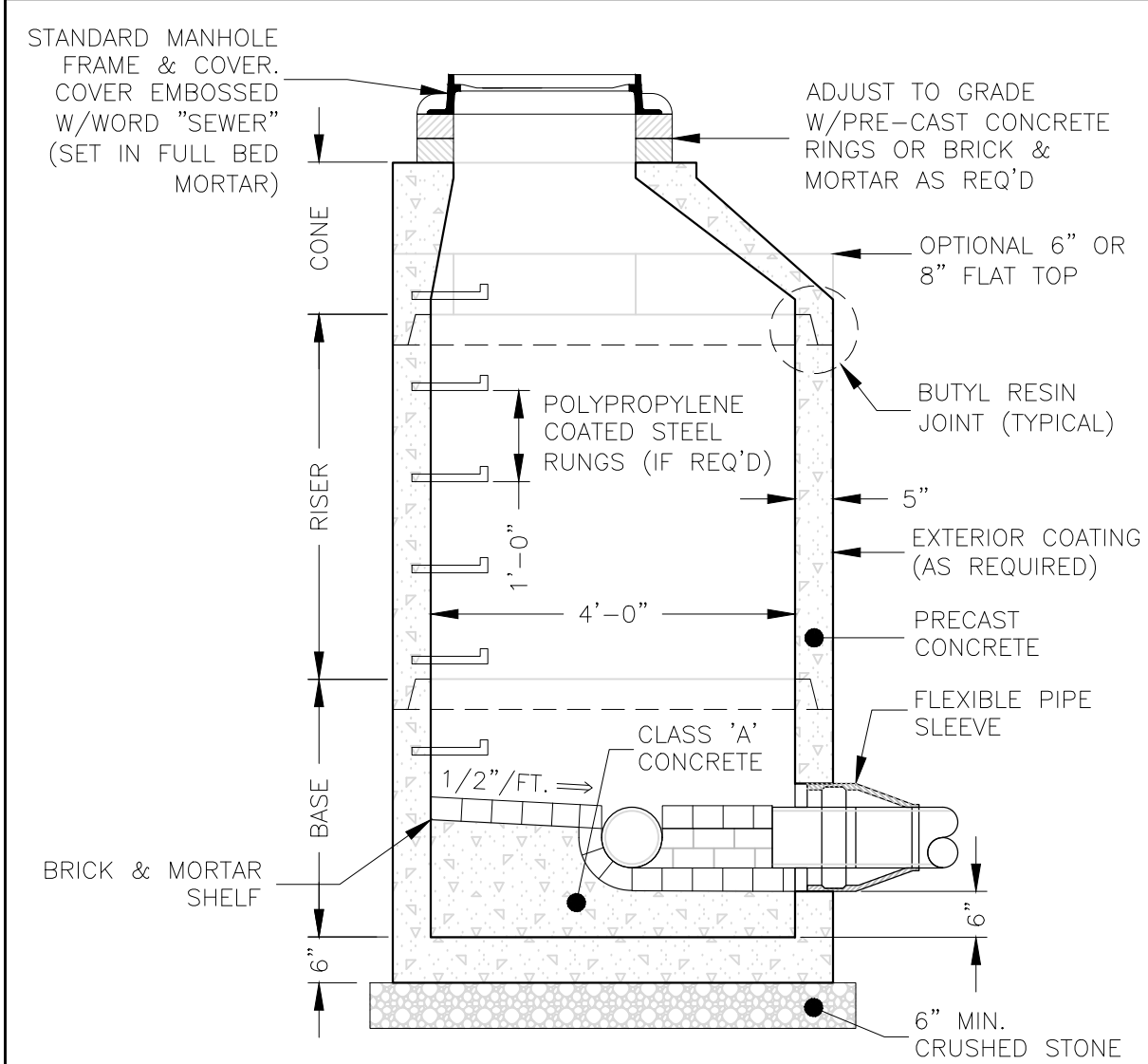
SEAL

PHOTOMETRIC PLAN  
NAHANT STREET APARTMENTS  
32-32A & 36 NAHANT STREET, WAKEFIELD, MA

NO.	DATE	DESCRIPTION
6		
5		
4		
3		
2		
1		BUILDING UNITS AND LAYOUT

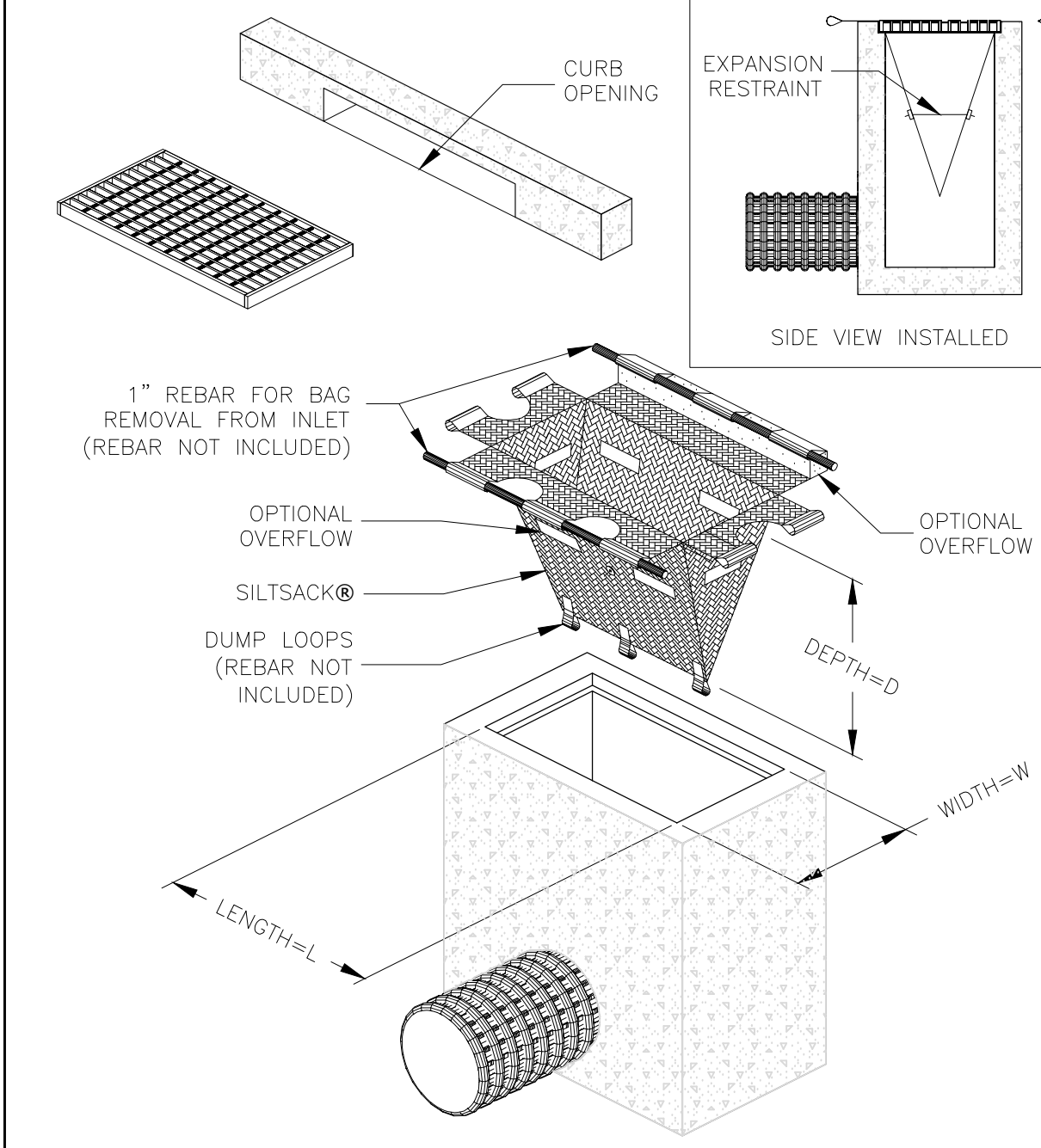
0' 5' 10' 20'  
SCALE: 1"=10'  
JANUARY 5, 2024

DRAWING: C7.1  
SHEET 7 OF 10

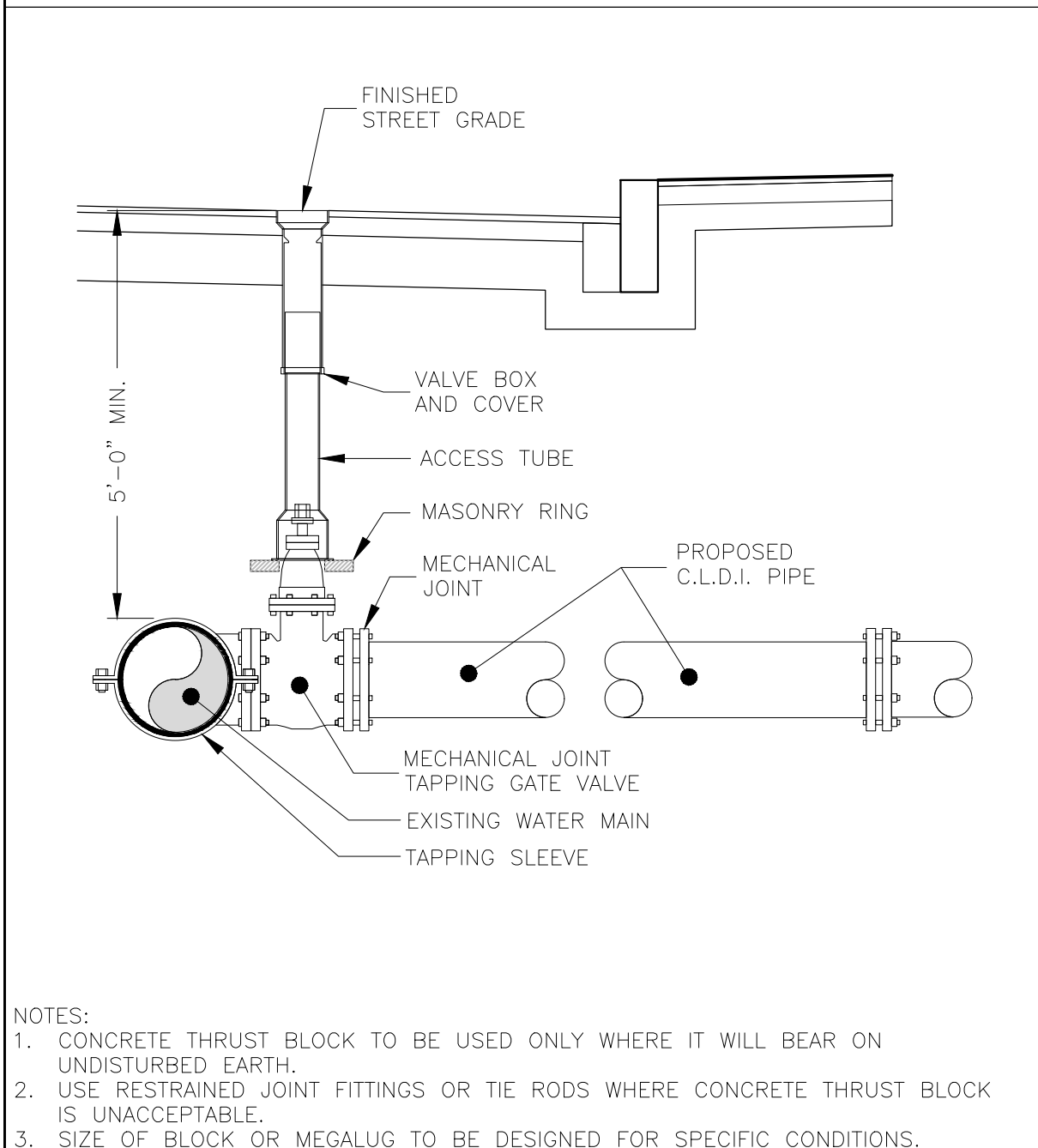


NOTES:  
 1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.  
 2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185 SPEC. 0.12 SQ. IN./LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.  
 3. H-20 DESIGN LOADING PER AASHTO HS-20-44; ASTM C478 SPEC FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."

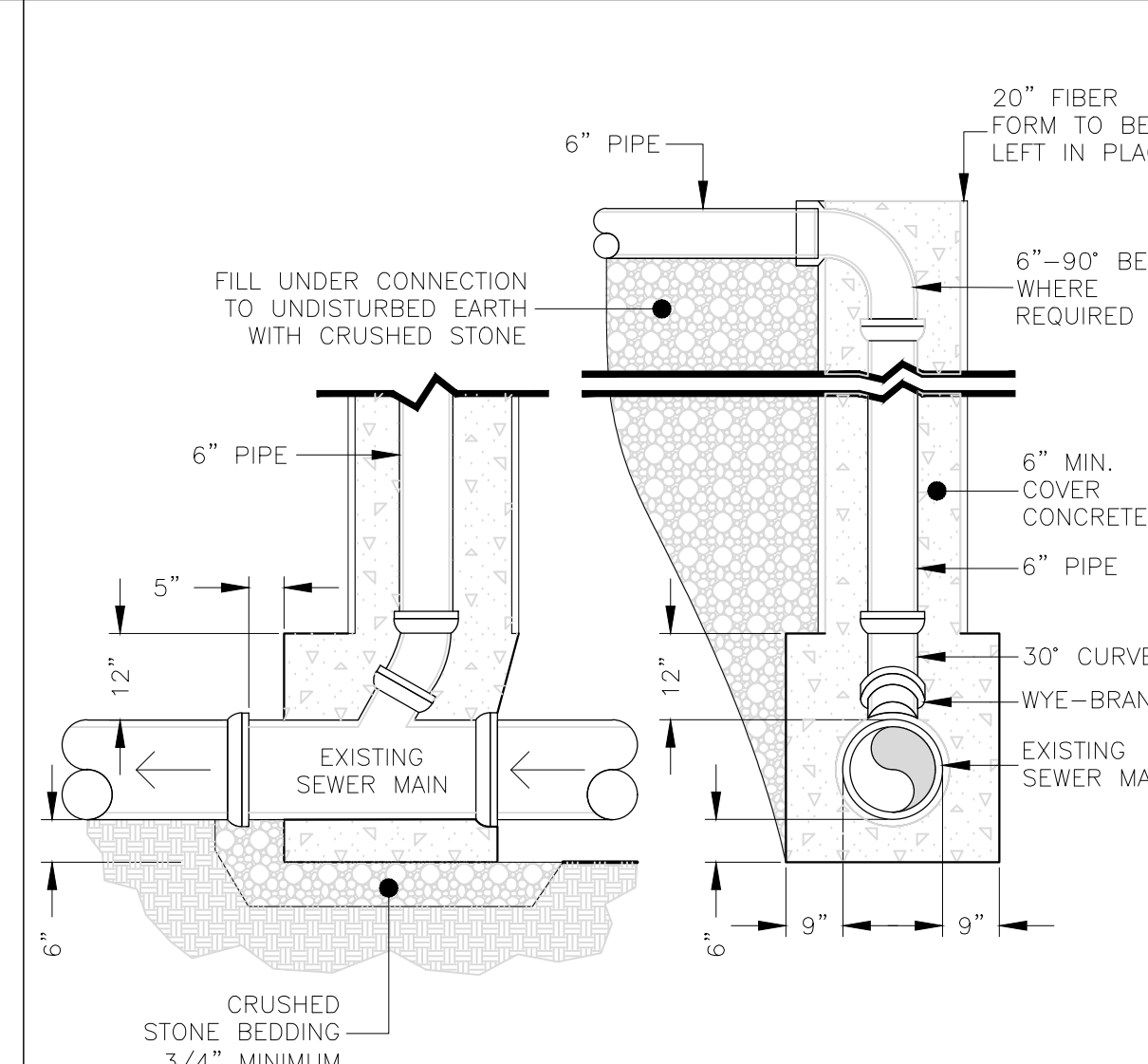
**PRE-CAST SEWER MANHOLE**  
NOT TO SCALE



**SILTSACK®**  
NOT TO SCALE

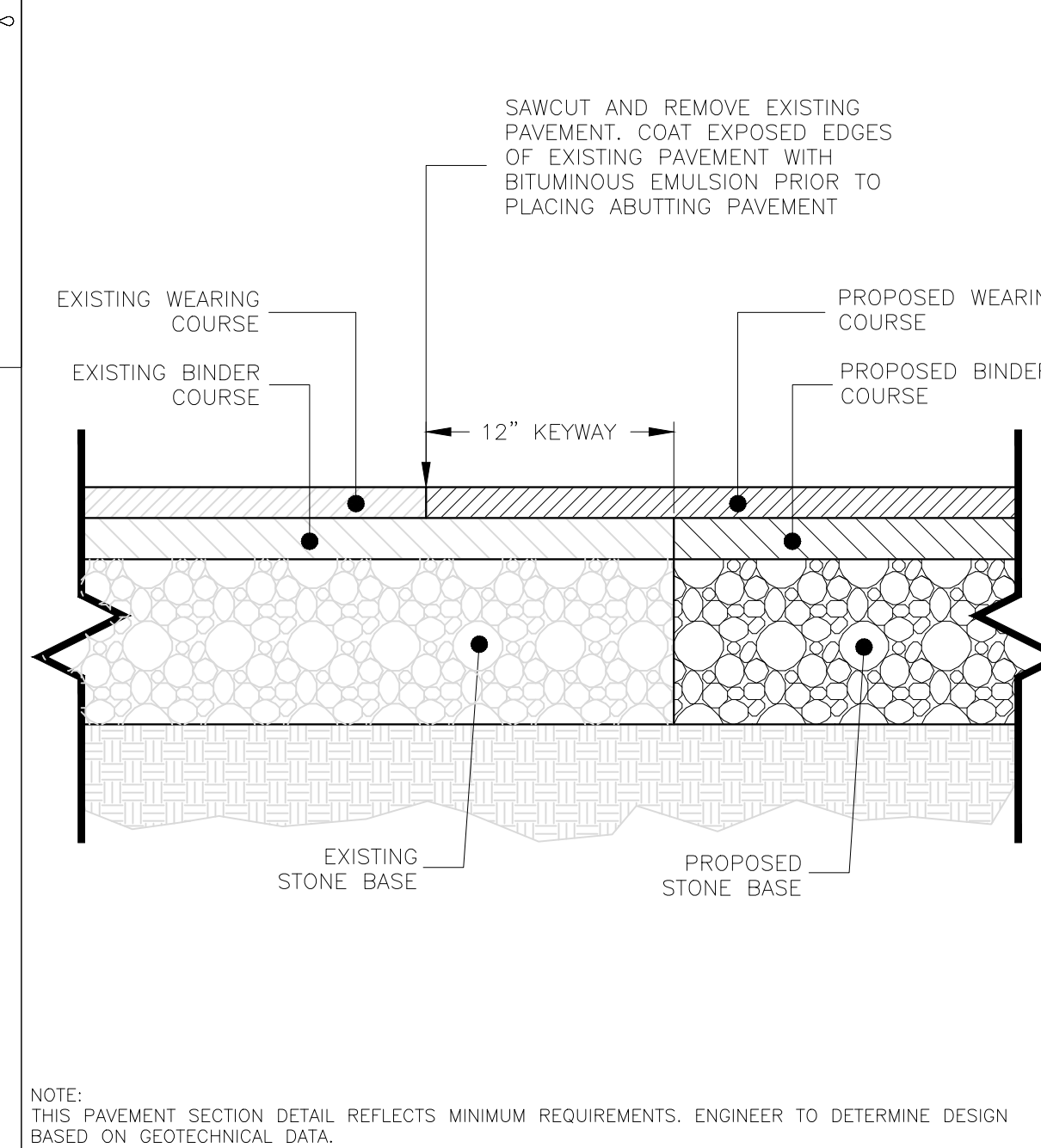


**TAPPING SLEEVE & GATE**  
NOT TO SCALE

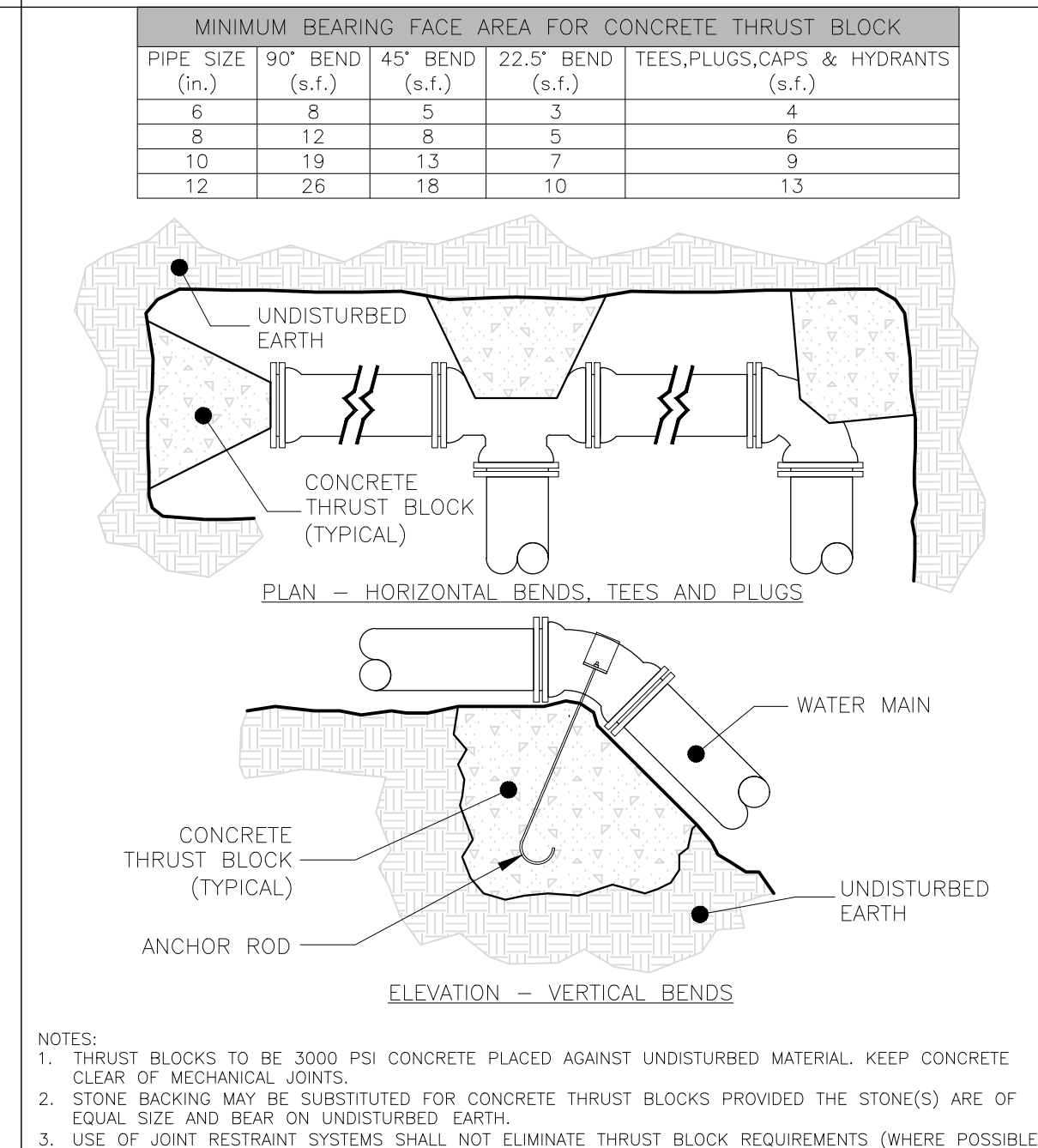


NOTES:  
 1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.  
 2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185 SPEC. 0.12 SQ. IN./LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.  
 3. H-20 DESIGN LOADING PER AASHTO HS-20-44; ASTM C478 SPEC FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."

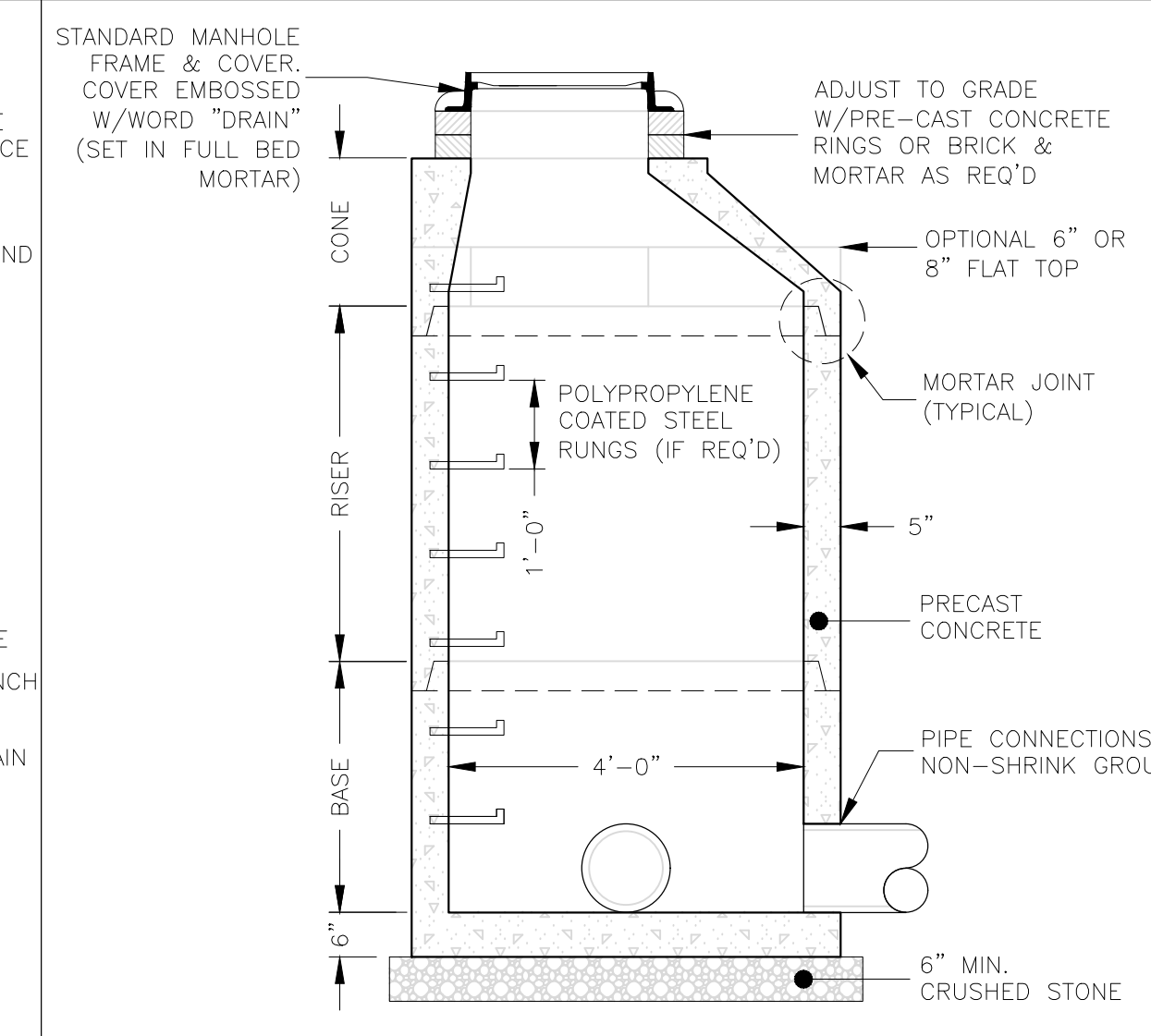
**SEWER CHIMNEY**  
NOT TO SCALE



**PAVEMENT KEYWAY**  
NOT TO SCALE

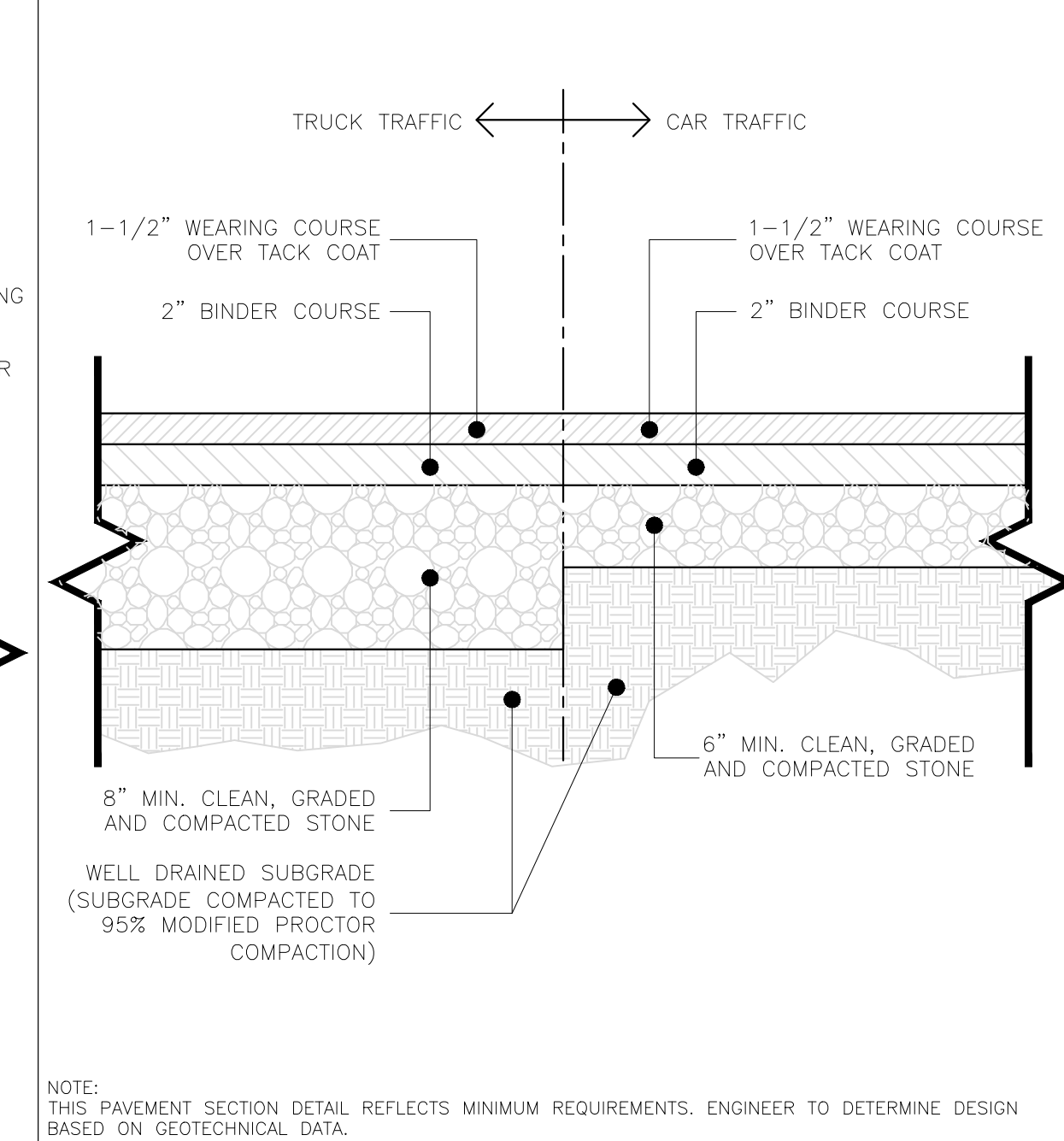


**THRUST BLOCK**  
NOT TO SCALE

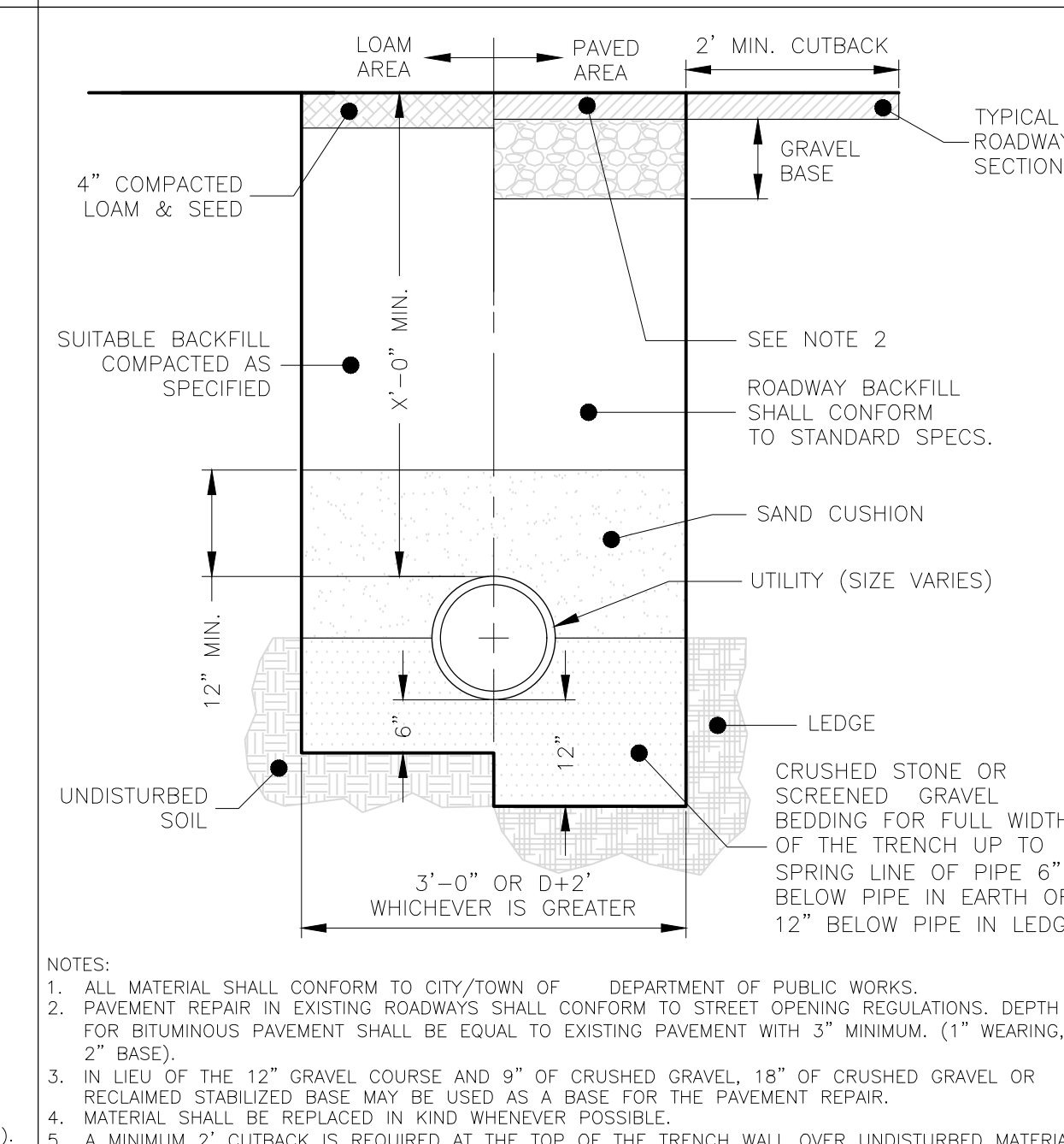


NOTES:  
 1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.  
 2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185 SPEC. 0.12 SQ. IN./LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.  
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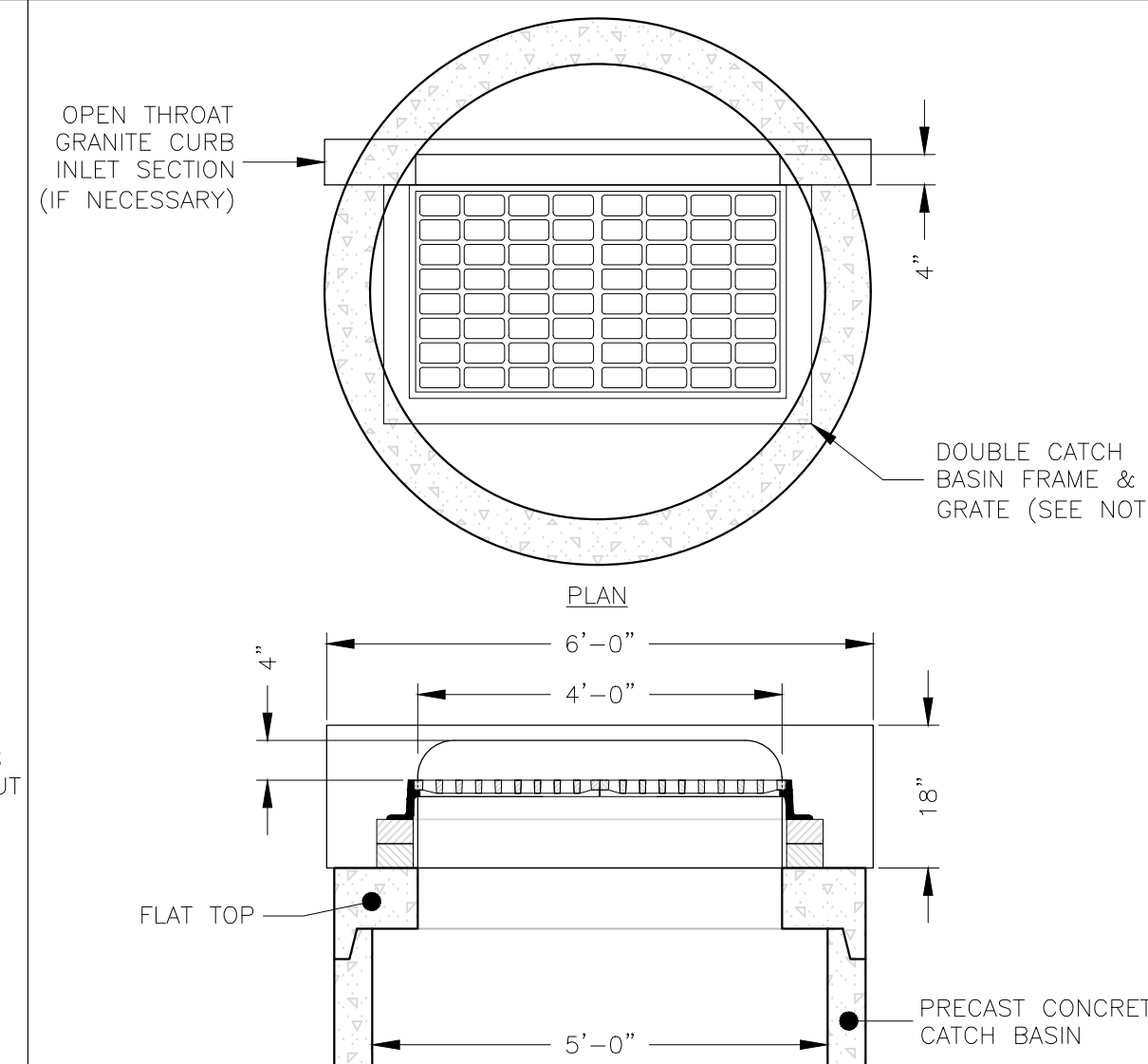
**PRECAST DRAIN MANHOLE**  
NOT TO SCALE



**PAVEMENT SECTION**  
NOT TO SCALE

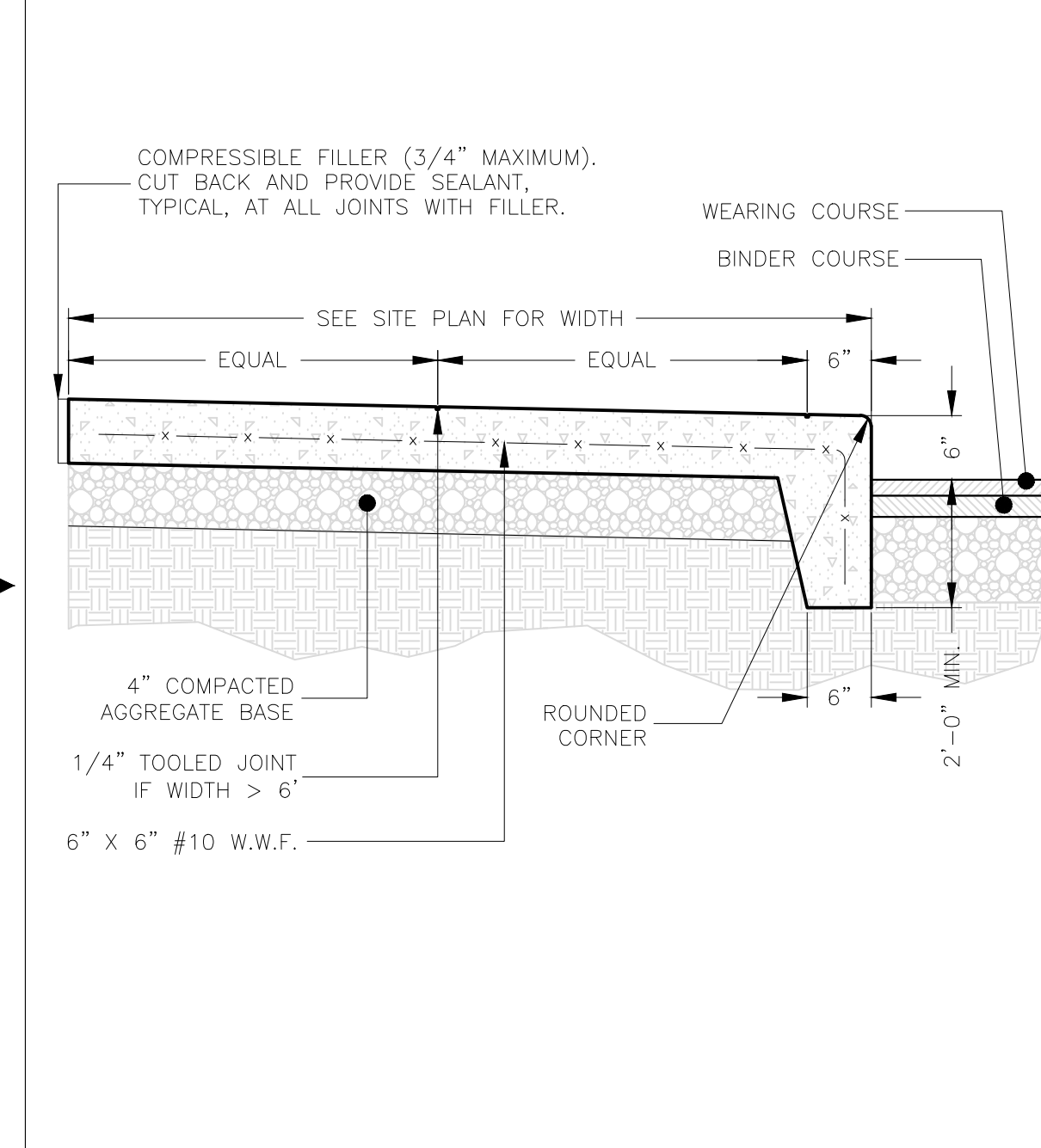


**UTILITY TRENCH**  
NOT TO SCALE

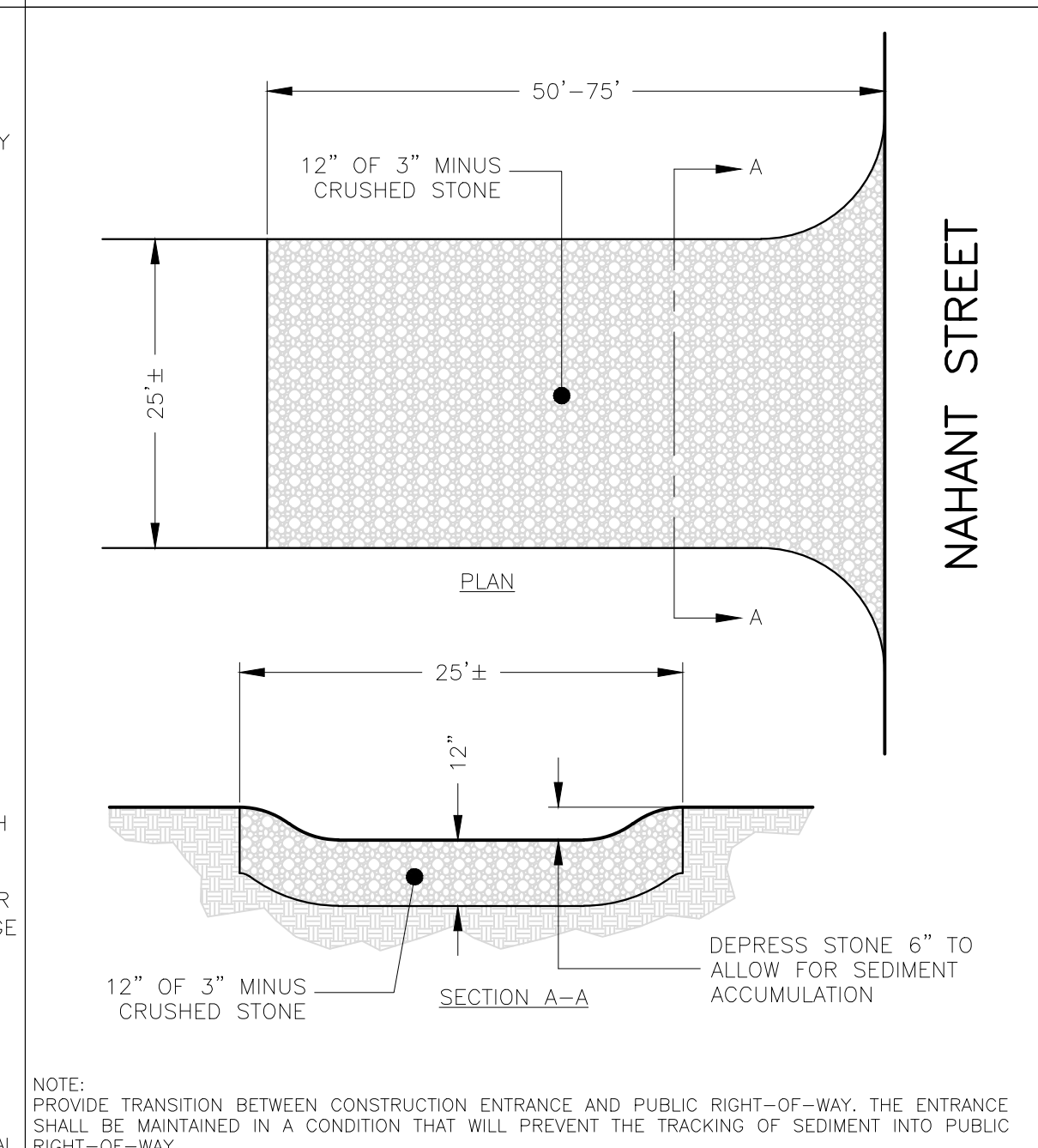


NOTES:  
 1. ON SLOPES USE LEBARON LV2448-2-000 FRAME W/LEBARON LK120D-300 3 FLANGE CASCADE GRATE OR APPROVED EQUAL.  
 2. AT LOW POINTS USE LEBARON LV2448-2-000 FRAME W/LEBARON LF248-2-000 3 FLANGE GRATE OR APPROVED EQUAL.

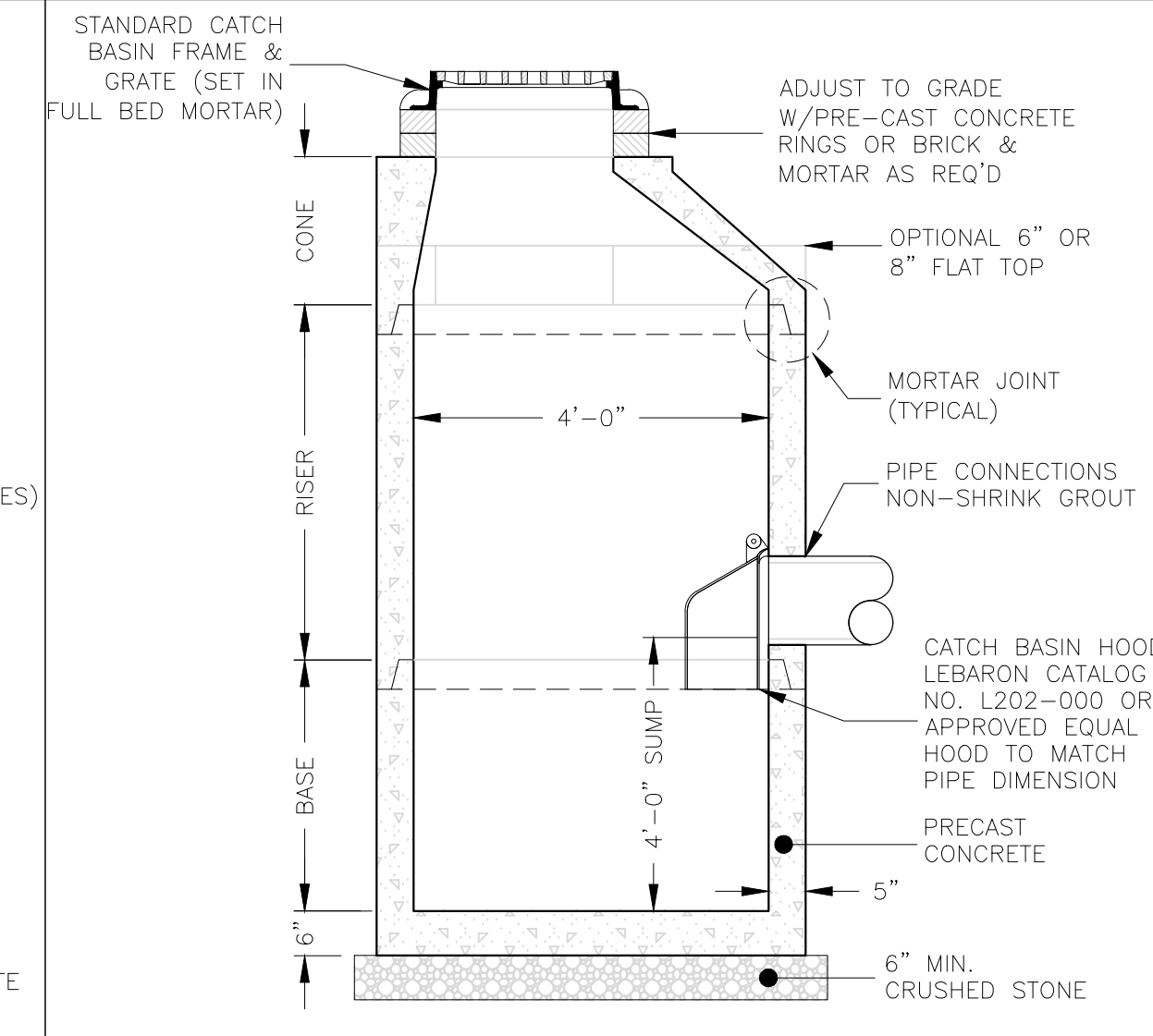
**DOUBLE CATCH BASIN FRAME & GRATE**  
NOT TO SCALE



**CONCRETE SIDEWALK (BUILDING PERIMETER)**  
NOT TO SCALE

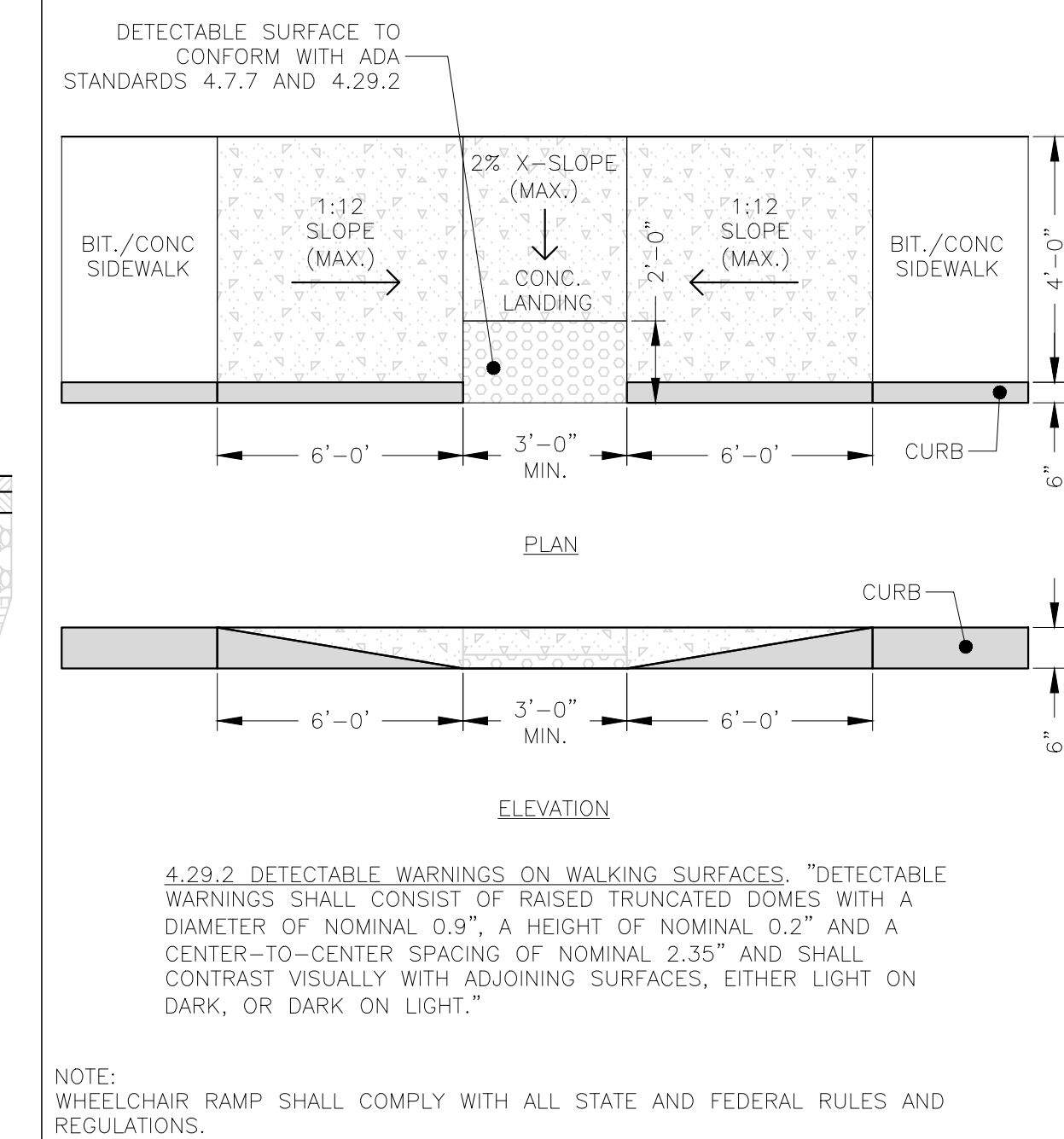


**TIRE TRACKING PAD**  
NOT TO SCALE

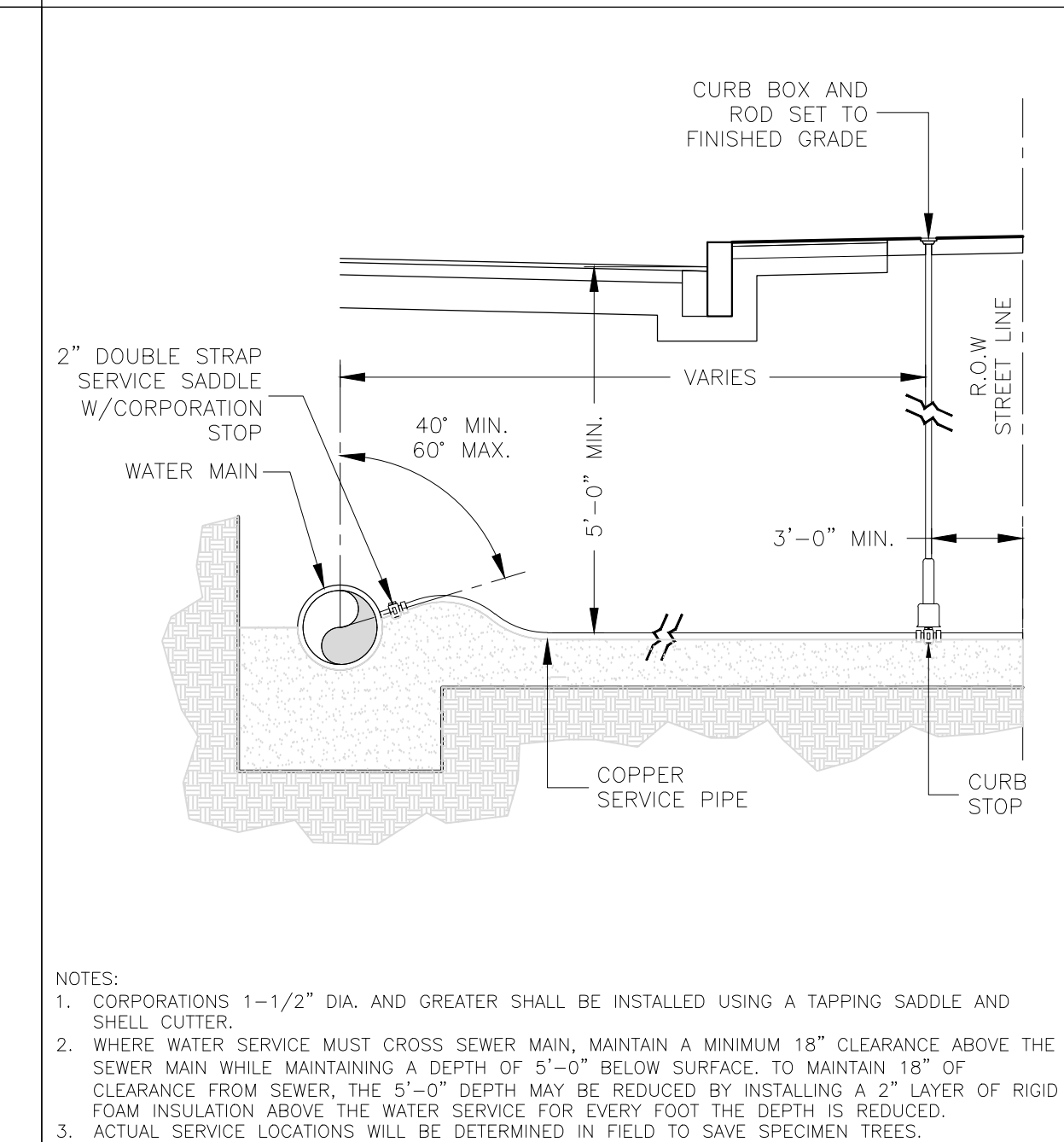


NOTES:  
 1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.  
 2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185 SPEC. 0.12 SQ. IN./LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.  
 3. H-20 DESIGN LOADING PER AASHTO HS-20-44; ASTM C478 SPEC FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."

**PRECAST CATCH BASIN**  
NOT TO SCALE



**WHEELCHAIR RAMP**  
NOT TO SCALE



**WATER SERVICE CONNECTION**  
NOT TO SCALE

**WILLIAMS & SPARAGES**  
 32 NAHANT STREET  
 WAKEFIELD, MA 01880  
 PHONE: (978) 339-8088  
 FAX: (978) 339-8089  
 WWW.WSNGR.COM

Owner / Applicant:  
 32 Nahant Street, LLC  
 9A Melvin Street  
 Wakefield, MA 01880

Designed By: MEM  
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 Drawing Issued for Construction

SCALE: NONE

6	5	4	3	2	1
12	11	10	9	8	7

CONSTRUCTION DETAILS PLAN  
 NAHANT STREET APARTMENTS  
 32-32A & 36 NAHANT STREET, WAKEFIELD, MA

SCALE: NONE

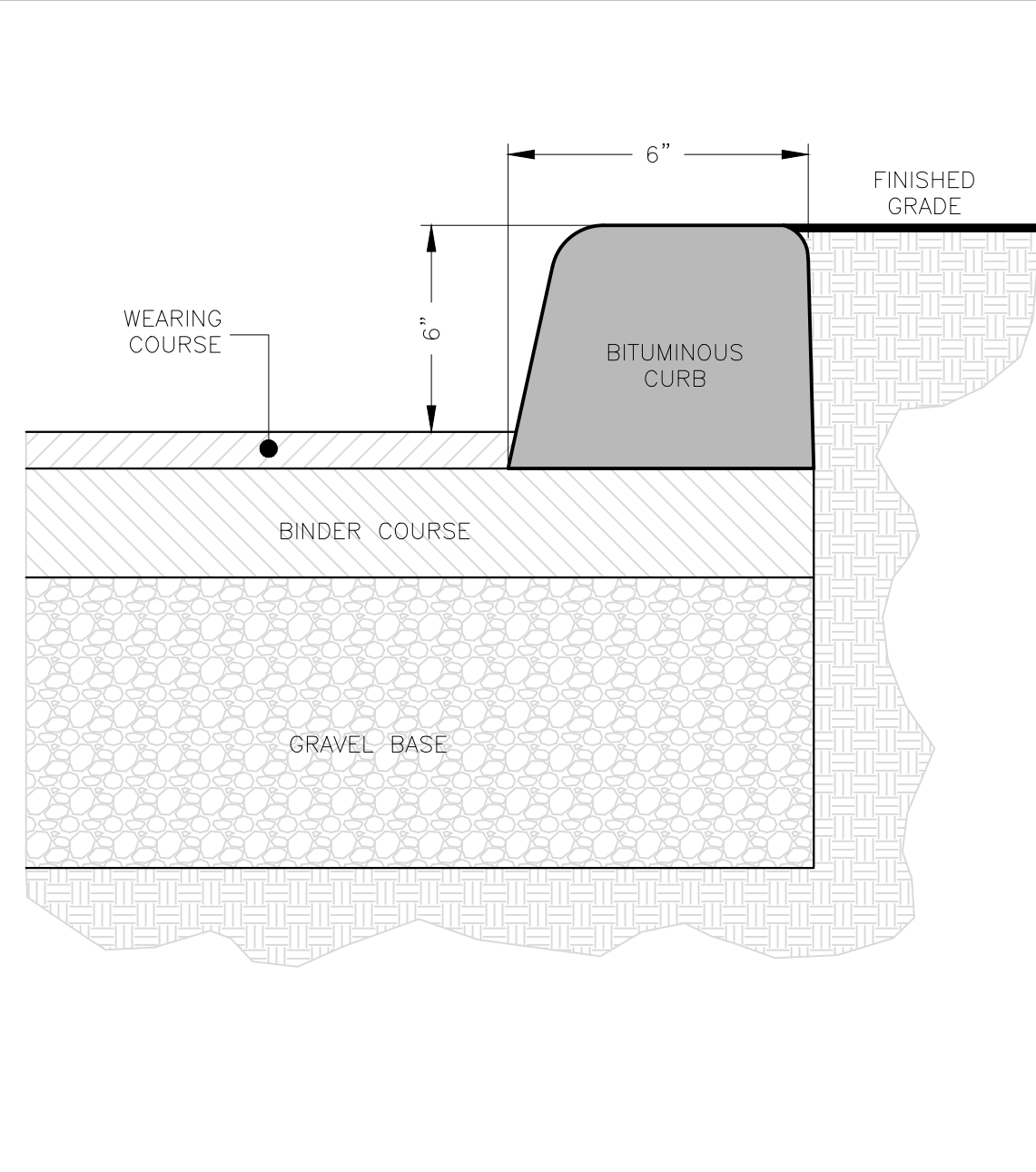
JANUARY 5, 2024

2-8-2024

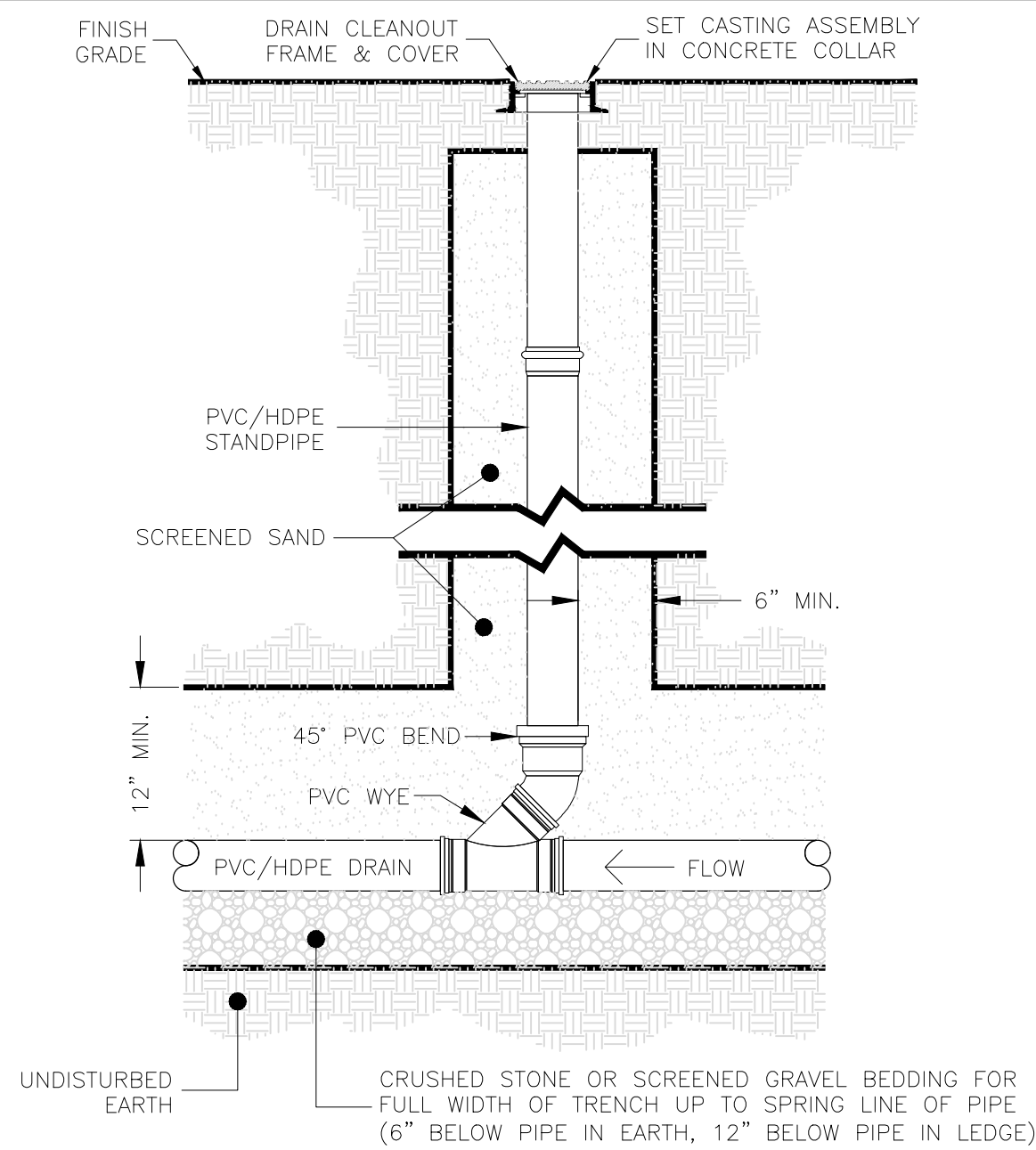
DRAWING: C8.1

SHEET 8 OF 10

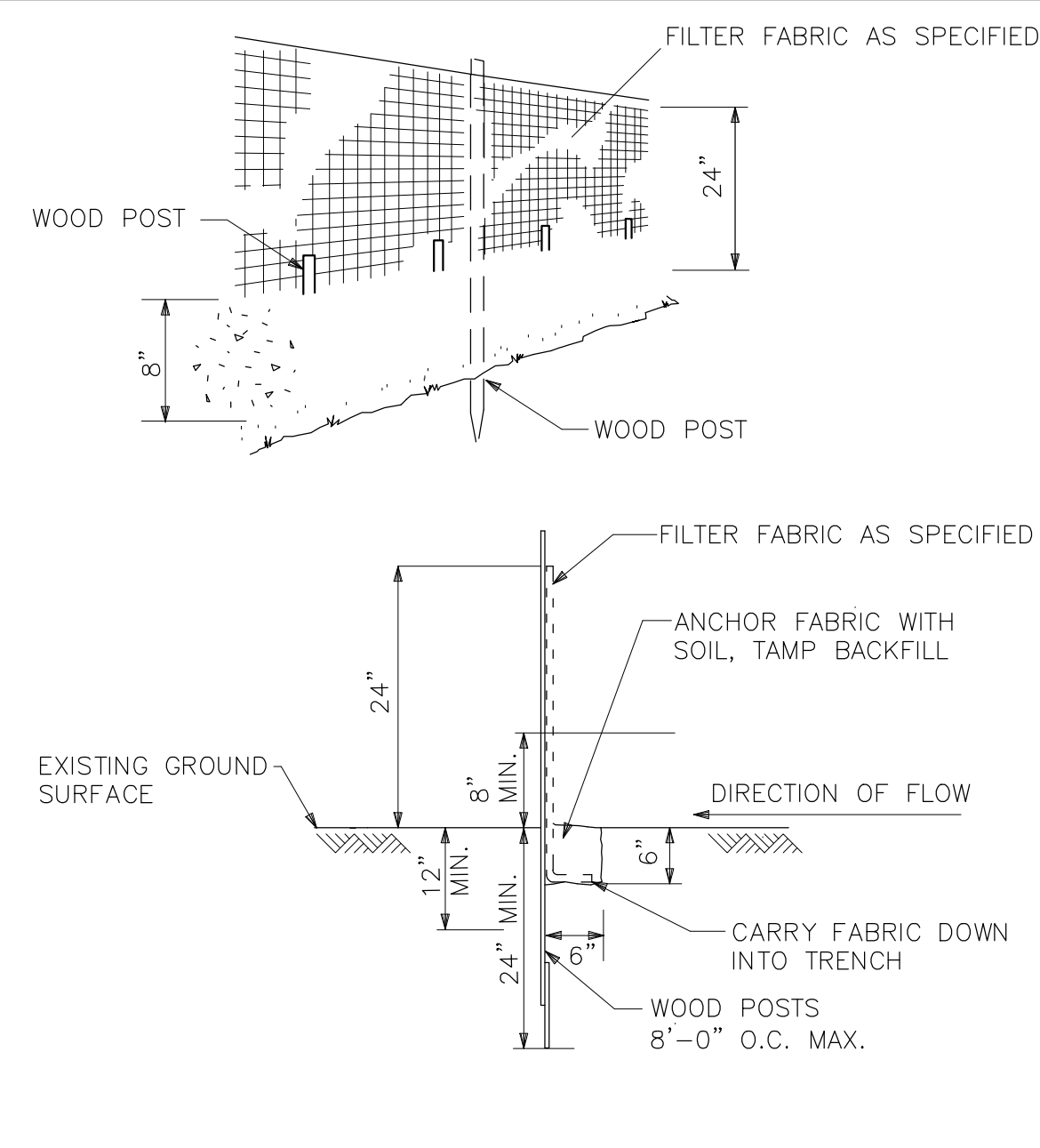




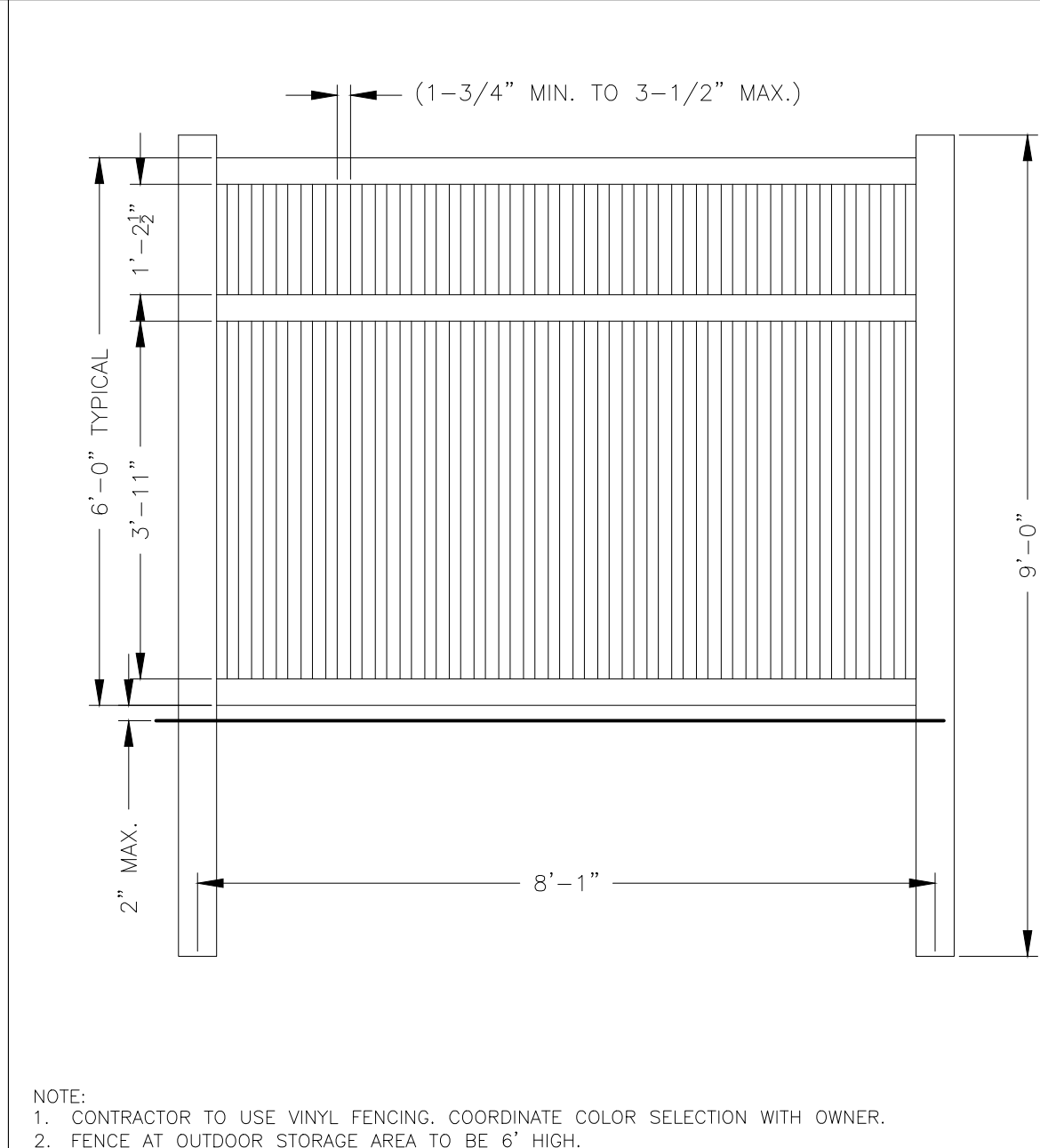
**BITUMINOUS CURB**  
NOT TO SCALE



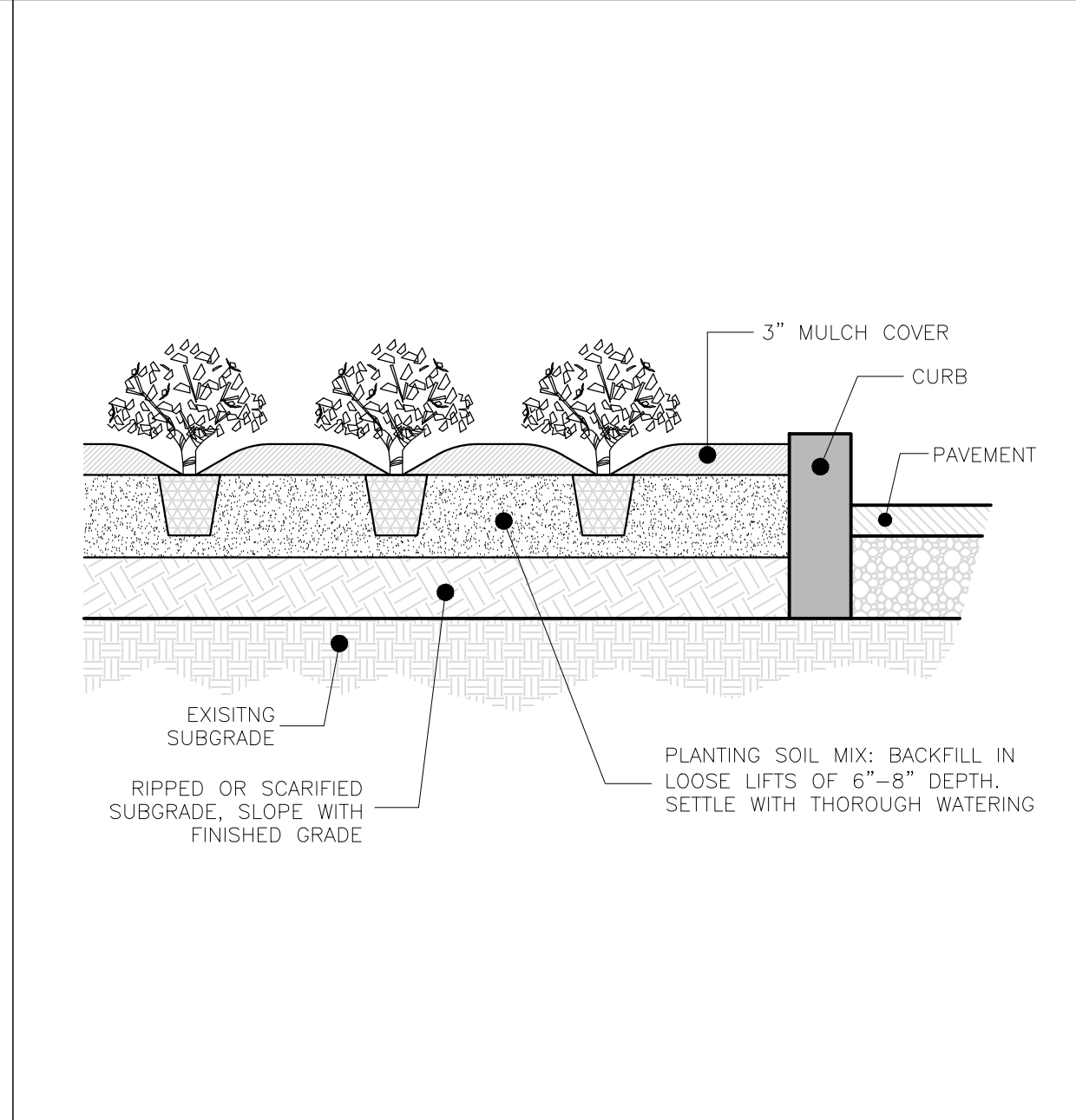
**DRAIN CLEANOUT**  
NOT TO SCALE



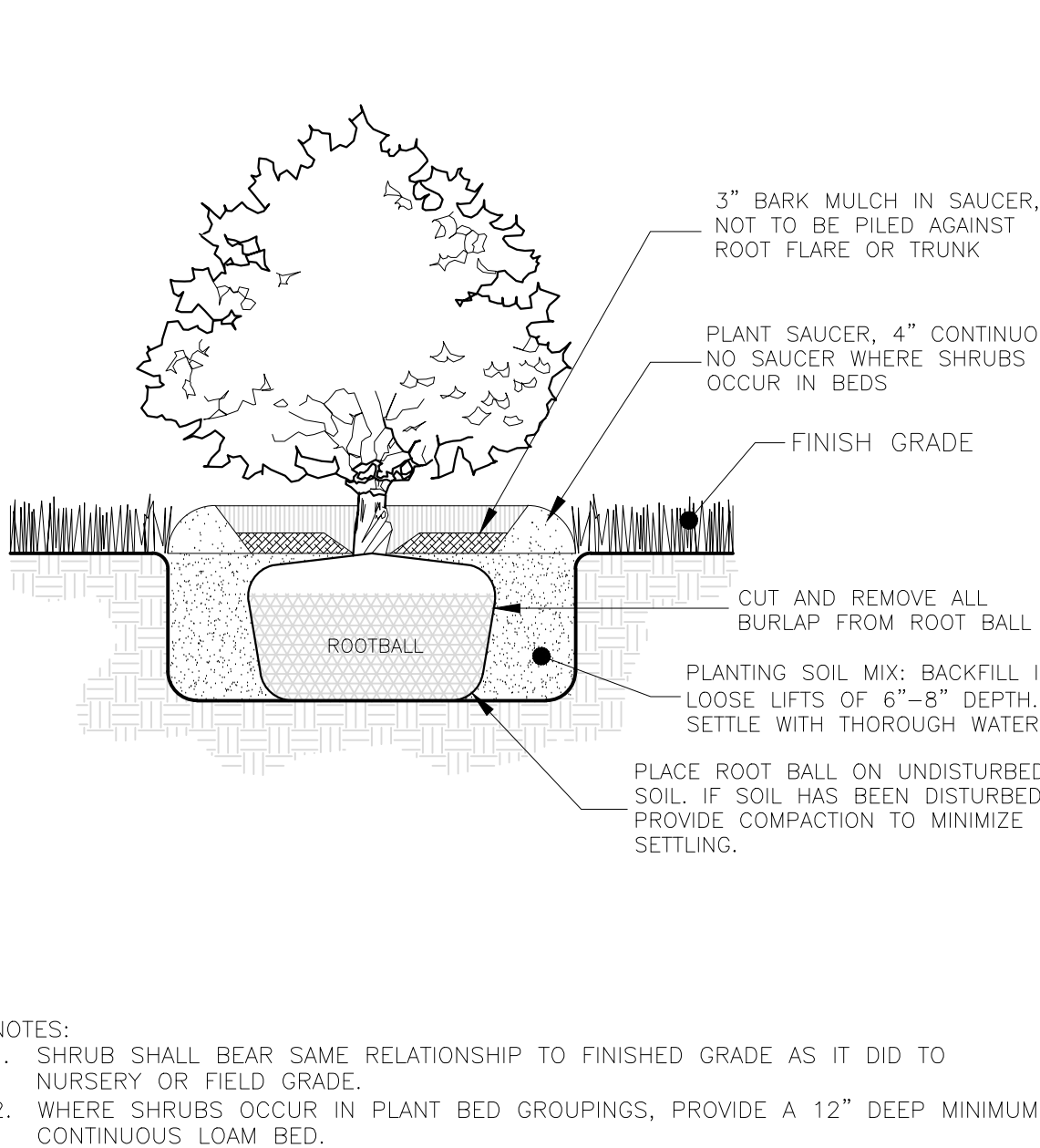
**SILT FENCE W/MULCH SOCK**  
NOT TO SCALE



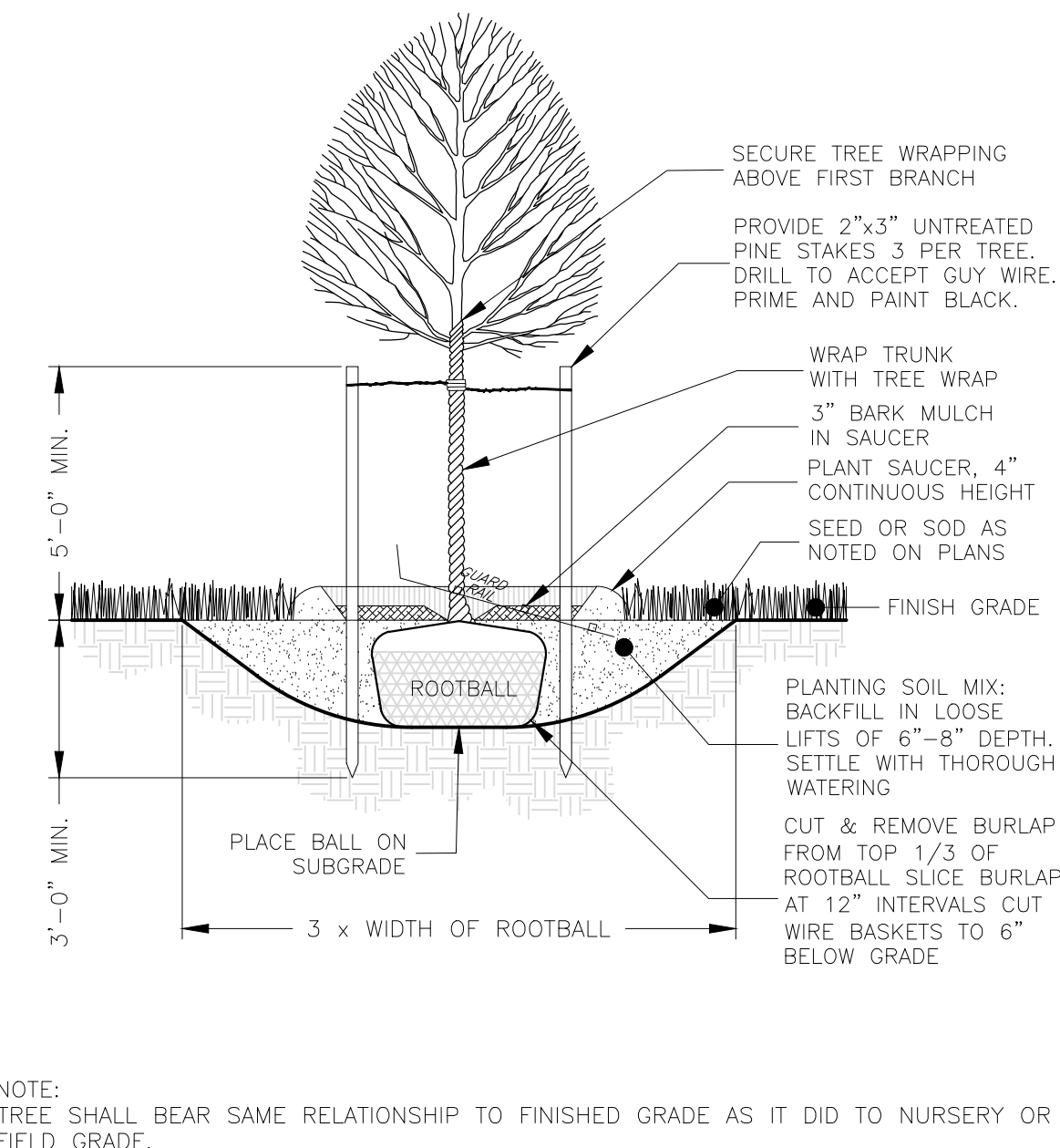
**PRIVACY FENCE**  
NOT TO SCALE



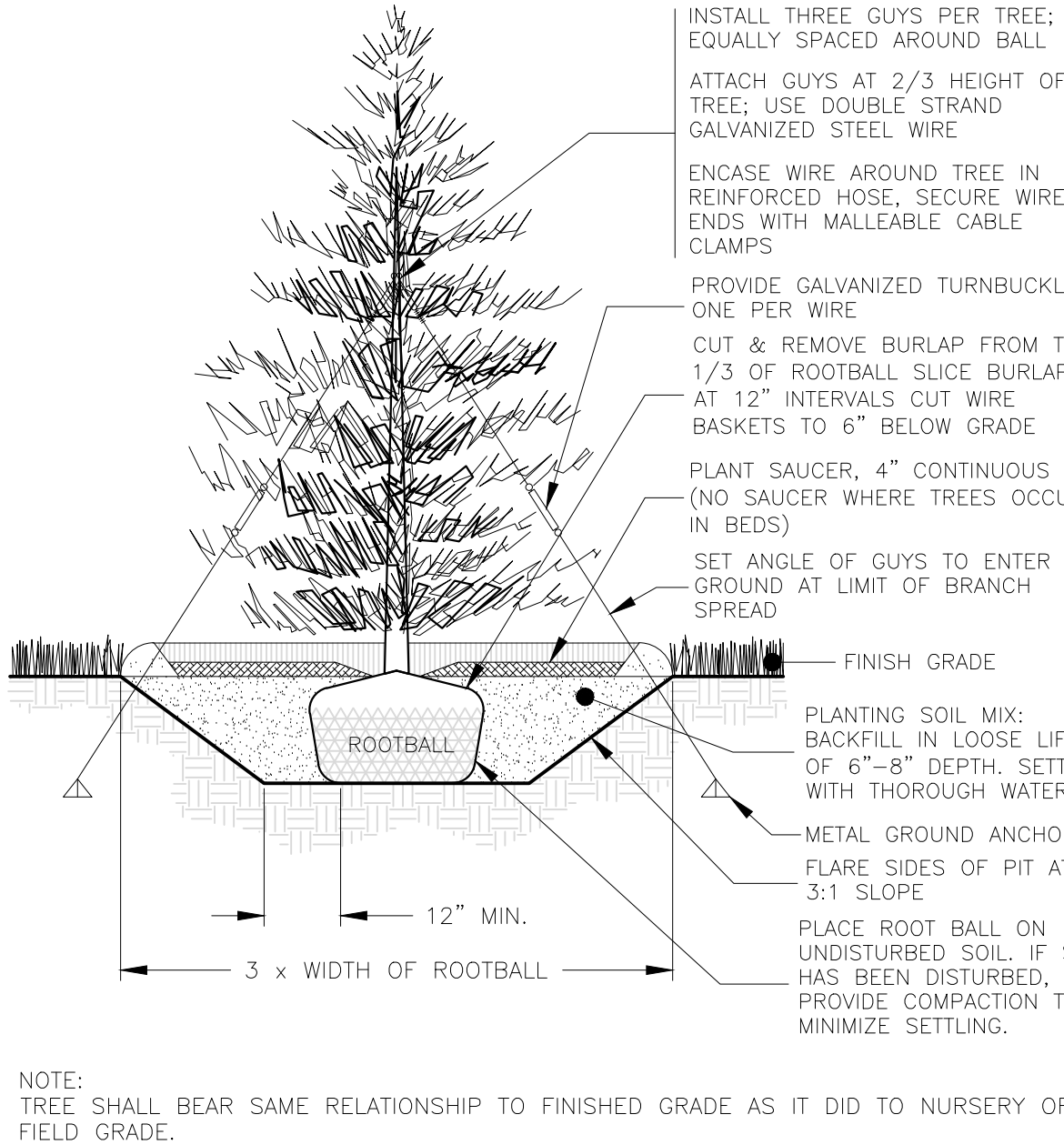
**GROUND COVER PLANTING**  
NOT TO SCALE



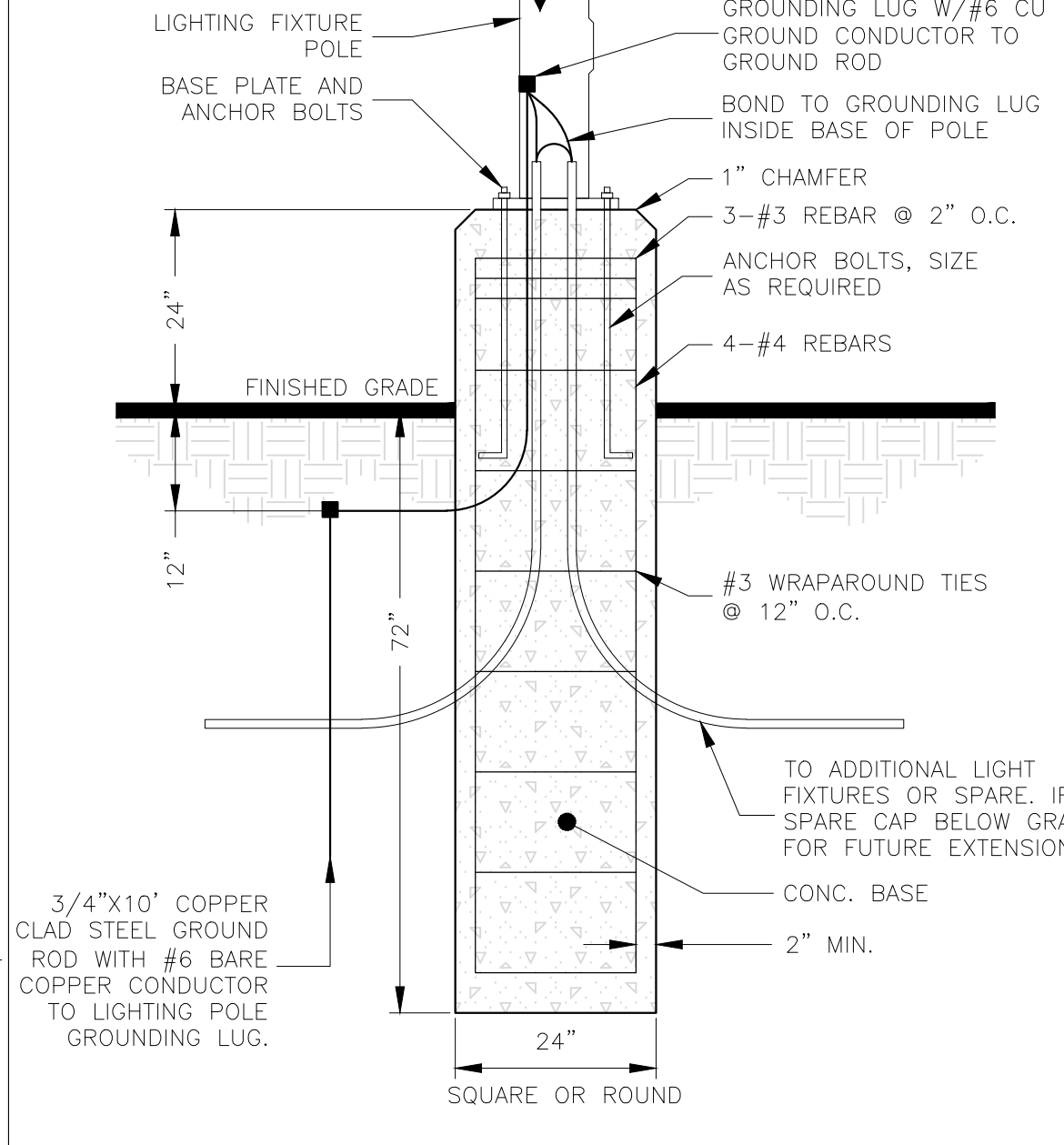
**SHRUB PLANTING**  
NOT TO SCALE



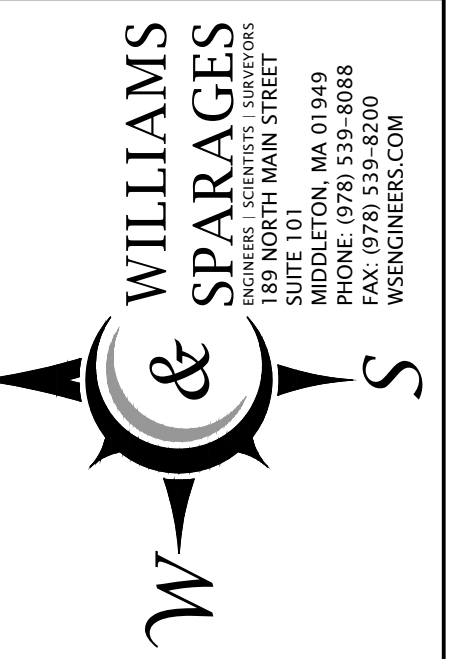
**DECIDUOUS TREE PLANTING**  
NOT TO SCALE



**CONIFEROUS TREE PLANTING**  
NOT TO SCALE



**LIGHT POLE BASE**  
NOT TO SCALE



**WILLIAMS & SPARAGES**  
INCORPORATED  
150 NORTH MAIN STREET  
MIDDLETON, MA 01949  
PHONE: (978) 339-8088  
FAX: (978) 339-8080  
WWW.WSINC.COM

Owner / Applicant:  
32 Nahant Street, LLC  
9A Melvin Street  
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SEAL

6						
5						
4						
3						
2						
1						

**CONSTRUCTION DETAILS PLAN**  
**NAHANT STREET APARTMENTS**  
32-32A & 36 NAHANT STREET, WAKEFIELD, MA

SCALE: NONE

JANUARY 5, 2024

2-8-2024

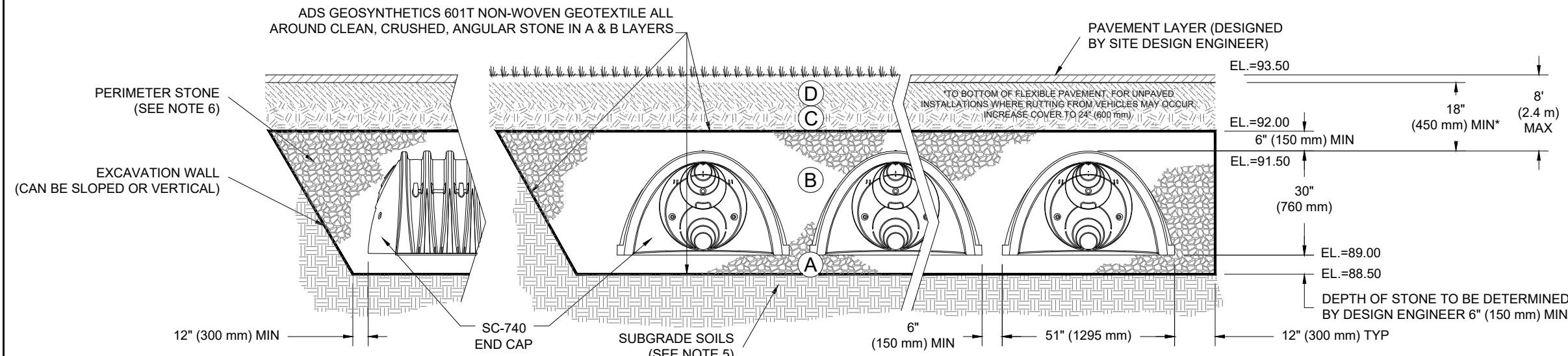
DRAWING: C8.2

SHEET 9 OF 10

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 A-1, A-2-4, A-3  OR AASHTO M43 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	AASHTO M43 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. **

PLEASE NOTE:  
 1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE."  
 2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTION IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.  
 3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

- SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



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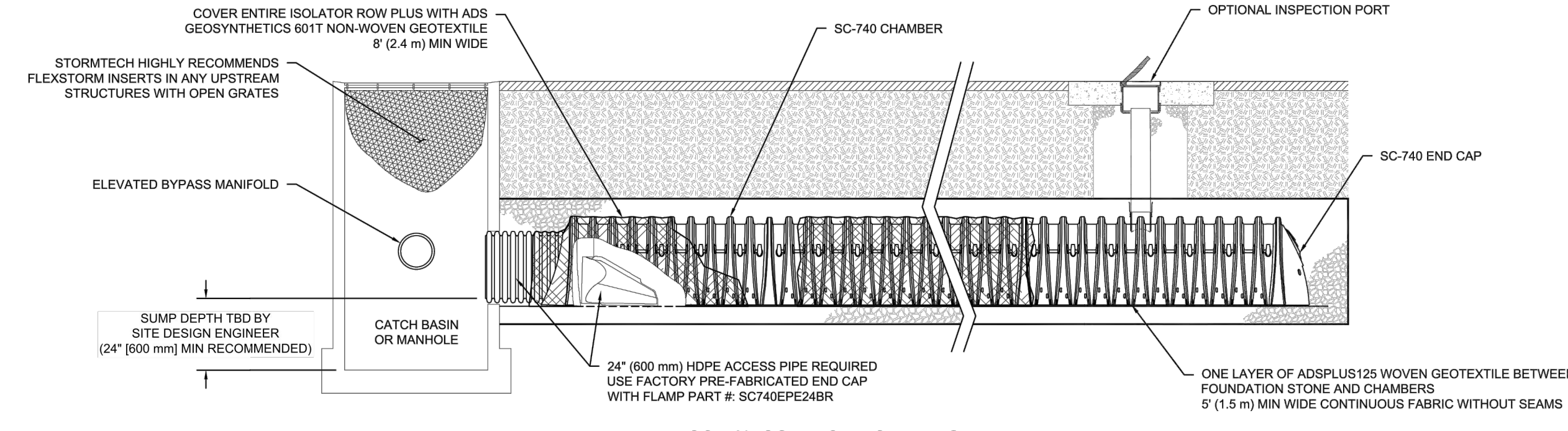
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SEAL

CONSTRUCTION DETAILS PLAN	
NAHANT STREET APARTMENTS	
32-32A & 36 NAHANT STREET, WAKEFIELD, MA	
SCALE: NONE	JANUARY 5, 2024
6	12
5	11
4	10
3	9
2	8
1	7

DRAWING: C8.3  
 SHEET 10 OF 10

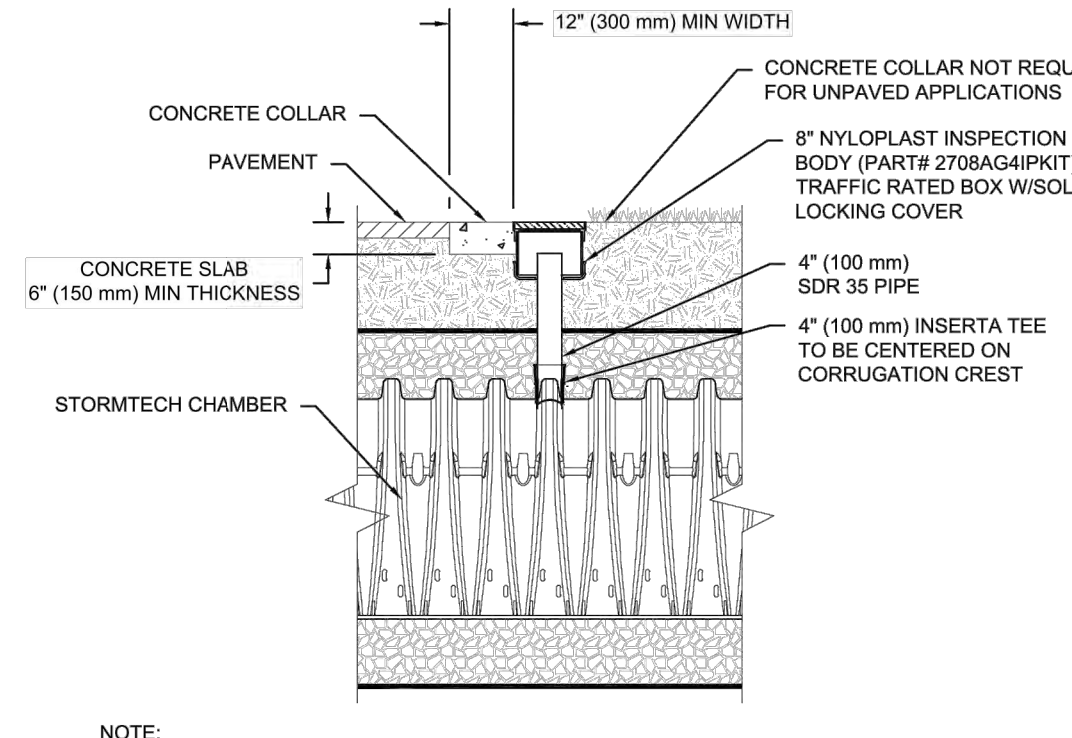


INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
- REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
- REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
  - APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
  - VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

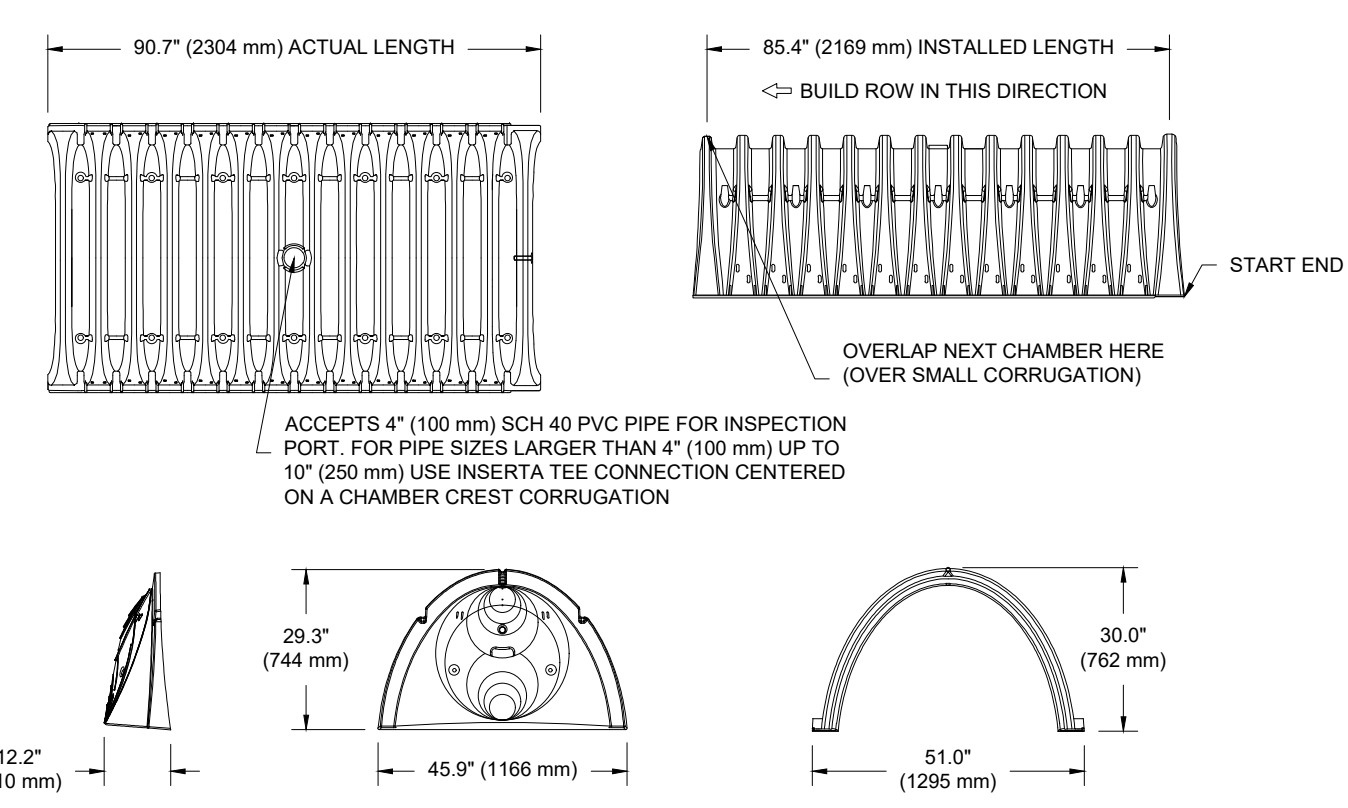
- INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
- CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE: INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

STORMTECH SC-740 ISOLATOR ROW & INSPECTION PORT  
 NOT TO SCALE

STORMTECH SC-740 CROSS SECTION SWMA1P  
 NOT TO SCALE



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W x H x INSTALLED LENGTH)	51.0" X 30.0" X 85.4" (1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET (1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET (2.12 m³)
WEIGHT	75.0 lbs. (33.6 kg)

\*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

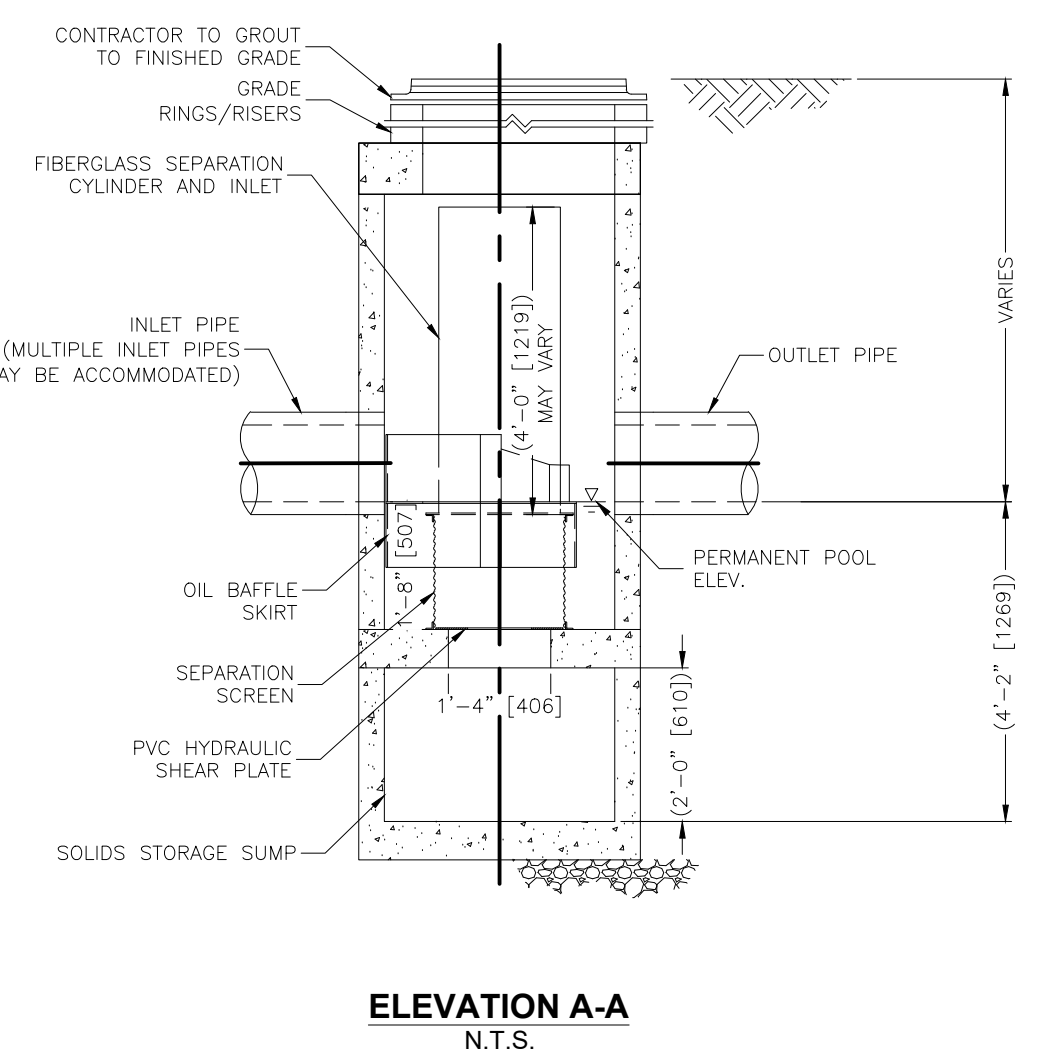
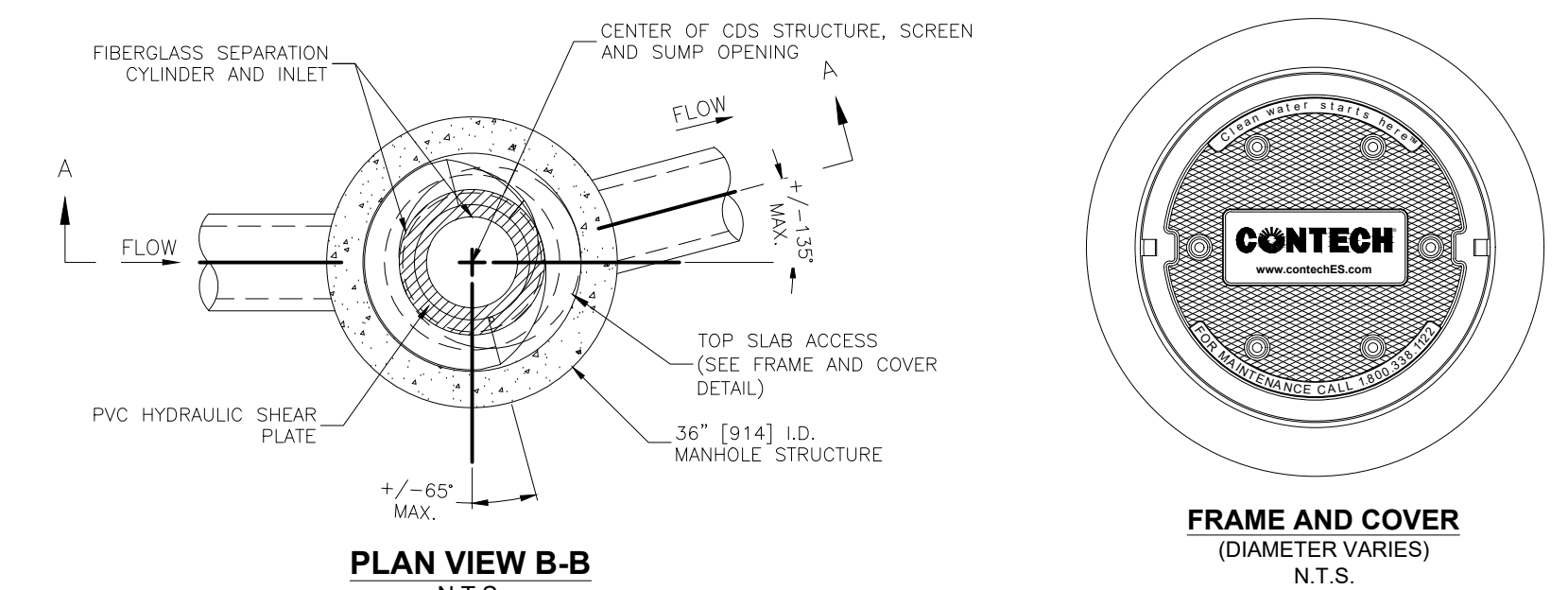
STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B" STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	A	B	C
SC740EPE00T / SC740EPE00TBC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE00B / SC740EPE00BPC	---	---	0.5" (13 mm)	---
SC740EPE08T / SC740EPE08TBC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC	---	---	0.6" (15 mm)	---
SC740EPE10T / SC740EPE10TBC	10" (250 mm)	13.4" (340 mm)	---	0.7" (18 mm)
SC740EPE10B / SC740EPE10BPC	---	---	12.5" (318 mm)	---
SC740EPE12T / SC740EPE12TBC	12" (300 mm)	14.7" (373 mm)	---	1.2" (30 mm)
SC740EPE12B / SC740EPE12BPC	---	---	9.0" (229 mm)	---
SC740EPE15T / SC740EPE15TBC	15" (375 mm)	18.4" (467 mm)	---	1.3" (33 mm)
SC740EPE15B / SC740EPE15BPC	---	---	5.0" (127 mm)	---
SC740EPE18T / SC740EPE18TBC	18" (450 mm)	19.7" (500 mm)	---	1.6" (41 mm)
SC740EPE18B / SC740EPE18BPC	---	---	18.5" (470 mm)	0.1" (3 mm)
SC740EPE24B*	24" (600 mm)	---	---	---

ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

\* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL  
 STORMTECH SC-740 TECHNICAL SPECIFICATIONS  
 NOT TO SCALE



GENERAL NOTES

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. [www.ContechES.com](http://www.ContechES.com)
- CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
- STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
- IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
- CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
- CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH CDS 1515-3-C  
 NOT TO SCALE

# Transportation Impact Assessment

Proposed Residential Development

119-135 Nahant Street

Wakefield, Massachusetts

*Prepared for:*

The Residences at Nahant LLC

246 Andover Street, Suite 301

Peabody, Massachusetts

February 2024

*Prepared by:*

 **Vanasse &  
Associates inc**  
Transportation Engineers & Planners

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Suite 140  
Andover, MA 01810

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# **EXECUTIVE SUMMARY**

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## **DESCRIPTION OF PROJECT**

Vanasse & Associates, Inc. (VAI) has prepared this Transportation Impact Assessment (TIA) to identify traffic impacts associated with a proposed 100-unit residential development to be located at 119-135 Nahant Street in Wakefield, Massachusetts (the “Project”). The purpose of this TIA is to review baseline and future traffic conditions in the vicinity of the site, determine the traffic impact of the proposed Project at key intersections expected to experience increased traffic levels from the Project, and review the need for improvements to mitigate the Project’s traffic impact.

## **PROPOSED PROJECT**

The site is bounded by Nahant Street to the north and single-family residential homes to the south, east, and west. Currently, the site contains two single-family residential homes and a 4,480 square foot (sf) manufacturing building. The site currently has two curb cuts onto Nahant Street. The east curb cut will be a full access driveway while the west curb cut will be exit only. The Project entails razing the existing buildings and constructing a residential building consisting of a total of 100 multifamily units. The site will provide 133 parking spaces (parking ratio of 1.33 parking spaces per unit) and proposed site access will be provided via two curb cuts onto Nahant Street.

## **BASELINE CONDITIONS**

A comprehensive field inventory was conducted to collect existing roadway geometrics, traffic volumes, operating characteristics, speed limits, and sight distances, as well as land use information. Traffic volumes were collected in December 2023 at the intersections expected to receive the traffic impact from the Project and requested for study by the Wakefield Traffic Advisory Committee (TAC) at their December 1, 2023 meeting.

## **TAC SPECIFIC ITEMS**

Several specific items were requested by the Wakefield TAC in their discussion on the Project. These included an expanded afternoon count period to account for school dismissal periods, a review of truck volumes on Nahant Street, a review of cut-through traffic in the area, a review of

speed data on Nahant Street, and the incorporation of roadway improvement projects at intersections in the study area. In summary, most intersections had an afternoon peak hour of 3:45 to 4:45 PM, and neither high (more than 10 percent) truck volumes nor significant cut-through traffic were recorded in the count data. Speed data indicated non-compliance with posted speed limits; measures to address this are provided in the report.

## **FUTURE CONDITIONS**

Traffic volumes within the study area were projected to 2031, which reflects a seven-year planning horizon consistent with State traffic study guidelines. These conditions incorporate traffic growth due to general background traffic increases, traffic volume from four development projects currently being proposed/permitted or under construction that are expected to generate traffic in the future, and proposed roadway improvement projects. This condition is referred to as the No-Build condition.

## **PROJECT-GENERATED TRAFFIC**

The Project is expected to generate 412 new vehicle trips on an average weekday (two-way, 24-hour volume), with 33 new vehicle trips (7 entering and 26 exiting) expected during the weekday morning peak hour and 34 new vehicle trips (22 entering and 12 exiting) expected during the weekday evening peak hour.

Project-related traffic-volume increases external to the study area relative to 2031 No-Build conditions are anticipated to range from 1 to 11 vehicles or 0.1 to 2.0 percent during the peak periods.

## **PARKING**

A parking analysis was conducted using industry standard parking supply data and local data from a multi-phase parking study conducted by the Metropolitan Area Planning Council (MAPC). This review indicated that the Project supply rate of 1.33 spaces per unit exceeds both the industry data of 1.13 spaces per unit and the MAPC data of 1.04 spaces per unit.

## **TRAFFIC OPERATIONS ANALYSIS**

Under future conditions, operations are generally preserved with minor increases in delays and vehicle queue lengths on the various approaches.

## **RECOMMENDATIONS**

Access to the Project site will be provided via two curb cuts on Nahant Street. The east curb cut will be a full access driveway while the west curb cut will be exit only. The following recommendations are offered with respect to the design and operation of the Project site driveways:

- The driveways should be placed under STOP-sign (MUTCD R1-1) control, with a painted STOP-bar included.



- All signs and other pavement markings to be installed within the Project site shall conform to the applicable standards of the current MUTCD.
- Signs and landscaping adjacent to the Project site driveways should be designed and maintained so as not to restrict lines of sight.
- Snow windrows within sight triangle areas of the Project site driveways should be promptly removed where such accumulations would impede sightlines.

Increasing the amount of speed limit signage and the presence of police officers along Nahant Street could reduce vehicle speeds to the posted limit of 20 mph. A design speed of 20 mph corresponds to an SSD of 115 feet, which would fall inside the measured SSD of the Project site west driveway approaching from the west. It is suggested that in order to address the speeding issues on Nahant Street, a radar speed feedback sign could be installed on each approach of Nahant Street in the vicinity of the Project or on straight segments of the street. The same type of sign that exists on Nahant Street near Partridge Lane could be utilized.

## **CONCLUSIONS**

As documented in this study, Project-related traffic increases will not result in significant increases in traffic volumes or traffic delays within the study area. The site driveways will provide adequate access to and from the development. In general, Project-related traffic can be adequately accommodated within the existing and future infrastructure with minimal impact on the traffic operations within the study area.

# **INTRODUCTION**

---

Vanasse & Associates, Inc. (VAI) has prepared this Transportation Impact Assessment (TIA) in order to identify the traffic impacts associated with the proposed residential development to be located at 119-135 Nahant Street in Wakefield, Massachusetts. This report identifies and analyzes baseline and future traffic conditions both with and without the Project and reviews access requirements, potential off-site improvements, and safety considerations.

## **STUDY METHODOLOGY**

This study was prepared in accordance with the State guidelines for TIAs and was conducted in three distinct stages.

The first stage involved an assessment of baseline conditions in the study area and included an inventory of roadway geometry, observations of traffic flow, and collection of peak-period traffic counts.

In the second stage of the study, future traffic conditions were projected and analyzed. Specific travel demand forecasts for the Project were assessed along with future traffic demands due to expected traffic growth independent of the Project. A seven-year time horizon was selected for these analyses consistent with State guidelines for the preparation of TIAs. The traffic analysis conducted in stage two identifies projected future roadway capacity, traffic safety, and site access issues.

The third stage of the study presents and evaluates measures to address traffic and safety issues, if any are necessary, based on the results from stage two of the study.

## **BASELINE CONDITIONS**

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A comprehensive field inventory of baseline conditions within the study area was conducted in December 2023 and January 2024. The field investigation consisted of an inventory of existing roadway geometrics; traffic volumes; and operating characteristics; as well as posted speed limits, sight distance, and land use information within the study area. The study area for the Project contains the major roadway which provides access to the Project, as well as the intersections which are expected to accommodate the majority of Project-related traffic and that were requested for study by the Wakefield TAC in their December 1, 2023 meeting. The study area is listed below and graphically depicted on Figure 1.

- Main Street at North Avenue and Nahant Street
- Nahant Street at Traverse Street
- Nahant Street at Middlesex Street and the existing driveway
- Nahant Street at Hart Street
- Farm Street at Nahant Street
- Farm Street at Hemlock Road

The following describes the study area roadway which provides access/egress to the Project.

### **GEOMETRY**

#### **Roadway**

##### **Nahant Street**

Nahant Street is classified as an urban minor arterial roadway under Town jurisdiction. Nahant Street runs in a general east-to-west alignment throughout the study area and provides one general-purpose travel lane in each direction separated by a double-yellow centerline with exclusive turn lanes provided at some intersections. Land uses along Nahant Street throughout the study area generally consist of commercial, residential, and open and wooded space.

#### **Intersections**

Figure 2 summarizes existing lane use, travel lane widths, and sidewalk and crosswalk locations at the study area intersections.

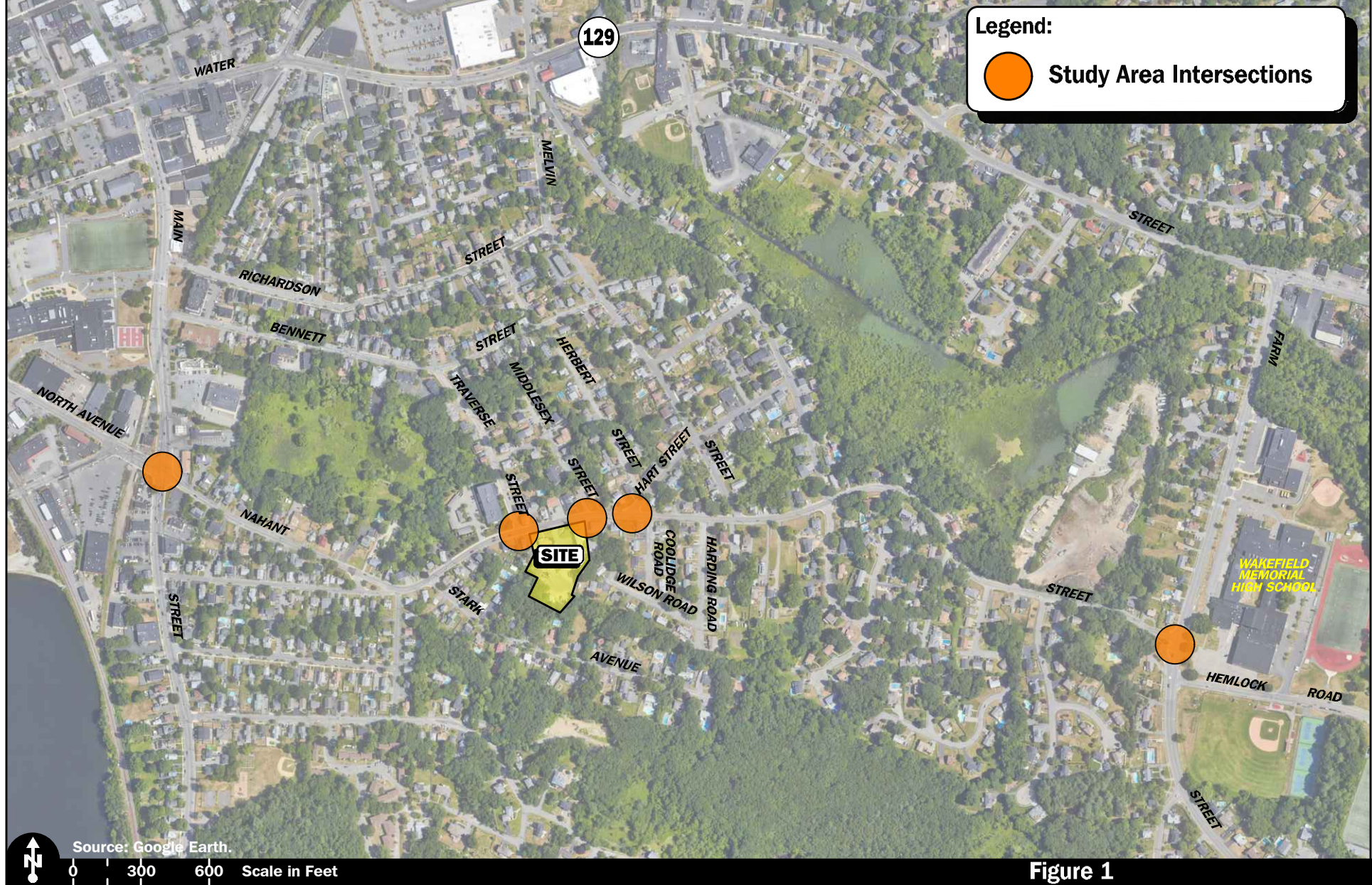
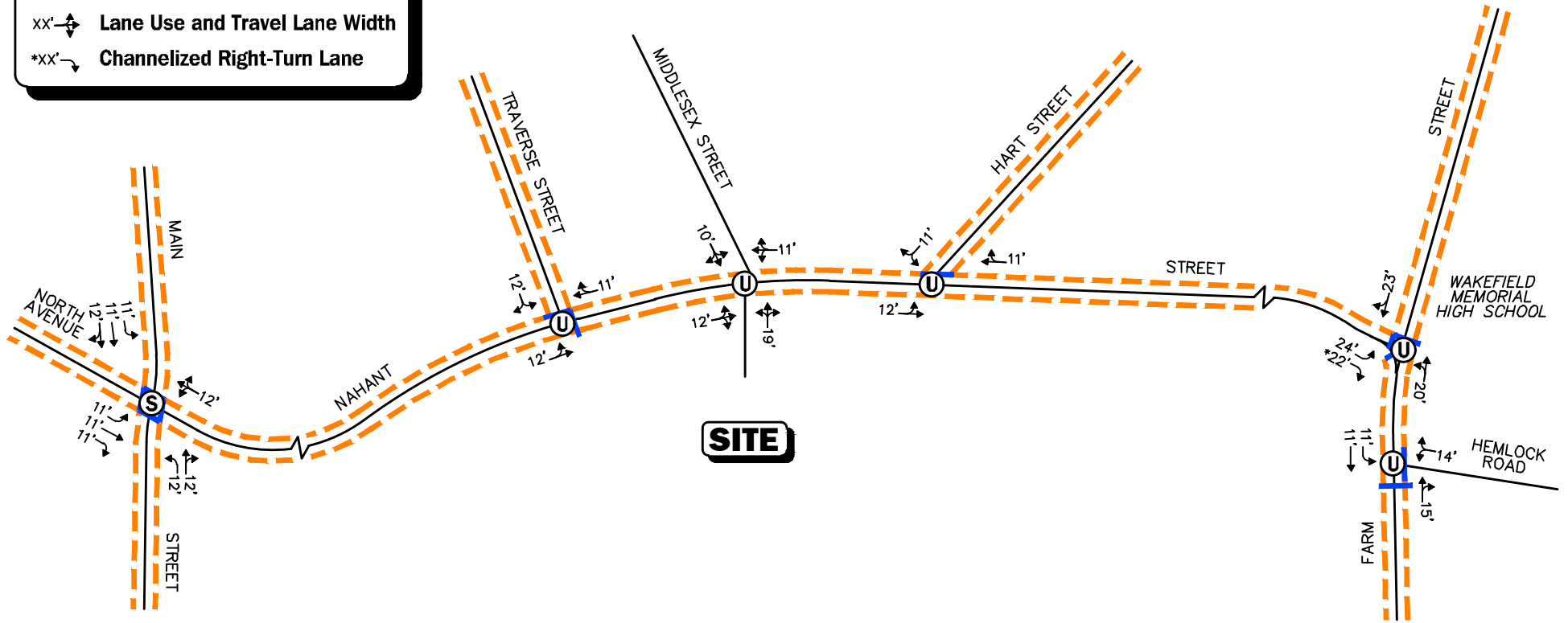


Figure 1  
Site Location and Study Area Map

**Legend:**

- ⓪ Unsignalized Intersection
- Ⓢ Signalized Intersection
- - - Sidewalk
- Crosswalk
- xx' ↕ Lane Use and Travel Lane Width
- \*xx' ↘ Channelized Right-Turn Lane



Not to Scale



**Figure 2**  
Existing Intersection Lane Use,  
Travel Lane Width, and  
Pedestrian Facilities

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## **BASELINE TRAFFIC VOLUMES**

In order to establish baseline traffic-volume demands and flow patterns within the study area, manual turning movement counts (TMCs) were completed in December 2023. The TMCs were conducted during the weekday morning (7:00 to 9:00 AM) and weekday evening (2:00 to 6:00 PM) peak periods. Bicycles and pedestrians were also counted.

The Wakefield TAC requested traffic volumes be collected from 2:00 to 6:00 PM to account for local school dismissal traffic volumes that could impact that peak hour volumes. With the exception of the Main Street at North Avenue and Nahant Street intersection, which peaked at 4:45 to 5:45 PM, study area intersections saw individual weekday evening peak hours of between 3:30 to 4:30 PM and 3:45 to 4:45 PM. However, the peak hour volumes from the individual intersections' peak hours were used for analysis purposes.

### **Traffic-Volume Adjustments**

In order to develop 2024 Baseline traffic-volume conditions, Massachusetts Department of Transportation (MassDOT) weekday seasonal factors for Urban Groups 4-7 (major and minor collectors and local roads and streets, the functional classifications of the majority of the study area roadways) were reviewed.<sup>1</sup> Based on a review of this data, it was determined that traffic volumes for the month of December are 4 percent *below* average-month conditions. As such, the traffic volumes were adjusted upward by 4 percent in order to be representative of average-month conditions.

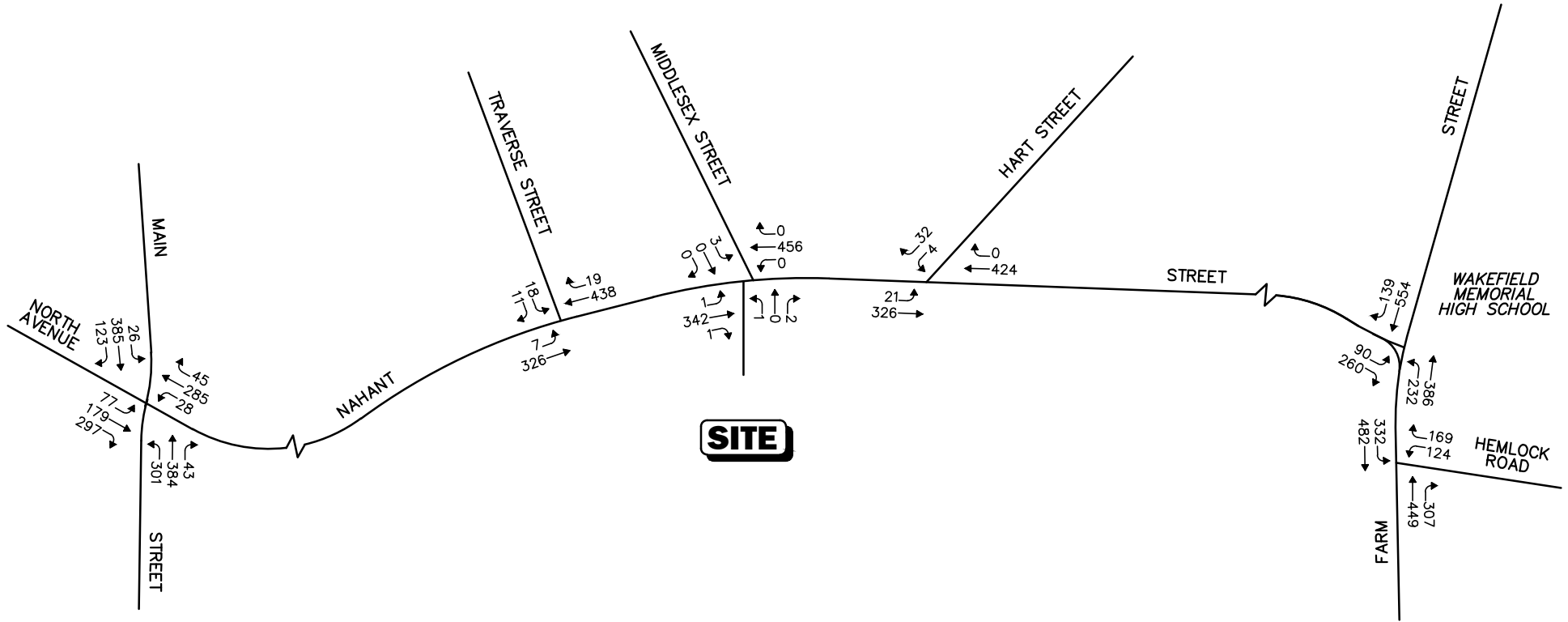
MassDOT no longer requires pandemic-related adjustment of traffic counts performed after March 2022 except in locations where the predominant land use consists of offices or similar uses.<sup>2</sup> Given that the predominant land use within the study area is residential, no further adjustment (beyond the seasonal adjustment) is necessary.

As can be seen in Table 1, Nahant Street was observed to carry approximately 9,200 vehicles per day (vpd) with 803 vehicles per hour (vph) during the weekday morning peak hour and 905 vph during the weekday evening peak hour. During the weekday morning peak hour, 57 percent of the traffic is traveling westbound and during the weekday evening peak hour, 55 percent of the traffic is traveling westbound. The baseline weekday morning and evening peak-hour traffic volumes for the study area intersections are graphically depicted on Figure 3 and Figure 4, respectively.

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<sup>1</sup>MassDOT statewide Traffic Data Collection; 2019 Weekday Seasonal Factors, Groups U4-7.

<sup>2</sup>25% *Design Submission Guidelines*; MassDOT Highway Division, Traffic and Safety Engineering; Revised May 31, 2022.



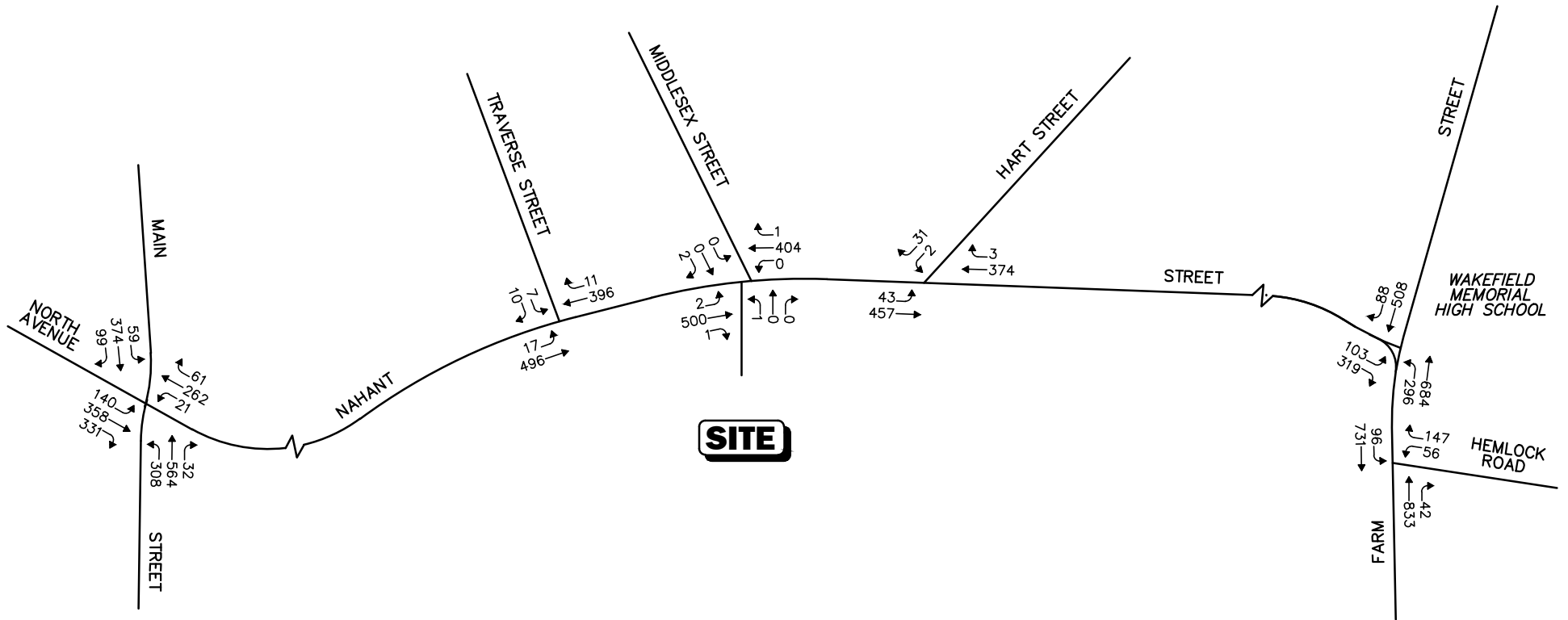
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not to Scale



Figure 3

2024 Baseline  
Weekday Morning  
Peak-Hour Traffic Volumes



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

Not to Scale

Figure 4

2024 Baseline  
Weekday Evening  
Peak-Hour Traffic Volumes





**Table 1**  
**2024 BASELINE ROADWAY TRAFFIC-VOLUME SUMMARY**

Location	Weekday		Weekday Morning Peak Hour		Weekday Evening Peak Hour		
	Daily Volume (vpd) <sup>a</sup>	Volume (vph) <sup>b</sup>	Percent of Daily Traffic <sup>c</sup>	Predominant Flow	Volume (vph)	Percent of Daily Traffic	Predominant Flow
Nahant St, east of Middlesex St	9,200	803	8.7	56.8% WB	905	9.8	55.2% WB

<sup>a</sup>Two-way daily traffic expressed in vehicles per day. Based on automatic traffic recorder counts collected in December 2023.

<sup>b</sup>Two-way peak-hour volume expressed in vehicles per hour.

<sup>c</sup>The percent of daily traffic that occurs during the peak hour.

WB = westbound.

### **Truck Volumes**

As requested by the Wakefield TAC, the percentage of trucks that travel on Nahant Street past the Project site was identified. The truck volumes were calculated using the vehicle classifications from the TMCs conducted at the intersection of Nahant Street at Middlesex Street. During the weekday morning peak hour, 3 percent (10 vehicles) of total vehicles traveling eastbound are trucks; of total vehicles traveling westbound, 2 percent (9 vehicles) are trucks. During the weekday evening peak hour, of total vehicles traveling eastbound, 1 percent (4 vehicles) are trucks, of total vehicles traveling westbound, one percent (5 vehicles) are trucks.

### **Cut-Through Traffic Volumes**

As requested by the Wakefield (TAC), a review of possible cut-through traffic on Traverse Street was conducted. This definition of cut-through traffic pertains to traffic using Bennett Street and Traverse Street to avoid the intersection of Main Street at North Avenue and Nahant Street. Using this definition, during the weekday morning peak hour 18 vehicles were observed turning left from Traverse Street to Nahant Street and 19 vehicles were observed turning right from Nahant Street to Traverse Street. A portion of this volume could be cut-through traffic; however, there are also a number of multi-family developments and duplex units on Bennett Street and Traverse Street that could account for a majority of this traffic volume. During the morning peak hour, this corresponds to 5 percent of total intersection traffic. During the weekday evening peak hour, the volume making these movements is 7 vehicles from Traverse Street and 11 vehicles from Nahant Street, this corresponds to 2 percent of total intersection traffic volumes.

### **PEDESTRIAN AND BICYCLE FACILITIES**

A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in January 2024. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study area roadways and at the study area intersections, as well as the location of bicycle facilities. The full field inventory of the study area is shown in Figure 2.

**PUBLIC TRANSPORTATION**

Public transportation services are provided within the study area by the Massachusetts Bay Transportation Authority (MBTA). The MBTA provides a fixed-route bus service with a bus stop at the intersection of Main Street at Nahant Street/North Avenue, which is located approximately 0.4 miles (an 8-minute walk) to the west of the Project site. Connections to the Haverhill commuter rail Wakefield station are also possible via a 0.75-mile walk from the site (a 15-minute walk). Table 2 summarizes the characteristics of these services. Schedule and fare information for the fixed-route service are provided in the Appendix.

**Table 2  
PUBLIC TRANSPORTATION SERVICES<sup>a</sup>**

Service	Weekday		Saturday		Sunday	
	Hours of Operation	Headway (minutes)	Hours of Operation	Headway (minutes)	Hours of Operation	Headway (minutes)
Route 137	5:33 AM – 10:42 PM	20-57	6:09 AM – 9:15 PM	42-88	8:10 AM – 6:29 PM	91-121
Commuter Rail	5:24 AM – 12:07 AM	45-130	6:16 AM – 11:57 PM	120-195	6:16 AM – 11:57 PM	120-195

<sup>a</sup>Based on latest schedule and route information available from MBTA.

**MOTOR VEHICLE CRASH DATA**

Motor vehicle crash information for the study area intersections was provided by the MassDOT Safety Management/Traffic Operations Unit for the most recent five-year period available (2016 through 2020) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized in Table 3 by intersection, type, weather condition, lighting condition, pavement condition, and severity.

As can be seen in Table 3, the intersection of Main Street at North Avenue and Nahant Street experienced 19 accidents over the five-year review period, averaging 3.8 accidents per year. The majority of the accidents were angled collisions (7 out of 19), occurred on dry pavement (16 out of 19), during daylight (15 out of 19), in clear weather (16 out of 19), and caused property damage only (17 out of 19). The intersection of Nahant Street at Traverse Street experienced 2 accidents over the five-year review period, averaging 0.4 accidents per year. The accidents were a head-on and a pedestrian collision, occurred on dry or wet pavement, during the night on a lighted roadway, in clear or rainy weather, and caused property damage-only or non-fatal injuries. The intersection of Nahant Street at Hart Street experienced 6 accidents over the five-year review period, averaging 1.2 accidents per year. The majority of the accidents were sideswipe collisions (3 out of 6), occurred on wet pavement (3 out of 6), during daylight (3 out of 6), in clear weather (3 out of 6), and caused property damage only (4 out of 6). The intersection of Farm Street at Nahant Street and Hemlock Road experienced 17 accidents over the five-year review period, averaging 3.4 accidents per year. The majority of the accidents were angle collisions (7 out of 17), occurred on dry pavement (14 out of 17), during daylight (12 out of 17), in clear weather (12 out of 17), and caused property damage only (12 out of 17). The intersection of Nahant Street at Middlesex Street and the existing driveway

had no accidents reported over the five-year review period. No fatalities were reported over the period reviewed. The crash rates for the intersections were observed to be lower than the MassDOT District 4 crash rates for unsignalized intersections.

**Table 3**  
**MOTOR VEHICLE CRASH DATA SUMMARY**

Scenario	Main St at North Ave and Nahant St	Nahant St at Traverse St	Nahant St at Middlesex St and the existing driveway	Nahant St at Hart St	Farm St at Nahant St and Hemlock Rd
<i>Year:</i>					
2016	8	1	0	1	7
2017	0	0	0	1	4
2018	5	1	0	1	6
2019	6	0	0	2	0
2020	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>
Total	19	2	0	6	17
Average <sup>a</sup>	3.8	0.4	0.0	1.2	3.4
Crash Rate <sup>b</sup>	0.36	0.11	0.00	0.33	0.40
Significant <sup>c</sup>	No	No	No	No	No
<i>Type:</i>					
Angle	7	0	0	1	7
Rear-End	3	0	0	1	5
Head-On	2	1	0	0	0
Sideswipe	5	0	0	3	1
Fixed Object	1	0	0	1	1
Pedestrian	1	1	0	0	2
Bicyclist	0	0	0	0	0
Unknown/Other	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>
Total	19	2	0	6	17
<i>Weather Conditions:</i>					
Clear	16	1	0	3	12
Cloudy/Rain	3	1	0	2	5
Snow/Ice	0	0	0	0	0
Fog	0	0	0	0	0
Unknown/Other	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>
Total	19	2	0	6	17
<i>Lighting Conditions:</i>					
Daylight	15	0	0	3	12
Dawn/Dusk	0	0	0	0	2
Dark (lit)	4	2	0	2	3
Dark (unlit)	0	0	0	0	0
Unknown/Other	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>
Total	19	2	0	6	15
<i>Pavement Conditions :</i>					
Dry	16	1	0	1	14
Wet	2	1	0	3	3
Snow/Ice	0	0	0	0	0
Unknown/Other	<u>1</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>0</u>
Total	19	2	0	6	17
<i>Severity:</i>					
Property Damage Only	17	1	0	4	12
Personal Injury	2	1	0	0	4
Fatality	0	0	0	0	0
Unknown/Other	<u>0</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>1</u>
Total	19	2	0	6	17

<sup>a</sup>Average number of crashes over a five-year period.

<sup>b</sup>Crash rate per million entering vehicles (mev).

<sup>c</sup>Significant if crash rate > 0.57 for unsignalized intersections (MassDOT District 4 rates).

Source: MassDOT Crash Data, 2016 through 2020.

## VEHICLE SPEEDS

Existing vehicle speeds along Nahant Street, east of Middlesex Street, were recorded to determine the average and 85<sup>th</sup> percentile vehicle speeds. The speed limit on Nahant Street is posted at 20 miles per hour (mph). The results of the speed measurements are shown in Table 4.

**Table 4**  
**OBSERVED VEHICLE SPEEDS (In Miles Per Hour)**

Location/Direction	Average Speed	85 <sup>th</sup> Percentile Speed <sup>a</sup>
<i>Nahant Street, east of Middlesex Street:</i>		
Eastbound	24	29
Westbound	22	26

<sup>a</sup>The 85<sup>th</sup> percentile speed is the speed at which 85 percent of the traffic is traveling at or below. It is commonly used for setting speed limits on roadways.

As can be seen from Table 4, the average speed recorded eastbound on Nahant Street was 24 mph and the 85<sup>th</sup> percentile speed recorded was 29 mph, which is 9 mph above the posted speed limit. The average speed recorded westbound was 22 mph and the 85<sup>th</sup> percentile speed was 26 mph.

## **FUTURE CONDITIONS**

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To determine the impact of site-generated traffic volumes on the roadway network under future conditions, baseline traffic volumes in the study area were projected to the year 2031. Traffic volumes on the roadway network at that time, in the absence of the Project (that is, the No-Build condition), would include baseline traffic, new traffic due to general background traffic growth, and traffic related to specific development by others expected to be completed by 2031. Inclusion of these factors resulted in the development of 2031 No-Build traffic volumes. Anticipated site-generated traffic volumes were then superimposed upon these No-Build traffic-flow networks to develop the 2031 Build traffic-volume conditions.

### **FUTURE TRAFFIC GROWTH**

Traffic growth on area roadways is a function of the expected land development impacting the study area. Several methods are used to estimate this growth. A procedure frequently employed estimates an annual percentage increase in traffic growth and applies that percentage to all baseline traffic volumes under study. The drawback to such a procedure is that some turning volumes may actually grow at either a higher or a lower rate at particular intersections.

In addition, we identified the location and type of planned development affecting the study area, estimated the traffic to be generated by that development, and assigned it to the area roadway network. This produces a more realistic estimate of growth for local traffic. However, the drawback of this procedure is that the potential growth in population and development external to the study area would not be accounted for in the traffic projections.

To provide a conservative analysis framework, both procedures were used in this TIA.

### **General Background Growth**

Traffic-volume data compiled by MassDOT from permanent count stations and historic traffic counts in the area were reviewed in order to determine general background traffic growth trends. Based on a review of this data and other area traffic studies, it was determined that the traffic volumes are increasing in the area by approximately 0.23 percent per year on average. Therefore, a 1.0 percent per year compounded annual background traffic growth rate was used to account for future traffic growth including presently unforeseen development within the study area.

### Specific Development by Others

The City of Wakefield was contacted in order to determine if there are any planned or approved development projects that are expected to influence future traffic volumes within the study area. Based on these discussions, the following projects were identified for inclusion in this assessment:

- ***Proposed Residential Development (40B) – 32 Nahant Street.*** This project entails construction of a 32-unit multifamily residential building to be located at 32-36 Nahant Street in Wakefield, Massachusetts. Traffic volumes were generated based on the number of units proposed and were added to the future condition networks.
- ***Proposed Residential Development (40B) – 0 Stark Avenue.*** This project entails the construction of four residential buildings that will consist of a total of 12 multifamily units to be located off an extension of Stark Avenue in Wakefield, Massachusetts. Traffic volumes were generated based on the number of units proposed and were added to the future condition networks.
- ***Proposed Residential Development – 10 Broadway Street.*** This project entails construction of a 124-unit multifamily residential building to be located at 10 Broadway Street in Wakefield, Massachusetts. Traffic volumes from the *TIA*<sup>3</sup> submitted by VAI dated July 2022 were added to the future condition networks.
- ***Proposed Mixed-Use Redevelopment – 460 Main Street.*** This project entails construction of a building consisting of 4,400 sf retail space and 16 multifamily units to be located at 460-472 Main Street in Wakefield, Massachusetts. Traffic volumes from the *TIA*<sup>4</sup> submitted by VAI dated June 2023 were added to the future condition networks.

No other developments were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate of 1.0 percent.

### Planned Roadway Improvements

The Town of Wakefield and MassDOT were contacted in order to determine if there are any planned roadway improvement projects expected to be completed within the study area in the seven-year planning horizon. Based on these discussions, the following roadway improvement projects were identified:

- ***Envision Wakefield: Downtown Revitalization – Complete Streets Funding*** This project is being undertaken by the Town of Wakefield with assistance from VHB. Concept plans for the *Downtown Revitalization* implement the following changes at the intersection of Main Street at North Avenue and Nahant Street:
  - At each approach to the intersection crosswalks are repositioned and painted.
  - Intersection sidewalks and curb cuts will be cut back or extended to either increase entering lane widths or add roadway shoulders.
  - There will be no change to the lane configurations after this roadway improvement.

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<sup>3</sup>*Transportation Impact Assessment*, 10 Broadway Street, Wakefield, Massachusetts; VAI; July 2022.

<sup>4</sup>*Transportation Impact Assessment*, 460-472 Main Street, Wakefield, Massachusetts; VAI; June 2023.

- New traffic signal timings will be implemented but were not available from the Town before submitting this report.
- ***Reconstruction of Farm Street at Nahant Street and Farm Street at Hemlock Road.*** This project is being undertaken by the Town of Wakefield. Concept plans provided by the Wakefield Engineering Department show the two T-intersections are proposed to be reconstructed in the future as a combined roundabout.

No other roadway improvement projects aside from routine maintenance activities were identified to be planned within the study area at this time.

### **No-Build Traffic Volumes**

The 2031 No-Build peak-hour traffic-volume networks were developed by applying the 1.0 percent per year compounded annual background traffic growth rate to the 2024 Baseline peak-hour traffic volumes. The resulting 2031 No-Build weekday morning and evening peak-hour traffic-volume networks are shown on Figure 5 and Figure 6, respectively.

### **PROJECT-GENERATED TRAFFIC**

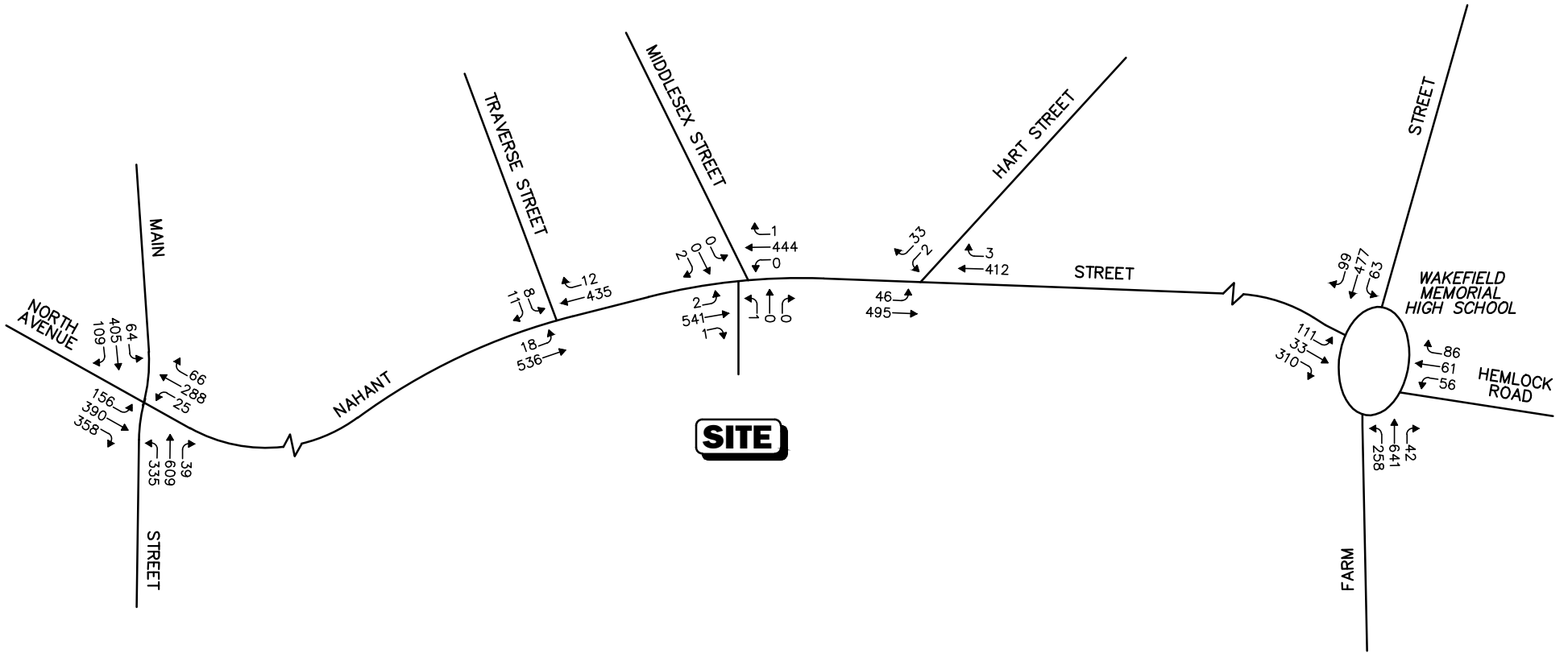
The Project entails razing the existing buildings and constructing a 100-unit residential building. The existing buildings are two single-family residential homes and a 4,480 square foot (sf) manufacturing building. In order to develop the traffic characteristics of the proposed Project, trip-generation statistics published by the Institute of Transportation Engineers (ITE)<sup>5</sup> for Land Use Code (LUC) 140, *Manufacturing*, LUC 210, *Single-Family Detached Housing*, and LUC 221, *Multifamily Housing (Mid-Rise)* were used. A comparison between the existing buildings and the proposed site along with the net traffic increase due to the Project is shown in Table 5.

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<sup>5</sup>*Trip Generation*, 11<sup>th</sup> Edition; Institute of Transportation Engineers; Washington, DC; 2021.







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

Not to Scale

Figure 6

2031 No-Build  
Weekday Evening  
Peak-Hour Traffic Volumes



**Table 5  
PROPOSED SITE TRIP-GENERATION SUMMARY**

Time Period	Existing		Total Trips (C=A+B)	Proposed	Net Change (E=D-C)
	Manufacturing Building <sup>a</sup> (A)	Residential Homes <sup>b</sup> (B)		Residential Building <sup>c</sup> (D)	
Weekday Daily	22	20	42	454	412
<i>Weekday Morning Peak Hour:</i>					
Entering	2	0	2	9	7
<u>Exiting</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>28</u>	<u>26</u>
Total	3	1	4	37	33
<i>Weekday Evening Peak Hour:</i>					
Entering	1	1	2	24	22
<u>Exiting</u>	<u>2</u>	<u>1</u>	<u>3</u>	<u>15</u>	<u>12</u>
Total	3	2	5	39	34

<sup>a</sup>Based on ITE LUC 140, *Manufacturing*; 4,480 sf.

<sup>b</sup>Based on ITE LUC 210, *Single-Family Detached Housing*; 2 units.

<sup>c</sup>Based on ITE LUC 221, *Multifamily Housing (Mid-Rise)*; 100 units.

As can be seen in Table 5, the Project is expected to generate 412 new vehicle trips (approximately 206 entering and exiting) on an average weekday (two-way, 24-hour volume), with 33 new vehicle trips (7 entering and 26 exiting) expected during the weekday morning peak hour and 34 new vehicle trips (22 entering and 12 exiting) expected during the weekday evening peak hour.

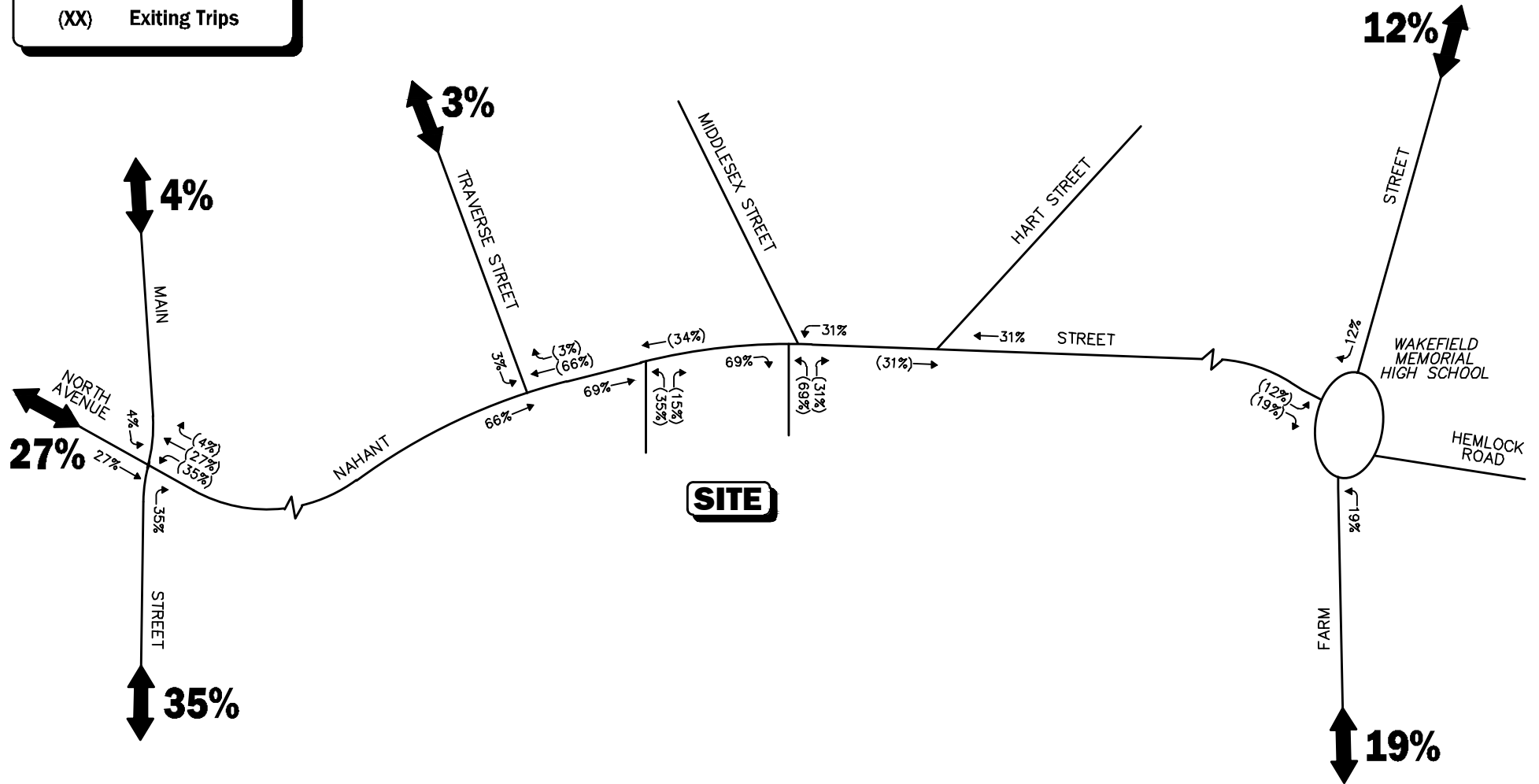
### **TRIP DISTRIBUTION AND ASSIGNMENT**

The directional distribution of the site-generated trips to and from the Project was determined based on a combination of a review of baseline travel patterns at the study area intersections and Journey-to-Work data for Wakefield obtained from the United States Census Bureau.<sup>6</sup> The trip distribution for the Project is summarized in Table 6 and graphically depicted on Figure 7. The weekday morning and evening peak-hour traffic volumes expected to be generated by the Project were assigned on the study area roadway network as shown on Figure 8 and Figure 9, respectively.

<sup>6</sup>2011-2015 5-Year American Community Survey; U.S. Census Bureau; 2019.

**Legend:**

- XX Entering Trips
- (XX) Exiting Trips



Not to Scale

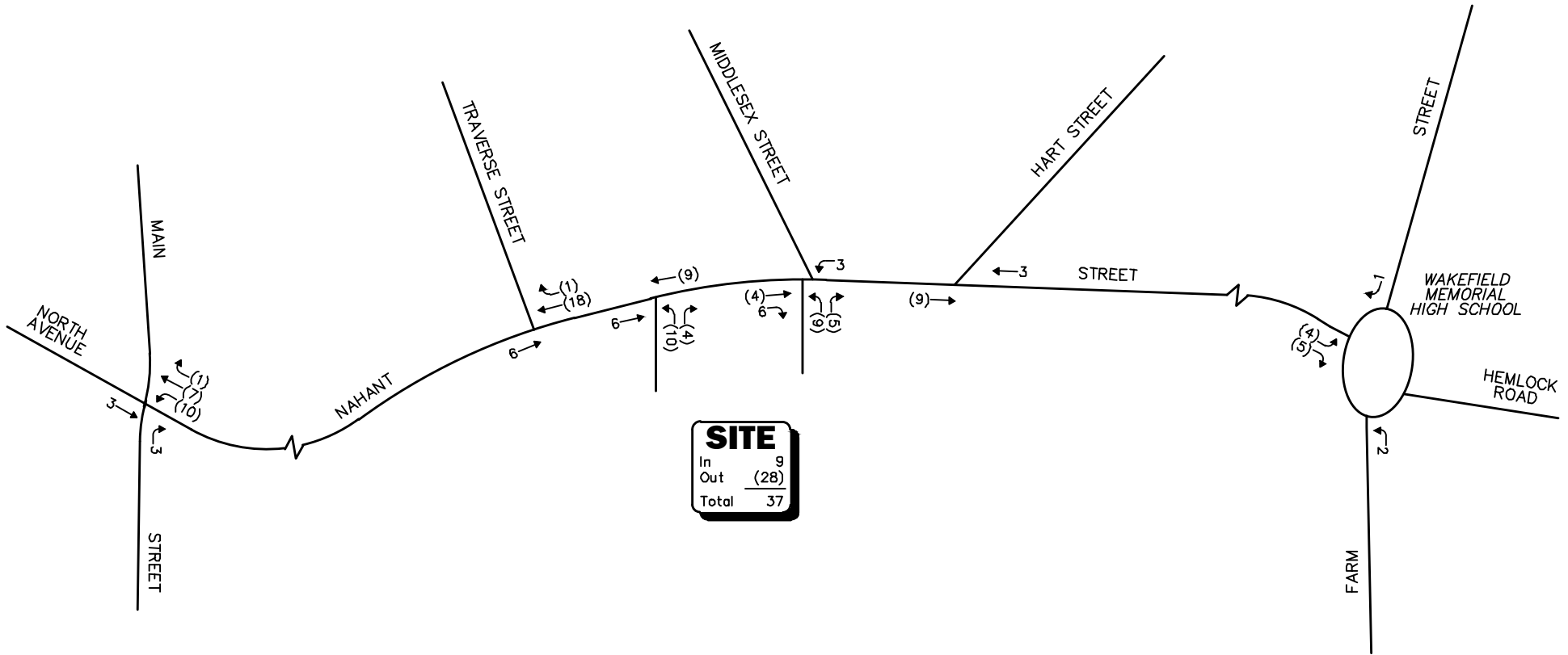
Figure 7  
Trip Distribution Map



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**Legend:**

- XX Entering Trips
- (XX) Exiting Trips



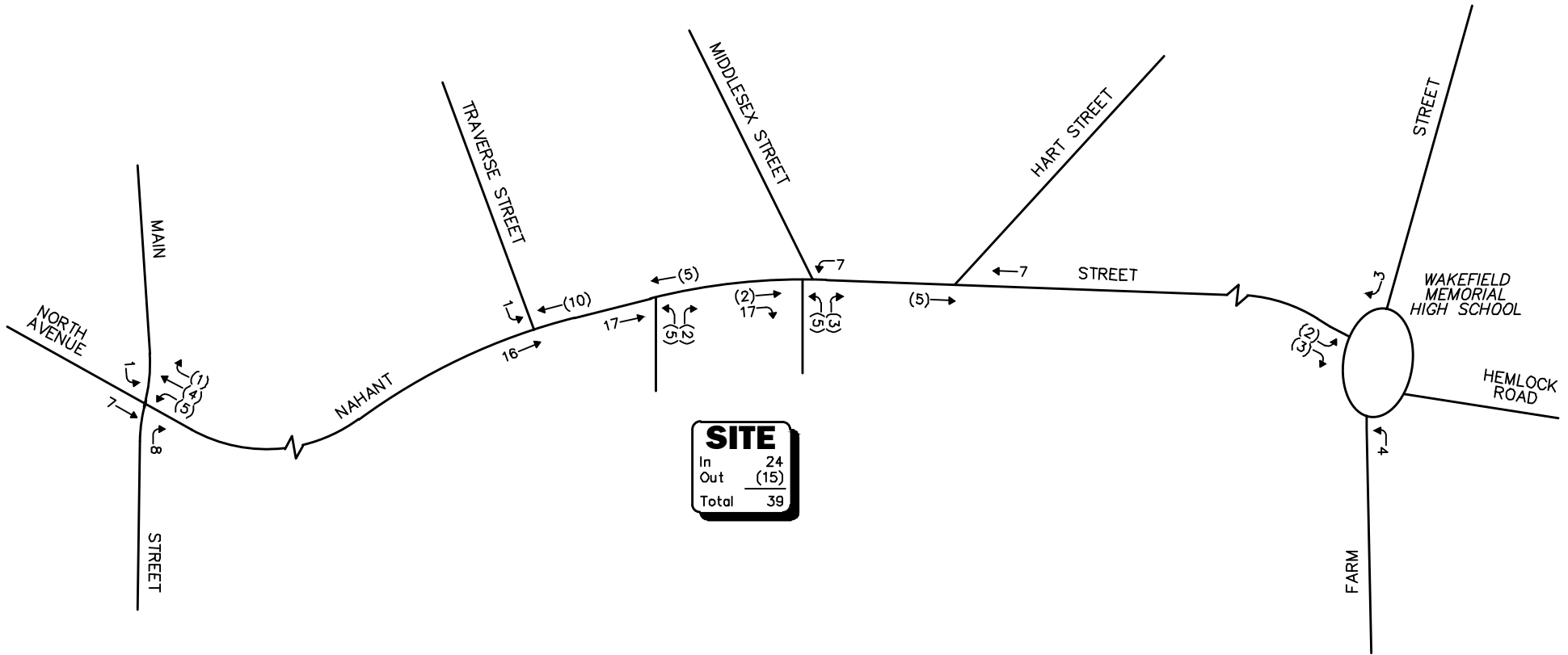
Not to Scale



**Figure 8**  
**Project-Generated**  
**Weekday Morning**  
**Peak-Hour Traffic Volumes**

**Legend:**

- XX Entering Trips
- (XX) Exiting Trips



Not to Scale



**Figure 9**  
**Project-Generated**  
**Weekday Evening**  
**Peak-Hour Traffic Volumes**

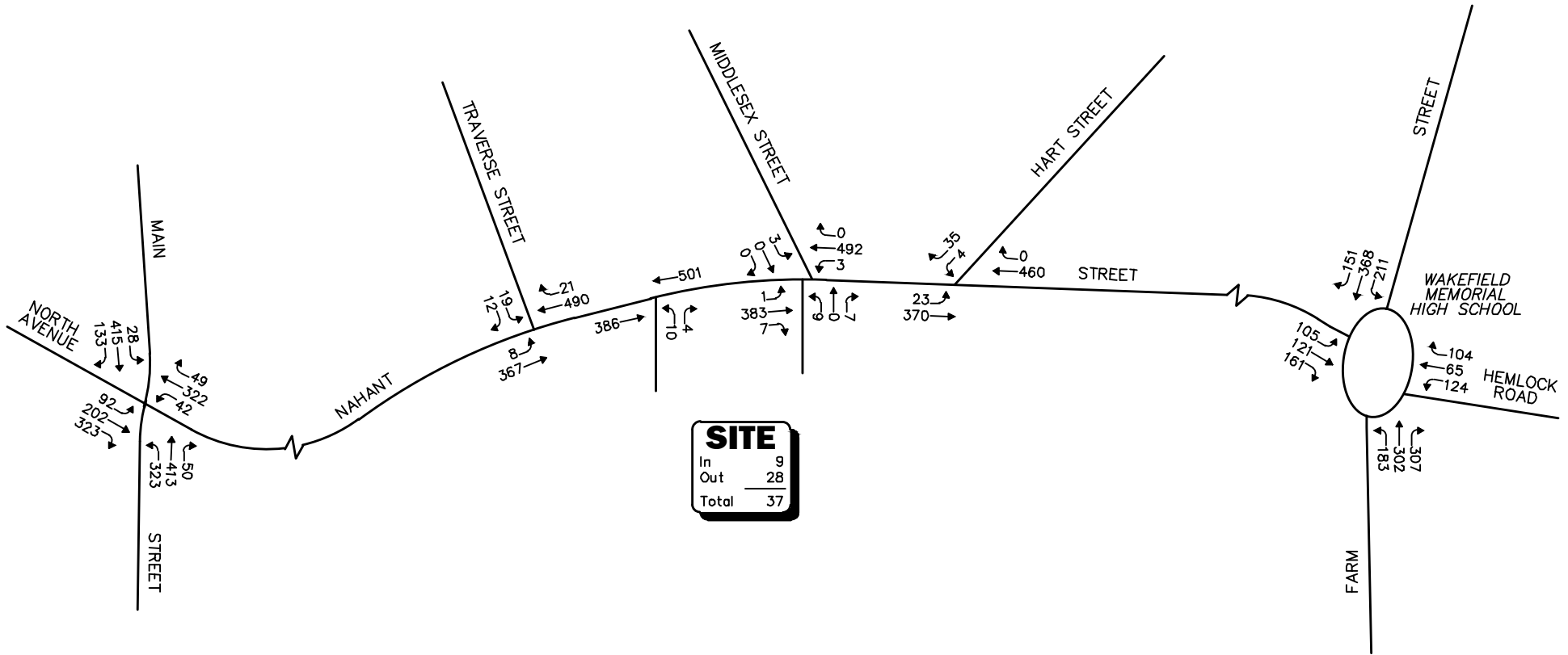
**Table 6**  
**TRIP-DISTRIBUTION SUMMARY**

Roadway	Direction (To/From)	Percent (To/From)
Main Street	North	4
Farm Street	North	12
Traverse Street	North	3
Main Street	South	35
Farm Street	South	19
North Avenue	West	<u>27</u>
<b>TOTAL</b>		100

**FUTURE TRAFFIC VOLUMES – BUILD CONDITION**

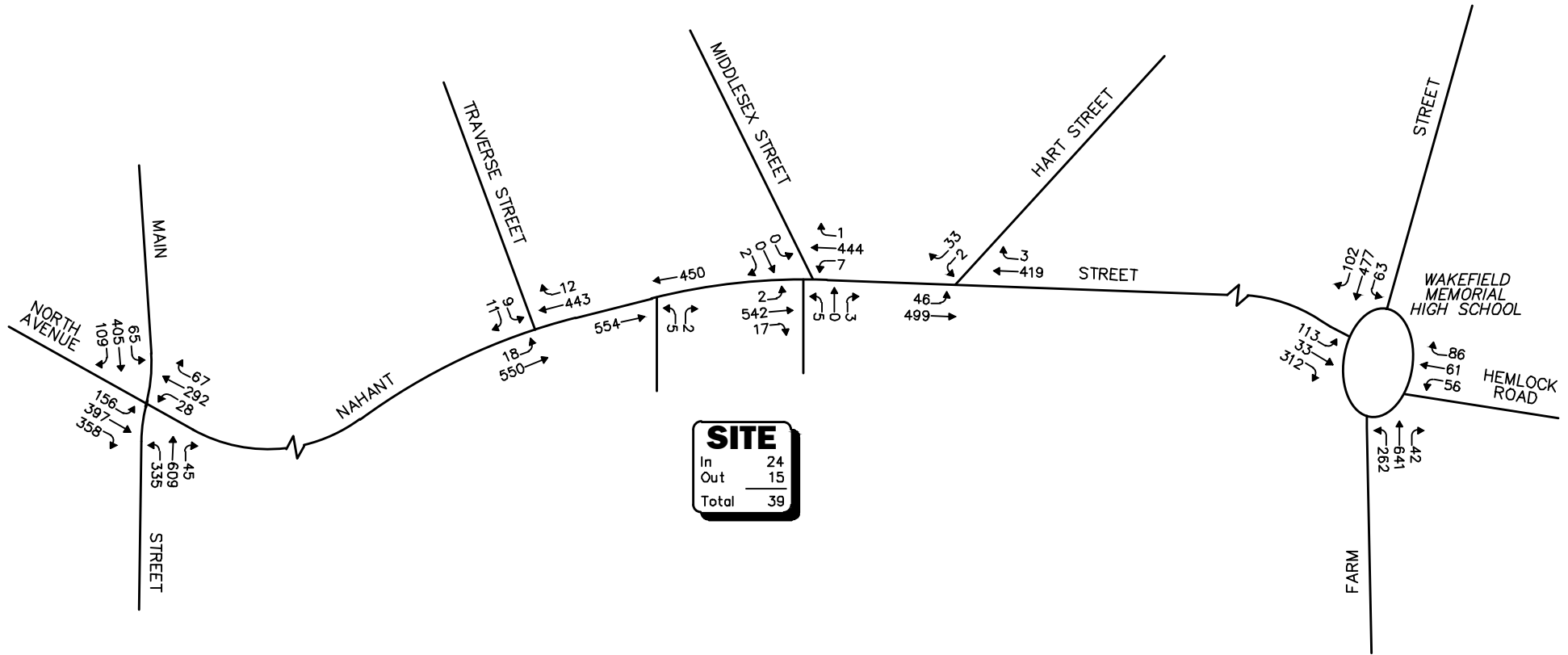
The 2031 Build condition networks consist of the 2031 No-Build traffic volumes with the existing site-generated traffic volumes removed and the anticipated Project-generated traffic added to them. The 2031 Build weekday morning and evening peak-hour traffic-volume networks are graphically depicted on Figure 10 and Figure 11, respectively.

A summary of peak-hour projected traffic-volume increases external to the study area that is the subject of this assessment is shown in Table 7. These volumes are based on the expected increases from the Project.



**Figure 10**  
**2031 Build**  
**Weekday Morning**  
**Peak-Hour Traffic Volumes**





**Figure 11**  
**2031 Build**  
**Weekday Evening**  
**Peak-Hour Traffic Volumes**





**Table 7**  
**PEAK-HOUR TRAFFIC-VOLUME INCREASES**

Location/Peak Hour	2031 No-Build	2031 Build	Traffic-Volume Increase Over No-Build	Percent Increase Over No-Build
<i>Main Street, north of Nahant Street:</i>				
Weekday Morning	1,129	1,130	1	0.1
Weekday Evening	1,409	1,411	2	0.1
<i>Farm Street, north of Nahant Street:</i>				
Weekday Morning	1,236	1,241	5	0.4
Weekday Evening	1,477	1,482	5	0.3
<i>Traverse Street, north of Nahant Street:</i>				
Weekday Morning	59	60	1	1.7
Weekday Evening	49	50	1	2.0
<i>Main Street, south of Nahant Street:</i>				
Weekday Morning	1,556	1,566	10	0.6
Weekday Evening	1,771	1,780	9	0.5
<i>Farm Street, south of Hemlock Road:</i>				
Weekday Morning	1,439	1,445	6	0.4
Weekday Evening	1,784	1,790	6	0.3
<i>North Avenue, west of Main Street:</i>				
Weekday Morning	1,385	1,395	10	0.7
Weekday Evening	1,636	1,647	11	0.7

As shown in Table 7, Project-related traffic-volume increases external to the study area relative to 2031 No-Build conditions are anticipated to range from 1 to 11 vehicles or 0.1 to 2.0 percent during the peak periods.

### **PARKING DEMAND**

A parking demand analysis was performed to evaluate the ability of the proposed parking supply to accommodate the anticipated parking demand for the Project. In order to identify the parking demand for this Project, parking demand calculations were performed based on data published by the ITE. The ITE provides parking generation equations for a number of land use codes as part of their *Parking Generation* manual<sup>7</sup> including LUC 221, *Multifamily Housing (Mid-Rise)*. While the Project is approximately 0.75-miles from the Wakefield commuter rail station, it does not meet the ITE definition for a site close to transit and therefore ITE data for sites further than 0.5 mile from rail transit was used. Table 8 summarizes the ITE parking demand calculations applied to the Project.

<sup>7</sup>*Parking Demand, 6<sup>th</sup> Edition*, Institute of Transportation Engineers, Washington D.C., 2023.

**Table 8**  
**WEEKDAY PEAK-PARKING DEMAND<sup>a</sup>**

Units	Spaces	
	ITE Indicated Parking Demand	Proposed Parking Supply
100	113	133

<sup>a</sup>ITE *Parking Generation Manual* LUC 221, *Multifamily Housing (Mid-Rise, Not close to rail transit)*.

As shown in Table 8, ITE indicates the weekday evening peak-parking demand for this Project is 113 parking spaces, which is below the proposed supply of 133 parking spaces. The proposed parking supply corresponds to a parking ratio of 1.33 parking spaces per unit. This ratio falls within the ITE range rates (0.39-1.75) for this use.

As a development permitted under Massachusetts General Laws Chapter 40B, the Project parking supply is not required to comply with the minimum parking requirements of Section 190-41, Required Off-Street Parking Spaces,<sup>8</sup> of the Town of Wakefield Zoning By-law which would require 2.0 parking spaces per unit. However, new publications indicate that a smaller number of parking spaces, below the 1.5-2.0 spaces per residential unit rates, are desirable. The recent update to the 2023 MAPC *Perfect Fit Parking Initiative* study<sup>9</sup> includes data on parking demand for Melrose and Malden, with are south of Wakefield but are along the same commuter rail line. The study indicates that at these communities during periods of peak parking demand, only 74 percent of the parking spaces at observed multifamily residential developments (during the peak overnight demand period) were occupied. At these properties, the average total parking supply was 1.04 spaces per unit, but the average parking demand was 0.72 space per unit. It is important to note that the MAPC and Northshore community data is likely more representative of area parking demands than the national data from ITE. The Project proponent will actively manage the parking to ensure residents and visitors park on-site.

<sup>8</sup>The Town of Wakefield Zoning by Law (Section 190-41.B) requires a parking rate of 1.5 spaces per residential unit for multifamily attached dwellings providing two bedrooms or fewer and 2.0 spaces per residential unit for multifamily attached dwellings providing three bedrooms.

<sup>9</sup>*Perfect Fit Parking Initiative: Phase 4 Update*, MAPC, July 2023.

## SIGHT DISTANCE EVALUATION

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Sight distance measurements were performed at the site driveway intersections with Nahant Street in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)<sup>10</sup> recommendations. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance recommended to be provided by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD is the sight distance recommended to be provided by a driver entering or crossing an intersecting roadway to perceive an on-coming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. ***In accordance with AASHTO standards, if the measured ISD is at least equal to the recommended SSD value for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions.*** Table 9 presents the measured SSD and ISD at the subject intersections.

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<sup>10</sup> *A Policy on Geometric Design of Highway and Streets*, 7<sup>th</sup> Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.

**Table 9**  
**SIGHT DISTANCE ANALYSIS<sup>a</sup>**

Intersection/Sight Distance Measurement	Recommended Distances (Feet)	Field Measured Distances (Feet)
	Speed Limit (EB/WB) of (29/26) mph on Nahant Street	
<b><i>Nahant Street at the Project site east driveway</i></b>		
<i>Stopping Sight Distance:</i>		
Nahant Street approaching from the east	165	380
Nahant Street approaching from the west	190	415
<i>Intersection Sight Distance<sup>b</sup>:</i>		
Left turn from site driveway (looking east)	290	180
Left turn from site driveway (looking west)	320	410
<b><i>Nahant Street at the Project site west driveway</i></b>		
<i>Stopping Sight Distance:</i>		
Nahant Street approaching from the east	165	451
Nahant Street approaching from the west	190	300
<i>Intersection Sight Distance:</i>		
Left turn from site driveway (looking east)	290	435
Left turn from site driveway (looking west)	320	164 (233) <sup>c</sup>

<sup>a</sup>Recommended values obtained from *A Policy on Geometric Design of Highways and Streets*, 7<sup>th</sup> Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018.

<sup>b</sup>Values shown are the intersection sight distance for a vehicle turning right or left exiting a roadway under STOP control such that motorists approaching the intersection on the major street should not need to adjust their travel speed to less than 70 percent of their initial approach speed.

<sup>c</sup>Value exists at 12 feet back from the edge of traveled way.

As can be seen in Table 9, the sight distance at the intersection of the Project site east driveway with Nahant Street were found to exceed the recommended values for SSD, and only for ISD looking west. The sight distance at the intersection of the Project site west driveway with Nahant Street were found to exceed the recommended values for SSD approaching from the west, and ISD looking east. The sight distance measurements for the ISD left turn from the site driveway (looking west) was measured at 164 feet using standard AASHTO guidelines of 14.5 feet back from the edge of traveled way. However, at a point 12 feet back from the edge of the traveled way, sight distance increases from 164 to 233 feet. Since motorists typically do not enter the roadway from 14.5 feet back from the traveled way but instead proceed until the front of the vehicle is at the edge of the traveled way, it is likely that the sight distance of 233 feet will be available to motorists exiting the driveway.

# **TRAFFIC OPERATIONS ANALYSIS**

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Measuring baseline and future traffic volumes quantify traffic flow within the study area. To assess quality of flow, roadway capacity, and vehicle queue analyses were conducted under Baseline, No-Build, and Build traffic-volume conditions. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them, with vehicle queue analyses providing a secondary measure of the operational characteristics of an intersection or section of roadway under study.

## **METHODOLOGY**

### **Levels of Service**

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.<sup>11</sup> The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best-operating conditions and LOS F representing congested or constrained operating conditions.

Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

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<sup>11</sup>The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual 6<sup>th</sup> Edition*; Transportation Research Board; Washington, DC; 2016.

## Signalized Intersections

The six levels of service for signalized intersections may be described as follows:

- *LOS A* describes operations with very low control delay; most vehicles do not stop at all.
- *LOS B* describes operations with relatively low control delay. However, more vehicles stop than *LOS A*.
- *LOS C* describes operations with higher control delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
- *LOS D* describes operations with control delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop, and individual cycle failures are noticeable.
- *LOS E* describes operations with high control delay values. Individual cycle failures is frequent occurrences.
- *LOS F* describes operations with high control delay values that often occur with oversaturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Levels of service for signalized intersections were calculated using the Percentile Delay Method implemented as a part of the Synchro™ 11 software as required by MassDOT. The Percentile Delay Method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on “percentile” delay. Level-of-service designations are based on the criterion of percentile delay per vehicle and is a measure of: i) driver discomfort; ii) motorist frustration; and iii) fuel consumption; and includes a uniform delay based on percentile volumes using a Poisson arrival pattern, an initial queue move-up time, and a queue interaction delay that accounts for delays resulting from queues extending from adjacent intersections. Table 10 summarizes the relationship between level-of-service and percentile delay and uses the same numerical delay thresholds as the HCM method. The tabulated percentile delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to entire intersections.

**Table 10**  
**LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS<sup>a</sup>**

Level of Service	Percentile Delay Per Vehicle (Seconds)
A	≤10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	>80.0

<sup>a</sup>Source: Highway Capacity Manual; Transportation Research Board; Washington, DC; 2000; page 16-2.

## Unsignalized Intersections

The six levels of service for unsignalized intersections may be described as follows:

- *LOS A* represents a condition with little or no control delay to minor street traffic.
- *LOS B* represents a condition with short control delays to minor street traffic.
- *LOS C* represents a condition with average control delays to minor street traffic.
- *LOS D* represents a condition with long control delays to minor street traffic.
- *LOS E* represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
- *LOS F* represents a condition where minor street demand volume exceeds capacity of an approach lane, with control delays resulting.

The levels of service of unsignalized intersections are determined by application of a procedure described in the *Highway Capacity Manual 6<sup>th</sup> Edition* (HCM). Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the *Highway Capacity Manual 6<sup>th</sup> Edition*. Table 11 summarizes the relationship between level of service and average control delay.

**Table 11**  
**LEVEL-OF-SERVICE CRITERIA FOR**  
**UNSIGNALIZED INTERSECTIONS<sup>a</sup>**

Level-of-Service by Volume-to-Capacity Ratio		Average Control Delay (Seconds Per Vehicle)
$v/c \leq 1.0$	$v/c > 1.0$	
A	F	$\leq 10.0$
B	F	10.1 to 15.0
C	F	15.1 to 25.0
D	F	25.1 to 35.0
E	F	35.1 to 50.0
F	F	$> 50.0$

<sup>a</sup>Source: *Highway Capacity Manual 6<sup>th</sup> Edition*; Transportation Research Board; Washington, DC; 2016; page 20-6.

## **SIDRA: Rotary Analysis**

The unsignalized capacity analysis for the approaches at the future Farm Street at Nahant Street and Hemlock Road rotary is based on the procedures described in the Traffic Signalized and Unsignalized Intersection Design and Research Aid (SIDRA) Intersection.<sup>12</sup> The main features of the SIDRA Intersection method for unsignalized capacity estimation are the dependence of gap acceptance parameters on roadway geometry, entry lane flows, and the designation of traffic control on approach lanes.

The SIDRA analytical model calculates several components of delay. One of these, the average total delay component, produces level-of-service results based on the concepts described in the HCM. The delay ranges that define levels of service for roundabouts are shown in Table 12.

**Table 12**  
**LEVEL-OF-SERVICE CRITERIA FOR SIDRA:**  
**UNSIGNALIZED INTERSECTIONS<sup>a</sup>**

Level-Of-Service	Control Delay Per Vehicle (Seconds)
A	≤10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 50.0
E	50.1 to 70.0
F	>70.0

<sup>a</sup>Source: *SIDRA Intersection 9.0 User Guide*; Akcelik & Associates Pty Ltd; Greythorn, Victoria 3104, Australia; October 2020.

<sup>12</sup>Traffic Signalized and Unsignalized Intersection Design and Research Aid, SIDRA Intersection 9.0 User Guide; Akcelik & Associates Pty Ltd; Greythorn, Victoria 3104, Australia; October 2020.



## **ANALYSIS RESULTS**

Level-of-service analyses were conducted for 2024 Baseline, 2031 No-Build, and 2031 Build conditions for the study area intersections. The results of the intersection capacity analysis within the study area are described below, with a tabular summary provided in Tables 13, 14, and 15.

### **Signalized Intersection**

#### **Main Street at North Avenue and Nahant Street**

Under 2024 Baseline conditions, this intersection operates at an overall LOS C during the weekday morning and evening peak hours. Under 2031 No-Build conditions, this intersection operates at an overall LOS D during the weekday morning and evening peak hours. No changes to the overall level of service under 2031 Build conditions due to the addition of Project traffic. The vehicle queue lengths increase by, at the most, 2 vehicles with the addition of Project traffic.

**Table 13**  
**SIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY**

Signalized Intersection/Peak Hour/Movement	2024 Baseline				2031 No-Build				2031 Build			
	V/C <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup> Avg/95 <sup>th</sup>	V/C	Delay	LOS	Queue Avg/95 <sup>th</sup>	V/C	Delay	LOS	Queue Avg/95 <sup>th</sup>
<i>Main Street at North Avenue and Nahant Street</i>												
<i>Weekday Morning:</i>												
North Avenue EB LT	0.52	52.8	D	2/5	0.52	41.1	D	1/5	0.54	42.6	D	1/6
North Avenue EB TH	0.44	40.8	D	4/9	0.41	29.7	C	3/8	0.42	29.9	C	3/8
North Avenue EB RT	0.36	2.2	A	0/1	0.35	2.0	A	0/1	0.35	2.0	A	0/1
Nahant Street WB LT/TH/RT	0.80	54.1	D	9/20	0.84	47.1	D	7/19	0.89	52.8	D	7/21
Main Street NB LT	0.73	30.0	C	5/11	0.86	43.8	D	4/15	0.86	43.8	D	4/15
Main Street NB TH/RT	0.60	26.5	C	9/16	0.68	29.0	C	6/19	0.68	29.2	C	6/19
Main Street SB LT	0.16	40.3	D	1/2	0.18	36.5	D	1/2	0.18	36.5	D	1/2
Main Street SB TH/RT	0.74	44.5	D	7/11	0.86	46.6	D	5/13	0.86	46.6	D	5/13
<b>Overall</b>	--	<b>34.3</b>	<b>C</b>	--	--	<b>35.1</b>	<b>D</b>	--	--	<b>36.2</b>	<b>D</b>	--
<i>Weekday Evening:</i>												
North Avenue EB LT	0.59	44.8	D	3/10	0.65	50.1	D	4/11	0.66	50.7	D	4/11
North Avenue EB TH	0.68	40.2	D	8/21	0.66	42.0	D	11/21	0.67	42.5	D	11/21
North Avenue EB RT	0.35	2.3	A	1/2	0.40	5.4	A	2/3	0.40	5.6	A	2/4
Nahant Street WB LT/TH/RT	0.69	40.6	D	7/20	0.77	47.9	D	11/23	0.82	52.4	D	12/25
Main Street NB LT	0.69	26.6	C	5/10	0.81	37.4	D	6/18	0.81	37.4	D	6/18
Main Street NB TH/RT	0.80	33.8	C	12/24	0.77	34.9	C	17/36	0.78	35.3	D	17/36
Main Street SB LT	0.47	49.6	D	1/4	0.48	49.3	D	2/5	0.50	50.7	D	2/5
Main Street SB TH/RT	0.70	41.5	D	5/10	0.46	33.6	C	7/12	0.46	33.6	C	7/12
<b>Overall</b>	--	<b>33.0</b>	<b>C</b>	--	--	<b>35.1</b>	<b>D</b>	--	--	<b>36.0</b>	<b>D</b>	--

<sup>a</sup>Volume-to-capacity ratio.

<sup>b</sup>Control (signal) delay per vehicle in seconds.

<sup>c</sup>Level of service.

<sup>d</sup>Queue length in vehicles.

NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

## **Unsignalized Intersections**

### **Nahant Street at Traverse Street**

Under 2024 Baseline and 2031 No-Build conditions, the critical movement at this intersection operates at LOS C during the weekday morning and evening peak hours. There is no change in the level of service under 2031 Build conditions. The queue is not expected to increase under 2031 Build conditions compared to 2031 No-Build conditions.

### **Nahant Street at Middlesex Street and the existing driveway (Project Site East Driveway)**

Under 2024 Baseline conditions, the critical movements at this intersection operate at LOS C during the weekday morning peak hour and LOS C or better during the weekday evening peak hour. Under 2031 No-Build conditions, the critical movements at this intersection operate at LOS D or better during the weekday morning peak hour and LOS C or better during the weekday evening peak hour. There is no change in the level of service under 2031 Build conditions. The queue is not expected to increase under 2031 Build conditions compared to 2031 No-Build conditions.

### **Nahant Street at Hart Street**

Under 2024 Baseline and 2031 No-Build conditions, the critical movement at this intersection operates at LOS B during the weekday morning and evening peak hours. There is no change in the level of service under 2031 Build conditions. The queue is not expected to increase under 2031 Build conditions compared to 2031 No-Build conditions.

### **Farm Street at Nahant Street**

Under 2024 Baseline conditions, the critical movements at this intersection operate at LOS F or better during the weekday morning and evening peak hours. Under future conditions, this intersection will be reconstructed as part of a roundabout.

### **Farm Street at Hemlock Road**

Under 2024 Baseline conditions, the critical movement at this intersection operates at LOS F during the weekday morning and evening peak hours. Under future conditions, this intersection will be reconstructed as part of a roundabout.

### **Nahant Street at the Project Site West Driveway**

Under 2031 Build conditions, the critical movement at this intersection operates at LOS C during the weekday morning and evening peak hours. Under 2031 Build conditions, the average vehicle queue is 1 vehicle during the morning and evening peak hours.

**Table 14**  
**UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY**

Unsignalized Intersection/ Critical Movement/Peak Hour	2024 Baseline				2031 No-Build				2031 Build			
	Demand <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	Demand	Delay	LOS	Queue	Demand	Delay	LOS	Queue
<b><i>Nahant Street at Traverse Street</i></b>												
<i>Weekday Morning:</i>												
Traverse Street SB LT/RT	29	17.9	C	1	31	20.0	C	1	31	20.7	C	1
<i>Weekday Evening:</i>												
Traverse Street SB LT/RT	17	15.0	C	1	19	16.4	C	1	20	17.2	C	1
<b><i>Nahant Street at Middlesex Street and the existing driveway (Project Site Driveway)</i></b>												
<i>Weekday Morning:</i>												
Existing dwy (Project Site East Dwy) NB LT/TH/RT	3	15.1	C	1	3	16.4	C	1	16	22.5	C	1
Middlesex Street SB LT/TH/RT	3	23.1	C	1	3	26.3	D	1	3	27.8	D	1
<i>Weekday Evening:</i>												
Existing dwy (Project Site East Dwy) NB LT/TH/RT	1	21.4	C	1	1	23.8	C	1	8	21.9	C	1
Middlesex Street SB LT/TH/RT	2	11.0	B	0	2	11.3	B	0	2	11.3	B	0
<b><i>Nahant Street at Hart Street</i></b>												
<i>Weekday Morning:</i>												
Hart Street SB LT/RT	36	12.6	B	1	39	13.1	B	1	39	13.2	B	1
<i>Weekday Evening:</i>												
Hart Street SB LT/RT	33	11.5	B	1	35	12.0	B	1	35	12.1	B	1
<b><i>Farm Street at Nahant Street</i></b>												
<i>Weekday Morning:</i>												
Nahant Street EB LT	90	>50.0	F	10								
Nahant Street EB RT	260	31.8	D	6								
<i>Weekday Evening:</i>												
Nahant Street EB LT	103	>50.0	F	14								
Nahant Street EB RT	319	26.5	D	5								
<b><i>Farm Street at Hemlock Road</i></b>												
<i>Weekday Morning:</i>												
Hemlock Road WB LT/RT	293	>50.0	F	54								
<i>Weekday Evening:</i>												
Hemlock Road WB LT/RT	827	>50.0	F	22								

See Table 15 for future conditions.

See Table 15 for future conditions.

See notes at the end of table.

**Table 14 (Continued)**  
**UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY**

Unsignalized Intersection/ Critical Movement/Peak Hour	2024 Baseline				2031 No-Build				2031 Build			
	Demand <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	Demand	Delay	LOS	Queue	Demand	Delay	LOS	Queue
<b><i>Nahant Street at Project Site West Driveway</i></b>												
<i>Weekday Morning:</i>												
Project Site West Dwy NB LT/RT	Intersection only exists under Build conditions.								14	19.1	C	1
<i>Weekday Evening:</i>												
Project Site West Dwy NB LT/RT									7	18.5	C	1

<sup>a</sup>Demand in vehicles per hour.

<sup>b</sup>Delay in seconds per vehicle.

<sup>c</sup>Level of service.

<sup>d</sup>95th percentile queue length (veh).

NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

## **Rotary Intersections**

### **Farm Street at Nahant Street and Hemlock Road**

Under 2031 No-Build conditions, the rotary operates at an overall LOS D during the weekday morning peak hour and LOS C during the evening peak hour. There is no change in the level of service under 2031 Build conditions. The queue is expected to increase by at most 2 vehicles under 2031 Build conditions compared to 2031 No-Build conditions.

**Table 15**  
**ROTARY CAPACITY ANALYSIS SUMMARY**

Unsignalized Intersection/ Critical Movement/Peak Hour	2024 Baseline				2031 No-Build				2031 Build			
	Demand <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	Demand	Delay	LOS	Queue	Demand	Delay	LOS	Queue
<b><i>Farm Street at Nahant Street and Hemlock Road</i></b>												
<i>Weekday Morning:</i>												
Nahant Street EB LT/TH/RT					378	21.5	C	8	387	21.8	C	8
Hemlock Road WB LT/TH/RT					293	20.8	C	7	293	20.9	C	7
Farm Street NB LT/TH/RT					791	42.5	D	34	792	43.0	D	34
Farm Street SB LT/TH/RT					727	40.7	D	31	730	40.9	D	31
<b>Overall</b>		See in Table 14			--	<b>35.4</b>	<b>D</b>	--	--	<b>35.6</b>	<b>D</b>	--
<i>Weekday Evening:</i>												
Nahant Street EB LT/TH/RT					454	17.9	B	8	458	18.3	B	8
Hemlock Road WB LT/TH/RT					203	38.3	D	8	203	39.3	D	8
Farm Street NB LT/TH/RT					941	36.8	D	44	945	37.9	D	46
Farm Street SB LT/TH/RT					639	22.7	C	16	642	23.3	C	17
<b>Overall</b>					--	<b>29.1</b>	<b>C</b>	--	--	<b>29.9</b>	<b>C</b>	--

<sup>a</sup>Demand in vehicles per hour.

<sup>b</sup>Delay in seconds per vehicle.

<sup>c</sup>Level of service.

<sup>d</sup>95th percentile queue length (veh).

NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

## **RECOMMENDATIONS AND CONCLUSIONS**

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VAI has prepared this TIA to identify traffic impacts associated with a proposed residential development to be located at 119-135 Nahant Street in Wakefield, Massachusetts. This study was prepared in accordance with MassDOT Guidelines for TIAs; and was conducted with input from the Wakefield TAC and the Wakefield Engineering Department. Based on the results of this study, the following can be concluded:

- The study area intersection crash rates were observed to be lower than the MassDOT District 4 crash rates for unsignalized and signalized intersections.
- The Project is expected to generate 412 new vehicle trips (approximately 206 entering and exiting) on an average weekday (two-way, 24-hour volume), with 33 new vehicle trips (7 entering and 26 exiting) expected during the weekday morning peak hour and 34 new vehicle trips (22 entering and 12 exiting) expected during the weekday evening peak hour.
- The sight distance at the intersection of the Project site east driveway with Nahant Street was found to exceed the recommended values for SSD and ISD looking west. The Project site west driveway was found to exceed the recommended values for SSD approaching from the west and ISD looking east.
- The analysis has indicated that the Project will generally result in minimal impact on motorist delays and vehicle queue lengths at the study intersection.
- Items requested to be reviewed by the Wakefield TAC included the amount of truck traffic on Nahant Street, levels of cut-through traffic, and expanded data collection during the afternoon school dismissal period. None of these items appeared to present excessive negative conditions during the periods reviewed.
- Vehicle speeds were shown to be higher than the posted speed limit of 20 mph on Nahant Street. Measures are proposed to address this condition.

### **RECOMMENDATIONS**

A transportation improvement program has been developed that is designed to provide safe access to the Project and address any deficiencies identified at the study area locations. The following



improvements have been recommended as a part of this evaluation:

### **Project Access**

Access to the Project site will be provided via two curb cuts onto Nahant Street. As the site currently has two curb cuts, the Project will not increase number of curb cuts onto Nahant Street. The following recommendations are offered with respect to the design and operation of the Project site driveways:

- The driveways should be placed under STOP-sign (MUTCD R1-1) control, with a painted STOP-bar included.
- All signs and other pavement markings to be installed within the Project site shall conform to the applicable standards of the current MUTCD.
- Signs and landscaping adjacent to the Project site driveways should be designed and maintained so as not to restrict lines of sight.
- Snow windrows within sight triangle areas of the Project site driveways should be promptly removed where such accumulations would impede sightlines.

### **Nahant Street Traffic Calming**

Increasing the amount of speed limit signage and the presence of police officers along Nahant Street could reduce vehicle speeds to the posted limit of 20 mph. A design speed of 20 mph corresponds to an SSD of 115 feet, which would fall inside the measured SSD of the Project site west driveway approaching from the west. It is suggested that in order to address the speeding issues on Nahant Street, a radar speed feedback sign could be installed on each approach of Nahant Street in the vicinity of the Project or on straight segments of the street. The same type of sign that exists on Nahant Street near Partridge Lane could be utilized.

### **CONCLUSIONS**

As documented in this study, Project-related traffic increases will not result in significant increases in traffic volumes or traffic delays within the study area. The site driveways will provide adequate access to and from the development. In general, Project-related traffic can be adequately accommodated within the existing and future infrastructure with minimal impact on the traffic operations within the study area.

## APPENDIX

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AUTOMATIC TRAFFIC RECORDER  
TRAFFIC COUNT DATA  
SEASONAL ADJUSTMENT DATA  
PUBLIC TRANSPORTATION SCHEDULES  
MASSDOT CRASH RATE WORKSHEETS  
VEHICLE SPEED DATA  
GROWTH RATE DATA  
TRIP GENERATION DATA  
TRIP DISTRIBUTION DATA  
PARKING ANALYSIS  
CAPACITY ANALYSIS



AUTOMATIC TRAFFIC RECORDER

---



Accurate Counts  
978-664-2565

Location : Nahant Street  
 Location : East of Middlesex Street  
 City/State: Wakefield, MA  
 Direction: EB

Site Code: 98560001

12/20/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	2	0	4	2	0	1	0	0	0	0	9
1:00	0	0	0	1	0	1	0	1	1	0	0	0	0	0	4
2:00	0	0	1	0	0	0	1	4	0	0	1	0	0	0	7
3:00	0	0	0	0	1	0	0	2	1	0	0	0	0	0	4
4:00	0	0	0	0	2	0	3	3	1	1	2	0	0	0	12
5:00	0	0	0	0	2	4	6	6	8	7	0	1	1	0	35
6:00	0	0	0	0	6	11	16	23	31	15	7	1	3	3	116
7:00	0	0	1	9	5	11	29	64	75	53	15	10	9	4	285
8:00	0	0	1	4	16	23	33	71	55	40	12	8	4	2	269
9:00	0	0	5	5	11	16	33	40	42	20	16	6	6	1	201
10:00	0	0	0	5	19	13	33	34	42	24	11	3	2	2	188
11:00	0	0	1	2	9	26	24	37	44	33	17	3	1	0	197
12:00 PM	0	0	0	4	12	20	23	35	52	30	16	8	7	5	212
1:00	0	0	2	13	19	17	39	47	51	18	14	5	5	5	235
2:00	0	0	4	14	30	36	41	81	52	24	16	3	6	4	311
3:00	0	0	8	21	20	22	65	100	94	40	15	17	5	3	410
4:00	0	0	4	3	23	39	65	129	91	40	24	6	6	5	435
5:00	0	0	15	13	24	27	77	126	93	37	20	6	3	1	442
6:00	0	0	1	2	9	23	46	74	68	28	9	6	2	0	268
7:00	0	0	0	1	17	13	27	57	43	24	9	4	4	2	201
8:00	0	0	0	0	13	22	21	20	21	14	7	5	1	1	125
9:00	0	0	0	1	12	10	10	10	20	9	6	1	0	1	80
10:00	0	0	0	0	5	10	10	5	1	3	1	1	0	0	36
11:00	0	0	0	0	4	7	2	4	2	3	0	1	0	0	23
Total	0	0	43	98	261	351	608	975	888	464	218	95	65	39	4105

Percentile 15th 50th 85th 95th  
 Speed 17 23 29 33  
 Mean Speed (Average) 24.1  
 10 MPH Pace Speed 18-27  
 Number in Pace 2622  
 Percent in Pace 63.9%  
 Number > 24 MPH 1769  
 Percent > 24 MPH 43.1%

Accurate Counts  
978-664-2565

Location : Nahant Street  
 Location : East of Middlesex Street  
 City/State: Wakefield, MA  
 Direction: EB

Site Code: 98560001

12/21/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	2	1	2	2	0	0	0	0	0	7
1:00	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
2:00	0	0	0	1	0	1	0	0	1	0	0	1	0	0	4
3:00	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
4:00	0	0	0	0	1	2	4	5	2	1	1	1	0	0	17
5:00	0	0	0	0	4	3	2	8	13	3	2	1	0	0	36
6:00	0	0	1	2	2	9	20	16	26	12	16	6	3	1	114
7:00	0	0	1	4	9	12	51	57	69	45	26	18	10	4	306
8:00	0	0	0	5	13	13	28	51	54	40	19	5	8	3	239
9:00	0	0	1	0	10	12	30	41	38	16	20	4	3	1	176
10:00	0	0	1	2	11	11	31	42	54	28	17	3	7	1	208
11:00	0	0	0	4	7	12	23	37	47	23	24	10	4	4	195
12:00 PM	0	0	0	3	11	10	21	39	58	32	20	12	3	4	213
1:00	0	0	0	5	8	11	30	47	48	36	18	12	9	7	231
2:00	0	0	3	6	14	41	58	57	65	47	27	8	11	8	345
3:00	0	0	3	5	19	34	75	69	90	45	26	16	6	2	390
4:00	0	0	8	13	20	52	89	113	82	45	18	10	1	1	452
5:00	0	0	3	3	29	23	80	114	88	41	28	9	2	2	422
6:00	0	0	1	4	21	22	49	85	82	32	22	8	3	2	331
7:00	0	0	1	3	10	14	34	33	25	17	2	5	3	2	149
8:00	0	0	1	1	7	11	22	23	26	10	6	3	0	0	110
9:00	0	0	0	0	10	9	10	15	20	8	5	4	3	0	84
10:00	0	0	1	0	11	6	5	9	5	4	2	0	1	1	45
11:00	0	0	0	0	0	0	1	0	1	1	0	1	0	0	4
<b>Total</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>61</b>	<b>218</b>	<b>310</b>	<b>664</b>	<b>863</b>	<b>898</b>	<b>487</b>	<b>299</b>	<b>137</b>	<b>77</b>	<b>43</b>	<b>4082</b>
			Percentile	15th	50th	85th	95th								
			Speed	18	24	30	34								
			Mean Speed (Average)	24.9											
			10 MPH Pace Speed	18-27											
			Number in Pace	2581											
			Percent in Pace	63.2%											
			Number > 24 MPH	1941											
			Percent > 24 MPH	47.6%											
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>68</b>	<b>159</b>	<b>479</b>	<b>661</b>	<b>1272</b>	<b>1838</b>	<b>1786</b>	<b>951</b>	<b>517</b>	<b>232</b>	<b>142</b>	<b>82</b>	<b>8187</b>
			Percentile	15th	50th	85th	95th								
			Speed	17	24	29	34								
			Mean Speed (Average)	24.5											
			10 MPH Pace Speed	18-27											
			Number in Pace	5203											
			Percent in Pace	63.6%											
			Number > 24 MPH	3710											
			Percent > 24 MPH	45.3%											

Accurate Counts  
978-664-2565

Location : Nahant Street  
 Location : East of Middlesex Street  
 City/State: Wakefield, MA  
 Direction: WB

Site Code: 98560001

12/20/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	1	5	4	1	1	0	0	0	12
1:00	0	0	0	0	0	1	1	4	3	1	0	0	0	0	10
2:00	0	0	0	0	0	0	0	2	1	0	0	0	0	0	3
3:00	0	0	0	0	0	0	1	2	2	1	0	0	0	0	6
4:00	0	0	0	0	0	2	5	4	4	8	0	1	0	0	24
5:00	0	0	0	0	1	9	4	14	22	5	4	1	0	0	60
6:00	0	0	0	1	4	15	47	76	42	19	2	1	4	0	211
7:00	0	0	0	4	8	14	98	125	101	43	12	8	3	1	417
8:00	0	0	5	1	6	15	101	131	98	26	8	3	1	0	395
9:00	0	0	1	0	14	22	68	70	57	13	7	4	0	0	256
10:00	0	0	2	1	10	9	54	76	44	13	4	1	0	0	214
11:00	0	0	0	0	8	12	66	133	47	12	2	0	2	1	283
12:00 PM	0	0	2	1	3	23	67	114	64	11	6	0	2	1	294
1:00	0	0	1	4	12	20	69	104	69	15	4	1	2	0	301
2:00	0	0	3	8	10	30	129	138	83	24	6	2	0	0	433
3:00	0	0	0	1	4	17	72	119	94	46	6	2	2	0	363
4:00	0	0	0	4	16	42	94	119	57	21	4	1	0	0	358
5:00	0	0	0	1	3	24	93	138	64	20	3	1	1	1	349
6:00	0	0	0	0	3	15	63	73	49	19	1	1	0	0	224
7:00	0	0	0	3	4	13	58	85	46	11	2	0	0	0	222
8:00	0	0	0	0	3	8	29	46	33	12	1	1	0	0	133
9:00	0	0	0	0	1	6	22	33	33	14	0	0	0	0	109
10:00	0	0	0	0	0	1	9	32	16	9	1	0	0	0	68
11:00	0	0	0	0	0	1	3	14	11	6	1	1	1	0	38
Total	0	0	14	29	110	299	1154	1657	1044	350	75	29	18	4	4783

Percentile	15th
Speed	19
Mean Speed (Average)	22.6
10 MPH Pace Speed	18-27
Number in Pace	3970
Percent in Pace	83.0%
Number > 24 MPH	1520
Percent > 24 MPH	31.8%

Accurate Counts  
978-664-2565

Location : Nahant Street  
 Location : East of Middlesex Street  
 City/State: Wakefield, MA  
 Direction: WB

Site Code: 98560001

12/21/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	1	5	5	2	3	0	0	0	0	16
1:00	0	0	0	0	1	0	0	6	3	1	0	0	0	0	11
2:00	0	0	0	0	0	0	1	0	1	0	1	0	0	0	3
3:00	0	0	0	0	0	0	1	2	0	2	0	0	0	0	5
4:00	0	0	0	0	1	4	3	5	6	1	2	0	1	0	23
5:00	0	0	0	0	3	5	16	27	6	7	3	4	0	0	71
6:00	0	0	0	0	4	8	43	82	46	12	5	0	0	0	200
7:00	0	0	1	4	7	18	67	113	83	37	7	0	1	1	339
8:00	0	0	0	1	3	22	51	114	109	35	11	1	3	0	350
9:00	0	0	0	2	7	14	40	82	80	25	6	2	0	1	259
10:00	0	0	0	0	0	14	47	81	58	18	3	4	2	1	228
11:00	0	0	0	2	9	11	55	86	71	26	9	1	0	0	270
12:00 PM	0	0	1	2	6	13	56	112	58	24	9	0	1	1	283
1:00	0	0	0	0	5	16	71	117	85	29	4	3	2	1	333
2:00	0	0	0	1	2	16	82	145	121	43	12	3	0	0	425
3:00	0	0	1	4	8	20	106	163	68	30	5	2	4	2	413
4:00	0	0	1	0	8	14	79	117	81	26	11	4	2	2	345
5:00	0	0	0	3	7	18	78	131	89	21	7	2	1	0	357
6:00	0	0	0	1	0	21	62	100	77	16	2	0	0	1	280
7:00	0	0	0	1	5	9	34	72	42	13	1	0	2	0	179
8:00	0	0	0	1	8	7	28	47	37	9	3	0	0	0	140
9:00	0	0	0	0	0	5	19	37	26	7	1	1	0	1	97
10:00	0	0	0	0	1	4	13	22	23	5	1	0	0	1	70
11:00	0	0	0	0	1	0	1	0	5	2	0	0	0	0	9
<b>Total</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>22</b>	<b>86</b>	<b>240</b>	<b>958</b>	<b>1666</b>	<b>1177</b>	<b>392</b>	<b>103</b>	<b>27</b>	<b>19</b>	<b>12</b>	<b>4706</b>

Percentile	15th	50th	85th	95th
Speed	19	23	27	29
Mean Speed (Average)	23.3			
10 MPH Pace Speed	18-27			
Number in Pace	3927			
Percent in Pace	83.4%			
Number > 24 MPH	1730			
Percent > 24 MPH	36.8%			

<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>51</b>	<b>196</b>	<b>539</b>	<b>2112</b>	<b>3323</b>	<b>2221</b>	<b>742</b>	<b>178</b>	<b>56</b>	<b>37</b>	<b>16</b>	<b>9489</b>
Stats															
Percentile				15th	50th	85th	95th								
Speed				19	22	26	29								
Mean Speed (Average)				22.9											
10 MPH Pace Speed				18-27											
Number in Pace				7897											
Percent in Pace				83.2%											
Number > 24 MPH				3250											
Percent > 24 MPH				34.2%											

Accurate Counts  
978-664-2565

Location : Nahant Street  
Location : East of Middlesex Street  
City/State: Wakefield, MA  
Direction: Combined

Site Code: 98560001

12/20/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	2	0	5	7	4	2	1	0	0	0	21
1:00	0	0	0	1	0	2	1	5	4	1	0	0	0	0	14
2:00	0	0	1	0	0	0	1	6	1	0	1	0	0	0	10
3:00	0	0	0	0	1	0	1	4	3	1	0	0	0	0	10
4:00	0	0	0	0	2	2	8	7	5	9	2	1	0	0	36
5:00	0	0	0	0	3	13	10	20	30	12	4	2	1	0	95
6:00	0	0	0	1	10	26	63	99	73	34	9	2	7	3	327
7:00	0	0	1	13	13	25	127	189	176	96	27	18	12	5	702
8:00	0	0	6	5	22	38	134	202	153	66	20	11	5	2	664
9:00	0	0	6	5	25	38	101	110	99	33	23	10	6	1	457
10:00	0	0	2	6	29	22	87	110	86	37	15	4	2	2	402
11:00	0	0	1	2	17	38	90	170	91	45	19	3	3	1	480
12:00 PM	0	0	2	5	15	43	90	149	116	41	22	8	9	6	506
1:00	0	0	3	17	31	37	108	151	120	33	18	6	7	5	536
2:00	0	0	7	22	40	66	170	219	135	48	22	5	6	4	744
3:00	0	0	8	22	24	39	137	219	188	86	21	19	7	3	773
4:00	0	0	4	7	39	81	159	248	148	61	28	7	6	5	793
5:00	0	0	15	14	27	51	170	264	157	57	23	7	4	2	791
6:00	0	0	1	2	12	38	109	147	117	47	10	7	2	0	492
7:00	0	0	0	4	21	26	85	142	89	35	11	4	4	2	423
8:00	0	0	0	0	16	30	50	66	54	26	8	6	1	1	258
9:00	0	0	0	1	13	16	32	43	53	23	6	1	0	1	189
10:00	0	0	0	0	5	11	19	37	17	12	2	1	0	0	104
11:00	0	0	0	0	4	8	5	18	13	9	1	2	1	0	61
Total	0	0	57	127	371	650	1762	2632	1932	814	293	124	83	43	8888

Percentile 15th 50th 85th 95th  
Speed 18 22 27 31  
Mean Speed (Average) 23.3  
10 MPH Pace Speed 18-27  
Number in Pace 6592  
Percent in Pace 74.2%  
Number > 24 MPH 3289  
Percent > 24 MPH 37.0%



Accurate Counts  
978-664-2565

Location : Nahant Street  
 Location : East of Middlesex Street  
 City/State: Wakefield, MA  
 Direction: Combined

Site Code: 98560001

12/21/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	3	6	7	4	3	0	0	0	0	23
1:00	0	0	0	0	2	0	0	6	4	1	0	0	0	0	13
2:00	0	0	0	1	0	1	1	0	2	0	1	1	0	0	7
3:00	0	0	0	0	0	0	1	2	1	3	0	0	0	0	7
4:00	0	0	0	0	2	6	7	10	8	2	3	1	1	0	40
5:00	0	0	0	0	7	8	18	35	19	10	5	5	0	0	107
6:00	0	0	1	2	6	17	63	98	72	24	21	6	3	1	314
7:00	0	0	2	8	16	30	118	170	152	82	33	18	11	5	645
8:00	0	0	0	6	16	35	79	165	163	75	30	6	11	3	589
9:00	0	0	1	2	17	26	70	123	118	41	26	6	3	2	435
10:00	0	0	1	2	11	25	78	123	112	46	20	7	9	2	436
11:00	0	0	0	6	16	23	78	123	118	49	33	11	4	4	465
12:00 PM	0	0	1	5	17	23	77	151	116	56	29	12	4	5	496
1:00	0	0	0	5	13	27	101	164	133	65	22	15	11	8	564
2:00	0	0	3	7	16	57	140	202	186	90	39	11	11	8	770
3:00	0	0	4	9	27	54	181	232	158	75	31	18	10	4	803
4:00	0	0	9	13	28	66	168	230	163	71	29	14	3	3	797
5:00	0	0	3	6	36	41	158	245	177	62	35	11	3	2	779
6:00	0	0	1	5	21	43	111	185	159	48	24	8	3	3	611
7:00	0	0	1	4	15	23	68	105	67	30	3	5	5	2	328
8:00	0	0	1	2	15	18	50	70	63	19	9	3	0	0	250
9:00	0	0	0	0	10	14	29	52	46	15	6	5	3	1	181
10:00	0	0	1	0	12	10	18	31	28	9	3	0	1	2	115
11:00	0	0	0	0	1	0	2	0	6	3	0	1	0	0	13
<b>Total</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>83</b>	<b>304</b>	<b>550</b>	<b>1622</b>	<b>2529</b>	<b>2075</b>	<b>879</b>	<b>402</b>	<b>164</b>	<b>96</b>	<b>55</b>	<b>8788</b>
				Percentile	15th	50th	85th	95th							
				Speed	19	23	28	32							
				Mean Speed (Average)	24.0										
				10 MPH Pace Speed	18-27										
				Number in Pace	6508										
				Percent in Pace	74.1%										
				Number > 24 MPH	3671										
				Percent > 24 MPH	41.8%										
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>86</b>	<b>210</b>	<b>675</b>	<b>1200</b>	<b>3384</b>	<b>5161</b>	<b>4007</b>	<b>1693</b>	<b>695</b>	<b>288</b>	<b>179</b>	<b>98</b>	<b>17676</b>
<b>Stats</b>				Percentile	15th	50th	85th	95th							
				Speed	19	23	27	32							
				Mean Speed (Average)	23.7										
				10 MPH Pace Speed	18-27										
				Number in Pace	13100										
				Percent in Pace	74.1%										
				Number > 24 MPH	6959										
				Percent > 24 MPH	39.4%										

TRAFFIC COUNT DATA

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# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Main St From North			Nahant St From East			Main St From South			North Ave From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	10	73	19	12	59	6	43	49	11	19	53	61	415
07:15 AM	13	95	29	9	57	20	50	70	13	15	66	71	508
07:30 AM	1	102	39	4	75	7	85	112	7	22	30	84	568
07:45 AM	10	87	27	9	65	10	74	93	11	20	40	78	524
<b>Total</b>	<b>34</b>	<b>357</b>	<b>114</b>	<b>34</b>	<b>256</b>	<b>43</b>	<b>252</b>	<b>324</b>	<b>42</b>	<b>76</b>	<b>189</b>	<b>294</b>	<b>2015</b>
08:00 AM	1	86	23	5	77	6	80	94	10	17	36	53	488
08:15 AM	10	57	27	5	69	5	78	81	8	22	51	57	470
08:30 AM	14	91	24	5	81	10	83	104	12	28	63	67	582
08:45 AM	6	96	28	5	68	14	77	106	5	26	50	58	539
<b>Total</b>	<b>31</b>	<b>330</b>	<b>102</b>	<b>20</b>	<b>295</b>	<b>35</b>	<b>318</b>	<b>385</b>	<b>35</b>	<b>93</b>	<b>200</b>	<b>235</b>	<b>2079</b>
<b>Grand Total</b>	<b>65</b>	<b>687</b>	<b>216</b>	<b>54</b>	<b>551</b>	<b>78</b>	<b>570</b>	<b>709</b>	<b>77</b>	<b>169</b>	<b>389</b>	<b>529</b>	<b>4094</b>
Apprch %	6.7	71	22.3	7.9	80.7	11.4	42	52.3	5.7	15.5	35.8	48.7	
Total %	1.6	16.8	5.3	1.3	13.5	1.9	13.9	17.3	1.9	4.1	9.5	12.9	
Cars	64	665	214	52	541	76	556	689	74	162	378	513	3984
% Cars	98.5	96.8	99.1	96.3	98.2	97.4	97.5	97.2	96.1	95.9	97.2	97	97.3
Trucks	1	22	2	2	10	2	14	20	3	7	11	16	110
% Trucks	1.5	3.2	0.9	3.7	1.8	2.6	2.5	2.8	3.9	4.1	2.8	3	2.7

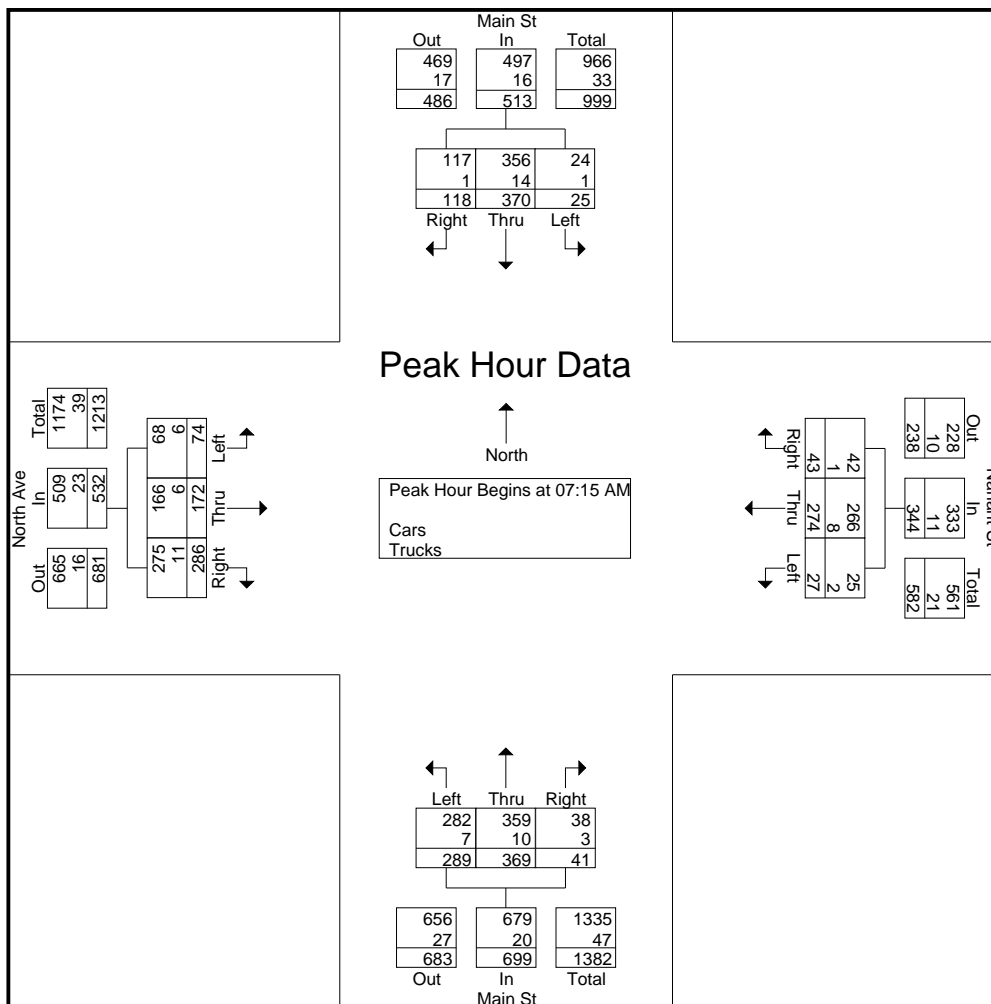
Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	<b>13</b>	95	29	137	<b>9</b>	57	<b>20</b>	86	50	70	<b>13</b>	133	15	<b>66</b>	71	<b>152</b>	508
07:30 AM	1	<b>102</b>	<b>39</b>	<b>142</b>	4	75	7	86	<b>85</b>	<b>112</b>	7	<b>204</b>	<b>22</b>	30	<b>84</b>	136	<b>568</b>
07:45 AM	10	87	27	124	9	65	10	84	74	93	11	178	20	40	78	138	524
08:00 AM	1	86	23	110	5	<b>77</b>	6	<b>88</b>	80	94	10	184	17	36	53	106	488
<b>Total Volume</b>	<b>25</b>	<b>370</b>	<b>118</b>	<b>513</b>	<b>27</b>	<b>274</b>	<b>43</b>	<b>344</b>	<b>289</b>	<b>369</b>	<b>41</b>	<b>699</b>	<b>74</b>	<b>172</b>	<b>286</b>	<b>532</b>	<b>2088</b>
% App. Total	4.9	72.1	23		7.8	79.7	12.5		41.3	52.8	5.9		13.9	32.3	53.8		
PHF	.481	.907	.756	.903	.750	.890	.538	.977	.850	.824	.788	.857	.841	.652	.851	.875	.919
Cars	24	356	117	497	25	266	42	333	282	359	38	679	68	166	275	509	2018
% Cars	96.0	96.2	99.2	96.9	92.6	97.1	97.7	96.8	97.6	97.3	92.7	97.1	91.9	96.5	96.2	95.7	96.6
Trucks	1	14	1	16	2	8	1	11	7	10	3	20	6	6	11	23	70
% Trucks	4.0	3.8	0.8	3.1	7.4	2.9	2.3	3.2	2.4	2.7	7.3	2.9	8.1	3.5	3.8	4.3	3.4

# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

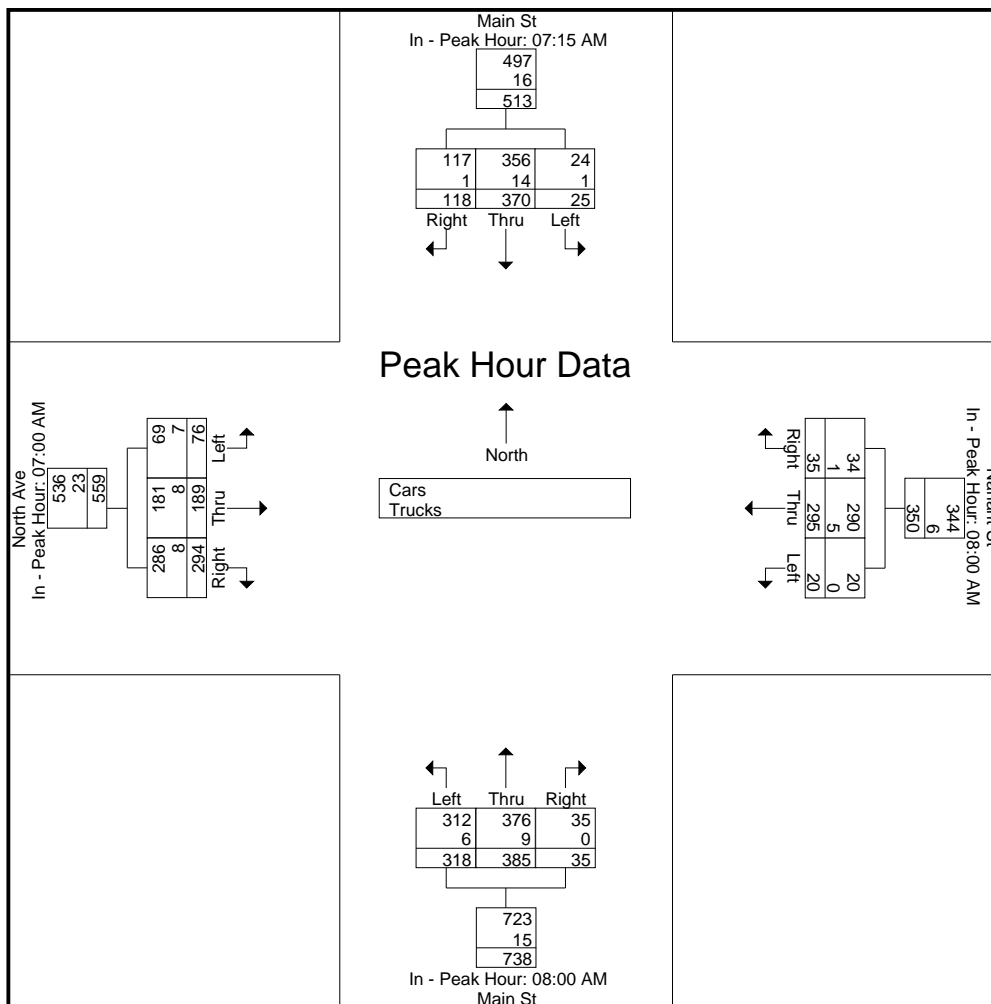
	07:15 AM				08:00 AM				08:00 AM				07:00 AM			
+0 mins.	13	95	29	137	5	77	6	88	80	94	10	184	19	53	61	133
+15 mins.	1	102	39	142	5	69	5	79	78	81	8	167	15	66	71	152
+30 mins.	10	87	27	124	5	81	10	96	83	104	12	199	22	30	84	136
+45 mins.	1	86	23	110	5	68	14	87	77	106	5	188	20	40	78	138
Total Volume	25	370	118	513	20	295	35	350	318	385	35	738	76	189	294	559
% App. Total	4.9	72.1	23		5.7	84.3	10		43.1	52.2	4.7		13.6	33.8	52.6	
PHF	.481	.907	.756	.903	1.000	.910	.625	.911	.958	.908	.729	.927	.864	.716	.875	.919
Cars	24	356	117	497	20	290	34	344	312	376	35	723	69	181	286	536
% Cars	96	96.2	99.2	96.9	100	98.3	97.1	98.3	98.1	97.7	100	98	90.8	95.8	97.3	95.9
Trucks	1	14	1	16	0	5	1	6	6	9	0	15	7	8	8	23
% Trucks	4	3.8	0.8	3.1	0	1.7	2.9	1.7	1.9	2.3	0	2	9.2	4.2	2.7	4.1

# Accurate Counts

978-664-2565

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Main St From North			Nahant St From East			Main St From South			North Ave From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	10	71	19	12	59	6	39	48	11	18	51	61	405
07:15 AM	12	88	29	9	56	20	49	70	10	14	64	70	491
07:30 AM	1	100	39	3	74	6	82	107	7	18	27	78	542
07:45 AM	10	85	27	8	62	10	74	88	11	19	39	77	510
<b>Total</b>	<b>33</b>	<b>344</b>	<b>114</b>	<b>32</b>	<b>251</b>	<b>42</b>	<b>244</b>	<b>313</b>	<b>39</b>	<b>69</b>	<b>181</b>	<b>286</b>	<b>1948</b>
08:00 AM	1	83	22	5	74	6	77	94	10	17	36	50	475
08:15 AM	10	56	27	5	68	4	77	79	8	22	51	56	463
08:30 AM	14	89	23	5	80	10	82	98	12	28	62	64	567
08:45 AM	6	93	28	5	68	14	76	105	5	26	48	57	531
<b>Total</b>	<b>31</b>	<b>321</b>	<b>100</b>	<b>20</b>	<b>290</b>	<b>34</b>	<b>312</b>	<b>376</b>	<b>35</b>	<b>93</b>	<b>197</b>	<b>227</b>	<b>2036</b>
<b>Grand Total</b>	<b>64</b>	<b>665</b>	<b>214</b>	<b>52</b>	<b>541</b>	<b>76</b>	<b>556</b>	<b>689</b>	<b>74</b>	<b>162</b>	<b>378</b>	<b>513</b>	<b>3984</b>
Apprch %	6.8	70.5	22.7	7.8	80.9	11.4	42.2	52.2	5.6	15.4	35.9	48.7	
Total %	1.6	16.7	5.4	1.3	13.6	1.9	14	17.3	1.9	4.1	9.5	12.9	

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	1	83	22	106	5	74	6	85	77	94	10	181	17	36	50	103	475
08:15 AM	10	56	27	93	5	68	4	77	77	79	8	164	22	51	56	129	463
08:30 AM	14	89	23	126	5	80	10	95	82	98	12	192	28	62	64	154	567
08:45 AM	6	93	28	127	5	68	14	87	76	105	5	186	26	48	57	131	531
Total Volume	31	321	100	452	20	290	34	344	312	376	35	723	93	197	227	517	2036
% App. Total	6.9	71	22.1		5.8	84.3	9.9		43.2	52	4.8		18	38.1	43.9		
PHF	.554	.863	.893	.890	1.00	.906	.607	.905	.951	.895	.729	.941	.830	.794	.887	.839	.898

# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Main St From North			Nahant St From East			Main St From South			North Ave From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	2	0	0	0	0	4	1	0	1	2	0	10
07:15 AM	1	7	0	0	1	0	1	0	3	1	2	1	17
07:30 AM	0	2	0	1	1	1	3	5	0	4	3	6	26
07:45 AM	0	2	0	1	3	0	0	5	0	1	1	1	14
<b>Total</b>	<b>1</b>	<b>13</b>	<b>0</b>	<b>2</b>	<b>5</b>	<b>1</b>	<b>8</b>	<b>11</b>	<b>3</b>	<b>7</b>	<b>8</b>	<b>8</b>	<b>67</b>
08:00 AM	0	3	1	0	3	0	3	0	0	0	0	3	13
08:15 AM	0	1	0	0	1	1	1	2	0	0	0	1	7
08:30 AM	0	2	1	0	1	0	1	6	0	0	1	3	15
08:45 AM	0	3	0	0	0	0	1	1	0	0	2	1	8
<b>Total</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>6</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>8</b>	<b>43</b>
<b>Grand Total</b>	<b>1</b>	<b>22</b>	<b>2</b>	<b>2</b>	<b>10</b>	<b>2</b>	<b>14</b>	<b>20</b>	<b>3</b>	<b>7</b>	<b>11</b>	<b>16</b>	<b>110</b>
Apprch %	4	88	8	14.3	71.4	14.3	37.8	54.1	8.1	20.6	32.4	47.1	
Total %	0.9	20	1.8	1.8	9.1	1.8	12.7	18.2	2.7	6.4	10	14.5	

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
<b>Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1</b>																	
<b>Peak Hour for Entire Intersection Begins at 07:15 AM</b>																	
07:15 AM	1	7	0	8	0	1	0	1	1	0	3	4	1	2	1	4	17
07:30 AM	0	2	0	2	1	1	1	3	3	5	0	8	4	3	6	13	26
07:45 AM	0	2	0	2	1	3	0	4	0	5	0	5	1	1	1	3	14
08:00 AM	0	3	1	4	0	3	0	3	3	0	0	3	0	0	3	3	13
<b>Total Volume</b>	<b>1</b>	<b>14</b>	<b>1</b>	<b>16</b>	<b>2</b>	<b>8</b>	<b>1</b>	<b>11</b>	<b>7</b>	<b>10</b>	<b>3</b>	<b>20</b>	<b>6</b>	<b>6</b>	<b>11</b>	<b>23</b>	<b>70</b>
% App. Total	6.2	87.5	6.2		18.2	72.7	9.1		35	50	15		26.1	26.1	47.8		
PHF	.250	.500	.250	.500	.500	.667	.250	.688	.583	.500	.250	.625	.375	.500	.458	.442	.673

# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 10

## Groups Printed- Bikes Peds

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2	4	0	4
07:15 AM	0	1	0	3	0	0	0	2	0	0	0	0	0	0	0	4	9	1	10
07:30 AM	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	1	6	0	6
07:45 AM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	1	6	0	6
<b>Total</b>	0	1	0	8	0	0	0	8	0	0	0	1	0	0	0	8	25	1	26
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
08:15 AM	0	0	0	2	0	0	0	2	0	0	0	1	0	0	0	2	7	0	7
08:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	3	0	3
<b>Total</b>	0	0	0	2	0	0	0	3	0	1	0	3	0	0	0	4	12	1	13
<b>Grand Total</b>	0	1	0	10	0	0	0	11	0	1	0	4	0	0	0	12	37	2	39
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0				
Total %	0	50	0		0	0	0		0	50	0		0	0	0		94.9	5.1	

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
<b>Total Volume</b>	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
<b>% App. Total</b>	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.500



# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 1

## Groups Printed- Cars - Trucks

Start Time	Main St From North			Nahant St From East			Main St From South			North Ave From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	12	75	24	8	57	24	84	111	9	37	44	84	569
02:15 PM	18	94	29	10	54	17	65	110	11	42	55	87	592
02:30 PM	16	97	35	8	60	18	59	98	8	41	57	80	577
02:45 PM	9	83	25	9	65	18	59	108	11	31	51	69	538
<b>Total</b>	<b>55</b>	<b>349</b>	<b>113</b>	<b>35</b>	<b>236</b>	<b>77</b>	<b>267</b>	<b>427</b>	<b>39</b>	<b>151</b>	<b>207</b>	<b>320</b>	<b>2276</b>
03:00 PM	14	78	27	4	58	27	74	106	8	40	60	75	571
03:15 PM	10	90	28	3	67	15	60	121	10	33	69	70	576
03:30 PM	11	93	30	5	55	10	65	122	8	33	59	61	552
03:45 PM	13	83	30	5	60	8	72	123	7	29	75	78	583
<b>Total</b>	<b>48</b>	<b>344</b>	<b>115</b>	<b>17</b>	<b>240</b>	<b>60</b>	<b>271</b>	<b>472</b>	<b>33</b>	<b>135</b>	<b>263</b>	<b>284</b>	<b>2282</b>
04:00 PM	11	71	21	3	69	17	58	107	8	33	81	74	553
04:15 PM	12	87	35	6	55	15	63	134	11	32	95	67	612
04:30 PM	17	104	23	5	66	14	57	141	5	35	86	72	625
04:45 PM	8	98	26	7	61	14	77	135	5	32	88	78	629
<b>Total</b>	<b>48</b>	<b>360</b>	<b>105</b>	<b>21</b>	<b>251</b>	<b>60</b>	<b>255</b>	<b>517</b>	<b>29</b>	<b>132</b>	<b>350</b>	<b>291</b>	<b>2419</b>
05:00 PM	14	86	27	5	57	16	79	147	5	33	81	83	633
05:15 PM	25	91	19	5	68	13	67	132	6	34	83	70	613
05:30 PM	10	85	23	3	66	16	73	128	15	36	92	87	634
05:45 PM	11	83	29	4	51	8	76	126	5	25	67	70	555
<b>Total</b>	<b>60</b>	<b>345</b>	<b>98</b>	<b>17</b>	<b>242</b>	<b>53</b>	<b>295</b>	<b>533</b>	<b>31</b>	<b>128</b>	<b>323</b>	<b>310</b>	<b>2435</b>
<b>Grand Total</b>	<b>211</b>	<b>1398</b>	<b>431</b>	<b>90</b>	<b>969</b>	<b>250</b>	<b>1088</b>	<b>1949</b>	<b>132</b>	<b>546</b>	<b>1143</b>	<b>1205</b>	<b>9412</b>
Apprch %	10.3	68.5	21.1	6.9	74	19.1	34.3	61.5	4.2	18.9	39.5	41.6	
Total %	2.2	14.9	4.6	1	10.3	2.7	11.6	20.7	1.4	5.8	12.1	12.8	
Cars	209	1377	427	89	950	244	1081	1931	129	544	1125	1195	9301
% Cars	99.1	98.5	99.1	98.9	98	97.6	99.4	99.1	97.7	99.6	98.4	99.2	98.8
Trucks	2	21	4	1	19	6	7	18	3	2	18	10	111
% Trucks	0.9	1.5	0.9	1.1	2	2.4	0.6	0.9	2.3	0.4	1.6	0.8	1.2

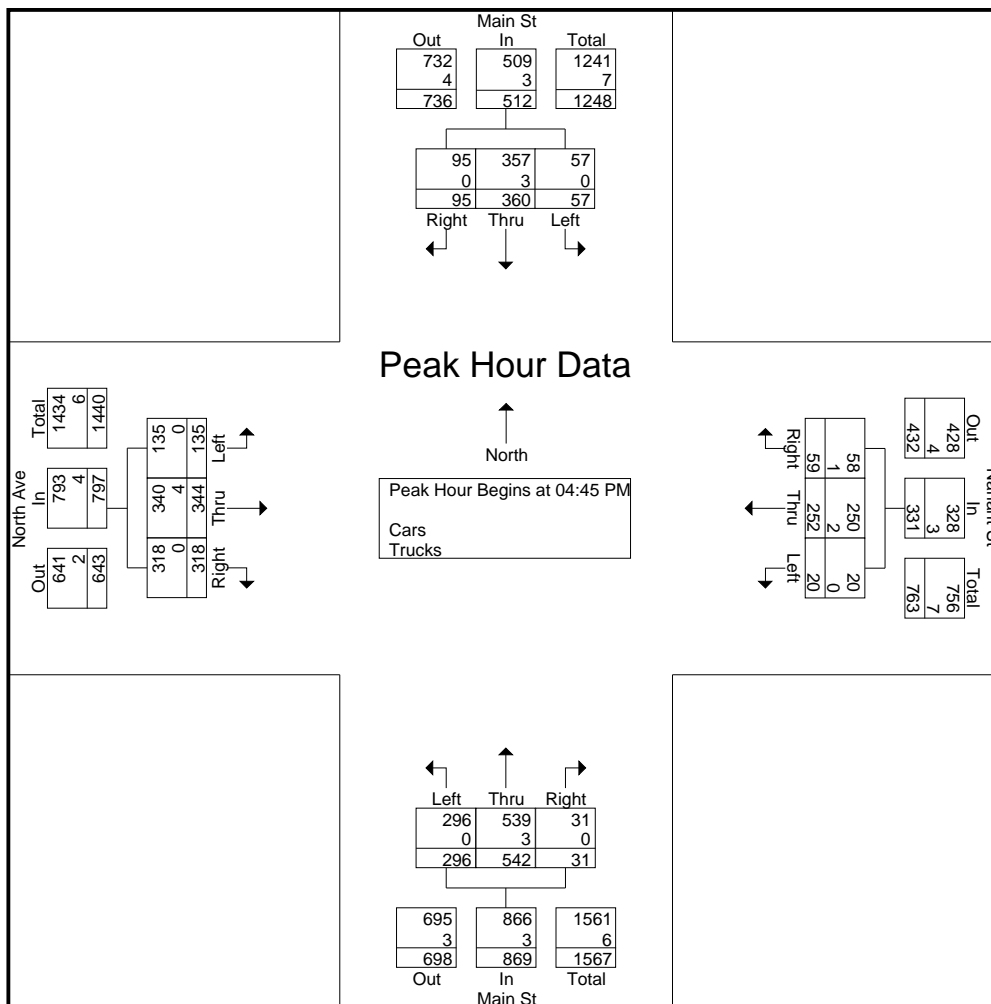
Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	8	<b>98</b>	26	132	<b>7</b>	61	14	82	77	135	5	217	32	88	78	198	629
05:00 PM	14	86	<b>27</b>	127	5	57	<b>16</b>	78	<b>79</b>	<b>147</b>	5	<b>231</b>	33	81	83	197	633
05:15 PM	<b>25</b>	91	19	<b>135</b>	5	<b>68</b>	13	<b>86</b>	67	132	6	205	34	83	70	187	613
05:30 PM	10	85	23	118	3	66	16	85	73	128	<b>15</b>	216	<b>36</b>	<b>92</b>	<b>87</b>	<b>215</b>	<b>634</b>
Total Volume	57	360	95	512	20	252	59	331	296	542	31	869	135	344	318	797	2509
% App. Total	11.1	70.3	18.6		6	76.1	17.8		34.1	62.4	3.6		16.9	43.2	39.9		
PHF	.570	.918	.880	.948	.714	.926	.922	.962	.937	.922	.517	.940	.938	.935	.914	.927	.989
Cars	57	357	95	509	20	250	58	328	296	539	31	866	135	340	318	793	2496
% Cars	100	99.2	100	99.4	100	99.2	98.3	99.1	100	99.4	100	99.7	100	98.8	100	99.5	99.5
Trucks	0	3	0	3	0	2	1	3	0	3	0	3	0	4	0	4	13
% Trucks	0	0.8	0	0.6	0	0.8	1.7	0.9	0	0.6	0	0.3	0	1.2	0	0.5	0.5

# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 2



**Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1**

**Peak Hour for Each Approach Begins at:**

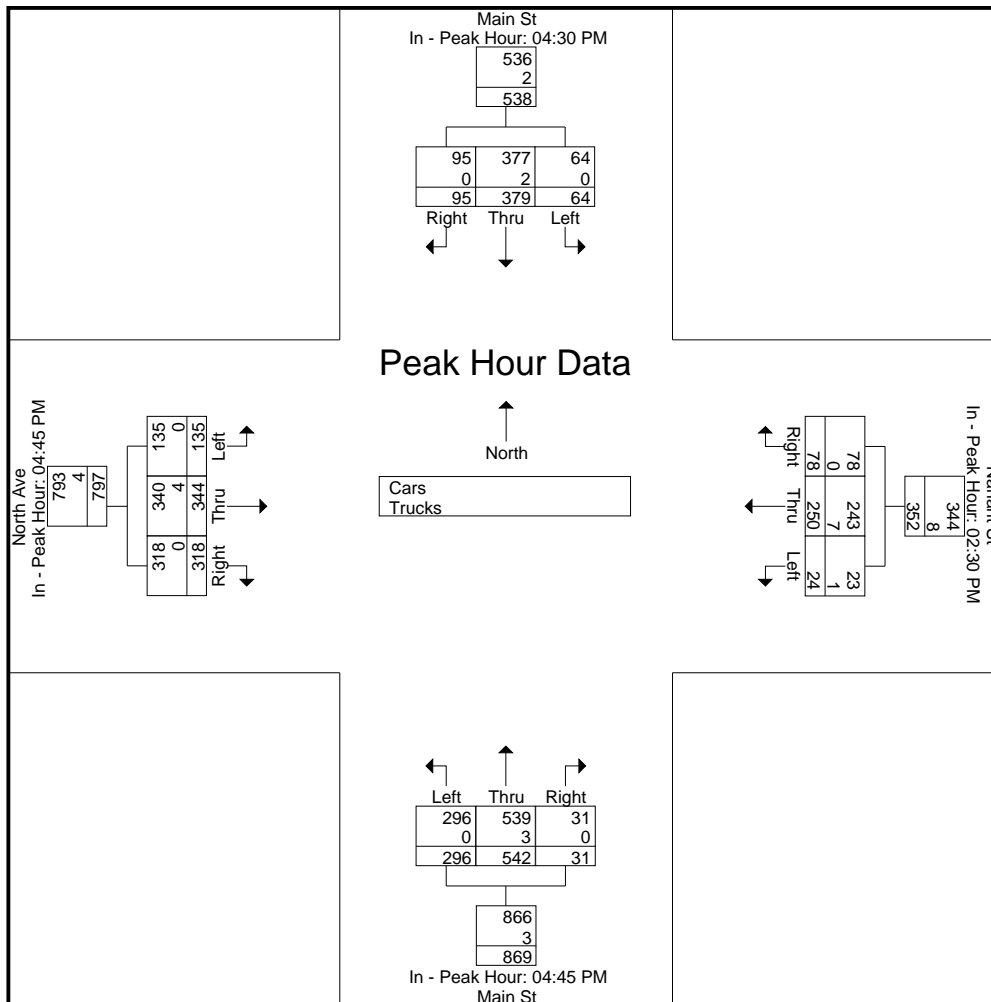
	04:30 PM				02:30 PM				04:45 PM				04:45 PM			
+0 mins.	17	<b>104</b>	23	<b>144</b>	8	60	18	86	77	135	5	217	32	88	78	198
+15 mins.	8	98	26	132	<b>9</b>	65	18	<b>92</b>	<b>79</b>	<b>147</b>	5	<b>231</b>	33	81	83	197
+30 mins.	14	86	<b>27</b>	127	4	58	<b>27</b>	89	67	132	6	205	34	83	70	187
+45 mins.	<b>25</b>	91	19	135	3	<b>67</b>	15	85	73	128	<b>15</b>	216	<b>36</b>	<b>92</b>	<b>87</b>	<b>215</b>
Total Volume	64	379	95	538	24	250	78	352	296	542	31	869	135	344	318	797
% App. Total	11.9	70.4	17.7		6.8	71	22.2		34.1	62.4	3.6		16.9	43.2	39.9	
PHF	.640	.911	.880	.934	.667	.933	.722	.957	.937	.922	.517	.940	.938	.935	.914	.927
Cars	64	377	95	536	23	243	78	344	296	539	31	866	135	340	318	793
% Cars	100	99.5	100	99.6	95.8	97.2	100	97.7	100	99.4	100	99.7	100	98.8	100	99.5
Trucks	0	2	0	2	1	7	0	8	0	3	0	3	0	4	0	4
% Trucks	0	0.5	0	0.4	4.2	2.8	0	2.3	0	0.6	0	0.3	0	1.2	0	0.5

# Accurate Counts

978-664-2565

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Main St From North			Nahant St From East			Main St From South			North Ave From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	12	72	23	8	56	21	84	109	8	37	43	84	557
02:15 PM	17	92	29	10	52	17	65	109	11	42	53	85	582
02:30 PM	16	94	35	8	60	18	57	96	8	41	56	77	566
02:45 PM	9	80	25	8	61	18	57	107	11	31	51	67	525
<b>Total</b>	<b>54</b>	<b>338</b>	<b>112</b>	<b>34</b>	<b>229</b>	<b>74</b>	<b>263</b>	<b>421</b>	<b>38</b>	<b>151</b>	<b>203</b>	<b>313</b>	<b>2230</b>
03:00 PM	14	77	27	4	56	27	74	106	7	40	59	75	566
03:15 PM	10	87	26	3	66	15	58	119	10	33	68	70	565
03:30 PM	11	93	30	5	55	10	65	119	8	33	58	61	548
03:45 PM	12	83	30	5	58	8	72	123	7	29	73	78	578
<b>Total</b>	<b>47</b>	<b>340</b>	<b>113</b>	<b>17</b>	<b>235</b>	<b>60</b>	<b>269</b>	<b>467</b>	<b>32</b>	<b>135</b>	<b>258</b>	<b>284</b>	<b>2257</b>
04:00 PM	11	70	20	3	67	16	58	105	8	33	77	73	541
04:15 PM	12	86	35	6	52	14	63	134	10	31	95	67	605
04:30 PM	17	104	23	5	66	14	56	139	5	34	86	71	620
04:45 PM	8	96	26	7	61	14	77	134	5	32	86	78	624
<b>Total</b>	<b>48</b>	<b>356</b>	<b>104</b>	<b>21</b>	<b>246</b>	<b>58</b>	<b>254</b>	<b>512</b>	<b>28</b>	<b>130</b>	<b>344</b>	<b>289</b>	<b>2390</b>
05:00 PM	14	86	27	5	57	16	79	146	5	33	80	83	631
05:15 PM	25	91	19	5	68	13	67	132	6	34	83	70	613
05:30 PM	10	84	23	3	64	15	73	127	15	36	91	87	628
05:45 PM	11	82	29	4	51	8	76	126	5	25	66	69	552
<b>Total</b>	<b>60</b>	<b>343</b>	<b>98</b>	<b>17</b>	<b>240</b>	<b>52</b>	<b>295</b>	<b>531</b>	<b>31</b>	<b>128</b>	<b>320</b>	<b>309</b>	<b>2424</b>
<b>Grand Total</b>	<b>209</b>	<b>1377</b>	<b>427</b>	<b>89</b>	<b>950</b>	<b>244</b>	<b>1081</b>	<b>1931</b>	<b>129</b>	<b>544</b>	<b>1125</b>	<b>1195</b>	<b>9301</b>
Apprch %	10.4	68.4	21.2	6.9	74	19	34.4	61.5	4.1	19	39.3	41.7	
Total %	2.2	14.8	4.6	1	10.2	2.6	11.6	20.8	1.4	5.8	12.1	12.8	

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	8	<b>96</b>	26	130	<b>7</b>	61	14	82	77	134	5	216	32	86	78	196	624
05:00 PM	14	86	<b>27</b>	127	5	57	<b>16</b>	78	<b>79</b>	<b>146</b>	5	<b>230</b>	33	80	83	196	<b>631</b>
05:15 PM	<b>25</b>	91	19	<b>135</b>	5	<b>68</b>	13	<b>86</b>	67	132	6	205	34	83	70	187	613
05:30 PM	10	84	23	117	3	64	15	82	73	127	<b>15</b>	215	<b>36</b>	<b>91</b>	<b>87</b>	<b>214</b>	628
Total Volume	57	357	95	509	20	250	58	328	296	539	31	866	135	340	318	793	2496
% App. Total	11.2	70.1	18.7		6.1	76.2	17.7		34.2	62.2	3.6		17	42.9	40.1		
PHF	.570	.930	.880	.943	.714	.919	.906	.953	.937	.923	.517	.941	.938	.934	.914	.926	.989

# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 7

## Groups Printed- Trucks

Start Time	Main St From North			Nahant St From East			Main St From South			North Ave From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	0	3	1	0	1	3	0	2	1	0	1	0	12
02:15 PM	1	2	0	0	2	0	0	1	0	0	2	2	10
02:30 PM	0	3	0	0	0	0	2	2	0	0	1	3	11
02:45 PM	0	3	0	1	4	0	2	1	0	0	0	2	13
<b>Total</b>	<b>1</b>	<b>11</b>	<b>1</b>	<b>1</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>7</b>	<b>46</b>
03:00 PM	0	1	0	0	2	0	0	0	1	0	1	0	5
03:15 PM	0	3	2	0	1	0	2	2	0	0	1	0	11
03:30 PM	0	0	0	0	0	0	0	3	0	0	1	0	4
03:45 PM	1	0	0	0	2	0	0	0	0	0	2	0	5
<b>Total</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>2</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>25</b>
04:00 PM	0	1	1	0	2	1	0	2	0	0	4	1	12
04:15 PM	0	1	0	0	3	1	0	0	1	1	0	0	7
04:30 PM	0	0	0	0	0	0	1	2	0	1	0	1	5
04:45 PM	0	2	0	0	0	0	0	1	0	0	2	0	5
<b>Total</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>6</b>	<b>2</b>	<b>29</b>
05:00 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	2	1	0	1	0	0	1	0	6
05:45 PM	0	1	0	0	0	0	0	0	0	0	1	1	3
<b>Total</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>11</b>
<b>Grand Total</b>	<b>2</b>	<b>21</b>	<b>4</b>	<b>1</b>	<b>19</b>	<b>6</b>	<b>7</b>	<b>18</b>	<b>3</b>	<b>2</b>	<b>18</b>	<b>10</b>	<b>111</b>
Apprch %	7.4	77.8	14.8	3.8	73.1	23.1	25	64.3	10.7	6.7	60	33.3	
Total %	1.8	18.9	3.6	0.9	17.1	5.4	6.3	16.2	2.7	1.8	16.2	9	

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	0	3	1	4	0	1	3	4	0	2	1	3	0	1	0	1	12
02:15 PM	1	2	0	3	0	2	0	2	0	1	0	1	0	2	2	4	10
02:30 PM	0	3	0	3	0	0	0	0	2	2	0	4	0	1	3	4	11
02:45 PM	0	3	0	3	1	4	0	5	2	1	0	3	0	0	2	2	13
<b>Total Volume</b>	<b>1</b>	<b>11</b>	<b>1</b>	<b>13</b>	<b>1</b>	<b>7</b>	<b>3</b>	<b>11</b>	<b>4</b>	<b>6</b>	<b>1</b>	<b>11</b>	<b>0</b>	<b>4</b>	<b>7</b>	<b>11</b>	<b>46</b>
<b>% App. Total</b>	<b>7.7</b>	<b>84.6</b>	<b>7.7</b>		<b>9.1</b>	<b>63.6</b>	<b>27.3</b>		<b>36.4</b>	<b>54.5</b>	<b>9.1</b>		<b>0</b>	<b>36.4</b>	<b>63.6</b>		
PHF	.250	.917	.250	.813	.250	.438	.250	.550	.500	.750	.250	.688	.000	.500	.583	.688	.885

# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 10

## Groups Printed- Bikes Peds

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
02:00 PM	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	2	1	3
02:15 PM	0	0	0	5	0	0	0	15	0	0	0	0	0	0	0	5	25	0	25
02:30 PM	0	0	0	0	0	0	0	10	0	1	0	1	0	0	0	1	12	1	13
02:45 PM	0	0	0	6	0	0	0	2	1	0	0	1	0	0	0	4	13	1	14
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>52</b>	<b>3</b>	<b>55</b>
03:00 PM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	1	6	0	6
03:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
03:30 PM	0	0	0	2	0	0	0	6	0	1	0	2	0	0	0	0	10	1	11
03:45 PM	0	0	0	1	0	0	0	8	0	0	0	0	0	0	0	1	10	0	10
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>27</b>	<b>1</b>	<b>28</b>
04:00 PM	0	0	0	0	0	0	0	2	0	0	0	3	0	0	0	2	7	0	7
04:15 PM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	5	0	5
04:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	0	2
<b>Total</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>14</b>	<b>1</b>	<b>15</b>
05:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	1	0	0	0	2	0	1	0	0	0	0	0	0	3	1	4
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>5</b>
<b>Grand Total</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>59</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>97</b>	<b>6</b>	<b>103</b>
Apprch %	0	100	0		0	0	0		20	80	0		0	0	0				
Total %	0	16.7	0		0	0	0		16.7	66.7	0		0	0	0		94.2	5.8	

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
02:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33.3</b>	<b>66.7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.500	.000	.750	.000	.000	.000	.000	.750

# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Traverse St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	1	3	71	2	0	84	161
07:15 AM	10	3	97	3	1	108	222
07:30 AM	2	3	111	9	2	55	182
07:45 AM	3	0	119	4	2	67	195
<b>Total</b>	<b>16</b>	<b>9</b>	<b>398</b>	<b>18</b>	<b>5</b>	<b>314</b>	<b>760</b>
08:00 AM	1	5	94	2	2	61	165
08:15 AM	5	3	93	2	2	76	181
08:30 AM	3	0	118	9	1	91	222
08:45 AM	0	1	85	0	3	67	156
<b>Total</b>	<b>9</b>	<b>9</b>	<b>390</b>	<b>13</b>	<b>8</b>	<b>295</b>	<b>724</b>
<b>Grand Total</b>	<b>25</b>	<b>18</b>	<b>788</b>	<b>31</b>	<b>13</b>	<b>609</b>	<b>1484</b>
Apprch %	58.1	41.9	96.2	3.8	2.1	97.9	
Total %	1.7	1.2	53.1	2.1	0.9	41	
Cars	25	18	776	31	13	592	1455
% Cars	100	100	98.5	100	100	97.2	98
Trucks	0	0	12	0	0	17	29
% Trucks	0	0	1.5	0	0	2.8	2

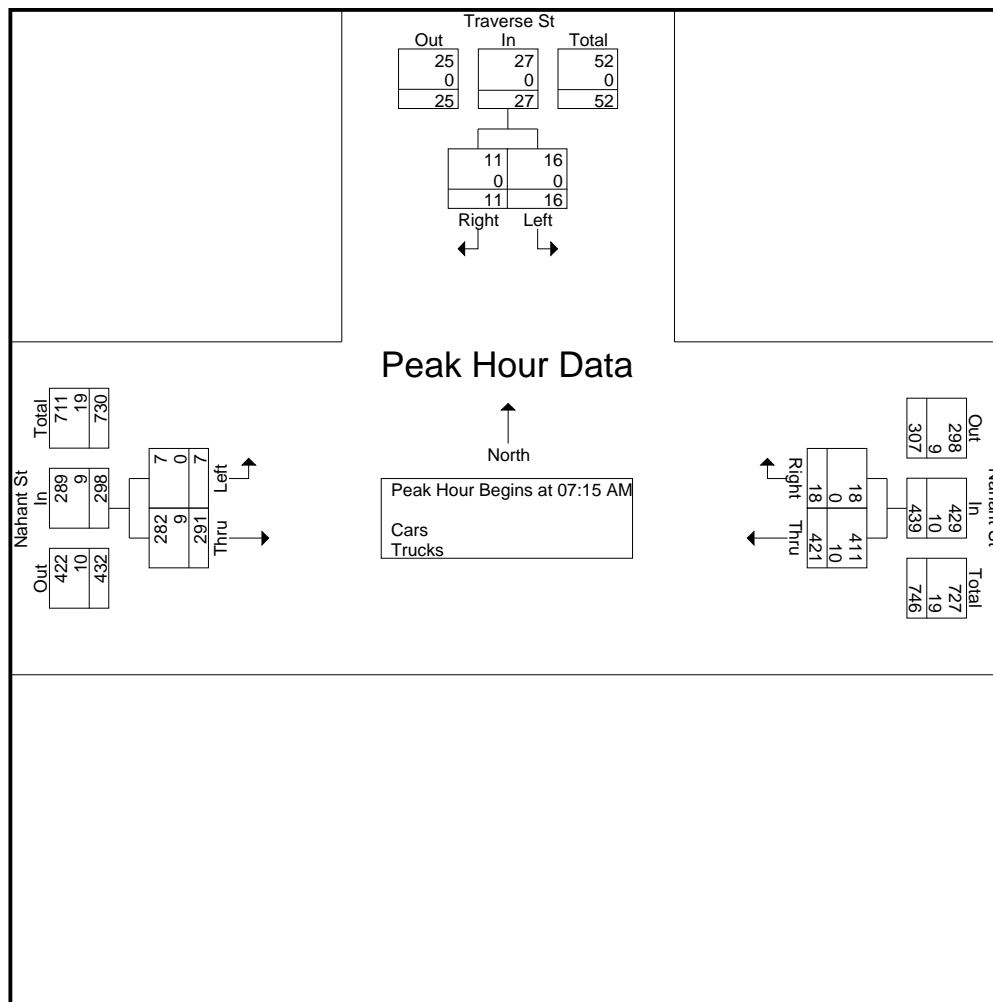
Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	<b>10</b>	3	<b>13</b>	97	3	100	1	<b>108</b>	<b>109</b>	<b>222</b>
07:30 AM	2	3	5	111	9	120	2	55	57	182
07:45 AM	3	0	3	<b>119</b>	4	<b>123</b>	2	67	69	195
08:00 AM	1	<b>5</b>	6	94	2	96	2	61	63	165
Total Volume	16	11	27	421	18	439	7	291	298	764
% App. Total	59.3	40.7		95.9	4.1		2.3	97.7		
PHF	.400	.550	.519	.884	.500	.892	.875	.674	.683	.860
Cars	16	11	27	411	18	429	7	282	289	745
% Cars	100	100	100	97.6	100	97.7	100	96.9	97.0	97.5
Trucks	0	0	0	10	0	10	0	9	9	19
% Trucks	0	0	0	2.4	0	2.3	0	3.1	3.0	2.5

# Accurate Counts

978-664-2565

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 2

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear



**Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1**

Peak Hour for Each Approach Begins at:

	07:15 AM			07:45 AM			07:00 AM		
+0 mins.	<b>10</b>	3	<b>13</b>	<b>119</b>	4	123	0	84	84
+15 mins.	2	3	5	94	2	96	1	<b>108</b>	<b>109</b>
+30 mins.	3	0	3	93	2	95	2	55	57
+45 mins.	1	<b>5</b>	6	118	<b>9</b>	<b>127</b>	2	67	69
Total Volume	16	11	27	424	17	441	5	314	319
% App. Total	59.3	40.7		96.1	3.9		1.6	98.4	
PHF	.400	.550	.519	.891	.472	.868	.625	.727	.732
Cars	16	11	27	415	17	432	5	303	308
% Cars	100	100	100	97.9	100	98	100	96.5	96.6
Trucks	0	0	0	9	0	9	0	11	11
% Trucks	0	0	0	2.1	0	2	0	3.5	3.4

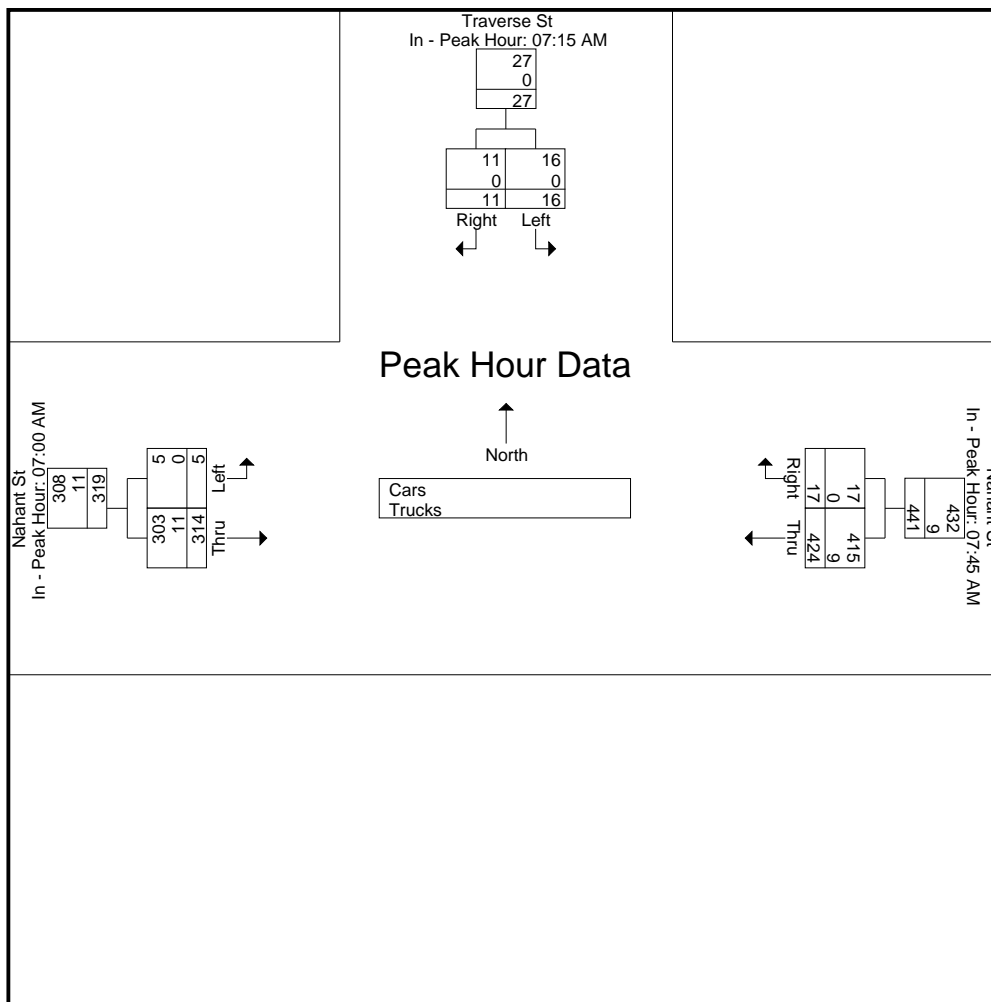


# Accurate Counts

978-664-2565

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Traverse St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	1	3	71	2	0	81	158
07:15 AM	10	3	95	3	1	103	215
07:30 AM	2	3	110	9	2	52	178
07:45 AM	3	0	115	4	2	67	191
<b>Total</b>	<b>16</b>	<b>9</b>	<b>391</b>	<b>18</b>	<b>5</b>	<b>303</b>	<b>742</b>
08:00 AM	1	5	91	2	2	60	161
08:15 AM	5	3	92	2	2	75	179
08:30 AM	3	0	117	9	1	89	219
08:45 AM	0	1	85	0	3	65	154
<b>Total</b>	<b>9</b>	<b>9</b>	<b>385</b>	<b>13</b>	<b>8</b>	<b>289</b>	<b>713</b>
<b>Grand Total</b>	<b>25</b>	<b>18</b>	<b>776</b>	<b>31</b>	<b>13</b>	<b>592</b>	<b>1455</b>
Apprch %	58.1	41.9	96.2	3.8	2.1	97.9	
Total %	1.7	1.2	53.3	2.1	0.9	40.7	

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	3	0	3	115	4	119	2	67	69	191
08:00 AM	1	5	6	91	2	93	2	60	62	161
08:15 AM	5	3	8	92	2	94	2	75	77	179
08:30 AM	3	0	3	117	9	126	1	89	90	219
<b>Total Volume</b>	<b>12</b>	<b>8</b>	<b>20</b>	<b>415</b>	<b>17</b>	<b>432</b>	<b>7</b>	<b>291</b>	<b>298</b>	<b>750</b>
% App. Total	60	40		96.1	3.9		2.3	97.7		
PHF	.600	.400	.625	.887	.472	.857	.875	.817	.828	.856

# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Traverse St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	0	0	0	0	0	3	3
07:15 AM	0	0	2	0	0	5	7
07:30 AM	0	0	1	0	0	3	4
07:45 AM	0	0	4	0	0	0	4
<b>Total</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>18</b>
08:00 AM	0	0	3	0	0	1	4
08:15 AM	0	0	1	0	0	1	2
08:30 AM	0	0	1	0	0	2	3
08:45 AM	0	0	0	0	0	2	2
<b>Total</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>11</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>29</b>
Apprch %	0	0	100	0	0	100	
Total %	0	0	41.4	0	0	58.6	

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	2	0	2	0	5	5	7
07:30 AM	0	0	0	1	0	1	0	3	3	4
07:45 AM	0	0	0	4	0	4	0	0	0	4
08:00 AM	0	0	0	3	0	3	0	1	1	4
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>19</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>63.2</b>
PHF	.000	.000	.000	.625	.000	.625	.000	.450	.450	.679



# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Traverse St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
02:00 PM	1	1	106	8	2	71	189
02:15 PM	5	8	112	6	3	87	221
02:30 PM	5	3	87	2	5	95	197
02:45 PM	4	0	110	2	7	76	199
<b>Total</b>	<b>15</b>	<b>12</b>	<b>415</b>	<b>18</b>	<b>17</b>	<b>329</b>	<b>806</b>
03:00 PM	3	1	98	6	5	102	215
03:15 PM	3	2	71	2	2	100	180
03:30 PM	3	5	83	5	4	94	194
03:45 PM	2	1	101	0	6	126	236
<b>Total</b>	<b>11</b>	<b>9</b>	<b>353</b>	<b>13</b>	<b>17</b>	<b>422</b>	<b>825</b>
04:00 PM	1	2	93	3	0	118	217
04:15 PM	1	2	104	3	6	127	243
04:30 PM	4	2	71	2	1	105	185
04:45 PM	2	5	86	0	1	115	209
<b>Total</b>	<b>8</b>	<b>11</b>	<b>354</b>	<b>8</b>	<b>8</b>	<b>465</b>	<b>854</b>
05:00 PM	1	2	82	2	2	109	198
05:15 PM	2	1	95	4	2	147	251
05:30 PM	2	2	98	2	2	114	220
05:45 PM	1	3	70	3	3	113	193
<b>Total</b>	<b>6</b>	<b>8</b>	<b>345</b>	<b>11</b>	<b>9</b>	<b>483</b>	<b>862</b>
<b>Grand Total</b>	<b>40</b>	<b>40</b>	<b>1467</b>	<b>50</b>	<b>51</b>	<b>1699</b>	<b>3347</b>
Apprch %	50	50	96.7	3.3	2.9	97.1	
Total %	1.2	1.2	43.8	1.5	1.5	50.8	
Cars	38	40	1445	50	50	1674	3297
% Cars	95	100	98.5	100	98	98.5	98.5
Trucks	2	0	22	0	1	25	50
% Trucks	5	0	1.5	0	2	1.5	1.5

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:30 PM										
03:30 PM	<b>3</b>	<b>5</b>	<b>8</b>	83	<b>5</b>	88	4	94	98	194
03:45 PM	2	1	3	101	0	101	<b>6</b>	126	132	236
04:00 PM	1	2	3	93	3	96	0	118	118	217
04:15 PM	1	2	3	<b>104</b>	3	<b>107</b>	6	<b>127</b>	<b>133</b>	<b>243</b>
Total Volume	7	10	17	381	11	392	16	465	481	890
% App. Total	41.2	58.8		97.2	2.8		3.3	96.7		
PHF	.583	.500	.531	.916	.550	.916	.667	.915	.904	.916
Cars	7	10	17	376	11	387	16	459	475	879
% Cars	100	100	100	98.7	100	98.7	100	98.7	98.8	98.8
Trucks	0	0	0	5	0	5	0	6	6	11
% Trucks	0	0	0	1.3	0	1.3	0	1.3	1.2	1.2

# Accurate Counts

978-664-2565

File Name : 98560002

Site Code : 98560002

Start Date : 12/20/2023

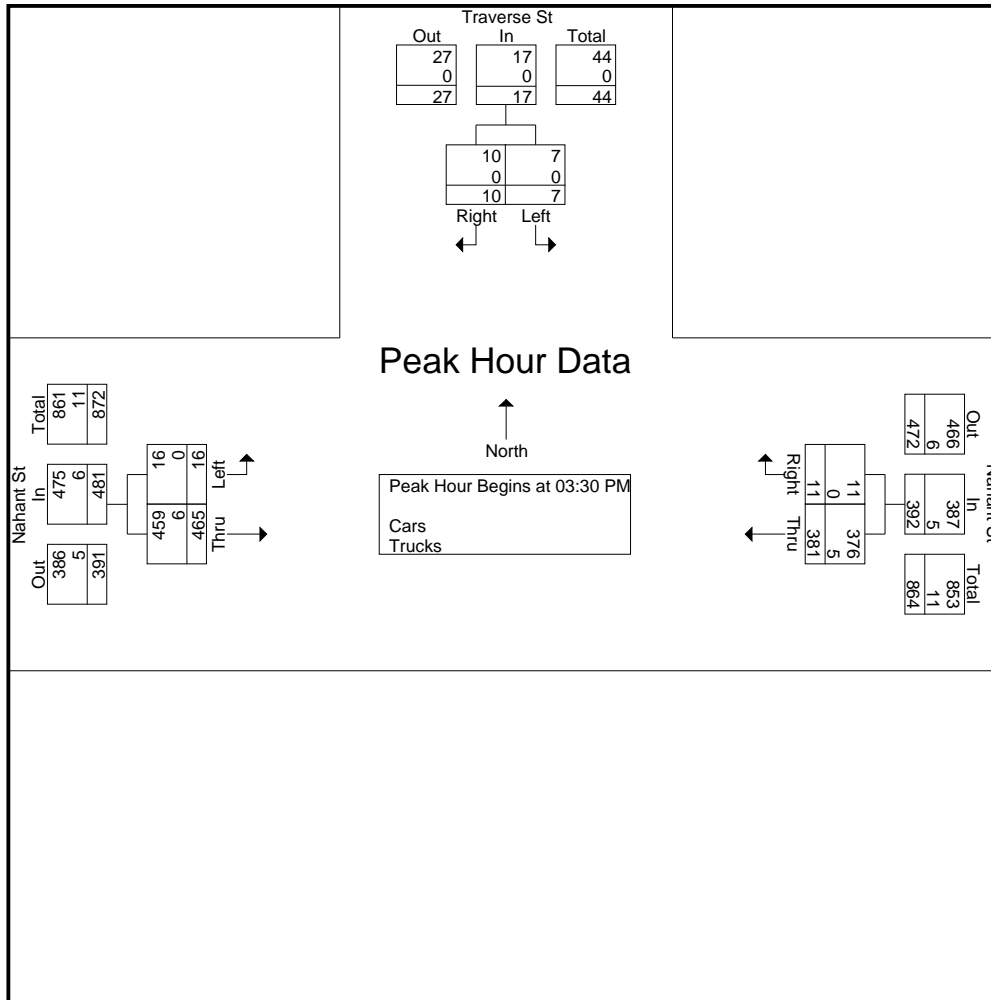
Page No : 2

N/S Street : Traverse Street

E/W Street : Nahant Street

City/State : Wakefield, MA

Weather : Clear



**Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1**

Peak Hour for Each Approach Begins at:

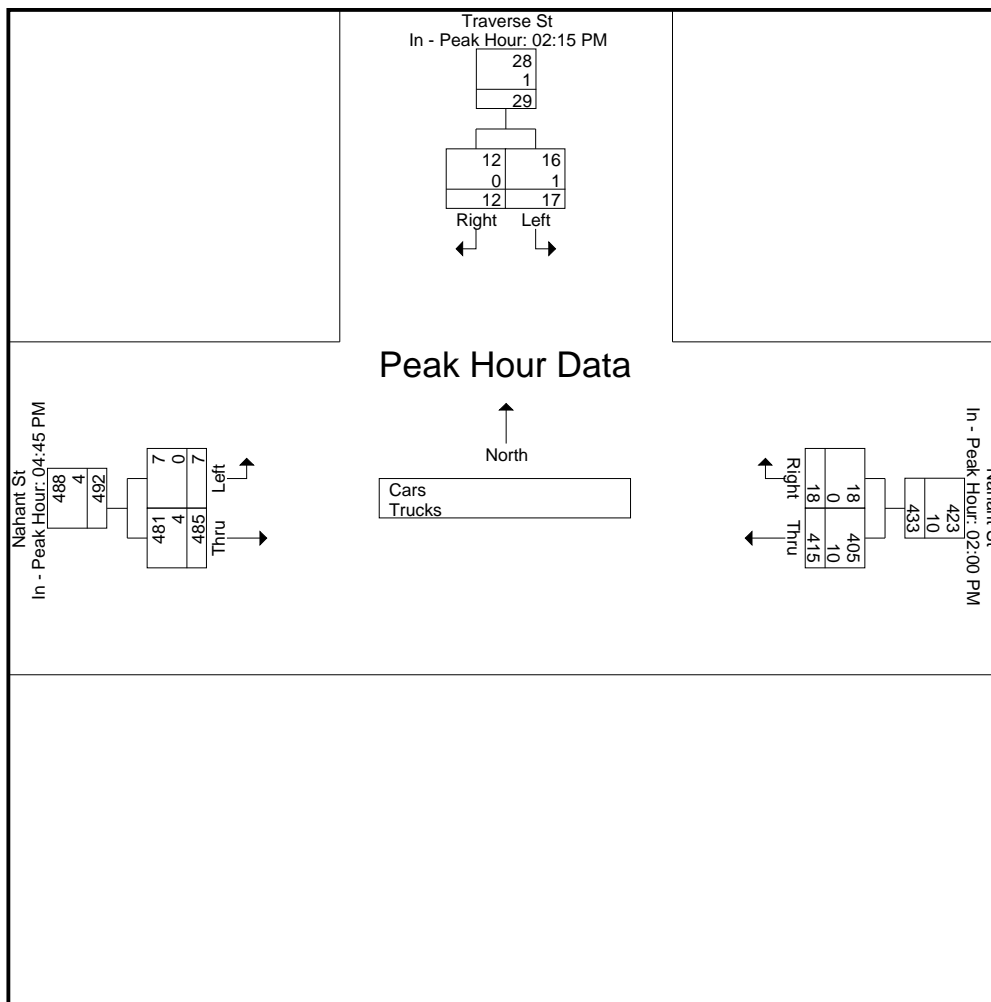
	02:15 PM			02:00 PM			04:45 PM		
+0 mins.	5	8	13	106	8	114	1	115	116
+15 mins.	5	3	8	112	6	118	2	109	111
+30 mins.	4	0	4	87	2	89	2	147	149
+45 mins.	3	1	4	110	2	112	2	114	116
<b>Total Volume</b>	17	12	29	415	18	433	7	485	492
<b>% App. Total</b>	58.6	41.4		95.8	4.2		1.4	98.6	
PHF	.850	.375	.558	.926	.563	.917	.875	.825	.826
Cars	16	12	28	405	18	423	7	481	488
% Cars	94.1	100	96.6	97.6	100	97.7	100	99.2	99.2
Trucks	1	0	1	10	0	10	0	4	4
% Trucks	5.9	0	3.4	2.4	0	2.3	0	0.8	0.8

# Accurate Counts

978-664-2565

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Traverse St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
02:00 PM	1	1	102	8	2	68	182
02:15 PM	5	8	111	6	3	85	218
02:30 PM	4	3	86	2	5	93	193
02:45 PM	4	0	106	2	7	74	193
<b>Total</b>	<b>14</b>	<b>12</b>	<b>405</b>	<b>18</b>	<b>17</b>	<b>320</b>	<b>786</b>
03:00 PM	3	1	96	6	4	99	209
03:15 PM	3	2	69	2	2	99	177
03:30 PM	3	5	83	5	4	93	193
03:45 PM	2	1	100	0	6	123	232
<b>Total</b>	<b>11</b>	<b>9</b>	<b>348</b>	<b>13</b>	<b>16</b>	<b>414</b>	<b>811</b>
04:00 PM	1	2	92	3	0	116	214
04:15 PM	1	2	101	3	6	127	240
04:30 PM	4	2	71	2	1	104	184
04:45 PM	2	5	86	0	1	113	207
<b>Total</b>	<b>8</b>	<b>11</b>	<b>350</b>	<b>8</b>	<b>8</b>	<b>460</b>	<b>845</b>
05:00 PM	1	2	82	2	2	107	196
05:15 PM	1	1	95	4	2	147	250
05:30 PM	2	2	95	2	2	114	217
05:45 PM	1	3	70	3	3	112	192
<b>Total</b>	<b>5</b>	<b>8</b>	<b>342</b>	<b>11</b>	<b>9</b>	<b>480</b>	<b>855</b>
<b>Grand Total</b>	<b>38</b>	<b>40</b>	<b>1445</b>	<b>50</b>	<b>50</b>	<b>1674</b>	<b>3297</b>
Apprch %	48.7	51.3	96.7	3.3	2.9	97.1	
Total %	1.2	1.2	43.8	1.5	1.5	50.8	

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:30 PM										
03:30 PM	<b>3</b>	<b>5</b>	<b>8</b>	83	<b>5</b>	88	4	93	97	193
03:45 PM	2	1	3	100	0	100	<b>6</b>	123	129	232
04:00 PM	1	2	3	92	3	95	0	116	116	214
04:15 PM	1	2	3	<b>101</b>	3	<b>104</b>	6	<b>127</b>	<b>133</b>	<b>240</b>
<b>Total Volume</b>	<b>7</b>	<b>10</b>	<b>17</b>	<b>376</b>	<b>11</b>	<b>387</b>	<b>16</b>	<b>459</b>	<b>475</b>	<b>879</b>
% App. Total	41.2	58.8		97.2	2.8		3.4	96.6		
PHF	.583	.500	.531	.931	.550	.930	.667	.904	.893	.916



# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Traverse St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
02:00 PM	0	0	4	0	0	3	7
02:15 PM	0	0	1	0	0	2	3
02:30 PM	1	0	1	0	0	2	4
02:45 PM	0	0	4	0	0	2	6
<b>Total</b>	<b>1</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>20</b>
03:00 PM	0	0	2	0	1	3	6
03:15 PM	0	0	2	0	0	1	3
03:30 PM	0	0	0	0	0	1	1
03:45 PM	0	0	1	0	0	3	4
<b>Total</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>14</b>
04:00 PM	0	0	1	0	0	2	3
04:15 PM	0	0	3	0	0	0	3
04:30 PM	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	2	2
<b>Total</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>9</b>
05:00 PM	0	0	0	0	0	2	2
05:15 PM	1	0	0	0	0	0	1
05:30 PM	0	0	3	0	0	0	3
05:45 PM	0	0	0	0	0	1	1
<b>Total</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>7</b>
<b>Grand Total</b>	<b>2</b>	<b>0</b>	<b>22</b>	<b>0</b>	<b>1</b>	<b>25</b>	<b>50</b>
Apprch %	100	0	100	0	3.8	96.2	
Total %	4	0	44	0	2	50	

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	4	0	4	0	3	3	7
02:15 PM	0	0	0	1	0	1	0	2	2	3
02:30 PM	1	0	1	1	0	1	0	2	2	4
02:45 PM	0	0	0	4	0	4	0	2	2	6
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>20</b>
% App. Total	100	0		100	0		0	100		
PHF	.250	.000	.250	.625	.000	.625	.000	.750	.750	.714

# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 10

### Groups Printed- Bikes Peds

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds			
02:00 PM	0	0	0	1	0	1	0	0	0	1	1	2
02:15 PM	0	0	9	0	0	0	0	0	0	9	0	9
02:30 PM	0	0	3	0	1	0	0	0	0	3	1	4
02:45 PM	0	0	8	0	0	2	0	0	0	10	0	10
<b>Total</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>2</b>	<b>25</b>
03:00 PM	0	0	3	0	0	0	0	0	0	3	0	3
03:15 PM	0	0	2	0	0	1	0	0	0	3	0	3
03:30 PM	0	0	1	0	0	0	0	0	0	1	0	1
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>7</b>
04:00 PM	0	0	3	0	0	0	0	0	0	3	0	3
04:15 PM	0	0	2	0	0	0	0	0	0	2	0	2
04:30 PM	0	0	3	0	0	1	0	0	0	4	0	4
04:45 PM	0	0	1	0	0	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>35</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>2</b>	<b>42</b>
Apprch %	0	0		50	50		0	0				
Total %	0	0		50	50		0	0		95.2	4.8	

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	1	0	1	0	0	0	1
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	1	1	0	0	0	1
02:45 PM	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>50</b>
<b>PHF</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.250</b>	<b>.250</b>	<b>.500</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.500</b>

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Middlesex St From North			Nahant St From East			Site Driveway From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	76	0	2	0	0	0	84	0	162
07:15 AM	0	0	0	0	96	0	1	0	0	0	120	0	217
07:30 AM	0	0	1	0	117	0	0	0	0	0	57	1	176
07:45 AM	1	0	1	0	122	0	0	0	0	1	68	0	193
<b>Total</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>411</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>329</b>	<b>1</b>	<b>748</b>
08:00 AM	0	0	0	0	96	0	0	0	0	0	62	0	158
08:15 AM	0	0	1	0	97	0	0	0	0	0	81	0	179
08:30 AM	0	0	0	0	124	0	0	0	0	0	94	0	218
08:45 AM	0	0	0	1	84	0	1	0	1	0	66	1	154
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>401</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>303</b>	<b>1</b>	<b>709</b>
<b>Grand Total</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>812</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>632</b>	<b>2</b>	<b>1457</b>
Apprch %	25	0	75	0.1	99.9	0	80	0	20	0.2	99.5	0.3	
Total %	0.1	0	0.2	0.1	55.7	0	0.3	0	0.1	0.1	43.4	0.1	
Cars	1	0	3	1	801	0	4	0	1	1	619	2	1433
% Cars	100	0	100	100	98.6	0	100	0	100	100	97.9	100	98.4
Trucks	0	0	0	0	11	0	0	0	0	0	13	0	24
% Trucks	0	0	0	0	1.4	0	0	0	0	0	2.1	0	1.6

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	76	0	76	2	0	0	2	0	84	0	84	162
07:15 AM	0	0	0	0	0	96	0	96	1	0	0	1	0	120	0	120	217
07:30 AM	0	0	1	1	0	117	0	117	0	0	0	0	0	57	1	58	176
07:45 AM	1	0	1	2	0	122	0	122	0	0	0	0	1	68	0	69	193
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>411</b>	<b>0</b>	<b>411</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>329</b>	<b>1</b>	<b>331</b>	<b>748</b>
% App. Total	33.3	0	66.7		0	100	0		100	0	0		0.3	99.4	0.3		
PHF	.250	.000	.500	.375	.000	.842	.000	.842	.375	.000	.000	.375	.250	.685	.250	.690	.862
Cars	1	0	2	3	0	404	0	404	3	0	0	3	1	319	1	321	731
% Cars	100	0	100	100	0	98.3	0	98.3	100	0	0	100	100	97.0	100	97.0	97.7
Trucks	0	0	0	0	0	7	0	7	0	0	0	0	0	10	0	10	17
% Trucks	0	0	0	0	0	1.7	0	1.7	0	0	0	0	0	3.0	0	3.0	2.3

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy

E/W Street : Nahant Street

City/State : Wakefield, MA

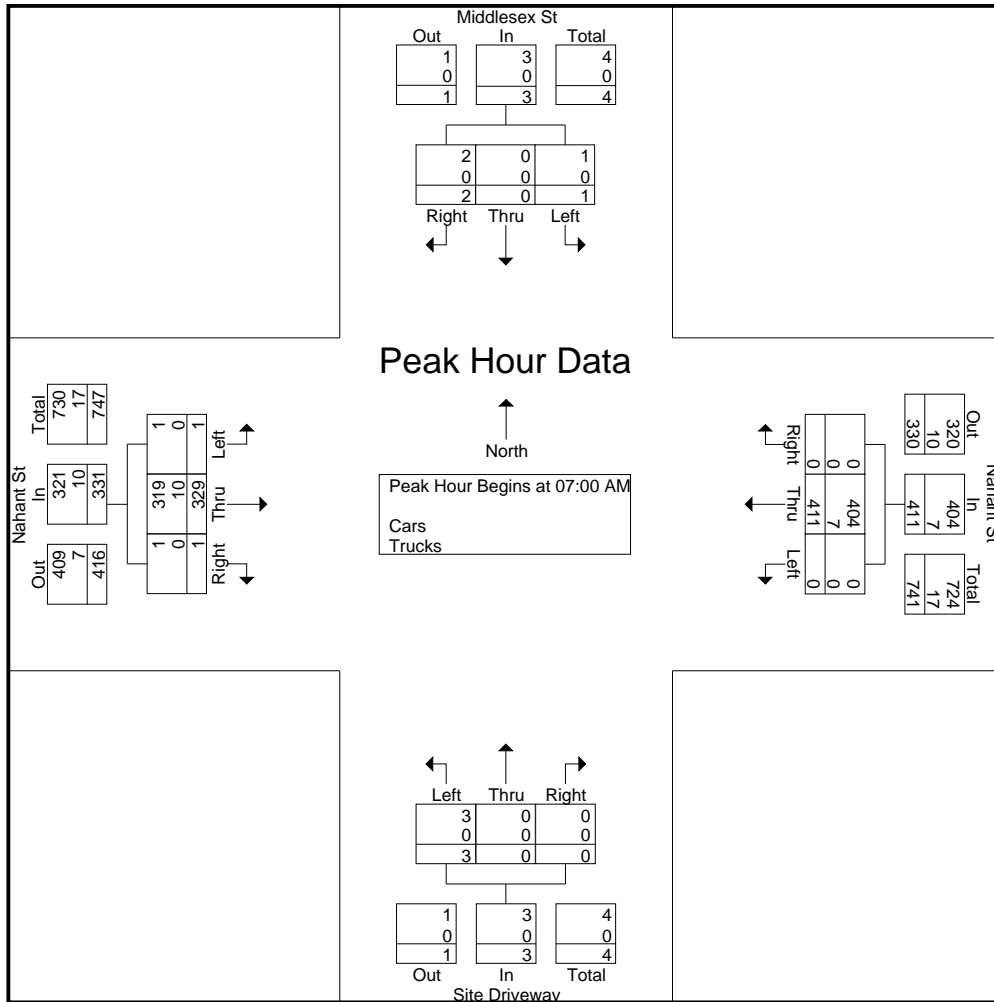
Weather : Clear

File Name : 98560003

Site Code : 98560003

Start Date : 12/20/2023

Page No : 2



**Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1**

**Peak Hour for Each Approach Begins at:**

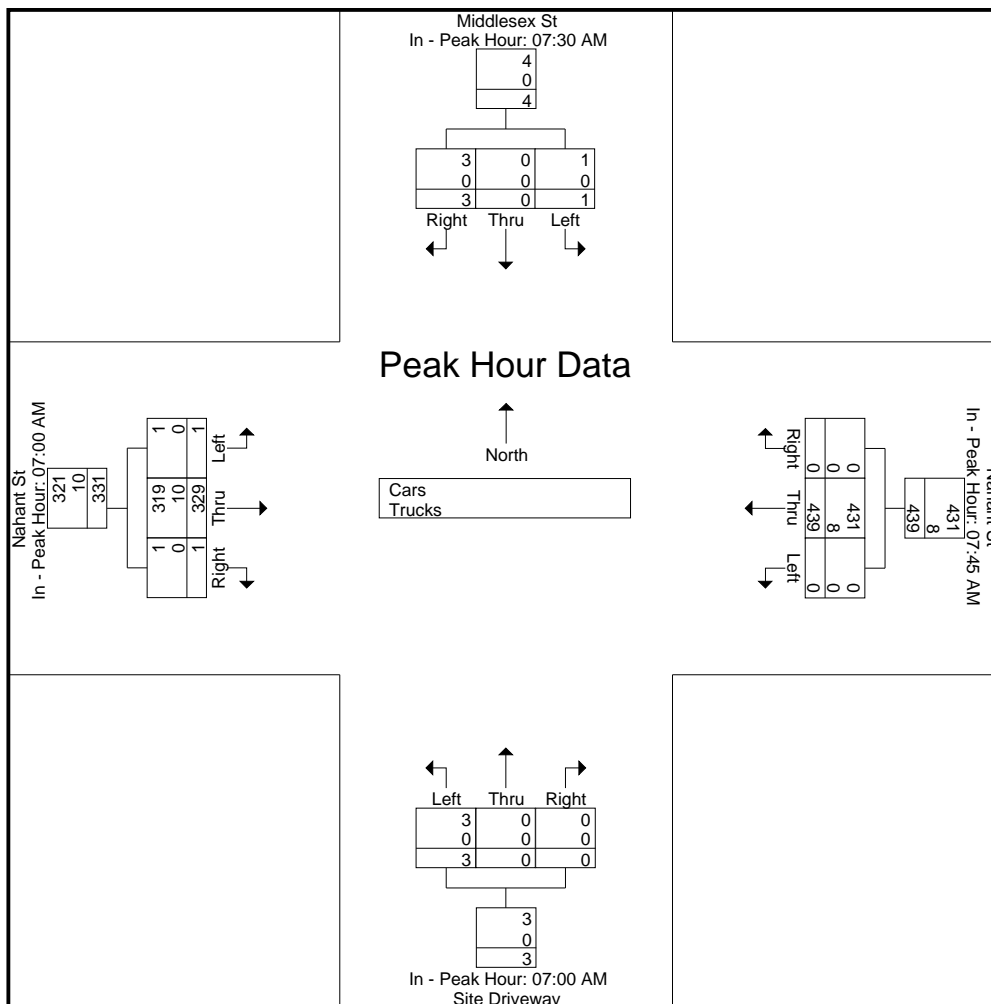
	07:30 AM				07:45 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	1	1	0	122	0	122	2	0	0	2	0	84	0	84
+15 mins.	1	0	1	2	0	96	0	96	1	0	0	1	0	120	0	120
+30 mins.	0	0	0	0	0	97	0	97	0	0	0	0	0	57	1	58
+45 mins.	0	0	1	1	0	124	0	124	0	0	0	0	1	68	0	69
Total Volume	1	0	3	4	0	439	0	439	3	0	0	3	1	329	1	331
% App. Total	25	0	75		0	100	0		100	0	0		0.3	99.4	0.3	
PHF	.250	.000	.750	.500	.000	.885	.000	.885	.375	.000	.000	.375	.250	.685	.250	.690
Cars	1	0	3	4	0	431	0	431	3	0	0	3	1	319	1	321
% Cars	100	0	100	100	0	98.2	0	98.2	100	0	0	100	100	97	100	97
Trucks	0	0	0	0	0	8	0	8	0	0	0	0	0	10	0	10
% Trucks	0	0	0	0	0	1.8	0	1.8	0	0	0	0	0	3	0	3

# Accurate Counts

978-664-2565

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Middlesex St From North			Nahant St From East			Site Driveway From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	76	0	2	0	0	0	82	0	160
07:15 AM	0	0	0	0	94	0	1	0	0	0	115	0	210
07:30 AM	0	0	1	0	116	0	0	0	0	0	54	1	172
07:45 AM	1	0	1	0	118	0	0	0	0	1	68	0	189
<b>Total</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>404</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>319</b>	<b>1</b>	<b>731</b>
08:00 AM	0	0	0	0	93	0	0	0	0	0	61	0	154
08:15 AM	0	0	1	0	97	0	0	0	0	0	81	0	179
08:30 AM	0	0	0	0	123	0	0	0	0	0	93	0	216
08:45 AM	0	0	0	1	84	0	1	0	1	0	65	1	153
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>397</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>300</b>	<b>1</b>	<b>702</b>
<b>Grand Total</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>801</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>619</b>	<b>2</b>	<b>1433</b>
Apprch %	25	0	75	0.1	99.9	0	80	0	20	0.2	99.5	0.3	
Total %	0.1	0	0.2	0.1	55.9	0	0.3	0	0.1	0.1	43.2	0.1	

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	1	0	1	2	0	118	0	118	0	0	0	0	1	68	0	69	189
08:00 AM	0	0	0	0	0	93	0	93	0	0	0	0	0	61	0	61	154
08:15 AM	0	0	1	1	0	97	0	97	0	0	0	0	0	81	0	81	179
08:30 AM	0	0	0	0	0	123	0	123	0	0	0	0	0	93	0	93	216
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>431</b>	<b>0</b>	<b>431</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>303</b>	<b>0</b>	<b>304</b>	<b>738</b>
% App. Total	33.3	0	66.7		0	100	0		0	0	0		0.3	99.7	0		
PHF	.250	.000	.500	.375	.000	.876	.000	.876	.000	.000	.000	.000	.250	.815	.000	.817	.854

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Middlesex St From North			Nahant St From East			Site Driveway From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
07:15 AM	0	0	0	0	2	0	0	0	0	0	5	0	7
07:30 AM	0	0	0	0	1	0	0	0	0	0	3	0	4
07:45 AM	0	0	0	0	4	0	0	0	0	0	0	0	4
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>17</b>
08:00 AM	0	0	0	0	3	0	0	0	0	0	1	0	4
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	1	0	0	0	0	0	1	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>7</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>24</b>
Apprch %	0	0	0	0	100	0	0	0	0	0	100	0	
Total %	0	0	0	0	45.8	0	0	0	0	0	54.2	0	

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	5	0	5	7
07:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	3	4
07:45 AM	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	4
08:00 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	1	0	1	4
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>19</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>0</b>
PHF	.000	.000	.000	.000	.000	.625	.000	.625	.000	.000	.000	.000	.000	.450	.000	.450	.679

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 10

## Groups Printed- Bikes Peds

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
07:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
07:30 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	0	0	0	2	0	0	0	0	0	0	0	1	0	1	0	0	3	1	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Grand Total</b>	0	0	0	3	0	0	0	0	0	0	0	1	0	1	0	0	4	1	5
Apprch %	0	0	0		0	0	0		0	0	0		0	100	0				
Total %	0	0	0		0	0	0		0	0	0		0	100	0		80	20	

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
<b>% App. Total</b>	0	0	0		0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250



# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Middlesex St From North			Nahant St From East			Site Driveway From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	0	0	0	0	114	0	0	0	0	0	73	0	187
02:15 PM	0	0	0	0	122	0	0	0	0	0	91	0	213
02:30 PM	0	0	0	2	87	0	1	0	2	0	99	0	191
02:45 PM	0	0	0	0	110	0	0	0	0	0	80	0	190
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>433</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>343</b>	<b>0</b>	<b>781</b>
03:00 PM	0	0	0	0	104	0	0	0	0	0	105	0	209
03:15 PM	0	0	0	0	71	0	0	0	0	0	104	0	175
03:30 PM	0	0	0	0	89	0	0	0	0	0	95	0	184
03:45 PM	0	0	0	0	99	0	1	0	0	0	129	0	229
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>363</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>433</b>	<b>0</b>	<b>797</b>
04:00 PM	0	0	0	0	99	0	0	0	0	0	119	0	218
04:15 PM	0	0	1	0	107	0	0	0	0	2	124	1	235
04:30 PM	0	0	1	0	74	1	0	0	0	0	109	0	185
04:45 PM	0	0	0	0	83	0	0	0	0	0	118	1	202
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>363</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>470</b>	<b>2</b>	<b>840</b>
05:00 PM	0	0	0	0	84	0	1	0	0	0	109	0	194
05:15 PM	0	0	0	0	97	0	0	0	0	0	149	0	246
05:30 PM	0	0	0	0	100	0	0	0	0	0	114	0	214
05:45 PM	0	0	0	0	73	1	0	0	0	0	114	0	188
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>354</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>486</b>	<b>0</b>	<b>842</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1513</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1732</b>	<b>2</b>	<b>3260</b>
Apprch %	0	0	100	0.1	99.7	0.1	60	0	40	0.1	99.8	0.1	
Total %	0	0	0.1	0.1	46.4	0.1	0.1	0	0.1	0.1	53.1	0.1	
Cars	0	0	2	2	1491	2	3	0	2	2	1711	2	3217
% Cars	0	0	100	100	98.5	100	100	0	100	100	98.8	100	98.7
Trucks	0	0	0	0	22	0	0	0	0	0	21	0	43
% Trucks	0	0	0	0	1.5	0	0	0	0	0	1.2	0	1.3

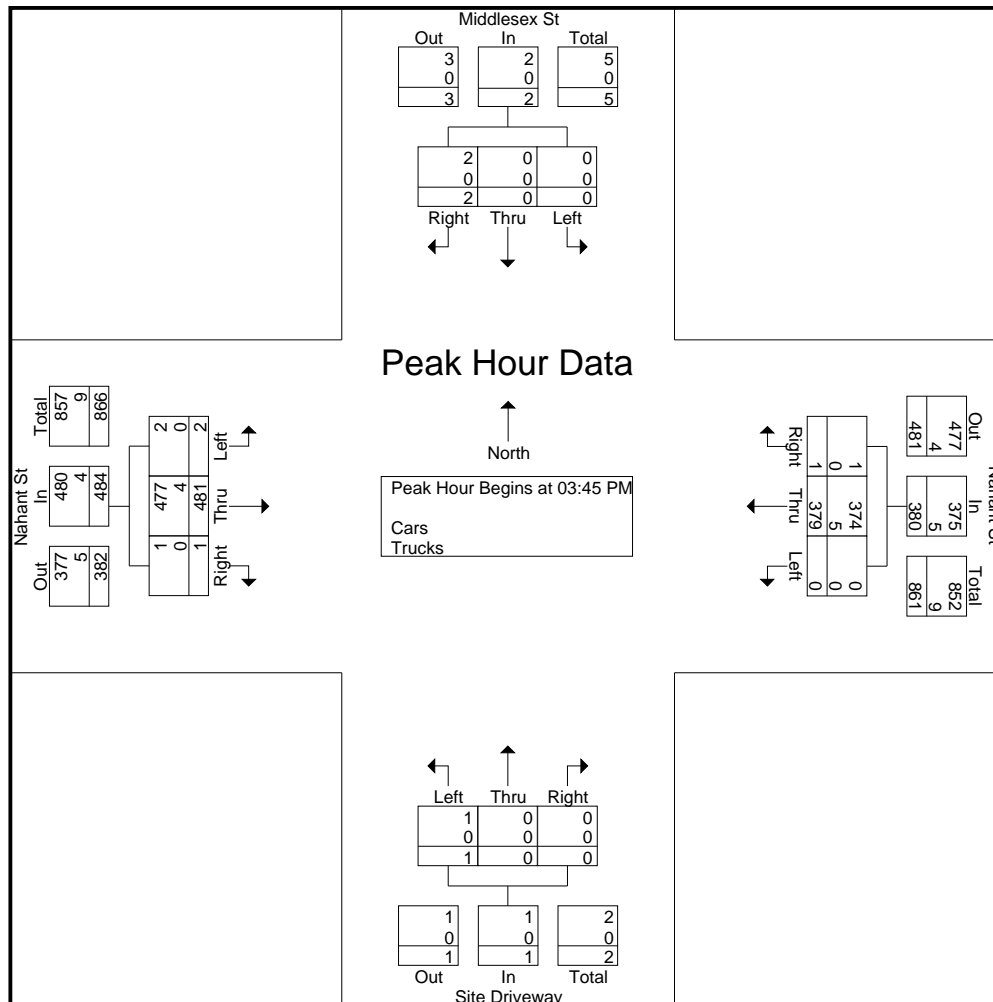
Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:45 PM																	
03:45 PM	0	0	0	0	0	99	0	99	1	0	0	1	0	129	0	129	229
04:00 PM	0	0	0	0	0	99	0	99	0	0	0	0	0	119	0	119	218
04:15 PM	0	0	1	1	0	107	0	107	0	0	0	0	2	124	1	127	235
04:30 PM	0	0	1	1	0	74	1	75	0	0	0	0	0	109	0	109	185
Total Volume	0	0	2	2	0	379	1	380	1	0	0	1	2	481	1	484	867
% App. Total	0	0	100		0	99.7	0.3		100	0	0		0.4	99.4	0.2		
PHF	.000	.000	.500	.500	.000	.886	.250	.888	.250	.000	.000	.250	.250	.932	.250	.938	.922
Cars	0	0	2	2	0	374	1	375	1	0	0	1	2	477	1	480	858
% Cars	0	0	100	100	0	98.7	100	98.7	100	0	0	100	100	99.2	100	99.2	99.0
Trucks	0	0	0	0	0	5	0	5	0	0	0	0	0	4	0	4	9
% Trucks	0	0	0	0	0	1.3	0	1.3	0	0	0	0	0	0.8	0	0.8	1.0

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 2



**Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1**

**Peak Hour for Each Approach Begins at:**

	03:45 PM				02:00 PM				02:00 PM				04:45 PM			
+0 mins.	0	0	0	0	0	114	0	114	0	0	0	0	0	118	1	119
+15 mins.	0	0	0	0	0	<b>122</b>	0	<b>122</b>	0	0	0	0	0	109	0	109
+30 mins.	0	0	<b>1</b>	<b>1</b>	<b>2</b>	87	0	89	<b>1</b>	0	<b>2</b>	<b>3</b>	0	<b>149</b>	0	<b>149</b>
+45 mins.	0	0	1	1	0	110	0	110	0	0	0	0	0	114	0	114
Total Volume	0	0	2	2	2	433	0	435	1	0	2	3	0	490	1	491
% App. Total	0	0	100		0.5	99.5	0		33.3	0	66.7		0	99.8	0.2	
PHF	.000	.000	.500	.500	.250	.887	.000	.891	.250	.000	.250	.250	.000	.822	.250	.824
Cars	0	0	2	2	2	422	0	424	1	0	2	3	0	486	1	487
% Cars	0	0	100	100	100	97.5	0	97.5	100	0	100	100	0	99.2	100	99.2
Trucks	0	0	0	0	0	11	0	11	0	0	0	0	0	4	0	4
% Trucks	0	0	0	0	0	2.5	0	2.5	0	0	0	0	0	0.8	0	0.8

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy

E/W Street : Nahant Street

City/State : Wakefield, MA

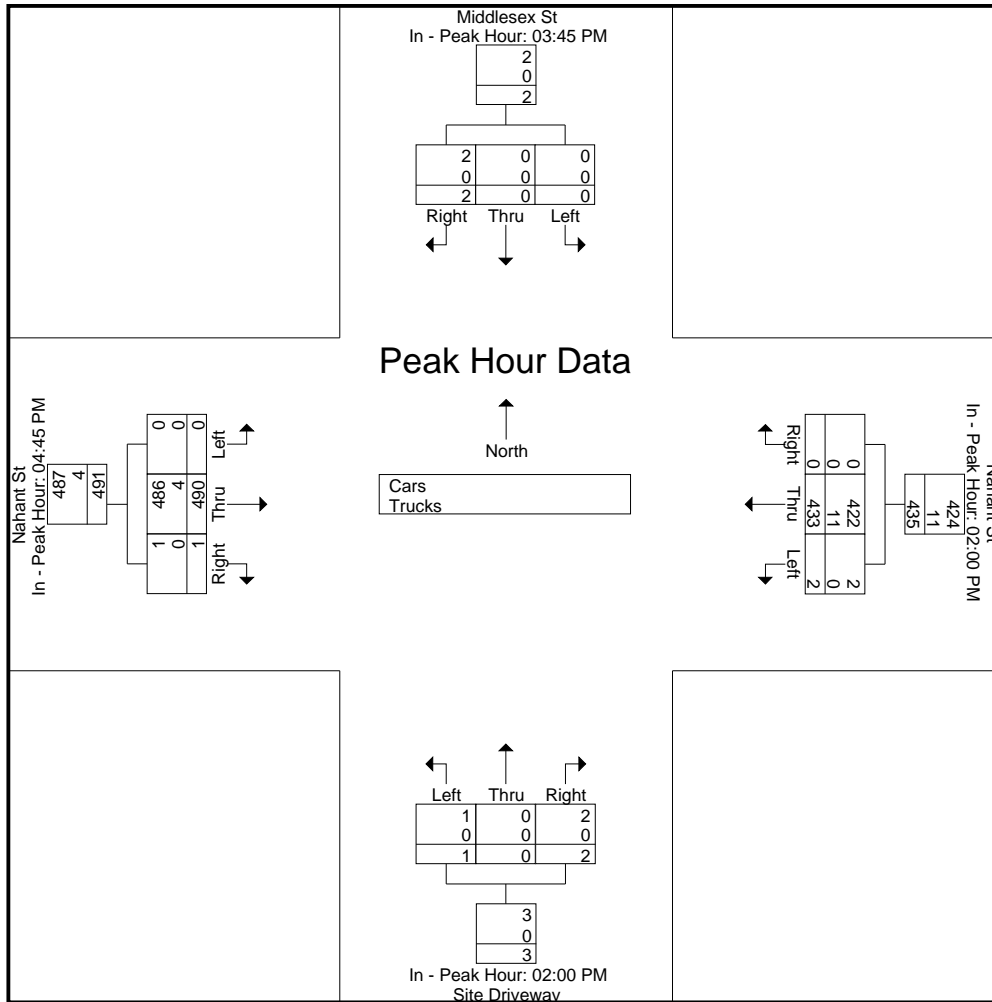
Weather : Clear

File Name : 98560003

Site Code : 98560003

Start Date : 12/20/2023

Page No : 3



# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Middlesex St From North			Nahant St From East			Site Driveway From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	0	0	0	0	110	0	0	0	0	0	70	0	180
02:15 PM	0	0	0	0	121	0	0	0	0	0	90	0	211
02:30 PM	0	0	0	2	86	0	1	0	2	0	97	0	188
02:45 PM	0	0	0	0	105	0	0	0	0	0	78	0	183
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>422</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>335</b>	<b>0</b>	<b>762</b>
03:00 PM	0	0	0	0	103	0	0	0	0	0	103	0	206
03:15 PM	0	0	0	0	69	0	0	0	0	0	103	0	172
03:30 PM	0	0	0	0	89	0	0	0	0	0	94	0	183
03:45 PM	0	0	0	0	98	0	1	0	0	0	127	0	226
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>359</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>427</b>	<b>0</b>	<b>787</b>
04:00 PM	0	0	0	0	97	0	0	0	0	0	118	0	215
04:15 PM	0	0	1	0	105	0	0	0	0	2	124	1	233
04:30 PM	0	0	1	0	74	1	0	0	0	0	108	0	184
04:45 PM	0	0	0	0	83	0	0	0	0	0	117	1	201
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>359</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>467</b>	<b>2</b>	<b>833</b>
05:00 PM	0	0	0	0	84	0	1	0	0	0	108	0	193
05:15 PM	0	0	0	0	97	0	0	0	0	0	147	0	244
05:30 PM	0	0	0	0	97	0	0	0	0	0	114	0	211
05:45 PM	0	0	0	0	73	1	0	0	0	0	113	0	187
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>351</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>482</b>	<b>0</b>	<b>835</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1491</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1711</b>	<b>2</b>	<b>3217</b>
Apprch %	0	0	100	0.1	99.7	0.1	60	0	40	0.1	99.8	0.1	
Total %	0	0	0.1	0.1	46.3	0.1	0.1	0	0.1	0.1	53.2	0.1	

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:45 PM																	
03:45 PM	0	0	0	0	0	98	0	98	1	0	0	1	0	127	0	127	226
04:00 PM	0	0	0	0	0	97	0	97	0	0	0	0	0	118	0	118	215
04:15 PM	0	0	1	1	0	105	0	105	0	0	0	0	2	124	1	127	233
04:30 PM	0	0	1	1	0	74	1	75	0	0	0	0	0	108	0	108	184
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>374</b>	<b>1</b>	<b>375</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>477</b>	<b>1</b>	<b>480</b>	<b>858</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b></b>	<b>0</b>	<b>99.7</b>	<b>0.3</b>	<b></b>	<b>100</b>	<b>0</b>	<b>0</b>	<b></b>	<b>0.4</b>	<b>99.4</b>	<b>0.2</b>	<b></b>	<b></b>
PHF	.000	.000	.500	.500	.000	.890	.250	.893	.250	.000	.000	.250	.250	.939	.250	.945	.921

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 7

## Groups Printed- Trucks

Start Time	Middlesex St From North			Nahant St From East			Site Driveway From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	0	0	0	0	4	0	0	0	0	0	3	0	7
02:15 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
02:30 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
02:45 PM	0	0	0	0	5	0	0	0	0	0	2	0	7
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>19</b>
03:00 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
03:15 PM	0	0	0	0	2	0	0	0	0	0	1	0	3
03:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
03:45 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>10</b>
04:00 PM	0	0	0	0	2	0	0	0	0	0	1	0	3
04:15 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>7</b>
05:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
05:30 PM	0	0	0	0	3	0	0	0	0	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>7</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>0</b>	<b>43</b>
Apprch %	0	0	0	0	100	0	0	0	0	0	100	0	
Total %	0	0	0	0	51.2	0	0	0	0	0	48.8	0	

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	0	0	0	0	0	4	0	4	0	0	0	0	0	3	0	3	7
02:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
02:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	2	3
02:45 PM	0	0	0	0	0	5	0	5	0	0	0	0	0	2	0	2	7
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>8</b>	<b>19</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>55.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>66.7</b>	<b>67.9</b>
PHF	.000	.000	.000	.000	.000	.550	.000	.550	.000	.000	.000	.000	.000	.667	.000	.667	.679

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 10

## Groups Printed- Bikes Peds

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
02:00 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2
02:15 PM	0	0	0	8	0	0	0	0	0	0	0	1	0	0	0	0	9	0	9
02:30 PM	0	0	0	8	0	2	0	0	0	0	0	0	0	0	0	0	8	2	10
02:45 PM	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	12	0	12
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>31</b>	<b>2</b>	<b>33</b>
03:00 PM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
03:15 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	3	0	3
03:30 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	3	0	3
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>
04:00 PM	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	4	0	4
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	2	1	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
04:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>1</b>	<b>9</b>
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>49</b>	<b>3</b>	<b>52</b>
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0				
Total %	0	0	0		0	66.7	0		0	0	0		0	33.3	0		94.2	5.8	

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Hart St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	0	7	69	1	2	82	161
07:15 AM	0	15	81	0	7	113	216
07:30 AM	0	15	100	1	10	46	172
07:45 AM	1	7	115	0	5	64	192
<b>Total</b>	<b>1</b>	<b>44</b>	<b>365</b>	<b>2</b>	<b>24</b>	<b>305</b>	<b>741</b>
08:00 AM	0	6	92	0	1	61	160
08:15 AM	1	8	88	0	6	76	179
08:30 AM	2	10	113	0	7	90	222
08:45 AM	1	7	79	1	7	60	155
<b>Total</b>	<b>4</b>	<b>31</b>	<b>372</b>	<b>1</b>	<b>21</b>	<b>287</b>	<b>716</b>
<b>Grand Total</b>	<b>5</b>	<b>75</b>	<b>737</b>	<b>3</b>	<b>45</b>	<b>592</b>	<b>1457</b>
Apprch %	6.2	93.8	99.6	0.4	7.1	92.9	
Total %	0.3	5.1	50.6	0.2	3.1	40.6	
Cars	5	74	729	3	45	582	1438
% Cars	100	98.7	98.9	100	100	98.3	98.7
Trucks	0	1	8	0	0	10	19
% Trucks	0	1.3	1.1	0	0	1.7	1.3

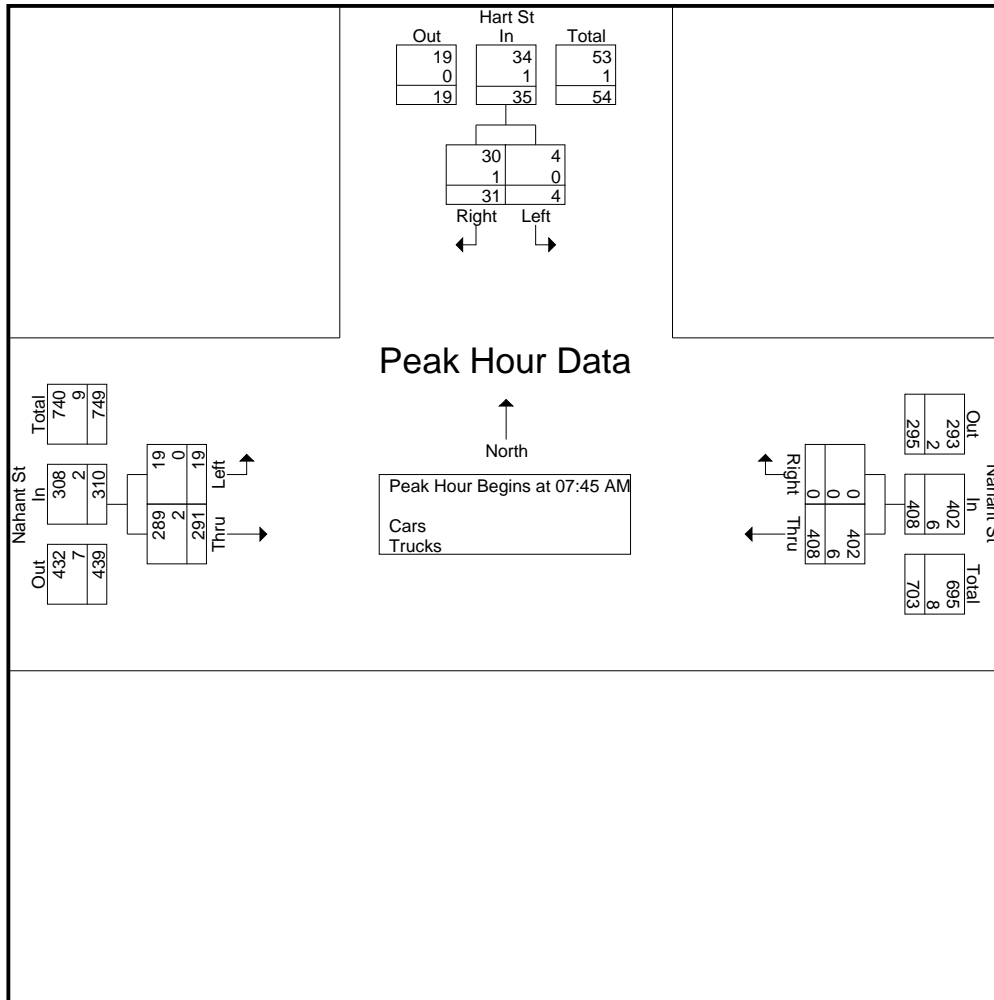
Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	1	7	8	115	0	115	5	64	69	192
08:00 AM	0	6	6	92	0	92	1	61	62	160
08:15 AM	1	8	9	88	0	88	6	76	82	179
08:30 AM	2	10	12	113	0	113	7	90	97	222
Total Volume	4	31	35	408	0	408	19	291	310	753
% App. Total	11.4	88.6		100	0		6.1	93.9		
PHF	.500	.775	.729	.887	.000	.887	.679	.808	.799	.848
Cars	4	30	34	402	0	402	19	289	308	744
% Cars	100	96.8	97.1	98.5	0	98.5	100	99.3	99.4	98.8
Trucks	0	1	1	6	0	6	0	2	2	9
% Trucks	0	3.2	2.9	1.5	0	1.5	0	0.7	0.6	1.2

# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 2



**Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1**

Peak Hour for Each Approach Begins at:

	07:00 AM			07:45 AM			07:00 AM		
+0 mins.	0	7	7	<b>115</b>	0	<b>115</b>	2	82	84
+15 mins.	0	<b>15</b>	<b>15</b>	92	0	92	7	<b>113</b>	<b>120</b>
+30 mins.	0	15	15	88	0	88	<b>10</b>	46	56
+45 mins.	<b>1</b>	7	8	113	0	113	5	64	69
Total Volume	1	44	45	408	0	408	24	305	329
% App. Total	2.2	97.8		100	0		7.3	92.7	
PHF	.250	.733	.750	.887	.000	.887	.600	.675	.685
Cars	1	43	44	402	0	402	24	298	322
% Cars	100	97.7	97.8	98.5	0	98.5	100	97.7	97.9
Trucks	0	1	1	6	0	6	0	7	7
% Trucks	0	2.3	2.2	1.5	0	1.5	0	2.3	2.1

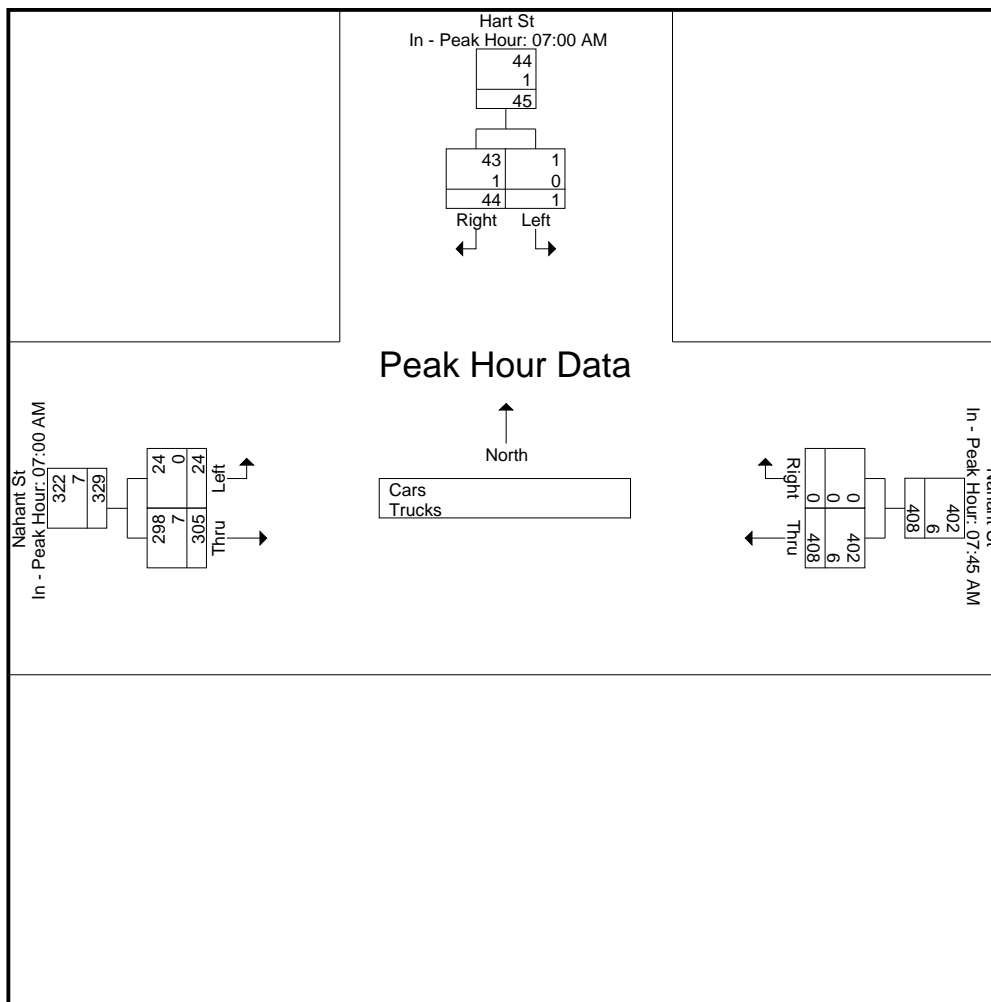


# Accurate Counts

978-664-2565

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 4

### Groups Printed- Cars

Start Time	Hart St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	0	7	69	1	2	81	160
07:15 AM	0	15	80	0	7	110	212
07:30 AM	0	15	99	1	10	43	168
07:45 AM	1	6	112	0	5	64	188
<b>Total</b>	<b>1</b>	<b>43</b>	<b>360</b>	<b>2</b>	<b>24</b>	<b>298</b>	<b>728</b>
08:00 AM	0	6	90	0	1	60	157
08:15 AM	1	8	88	0	6	75	178
08:30 AM	2	10	112	0	7	90	221
08:45 AM	1	7	79	1	7	59	154
<b>Total</b>	<b>4</b>	<b>31</b>	<b>369</b>	<b>1</b>	<b>21</b>	<b>284</b>	<b>710</b>
<b>Grand Total</b>	<b>5</b>	<b>74</b>	<b>729</b>	<b>3</b>	<b>45</b>	<b>582</b>	<b>1438</b>
Apprch %	6.3	93.7	99.6	0.4	7.2	92.8	
Total %	0.3	5.1	50.7	0.2	3.1	40.5	

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	1	6	7	112	0	112	5	64	69	188
08:00 AM	0	6	6	90	0	90	1	60	61	157
08:15 AM	1	8	9	88	0	88	6	75	81	178
08:30 AM	2	10	12	112	0	112	7	90	97	221
<b>Total Volume</b>	<b>4</b>	<b>30</b>	<b>34</b>	<b>402</b>	<b>0</b>	<b>402</b>	<b>19</b>	<b>289</b>	<b>308</b>	<b>744</b>
% App. Total	11.8	88.2		100	0		6.2	93.8		
PHF	.500	.750	.708	.897	.000	.897	.679	.803	.794	.842

# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Hart St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	0	0	0	0	0	1	1
07:15 AM	0	0	1	0	0	3	4
07:30 AM	0	0	1	0	0	3	4
07:45 AM	0	1	3	0	0	0	4
<b>Total</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>13</b>
08:00 AM	0	0	2	0	0	1	3
08:15 AM	0	0	0	0	0	1	1
08:30 AM	0	0	1	0	0	0	1
08:45 AM	0	0	0	0	0	1	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>6</b>
<b>Grand Total</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>19</b>
Apprch %	0	100	100	0	0	100	
Total %	0	5.3	42.1	0	0	52.6	

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	1	0	1	0	3	3	4
07:30 AM	0	0	0	1	0	1	0	3	3	4
07:45 AM	0	1	1	3	0	3	0	0	0	4
08:00 AM	0	0	0	2	0	2	0	1	1	3
<b>Total Volume</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>15</b>
<b>% App. Total</b>	<b>0</b>	<b>100</b>		<b>100</b>	<b>0</b>		<b>0</b>	<b>100</b>		
PHF	.000	.250	.250	.583	.000	.583	.000	.583	.583	.938

# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 10

### Groups Printed- Bikes Peds

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds			
07:00 AM	0	0	0	0	0	0	0	1	0	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	0	0	0	0	0	0	0	1	0	0	1	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	1	0	0	0	0	0	0	1	0	1
<b>Total</b>	0	0	1	0	0	0	0	0	0	1	0	1
<b>Grand Total</b>	0	0	1	0	0	0	0	1	0	1	1	2
Apprch %	0	0		0	0		0	100				
Total %	0	0		0	0		0	100		50	50	

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	1	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	0	0	0	0	0	0	0	1	1	1
<b>% App. Total</b>	0	0		0	0		0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.250	.250	.250

# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Hart St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
02:00 PM	1	11	103	2	6	68	191
02:15 PM	3	7	117	0	7	84	218
02:30 PM	0	7	81	0	15	87	190
02:45 PM	0	7	104	2	11	72	196
<b>Total</b>	<b>4</b>	<b>32</b>	<b>405</b>	<b>4</b>	<b>39</b>	<b>311</b>	<b>795</b>
03:00 PM	0	6	96	0	11	92	205
03:15 PM	0	0	71	1	5	98	175
03:30 PM	0	11	78	0	13	82	184
03:45 PM	0	10	90	1	13	115	229
<b>Total</b>	<b>0</b>	<b>27</b>	<b>335</b>	<b>2</b>	<b>42</b>	<b>387</b>	<b>793</b>
04:00 PM	1	5	94	1	8	112	221
04:15 PM	0	11	93	1	13	107	225
04:30 PM	1	4	72	0	7	104	188
04:45 PM	1	9	72	0	3	115	200
<b>Total</b>	<b>3</b>	<b>29</b>	<b>331</b>	<b>2</b>	<b>31</b>	<b>438</b>	<b>834</b>
05:00 PM	0	4	80	1	8	101	194
05:15 PM	1	4	92	2	11	134	244
05:30 PM	0	9	91	1	9	108	218
05:45 PM	2	5	69	1	4	108	189
<b>Total</b>	<b>3</b>	<b>22</b>	<b>332</b>	<b>5</b>	<b>32</b>	<b>451</b>	<b>845</b>
<b>Grand Total</b>	<b>10</b>	<b>110</b>	<b>1403</b>	<b>13</b>	<b>144</b>	<b>1587</b>	<b>3267</b>
Apprch %	8.3	91.7	99.1	0.9	8.3	91.7	
Total %	0.3	3.4	42.9	0.4	4.4	48.6	
Cars	10	110	1380	13	144	1570	3227
% Cars	100	100	98.4	100	100	98.9	98.8
Trucks	0	0	23	0	0	17	40
% Trucks	0	0	1.6	0	0	1.1	1.2

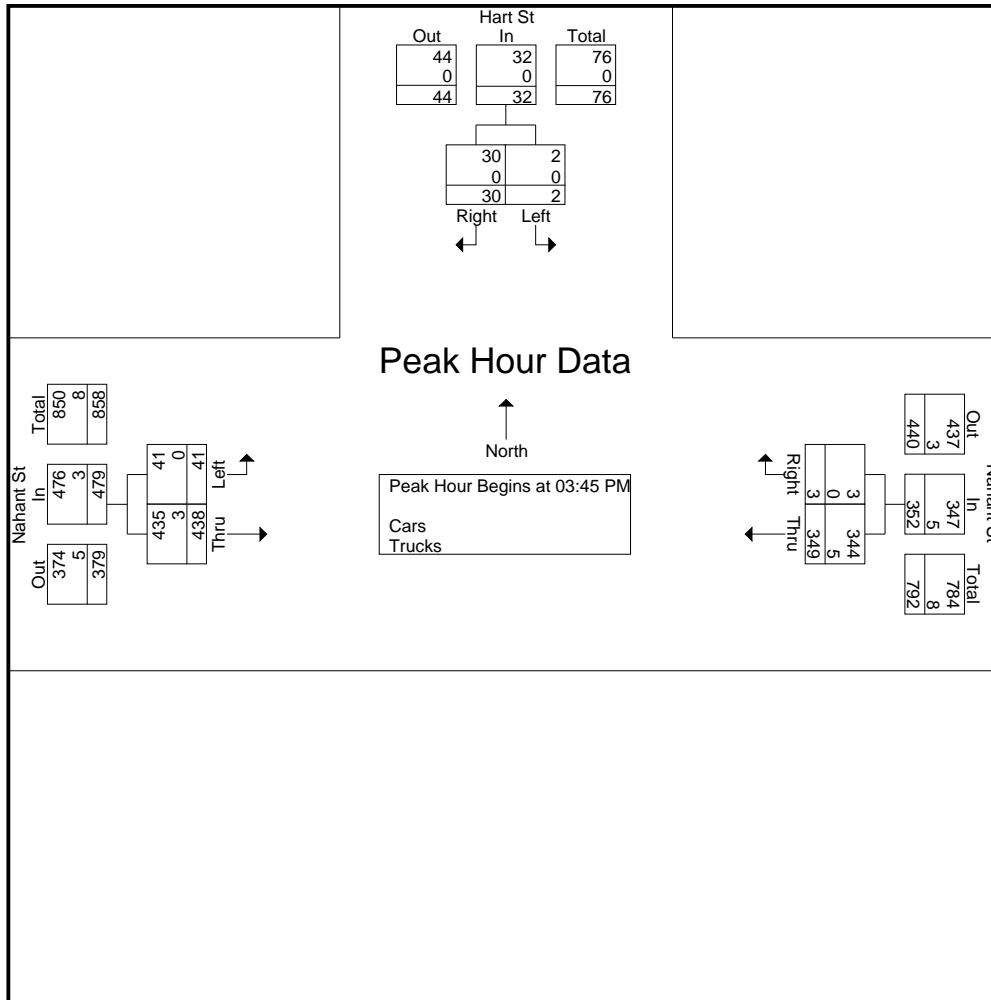
Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:45 PM										
03:45 PM	0	10	10	90	1	91	13	115	128	229
04:00 PM	1	5	6	94	1	95	8	112	120	221
04:15 PM	0	11	11	93	1	94	13	107	120	225
04:30 PM	1	4	5	72	0	72	7	104	111	188
Total Volume	2	30	32	349	3	352	41	438	479	863
% App. Total	6.2	93.8		99.1	0.9		8.6	91.4		
PHF	.500	.682	.727	.928	.750	.926	.788	.952	.936	.942
Cars	2	30	32	344	3	347	41	435	476	855
% Cars	100	100	100	98.6	100	98.6	100	99.3	99.4	99.1
Trucks	0	0	0	5	0	5	0	3	3	8
% Trucks	0	0	0	1.4	0	1.4	0	0.7	0.6	0.9

# Accurate Counts

978-664-2565

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 2

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear



**Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1**

Peak Hour for Each Approach Begins at:

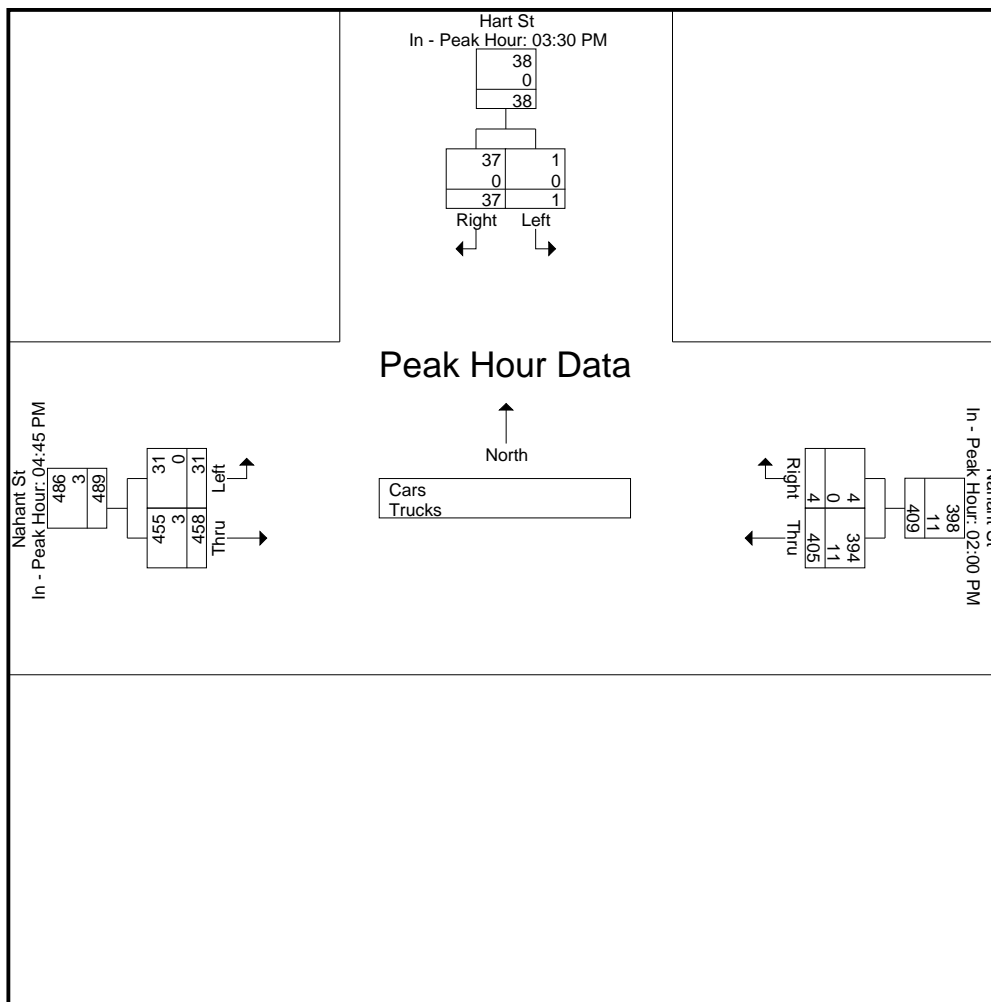
	03:30 PM			02:00 PM			04:45 PM		
+0 mins.	0	11	11	103	2	105	3	115	118
+15 mins.	0	10	10	117	0	117	8	101	109
+30 mins.	1	5	6	81	0	81	11	134	145
+45 mins.	0	11	11	104	2	106	9	108	117
<b>Total Volume</b>	1	37	38	405	4	409	31	458	489
<b>% App. Total</b>	2.6	97.4		99	1		6.3	93.7	
PHF	.250	.841	.864	.865	.500	.874	.705	.854	.843
Cars	1	37	38	394	4	398	31	455	486
% Cars	100	100	100	97.3	100	97.3	100	99.3	99.4
Trucks	0	0	0	11	0	11	0	3	3
% Trucks	0	0	0	2.7	0	2.7	0	0.7	0.6

# Accurate Counts

978-664-2565

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Hart St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
02:00 PM	1	11	99	2	6	67	186
02:15 PM	3	7	116	0	7	84	217
02:30 PM	0	7	80	0	15	83	185
02:45 PM	0	7	99	2	11	70	189
<b>Total</b>	<b>4</b>	<b>32</b>	<b>394</b>	<b>4</b>	<b>39</b>	<b>304</b>	<b>777</b>
03:00 PM	0	6	95	0	11	90	202
03:15 PM	0	0	69	1	5	98	173
03:30 PM	0	11	78	0	13	81	183
03:45 PM	0	10	89	1	13	114	227
<b>Total</b>	<b>0</b>	<b>27</b>	<b>331</b>	<b>2</b>	<b>42</b>	<b>383</b>	<b>785</b>
04:00 PM	1	5	92	1	8	111	218
04:15 PM	0	11	91	1	13	107	223
04:30 PM	1	4	72	0	7	103	187
04:45 PM	1	9	72	0	3	113	198
<b>Total</b>	<b>3</b>	<b>29</b>	<b>327</b>	<b>2</b>	<b>31</b>	<b>434</b>	<b>826</b>
05:00 PM	0	4	80	1	8	101	194
05:15 PM	1	4	92	2	11	134	244
05:30 PM	0	9	87	1	9	107	213
05:45 PM	2	5	69	1	4	107	188
<b>Total</b>	<b>3</b>	<b>22</b>	<b>328</b>	<b>5</b>	<b>32</b>	<b>449</b>	<b>839</b>
<b>Grand Total</b>	<b>10</b>	<b>110</b>	<b>1380</b>	<b>13</b>	<b>144</b>	<b>1570</b>	<b>3227</b>
Apprch %	8.3	91.7	99.1	0.9	8.4	91.6	
Total %	0.3	3.4	42.8	0.4	4.5	48.7	

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:45 PM										
03:45 PM	0	10	10	89	1	90	13	114	127	227
04:00 PM	1	5	6	92	1	93	8	111	119	218
04:15 PM	0	11	11	91	1	92	13	107	120	223
04:30 PM	1	4	5	72	0	72	7	103	110	187
<b>Total Volume</b>	<b>2</b>	<b>30</b>	<b>32</b>	<b>344</b>	<b>3</b>	<b>347</b>	<b>41</b>	<b>435</b>	<b>476</b>	<b>855</b>
<b>% App. Total</b>	<b>6.2</b>	<b>93.8</b>		<b>99.1</b>	<b>0.9</b>		<b>8.6</b>	<b>91.4</b>		
<b>PHF</b>	<b>.500</b>	<b>.682</b>	<b>.727</b>	<b>.935</b>	<b>.750</b>	<b>.933</b>	<b>.788</b>	<b>.954</b>	<b>.937</b>	<b>.942</b>



# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 7

## Groups Printed- Trucks

Start Time	Hart St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
02:00 PM	0	0	4	0	0	1	5
02:15 PM	0	0	1	0	0	0	1
02:30 PM	0	0	1	0	0	4	5
02:45 PM	0	0	5	0	0	2	7
<b>Total</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>18</b>
03:00 PM	0	0	1	0	0	2	3
03:15 PM	0	0	2	0	0	0	2
03:30 PM	0	0	0	0	0	1	1
03:45 PM	0	0	1	0	0	1	2
<b>Total</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>8</b>
04:00 PM	0	0	2	0	0	1	3
04:15 PM	0	0	2	0	0	0	2
04:30 PM	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	2	2
<b>Total</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>8</b>
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	4	0	0	1	5
05:45 PM	0	0	0	0	0	1	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>6</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>40</b>
Apprch %	0	0	100	0	0	100	
Total %	0	0	57.5	0	0	42.5	

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	4	0	4	0	1	1	5
02:15 PM	0	0	0	1	0	1	0	0	0	1
02:30 PM	0	0	0	1	0	1	0	4	4	5
02:45 PM	0	0	0	5	0	5	0	2	2	7
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>18</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>
PHF	.000	.000	.000	.550	.000	.550	.000	.438	.438	.643

# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 10

### Groups Printed- Bikes Peds

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds			
02:00 PM	0	0	2	0	0	1	0	0	1	4	0	4
02:15 PM	0	0	9	0	0	0	0	0	0	9	0	9
02:30 PM	0	0	6	0	0	0	0	0	0	6	0	6
02:45 PM	0	0	6	0	0	1	0	0	0	7	0	7
<b>Total</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>26</b>	<b>0</b>	<b>26</b>
03:00 PM	0	0	2	0	0	0	0	0	0	2	0	2
03:15 PM	0	0	1	0	0	0	0	0	0	1	0	1
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>
04:00 PM	0	0	3	0	0	0	0	0	0	3	0	3
04:15 PM	0	0	0	0	0	0	1	0	0	0	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>4</b>
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>32</b>	<b>1</b>	<b>33</b>
Apprch %	0	0		0	0		100	0				
Total %	0	0		0	0		100	0		97	3	

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:30 PM										
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	1	0	1	1
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>PHF</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.250</b>	<b>.000</b>	<b>.250</b>	<b>.250</b>

# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	75	68	32	15	10	13	39	68	52	24	31	40	467
07:15 AM	74	90	33	13	8	24	35	76	99	30	42	27	551
07:30 AM	49	93	27	44	16	34	40	60	95	14	28	30	530
07:45 AM	13	79	42	52	31	33	47	67	61	19	20	37	501
<b>Total</b>	<b>211</b>	<b>330</b>	<b>134</b>	<b>124</b>	<b>65</b>	<b>104</b>	<b>161</b>	<b>271</b>	<b>307</b>	<b>87</b>	<b>121</b>	<b>134</b>	<b>2049</b>
08:00 AM	3	65	26	15	9	8	45	62	15	20	7	37	312
08:15 AM	5	76	20	4	4	2	69	73	12	40	3	42	350
08:30 AM	12	84	61	5	2	3	64	88	9	47	6	48	429
08:45 AM	3	67	20	5	5	6	55	60	6	16	0	52	295
<b>Total</b>	<b>23</b>	<b>292</b>	<b>127</b>	<b>29</b>	<b>20</b>	<b>19</b>	<b>233</b>	<b>283</b>	<b>42</b>	<b>123</b>	<b>16</b>	<b>179</b>	<b>1386</b>
<b>Grand Total</b>	<b>234</b>	<b>622</b>	<b>261</b>	<b>153</b>	<b>85</b>	<b>123</b>	<b>394</b>	<b>554</b>	<b>349</b>	<b>210</b>	<b>137</b>	<b>313</b>	<b>3435</b>
Apprch %	20.9	55.7	23.4	42.4	23.5	34.1	30.4	42.7	26.9	31.8	20.8	47.4	
Total %	6.8	18.1	7.6	4.5	2.5	3.6	11.5	16.1	10.2	6.1	4	9.1	
Cars	226	602	261	102	82	105	389	535	316	206	131	312	3267
% Cars	96.6	96.8	100	66.7	96.5	85.4	98.7	96.6	90.5	98.1	95.6	99.7	95.1
Trucks	8	20	0	51	3	18	5	19	33	4	6	1	168
% Trucks	3.4	3.2	0	33.3	3.5	14.6	1.3	3.4	9.5	1.9	4.4	0.3	4.9

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	<b>75</b>	68	32	175	15	10	13	38	39	68	52	159	24	31	<b>40</b>	95	467
07:15 AM	74	90	33	<b>197</b>	13	8	24	45	35	<b>76</b>	<b>99</b>	<b>210</b>	<b>30</b>	<b>42</b>	27	<b>99</b>	<b>551</b>
07:30 AM	49	<b>93</b>	27	169	44	16	<b>34</b>	94	40	60	95	195	14	28	30	72	530
07:45 AM	13	79	<b>42</b>	134	<b>52</b>	<b>31</b>	<b>33</b>	<b>116</b>	<b>47</b>	67	61	175	19	20	37	76	501
<b>Total Volume</b>	<b>211</b>	<b>330</b>	<b>134</b>	<b>675</b>	<b>124</b>	<b>65</b>	<b>104</b>	<b>293</b>	<b>161</b>	<b>271</b>	<b>307</b>	<b>739</b>	<b>87</b>	<b>121</b>	<b>134</b>	<b>342</b>	<b>2049</b>
% App. Total	31.3	48.9	19.9		42.3	22.2	35.5		21.8	36.7	41.5		25.4	35.4	39.2		
PHF	.703	.887	.798	.857	.596	.524	.765	.631	.856	.891	.775	.880	.725	.720	.838	.864	.930
Cars	206	318	134	658	80	63	87	230	159	261	284	704	86	115	134	335	1927
% Cars	97.6	96.4	100	97.5	64.5	96.9	83.7	78.5	98.8	96.3	92.5	95.3	98.9	95.0	100	98.0	94.0
Trucks	5	12	0	17	44	2	17	63	2	10	23	35	1	6	0	7	122
% Trucks	2.4	3.6	0	2.5	35.5	3.1	16.3	21.5	1.2	3.7	7.5	4.7	1.1	5.0	0	2.0	6.0

# Accurate Counts

978-664-2565

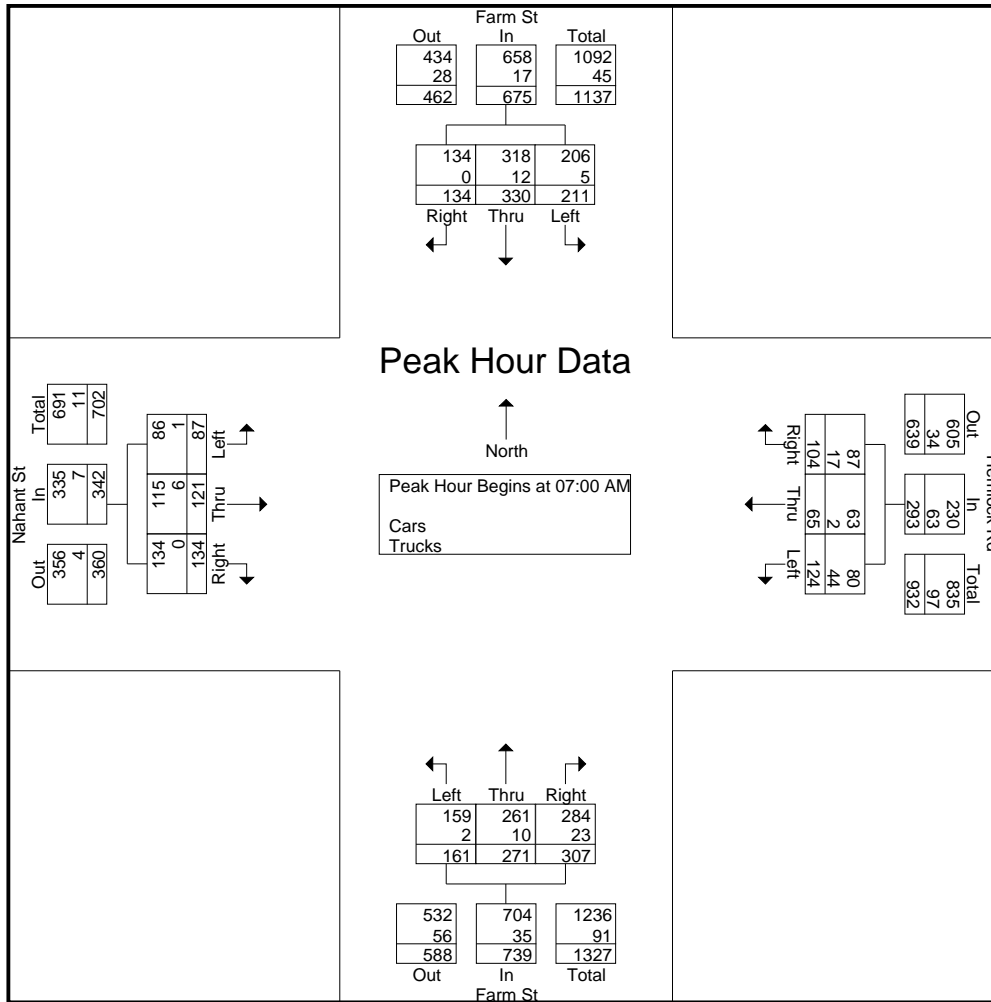
File Name : 98560005

Site Code : 98560005

Start Date : 12/20/2023

Page No : 2

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

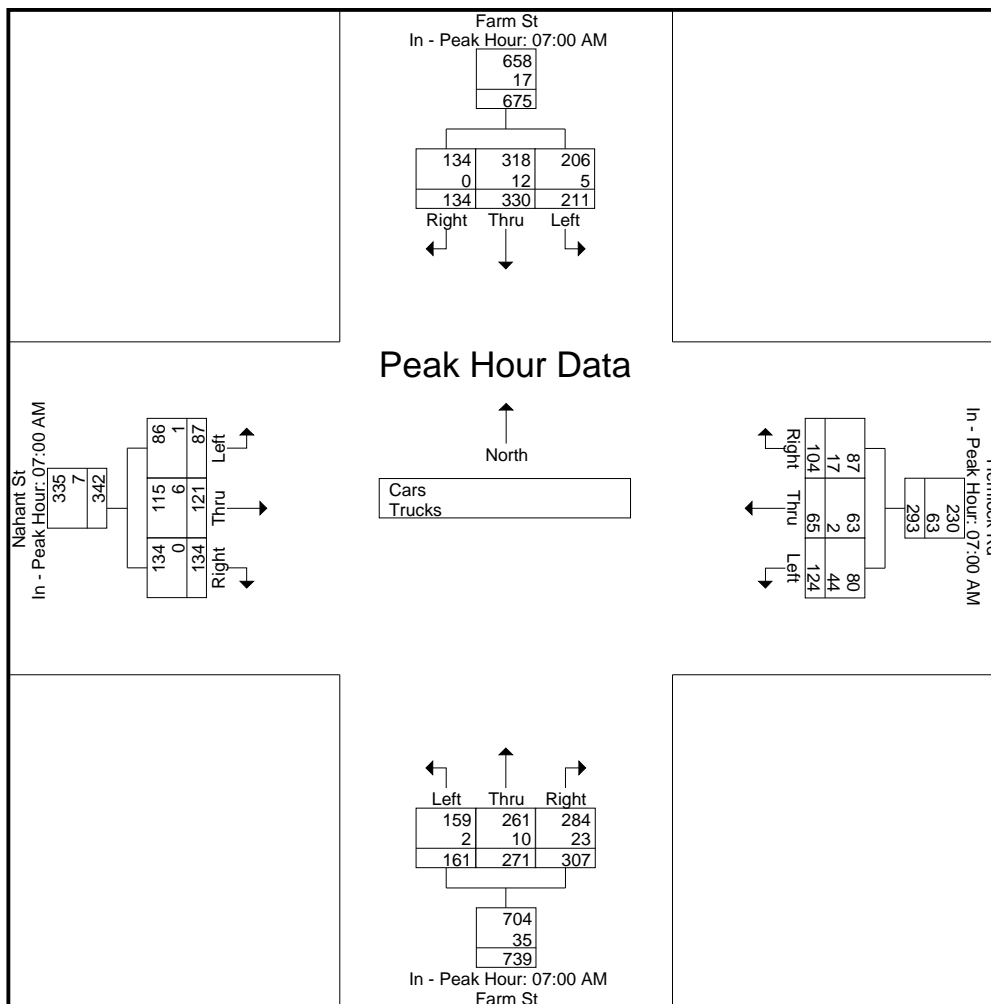
	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	<b>75</b>	68	32	175	15	10	13	38	39	68	52	159	24	31	<b>40</b>	95
+15 mins.	74	90	33	<b>197</b>	13	8	24	45	35	<b>76</b>	<b>99</b>	<b>210</b>	<b>30</b>	<b>42</b>	27	<b>99</b>
+30 mins.	49	<b>93</b>	27	169	44	16	<b>34</b>	94	40	60	95	195	14	28	30	72
+45 mins.	13	79	<b>42</b>	134	<b>52</b>	<b>31</b>	33	<b>116</b>	<b>47</b>	67	61	175	19	20	37	76
Total Volume	211	330	134	675	124	65	104	293	161	271	307	739	87	121	134	342
% App. Total	31.3	48.9	19.9		42.3	22.2	35.5		21.8	36.7	41.5		25.4	35.4	39.2	
PHF	.703	.887	.798	.857	.596	.524	.765	.631	.856	.891	.775	.880	.725	.720	.838	.864
Cars	206	318	134	658	80	63	87	230	159	261	284	704	86	115	134	335
% Cars	97.6	96.4	100	97.5	64.5	96.9	83.7	78.5	98.8	96.3	92.5	95.3	98.9	95	100	98
Trucks	5	12	0	17	44	2	17	63	2	10	23	35	1	6	0	7
% Trucks	2.4	3.6	0	2.5	35.5	3.1	16.3	21.5	1.2	3.7	7.5	4.7	1.1	5	0	2

# Accurate Counts

978-664-2565

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 4

### Groups Printed- Cars

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	74	65	32	6	10	10	39	65	50	24	29	40	444
07:15 AM	74	84	33	9	8	15	35	74	89	30	40	27	518
07:30 AM	45	93	27	26	16	30	40	57	87	13	26	30	490
07:45 AM	13	76	42	39	29	32	45	65	58	19	20	37	475
<b>Total</b>	<b>206</b>	<b>318</b>	<b>134</b>	<b>80</b>	<b>63</b>	<b>87</b>	<b>159</b>	<b>261</b>	<b>284</b>	<b>86</b>	<b>115</b>	<b>134</b>	<b>1927</b>
08:00 AM	3	63	26	15	8	7	44	61	15	20	7	36	305
08:15 AM	4	75	20	3	4	2	69	72	7	39	3	42	340
08:30 AM	11	83	61	2	2	3	63	84	7	46	6	48	416
08:45 AM	2	63	20	2	5	6	54	57	3	15	0	52	279
<b>Total</b>	<b>20</b>	<b>284</b>	<b>127</b>	<b>22</b>	<b>19</b>	<b>18</b>	<b>230</b>	<b>274</b>	<b>32</b>	<b>120</b>	<b>16</b>	<b>178</b>	<b>1340</b>
<b>Grand Total</b>	<b>226</b>	<b>602</b>	<b>261</b>	<b>102</b>	<b>82</b>	<b>105</b>	<b>389</b>	<b>535</b>	<b>316</b>	<b>206</b>	<b>131</b>	<b>312</b>	<b>3267</b>
Apprch %	20.8	55.3	24	35.3	28.4	36.3	31.4	43.1	25.5	31.7	20.2	48.1	
Total %	6.9	18.4	8	3.1	2.5	3.2	11.9	16.4	9.7	6.3	4	9.6	

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
<b>Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1</b>																	
<b>Peak Hour for Entire Intersection Begins at 07:00 AM</b>																	
07:00 AM	<b>74</b>	65	32	171	6	10	10	26	39	65	50	154	24	29	<b>40</b>	93	444
07:15 AM	74	84	33	<b>191</b>	9	8	15	32	35	<b>74</b>	<b>89</b>	<b>198</b>	<b>30</b>	<b>40</b>	27	<b>97</b>	<b>518</b>
07:30 AM	45	<b>93</b>	27	165	26	16	30	72	40	57	87	184	13	26	30	69	490
07:45 AM	13	76	<b>42</b>	131	<b>39</b>	<b>29</b>	<b>32</b>	<b>100</b>	<b>45</b>	65	58	168	19	20	37	76	475
<b>Total Volume</b>	206	318	134	658	80	63	87	230	159	261	284	704	86	115	134	335	1927
<b>% App. Total</b>	31.3	48.3	20.4		34.8	27.4	37.8		22.6	37.1	40.3		25.7	34.3	40		
PHF	.696	.855	.798	.861	.513	.543	.680	.575	.883	.882	.798	.889	.717	.719	.838	.863	.930

# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	1	3	0	9	0	3	0	3	2	0	2	0	23
07:15 AM	0	6	0	4	0	9	0	2	10	0	2	0	33
07:30 AM	4	0	0	18	0	4	0	3	8	1	2	0	40
07:45 AM	0	3	0	13	2	1	2	2	3	0	0	0	26
<b>Total</b>	<b>5</b>	<b>12</b>	<b>0</b>	<b>44</b>	<b>2</b>	<b>17</b>	<b>2</b>	<b>10</b>	<b>23</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>122</b>
08:00 AM	0	2	0	0	1	1	1	1	0	0	0	1	7
08:15 AM	1	1	0	1	0	0	0	1	5	1	0	0	10
08:30 AM	1	1	0	3	0	0	1	4	2	1	0	0	13
08:45 AM	1	4	0	3	0	0	1	3	3	1	0	0	16
<b>Total</b>	<b>3</b>	<b>8</b>	<b>0</b>	<b>7</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>9</b>	<b>10</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>46</b>
<b>Grand Total</b>	<b>8</b>	<b>20</b>	<b>0</b>	<b>51</b>	<b>3</b>	<b>18</b>	<b>5</b>	<b>19</b>	<b>33</b>	<b>4</b>	<b>6</b>	<b>1</b>	<b>168</b>
Apprch %	28.6	71.4	0	70.8	4.2	25	8.8	33.3	57.9	36.4	54.5	9.1	
Total %	4.8	11.9	0	30.4	1.8	10.7	3	11.3	19.6	2.4	3.6	0.6	

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
<b>Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1</b>																	
<b>Peak Hour for Entire Intersection Begins at 07:00 AM</b>																	
07:00 AM	1	3	0	4	9	0	3	12	0	<b>3</b>	2	5	0	<b>2</b>	0	2	23
07:15 AM	0	<b>6</b>	0	<b>6</b>	4	0	<b>9</b>	13	0	2	<b>10</b>	<b>12</b>	0	2	0	2	33
07:30 AM	<b>4</b>	0	0	4	<b>18</b>	0	4	<b>22</b>	0	3	8	11	<b>1</b>	2	0	<b>3</b>	<b>40</b>
07:45 AM	0	3	0	3	13	<b>2</b>	1	16	<b>2</b>	2	3	7	0	0	0	0	26
<b>Total Volume</b>	<b>5</b>	<b>12</b>	<b>0</b>	<b>17</b>	<b>44</b>	<b>2</b>	<b>17</b>	<b>63</b>	<b>2</b>	<b>10</b>	<b>23</b>	<b>35</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>7</b>	<b>122</b>
<b>% App. Total</b>	<b>29.4</b>	<b>70.6</b>	<b>0</b>		<b>69.8</b>	<b>3.2</b>	<b>27</b>		<b>5.7</b>	<b>28.6</b>	<b>65.7</b>		<b>14.3</b>	<b>85.7</b>	<b>0</b>		
PHF	.313	.500	.000	.708	.611	.250	.472	.716	.250	.833	.575	.729	.250	.750	.000	.583	.763

# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 10

### Groups Printed- Bikes Peds

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Exclu. Total	Inclu. Total	Int. Total	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds				
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
07:15 AM	0	0	0	2	0	0	0	19	0	0	0	0	0	0	0	0	0	21	0	21
07:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2
07:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	0	0	0	4	0	0	0	19	0	0	0	0	0	0	0	0	2	25	0	25
08:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
08:15 AM	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	4	0	4
08:30 AM	0	0	0	3	0	0	0	3	0	0	0	1	0	0	0	0	0	7	0	7
08:45 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	2
<b>Total</b>	0	0	0	8	0	0	0	5	0	0	0	1	0	0	0	0	0	14	0	14
<b>Grand Total</b>	0	0	0	12	0	0	0	24	0	0	0	1	0	0	0	2	0	39	0	39
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0					
Total %																	100	0		

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:00 AM																		
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% App. Total</b>	0	0	0		0	0	0		0	0	0		0	0	0			
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	15	73	51	26	19	27	58	73	12	13	13	34	414
02:15 PM	20	81	25	17	31	35	65	68	28	20	12	48	450
02:30 PM	15	78	15	59	38	50	38	106	12	43	9	47	510
02:45 PM	6	103	55	58	35	26	35	69	12	15	8	45	467
<b>Total</b>	<b>56</b>	<b>335</b>	<b>146</b>	<b>160</b>	<b>123</b>	<b>138</b>	<b>196</b>	<b>316</b>	<b>64</b>	<b>91</b>	<b>42</b>	<b>174</b>	<b>1841</b>
03:00 PM	9	96	25	25	19	43	57	122	13	18	4	68	499
03:15 PM	19	82	23	17	16	30	42	118	10	16	7	71	451
03:30 PM	18	111	22	29	18	26	50	157	11	19	10	54	525
03:45 PM	18	98	20	11	13	18	63	147	19	20	9	76	512
<b>Total</b>	<b>64</b>	<b>387</b>	<b>90</b>	<b>82</b>	<b>66</b>	<b>117</b>	<b>212</b>	<b>544</b>	<b>53</b>	<b>73</b>	<b>30</b>	<b>269</b>	<b>1987</b>
04:00 PM	14	99	25	10	13	16	57	148	6	28	6	70	492
04:15 PM	13	120	18	6	17	26	56	123	6	32	8	75	500
04:30 PM	7	122	16	4	11	18	50	135	6	19	9	81	478
04:45 PM	10	122	20	3	7	13	51	141	10	30	6	80	493
<b>Total</b>	<b>44</b>	<b>463</b>	<b>79</b>	<b>23</b>	<b>48</b>	<b>73</b>	<b>214</b>	<b>547</b>	<b>28</b>	<b>109</b>	<b>29</b>	<b>306</b>	<b>1963</b>
05:00 PM	6	122	31	3	3	6	53	112	5	12	8	87	448
05:15 PM	7	123	21	6	4	12	68	154	8	27	10	89	529
05:30 PM	12	111	35	6	4	3	51	125	12	18	6	86	469
05:45 PM	12	113	19	17	11	11	42	114	2	27	14	75	457
<b>Total</b>	<b>37</b>	<b>469</b>	<b>106</b>	<b>32</b>	<b>22</b>	<b>32</b>	<b>214</b>	<b>505</b>	<b>27</b>	<b>84</b>	<b>38</b>	<b>337</b>	<b>1903</b>
<b>Grand Total</b>	<b>201</b>	<b>1654</b>	<b>421</b>	<b>297</b>	<b>259</b>	<b>360</b>	<b>836</b>	<b>1912</b>	<b>172</b>	<b>357</b>	<b>139</b>	<b>1086</b>	<b>7694</b>
Apprch %	8.8	72.7	18.5	32.4	28.3	39.3	28.6	65.5	5.9	22.6	8.8	68.6	
Total %	2.6	21.5	5.5	3.9	3.4	4.7	10.9	24.9	2.2	4.6	1.8	14.1	
Cars	195	1639	417	272	246	339	832	1888	145	349	130	1079	7531
% Cars	97	99.1	99	91.6	95	94.2	99.5	98.7	84.3	97.8	93.5	99.4	97.9
Trucks	6	15	4	25	13	21	4	24	27	8	9	7	163
% Trucks	3	0.9	1	8.4	5	5.8	0.5	1.3	15.7	2.2	6.5	0.6	2.1

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	<b>18</b>	111	22	<b>151</b>	<b>29</b>	<b>18</b>	<b>26</b>	<b>73</b>	50	<b>157</b>	11	218	19	<b>10</b>	54	83	<b>525</b>
03:45 PM	18	98	20	136	11	13	18	42	<b>63</b>	147	<b>19</b>	<b>229</b>	20	9	<b>76</b>	105	512
04:00 PM	14	99	<b>25</b>	138	10	13	16	39	57	148	6	211	28	6	70	104	492
04:15 PM	13	<b>120</b>	18	151	6	17	26	49	56	123	6	185	<b>32</b>	8	75	<b>115</b>	500
Total Volume	63	428	85	576	56	61	86	203	226	575	42	843	99	33	275	407	2029
% App. Total	10.9	74.3	14.8		27.6	30	42.4		26.8	68.2	5		24.3	8.1	67.6		
PHF	.875	.892	.850	.954	.483	.847	.827	.695	.897	.916	.553	.920	.773	.825	.905	.885	.966
Cars	63	422	84	569	52	57	84	193	225	569	36	830	94	30	274	398	1990
% Cars	100	98.6	98.8	98.8	92.9	93.4	97.7	95.1	99.6	99.0	85.7	98.5	94.9	90.9	99.6	97.8	98.1
Trucks	0	6	1	7	4	4	2	10	1	6	6	13	5	3	1	9	39
% Trucks	0	1.4	1.2	1.2	7.1	6.6	2.3	4.9	0.4	1.0	14.3	1.5	5.1	9.1	0.4	2.2	1.9

# Accurate Counts

978-664-2565

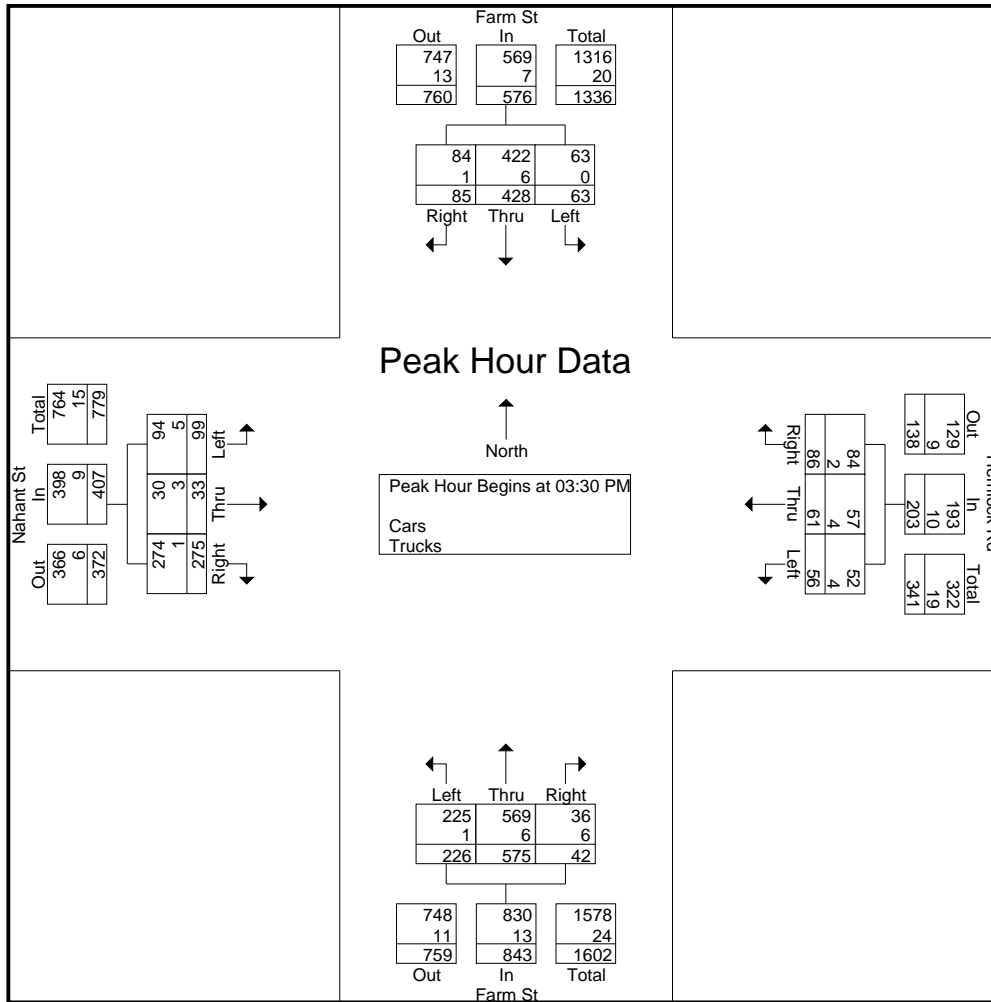
File Name : 98560005

Site Code : 98560005

Start Date : 12/20/2023

Page No : 2

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear



**Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1**

**Peak Hour for Each Approach Begins at:**

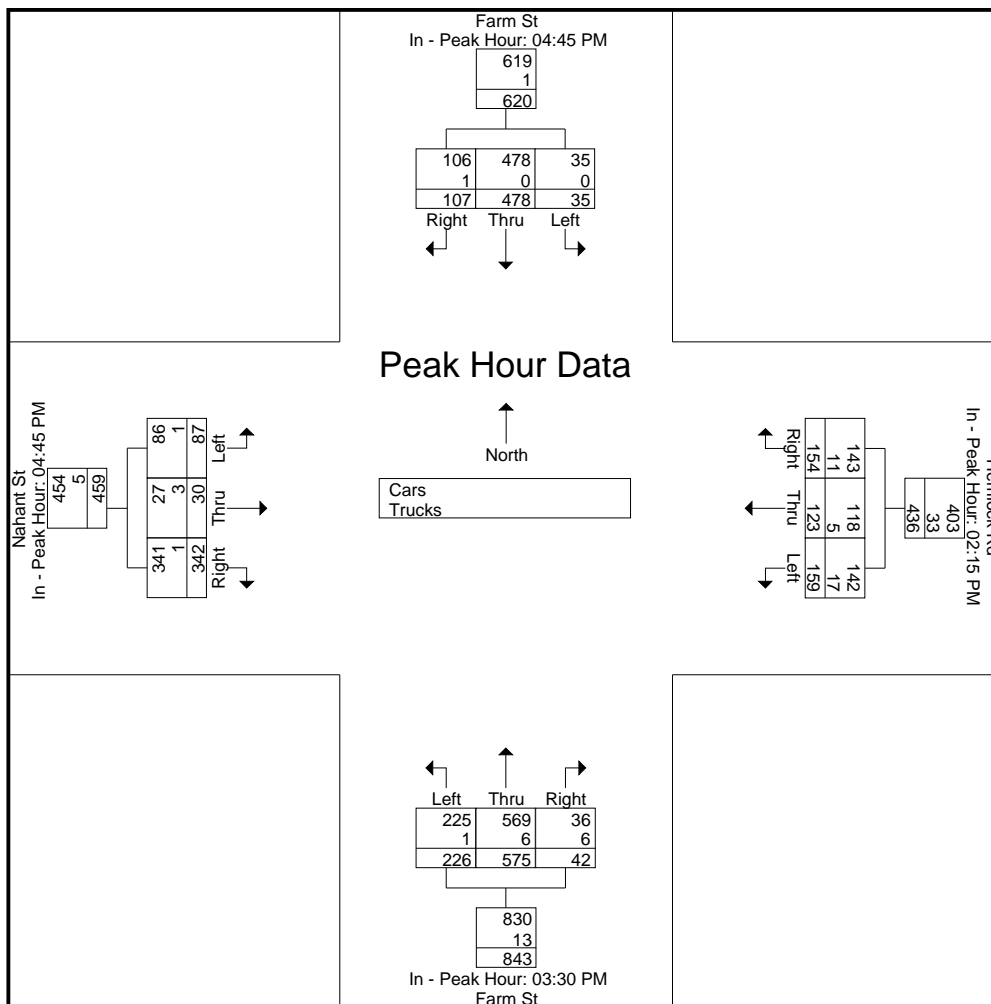
	04:45 PM				02:15 PM				03:30 PM				04:45 PM			
+0 mins.	10	122	20	152	17	31	35	83	50	<b>157</b>	11	218	<b>30</b>	6	80	116
+15 mins.	6	122	31	<b>159</b>	<b>59</b>	<b>38</b>	<b>50</b>	<b>147</b>	<b>63</b>	147	<b>19</b>	<b>229</b>	12	8	87	107
+30 mins.	7	<b>123</b>	21	151	58	35	26	119	57	148	6	211	27	<b>10</b>	<b>89</b>	<b>126</b>
+45 mins.	<b>12</b>	111	<b>35</b>	158	25	19	43	87	56	123	6	185	18	6	86	110
Total Volume	35	478	107	620	159	123	154	436	226	575	42	843	87	30	342	459
% App. Total	5.6	77.1	17.3		36.5	28.2	35.3		26.8	68.2	5		19	6.5	74.5	
PHF	.729	.972	.764	.975	.674	.809	.770	.741	.897	.916	.553	.920	.725	.750	.961	.911
Cars	35	478	106	619	142	118	143	403	225	569	36	830	86	27	341	454
% Cars	100	100	99.1	99.8	89.3	95.9	92.9	92.4	99.6	99	85.7	98.5	98.9	90	99.7	98.9
Trucks	0	0	1	1	17	5	11	33	1	6	6	13	1	3	1	5
% Trucks	0	0	0.9	0.2	10.7	4.1	7.1	7.6	0.4	1	14.3	1.5	1.1	10	0.3	1.1

# Accurate Counts

978-664-2565

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
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N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	14	71	50	25	18	24	57	70	7	13	11	34	394
02:15 PM	18	79	25	15	31	32	65	67	23	20	12	48	435
02:30 PM	12	77	15	55	37	46	38	104	12	41	8	46	491
02:45 PM	6	101	55	49	31	22	33	66	8	15	8	45	439
<b>Total</b>	<b>50</b>	<b>328</b>	<b>145</b>	<b>144</b>	<b>117</b>	<b>124</b>	<b>193</b>	<b>307</b>	<b>50</b>	<b>89</b>	<b>39</b>	<b>173</b>	<b>1759</b>
03:00 PM	9	96	25	23	19	43	57	120	10	18	4	67	491
03:15 PM	19	82	22	17	15	27	42	116	10	16	7	69	442
03:30 PM	18	111	22	29	18	26	50	156	7	18	10	54	519
03:45 PM	18	96	20	8	12	16	63	145	17	19	8	76	498
<b>Total</b>	<b>64</b>	<b>385</b>	<b>89</b>	<b>77</b>	<b>64</b>	<b>112</b>	<b>212</b>	<b>537</b>	<b>44</b>	<b>71</b>	<b>29</b>	<b>266</b>	<b>1950</b>
04:00 PM	14	96	24	9	11	16	56	147	6	27	4	69	479
04:15 PM	13	119	18	6	16	26	56	121	6	30	8	75	494
04:30 PM	7	120	16	4	11	18	50	134	6	19	9	81	475
04:45 PM	10	122	20	3	7	13	51	140	9	29	6	80	490
<b>Total</b>	<b>44</b>	<b>457</b>	<b>78</b>	<b>22</b>	<b>45</b>	<b>73</b>	<b>213</b>	<b>542</b>	<b>27</b>	<b>105</b>	<b>27</b>	<b>305</b>	<b>1938</b>
05:00 PM	6	122	31	3	3	5	53	112	5	12	6	87	445
05:15 PM	7	123	20	6	4	12	68	152	7	27	9	88	523
05:30 PM	12	111	35	6	2	3	51	124	11	18	6	86	465
05:45 PM	12	113	19	14	11	10	42	114	1	27	14	74	451
<b>Total</b>	<b>37</b>	<b>469</b>	<b>105</b>	<b>29</b>	<b>20</b>	<b>30</b>	<b>214</b>	<b>502</b>	<b>24</b>	<b>84</b>	<b>35</b>	<b>335</b>	<b>1884</b>
<b>Grand Total</b>	<b>195</b>	<b>1639</b>	<b>417</b>	<b>272</b>	<b>246</b>	<b>339</b>	<b>832</b>	<b>1888</b>	<b>145</b>	<b>349</b>	<b>130</b>	<b>1079</b>	<b>7531</b>
Apprch %	8.7	72.8	18.5	31.7	28.7	39.6	29	65.9	5.1	22.4	8.3	69.3	
Total %	2.6	21.8	5.5	3.6	3.3	4.5	11	25.1	1.9	4.6	1.7	14.3	

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	<b>18</b>	111	22	<b>151</b>	<b>29</b>	<b>18</b>	<b>26</b>	<b>73</b>	50	<b>156</b>	7	213	18	<b>10</b>	54	82	<b>519</b>
03:45 PM	18	96	20	134	8	12	16	36	<b>63</b>	145	<b>17</b>	<b>225</b>	19	8	<b>76</b>	103	498
04:00 PM	14	96	<b>24</b>	134	9	11	16	36	56	147	6	209	27	4	69	100	479
04:15 PM	13	<b>119</b>	18	150	6	16	26	48	56	121	6	183	<b>30</b>	8	75	<b>113</b>	494
Total Volume	63	422	84	569	52	57	84	193	225	569	36	830	94	30	274	398	1990
% App. Total	11.1	74.2	14.8		26.9	29.5	43.5		27.1	68.6	4.3		23.6	7.5	68.8		
PHF	.875	.887	.875	.942	.448	.792	.808	.661	.893	.912	.529	.922	.783	.750	.901	.881	.959

# Accurate Counts

978-664-2565

N/S Street : Farm Street  
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 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 7

## Groups Printed- Trucks

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	1	2	1	1	1	3	1	3	5	0	2	0	20
02:15 PM	2	2	0	2	0	3	0	1	5	0	0	0	15
02:30 PM	3	1	0	4	1	4	0	2	0	2	1	1	19
02:45 PM	0	2	0	9	4	4	2	3	4	0	0	0	28
<b>Total</b>	<b>6</b>	<b>7</b>	<b>1</b>	<b>16</b>	<b>6</b>	<b>14</b>	<b>3</b>	<b>9</b>	<b>14</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>82</b>
03:00 PM	0	0	0	2	0	0	0	2	3	0	0	1	8
03:15 PM	0	0	1	0	1	3	0	2	0	0	0	2	9
03:30 PM	0	0	0	0	0	0	0	1	4	1	0	0	6
03:45 PM	0	2	0	3	1	2	0	2	2	1	1	0	14
<b>Total</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>7</b>	<b>9</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>37</b>
04:00 PM	0	3	1	1	2	0	1	1	0	1	2	1	13
04:15 PM	0	1	0	0	1	0	0	2	0	2	0	0	6
04:30 PM	0	2	0	0	0	0	0	1	0	0	0	0	3
04:45 PM	0	0	0	0	0	0	0	1	1	1	0	0	3
<b>Total</b>	<b>0</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>25</b>
05:00 PM	0	0	0	0	0	1	0	0	0	0	2	0	3
05:15 PM	0	0	1	0	0	0	0	2	1	0	1	1	6
05:30 PM	0	0	0	0	2	0	0	1	1	0	0	0	4
05:45 PM	0	0	0	3	0	1	0	0	1	0	0	1	6
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>19</b>
<b>Grand Total</b>	<b>6</b>	<b>15</b>	<b>4</b>	<b>25</b>	<b>13</b>	<b>21</b>	<b>4</b>	<b>24</b>	<b>27</b>	<b>8</b>	<b>9</b>	<b>7</b>	<b>163</b>
Apprch %	24	60	16	42.4	22	35.6	7.3	43.6	49.1	33.3	37.5	29.2	
Total %	3.7	9.2	2.5	15.3	8	12.9	2.5	14.7	16.6	4.9	5.5	4.3	

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	1	2	1	4	1	1	3	5	1	3	5	9	0	2	0	2	20
02:15 PM	2	2	0	4	2	0	3	5	0	1	5	6	0	0	0	0	15
02:30 PM	3	1	0	4	4	1	4	9	0	2	0	2	2	1	1	4	19
02:45 PM	0	2	0	2	9	4	4	17	2	3	4	9	0	0	0	0	28
<b>Total Volume</b>	<b>6</b>	<b>7</b>	<b>1</b>	<b>14</b>	<b>16</b>	<b>6</b>	<b>14</b>	<b>36</b>	<b>3</b>	<b>9</b>	<b>14</b>	<b>26</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>6</b>	<b>82</b>
% App. Total	42.9	50	7.1		44.4	16.7	38.9		11.5	34.6	53.8		33.3	50	16.7		
PHF	.500	.875	.250	.875	.444	.375	.875	.529	.375	.750	.700	.722	.250	.375	.250	.375	.732

# Accurate Counts

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 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 10

### Groups Printed- Bikes Peds

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
02:00 PM	0	0	0	46	0	0	0	0	0	0	0	0	0	0	0	10	56	0	56
02:15 PM	0	0	0	6	0	0	0	2	0	0	0	0	0	0	0	2	10	0	10
02:30 PM	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	2	6	0	6
02:45 PM	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>65</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>82</b>	<b>0</b>	<b>82</b>
03:00 PM	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	4	0	4
03:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
03:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
03:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>9</b>	<b>0</b>	<b>9</b>
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>72</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>92</b>	<b>0</b>	<b>92</b>
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

SEASONAL ADJUSTMENT DATA

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Massachusetts Highway Department  
Statewide Traffic Data Collection  
2019 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.22	1.14	1.12	1.06	1.00	0.96	0.87	0.85	0.96	0.99	1.04	1.12	0.85
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.15	1.06	1.07	1.00	0.89	0.88	0.89	0.89	0.95	0.92	1.02	1.01	0.97
R4-R7	1.09	1.09	1.11	1.02	0.96	0.92	0.89	0.89	0.99	0.98	1.09	1.13	0.98
U1-Boston	1.03	1.01	0.98	0.94	0.94	0.92	0.95	0.93	0.94	0.94	0.97	1.04	0.96
U1-Essex	1.09	1.06	1.03	0.99	0.94	0.90	0.88	0.86	0.93	0.94	0.99	1.06	0.93
U1-Southeast	1.06	1.05	1.01	0.97	0.95	0.93	0.93	0.90	0.94	0.94	0.98	1.04	0.98
U1-West	1.19	1.14	1.09	0.95	0.92	0.89	0.89	0.86	0.91	0.95	0.97	1.07	0.84
U1-Worcester	1.02	1.04	0.97	0.94	0.93	0.91	0.95	0.91	0.93	0.92	0.95	1.10	0.88
U2	1.01	1.00	0.94	0.93	0.91	0.89	0.93	0.90	0.90	0.91	0.94	1.02	0.99
U3	1.06	1.03	0.98	0.94	0.93	0.91	0.95	0.91	0.92	0.93	0.97	1.00	0.98
U4-U7	1.01	1.00	0.95	0.92	0.88	0.86	0.92	0.91	0.92	0.94	0.99	1.04	0.99
Rec - East	1.04	1.16	1.12	0.98	0.92	0.88	0.77	0.81	0.94	1.02	1.08	1.12	0.99
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.98

Round off:

0-999 = 10

>1000 = 100

U = Urban

R = Rural

1 - Interstate

2 - Freeway and Expressway

3 - Other Principal Arterial

4 - Minor Arterial

5 - Major Collector

6 - Minor Collector

7 - Local Road and Street

**Recreational - East Group** - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

**Recreational - West Group** - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113, 1114,1116,2196,2197 and 2198.



PUBLIC TRANSPORTATION SCHEDULES

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Effective **August 27, 2023**

Replaces July 2023

# 137 Reading Depot – Malden Ctr Sta

## Schedule Change

Weekday, Saturday and Sunday

## Connections

ORANGE LINE

HAVERHILL LINE

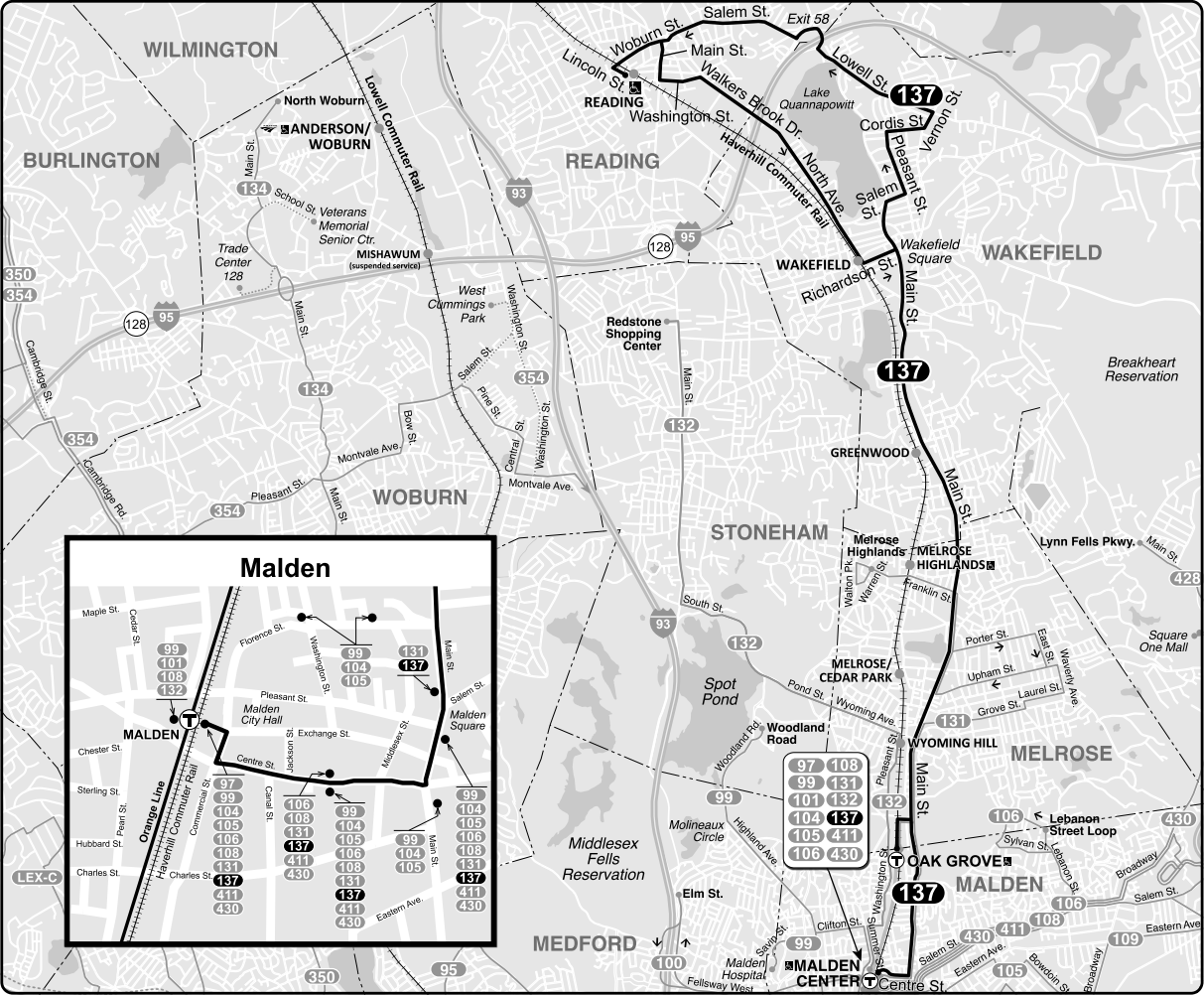


Information **617-222-3200**  
 Lost and Found **617-222-2229**  
 TTY **617-222-5146**

Realtime arrival information, maps, and more

**mbta.com**

A126-3-22.1



- Transfer to bus/subway available on CharlieCard—good for 2 hours, pay fare difference.
- Children 11 & under ride free with a paying customer.
- ♿ All MBTA buses are accessible to people with disabilities.

	CharlieCard	Cash on board	Reduced fare
<b>Bus</b>	<b>\$1.70</b>	<b>\$1.70</b>	<b>\$0.85</b>
<b>Bus + Subway</b>	<b>\$2.40</b>	<b>\$4.10</b>	<b>\$1.10</b>

Complete fare/pass rules and free/reduced fare eligibility:  
[mbta.com/fares](http://mbta.com/fares) or call **617-222-3200**

**Weekday 137**

Inbound				Outbound			
Reading Depot	Wakefield Square	Oak Grove Station	Malden Center Station	Malden Center Station	Oak Grove Station	Wakefield Square	Reading Depot
5:25	5:33	5:49	5:57	4:45	4:52	5:07	5:22
6:10	6:22	6:42	6:56	5:29	5:36	5:51	6:06
6:55	7:07	7:27	-	6:27	6:36	6:56	7:12
7:15	7:27	7:47	-	7:07	7:16	7:36	7:52
7:35	7:47	8:07	-	-	7:36	7:56	8:12
7:55	8:07	8:26	-	-	7:56	8:16	8:32
8:15	8:27	8:46	-	-	8:16	8:36	8:52
8:35	8:47	9:06	-	-	8:30	8:50	9:06
8:55	9:07	9:26	9:38	-	8:51	9:11	9:27
9:30	9:42	10:01	10:13	-	9:23	9:43	9:59
10:02	10:14	10:33	10:45	9:45	9:54	10:13	10:32
10:35	10:47	11:06	11:19	10:20	10:30	10:48	11:07
11:10	11:23	11:44	11:57	10:55	11:04	11:23	11:42
11:45	11:58	<b>12:19</b>	<b>12:32</b>	11:30	11:38	11:57	<b>12:16</b>
<b>12:19</b>	<b>12:32</b>	<b>12:53</b>	<b>1:05</b>	<b>12:05</b>	<b>12:14</b>	<b>12:34</b>	<b>12:53</b>
<b>12:56</b>	<b>1:07</b>	<b>1:24</b>	<b>1:36</b>	<b>12:40</b>	<b>12:49</b>	<b>1:10</b>	<b>1:29</b>
<b>1:32</b>	<b>1:43</b>	<b>2:00</b>	<b>2:15</b>	<b>1:13</b>	<b>1:23</b>	<b>1:43</b>	<b>2:02</b>
<b>2:05</b>	<b>2:17</b>	<b>2:43</b>	<b>2:58</b>	<b>1:45</b>	<b>1:55</b>	<b>2:15</b>	<b>2:34</b>
<b>2:37</b>	<b>2:49</b>	<b>3:10</b>	<b>3:24</b>	<b>2:25</b>	<b>2:35</b>	<b>2:56</b>	<b>3:15</b>
<b>3:18</b>	<b>3:30</b>	<b>3:48</b>	<b>4:02</b>	<b>3:05</b>	<b>3:15</b>	<b>3:36</b>	<b>3:55</b>
<b>3:58</b>	<b>4:10</b>	<b>4:28</b>	-	<b>3:40</b>	<b>3:50</b>	<b>4:11</b>	<b>4:30</b>
<b>4:33</b>	<b>4:45</b>	<b>5:03</b>	-	-	<b>4:20</b>	<b>4:41</b>	<b>5:00</b>
<b>5:03</b>	<b>5:15</b>	<b>5:33</b>	-	-	<b>4:45</b>	<b>5:06</b>	<b>5:25</b>
<b>5:28</b>	<b>5:40</b>	<b>5:58</b>	-	-	<b>5:10</b>	<b>5:31</b>	<b>5:50</b>
<b>5:53</b>	<b>6:05</b>	<b>6:22</b>	-	-	<b>5:37</b>	<b>5:58</b>	<b>6:17</b>
<b>6:20</b>	<b>6:31</b>	<b>6:48</b>	-	-	<b>6:02</b>	<b>6:23</b>	<b>6:42</b>
<b>6:45</b>	<b>6:56</b>	<b>7:13</b>	-	-	<b>6:27</b>	<b>6:48</b>	<b>7:07</b>
<b>7:10</b>	<b>7:21</b>	<b>7:38</b>	-	-	<b>6:52</b>	<b>7:11</b>	<b>7:30</b>
<b>7:33</b>	<b>7:44</b>	<b>8:01</b>	-	-	<b>7:17</b>	<b>7:34</b>	<b>7:53</b>
<b>7:56</b>	<b>8:07</b>	<b>8:24</b>	-	<b>7:35</b>	<b>7:44</b>	<b>8:01</b>	<b>8:20</b>
<b>8:23</b>	<b>8:34</b>	<b>8:51</b>	<b>9:04</b>	<b>8:10</b>	<b>8:19</b>	<b>8:37</b>	<b>8:56</b>
<b>8:59</b>	<b>9:08</b>	<b>9:26</b>	<b>9:39</b>	<b>9:10</b>	<b>9:19</b>	<b>9:35</b>	<b>9:54</b>
<b>9:57</b>	<b>10:06</b>	<b>10:20</b>	<b>10:30</b>	<b>9:50</b>	<b>9:59</b>	<b>10:15</b>	<b>10:30</b>
<b>10:33</b>	<b>10:42</b>	<b>10:56</b>	<b>11:06</b>				

**Saturday 137**

Inbound				Outbound			
Reading Depot	Wakefield Square	Oak Grove Station	Malden Center Station	Malden Center Station	Oak Grove Station	Wakefield Square	Reading Depot
6:00	6:09	6:24	6:36	6:00	6:08	6:25	6:39
6:42	6:51	7:06	7:18	6:55	7:03	7:20	7:34
7:37	7:46	8:02	8:15	7:50	7:58	8:15	8:29
8:32	8:42	8:58	9:11	8:45	8:53	9:12	9:27
9:30	9:41	9:59	10:12	9:40	9:50	10:09	10:24
10:27	10:38	10:56	11:09	10:30	10:40	10:59	11:18
11:21	11:34	11:53	<b>12:06</b>	11:30	11:41	<b>12:02</b>	<b>12:18</b>
<b>12:21</b>	<b>12:34</b>	<b>12:53</b>	<b>1:06</b>	<b>12:25</b>	<b>12:36</b>	<b>12:57</b>	<b>1:13</b>
<b>1:16</b>	<b>1:29</b>	<b>1:48</b>	<b>2:01</b>	<b>1:20</b>	<b>1:31</b>	<b>1:52</b>	<b>2:08</b>
<b>2:11</b>	<b>2:24</b>	<b>2:43</b>	<b>2:56</b>	<b>2:15</b>	<b>2:26</b>	<b>2:47</b>	<b>3:03</b>
<b>3:06</b>	<b>3:18</b>	<b>3:38</b>	<b>3:50</b>	<b>3:10</b>	<b>3:21</b>	<b>3:42</b>	<b>3:58</b>
<b>4:01</b>	<b>4:13</b>	<b>4:33</b>	<b>4:45</b>	<b>4:05</b>	<b>4:15</b>	<b>4:33</b>	<b>4:50</b>
<b>4:53</b>	<b>5:05</b>	<b>5:24</b>	<b>5:36</b>	<b>5:00</b>	<b>5:10</b>	<b>5:28</b>	<b>5:45</b>
<b>5:48</b>	<b>5:59</b>	<b>6:18</b>	<b>6:30</b>	<b>5:55</b>	<b>6:05</b>	<b>6:23</b>	<b>6:40</b>
<b>6:43</b>	<b>6:54</b>	<b>7:10</b>	<b>7:22</b>	<b>6:50</b>	<b>7:00</b>	<b>7:18</b>	<b>7:35</b>
<b>7:38</b>	<b>7:48</b>	<b>8:04</b>	<b>8:16</b>	<b>7:45</b>	<b>7:55</b>	<b>8:13</b>	<b>8:30</b>
-	<b>9:15</b>	<b>9:30</b>	<b>9:41</b>	<b>8:40</b>	<b>8:50</b>	<b>9:08</b>	--

PM times are **bold**

Information in this timetable is subject to change without notice. Traffic and weather may affect running times.

Always check bus destination signs before boarding. Some buses may only serve a part, or skip portions of this route.

**Sunday 137**

Inbound				Outbound			
Reading Depot	Wakefield Square	Oak Grove Station	Malden Center Station	Malden Center Station	Oak Grove Station	Wakefield Square	Reading Depot
8:00	8:10	8:26	8:39	8:45	8:53	9:12	9:27
9:30	9:41	9:59	10:12	10:30	10:40	10:59	11:18
11:21	11:34	11:53	<b>12:06</b>	<b>12:15</b>	<b>12:26</b>	<b>12:47</b>	<b>1:03</b>
<b>1:06</b>	<b>1:19</b>	<b>1:38</b>	<b>1:51</b>	<b>2:00</b>	<b>2:11</b>	<b>2:32</b>	<b>2:48</b>
<b>2:51</b>	<b>3:04</b>	<b>3:24</b>	<b>3:36</b>	<b>3:45</b>	<b>3:56</b>	<b>4:15</b>	<b>4:32</b>
<b>4:35</b>	<b>4:47</b>	<b>5:06</b>	<b>5:18</b>	<b>5:30</b>	<b>5:40</b>	<b>5:58</b>	<b>6:15</b>
<b>6:18</b>	<b>6:29</b>	<b>6:48</b>	<b>7:00</b>				

**2023 Holidays**

- SAT** Patriots' Day
- SUN** Thanksgiving
- SUN** Memorial Day
- SUN** Christmas Day
- SUN** Independence Day
- SUN** New Year's Eve
- SUN** Labor Day
- SUN** New Year's Day
- SAT** Indigenous People's Day



MASSDOT CRASH RATE WORKSHEETS

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## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wakefield COUNT DATE : Dec-23

DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

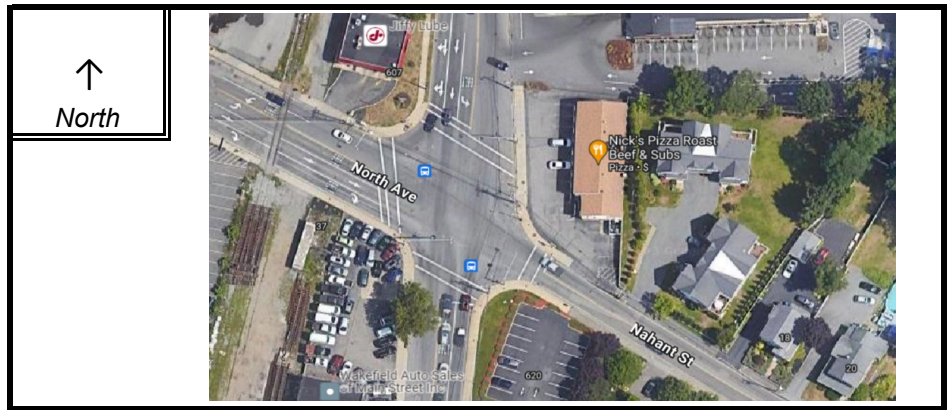
~ INTERSECTION DATA ~

MAJOR STREET : Main Street

MINOR STREET(S) : North Avenue

Nahant Street

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM) :	829	344	904	532		2,609

" K " FACTOR : **0.090** INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME : **28,989**

TOTAL # OF CRASHES : **19** # OF YEARS : **5** AVERAGE # OF CRASHES PER YEAR ( A ) : **3.80**

**CRASH RATE CALCULATION :**

**0.36**

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Below Statewide and District Crash Rates

Project Title & Date : Proposed Residential Development

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wakefield COUNT DATE : Dec-23

DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

### ~ INTERSECTION DATA ~

MAJOR STREET : Nahant Street

MINOR STREET(S) : Traverse Street

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM) :	513	407		17		<b>937</b>

" K " FACTOR :  INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES :  # OF YEARS :  AVERAGE # OF CRASHES PER YEAR ( A ) :

**CRASH RATE CALCULATION :**

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Below Statewide and District Crash Rates

Project Title & Date : Proposed Residential Development

# INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wakefield COUNT DATE : Dec-23

DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Nahant Street

MINOR STREET(S) : Middlesex Street

**INTERSECTION  
 DIAGRAM  
 (Label Approaches)**



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM) :	503	405	1	2		911

" K " FACTOR :  INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES :  # OF YEARS :  AVERAGE # OF CRASHES PER YEAR ( A ) :

**CRASH RATE CALCULATION :**

**0.00**

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Below Statewide and District Crash Rates

Project Title & Date : Proposed Residential Development



## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wakefield COUNT DATE : Dec-23

DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Nahant Street

MINOR STREET(S) : Hart Street

**INTERSECTION  
 DIAGRAM  
 (Label Approaches)**



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM) :	500	377		33		910

" K " FACTOR :  INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES :  # OF YEARS :  AVERAGE # OF CRASHES PER YEAR ( A ) :

**CRASH RATE CALCULATION :**  RATE =  $\frac{(A * 1,000,000)}{(V * 365)}$

Comments : Below Statewide and District Crash Rates

Project Title & Date: Proposed Residential Development

# INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wakefield COUNT DATE : Dec-23

DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Farm Street

MINOR STREET(S) : Nahant Street

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM) :	422	203	875	596		2,096

" K " FACTOR :  INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES :  # OF YEARS :  AVERAGE # OF CRASHES PER YEAR ( A ) :

**CRASH RATE CALCULATION :**

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Below Statewide and District Crash Rates

Project Title & Date: Proposed Residential Development

VEHICLE SPEED DATA

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Accurate Counts  
978-664-2565

Location : Nahant Street  
Location : East of Middlesex Street  
City/State: Wakefield, MA

Site Code: 98560001

12/20/2023 Time	EB		Hour Totals		WB		Hour Totals		Combined Totals	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	5	65			2	74				
12:15	1	50			5	76				
12:30	0	48			3	73				
12:45	3	49	9	212	2	71	12	294	21	506
1:00	2	47			2	89				
1:15	1	63			2	67				
1:30	0	61			4	72				
1:45	1	64	4	235	2	73	10	301	14	536
2:00	0	66			1	123				
2:15	2	85			0	114				
2:30	1	88			1	87				
2:45	4	72	7	311	1	109	3	433	10	744
3:00	1	101			0	99				
3:15	1	98			1	77				
3:30	0	89			1	88				
3:45	2	122	4	410	4	99	6	363	10	773
4:00	3	105			4	92				
4:15	2	117			2	109				
4:30	2	101			8	75				
4:45	5	112	12	435	10	82	24	358	36	793
5:00	10	98			11	83				
5:15	4	131			12	96				
5:30	6	114			12	99				
5:45	15	99	35	442	25	71	60	349	95	791
6:00	18	85			19	66				
6:15	13	71			45	53				
6:30	28	53			67	51				
6:45	57	59	116	268	80	54	211	224	327	492
7:00	73	37			81	54				
7:15	97	52			95	50				
7:30	50	58			113	68				
7:45	65	54	285	201	128	50	417	222	702	423
8:00	48	34			90	39				
8:15	72	28			103	30				
8:30	91	34			118	30				
8:45	58	29	269	125	84	34	395	133	664	258
9:00	45	19			73	37				
9:15	49	20			76	17				
9:30	55	23			59	32				
9:45	52	18	201	80	48	23	256	109	457	189
10:00	30	14			60	23				
10:15	48	10			57	13				
10:30	53	8			47	13				
10:45	57	4	188	36	50	19	214	68	402	104
11:00	45	5			67	14				
11:15	53	6			77	11				
11:30	56	10			78	7				
11:45	43	2	197	23	61	6	283	38	480	61
Total	1327	2778			1891	2892			3218	5670
Percent	32.3%	67.7%			39.5%	60.5%			36.2%	63.8%

Accurate Counts  
978-664-2565

Location : Nahant Street  
Location : East of Middlesex Street  
City/State: Wakefield, MA

Site Code: 98560001

12/21/2023 Time	EB		Hour Totals		WB		Hour Totals		Combined Totals	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	2	50			8	80				
12:15	1	61			4	76				
12:30	1	44			1	70				
12:45	3	58	7	213	3	57	16	283	23	496
1:00	0	61			5	66				
1:15	0	59			4	79				
1:30	1	50			1	101				
1:45	1	61	2	231	1	87	11	333	13	564
2:00	1	78			2	121				
2:15	0	78			1	93				
2:30	1	96			0	90				
2:45	2	93	4	345	0	121	3	425	7	770
3:00	0	92			2	104				
3:15	1	91			1	89				
3:30	1	94			0	110				
3:45	0	113	2	390	2	110	5	413	7	803
4:00	2	91			4	107				
4:15	4	130			5	82				
4:30	3	122			4	84				
4:45	8	109	17	452	10	72	23	345	40	797
5:00	8	106			12	98				
5:15	7	119			14	83				
5:30	5	97			13	87				
5:45	16	100	36	422	32	89	71	357	107	779
6:00	16	101			21	73				
6:15	18	102			46	66				
6:30	43	66			64	72				
6:45	37	62	114	331	69	69	200	280	314	611
7:00	99	36			84	55				
7:15	88	44			92	42				
7:30	60	30			80	38				
7:45	59	39	306	149	83	44	339	179	645	328
8:00	58	34			76	36				
8:15	55	28			77	32				
8:30	66	26			116	38				
8:45	60	22	239	110	81	34	350	140	589	250
9:00	43	27			62	31				
9:15	42	28			68	23				
9:30	48	19			63	27				
9:45	43	10	176	84	66	16	259	97	435	181
10:00	55	10			49	26				
10:15	50	12			65	20				
10:30	55	9			45	13				
10:45	48	14	208	45	69	11	228	70	436	115
11:00	43	4			63	9				
11:15	50	7			58	10				
11:30	45	5			71	17				
11:45	57	6	195	22	78	2	270	38	465	60
Total	1306	2794			1775	2960			3081	5754
Percent	31.9%	68.1%			37.5%	62.5%			34.9%	65.1%
Grand Total	2633	5572			3666	5852			6299	11424
Percent	32.1%	67.9%			38.5%	61.5%			35.5%	64.5%

ADT

ADT: 8,862

AADT: 8,862

Accurate Counts  
978-664-2565

Location : Nahant Street  
Location : East of Middlesex Street  
City/State: Wakefield, MA

Site Code: 98560001

12/18/2023 Time	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	*	*	9	12	7	16	*	*	*	*	*	*	8	14
1:00	*	*	*	*	4	10	2	11	*	*	*	*	*	*	3	10
2:00	*	*	*	*	7	3	4	3	*	*	*	*	*	*	6	3
3:00	*	*	*	*	4	6	2	5	*	*	*	*	*	*	3	6
4:00	*	*	*	*	12	24	17	23	*	*	*	*	*	*	14	24
5:00	*	*	*	*	35	60	36	71	*	*	*	*	*	*	36	66
6:00	*	*	*	*	116	211	114	200	*	*	*	*	*	*	115	206
7:00	*	*	*	*	285	417	306	339	*	*	*	*	*	*	296	378
8:00	*	*	*	*	269	395	239	350	*	*	*	*	*	*	254	372
9:00	*	*	*	*	201	256	176	259	*	*	*	*	*	*	188	258
10:00	*	*	*	*	188	214	208	228	*	*	*	*	*	*	198	221
11:00	*	*	*	*	197	283	195	270	*	*	*	*	*	*	196	276
12:00 PM	*	*	*	*	212	294	213	283	*	*	*	*	*	*	212	288
1:00	*	*	*	*	235	301	231	333	*	*	*	*	*	*	233	317
2:00	*	*	*	*	311	433	345	425	*	*	*	*	*	*	328	429
3:00	*	*	*	*	410	363	390	413	*	*	*	*	*	*	400	388
4:00	*	*	*	*	435	358	452	345	*	*	*	*	*	*	444	352
5:00	*	*	*	*	442	349	422	357	*	*	*	*	*	*	432	353
6:00	*	*	*	*	268	224	331	280	*	*	*	*	*	*	300	252
7:00	*	*	*	*	201	222	149	179	*	*	*	*	*	*	175	200
8:00	*	*	*	*	125	133	110	140	*	*	*	*	*	*	118	136
9:00	*	*	*	*	80	109	84	97	*	*	*	*	*	*	82	103
10:00	*	*	*	*	36	68	45	70	*	*	*	*	*	*	40	69
11:00	*	*	*	*	23	38	4	9	*	*	*	*	*	*	14	24
Total	0	0	0	0	4105	4783	4082	4706	0	0	0	0	0	0	4095	4745
Day	0		0		8888		8788		0		0		0		8840	
AM Peak Volume					7:00 285	7:00 417	7:00 306	8:00 350							7:00 296	7:00 378
PM Peak Volume					5:00 442	2:00 433	4:00 452	2:00 425							4:00 444	2:00 429
Comb Total ADT	0 ADT: 8,862		0 AADT: 8,862		8888		8788		0		0		0		8840	

## GROWTH RATE DATA

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**General Background Traffic Growth - Daily Traffic Volumes**

<b>CITY/TOWN</b>	<b>ROUTE/STREET</b>	<b>LOCATION</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>Average Annual</b>
Wakefield	Main Street	North of Water Street	15,739	15,911	14,627	15,330	15,547	16,402	16,582	16,798	12,400	12,574	12,924	<b>-1.85%</b>
Wakefield	Main Street	At Melrose City Line	13,049	13,192	12,841	13,211	13,418	12,186	12,320	12,480	13,207	13,392	13,446	<b>0.16%</b>
Wakefield	Yankee Division Highway	North of Main Street	133,096	130,226	122,700	135,088	137,350	133,916	134,579	138,422	140,727	139,400	142,046	<b>0.92%</b>
Wakefield	Yankee Division Highway	North of Route 28		141,000					137,541	148,269	147,824	146,684	144,478	<b>0.77%</b>
Wakefield	Yankee Division Highway	South of Ramp Walnut Street	124,859	127,229	124,187	130,074	129,565	128,788	134,300	134,844	132,277	137,999	140,822	<b>1.14%</b>
														<b>0.23%</b>



TRIP GENERATION DATA

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# Manufacturing (140)

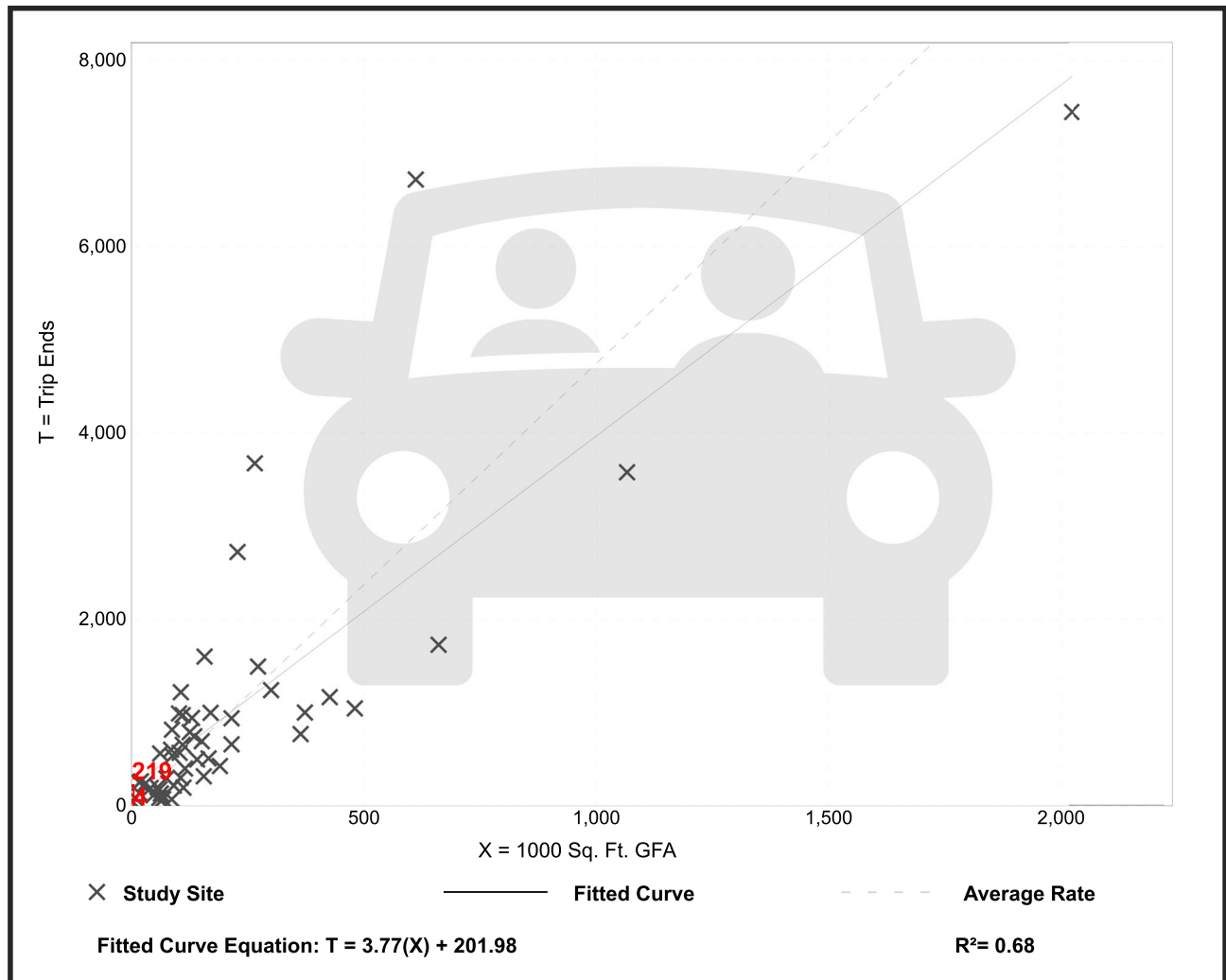
**Vehicle Trip Ends vs: 1000 Sq. Ft. GFA**  
**On a: Weekday**

**Setting/Location: General Urban/Suburban**  
Number of Studies: 53  
Avg. 1000 Sq. Ft. GFA: 208  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.75	0.83 - 49.50	3.20

## Data Plot and Equation



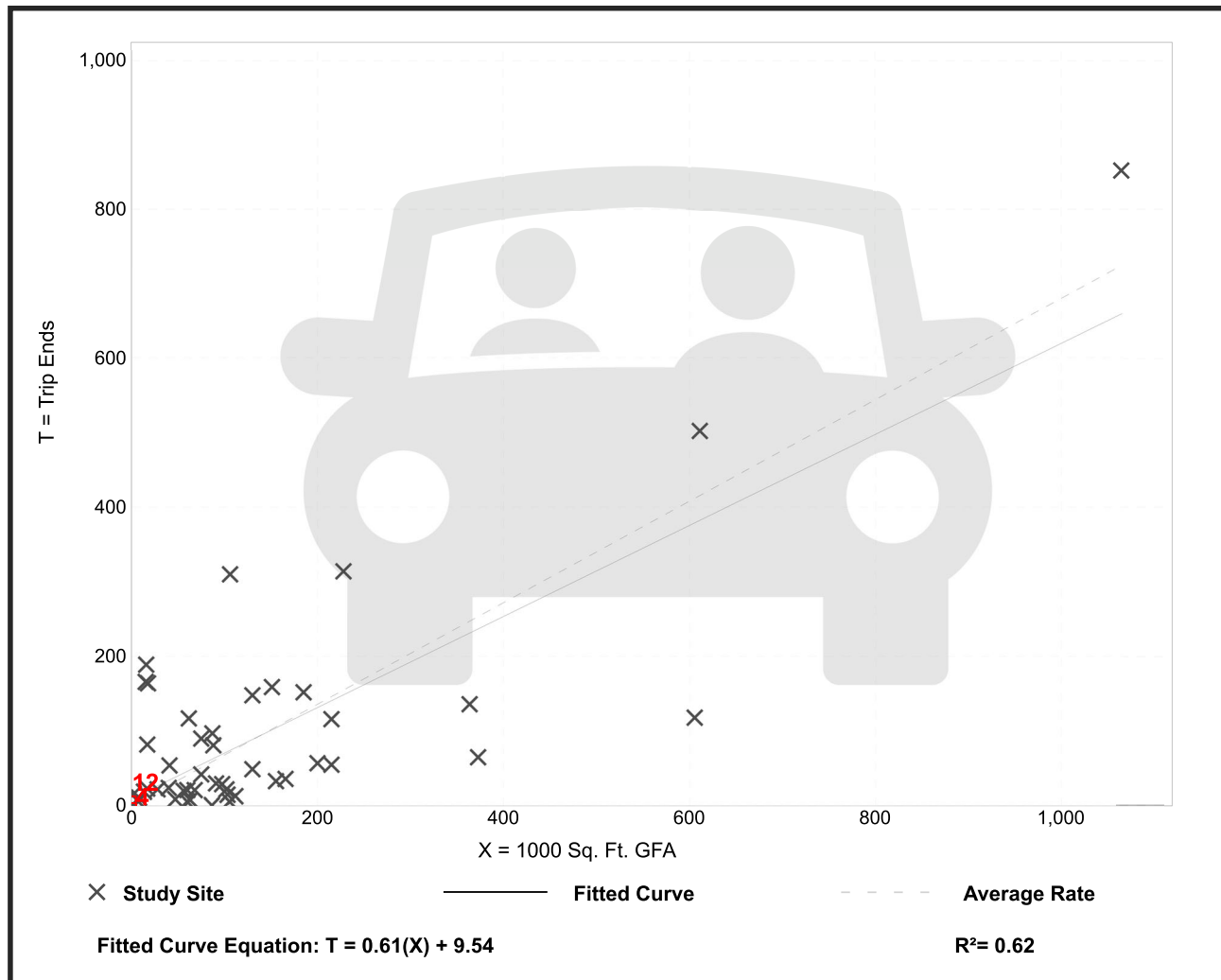
# Manufacturing (140)

**Vehicle Trip Ends vs: 1000 Sq. Ft. GFA**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 48  
 Avg. 1000 Sq. Ft. GFA: 138  
 Directional Distribution: 76% entering, 24% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.68	0.01 - 11.93	1.03

## Data Plot and Equation



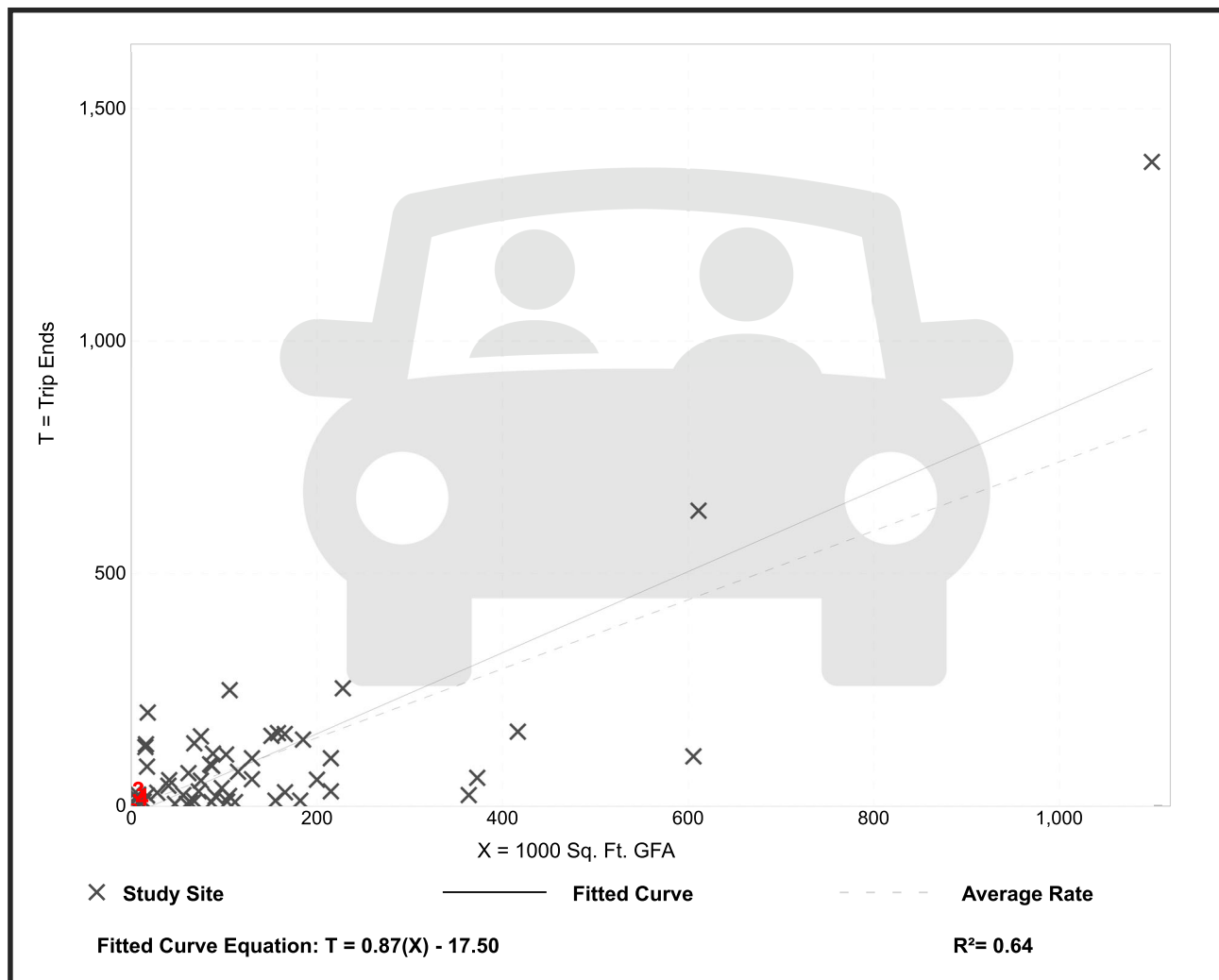
# Manufacturing (140)

**Vehicle Trip Ends vs: 1000 Sq. Ft. GFA**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 55  
 Avg. 1000 Sq. Ft. GFA: 142  
 Directional Distribution: 31% entering, 69% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.74	0.07 - 11.37	0.93

## Data Plot and Equation



# Single-Family Detached Housing (210)

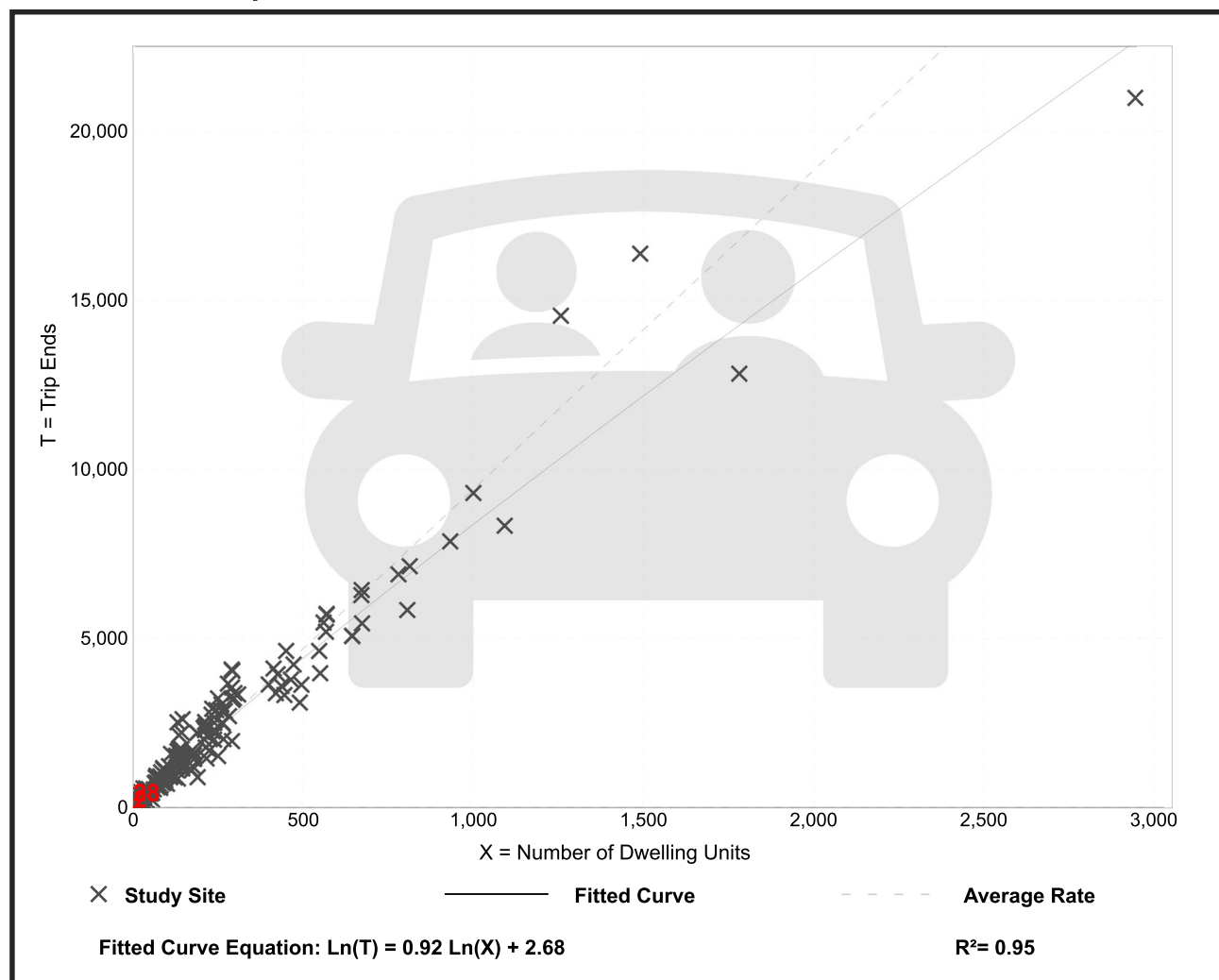
Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Setting/Location: General Urban/Suburban  
Number of Studies: 174  
Avg. Num. of Dwelling Units: 246  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

## Data Plot and Equation



# Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,  
Peak Hour of Adjacent Street Traffic,  
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 192

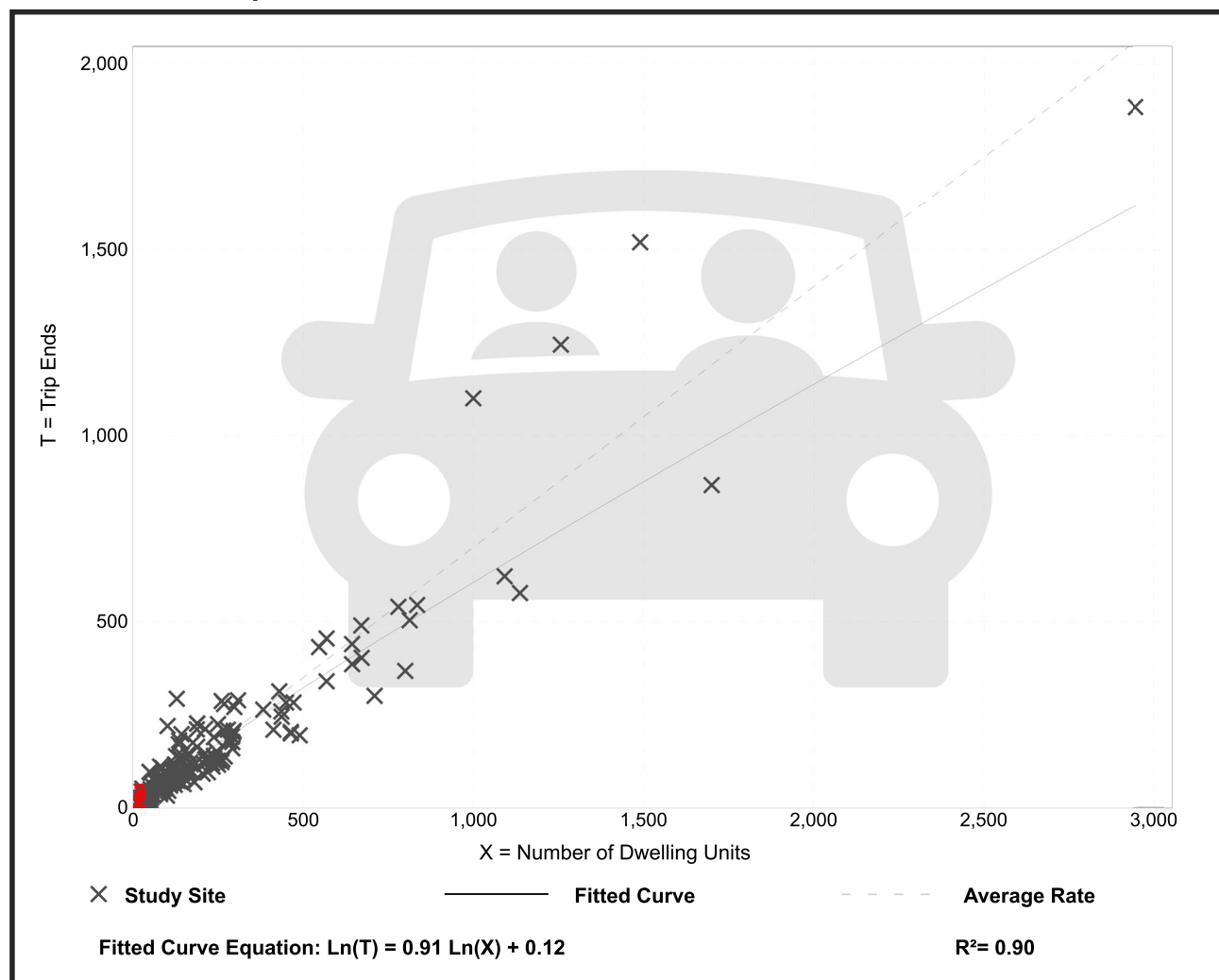
Avg. Num. of Dwelling Units: 226

Directional Distribution: 25% entering, 75% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

## Data Plot and Equation



# Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,  
Peak Hour of Adjacent Street Traffic,  
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 208

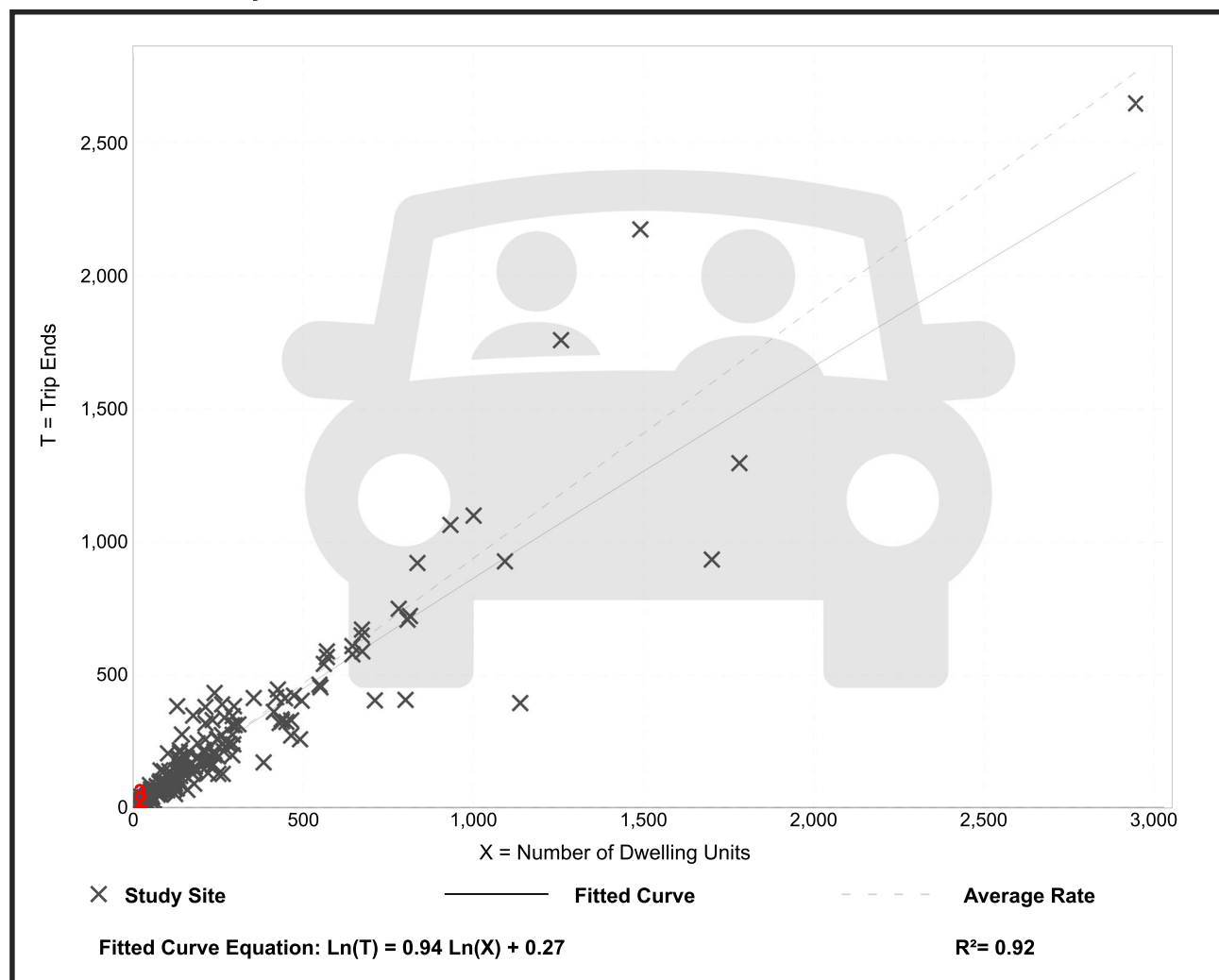
Avg. Num. of Dwelling Units: 248

Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

## Data Plot and Equation



# Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

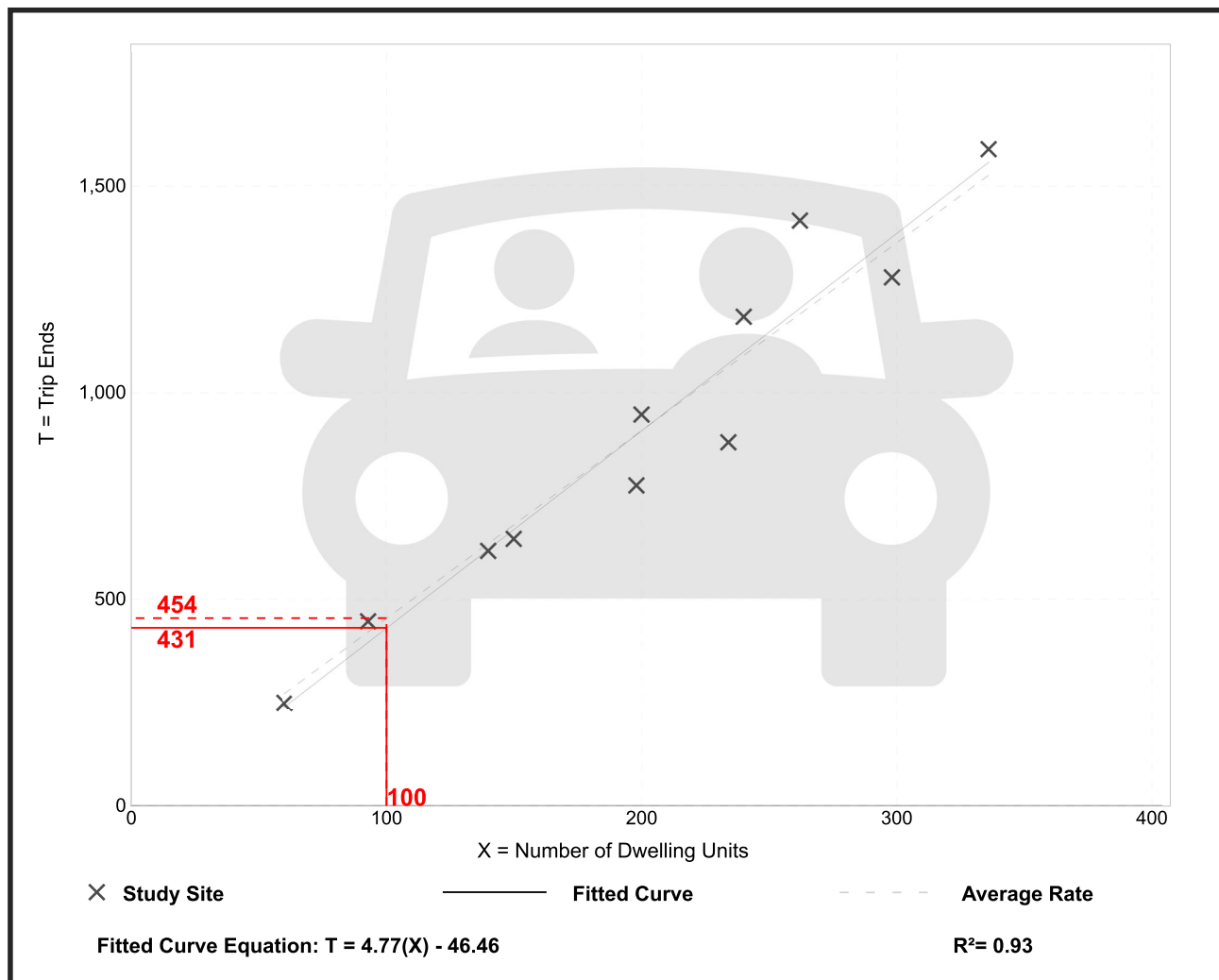
Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Setting/Location: General Urban/Suburban  
Number of Studies: 11  
Avg. Num. of Dwelling Units: 201  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.54	3.76 - 5.40	0.51

## Data Plot and Equation





# Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units  
 On a: Weekday,  
 Peak Hour of Adjacent Street Traffic,  
 One Hour Between 7 and 9 a.m.

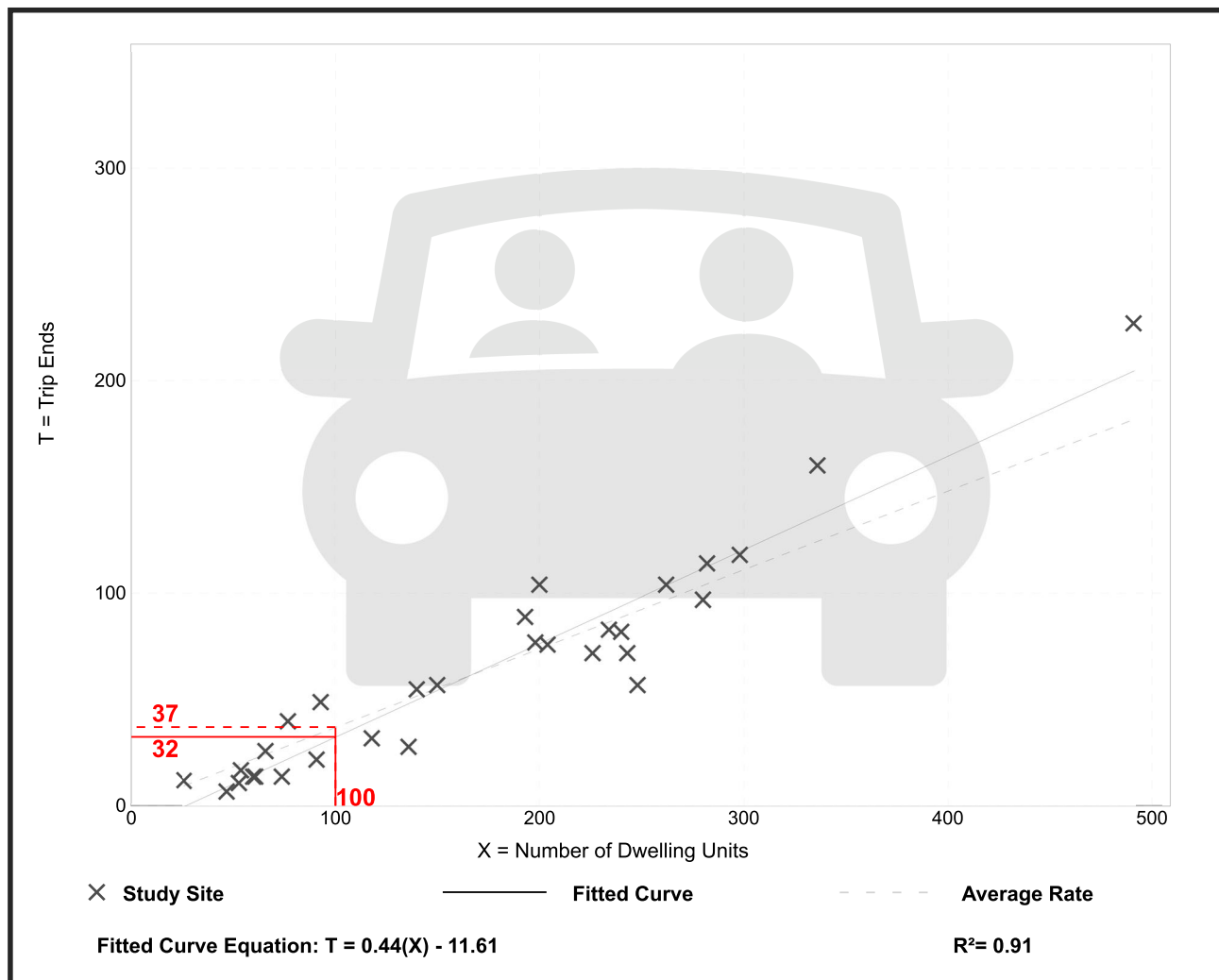
Setting/Location: General Urban/Suburban

Number of Studies: 30  
 Avg. Num. of Dwelling Units: 173  
 Directional Distribution: 23% entering, 77% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.37	0.15 - 0.53	0.09

## Data Plot and Equation



# Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday,  
Peak Hour of Adjacent Street Traffic,  
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 31

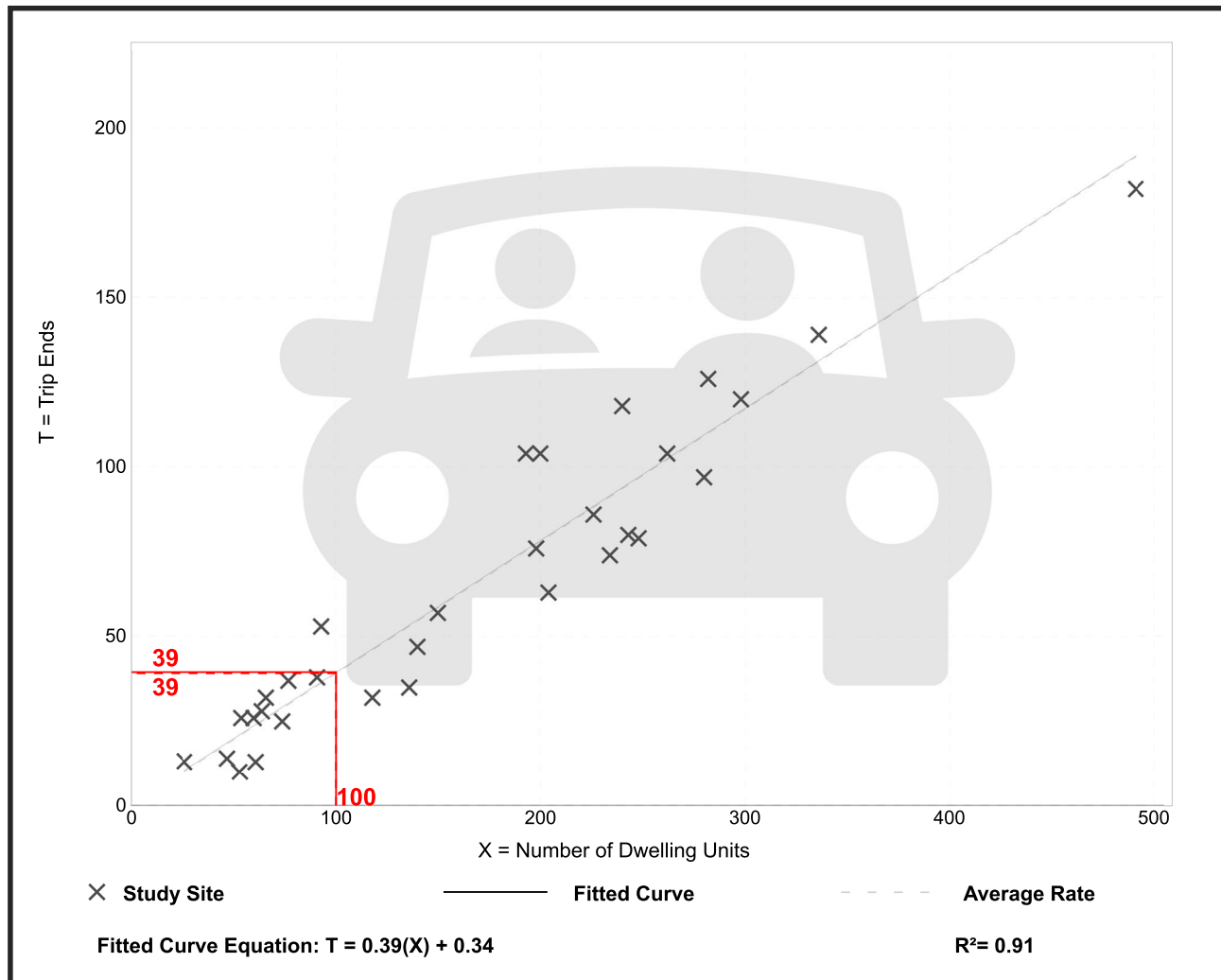
Avg. Num. of Dwelling Units: 169

Directional Distribution: 61% entering, 39% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.19 - 0.57	0.08

## Data Plot and Equation



TRIP DISTRIBUTION DATA

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Proposed Residential Development  
Wakefield, Massachusetts

Residence	Workplace	Number	Main Street (North)	Traverse Street (North)	Hart Street (North)	Farm Street (North)	Main Street (South)	Farm Street (South)	North Avenue (West)							
Wakefield town	Boston city	2,756	0	0	0	0	67%	1847	33%	909	0					
Wakefield town	Wakefield town	2,443	18%	440	1%	24	1%	24	16%	391	23%	562	20%	489	21%	513
Wakefield town	Woburn city	816	0	0	0	0	33%	269	0	0	67%	547				
Wakefield town	Cambridge city	683	0	0	0	0	34%	232	32%	219	34%	232				
Wakefield town	Reading town	624	0	0	0	0	0	0	100%	624						
Wakefield town	Burlington town	458	0	0	0	0	33%	151	0	0	67%	307				
Wakefield town	Waltham city	362	0	0	0	0	50%	181	0	0	50%	181				
Wakefield town	Melrose city	357	0	0	0	0	67%	239	33%	118	0					
Wakefield town	Beverly city	251	0	0	0	100%	251	0	0	0	0					
Wakefield town	Danvers town	247	0	0	0	100%	247	0	0	0	0					
Wakefield town	Wilmington town	244	0	33%	81	0	0	0	0	0	67%	163				
Wakefield town	Medford city	240	0	0	0	0	100%	240	0	0	0					
Wakefield town	Saugus town	225	0	0	0	50%	113	0	50%	113	0					
Wakefield town	Andover town	217	0	67%	145	0	0	0	0	0	33%	72				
Wakefield town	Peabody city	215	0	0	0	100%	215	0	0	0	0					
Wakefield town	Stoneham town	206	0	0	0	0	33%	68	0	0	67%	138				
Wakefield town	Somerville city	202	0	0	0	0	67%	135	33%	67	0					
Wakefield town	Malden city	198	0	0	0	0	67%	133	33%	65	0					
Wakefield town	Newton city	191	0	0	0	0	33%	63	33%	63	34%	65				
Wakefield town	Salem city	175	0	0	0	100%	175	0	0	0	0					
Wakefield town	Everett city	171	0	0	0	0	33%	56	67%	115	0					
Wakefield town	Bedford town	167	0	0	0	0	0	0	0	0	100%	167				
Wakefield town	Lexington town	167	0	0	0	0	33%	55	0	0	67%	112				
Wakefield town	Winchester town	165	0	0	0	0	67%	111	0	0	33%	54				
Wakefield town	Chelsea city	159	0	0	0	0	33%	52	67%	107	0					
Wakefield town	Lynnfield town	152	0	67%	102	0	33%	50	0	0	0					
Wakefield town	Chelmsford town	117	0	0	0	0	0	0	0	0	100%	117				
Wakefield town	Framingham town	101	0	0	0	0	33%	33	33%	33	34%	34				
Wakefield town	North Reading town	101	33%	33	67%	68	0	0	0	0	0					
Wakefield town	Billerica town	100	0	0	0	0	0	0	0	0	100%	100				
Wakefield town	Portsmouth city	83	0	0	0	0	55%	46	0	0	45%	37				
Wakefield town	Tewksbury town	81	33%	27	0	0	0	33%	27	0	0	34%	28			
Wakefield town	Watertown Town city	81	0	0	0	0	0	33%	27	33%	27	34%	28			
Wakefield town	Lynn city	75	0	0	0	0	33%	25	0	67%	50	0				
			0	0	0	0	0	0	0	0	0	0				
			0	0	0	0	0	0	0	0	0	0				
			0	0	0	0	0	0	0	0	0	0				
			0	0	0	0	0	0	0	0	0	0				
		12,830	500	420	24	1,512	4,482	2,373	3,519							
			3.9%	3.3%	0.2%	11.8%	34.9%	18.5%	27.4%							
		<u>SAY</u>	<b>4%</b>	<b>3%</b>	<b>0%</b>	<b>12%</b>	<b>35%</b>	<b>19%</b>	<b>27%</b>							

## PARKING ANALYSIS

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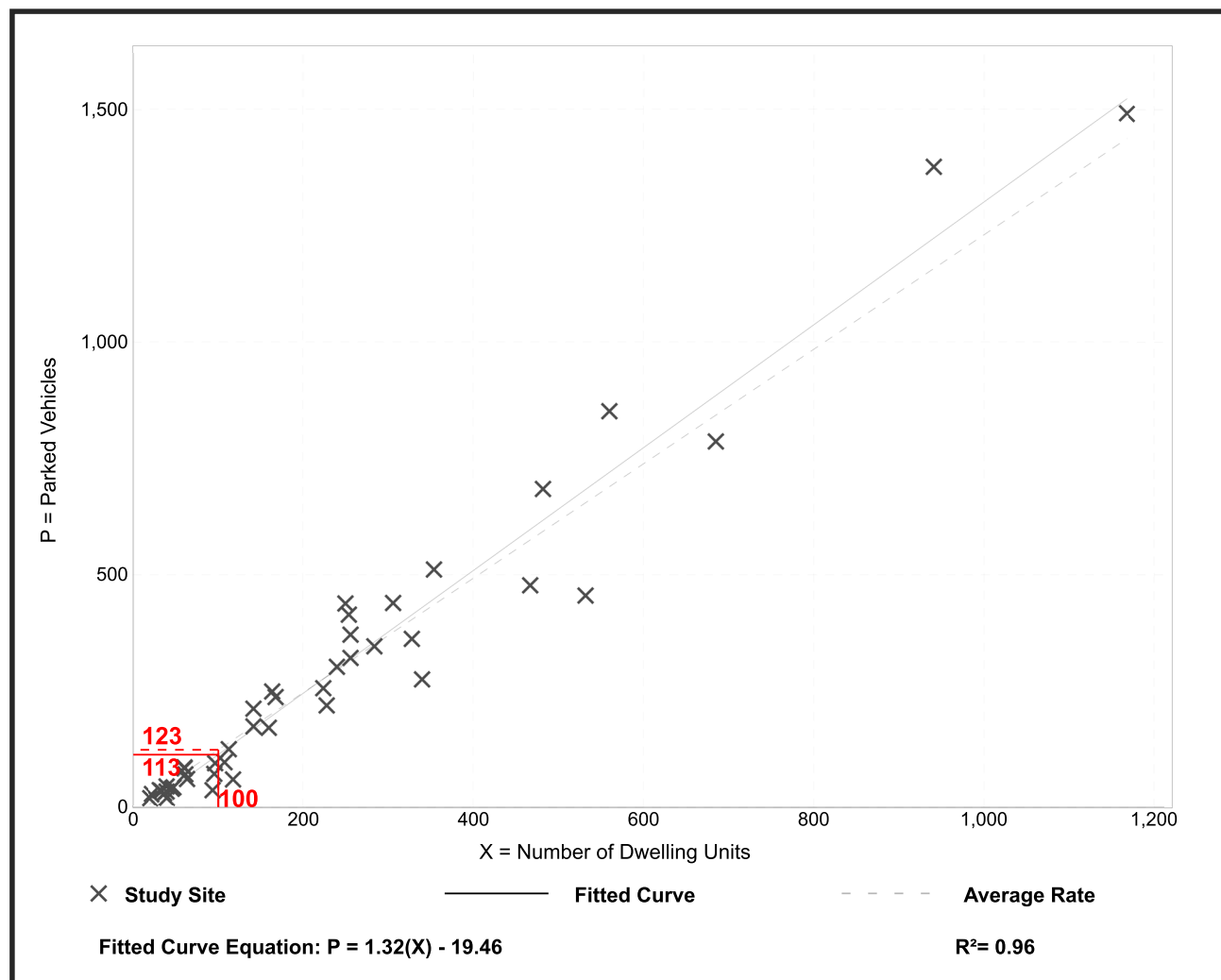
## Multifamily Housing - 2+ BR (Mid-Rise) - Not Close to Rail Transit (221)

**Peak Period Parking Demand vs: Dwelling Units**  
**On a: Weekday (Monday - Friday)**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 44  
 Avg. Num. of Dwelling Units: 231

### Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.23	0.39 - 1.75	0.98 / 1.45	1.15 - 1.31	0.27 (22%)

### Data Plot and Equation



site_id	add_num	add_str	zipcode	muni	util_rate	park_dem	park_sup
115	1000	Stone Place	2176	Melrose	0.82	1.73	2.1
121	108	Emerson V	2176	Melrose	0.84	1.15	1.37
127	12	Mt Vernon	2176	Melrose	1	1.5	1.5
159	175, 189, 1	Wyoming \	2176	Melrose	0.83	0.83	1
160	180	Green Stree	2176	Melrose	0.76	1.13	1.49
161	181	Pleasant St	2176	Melrose	0.86	1.04	1.21
165	185	Essex Stree	2176	Melrose	0.88	1.44	1.63
204	288	Main Stree	2176	Melrose	1	1	1
207	12	Wyoming \	2176	Melrose	0.82	0.75	0.92
213	333	Main Stree	2176	Melrose	0.65	0.71	1.1
221	37	Crystal Stre	2176	Melrose	0.8	1	1.25
227	42	Emerson V	2176	Melrose	0.74	0.93	1.27
228	43	Albion Stre	2176	Melrose	0.45	0.45	1
232	447	Pleasant St	2176	Melrose	0.8	0.76	0.95
248	56	Wyoming \	2176	Melrose	0.77	1.1	1.43
249	560	Lebanon St	2176	Melrose	0.63	1	1.6
251	585	Main Stree	2176	Melrose	0.84	1.15	1.36
285	929	Main Stree	2176	Melrose	0.73	1.1	1.5
287	99	Essex Stree	2176	Melrose	0.82	1.38	1.69
289	990	Main Stree	2176	Melrose	0.75	0.75	1

Average: 0.715943 0.7356 1.0424

site_id	add_num	add_str	zipcode	muni	hou_type	util_rate	park_dem	park_sup
109	100-150	Exchange S	2148	Malden	Apartment	0.7	0.53	0.76
118	1038	Main Stree	2148	Malden	Apartment	0.92	1.08	1.18
124	111	Devir Stree	2148	Malden	Condomini	0.58	1	1.71
126	117	Summer St	2148	Malden	Apartment	0.62	0.55	0.88
133	128	Salem Stre	2148	Malden	Apartment	0.84	1.31	1.56
134	129	Medford S	2148	Malden	Apartment	0.44	0.4	0.91
135	134	Summer St	2148	Malden	Apartment	0.68	0.64	0.94
138	135	Summer St	2148	Malden	Apartment	0.71	1.25	1.75
139	141	Pierce Stre	2148	Malden	Condomini	0.78	0.95	1.22
141	145	Glenwood	2148	Malden	Condomini	0.73	1.46	2
148	1538	Eastern Av	2148	Malden	Apartment	0.53	0.75	1.42
155	160	Pleasant St	2148	Malden	Apartment	0.52	0.36	0.7
156	17	Washingto	2148	Malden	Apartment	0.81	0.22	0.27
158	175	Summer St	2148	Malden	Apartment	0.56	0.56	1
169	198	Clifton Stre	2148	Malden	Apartment	0.56	0.9	1.6
191	244	Salem Stre	2148	Malden	Condomini	0.63	0.58	0.91
211	33, 36	Maple Stre	2148	Malden	Apartment	0.86	0.3	0.34
222	39	Florence Si	2148	Malden	Apartment	0.87	0.33	0.38
224	397	Highland A	2148	Malden	Apartment	0.53	0.88	1.67
239	8	Newman R	2148	Malden	Condomini	0.58	0.6	1.05
244	500	Broadway	2148	Malden	Apartment	0.87	1.04	1.19
245	525	Highland A	2148	Malden	Apartment	1	0.84	0.84
252	59	Green Stre	2148	Malden	Apartment	0.3	0.2	0.68
253	597	Pleasant St	2148	Malden	Apartment	0.87	1	1.15
257	62	Willow Stri	2148	Malden	Apartment	0.76	1.01	1.33
263	66, 92, 108	Devir Stree	2148	Malden	Apartment	0.39	0.51	1.31
265	68	Washingto	2148	Malden	Apartment	0.39	0.39	1
268	72	Ashland St	2148	Malden	Condomini	0.66	1.03	1.56
276	86	Maple Stre	2148	Malden	Apartment	0.58	0.73	1.27
280	9	Maple Stre	2148	Malden	Condomini	0.83	0.78	0.94

Average: 0.720698 0.737558 1.04157



## CAPACITY ANALYSIS

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2024 Baseline Weekday Morning Peak Hour  
2024 Baseline Weekday Evening Peak Hour  
2031 No-Build Weekday Morning Peak Hour  
2031 No-Build Weekday Evening Peak Hour  
2031 Build Weekday Morning Peak Hour  
2031 Build Weekday Evening Peak Hour



2024 Baseline Weekday Morning Peak Hour

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2024 Baseline Weekday Morning Peak Hour  
1: Main Street & North Avenue/Nahant Street

02/12/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	179	297	28	285	45	301	384	43	26	385	123
Future Volume (vph)	77	179	297	28	285	45	301	384	43	26	385	123
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850		0.983			0.985			0.964	
Flt Protected	0.950				0.996		0.950			0.950		
Satd. Flow (prot)	1616	1766	1501	0	1803	0	1770	1810	0	1678	3370	0
Flt Permitted	0.382				0.955		0.220			0.481		
Satd. Flow (perm)	650	1766	1501	0	1728	0	410	1810	0	849	3370	0
Satd. Flow (RTOR)			338		5			6			31	
Adj. Flow (vph)	88	203	338	29	291	46	350	447	50	29	428	137
Lane Group Flow (vph)	88	203	338	0	366	0	350	497	0	29	565	0
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2	13		6		13	10				14
Permitted Phases	2		2	6			10			14		
Detector Phase	2	2	13	6	6		13	10		14	14	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0	14.0	8.0	14.0	14.0		8.0	11.0		11.0	11.0	
Total Split (s)	39.0	39.0	28.0	39.0	39.0		28.0	66.0		38.0	38.0	
Total Split (%)	29.3%	29.3%	21.1%	29.3%	29.3%		21.1%	49.6%		28.6%	28.6%	
Maximum Green (s)	30.0	30.0	25.0	30.0	30.0		25.0	60.0		32.0	32.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		4.0	4.0	
All-Red Time (s)	6.0	6.0	0.0	6.0	6.0		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	9.0	9.0	3.0		9.0		3.0	6.0		6.0	6.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	None	Min	Min		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	28.3	28.3	56.9		28.3		52.3	49.1		23.7	23.7	
Actuated g/C Ratio	0.26	0.26	0.53		0.26		0.49	0.46		0.22	0.22	
v/c Ratio	0.52	0.44	0.36		0.80		0.73	0.60		0.16	0.74	
Control Delay	52.8	40.8	2.2		54.1		30.0	26.5		40.3	44.5	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	52.8	40.8	2.2		54.1		30.0	26.5		40.3	44.5	
LOS	D	D	A		D		C	C		D	D	
Approach Delay		21.7			54.1			28.0			44.3	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	50	112	0		223		132	218		16	174	
Queue Length 95th (ft)	#131	230	25		#501		270	405		49	287	
Internal Link Dist (ft)		395			1456			1087			1014	
Turn Bay Length (ft)	140		150				150			75		
Base Capacity (vph)	189	514	994		506		528	1057		263	1068	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	

2024 Baseline Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	21%
Maximum Green (s)	26.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	7.0
Flash Dont Walk (s)	19.0
Pedestrian Calls (#/hr)	21
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

2024 Baseline Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

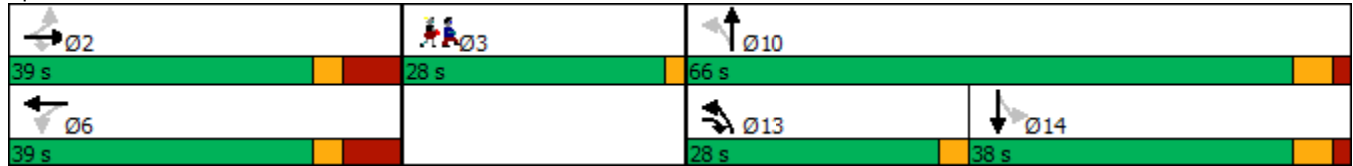


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.47	0.39	0.34		0.72		0.66	0.47		0.11	0.53	

Intersection Summary

Cycle Length: 133	
Actuated Cycle Length: 107.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 34.3	Intersection LOS: C
Intersection Capacity Utilization 83.3%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & North Avenue/Nahant Street



Lane Group	Ø3
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

2024 Baseline Weekday Morning Peak Hour  
2: Nahant Street & Traverse Street

02/12/2024

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	7	326	438	19	18	11
Future Vol, veh/h	7	326	438	19	18	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	89	89	52	52
Heavy Vehicles, %	0	3	2	0	0	0
Mvmt Flow	10	479	492	21	35	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	513	0	-	0	1002 503
Stage 1	-	-	-	-	503 -
Stage 2	-	-	-	-	499 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1063	-	-	-	271 573
Stage 1	-	-	-	-	612 -
Stage 2	-	-	-	-	614 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1063	-	-	-	267 573
Mov Cap-2 Maneuver	-	-	-	-	267 -
Stage 1	-	-	-	-	604 -
Stage 2	-	-	-	-	614 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	17.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1063	-	-	-	335
HCM Lane V/C Ratio	0.01	-	-	-	0.166
HCM Control Delay (s)	8.4	0	-	-	17.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.6

2024 Baseline Weekday Morning Peak Hour  
 3: Existing Driveway/Middlesex Street & Nahant Street

02/12/2024

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	342	1	0	456	0	1	0	2	3	0	0
Future Vol, veh/h	1	342	1	0	456	0	1	0	2	3	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	84	84	84	38	38	38	38	38	38
Heavy Vehicles, %	0	3	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	1	496	1	0	543	0	3	0	5	8	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	543	0	0	497	0	0	1042	1042	497	1044	1042	543
Stage 1	-	-	-	-	-	-	499	499	-	543	543	-
Stage 2	-	-	-	-	-	-	543	543	-	501	499	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1036	-	-	1077	-	-	210	232	577	209	232	544
Stage 1	-	-	-	-	-	-	557	547	-	528	523	-
Stage 2	-	-	-	-	-	-	528	523	-	556	547	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1036	-	-	1077	-	-	210	232	577	207	232	544
Mov Cap-2 Maneuver	-	-	-	-	-	-	210	232	-	207	232	-
Stage 1	-	-	-	-	-	-	556	546	-	527	523	-
Stage 2	-	-	-	-	-	-	528	523	-	550	546	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			15.1			23.1		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	365	1036	-	-	1077	-	-	207
HCM Lane V/C Ratio	0.022	0.001	-	-	-	-	-	0.038
HCM Control Delay (s)	15.1	8.5	0	-	0	-	-	23.1
HCM Lane LOS	C	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1



2024 Baseline Weekday Morning Peak Hour  
4: Nahant Street & Hart Street

02/12/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	21	326	424	0	4	32
Future Vol, veh/h	21	326	424	0	4	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	89	89	73	73
Heavy Vehicles, %	0	1	2	0	0	3
Mvmt Flow	26	408	476	0	5	44

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	476	0	-	0	936 476
Stage 1	-	-	-	-	476 -
Stage 2	-	-	-	-	460 -
Critical Hdwy	4.1	-	-	-	6.4 6.23
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.327
Pot Cap-1 Maneuver	1097	-	-	-	297 587
Stage 1	-	-	-	-	629 -
Stage 2	-	-	-	-	640 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1097	-	-	-	288 587
Mov Cap-2 Maneuver	-	-	-	-	288 -
Stage 1	-	-	-	-	610 -
Stage 2	-	-	-	-	640 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1097	-	-	-	526
HCM Lane V/C Ratio	0.024	-	-	-	0.094
HCM Control Delay (s)	8.4	0	-	-	12.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

2024 Baseline Weekday Morning Peak Hour  
5: Farm Street & Nahant Street

02/12/2024

Intersection						
Int Delay, s/veh	35.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↶	↷		↶	↷	
Traffic Vol, veh/h	90	260	232	386	554	139
Future Vol, veh/h	90	260	232	386	554	139
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	88	88	86	86
Heavy Vehicles, %	1	2	2	7	3	0
Mvmt Flow	105	302	264	439	644	162

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1692	725	806	0	-	0
Stage 1	725	-	-	-	-	-
Stage 2	967	-	-	-	-	-
Critical Hdwy	6.41	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 103	425	819	-	-	-
Stage 1	481	-	-	-	-	-
Stage 2	370	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 59	425	819	-	-	-
Mov Cap-2 Maneuver	~ 59	-	-	-	-	-
Stage 1	276	-	-	-	-	-
Stage 2	370	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	157.6	4.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	819	-	59	425	-	-
HCM Lane V/C Ratio	0.322	-	1.774	0.711	-	-
HCM Control Delay (s)	11.5	0\$	521.2	31.8	-	-
HCM Lane LOS	B	A	F	D	-	-
HCM 95th %tile Q(veh)	1.4	-	9.7	5.5	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

2024 Baseline Weekday Morning Peak Hour  
6: Farm Street & Hemlock Road

02/12/2024

Intersection						
Int Delay, s/veh	690.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		P		Y	↑
Traffic Vol, veh/h	124	169	449	307	332	482
Future Vol, veh/h	124	169	449	307	332	482
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	88	88	86	86
Heavy Vehicles, %	36	11	3	8	3	3
Mvmt Flow	197	268	510	349	386	560

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2017	685	0	0	859
Stage 1	685	-	-	-	-
Stage 2	1332	-	-	-	-
Critical Hdwy	6.76	6.31	-	-	4.13
Critical Hdwy Stg 1	5.76	-	-	-	-
Critical Hdwy Stg 2	5.76	-	-	-	-
Follow-up Hdwy	3.824	3.399	-	-	2.227
Pot Cap-1 Maneuver	~ 52	433	-	-	778
Stage 1	443	-	-	-	-
Stage 2	209	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	~ 26	433	-	-	778
Mov Cap-2 Maneuver	~ 26	-	-	-	-
Stage 1	443	-	-	-	-
Stage 2	~ 105	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, \$	3360.3	0	5.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	57	778
HCM Lane V/C Ratio	-	-	8.159	0.496
HCM Control Delay (s)	-	\$	3360.3	14.1
HCM Lane LOS	-	-	F	B
HCM 95th %tile Q(veh)	-	-	54.2	2.8

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

2024 Baseline Weekday Evening Peak Hour

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2024 Baseline Weekday Evening Peak Hour  
1: Main Street & North Avenue/Nahant Street

02/12/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	358	331	21	262	61	308	564	32	59	374	99
Future Volume (vph)	140	358	331	21	262	61	308	564	32	59	374	99
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850		0.976			0.992			0.969	
Flt Protected	0.950				0.997		0.950			0.950		
Satd. Flow (prot)	1745	1818	1561	0	1828	0	1805	1867	0	1745	3471	0
Flt Permitted	0.445				0.899		0.255			0.365		
Satd. Flow (perm)	817	1818	1561	0	1649	0	484	1867	0	670	3471	0
Satd. Flow (RTOR)			324		8			3			23	
Adj. Flow (vph)	151	385	356	22	273	64	328	600	34	62	394	104
Lane Group Flow (vph)	151	385	356	0	359	0	328	634	0	62	498	0
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2	13		6		13	10			14	
Permitted Phases	2		2	6			10			14		
Detector Phase	2	2	13	6	6		13	10		14	14	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0	14.0	8.0	14.0	14.0		8.0	11.0		11.0	11.0	
Total Split (s)	39.0	39.0	28.0	39.0	39.0		28.0	66.0		38.0	38.0	
Total Split (%)	29.3%	29.3%	21.1%	29.3%	29.3%		21.1%	49.6%		28.6%	28.6%	
Maximum Green (s)	30.0	30.0	25.0	30.0	30.0		25.0	60.0		32.0	32.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		4.0	4.0	
All-Red Time (s)	6.0	6.0	0.0	6.0	6.0		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	9.0	9.0	3.0		9.0		3.0	6.0		6.0	6.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	None	Min	Min		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	30.9	30.9	56.0		30.9		44.9	41.8		19.7	19.7	
Actuated g/C Ratio	0.31	0.31	0.57		0.31		0.45	0.42		0.20	0.20	
v/c Ratio	0.59	0.68	0.35		0.69		0.69	0.80		0.47	0.70	
Control Delay	44.8	40.2	2.3		40.6		26.6	33.8		49.6	41.5	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	44.8	40.2	2.3		40.6		26.6	33.8		49.6	41.5	
LOS	D	D	A		D		C	C		D	D	
Approach Delay		25.9			40.6			31.4			42.4	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	73	192	5		176		121	309		32	137	
Queue Length 95th (ft)	#247	#525	38		#499		255	599		93	251	
Internal Link Dist (ft)		395			1456			1087			1014	
Turn Bay Length (ft)	140		150				150			75		
Base Capacity (vph)	255	567	1109		520		563	1166		223	1171	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	

2024 Baseline Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	21%
Maximum Green (s)	26.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	7.0
Flash Dont Walk (s)	19.0
Pedestrian Calls (#/hr)	6
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

2024 Baseline Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

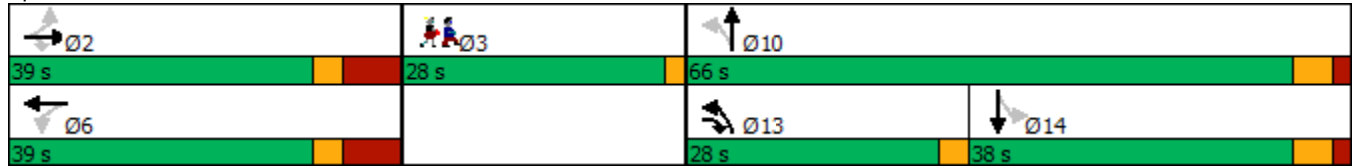


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.59	0.68	0.32		0.69		0.58	0.54		0.28	0.43	

Intersection Summary

Cycle Length: 133	
Actuated Cycle Length: 98.9	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 33.0	Intersection LOS: C
Intersection Capacity Utilization 98.3%	ICU Level of Service F
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & North Avenue/Nahant Street



Lane Group	Ø3
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	



2024 Baseline Weekday Evening Peak Hour  
2: Nahant Street & Traverse Street

02/12/2024

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	17	496	396	11	7	10
Future Vol, veh/h	17	496	396	11	7	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	92	92	53	53
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	19	551	430	12	13	19

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	442	0	-	0	1025 436
Stage 1	-	-	-	-	436 -
Stage 2	-	-	-	-	589 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1129	-	-	-	263 625
Stage 1	-	-	-	-	656 -
Stage 2	-	-	-	-	558 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1129	-	-	-	257 625
Mov Cap-2 Maneuver	-	-	-	-	257 -
Stage 1	-	-	-	-	640 -
Stage 2	-	-	-	-	558 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	15
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1129	-	-	-	393
HCM Lane V/C Ratio	0.017	-	-	-	0.082
HCM Control Delay (s)	8.2	0	-	-	15
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

2024 Baseline Weekday Evening Peak Hour  
 3: Existing Driveway/Middlesex Street & Nahant Street

02/12/2024

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	500	1	0	404	1	1	0	0	0	0	2
Future Vol, veh/h	2	500	1	0	404	1	1	0	0	0	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	89	89	89	25	25	25	25	50	50
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	2	532	1	0	454	1	4	0	0	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	455	0	0	533	0	0	994	992	533	992	992	455
Stage 1	-	-	-	-	-	-	537	537	-	455	455	-
Stage 2	-	-	-	-	-	-	457	455	-	537	537	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1116	-	-	1045	-	-	226	248	551	227	248	609
Stage 1	-	-	-	-	-	-	532	526	-	589	572	-
Stage 2	-	-	-	-	-	-	587	572	-	532	526	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1116	-	-	1045	-	-	224	247	551	227	247	609
Mov Cap-2 Maneuver	-	-	-	-	-	-	224	247	-	227	247	-
Stage 1	-	-	-	-	-	-	530	524	-	587	572	-
Stage 2	-	-	-	-	-	-	583	572	-	530	524	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			21.4			11		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	224	1116	-	-	1045	-	-	609
HCM Lane V/C Ratio	0.018	0.002	-	-	-	-	-	0.007
HCM Control Delay (s)	21.4	8.2	0	-	0	-	-	11
HCM Lane LOS	C	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

2024 Baseline Weekday Evening Peak Hour  
4: Nahant Street & Hart Street

02/12/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	43	457	374	3	2	31
Future Vol, veh/h	43	457	374	3	2	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	93	93	73	73
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	46	486	402	3	3	42

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	405	0	-	0	982
Stage 1	-	-	-	-	404
Stage 2	-	-	-	-	578
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1165	-	-	-	279
Stage 1	-	-	-	-	679
Stage 2	-	-	-	-	565
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1165	-	-	-	264
Mov Cap-2 Maneuver	-	-	-	-	264
Stage 1	-	-	-	-	642
Stage 2	-	-	-	-	565

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1165	-	-	-	598
HCM Lane V/C Ratio	0.039	-	-	-	0.076
HCM Control Delay (s)	8.2	0	-	-	11.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

2024 Baseline Weekday Evening Peak Hour  
5: Farm Street & Nahant Street

02/12/2024

Intersection						
Int Delay, s/veh	92.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	103	319	296	684	508	88
Future Vol, veh/h	103	319	296	684	508	88
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	92	92	95	95
Heavy Vehicles, %	5	1	2	1	1	1
Mvmt Flow	116	358	322	743	535	93

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1969	582	628	0	-	0
Stage 1	582	-	-	-	-	-
Stage 2	1387	-	-	-	-	-
Critical Hdwy	6.45	6.21	4.12	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.309	2.218	-	-	-
Pot Cap-1 Maneuver	~ 68	515	954	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	228	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 29	515	954	-	-	-
Mov Cap-2 Maneuver	~ 29	-	-	-	-	-
Stage 1	235	-	-	-	-	-
Stage 2	228	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	416.4	3.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	954	-	29	515	-	-
HCM Lane V/C Ratio	0.337	-	3.991	0.696	-	-
HCM Control Delay (s)	10.7	\$ 1624.1	26.5	-	-	-
HCM Lane LOS	B	A	F	D	-	-
HCM 95th %tile Q(veh)	1.5	-	14	5.4	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

2024 Baseline Weekday Evening Peak Hour  
6: Farm Street & Hemlock Road

02/12/2024

Intersection						
Int Delay, s/veh	67.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	56	147	833	42	96	731
Future Vol, veh/h	56	147	833	42	96	731
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	70	92	92	95	95
Heavy Vehicles, %	7	4	1	14	5	1
Mvmt Flow	80	210	905	46	101	769

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1899	928	0	0	951	0
Stage 1	928	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Critical Hdwy	6.47	6.24	-	-	4.15	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.336	-	-	2.245	-
Pot Cap-1 Maneuver	~ 74	322	-	-	710	-
Stage 1	377	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 63	322	-	-	710	-
Mov Cap-2 Maneuver	~ 63	-	-	-	-	-
Stage 1	377	-	-	-	-	-
Stage 2	309	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	\$ 488	0	1.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	151	710
HCM Lane V/C Ratio	-	-	1.921	0.142
HCM Control Delay (s)	-	-	\$ 488	10.9
HCM Lane LOS	-	-	F	B
HCM 95th %tile Q(veh)	-	-	22.3	0.5

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

2031 No-Build Weekday Morning Peak Hour

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2031 No-Build Weekday Morning Peak Hour  
1: Main Street & North Avenue/Nahant Street

02/12/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	199	323	34	315	48	323	413	48	28	415	133
Future Volume (vph)	92	199	323	34	315	48	323	413	48	28	415	133
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850		0.984			0.984			0.964	
Flt Protected	0.950				0.996		0.950			0.950		
Satd. Flow (prot)	1616	1766	1501	0	1804	0	1770	1808	0	1678	3370	0
Flt Permitted	0.383				0.947		0.205			0.480		
Satd. Flow (perm)	651	1766	1501	0	1715	0	382	1808	0	848	3370	0
Satd. Flow (RTOR)			351		6			6			37	
Adj. Flow (vph)	100	216	351	37	342	52	351	449	52	30	451	145
Lane Group Flow (vph)	100	216	351	0	431	0	351	501	0	30	596	0
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2	13		6		13	10				14
Permitted Phases	2		2	6			10			14		
Detector Phase	2	2	13	6	6		13	10		14	14	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0	14.0	8.0	14.0	14.0		8.0	11.0		11.0	11.0	
Total Split (s)	33.0	33.0	17.0	33.0	33.0		17.0	39.0		22.0	22.0	
Total Split (%)	33.0%	33.0%	17.0%	33.0%	33.0%		17.0%	39.0%		22.0%	22.0%	
Maximum Green (s)	24.0	24.0	14.0	24.0	24.0		14.0	33.0		16.0	16.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		4.0	4.0	
All-Red Time (s)	6.0	6.0	0.0	6.0	6.0		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	9.0	9.0	3.0		9.0		3.0	6.0		6.0	6.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	Min	Min		Min	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	24.6	24.6	47.2		24.6		36.9	33.9		16.4	16.4	
Actuated g/C Ratio	0.30	0.30	0.57		0.30		0.44	0.41		0.20	0.20	
v/c Ratio	0.52	0.41	0.35		0.84		0.86	0.68		0.18	0.86	
Control Delay	41.1	29.7	2.0		47.1		43.8	29.0		36.5	46.6	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	41.1	29.7	2.0		47.1		43.8	29.0		36.5	46.6	
LOS	D	C	A		D		D	C		D	D	
Approach Delay		16.8			47.1			35.1			46.1	
Approach LOS		B			D			D			D	
Queue Length 50th (ft)	35	72	0		165		91	157		11	123	
Queue Length 95th (ft)	#135	194	25		#487		#367	#465		45	#320	
Internal Link Dist (ft)		395			1456			1087			1014	
Turn Bay Length (ft)	140		150				150			75		
Base Capacity (vph)	193	522	1003		511		408	739		167	694	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	

2031 No-Build Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	28%
Maximum Green (s)	26.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	19.0
Pedestrian Calls (#/hr)	21
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	



2031 No-Build Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

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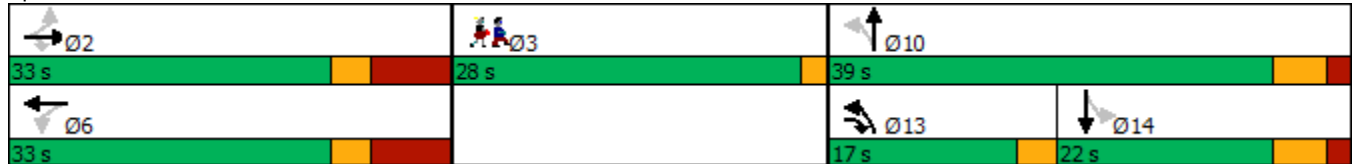


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.52	0.41	0.35		0.84		0.86	0.68		0.18	0.86	

Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 83.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 35.1	Intersection LOS: D
Intersection Capacity Utilization 88.8%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & North Avenue/Nahant Street



Lane Group	Ø3
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

2031 No-Build Weekday Morning Peak Hour  
2: Nahant Street & Traverse Street

02/12/2024

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	8	362	474	20	19	12
Future Vol, veh/h	8	362	474	20	19	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	89	89	52	52
Heavy Vehicles, %	0	3	2	0	0	0
Mvmt Flow	12	532	533	22	37	23

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	555	0	-	0	1100
Stage 1	-	-	-	-	544
Stage 2	-	-	-	-	556
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1026	-	-	-	237
Stage 1	-	-	-	-	586
Stage 2	-	-	-	-	578
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1026	-	-	-	233
Mov Cap-2 Maneuver	-	-	-	-	233
Stage 1	-	-	-	-	576
Stage 2	-	-	-	-	578

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	20
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1026	-	-	-	299
HCM Lane V/C Ratio	0.011	-	-	-	0.199
HCM Control Delay (s)	8.5	0	-	-	20
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.7

2031 No-Build Weekday Morning Peak Hour  
 3: Existing Driveway/Middlesex Street & Nahant Street

02/12/2024

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	379	1	0	493	0	1	0	2	3	0	0
Future Vol, veh/h	1	379	1	0	493	0	1	0	2	3	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	84	84	84	38	38	38	38	38	38
Heavy Vehicles, %	0	3	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	1	549	1	0	587	0	3	0	5	8	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	587	0	0	550	0	0	1139	1139	550	1141	1139	587
Stage 1	-	-	-	-	-	-	552	552	-	587	587	-
Stage 2	-	-	-	-	-	-	587	587	-	554	552	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	998	-	-	1030	-	-	180	203	539	179	203	513
Stage 1	-	-	-	-	-	-	522	518	-	499	500	-
Stage 2	-	-	-	-	-	-	499	500	-	520	518	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	998	-	-	1030	-	-	180	203	539	177	203	513
Mov Cap-2 Maneuver	-	-	-	-	-	-	180	203	-	177	203	-
Stage 1	-	-	-	-	-	-	521	517	-	499	500	-
Stage 2	-	-	-	-	-	-	499	500	-	514	517	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			16.4			26.3		
HCM LOS							C			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	324	998	-	-	1030	-	-	177
HCM Lane V/C Ratio	0.024	0.001	-	-	-	-	-	0.045
HCM Control Delay (s)	16.4	8.6	0	-	0	-	-	26.3
HCM Lane LOS	C	A	A	-	A	-	-	D
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

2031 No-Build Weekday Morning Peak Hour  
4: Nahant Street & Hart Street

02/12/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	23	361	458	0	4	35
Future Vol, veh/h	23	361	458	0	4	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	89	89	73	73
Heavy Vehicles, %	0	1	2	0	0	3
Mvmt Flow	29	451	515	0	5	48

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	515	0	-	0	1024 515
Stage 1	-	-	-	-	515 -
Stage 2	-	-	-	-	509 -
Critical Hdwy	4.1	-	-	-	6.4 6.23
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.327
Pot Cap-1 Maneuver	1061	-	-	-	263 558
Stage 1	-	-	-	-	604 -
Stage 2	-	-	-	-	608 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1061	-	-	-	254 558
Mov Cap-2 Maneuver	-	-	-	-	254 -
Stage 1	-	-	-	-	582 -
Stage 2	-	-	-	-	608 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1061	-	-	-	497
HCM Lane V/C Ratio	0.027	-	-	-	0.107
HCM Control Delay (s)	8.5	0	-	-	13.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

# LANE SUMMARY

**Site: 101 [Farm Street at Nahant Street Hemlock Road (Site Folder: General)]**

2031 No-Build Weekday Morning Peak Hour  
 Site Category: (None)  
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %]						[ Veh	Dist ] ft				
South: Farm Street													
Lane 1 <sup>d</sup>	860	4.9	895	0.960	100	42.5	LOS D	32.3	839.6	Full	1600	0.0	0.0
Approach	860	4.9		0.960		42.5	LOS D	32.3	839.6				
East: Hemlock Road													
Lane 1 <sup>d</sup>	318	21.6	515	0.619	100	20.8	LOS C	5.9	173.7	Full	1600	0.0	0.0
Approach	318	21.6		0.619		20.8	LOS C	5.9	173.7				
North: Farm Street													
Lane 1 <sup>d</sup>	793	2.6	841	0.943	100	40.7	LOS D	30.4	776.5	Full	1600	0.0	0.0
Approach	793	2.6		0.943		40.7	LOS D	30.4	776.5				
West: Nahant Street													
Lane 1 <sup>d</sup>	417	1.8	606	0.689	100	21.5	LOS C	7.9	200.5	Full	1600	0.0	0.0
Approach	417	1.8		0.689		21.5	LOS C	7.9	200.5				
Intersection	2389	5.8		0.960		35.4	LOS D	32.3	839.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Farm Street											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%	%	No.
Lane 1	198	328	334	860	4.9	895	0.960	100	NA	NA	
Approach	198	328	334	860	4.9		0.960				
East: Hemlock Road											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%	%	No.
Lane 1	135	71	113	318	21.6	515	0.619	100	NA	NA	
Approach	135	71	113	318	21.6		0.619				

North: Farm Street										
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N To Exit:	E	S	W			veh/h	Satn v/c	Util. %	SL %	Lane No.
Lane 1	229	400	164	793	2.6	841	0.943	100	NA	NA
Approach	229	400	164	793	2.6		0.943			
West: Nahant Street										
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit:	N	E	S			veh/h	Satn v/c	Util. %	SL %	Lane No.
Lane 1	113	132	173	417	1.8	606	0.689	100	NA	NA
Approach	113	132	173	417	1.8		0.689			
Total %HV Deg.Satn (v/c)										
Intersection	2389	5.8					0.960			

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Farm Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1			Merge Analysis not applied.								
East Exit: Hemlock Road Merge Type: <b>Not Applied</b>												
Full Length Lane	1			Merge Analysis not applied.								
North Exit: Farm Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1			Merge Analysis not applied.								
West Exit: Nahant Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1			Merge Analysis not applied.								

2031 No-Build Weekday Evening Peak Hour

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2031 No-Build Weekday Evening Peak Hour  
1: Main Street & North Avenue/Nahant Street

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	390	358	25	288	66	335	609	39	64	405	109
Future Volume (vph)	156	390	358	25	288	66	335	609	39	64	405	109
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850		0.976			0.991			0.968	
Flt Protected	0.950				0.997		0.950			0.950		
Satd. Flow (prot)	1745	1818	1561	0	1829	0	1805	1865	0	1745	3467	0
Flt Permitted	0.399				0.817		0.316			0.229		
Satd. Flow (perm)	733	1818	1561	0	1498	0	600	1865	0	421	3467	0
Satd. Flow (RTOR)			275		7			3			23	
Adj. Flow (vph)	170	424	389	27	313	72	364	662	42	70	440	118
Lane Group Flow (vph)	170	424	389	0	412	0	364	704	0	70	558	0
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2	13		6		13	10			14	
Permitted Phases	2		2	6			10			14		
Detector Phase	2	2	13	6	6		13	10		14	14	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0	14.0	8.0	14.0	14.0		8.0	11.0		11.0	11.0	
Total Split (s)	54.0	54.0	18.0	54.0	54.0		18.0	68.0		50.0	50.0	
Total Split (%)	36.0%	36.0%	12.0%	36.0%	36.0%		12.0%	45.3%		33.3%	33.3%	
Maximum Green (s)	45.0	45.0	15.0	45.0	45.0		15.0	62.0		44.0	44.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		4.0	4.0	
All-Red Time (s)	6.0	6.0	0.0	6.0	6.0		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	9.0	9.0	3.0		9.0		3.0	6.0		6.0	6.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	None	Min	Min		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	45.3	45.3	69.0		45.3		65.4	62.4		44.3	44.3	
Actuated g/C Ratio	0.36	0.36	0.54		0.36		0.51	0.49		0.35	0.35	
v/c Ratio	0.65	0.66	0.40		0.77		0.81	0.77		0.48	0.46	
Control Delay	50.1	42.0	5.4		47.9		37.4	34.9		49.3	33.6	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	50.1	42.0	5.4		47.9		37.4	34.9		49.3	33.6	
LOS	D	D	A		D		D	C		D	C	
Approach Delay		28.9			47.9			35.8			35.3	
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	109	273	40		275		161	422		42	167	
Queue Length 95th (ft)	#280	516	87		#587		#456	#892		121	294	
Internal Link Dist (ft)		395			1456			1087			1014	
Turn Bay Length (ft)	140		150				150			75		
Base Capacity (vph)	260	645	970		536		450	914		145	1219	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	

2031 No-Build Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

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Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	19%
Maximum Green (s)	26.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	19.0
Pedestrian Calls (#/hr)	6
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

2031 No-Build Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

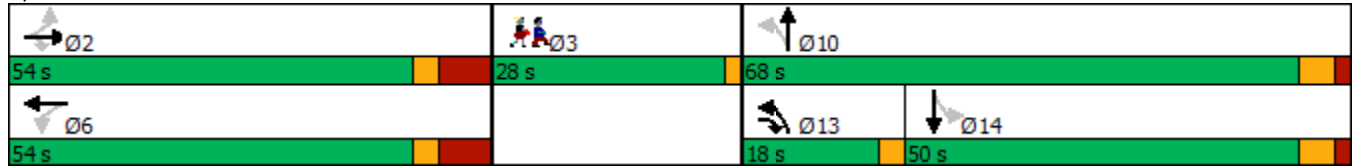


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.65	0.66	0.40		0.77		0.81	0.77		0.48	0.46	

Intersection Summary

Cycle Length: 150	
Actuated Cycle Length: 127.6	
Natural Cycle: 150	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 35.1	Intersection LOS: D
Intersection Capacity Utilization 104.7%	ICU Level of Service G
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & North Avenue/Nahant Street



Lane Group	Ø3
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

2031 No-Build Weekday Evening Peak Hour  
2: Nahant Street & Traverse Street

02/12/2024

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	18	536	435	12	8	11
Future Vol, veh/h	18	536	435	12	8	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	92	92	53	53
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	20	596	473	13	15	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	486	0	-	0	1116 480
Stage 1	-	-	-	-	480 -
Stage 2	-	-	-	-	636 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1087	-	-	-	232 590
Stage 1	-	-	-	-	627 -
Stage 2	-	-	-	-	531 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1087	-	-	-	226 590
Mov Cap-2 Maneuver	-	-	-	-	226 -
Stage 1	-	-	-	-	610 -
Stage 2	-	-	-	-	531 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1087	-	-	-	352
HCM Lane V/C Ratio	0.018	-	-	-	0.102
HCM Control Delay (s)	8.4	0	-	-	16.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

2031 No-Build Weekday Evening Peak Hour  
 3: Existing Driveway/Middlesex Street & Nahant Street

02/12/2024

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	541	1	0	444	1	1	0	0	0	0	2
Future Vol, veh/h	2	541	1	0	444	1	1	0	0	0	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	89	89	89	25	25	25	25	50	50
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	2	576	1	0	499	1	4	0	0	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	500	0	0	577	0	0	1083	1081	577	1081	1081	500
Stage 1	-	-	-	-	-	-	581	581	-	500	500	-
Stage 2	-	-	-	-	-	-	502	500	-	581	581	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1075	-	-	1006	-	-	197	220	520	197	220	575
Stage 1	-	-	-	-	-	-	503	503	-	557	546	-
Stage 2	-	-	-	-	-	-	555	546	-	503	503	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1075	-	-	1006	-	-	195	219	520	197	219	575
Mov Cap-2 Maneuver	-	-	-	-	-	-	195	219	-	197	219	-
Stage 1	-	-	-	-	-	-	501	501	-	555	546	-
Stage 2	-	-	-	-	-	-	551	546	-	501	501	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			23.8			11.3		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	195	1075	-	-	1006	-	-	575
HCM Lane V/C Ratio	0.021	0.002	-	-	-	-	-	0.007
HCM Control Delay (s)	23.8	8.4	0	-	0	-	-	11.3
HCM Lane LOS	C	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

2031 No-Build Weekday Evening Peak Hour  
4: Nahant Street & Hart Street

02/12/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	46	495	412	3	2	33
Future Vol, veh/h	46	495	412	3	2	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	93	93	73	73
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	49	527	443	3	3	45

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	446	0	-	0	1070
Stage 1	-	-	-	-	445
Stage 2	-	-	-	-	625
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1125	-	-	-	247
Stage 1	-	-	-	-	650
Stage 2	-	-	-	-	537
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1125	-	-	-	232
Mov Cap-2 Maneuver	-	-	-	-	232
Stage 1	-	-	-	-	610
Stage 2	-	-	-	-	537

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1125	-	-	-	564
HCM Lane V/C Ratio	0.043	-	-	-	0.085
HCM Control Delay (s)	8.3	0	-	-	12
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

# LANE SUMMARY

**Site: 101 [Farm Street at Nahant Street Hemlock Road (Site Folder: General)]**

2031 No-Build Weekday Evening Peak Hour  
 Site Category: (None)  
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %]						[ Veh	Dist ] ft				
South: Farm Street													
Lane 1 <sup>d</sup>	1023	1.6	1074	0.953	100	36.8	LOS D	43.7	1107.3	Full	1600	0.0	0.0
Approach	1023	1.6		0.953		36.8	LOS D	43.7	1107.3				
East: Hemlock Road													
Lane 1 <sup>d</sup>	221	4.9	314	0.703	100	38.3	LOS D	7.3	190.7	Full	1600	0.0	0.0
Approach	221	4.9		0.703		38.3	LOS D	7.3	190.7				
North: Farm Street													
Lane 1 <sup>d</sup>	695	0.9	866	0.802	100	22.7	LOS C	16.1	406.3	Full	1600	0.0	0.0
Approach	695	0.9		0.802		22.7	LOS C	16.1	406.3				
West: Nahant Street													
Lane 1 <sup>d</sup>	493	2.6	731	0.675	100	17.9	LOS B	7.8	200.0	Full	1600	0.0	0.0
Approach	493	2.6		0.675		17.9	LOS B	7.8	200.0				
Intersection	2432	1.9		0.953		29.1	LOS C	43.7	1107.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Lane LOS values are based on average delay per lane.  
 Intersection and Approach LOS values are based on average delay for all lanes.  
 Roundabout Capacity Model: SIDRA Standard.  
 Delay Model: HCM Delay Formula (Geometric Delay is not included).  
 Queue Model: HCM Queue Formula.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Farm Street											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%		No.
Lane 1	280	697	46	1023	1.6	1074	0.953	100	NA	NA	
Approach	280	697	46	1023	1.6		0.953				
East: Hemlock Road											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%		No.
Lane 1	61	66	93	221	4.9	314	0.703	100	NA	NA	
Approach	61	66	93	221	4.9		0.703				



North: Farm Street											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N To Exit:	E	S	W			Cap. veh/h	Satn v/c	Util. %	SL %	Lane No.	
Lane 1	68	518	108	695	0.9	866	0.802	100	NA	NA	
Approach	68	518	108	695	0.9		0.802				
West: Nahant Street											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W To Exit:	N	E	S			Cap. veh/h	Satn v/c	Util. %	SL %	Lane No.	
Lane 1	121	36	337	493	2.6	731	0.675	100	NA	NA	
Approach	121	36	337	493	2.6		0.675				
Total %HV Deg.Satn (v/c)											
Intersection	2432	1.9					0.953				

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Farm Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
East Exit: Hemlock Road Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
North Exit: Farm Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
West Exit: Nahant Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.

2031 Build Weekday Morning Peak Hour

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2031 Build Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	202	323	42	322	49	323	413	50	28	415	133
Future Volume (vph)	92	202	323	42	322	49	323	413	50	28	415	133
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850		0.984			0.984			0.964	
Flt Protected	0.950				0.995		0.950			0.950		
Satd. Flow (prot)	1616	1766	1501	0	1801	0	1770	1808	0	1678	3370	0
Flt Permitted	0.370				0.933		0.205			0.479		
Satd. Flow (perm)	629	1766	1501	0	1689	0	382	1808	0	846	3370	0
Satd. Flow (RTOR)			351		6			6			37	
Adj. Flow (vph)	100	220	351	46	350	53	351	449	54	30	451	145
Lane Group Flow (vph)	100	220	351	0	449	0	351	503	0	30	596	0
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2	13		6		13	10			14	
Permitted Phases	2		2	6			10			14		
Detector Phase	2	2	13	6	6		13	10		14	14	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0	14.0	8.0	14.0	14.0		8.0	11.0		11.0	11.0	
Total Split (s)	33.0	33.0	17.0	33.0	33.0		17.0	39.0		22.0	22.0	
Total Split (%)	33.0%	33.0%	17.0%	33.0%	33.0%		17.0%	39.0%		22.0%	22.0%	
Maximum Green (s)	24.0	24.0	14.0	24.0	24.0		14.0	33.0		16.0	16.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		4.0	4.0	
All-Red Time (s)	6.0	6.0	0.0	6.0	6.0		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	9.0	9.0	3.0		9.0		3.0	6.0		6.0	6.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	Min	Min		Min	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	24.6	24.6	47.2		24.6		36.9	33.9		16.4	16.4	
Actuated g/C Ratio	0.30	0.30	0.57		0.30		0.44	0.41		0.20	0.20	
v/c Ratio	0.54	0.42	0.35		0.89		0.86	0.68		0.18	0.86	
Control Delay	42.6	29.9	2.0		52.8		43.8	29.2		36.5	46.6	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	42.6	29.9	2.0		52.8		43.8	29.2		36.5	46.6	
LOS	D	C	A		D		D	C		D	D	
Approach Delay		17.2			52.8			35.2			46.1	
Approach LOS		B			D			D			D	
Queue Length 50th (ft)	35	73	0		176		91	158		11	123	
Queue Length 95th (ft)	#138	197	25		#518		#367	#468		45	#320	
Internal Link Dist (ft)		395			1252			1087			1014	
Turn Bay Length (ft)	140		150				150			75		
Base Capacity (vph)	185	522	1003		504		408	739		167	694	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	

2031 Build Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	28%
Maximum Green (s)	26.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	19.0
Pedestrian Calls (#/hr)	21
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

2031 Build Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.54	0.42	0.35		0.89		0.86	0.68		0.18	0.86	

Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 83.2	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 36.2	Intersection LOS: D
Intersection Capacity Utilization 89.8%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & North Avenue/Nahant Street



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Lane Group	Ø3
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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2031 Build Weekday Morning Peak Hour  
2: Nahant Street & Traverse Street

02/12/2024

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	8	367	490	21	19	12
Future Vol, veh/h	8	367	490	21	19	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	89	89	52	52
Heavy Vehicles, %	0	3	2	0	0	0
Mvmt Flow	12	540	551	24	37	23

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	575	0	-	0	1127
Stage 1	-	-	-	-	563
Stage 2	-	-	-	-	564
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1008	-	-	-	228
Stage 1	-	-	-	-	574
Stage 2	-	-	-	-	573
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1008	-	-	-	224
Mov Cap-2 Maneuver	-	-	-	-	224
Stage 1	-	-	-	-	564
Stage 2	-	-	-	-	573

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	20.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1008	-	-	-	288
HCM Lane V/C Ratio	0.012	-	-	-	0.207
HCM Control Delay (s)	8.6	0	-	-	20.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.8

2031 Build Weekday Morning Peak Hour  
 3: Project Site East Driveway/Middlesex Street & Nahant Street

02/12/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	383	7	3	492	0	9	0	7	3	0	0
Future Vol, veh/h	1	383	7	3	492	0	9	0	7	3	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	84	84	84	38	38	38	38	38	38
Heavy Vehicles, %	0	3	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	1	555	10	4	586	0	24	0	18	8	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	586	0	0	565	0	0	1156	1156	560	1165	1161	586
Stage 1	-	-	-	-	-	-	562	562	-	594	594	-
Stage 2	-	-	-	-	-	-	594	594	-	571	567	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	999	-	-	1017	-	-	175	198	532	173	197	514
Stage 1	-	-	-	-	-	-	515	513	-	495	496	-
Stage 2	-	-	-	-	-	-	495	496	-	509	510	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	999	-	-	1017	-	-	174	197	532	166	196	514
Mov Cap-2 Maneuver	-	-	-	-	-	-	174	197	-	166	196	-
Stage 1	-	-	-	-	-	-	514	512	-	495	493	-
Stage 2	-	-	-	-	-	-	492	493	-	491	509	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			22.5			27.8		
HCM LOS							C			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	247	999	-	-	1017	-	-	166
HCM Lane V/C Ratio	0.17	0.001	-	-	0.004	-	-	0.048
HCM Control Delay (s)	22.5	8.6	0	-	8.6	0	-	27.8
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1



2031 Build Weekday Morning Peak Hour  
4: Nahant Street & Hart Street

02/12/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	23	370	460	0	4	35
Future Vol, veh/h	23	370	460	0	4	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	89	89	73	73
Heavy Vehicles, %	0	1	2	0	0	3
Mvmt Flow	29	463	517	0	5	48

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	517	0	-	0	1038 517
Stage 1	-	-	-	-	517 -
Stage 2	-	-	-	-	521 -
Critical Hdwy	4.1	-	-	-	6.4 6.23
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.327
Pot Cap-1 Maneuver	1059	-	-	-	258 556
Stage 1	-	-	-	-	603 -
Stage 2	-	-	-	-	600 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1059	-	-	-	248 556
Mov Cap-2 Maneuver	-	-	-	-	248 -
Stage 1	-	-	-	-	581 -
Stage 2	-	-	-	-	600 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1059	-	-	-	493
HCM Lane V/C Ratio	0.027	-	-	-	0.108
HCM Control Delay (s)	8.5	0	-	-	13.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

# LANE SUMMARY

**Site: 101 [Farm Street at Nahant Street Hemlock Road (Site Folder: General)]**

2031 Build Weekday Morning Peak Hour  
 Site Category: (None)  
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %						[ Veh	Dist ] ft				
South: Farm Street													
Lane 1 <sup>d</sup>	861	4.9	894	0.963	100	43.0	LOS D	32.7	848.5	Full	1600	0.0	0.0
Approach	861	4.9		0.963		43.0	LOS D	32.7	848.5				
East: Hemlock Road													
Lane 1 <sup>d</sup>	318	21.6	513	0.620	100	20.9	LOS C	6.0	174.5	Full	1600	0.0	0.0
Approach	318	21.6		0.620		20.9	LOS C	6.0	174.5				
North: Farm Street													
Lane 1 <sup>d</sup>	793	2.6	841	0.944	100	40.9	LOS D	30.5	778.5	Full	1600	0.0	0.0
Approach	793	2.6		0.944		40.9	LOS D	30.5	778.5				
West: Nahant Street													
Lane 1 <sup>d</sup>	421	1.8	606	0.694	100	21.8	LOS C	8.1	204.4	Full	1600	0.0	0.0
Approach	421	1.8		0.694		21.8	LOS C	8.1	204.4				
Intersection	2393	5.8		0.963		35.6	LOS D	32.7	848.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Lane LOS values are based on average delay per lane.  
 Intersection and Approach LOS values are based on average delay for all lanes.  
 Roundabout Capacity Model: SIDRA Standard.  
 Delay Model: HCM Delay Formula (Geometric Delay is not included).  
 Queue Model: HCM Queue Formula.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Farm Street											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%		No.
Lane 1	199	328	334	861	4.9	894	0.963	100	NA	NA	
Approach	199	328	334	861	4.9		0.963				
East: Hemlock Road											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%		No.
Lane 1	135	71	113	318	21.6	513	0.620	100	NA	NA	
Approach	135	71	113	318	21.6		0.620				

North: Farm Street											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N To Exit:	E	S	W			Cap. veh/h	Satn v/c	Util. %	SL %	Lane No.	
Lane 1	229	400	164	793	2.6	841	0.944	100	NA	NA	
Approach	229	400	164	793	2.6		0.944				
West: Nahant Street											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W To Exit:	N	E	S			Cap. veh/h	Satn v/c	Util. %	SL %	Lane No.	
Lane 1	114	132	175	421	1.8	606	0.694	100	NA	NA	
Approach	114	132	175	421	1.8		0.694				
Total %HV Deg.Satn (v/c)											
Intersection	2393	5.8					0.963				

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Farm Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1			Merge Analysis not applied.								
East Exit: Hemlock Road Merge Type: <b>Not Applied</b>												
Full Length Lane	1			Merge Analysis not applied.								
North Exit: Farm Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1			Merge Analysis not applied.								
West Exit: Nahant Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1			Merge Analysis not applied.								

2031 Build Weekday Morning Peak Hour  
7: Project Site West Driveway & Nahant Street

02/12/2024

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	386	0	0	501	10	4
Future Vol, veh/h	386	0	0	501	10	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	68	68	89	89	92	92
Heavy Vehicles, %	3	0	0	2	0	0
Mvmt Flow	568	0	0	563	11	4

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	-	-	-	1131 568
Stage 1	-	-	-	-	568 -
Stage 2	-	-	-	-	563 -
Critical Hdwy	-	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	-	0	0	-	227 526
Stage 1	-	0	0	-	571 -
Stage 2	-	0	0	-	574 -
Platoon blocked, %	-				-
Mov Cap-1 Maneuver	-	-	-	-	227 526
Mov Cap-2 Maneuver	-	-	-	-	227 -
Stage 1	-	-	-	-	571 -
Stage 2	-	-	-	-	574 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	19.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	271	-	-
HCM Lane V/C Ratio	0.056	-	-
HCM Control Delay (s)	19.1	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	0.2	-	-

2031 Build Weekday Evening Peak Hour

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2031 Build Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	397	358	28	292	67	335	609	45	65	405	109
Future Volume (vph)	156	397	358	28	292	67	335	609	45	65	405	109
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850		0.977			0.990			0.968	
Flt Protected	0.950				0.996		0.950			0.950		
Satd. Flow (prot)	1745	1818	1561	0	1829	0	1805	1864	0	1745	3467	0
Flt Permitted	0.394				0.776		0.316			0.222		
Satd. Flow (perm)	724	1818	1561	0	1425	0	600	1864	0	408	3467	0
Satd. Flow (RTOR)			270		7			3			23	
Adj. Flow (vph)	170	432	389	30	317	73	364	662	49	71	440	118
Lane Group Flow (vph)	170	432	389	0	420	0	364	711	0	71	558	0
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2	13		6		13	10			14	
Permitted Phases	2		2	6			10			14		
Detector Phase	2	2	13	6	6		13	10		14	14	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0	14.0	8.0	14.0	14.0		8.0	11.0		11.0	11.0	
Total Split (s)	54.0	54.0	18.0	54.0	54.0		18.0	68.0		50.0	50.0	
Total Split (%)	36.0%	36.0%	12.0%	36.0%	36.0%		12.0%	45.3%		33.3%	33.3%	
Maximum Green (s)	45.0	45.0	15.0	45.0	45.0		15.0	62.0		44.0	44.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		4.0	4.0	
All-Red Time (s)	6.0	6.0	0.0	6.0	6.0		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	9.0	9.0	3.0		9.0		3.0	6.0		6.0	6.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	None	Min	Min		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	45.3	45.3	69.0		45.3		65.4	62.4		44.3	44.3	
Actuated g/C Ratio	0.36	0.36	0.54		0.36		0.51	0.49		0.35	0.35	
v/c Ratio	0.66	0.67	0.40		0.82		0.81	0.78		0.50	0.46	
Control Delay	50.7	42.5	5.6		52.4		37.4	35.3		50.7	33.6	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	50.7	42.5	5.6		52.4		37.4	35.3		50.7	33.6	
LOS	D	D	A		D		D	D		D	C	
Approach Delay		29.4			52.4			36.0			35.5	
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	110	280	42		288		161	430		43	167	
Queue Length 95th (ft)	#283	527	90		#628		#456	#906		#132	294	
Internal Link Dist (ft)		395			1192			1087			1014	
Turn Bay Length (ft)	140		150				150			75		
Base Capacity (vph)	257	645	968		510		450	913		141	1219	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	

2031 Build Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	19%
Maximum Green (s)	26.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	19.0
Pedestrian Calls (#/hr)	6
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

2031 Build Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

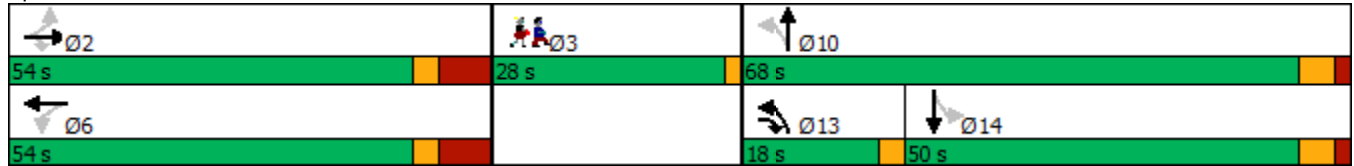


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.66	0.67	0.40		0.82		0.81	0.78		0.50	0.46	

Intersection Summary

Cycle Length: 150	
Actuated Cycle Length: 127.6	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 36.0	Intersection LOS: D
Intersection Capacity Utilization 105.8%	ICU Level of Service G
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & North Avenue/Nahant Street





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Lane Group	Ø3
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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2031 Build Weekday Evening Peak Hour  
2: Nahant Street & Traverse Street

02/12/2024

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	18	550	443	12	9	11
Future Vol, veh/h	18	550	443	12	9	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	92	92	53	53
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	20	611	482	13	17	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	495	0	-	0	1140 489
Stage 1	-	-	-	-	489 -
Stage 2	-	-	-	-	651 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1079	-	-	-	224 583
Stage 1	-	-	-	-	621 -
Stage 2	-	-	-	-	523 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1079	-	-	-	218 583
Mov Cap-2 Maneuver	-	-	-	-	218 -
Stage 1	-	-	-	-	604 -
Stage 2	-	-	-	-	523 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	17.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1079	-	-	-	332
HCM Lane V/C Ratio	0.019	-	-	-	0.114
HCM Control Delay (s)	8.4	0	-	-	17.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

2031 Build Weekday Evening Peak Hour  
 3: Project Site East Driveway/Middlesex Street & Nahant Street

02/12/2024

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	542	17	7	444	1	5	0	3	0	0	2
Future Vol, veh/h	2	542	17	7	444	1	5	0	3	0	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	89	89	89	25	25	25	25	50	50
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	2	577	18	8	499	1	20	0	12	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	500	0	0	595	0	0	1108	1106	586	1112	1115	500
Stage 1	-	-	-	-	-	-	590	590	-	516	516	-
Stage 2	-	-	-	-	-	-	518	516	-	596	599	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1075	-	-	991	-	-	189	212	514	188	210	575
Stage 1	-	-	-	-	-	-	497	498	-	546	538	-
Stage 2	-	-	-	-	-	-	544	538	-	494	494	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1075	-	-	991	-	-	186	209	514	182	207	575
Mov Cap-2 Maneuver	-	-	-	-	-	-	186	209	-	182	207	-
Stage 1	-	-	-	-	-	-	496	497	-	544	532	-
Stage 2	-	-	-	-	-	-	534	532	-	481	493	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			21.9			11.3		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	245	1075	-	-	991	-	-	575
HCM Lane V/C Ratio	0.131	0.002	-	-	0.008	-	-	0.007
HCM Control Delay (s)	21.9	8.4	0	-	8.7	0	-	11.3
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0

2031 Build Weekday Evening Peak Hour  
4: Nahant Street & Hart Street

02/12/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	46	499	419	3	2	33
Future Vol, veh/h	46	499	419	3	2	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	93	93	73	73
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	49	531	451	3	3	45

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	454	0	-	0	1082
Stage 1	-	-	-	-	453
Stage 2	-	-	-	-	629
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1117	-	-	-	243
Stage 1	-	-	-	-	645
Stage 2	-	-	-	-	535
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1117	-	-	-	228
Mov Cap-2 Maneuver	-	-	-	-	228
Stage 1	-	-	-	-	605
Stage 2	-	-	-	-	535

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1117	-	-	-	557
HCM Lane V/C Ratio	0.044	-	-	-	0.086
HCM Control Delay (s)	8.4	0	-	-	12.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

# LANE SUMMARY

**Site: 101 [Farm Street at Nahant Street Hemlock Road (Site Folder: General)]**

2031 Build Weekday Evening Peak Hour  
 Site Category: (None)  
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %]						[ Veh	Dist ] ft				
South: Farm Street													
Lane 1 <sup>d</sup>	1027	1.6	1072	0.958	100	37.9	LOS D	45.0	1139.3	Full	1600	0.0	0.0
Approach	1027	1.6		0.958		37.9	LOS D	45.0	1139.3				
East: Hemlock Road													
Lane 1 <sup>d</sup>	221	4.9	310	0.711	100	39.3	LOS D	7.5	194.5	Full	1600	0.0	0.0
Approach	221	4.9		0.711		39.3	LOS D	7.5	194.5				
North: Farm Street													
Lane 1 <sup>d</sup>	698	0.9	862	0.809	100	23.3	LOS C	16.6	418.5	Full	1600	0.0	0.0
Approach	698	0.9		0.809		23.3	LOS C	16.6	418.5				
West: Nahant Street													
Lane 1 <sup>d</sup>	498	2.6	730	0.682	100	18.3	LOS B	8.1	206.0	Full	1600	0.0	0.0
Approach	498	2.6		0.682		18.3	LOS B	8.1	206.0				
Intersection	2443	1.9		0.958		29.9	LOS C	45.0	1139.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Lane LOS values are based on average delay per lane.  
 Intersection and Approach LOS values are based on average delay for all lanes.  
 Roundabout Capacity Model: SIDRA Standard.  
 Delay Model: HCM Delay Formula (Geometric Delay is not included).  
 Queue Model: HCM Queue Formula.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Farm Street											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%		No.
Lane 1	285	697	46	1027	1.6	1072	0.958	100	NA	NA	
Approach	285	697	46	1027	1.6		0.958				
East: Hemlock Road											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%		No.
Lane 1	61	66	93	221	4.9	310	0.711	100	NA	NA	
Approach	61	66	93	221	4.9		0.711				

North: Farm Street											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From N To Exit:	E	S	W			veh/h	Satn v/c	Util. %	SL %	Lane No.	
Lane 1	68	518	111	698	0.9	862	0.809	100	NA	NA	
Approach	68	518	111	698	0.9		0.809				
West: Nahant Street											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From W To Exit:	N	E	S			veh/h	Satn v/c	Util. %	SL %	Lane No.	
Lane 1	123	36	339	498	2.6	730	0.682	100	NA	NA	
Approach	123	36	339	498	2.6		0.682				
Total %HV Deg.Satn (v/c)											
Intersection	2443	1.9					0.958				

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Farm Street												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
East Exit: Hemlock Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
North Exit: Farm Street												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									
West Exit: Nahant Street												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1		Merge Analysis not applied.									

2031 Build Weekday Evening Peak Hour  
7: Project Site West Driveway & Nahant Street

02/12/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	559	0	0	450	5	2
Future Vol, veh/h	559	0	0	450	5	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	92	92	92	92
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	621	0	0	489	5	2

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	-	-	-	1110 621
Stage 1	-	-	-	-	621 -
Stage 2	-	-	-	-	489 -
Critical Hdwy	-	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	-	0	0	-	234 491
Stage 1	-	0	0	-	540 -
Stage 2	-	0	0	-	621 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	234 491
Mov Cap-2 Maneuver	-	-	-	-	234 -
Stage 1	-	-	-	-	540 -
Stage 2	-	-	-	-	621 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	275	-	-
HCM Lane V/C Ratio	0.028	-	-
HCM Control Delay (s)	18.5	-	-
HCM Lane LOS	C	-	-
HCM 95th %tile Q(veh)	0.1	-	-

# **Transportation Impact Assessment**

Proposed Residential Development

32 Nahant Street

Wakefield, Massachusetts

*Prepared for:*

32 Nahant Street, LLC

9A Melvin Street

Wakefield, Massachusetts

February 2024

*Prepared by:*

 **Vanasse &  
Associates inc**  
Transportation Engineers & Planners

35 New England Business Center Drive  
Suite 140  
Andover, MA 01810



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# **EXECUTIVE SUMMARY**

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## **DESCRIPTION OF PROJECT**

Vanasse & Associates, Inc. (VAI) has prepared this Transportation Impact Assessment (TIA) to identify traffic impacts associated with a proposed residential development to be located at 32 & 32A Nahant Street and 36A Nahant Street in Wakefield, Massachusetts (the “Project”). The purpose of this TIA is to review baseline and future traffic conditions in the vicinity of the site, determine the traffic impact of the proposed Project at key intersections expected to experience increased traffic levels from the Project, and review the need for improvements to mitigate the Project’s traffic impact.

## **PROPOSED PROJECT**

The site is bounded by areas of open and wooded space to the north, single-family residential homes to the east and west, and Nahant Street to the south. Currently, the site contains 32 & 32A Nahant Street (an existing 2-family home) and 36A Nahant Street (an existing single family home). The development site currently has two curb cuts onto Nahant Street. The Project entails razing the existing buildings and constructing a residential building consisting of a total of 32 multifamily units. The site will provide 48 parking spaces and proposed site access will be provided via one curb cut onto Nahant Street.

## **BASELINE CONDITIONS**

A comprehensive field inventory was conducted to collect existing roadway geometrics, traffic volumes, operating characteristics, speed limits, and sight distances, as well as land use information. Traffic volumes were collected in December 2023 and January 2024 at the intersections expected to receive the traffic impact from the Project. The study area locations are listed below:

- Main Street at North Avenue and Nahant Street
- Nahant Street at Traverse Street
- Nahant Street at Middlesex Street and a private driveway
- Nahant Street at Hart Street
- Farm Street at Nahant Street

- Farm Street at Hemlock Road

### **SPECIFIC TRAFFIC ITEMS**

Several specific items were noted as part of the traffic analysis for this Project. These included an expanded afternoon count period to account for school dismissal periods, a review of truck volumes on Nahant Street, a review of cut-through traffic in the area, a review of speed data on Nahant Street, and the incorporation of roadway improvement projects at intersections in the study area. In summary, most intersections had an afternoon peak hour of 3:45 to 4:45 PM, and neither high (more than 10 percent) truck volumes nor significant cut-through traffic were recorded in the count data. Speed data indicated non-compliance with posted speed limits; this can be addressed with increased enforcement.

### **FUTURE CONDITIONS**

Traffic volumes within the study area were projected to 2031, which reflects a seven-year planning horizon consistent with State traffic study guidelines. These conditions incorporate traffic growth due to general background traffic increases, traffic volume from four development projects currently being proposed/permitted or under construction that are expected to generate traffic in the future, and proposed roadway improvement projects. This condition is referred to as the No-Build condition.

### **PROJECT-GENERATED TRAFFIC**

The Project is expected to generate 146 vehicle trips on an average weekday (two-way, 24-hour volume), with 12 vehicle trips (3 entering and 9 exiting) expected during the weekday morning peak hour and 12 vehicle trips (8 entering and 4 exiting) expected during the weekday evening peak hour.

Project-related traffic-volume increases external to the study area relative to 2031 No-Build conditions are anticipated to range from 1 to 5 vehicles or 0.1 to 0.3 percent during the peak periods.

### **PARKING**

A review of parking conditions was conducted using industry-standard parking supply data. This review indicated that the Project supply rate of 1.5 spaces per unit exceeds the industry data of 1.13 spaces per unit and the Town of Wakefield zoning ordinance of 1.5 spaces per unit.

### **TRAFFIC OPERATIONS ANALYSIS**

In future conditions, operations are generally preserved with minor increases in delays and vehicle queue lengths on the various approaches.

## **RECOMMENDATIONS**

Access to the Project site will be provided via one curb cut onto Nahant Street. The following recommendations are offered with respect to the design and operation of the Project site driveway:

- The driveway should be placed under STOP-sign (*Manual on Uniform Traffic Control Devices* (MUTCD)<sup>1</sup> R1-1) control, with a painted STOP-bar included.
- All signs and other pavement markings to be installed within the Project site shall conform to the applicable standards of the current MUTCD.
- Signs and landscaping adjacent to the Project site driveway should be designed and maintained so as not to restrict lines of sight.
- Snow windrows within sight triangle areas of the Project site driveway should be promptly removed where such accumulations would impede sightlines.

## **CONCLUSIONS**

As documented in this study, Project-related traffic increases will not result in significant increases in traffic volumes or traffic delays within the study area. The site driveway will provide safe and efficient access to and from the development. In general, Project-related traffic can be adequately accommodated within the existing and future infrastructure with minimal impact on the traffic operations within the study area.

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<sup>1</sup>*Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.

# **INTRODUCTION**

---

Vanasse & Associates, Inc. (VAI) has prepared this Transportation Impact Assessment (TIA) in order to identify the traffic impacts associated with the proposed residential development to be located at 32&32A Nahant Street and 36A Nahant Street in Wakefield, Massachusetts. This report identifies and analyzes baseline and future traffic conditions both with and without the Project and reviews access requirements, potential off-site improvements, and safety considerations.

## **STUDY METHODOLOGY**

This study was prepared in accordance with the State guidelines for TIAs and was conducted in three distinct stages.

The first stage involved an assessment of baseline conditions in the study area and included an inventory of roadway geometry, observations of traffic flow, and collection of peak-period traffic counts.

In the second stage of the study, future traffic conditions were projected and analyzed. Specific travel demand forecasts for the Project were assessed along with future traffic demands due to expected traffic growth independent of the Project. A seven-year time horizon was selected for these analyses consistent with State guidelines for the preparation of TIAs. The traffic analysis conducted in stage two identifies projected future roadway capacity, traffic safety, and site access issues.

The third stage of the study presents and evaluates measures to address traffic and safety issues, if any are necessary, based on the results from stage two of the study.

## **BASELINE CONDITIONS**

---

A comprehensive field inventory of baseline conditions within the study area was conducted in December 2023 and January 2024. The field investigation consisted of an inventory of existing roadway geometrics; traffic volumes; and operating characteristics; as well as posted speed limits, sight distance, and land use information within the study area. The study area for the Project contains the major roadway which provides access to the Project, as well as the intersections which are expected to accommodate the majority of Project-related traffic. The study area is listed below and graphically depicted on Figure 1.

- Main Street at North Avenue and Nahant Street
- Nahant Street at Traverse Street
- Nahant Street at Middlesex Street and a private driveway
- Nahant Street at Hart Street
- Farm Street at Nahant Street
- Farm Street at Hemlock Road

The following describes the study area roadway which provides access/egress to the Project.

### **GEOMETRY**

#### **Roadway**

##### **Nahant Street**

Nahant Street is classified as an urban minor arterial roadway under Town jurisdiction. Nahant Street runs in a general east-to-west alignment throughout the study area and provides one general-purpose travel lane in each direction separated by a double-yellow centerline with exclusive turn lanes provided at some intersections. Land uses along Nahant Street throughout the study area generally consist of commercial, residential, and open and wooded space.

#### **Intersections**

Figure 2 summarizes existing lane use, travel lane widths, and sidewalk and crosswalk locations at the study area intersections.



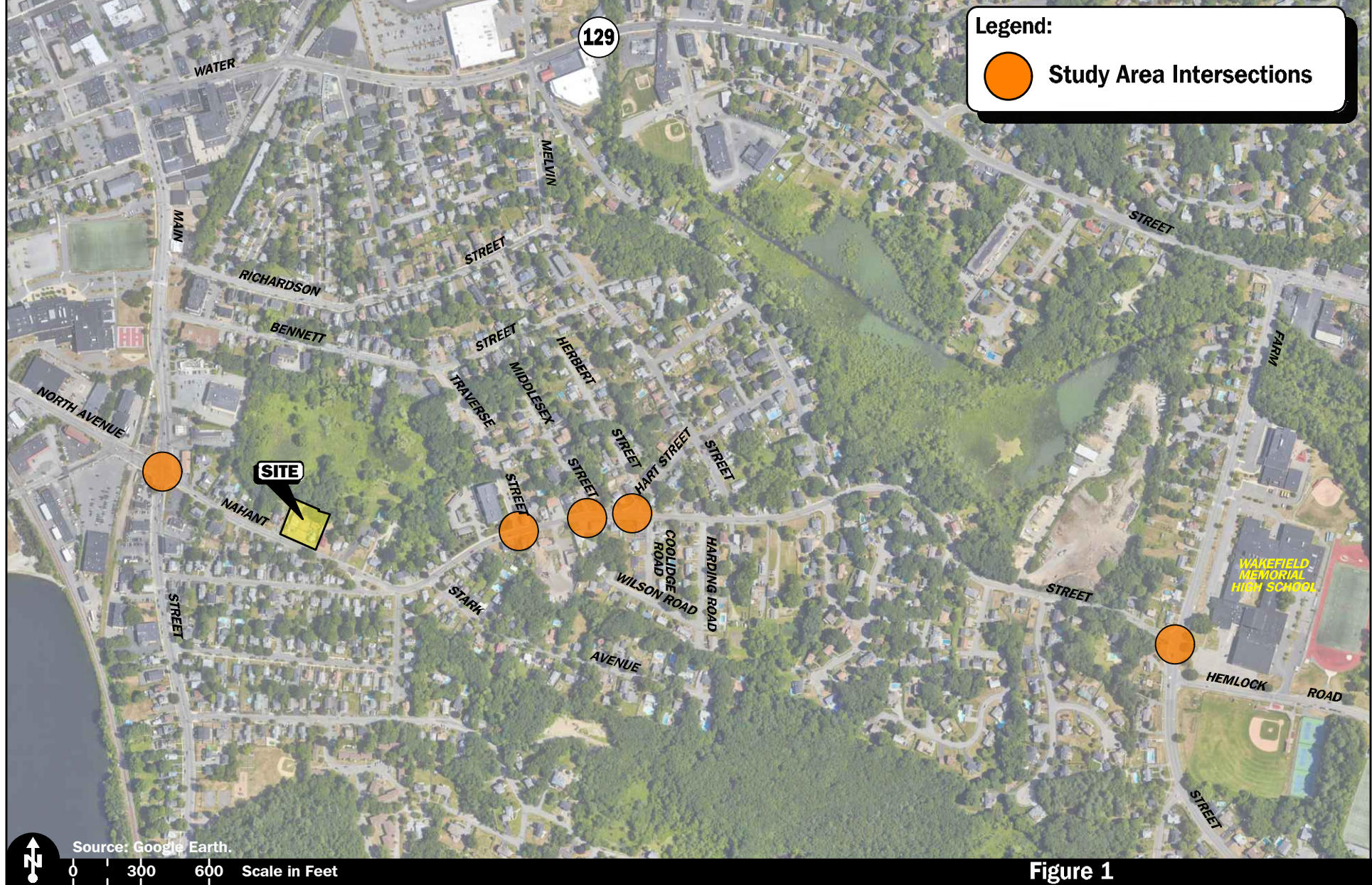
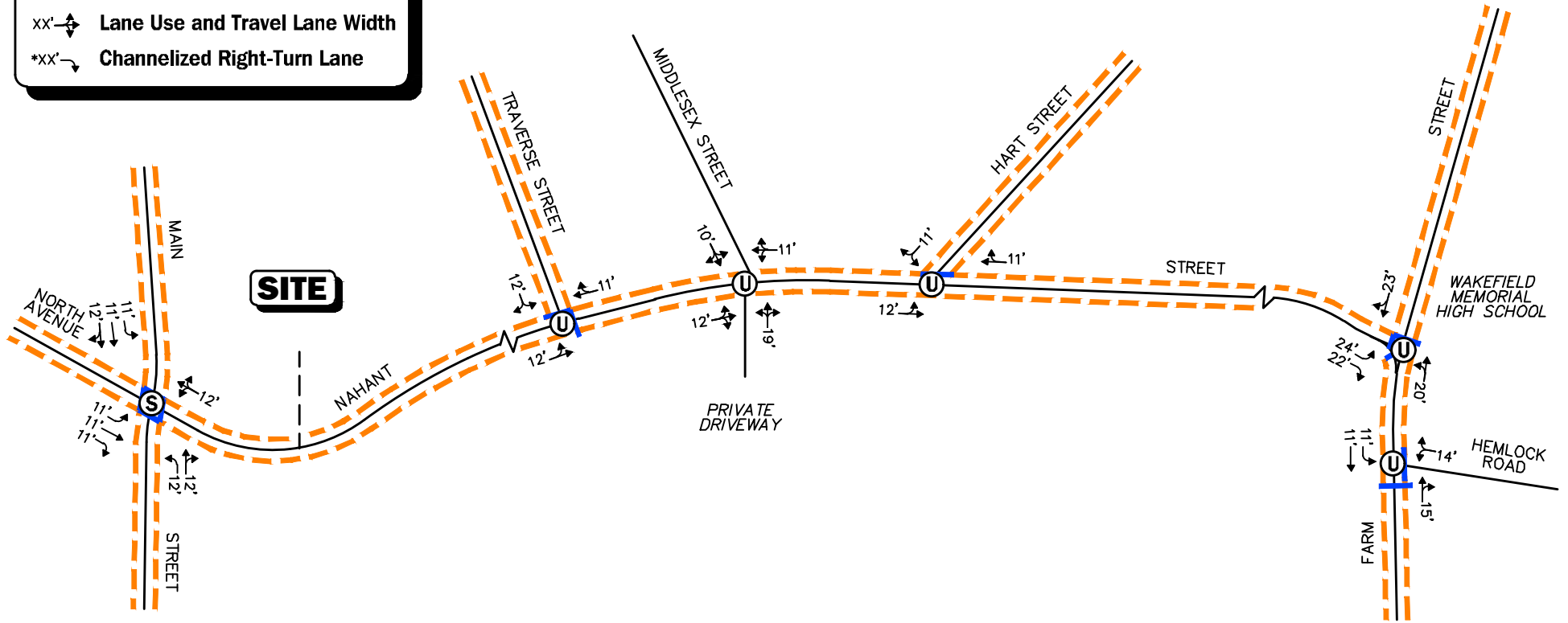


Figure 1  
Site Location and Study Area Map

**Legend:**

- ⓪ Unsignalized Intersection
- Ⓢ Signalized Intersection
- - - Sidewalk
- Crosswalk
- xx' ↔ Lane Use and Travel Lane Width
- \*xx' ↘ Channelized Right-Turn Lane



Not to Scale



**Figure 2**  
Existing Intersection Lane Use, Travel Lane Width, and Pedestrian Facilities

R:\9928\9928NT1.dwg, 1/30/2024 9:08:02 AM

## **BASELINE TRAFFIC VOLUMES**

In order to establish baseline traffic-volume demands and flow patterns within the study area, manual turning movement counts (TMCs) were completed in December 2023. The TMCs were conducted during the weekday morning (7:00 to 9:00 AM) and weekday evening (2:00 to 6:00 PM) peak periods. Bicycles and pedestrians were also counted.

Traffic volumes were collected from 2:00 to 6:00 PM to account for local school dismissal traffic volumes that could impact peak-hour volumes. With the exception of the Main Street at North Avenue and Nahant Street intersection, which peaked at 4:45 to 5:45 PM, study area intersections saw individual weekday evening peak hours between 3:30 to 4:30 PM and 3:45 to 4:45 PM. However, the peak-hour volumes from the individual intersections' peak hours were used for analysis purposes.

### **Traffic-Volume Adjustments**

In order to develop 2024 Baseline traffic-volume conditions, Massachusetts Department of Transportation (MassDOT) weekday seasonal factors for Urban Groups 4-7 (major and minor collectors and local roads and streets, the functional classifications of the majority of the study area roadways) were reviewed.<sup>2</sup> Based on a review of this data, it was determined that traffic volumes for the month of December are 4 percent *below* average-month conditions. As such, the traffic volumes were adjusted upward by 4 percent in order to be representative of average-month conditions.

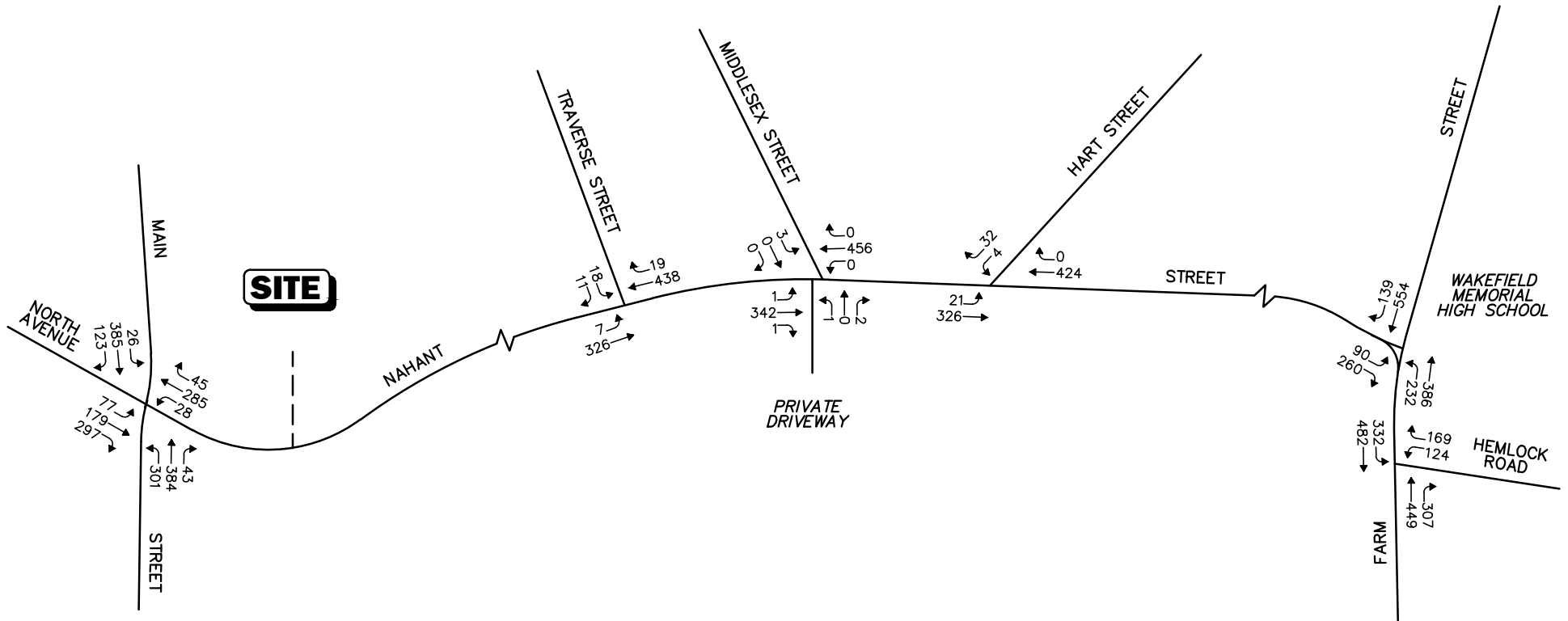
MassDOT no longer requires pandemic-related adjustment of traffic counts performed after March 2022 except in locations where the predominant land use consists of offices or similar uses.<sup>3</sup> Given that the predominant land use within the study area is residential, no further adjustment (beyond the seasonal adjustment) is necessary.

As can be seen in Table 1, Nahant Street was observed to carry approximately 9,200 vehicles per day (vpd) with 803 vehicles per hour (vph) during the weekday morning peak hour and 905 vph during the weekday evening peak hour. During the weekday morning peak hour, 57 percent of the traffic is traveling westbound and during the weekday evening peak hour, 55 percent of the traffic is traveling westbound. The baseline weekday morning and evening peak-hour traffic volumes for the study area intersections are graphically depicted on Figure 3 and Figure 4, respectively.

---

<sup>2</sup>MassDOT statewide Traffic Data Collection; 2019 Weekday Seasonal Factors, Groups U4-7.

<sup>3</sup>25% *Design Submission Guidelines*; MassDOT Highway Division, Traffic and Safety Engineering; Revised May 31, 2022.



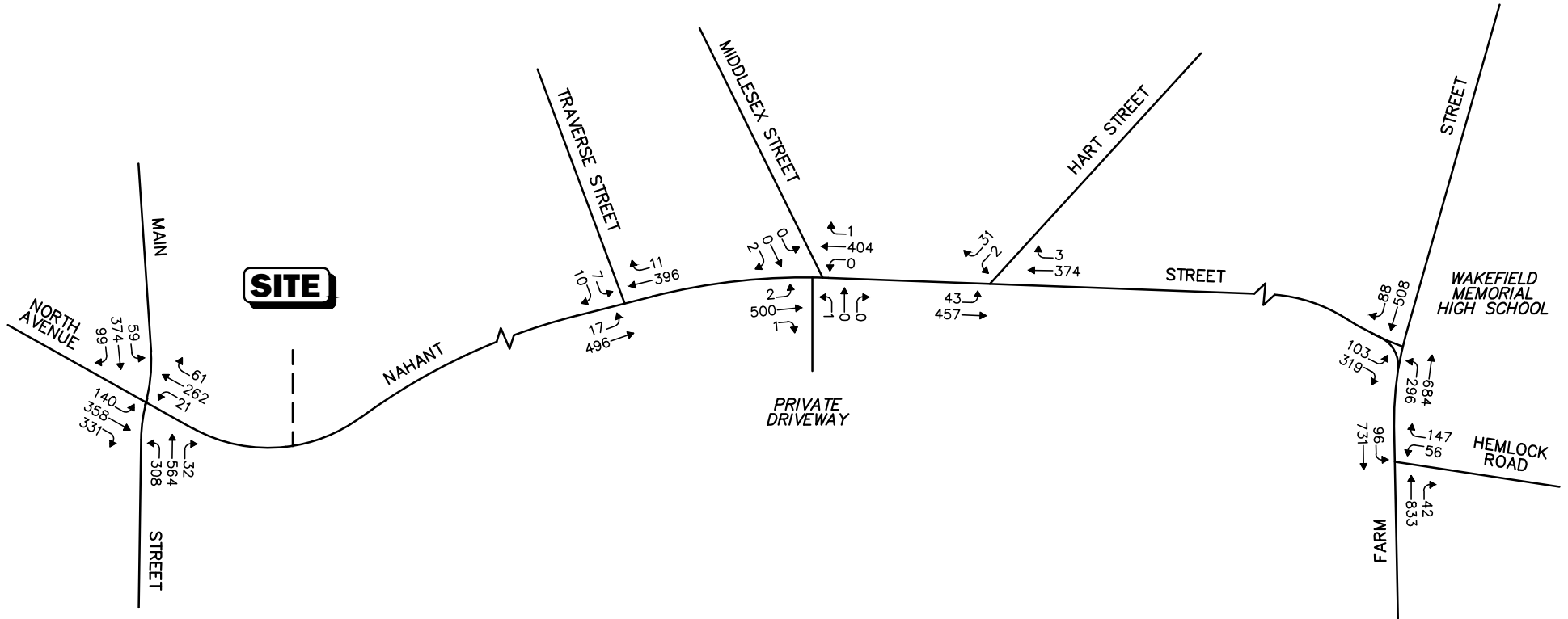
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not to Scale



Figure 3

2024 Baseline  
Weekday Morning  
Peak-Hour Traffic Volumes



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

Not to Scale



Figure 4

2024 Baseline  
Weekday Evening  
Peak-Hour Traffic Volumes

**Table 1**  
**2024 BASELINE ROADWAY TRAFFIC-VOLUME SUMMARY**

Location	Weekday		Weekday Morning Peak Hour		Weekday Evening Peak Hour		
	Daily Volume (vpd) <sup>a</sup>	Volume (vph) <sup>b</sup>	Percent of Daily Traffic <sup>c</sup>	Predominant Flow	Volume (vph)	Percent of Daily Traffic	Predominant Flow
Nahant Street, east of Middlesex Street	9,200	803	8.7	56.8% WB	905	9.8	55.2% WB

<sup>a</sup>Two-way daily traffic expressed in vehicles per day. Based on automatic traffic recorder counts collected in December 2023.

<sup>b</sup>Two-way peak-hour volume expressed in vehicles per hour.

<sup>c</sup>The percent of daily traffic that occurs during the peak hour.

WB = westbound.

### **Truck Volumes**

The percentage of trucks that travel on Nahant Street past the Project site was identified for this Project. The truck volumes were calculated using the vehicle classifications from the TMCs conducted at the intersection of Nahant Street at Middlesex Street. During the weekday morning peak hour, 3 percent (10 vehicles) of total vehicles traveling eastbound are trucks; of total vehicles traveling westbound, 2 percent (9 vehicles) are trucks. During the weekday evening peak hour, of total vehicles traveling eastbound, 1 percent (4 vehicles) are trucks, and of total vehicles traveling westbound, 1 percent (5 vehicles) are trucks.

### **Cut-Through Traffic Volumes**

A review of possible cut-through traffic on Traverse Street was conducted for this Project. This definition of cut-through traffic pertains to traffic using Bennett Street and Traverse Street to avoid the intersection of Main Street at North Avenue and Nahant Street. Using this definition, during the weekday morning peak hour, 18 vehicles were observed turning left from Traverse Street to Nahant Street and 19 vehicles were observed turning right from Nahant Street to Traverse Street. A portion of this volume could be cut-through traffic; however, there are also a number of multifamily developments and duplex units on Bennett Street and Traverse Street that could account for a majority of this traffic volume. During the morning peak hour, this corresponds to 5 percent of total intersection traffic. During the weekday evening peak hour, the volume making these movements is 7 vehicles from Traverse Street and 11 vehicles from Nahant Street, this corresponds to 2 percent of total intersection traffic volumes.

### **PEDESTRIAN AND BICYCLE FACILITIES**

A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in January 2024. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study area roadways and at the study area intersections, as well as the location of bicycle facilities. The full field inventory of the study area is shown in Figure 2.

**PUBLIC TRANSPORTATION**

Public transportation services are provided within the study area by the Massachusetts Bay Transportation Authority (MBTA). The MBTA provides a fixed-route bus service with a bus stop at the intersection of Main Street at Nahant Street/North Avenue, which is located approximately 0.1 mile (a 3-minute walk) to the west of the Project site. Connections to the Haverhill commuter rail Wakefield station are also possible via a 0.5-mile walk from the site (a 13-minute walk). Table 2 summarizes the characteristics of these services. Schedule and fare information for the fixed-route service are provided in the Appendix.

**Table 2  
PUBLIC TRANSPORTATION SERVICES<sup>a</sup>**

Service	Weekday		Saturday		Sunday	
	Hours of Operation	Headway (minutes)	Hours of Operation	Headway (minutes)	Hours of Operation	Headway (minutes)
Route 137	5:33 AM – 10:42 PM	20-57	6:09 AM – 9:15 PM	42-88	8:10 AM – 6:29 PM	91-121
Commuter Rail	5:24 AM – 12:07 AM	45-130	6:16 AM – 11:57 PM	120-195	6:16 AM – 11:57 PM	120-195

<sup>a</sup>Based on latest schedule and route information available from MBTA.

**MOTOR VEHICLE CRASH DATA**

Motor vehicle crash information for the study area intersections was provided by the MassDOT Safety Management/Traffic Operations Unit for the most recent five-year period available (2016 through 2020) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized in Table 3 by intersection, type, weather condition, lighting condition, pavement condition, and severity.

As can be seen in Table 3, the intersection of Main Street at North Avenue and Nahant Street experienced 19 accidents over the five-year review period, averaging 3.8 accidents per year. The majority of the accidents were angled collisions (7 out of 19), occurred on dry pavement (16 out of 19), during daylight (15 out of 19), in clear weather (16 out of 19), and caused property damage only (17 out of 19). The intersection of Nahant Street at Traverse Street experienced 2 accidents over the five-year review period, averaging 0.4 accidents per year. The accidents were a head-on and a pedestrian collision, occurred on dry or wet pavement, during the night on a lighted roadway, in clear or rainy weather, and caused property damage only or non-fatal injuries. The intersection of Nahant Street at Hart Street experienced 6 accidents over the five-year review period, averaging 1.2 accidents per year. The majority of the accidents were sideswipe collisions (3 out of 6), occurred on wet pavement (3 out of 6), during daylight (3 out of 6), in clear weather (3 out of 6), and caused property damage only (4 out of 6). The intersection of Farm Street at Nahant Street and Hemlock Road experienced 17 accidents over the five-year review period, averaging 3.4 accidents per year. The majority of the accidents were angle collisions (7 out of 17), occurred on dry pavement (14 out of 17), during daylight (12 out of 17), in clear weather (12 out of 17), and caused property damage only (12 out of 17). The intersection of Nahant Street at Middlesex Street and the private driveway

had no accidents reported over the five-year review period. No fatalities were reported over the five-year period reviewed. The crash rates for the intersections were observed to be lower than the MassDOT District 4 crash rates for signalized and unsignalized intersections.

**Table 3**  
**MOTOR VEHICLE CRASH DATA SUMMARY**

Scenario	Main Street at North Avenue and Nahant Street	Nahant Street at Traverse Street	Nahant Street at Middlesex Street and Private Driveway	Nahant Street at Hart Street	Farm Street at Nahant Street and Hemlock Road
<i>Year:</i>					
2016	8	1	0	1	7
2017	0	0	0	1	4
2018	5	1	0	1	6
2019	6	0	0	2	0
2020	0	0	0	1	0
Total	19	2	0	6	17
Average <sup>a</sup>	3.8	0.4	0.0	1.2	3.4
Crash Rate <sup>b</sup>	0.36	0.11	0.00	0.33	0.40
Significant <sup>c</sup>	No	No	No	No	No
<i>Type:</i>					
Angle	7	0	0	1	7
Rear-End	3	0	0	1	5
Head-On	2	1	0	0	0
Sideswipe	5	0	0	3	1
Fixed Object	1	0	0	1	1
Pedestrian	1	1	0	0	2
Bicyclist	0	0	0	0	0
Unknown/Other	0	0	0	0	1
Total	19	2	0	6	17
<i>Weather Conditions:</i>					
Clear	16	1	0	3	12
Cloudy/Rain	3	1	0	2	5
Snow/Ice	0	0	0	0	0
Fog	0	0	0	0	0
Unknown/Other	0	0	0	1	0
Total	19	2	0	6	17
<i>Lighting Conditions:</i>					
Daylight	15	0	0	3	12
Dawn/Dusk	0	0	0	0	2
Dark (lit)	4	2	0	2	3
Dark (unlit)	0	0	0	0	0
Unknown/Other	0	0	0	1	0
Total	19	2	0	6	17
<i>Pavement Conditions :</i>					
Dry	16	1	0	1	14
Wet	2	1	0	3	3
Snow/Ice	0	0	0	0	0
Unknown/Other	1	0	0	2	0
Total	19	2	0	6	17
<i>Severity:</i>					
Property Damage Only	17	1	0	4	12
Personal Injury	2	1	0	0	4
Fatality	0	0	0	0	0
Unknown/Other	0	0	0	2	1
Total	19	2	0	6	17

<sup>a</sup>Average number of crashes over a five-year period.

<sup>b</sup>Crash rate per million entering vehicles (mev).

<sup>c</sup>Significant if crash rate > 0.57 for unsignalized intersections (MassDOT District 4 rates).

Source: MassDOT Crash Data, 2016 through 2020.



## VEHICLE SPEEDS

Existing vehicle speeds along Nahant Street, east of Middlesex Street, were recorded to determine the average and 85<sup>th</sup> percentile vehicle speeds. The speed limit on Nahant Street is posted at 20 miles per hour (mph). The results of the speed measurements are shown in Table 4.

**Table 4**  
**OBSERVED VEHICLE SPEEDS (In Miles Per Hour)**

Location/Direction	Average Speed	85 <sup>th</sup> Percentile Speed <sup>a</sup>
<i>Nahant Street, east of Middlesex Street:</i>		
Eastbound	24	29
Westbound	22	26

<sup>a</sup>The 85<sup>th</sup> percentile speed is the speed at which 85 percent of the traffic is traveling at or below. It is commonly used for setting speed limits on roadways.

As can be seen from Table 4, the average speed recorded eastbound on Nahant Street was 24 mph and the 85<sup>th</sup> percentile speed recorded was 29 mph, which is 9 mph above the posted speed limit. The average speed recorded westbound was 22 mph and the 85<sup>th</sup> percentile speed was 26 mph.

## **FUTURE CONDITIONS**

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To determine the impact of site-generated traffic volumes on the roadway network under future conditions, baseline traffic volumes in the study area were projected to the year 2031. Traffic volumes on the roadway network at that time, in the absence of the Project (that is, the No-Build condition), would include baseline traffic, new traffic due to general background traffic growth, and traffic related to specific development by others expected to be completed by 2031. Inclusion of these factors resulted in the development of 2031 No-Build traffic volumes. Anticipated site-generated traffic volumes were then superimposed upon these No-Build traffic-flow networks to develop the 2031 Build traffic-volume conditions.

### **FUTURE TRAFFIC GROWTH**

Traffic growth on area roadways is a function of the expected land development impacting the study area. Several methods are used to estimate this growth. A procedure frequently employed estimates an annual percentage increase in traffic growth and applies that percentage to all baseline traffic volumes under study. The drawback to such a procedure is that some turning volumes may actually grow at either a higher or a lower rate at particular intersections.

In addition, we identified the location and type of planned development affecting the study area, estimated the traffic to be generated by that development, and assigned it to the area roadway network. This produces a more realistic estimate of growth for local traffic. However, the drawback of this procedure is that the potential growth in population and development external to the study area would not be accounted for in the traffic projections.

To provide a conservative analysis framework, both procedures were used in this TIA.

### **General Background Growth**

Traffic-volume data compiled by MassDOT from permanent count stations and historic traffic counts in the area were reviewed in order to determine general background traffic growth trends. Based on a review of this data and other area traffic studies, it was determined that the traffic volumes are increasing in the area by approximately 0.23 percent per year on average. Therefore, a 1.0 percent per year compounded annual background traffic growth rate was used to account for future traffic growth including presently unforeseen development within the study area.

### Specific Development by Others

The City of Wakefield was contacted in order to determine if there are any planned or approved development projects that are expected to influence future traffic volumes within the study area. Based on these discussions, the following projects were identified for inclusion in this assessment:

- ***Proposed Residential Development (40B) – 119 Nahant Street.*** This project entails construction of a 100-unit multifamily residential building to be located at 119-135 Nahant Street in Wakefield, Massachusetts. Traffic volumes were generated based on the number of units proposed and were added to the future condition networks.
- ***Proposed Residential Development (40B) – 0 Stark Avenue.*** This project entails the construction of four residential buildings that will consist of a total of 12 multifamily units to be located off an extension of Stark Avenue in Wakefield, Massachusetts. Traffic volumes were generated based on the number of units proposed and were added to the future condition networks.
- ***Proposed Residential Development – 10 Broadway Street.*** This project entails construction of a 124-unit multifamily residential building to be located at 10 Broadway Street in Wakefield, Massachusetts. Traffic volumes from the *TIA*<sup>4</sup> submitted by VAI dated July 2022 were added to the future condition networks.
- ***Proposed Mixed-Use Redevelopment – 460 Main Street.*** This project entails construction of a building consisting of 4,400 sf retail space and 16 multifamily units to be located at 460-472 Main Street in Wakefield, Massachusetts. Traffic volumes from the *TIA*<sup>5</sup> submitted by VAI dated June 2023 were added to the future condition networks.

No other developments were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate of 1.0 percent.

### Planned Roadway Improvements

The Town of Wakefield and MassDOT were contacted in order to determine if there are any planned roadway improvement projects expected to be completed within the study area in the seven-year planning horizon. Based on these discussions, the following roadway improvement projects were identified:

- ***Envision Wakefield: Downtown Revitalization – Complete Streets Funding.*** This project is being undertaken by the Town of Wakefield with assistance from VHB. Concept plans for the *Downtown Revitalization* implement the following changes at the intersection of Main Street at North Avenue and Nahant Street:
  - At each approach to the intersection crosswalks are repositioned and painted.
  - Intersection sidewalks and curb cuts will be cut back or extended to either increase entering lane widths or add roadway shoulders.
  - There will be no change to the lane configurations after this roadway improvement.

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<sup>4</sup>*Transportation Impact Assessment*, 10 Broadway Street, Wakefield, Massachusetts; VAI; July 2022.

<sup>5</sup>*Transportation Impact Assessment*, 460-472 Main Street, Wakefield, Massachusetts; VAI; June 2023.

- New traffic signal timings will be implemented but were not available from the Town before submitting this report.
- ***Reconstruction of Farm Street at Nahant Street and Farm Street at Hemlock Road.*** This project is being undertaken by the Town of Wakefield. Concept plans provided by the Wakefield Engineering Department show the two T-intersections are proposed to be reconstructed in the future as a combined roundabout.

No other roadway improvement projects aside from routine maintenance activities were identified to be planned within the study area at this time.

### **No-Build Traffic Volumes**

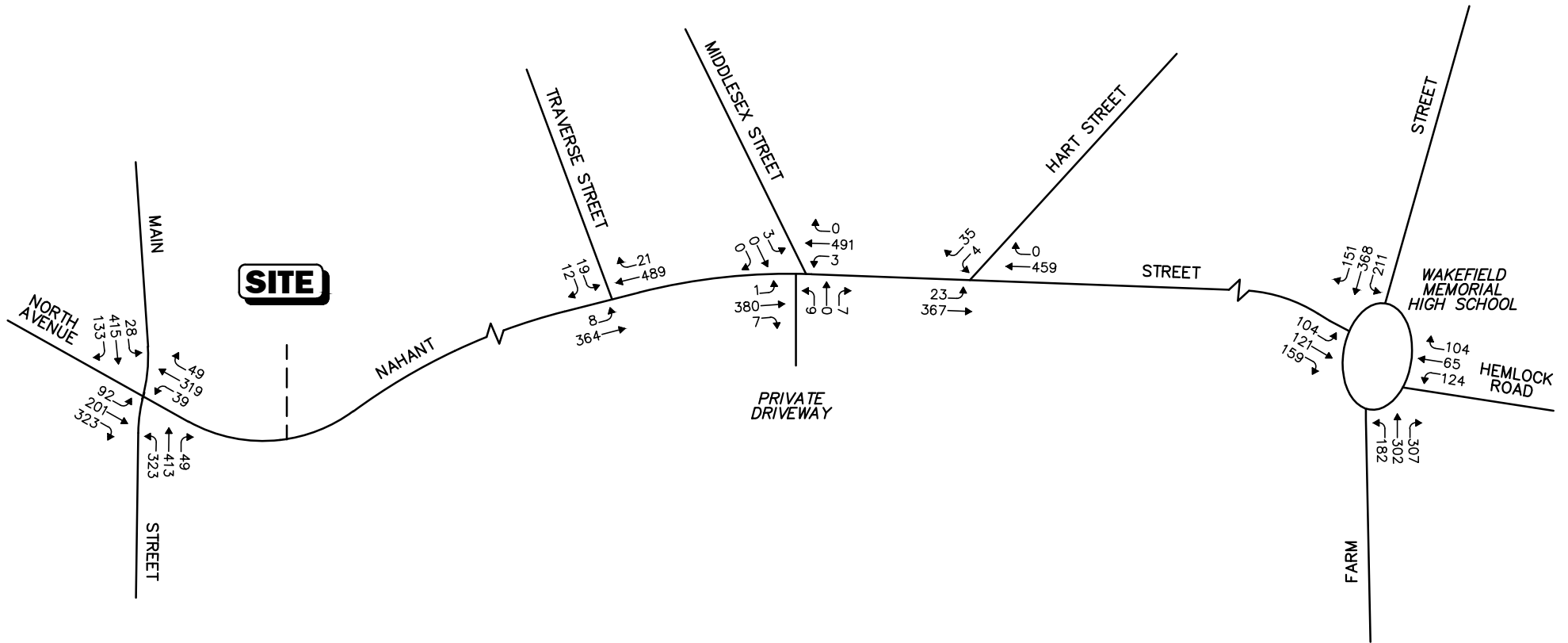
The 2031 No-Build peak-hour traffic-volume networks were developed by applying the 1.0 percent per year compounded annual background traffic growth rate to the 2024 Baseline peak-hour traffic volumes. The resulting 2031 No-Build weekday morning and evening peak-hour traffic-volume networks are shown on Figure 5 and Figure 6, respectively.

### **PROJECT-GENERATED TRAFFIC**

The Project entails razing the existing buildings and constructing a 32-unit residential building. In order to develop the traffic characteristics of the proposed Project, trip-generation statistics published by the Institute of Transportation Engineers (ITE)<sup>6</sup> for Land Use Code (LUC) 221, *Multifamily Housing (Mid-Rise)* was used. A summary of the expected vehicle-trip generation is provided in Table 5.

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<sup>6</sup>*Trip Generation*, 11<sup>th</sup> Edition; Institute of Transportation Engineers; Washington, DC; 2021.



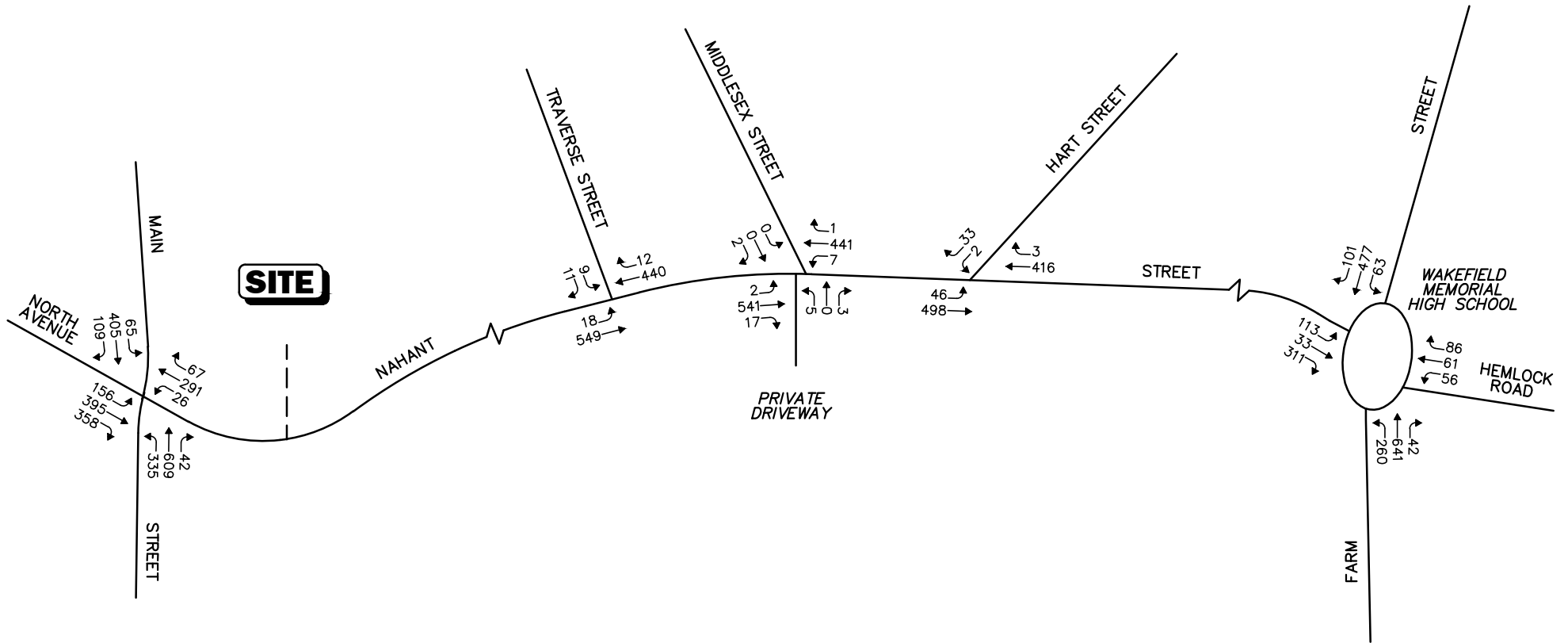
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not to Scale



Figure 5

2031 No-Build  
Weekday Morning  
Peak-Hour Traffic Volumes



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

Not to Scale



Figure 6

2031 No-Build  
Weekday Evening  
Peak-Hour Traffic Volumes

**Table 5  
PROPOSED SITE TRIP-GENERATION SUMMARY**

Time Period/ Directional Distribution	Trips <sup>a</sup>
Weekday Daily	146
<i>Weekday Morning Peak Hour:</i>	
Entering	3
<u>Exiting</u>	<u>9</u>
Total	12
<i>Weekday Evening Peak Hour:</i>	
Entering	8
<u>Exiting</u>	<u>4</u>
Total	12

<sup>a</sup>Based on ITE LUC 221, *Multifamily Housing (Mid-Rise)*; 32 units.

As can be seen in Table 5, the Project is expected to generate 146 vehicle trips (approximately 73 entering and exiting) on an average weekday (two-way, 24-hour volume), with 12 vehicle trips (3 entering and 9 exiting) expected during the weekday morning peak hour and 12 vehicle trips (8 entering and 4 exiting) expected during the weekday evening peak hour.

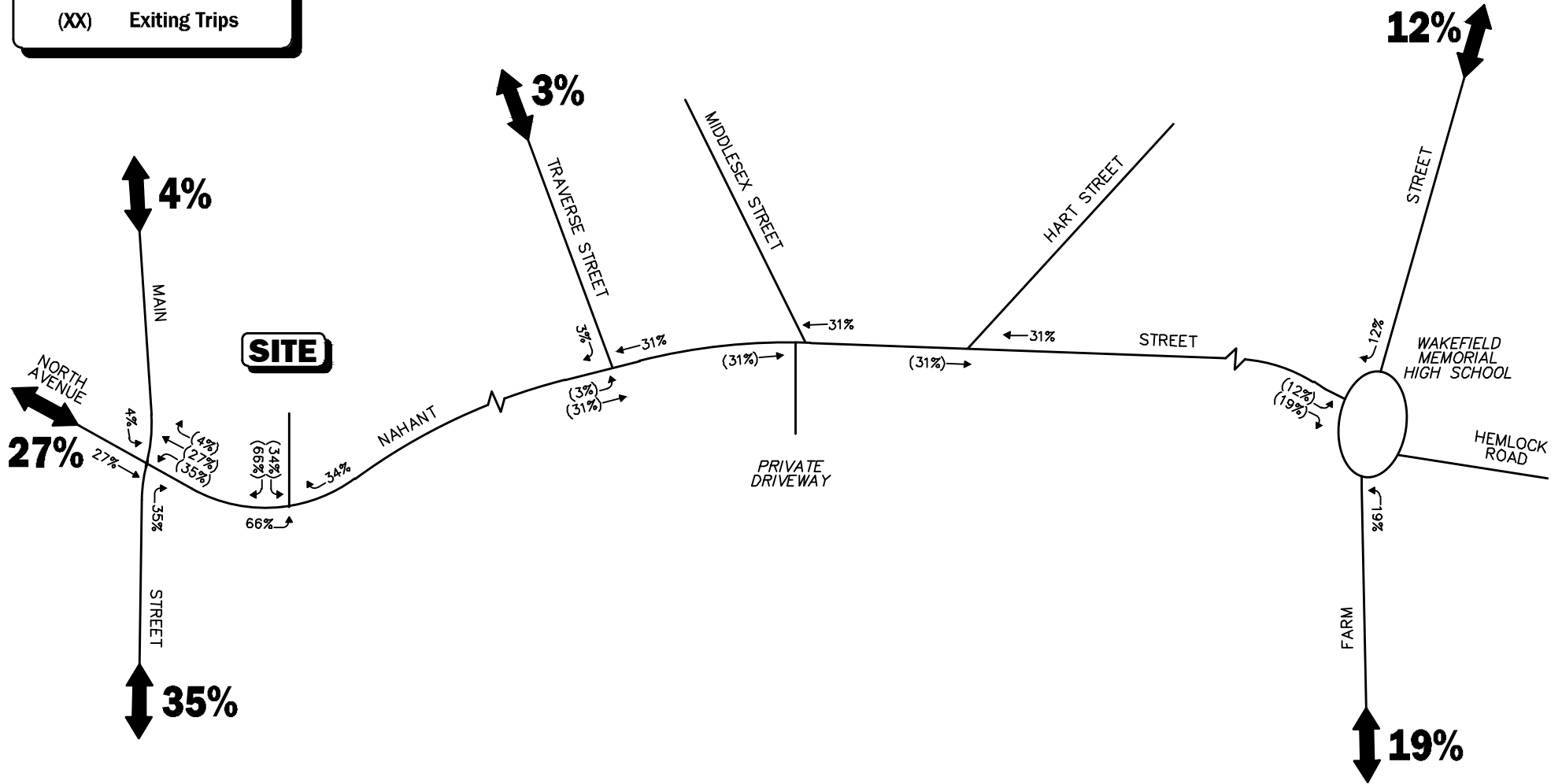
**TRIP DISTRIBUTION AND ASSIGNMENT**

The directional distribution of the site-generated trips to and from the Project was determined based on a combination of a review of baseline travel patterns at the study area intersections and Journey-to-Work data for Wakefield obtained from the United States Census Bureau.<sup>7</sup> The trip distribution for the Project is summarized in Table 6 and graphically depicted on Figure 7. The weekday morning and evening peak-hour traffic volumes expected to be generated by the Project were assigned on the study area roadway network as shown on Figure 8 and Figure 9, respectively.

<sup>7</sup>2011-2015 5-Year American Community Survey; U.S. Census Bureau; 2019.

**Legend:**

- XX Entering Trips
- (XX) Exiting Trips



Not to Scale

Figure 7

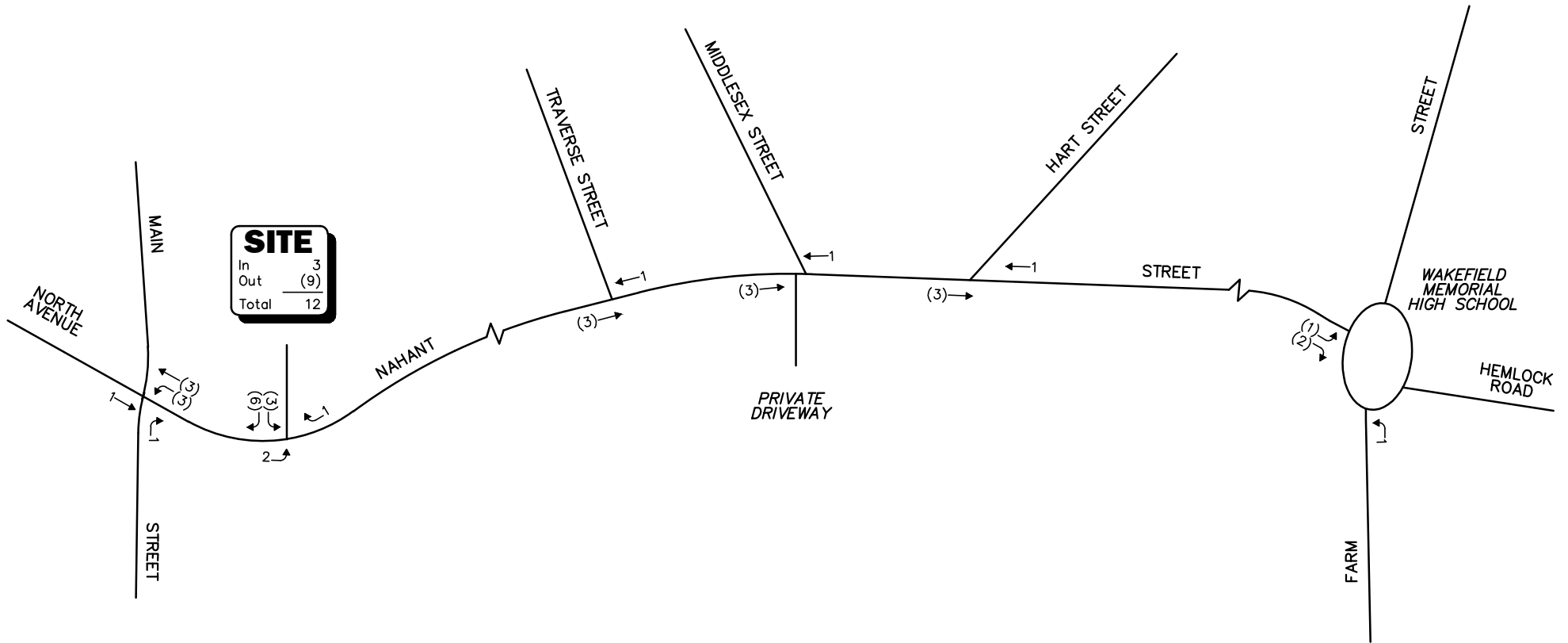
Trip Distribution Map





**Legend:**

- XX Entering Trips
- (XX) Exiting Trips



Not to Scale

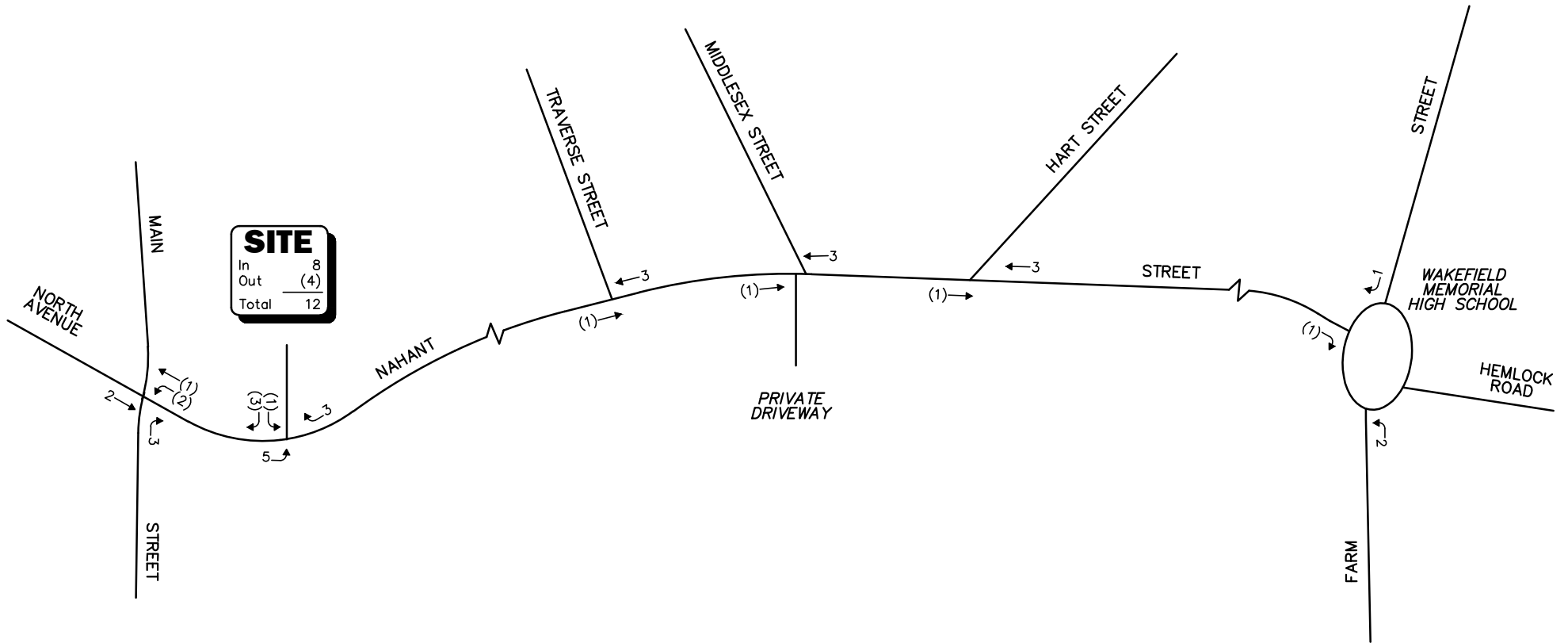


**Figure 8**

**Project-Generated  
Weekday Morning  
Peak-Hour Traffic Volumes**

**Legend:**

- XX Entering Trips
- (XX) Exiting Trips



Not to Scale



**Figure 9**

**Project-Generated  
Weekday Evening  
Peak-Hour Traffic Volumes**

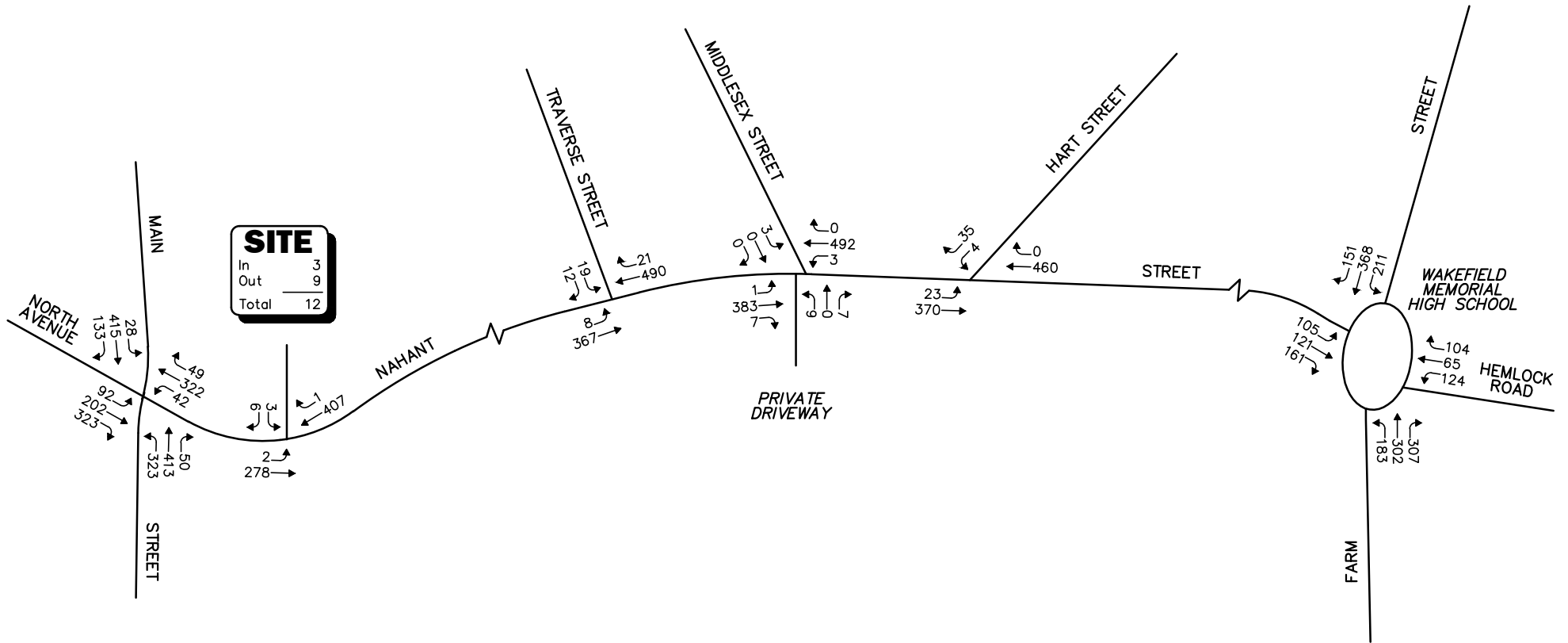
**Table 6**  
**TRIP-DISTRIBUTION SUMMARY**

Roadway	Direction (To/From)	Percent (To/From)
Main Street	North	4
Farm Street	North	12
Traverse Street	North	3
Main Street	South	35
Farm Street	South	19
North Avenue	West	<u>27</u>
TOTAL		100

**FUTURE TRAFFIC VOLUMES – BUILD CONDITION**

The 2031 Build condition networks consist of the 2031 No-Build traffic volumes with the existing site-generated traffic volumes removed and the anticipated Project-generated traffic added to them. The 2031 Build weekday morning and evening peak-hour traffic-volume networks are graphically depicted on Figure 10 and Figure 11, respectively.

A summary of peak-hour projected traffic-volume increases external to the study area that is the subject of this assessment is shown in Table 7. These volumes are based on the expected increases from the Project.



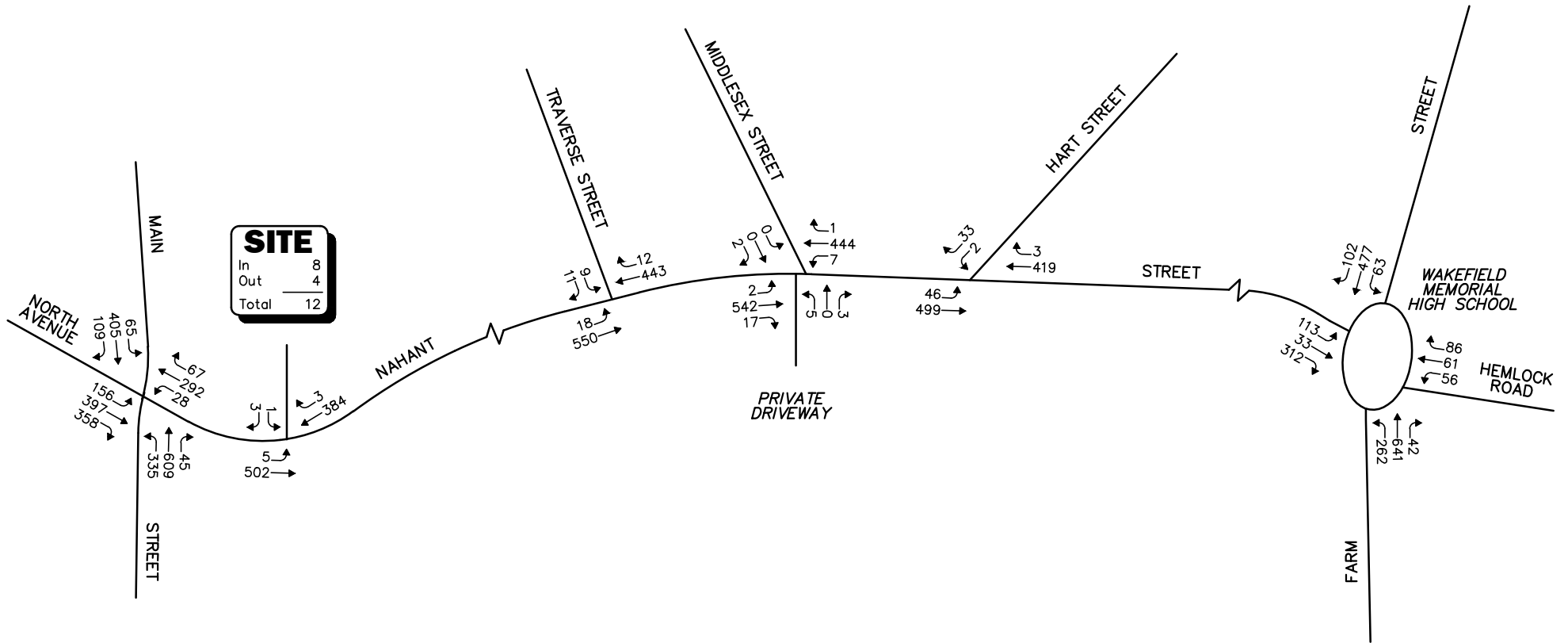
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not to Scale



Figure 10

2031 Build  
Weekday Morning  
Peak-Hour Traffic Volumes



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

Not to Scale



Figure 11

2031 Build  
 Weekday Evening  
 Peak-Hour Traffic Volumes

**Table 7**  
**PEAK-HOUR TRAFFIC-VOLUME INCREASES**

Location/Peak Hour	2031 No-Build	2031 Build	Traffic-Volume Increase Over No-Build	Percent Increase Over No-Build
<i>Main Street, north of Nahant Street:</i>				
Weekday Morning	1,130	1,130	0	0.0
Weekday Evening	1,411	1,411	0	0.0
<i>Farm Street, north of Nahant Street:</i>				
Weekday Morning	1,240	1,241	1	0.1
Weekday Evening	1,481	1,482	1	0.1
<i>Traverse Street, north of Nahant Street:</i>				
Weekday Morning	60	60	0	0.0
Weekday Evening	50	50	0	0.0
<i>Main Street, south of Nahant Street:</i>				
Weekday Morning	1,562	1,566	4	0.3
Weekday Evening	1,775	1,780	5	0.3
<i>Farm Street, south of Hemlock Road:</i>				
Weekday Morning	1,442	1,445	3	0.2
Weekday Evening	1,787	1,790	3	0.2
<i>North Avenue, west of Main Street:</i>				
Weekday Morning	1,391	1,395	4	0.3
Weekday Evening	1,644	1,647	3	0.2

As shown in Table 7, Project-related traffic-volume increases external to the study area relative to 2031 No-Build conditions are anticipated to range from 1 to 5 vehicles or 0.1 to 0.3 percent during the peak periods.

### **PARKING DEMAND**

A parking demand analysis was performed to evaluate the ability of the proposed parking supply to accommodate the anticipated parking demand for the Project. In order to identify the parking demand for this Project, parking demand calculations were performed based on data published by the ITE. The ITE provides parking generation equations for a number of land use codes as part of their *Parking Generation* manual<sup>8</sup> including LUC 221, *Multifamily Housing (Mid-Rise)*. While the Project is approximately 0.5 miles from the Wakefield commuter rail station, to provide a conservative assessment, ITE data for sites further than 0.5 miles from rail transit was used. Table 8 summarizes the ITE parking demand calculations applied to the Project.

<sup>8</sup>*Parking Demand, 6<sup>th</sup> Edition*, Institute of Transportation Engineers, Washington D.C., 2023.

**Table 8**  
**WEEKDAY PEAK-PARKING DEMAND<sup>a</sup>**

Units	Spaces	
	ITE Indicated Parking Demand	Proposed Parking Supply
32	23	48

<sup>a</sup>ITE *Parking Generation Manual* LUC 221, *Multifamily Housing (Mid-Rise, Not close to rail transit)*.

As shown in Table 8, ITE indicates the weekday evening peak-parking demand for this Project is 23 parking spaces, which is below the proposed supply of 48 parking spaces. The proposed parking supply corresponds to a parking ratio of 1.5 parking spaces per unit. This ratio falls within the ITE range rates (0.39 – 1.75) for this use.

The proposed parking supply complies with the minimum parking requirements of Section 190-41, Required Off-Street Parking Spaces,<sup>9</sup> of the Town of Wakefield Zoning Ordinance.

The Project proponent will actively manage the parking to ensure residents and visitors park on-site.

<sup>9</sup>The Town of Wakefield Zoning by Law (Section 190-41.B) requires a parking rate of 1.5 spaces per residential unit for multifamily attached dwellings providing two bedrooms or fewer and 2.0 spaces per residential unit for multifamily attached dwellings providing three bedrooms.

## SIGHT DISTANCE EVALUATION

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Sight distance measurements were performed at the site driveway intersection with Nahant Street in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)<sup>10</sup> recommendations. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance recommended to be provided by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD is the sight distance recommended to be provided by a driver entering or crossing an intersecting roadway to perceive an on-coming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. ***In accordance with AASHTO standards, if the measured ISD is at least equal to the recommended SSD value for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions.*** Table 9 presents the measured SSD and ISD at the subject intersection.

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<sup>10</sup>*A Policy on Geometric Design of Highway and Streets*, 7<sup>th</sup> Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.



**Table 9**  
**SIGHT DISTANCE ANALYSIS<sup>a</sup>**

Intersection/Sight Distance Measurement	Recommended Distances (Feet)	Field Measured Distances (Feet)
	Speed Limit (EB/WB) of (29/26) mph on Nahant Street	
<b><i>Nahant Street at the Project Site Driveway</i></b>		
<i>Stopping Sight Distance:</i>		
Nahant Street approaching from the east	165	566
Nahant Street approaching from the west	190	522
<i>Intersection Sight Distance<sup>b</sup>:</i>		
Left turn from site driveway (looking east)	290	575
Left turn from site driveway (looking west)	320	350

<sup>a</sup>Recommended values obtained from *A Policy on Geometric Design of Highways and Streets*, 7<sup>th</sup> Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018.

<sup>b</sup>Values shown are the intersection sight distance for a vehicle turning right or left exiting a roadway under STOP control such that motorists approaching the intersection on the major street should not need to adjust their travel speed to less than 70 percent of their initial approach speed.

As can be seen in Table 9, the sight distance at the intersection of the Project site driveway with Nahant Street was found to exceed the recommended values for SSD and ISD.

# **TRAFFIC OPERATIONS ANALYSIS**

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Measuring baseline and future traffic volumes quantify traffic flow within the study area. To assess quality of flow, roadway capacity, and vehicle queue analyses were conducted under Baseline, No-Build, and Build traffic-volume conditions. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them, with vehicle queue analyses providing a secondary measure of the operational characteristics of an intersection or section of roadway under study.

## **METHODOLOGY**

### **Levels of Service**

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.<sup>11</sup> The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best-operating conditions and LOS F representing congested or constrained operating conditions.

Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

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<sup>11</sup>The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual 6<sup>th</sup> Edition*; Transportation Research Board; Washington, DC; 2016.

## Signalized Intersections

The six levels of service for signalized intersections may be described as follows:

- *LOS A* describes operations with very low control delay; most vehicles do not stop at all.
- *LOS B* describes operations with relatively low control delay. However, more vehicles stop than *LOS A*.
- *LOS C* describes operations with higher control delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
- *LOS D* describes operations with control delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop, and individual cycle failures are noticeable.
- *LOS E* describes operations with high control delay values. Individual cycle failures are frequent occurrences.
- *LOS F* describes operations with high control delay values that often occur with over-saturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Levels of service for signalized intersections were calculated using the Percentile Delay Method implemented as a part of the Synchro™ 11 software as required by MassDOT. The Percentile Delay Method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on “percentile” delay. Level-of-service designations are based on the criterion of percentile delay per vehicle and are a measure of: i) driver discomfort; ii) motorist frustration; and iii) fuel consumption; and include a uniform delay based on percentile volumes using a Poisson arrival pattern, an initial queue move-up time, and a queue interaction delay that accounts for delays resulting from queues extending from adjacent intersections. Table 10 summarizes the relationship between level-of-service and percentile delay and uses the same numerical delay thresholds as the HCM method. The tabulated percentile delay criterion may be applied in assigning level-of-service designations to individual lane groups, individual intersection approaches, or entire intersections.

**Table 10**  
**LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS<sup>a</sup>**

Level of Service	Percentile Delay Per Vehicle (Seconds)
A	≤10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	>80.0

<sup>a</sup>Source: Highway Capacity Manual; Transportation Research Board; Washington, DC; 2000; page 16-2.

## Unsignalized Intersections

The six levels of service for unsignalized intersections may be described as follows:

- *LOS A* represents a condition with little or no control delay to minor street traffic.
- *LOS B* represents a condition with short control delays to minor street traffic.
- *LOS C* represents a condition with average control delays to minor street traffic.
- *LOS D* represents a condition with long control delays to minor street traffic.
- *LOS E* represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
- *LOS F* represents a condition where minor street demand volume exceeds capacity of an approach lane, with control delays resulting.

The levels of service of unsignalized intersections are determined by application of a procedure described in the *Highway Capacity Manual 6<sup>th</sup> Edition*. Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the *Highway Capacity Manual 6<sup>th</sup> Edition*. Table 11 summarizes the relationship between level of service and average control delay.

**Table 11**  
**LEVEL-OF-SERVICE CRITERIA FOR**  
**UNSIGNALIZED INTERSECTIONS<sup>a</sup>**

Level-of-Service by Volume-to-Capacity Ratio		Average Control Delay (Seconds Per Vehicle)
$v/c \leq 1.0$	$v/c > 1.0$	
A	F	$\leq 10.0$
B	F	10.1 to 15.0
C	F	15.1 to 25.0
D	F	25.1 to 35.0
E	F	35.1 to 50.0
F	F	$> 50.0$

<sup>a</sup>Source: *Highway Capacity Manual 6<sup>th</sup> Edition*; Transportation Research Board; Washington, DC; 2016; page 20-6.

## **SIDRA: Rotary Analysis**

The unsignalized capacity analysis for the approaches at the future Farm Street at Nahant Street and Hemlock Road rotary is based on the procedures described in the Traffic Signalized and Unsignalized Intersection Design and Research Aid (SIDRA) Intersection.<sup>12</sup> The main features of the SIDRA Intersection method for unsignalized capacity estimation are the dependence of gap acceptance parameters on roadway geometry, entry lane flows, and the designation of traffic control on approach lanes.

The SIDRA analytical model calculates several components of delay. One of these, the average total delay component, produces level-of-service results based on the concepts described in the *Highway Capacity Manual*. The delay ranges that define levels of service for roundabouts are shown in Table 12.

**Table 12**  
**LEVEL-OF-SERVICE CRITERIA FOR ROTARIES<sup>a</sup>**

Level of Service	Control Delay Per Vehicle (Seconds)
A	≤10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 50.0
E	50.1 to 70.0
F	>70.0

<sup>a</sup>Source: *SIDRA V9.1 Users Guide; SIDRA SOLUTIONS, AKCELIK & Associates Pty Ltd*; Greythorn, Victoria 3104, Australia; 2023.

<sup>12</sup>Traffic Signalized and Unsignalized Intersection Design and Research Aid, *SIDRA V9.1 Users Guide; SIDRA SOLUTIONS, AKCELIK & Associates Pty Ltd*; Greythorn, Victoria 3104, Australia; 2023.

## **ANALYSIS RESULTS**

Level-of-service analyses were conducted for 2024 Baseline, 2031 No-Build, and 2031 Build conditions for the study area intersections. The results of the intersection capacity analysis within the study area are described below, with a tabular summary provided in Tables 13, 14, and 15.

### **Signalized Intersection**

#### **Main Street at North Avenue and Nahant Street**

Under 2024 Baseline conditions, this intersection operates at an overall LOS C during the weekday morning and evening peak hours. Under 2031 No-Build conditions, this intersection operates at an overall LOS D during the weekday morning and evening peak hours. No changes to the overall level of service under 2031 Build conditions due to the addition of Project traffic. The vehicle queue lengths increase by, at the most, 1 vehicle with the addition of Project traffic.

**Table 13**  
**SIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY**

Signalized Intersection/Peak Hour/Movement	2024 Baseline				2031 No-Build				2031 Build			
	V/C <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup> Avg/95 <sup>th</sup>	V/C	Delay	LOS	Queue Avg/95 <sup>th</sup>	V/C	Delay	LOS	Queue Avg/95 <sup>th</sup>
<i>Main Street at North Avenue and Nahant Street</i>												
<i>Weekday Morning:</i>												
North Avenue EB LT	0.52	52.8	D	2/5	0.53	41.9	D	1/5	0.54	42.6	D	1/6
North Avenue EB TH	0.44	40.8	D	4/9	0.42	29.8	C	3/8	0.42	29.9	C	3/8
North Avenue EB RT	0.36	2.2	A	0/1	0.35	2.0	A	0/1	0.35	2.0	A	0/1
Nahant Street WB LT/TH/RT	0.80	54.1	D	9/20	0.87	50.3	D	7/20	0.89	52.8	D	7/21
Main Street NB LT	0.73	30.0	C	5/11	0.86	43.8	D	4/15	0.86	43.8	D	4/15
Main Street NB TH/RT	0.60	26.5	C	9/16	0.68	29.1	C	6/19	0.68	29.2	C	6/19
Main Street SB LT	0.16	40.3	D	1/2	0.18	36.5	D	1/2	0.18	36.5	D	1/2
Main Street SB TH/RT	0.74	44.5	D	7/11	0.86	46.6	D	5/13	0.86	46.6	D	5/13
<b>Overall</b>	--	<b>34.3</b>	<b>C</b>	--	--	<b>35.7</b>	<b>D</b>	--	--	<b>36.2</b>	<b>D</b>	--
<i>Weekday Evening:</i>												
North Avenue EB LT	0.59	44.8	D	3/10	0.66	50.5	D	4/11	0.66	50.7	D	4/11
North Avenue EB TH	0.68	40.2	D	8/21	0.67	42.3	D	11/21	0.67	42.5	D	11/21
North Avenue EB RT	0.35	2.3	A	1/2	0.40	5.5	A	2/4	0.40	5.6	A	2/4
Nahant Street WB LT/TH/RT	0.69	40.6	D	7/20	0.80	49.9	D	11/24	0.82	52.4	D	12/25
Main Street NB LT	0.69	26.6	C	5/10	0.81	37.4	D	6/18	0.81	37.4	D	6/18
Main Street NB TH/RT	0.80	33.8	C	12/24	0.78	35.1	D	17/36	0.78	35.3	D	17/36
Main Street SB LT	0.47	49.6	D	1/4	0.50	50.4	D	2/5	0.50	50.7	D	2/5
Main Street SB TH/RT	0.70	41.5	D	5/10	0.46	33.6	C	7/12	0.46	33.6	C	7/12
<b>Overall</b>	--	<b>33.0</b>	<b>C</b>	--	--	<b>35.6</b>	<b>D</b>	--	--	<b>36.0</b>	<b>D</b>	--

<sup>a</sup>Volume-to-capacity ratio.

<sup>b</sup>Control (signal) delay per vehicle in seconds.

<sup>c</sup>Level of service.

<sup>d</sup>Queue length in vehicles.

NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

## **Unsignalized Intersections**

### **Nahant Street at Traverse Street**

Under 2024 Baseline and 2031 No-Build conditions, the critical movement at this intersection operates at LOS C during the weekday morning and evening peak hours. There is no change in the level of service under 2031 Build conditions. The queue is not expected to increase under 2031 Build conditions compared to 2031 No-Build conditions.

### **Nahant Street at Middlesex Street and Private Driveway ANDREA**

Under 2024 Baseline conditions, the critical movements at this intersection operate at LOS C during the weekday morning peak hour and at LOS C or better during the weekday evening peak hour. Under 2031 No-Build conditions, the critical movements at this intersection operate at LOS D or better during the weekday morning peak hour and at LOS C or better during the weekday evening peak hour. There is no change in the level of service under 2031 Build conditions. The queue is not expected to increase under 2031 Build conditions compared to 2031 No-Build conditions.

### **Nahant Street at Hart Street**

Under 2024 Baseline and 2031 No-Build conditions, the critical movement at this intersection operates at LOS B during the weekday morning and evening peak hours. There is no change in the level of service under 2031 Build conditions. The queue is not expected to increase under 2031 Build conditions compared to 2031 No-Build conditions.

### **Farm Street at Nahant Street**

Under 2024 Baseline conditions, the critical movements at this intersection operate at LOS F or better during the weekday morning and evening peak hours. Under future conditions, this intersection will be reconstructed as part of a roundabout.

### **Farm Street at Hemlock Road**

Under 2024 Baseline conditions, the critical movement at this intersection operates at LOS F during the weekday morning and evening peak hours. Under future conditions, this intersection will be reconstructed as part of a roundabout.

### **Nahant Street at the Project Site Driveway**

Under 2031 Build conditions, the critical movement at this intersection operates at LOS B during the weekday morning and evening peak hours. Under 2031 Build conditions, the average vehicle queue is 1 vehicle during the morning peak hour and no vehicles during the evening peak hour.



**Table 14**  
**UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY**

Unsignalized Intersection/ Critical Movement/Peak Hour	2024 Baseline				2031 No-Build				2031 Build			
	Demand <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	Demand	Delay	LOS	Queue	Demand	Delay	LOS	Queue
<b><i>Nahant Street at Traverse Street</i></b>												
<i>Weekday Morning:</i>												
Traverse Street SB LT/RT	29	17.9	C	1	31	20.5	C	1	31	20.7	C	1
<i>Weekday Evening:</i>												
Traverse Street SB LT/RT	17	15.0	C	1	20	17.1	C	1	20	17.2	C	1
<b><i>Nahant Street at Middlesex Street and Private Driveway</i></b>												
<i>Weekday Morning:</i>												
Private driveway NB LT/TH/RT	3	15.1	C	1	16	22.4	C	1	16	22.5	C	1
Middlesex Street SB LT/TH/RT	3	23.1	C	1	3	27.6	D	1	3	27.8	D	1
<i>Weekday Evening:</i>												
Private driveway NB LT/TH/RT	1	21.4	C	1	8	21.8	C	1	8	21.9	C	1
Middlesex Street SB LT/TH/RT	2	11.0	B	0	2	11.3	B	0	2	11.3	B	0
<b><i>Nahant Street at Hart Street</i></b>												
<i>Weekday Morning:</i>												
Hart Street SB LT/RT	36	12.6	B	1	39	13.2	B	1	39	13.2	B	1
<i>Weekday Evening:</i>												
Hart Street SB LT/RT	33	11.5	B	1	35	12.0	B	1	35	12.1	B	1
<b><i>Farm Street at Nahant Street</i></b>												
<i>Weekday Morning:</i>												
Nahant Street EB LT	90	>50.0	F	10								
Nahant Street EB RT	260	31.8	D	6								
<i>Weekday Evening:</i>												
Nahant Street EB LT	103	>50.0	F	14								
Nahant Street EB RT	319	26.5	D	5								
<b><i>Farm Street at Nahant Street and Hemlock Road</i></b>												
<i>Weekday Morning:</i>												
Hemlock Road WB LT/RT	293	>50.0	F	54								
<i>Weekday Evening:</i>												
Hemlock Road WB LT/RT	203	>50.0	F	22								

See Table 15 for future conditions.

See Table 15 for future conditions.

See notes at the end of table.

**Table 14 (Continued)**  
**UNIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY**

Unsignalized Intersection/ Critical Movement/Peak Hour	2024 Baseline				2031 No-Build				2031 Build			
	Demand <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	Demand	Delay	LOS	Queue	Demand	Delay	LOS	Queue
<b><i>Nahant Street at the Project Site Driveway</i></b>												
<i>Weekday Morning:</i>												
Project site driveway SB LT/RT	Intersection only exists under Build conditions.								9	12.2	B	1
<i>Weekday Evening:</i>												
Project site driveway SB LT/RT									4	12.5	B	0

<sup>a</sup>Demand in vehicles per hour.

<sup>b</sup>Delay in seconds per vehicle.

<sup>c</sup>Level of service.

<sup>d</sup>95th percentile queue length (veh).

NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

## **Rotary Intersections**

### **Farm Street at Nahant Street and Hemlock Road**

Under 2031 No-Build conditions, the rotary operates at an overall LOS D during the weekday morning peak hour and at LOS C during the evening peak hour. There is no change in the level of service under 2031 Build conditions. The queue is expected to increase by, at most, 1 vehicle under 2031 Build conditions compared to 2031 No-Build conditions.

**Table 15**  
**ROTARY CAPACITY ANALYSIS SUMMARY**

Unsignalized Intersection/ Critical Movement/Peak Hour	2024 Baseline				2031 No-Build				2031 Build			
	Demand <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	Demand	Delay	LOS	Queue	Demand	Delay	LOS	Queue
<b><i>Farm Street at Nahant Street and Hemlock Road</i></b>												
<i>Weekday Morning:</i>												
Nahant Street EB LT/TH/RT					384	21.5	C	8	387	21.8	C	8
Hemlock Road WB LT/TH/RT					293	20.8	C	7	293	20.9	C	7
Farm Street NB LT/TH/RT					791	42.5	D	34	792	43.0	D	34
Farm Street SB LT/TH/RT					730	40.7	D	31	730	40.9	D	31
<b>Overall</b>		See in Table 14			--	<b>35.4</b>	<b>D</b>	--	--	<b>35.6</b>	<b>D</b>	--
<i>Weekday Evening:</i>												
Nahant Street EB LT/TH/RT					457	18.2	B	8	458	18.3	B	8
Hemlock Road WB LT/TH/RT					203	38.9	D	8	203	39.3	D	8
Farm Street NB LT/TH/RT					943	37.5	D	45	945	37.9	D	46
Farm Street SB LT/TH/RT					641	23.0	C	17	642	23.3	C	17
<b>Overall</b>					--	<b>29.6</b>	<b>C</b>	--	--	<b>29.9</b>	<b>C</b>	--

<sup>a</sup>Demand in vehicles per hour.

<sup>b</sup>Delay in seconds per vehicle.

<sup>c</sup>Level of service.

<sup>d</sup>95th percentile queue length (veh).

<sup>e</sup>Analysis conducted using SIDRA methodology.

NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

## **RECOMMENDATIONS AND CONCLUSIONS**

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VAI has prepared this TIA to identify traffic impacts associated with a proposed residential development to be located at 32&32A Nahant Street and 36A Nahant Street in Wakefield, Massachusetts. This study was prepared in accordance with MassDOT Guidelines for TIAs; and was conducted pursuant to the standards of the traffic engineering and transportation planning professions for the preparation of such reports. Based on the results of this study, the following can be concluded:

- The study area intersection crash rates were observed to be lower than the MassDOT District 4 crash rates for unsignalized and signalized intersections.
- The Project is expected to generate 146 vehicle trips (approximately 73 entering and exiting) on an average weekday (two-way, 24-hour volume), with 12 vehicle trips (3 entering and 9 exiting) expected during the weekday morning peak hour and 12 vehicle trips (8 entering and 4 exiting) expected during the weekday evening peak hour.
- The sight distance at the intersection of the Project site driveway with Nahant Street was found to exceed the recommended values for SSD and ISD.
- The analysis has indicated that the Project will generally result in minimal impact on motorist delays and vehicle queue lengths at the study intersection.

### **RECOMMENDATIONS**

A transportation improvement program has been developed that is designed to provide safe and efficient access to the Project and address any deficiencies identified at the study area locations. The following improvements have been recommended as a part of this evaluation:

#### **Project Access**

Access to the Project site will be provided via one curb cut onto Nahant Street. The following recommendations are offered with respect to the design and operation of the Project site driveway:

- The driveway should be placed under STOP-sign (MUTCD R1-1) control, with a painted STOP-bar included.

- All signs and other pavement markings to be installed within the Project site shall conform to the applicable standards of the current MUTCD.
- Signs and landscaping adjacent to the Project site driveway should be designed and maintained so as not to restrict lines of sight.
- Snow windrows within sight triangle areas of the Project site driveway should be promptly removed where such accumulations would impede sightlines.

## **CONCLUSIONS**

As documented in this study, Project-related traffic increases will not result in significant increases in traffic volumes or traffic delays within the study area. The site driveway will provide safe and efficient access to and from the development. In general, Project-related traffic can be adequately accommodated within the existing and future infrastructure with minimal impact on the traffic operations within the study area.

## APPENDIX

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AUTOMATIC TRAFFIC RECORDER  
TRAFFIC COUNT DATA  
SEASONAL ADJUSTMENT DATA  
PUBLIC TRANSPORTATION SCHEDULES  
MASSDOT CRASH RATE WORKSHEETS  
VEHICLE SPEED DATA  
GROWTH RATE DATA  
TRIP GENERATION DATA  
TRIP DISTRIBUTION DATA  
PARKING ANALYSIS  
CAPACITY ANALYSIS



AUTOMATIC TRAFFIC RECORDER

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Accurate Counts  
978-664-2565

Location : Nahant Street  
Location : East of Middlesex Street  
City/State: Wakefield, MA

Site Code: 98560001

12/20/2023 Time	EB		Hour Totals		WB		Hour Totals		Combined Totals	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	5	65			2	74				
12:15	1	50			5	76				
12:30	0	48			3	73				
12:45	3	49	9	212	2	71	12	294	21	506
1:00	2	47			2	89				
1:15	1	63			2	67				
1:30	0	61			4	72				
1:45	1	64	4	235	2	73	10	301	14	536
2:00	0	66			1	123				
2:15	2	85			0	114				
2:30	1	88			1	87				
2:45	4	72	7	311	1	109	3	433	10	744
3:00	1	101			0	99				
3:15	1	98			1	77				
3:30	0	89			1	88				
3:45	2	122	4	410	4	99	6	363	10	773
4:00	3	105			4	92				
4:15	2	117			2	109				
4:30	2	101			8	75				
4:45	5	112	12	435	10	82	24	358	36	793
5:00	10	98			11	83				
5:15	4	131			12	96				
5:30	6	114			12	99				
5:45	15	99	35	442	25	71	60	349	95	791
6:00	18	85			19	66				
6:15	13	71			45	53				
6:30	28	53			67	51				
6:45	57	59	116	268	80	54	211	224	327	492
7:00	73	37			81	54				
7:15	97	52			95	50				
7:30	50	58			113	68				
7:45	65	54	285	201	128	50	417	222	702	423
8:00	48	34			90	39				
8:15	72	28			103	30				
8:30	91	34			118	30				
8:45	58	29	269	125	84	34	395	133	664	258
9:00	45	19			73	37				
9:15	49	20			76	17				
9:30	55	23			59	32				
9:45	52	18	201	80	48	23	256	109	457	189
10:00	30	14			60	23				
10:15	48	10			57	13				
10:30	53	8			47	13				
10:45	57	4	188	36	50	19	214	68	402	104
11:00	45	5			67	14				
11:15	53	6			77	11				
11:30	56	10			78	7				
11:45	43	2	197	23	61	6	283	38	480	61
Total	1327	2778			1891	2892			3218	5670
Percent	32.3%	67.7%			39.5%	60.5%			36.2%	63.8%

Accurate Counts  
978-664-2565

Location : Nahant Street  
Location : East of Middlesex Street  
City/State: Wakefield, MA

Site Code: 98560001

12/21/2023 Time	EB		Hour Totals		WB		Hour Totals		Combined Totals	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	2	50			8	80				
12:15	1	61			4	76				
12:30	1	44			1	70				
12:45	3	58	7	213	3	57	16	283	23	496
1:00	0	61			5	66				
1:15	0	59			4	79				
1:30	1	50			1	101				
1:45	1	61	2	231	1	87	11	333	13	564
2:00	1	78			2	121				
2:15	0	78			1	93				
2:30	1	96			0	90				
2:45	2	93	4	345	0	121	3	425	7	770
3:00	0	92			2	104				
3:15	1	91			1	89				
3:30	1	94			0	110				
3:45	0	113	2	390	2	110	5	413	7	803
4:00	2	91			4	107				
4:15	4	130			5	82				
4:30	3	122			4	84				
4:45	8	109	17	452	10	72	23	345	40	797
5:00	8	106			12	98				
5:15	7	119			14	83				
5:30	5	97			13	87				
5:45	16	100	36	422	32	89	71	357	107	779
6:00	16	101			21	73				
6:15	18	102			46	66				
6:30	43	66			64	72				
6:45	37	62	114	331	69	69	200	280	314	611
7:00	99	36			84	55				
7:15	88	44			92	42				
7:30	60	30			80	38				
7:45	59	39	306	149	83	44	339	179	645	328
8:00	58	34			76	36				
8:15	55	28			77	32				
8:30	66	26			116	38				
8:45	60	22	239	110	81	34	350	140	589	250
9:00	43	27			62	31				
9:15	42	28			68	23				
9:30	48	19			63	27				
9:45	43	10	176	84	66	16	259	97	435	181
10:00	55	10			49	26				
10:15	50	12			65	20				
10:30	55	9			45	13				
10:45	48	14	208	45	69	11	228	70	436	115
11:00	43	4			63	9				
11:15	50	7			58	10				
11:30	45	5			71	17				
11:45	57	6	195	22	78	2	270	38	465	60
Total	1306	2794			1775	2960			3081	5754
Percent	31.9%	68.1%			37.5%	62.5%			34.9%	65.1%
Grand Total	2633	5572			3666	5852			6299	11424
Percent	32.1%	67.9%			38.5%	61.5%			35.5%	64.5%

ADT

ADT: 8,862

AADT: 8,862

Accurate Counts  
978-664-2565

Location : Nahant Street  
Location : East of Middlesex Street  
City/State: Wakefield, MA

Site Code: 98560001

12/18/2023 Time	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	*	*	9	12	7	16	*	*	*	*	*	*	8	14
1:00	*	*	*	*	4	10	2	11	*	*	*	*	*	*	3	10
2:00	*	*	*	*	7	3	4	3	*	*	*	*	*	*	6	3
3:00	*	*	*	*	4	6	2	5	*	*	*	*	*	*	3	6
4:00	*	*	*	*	12	24	17	23	*	*	*	*	*	*	14	24
5:00	*	*	*	*	35	60	36	71	*	*	*	*	*	*	36	66
6:00	*	*	*	*	116	211	114	200	*	*	*	*	*	*	115	206
7:00	*	*	*	*	285	417	306	339	*	*	*	*	*	*	296	378
8:00	*	*	*	*	269	395	239	350	*	*	*	*	*	*	254	372
9:00	*	*	*	*	201	256	176	259	*	*	*	*	*	*	188	258
10:00	*	*	*	*	188	214	208	228	*	*	*	*	*	*	198	221
11:00	*	*	*	*	197	283	195	270	*	*	*	*	*	*	196	276
12:00 PM	*	*	*	*	212	294	213	283	*	*	*	*	*	*	212	288
1:00	*	*	*	*	235	301	231	333	*	*	*	*	*	*	233	317
2:00	*	*	*	*	311	433	345	425	*	*	*	*	*	*	328	429
3:00	*	*	*	*	410	363	390	413	*	*	*	*	*	*	400	388
4:00	*	*	*	*	435	358	452	345	*	*	*	*	*	*	444	352
5:00	*	*	*	*	442	349	422	357	*	*	*	*	*	*	432	353
6:00	*	*	*	*	268	224	331	280	*	*	*	*	*	*	300	252
7:00	*	*	*	*	201	222	149	179	*	*	*	*	*	*	175	200
8:00	*	*	*	*	125	133	110	140	*	*	*	*	*	*	118	136
9:00	*	*	*	*	80	109	84	97	*	*	*	*	*	*	82	103
10:00	*	*	*	*	36	68	45	70	*	*	*	*	*	*	40	69
11:00	*	*	*	*	23	38	4	9	*	*	*	*	*	*	14	24
Total	0	0	0	0	4105	4783	4082	4706	0	0	0	0	0	0	4095	4745
Day	0		0		8888		8788		0		0		0		8840	
AM Peak Volume					7:00 285	7:00 417	7:00 306	8:00 350							7:00 296	7:00 378
PM Peak Volume					5:00 442	2:00 433	4:00 452	2:00 425							4:00 444	2:00 429
Comb Total ADT	0 ADT: 8,862		0 AADT: 8,862		8888		8788		0		0		0		8840	

TRAFFIC COUNT DATA

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# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Main St From North			Nahant St From East			Main St From South			North Ave From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	10	73	19	12	59	6	43	49	11	19	53	61	415
07:15 AM	13	95	29	9	57	20	50	70	13	15	66	71	508
07:30 AM	1	102	39	4	75	7	85	112	7	22	30	84	568
07:45 AM	10	87	27	9	65	10	74	93	11	20	40	78	524
<b>Total</b>	<b>34</b>	<b>357</b>	<b>114</b>	<b>34</b>	<b>256</b>	<b>43</b>	<b>252</b>	<b>324</b>	<b>42</b>	<b>76</b>	<b>189</b>	<b>294</b>	<b>2015</b>
08:00 AM	1	86	23	5	77	6	80	94	10	17	36	53	488
08:15 AM	10	57	27	5	69	5	78	81	8	22	51	57	470
08:30 AM	14	91	24	5	81	10	83	104	12	28	63	67	582
08:45 AM	6	96	28	5	68	14	77	106	5	26	50	58	539
<b>Total</b>	<b>31</b>	<b>330</b>	<b>102</b>	<b>20</b>	<b>295</b>	<b>35</b>	<b>318</b>	<b>385</b>	<b>35</b>	<b>93</b>	<b>200</b>	<b>235</b>	<b>2079</b>
<b>Grand Total</b>	<b>65</b>	<b>687</b>	<b>216</b>	<b>54</b>	<b>551</b>	<b>78</b>	<b>570</b>	<b>709</b>	<b>77</b>	<b>169</b>	<b>389</b>	<b>529</b>	<b>4094</b>
Apprch %	6.7	71	22.3	7.9	80.7	11.4	42	52.3	5.7	15.5	35.8	48.7	
Total %	1.6	16.8	5.3	1.3	13.5	1.9	13.9	17.3	1.9	4.1	9.5	12.9	
Cars	64	665	214	52	541	76	556	689	74	162	378	513	3984
% Cars	98.5	96.8	99.1	96.3	98.2	97.4	97.5	97.2	96.1	95.9	97.2	97	97.3
Trucks	1	22	2	2	10	2	14	20	3	7	11	16	110
% Trucks	1.5	3.2	0.9	3.7	1.8	2.6	2.5	2.8	3.9	4.1	2.8	3	2.7

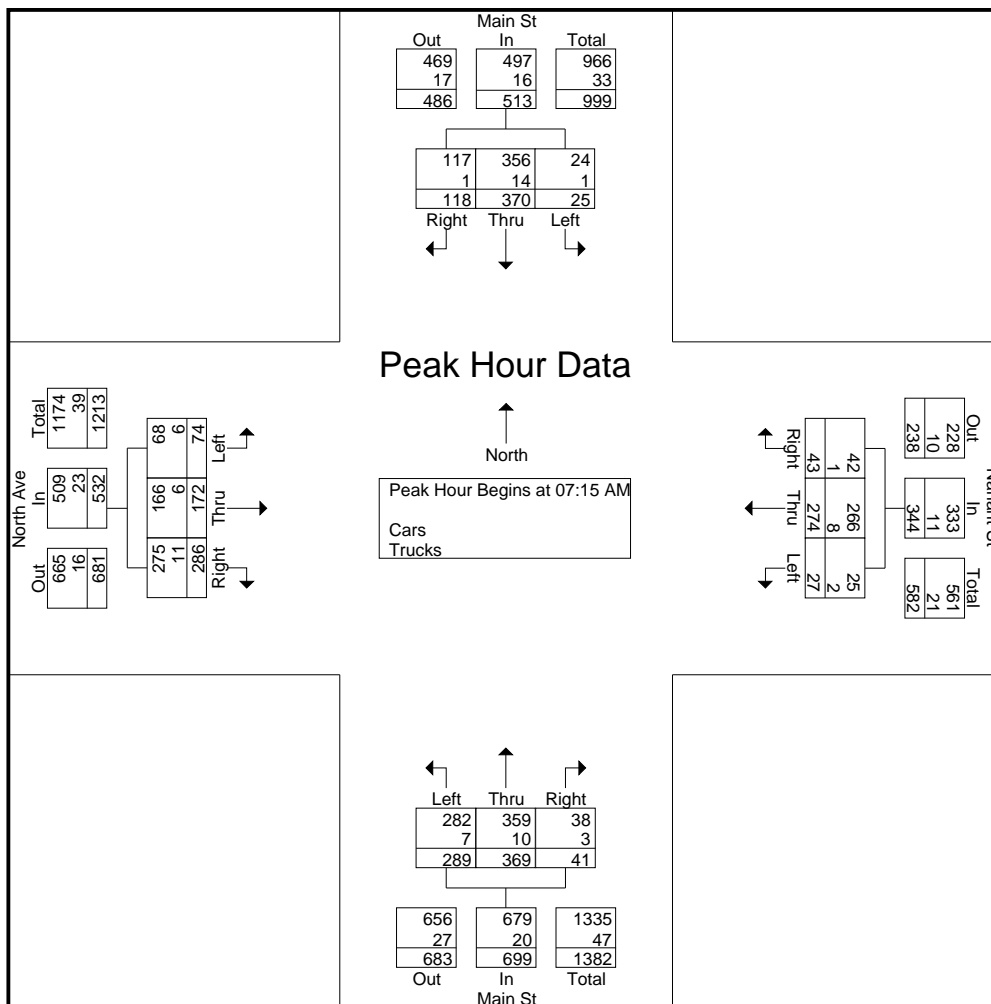
Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	<b>13</b>	95	29	137	<b>9</b>	57	<b>20</b>	86	50	70	<b>13</b>	133	15	<b>66</b>	71	<b>152</b>	508
07:30 AM	1	<b>102</b>	<b>39</b>	<b>142</b>	4	75	7	86	<b>85</b>	<b>112</b>	7	<b>204</b>	<b>22</b>	30	<b>84</b>	136	<b>568</b>
07:45 AM	10	87	27	124	9	65	10	84	74	93	11	178	20	40	78	138	524
08:00 AM	1	86	23	110	5	<b>77</b>	6	<b>88</b>	80	94	10	184	17	36	53	106	488
<b>Total Volume</b>	<b>25</b>	<b>370</b>	<b>118</b>	<b>513</b>	<b>27</b>	<b>274</b>	<b>43</b>	<b>344</b>	<b>289</b>	<b>369</b>	<b>41</b>	<b>699</b>	<b>74</b>	<b>172</b>	<b>286</b>	<b>532</b>	<b>2088</b>
% App. Total	4.9	72.1	23		7.8	79.7	12.5		41.3	52.8	5.9		13.9	32.3	53.8		
PHF	.481	.907	.756	.903	.750	.890	.538	.977	.850	.824	.788	.857	.841	.652	.851	.875	.919
Cars	24	356	117	497	25	266	42	333	282	359	38	679	68	166	275	509	2018
% Cars	96.0	96.2	99.2	96.9	92.6	97.1	97.7	96.8	97.6	97.3	92.7	97.1	91.9	96.5	96.2	95.7	96.6
Trucks	1	14	1	16	2	8	1	11	7	10	3	20	6	6	11	23	70
% Trucks	4.0	3.8	0.8	3.1	7.4	2.9	2.3	3.2	2.4	2.7	7.3	2.9	8.1	3.5	3.8	4.3	3.4

# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 2



**Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1**

**Peak Hour for Each Approach Begins at:**

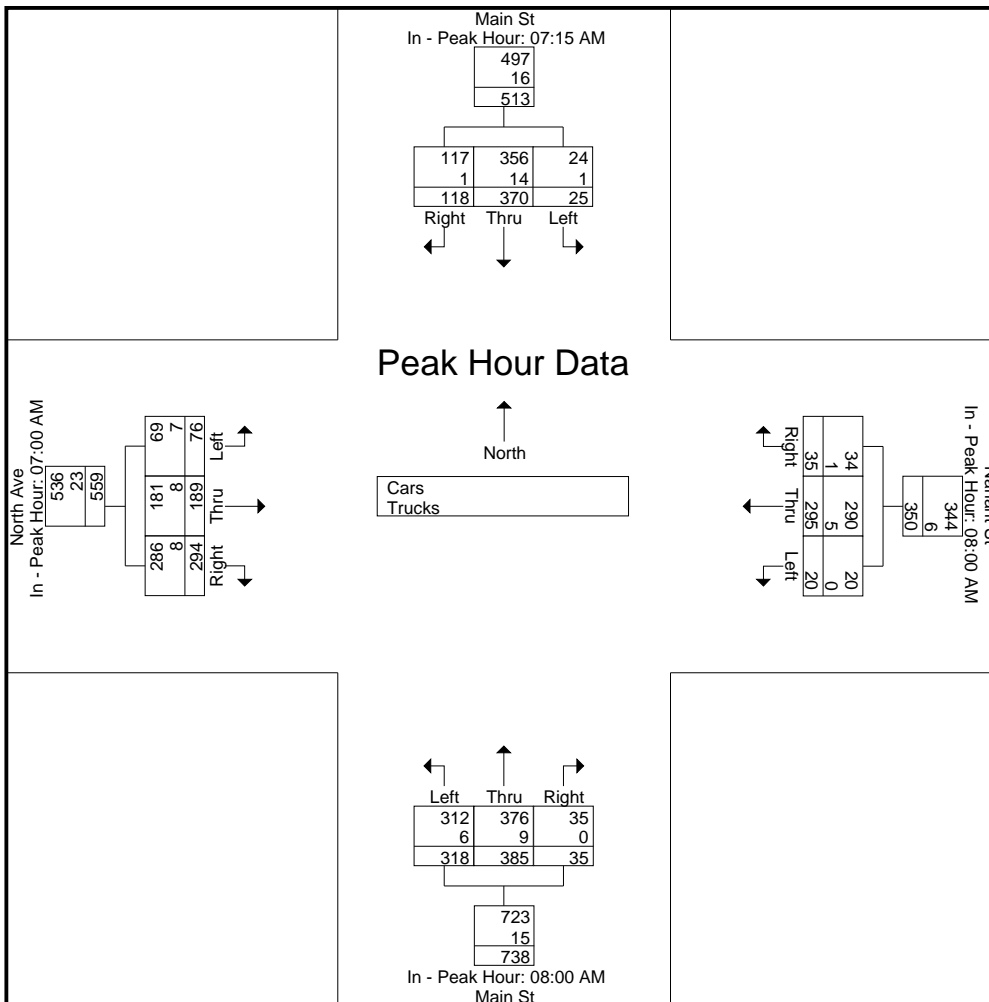
	07:15 AM				08:00 AM				08:00 AM				07:00 AM			
+0 mins.	13	95	29	137	5	77	6	88	80	94	10	184	19	53	61	133
+15 mins.	1	102	39	142	5	69	5	79	78	81	8	167	15	66	71	152
+30 mins.	10	87	27	124	5	81	10	96	83	104	12	199	22	30	84	136
+45 mins.	1	86	23	110	5	68	14	87	77	106	5	188	20	40	78	138
Total Volume	25	370	118	513	20	295	35	350	318	385	35	738	76	189	294	559
% App. Total	4.9	72.1	23		5.7	84.3	10		43.1	52.2	4.7		13.6	33.8	52.6	
PHF	.481	.907	.756	.903	1.000	.910	.625	.911	.958	.908	.729	.927	.864	.716	.875	.919
Cars	24	356	117	497	20	290	34	344	312	376	35	723	69	181	286	536
% Cars	96	96.2	99.2	96.9	100	98.3	97.1	98.3	98.1	97.7	100	98	90.8	95.8	97.3	95.9
Trucks	1	14	1	16	0	5	1	6	6	9	0	15	7	8	8	23
% Trucks	4	3.8	0.8	3.1	0	1.7	2.9	1.7	1.9	2.3	0	2	9.2	4.2	2.7	4.1

# Accurate Counts

978-664-2565

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Main St From North			Nahant St From East			Main St From South			North Ave From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	10	71	19	12	59	6	39	48	11	18	51	61	405
07:15 AM	12	88	29	9	56	20	49	70	10	14	64	70	491
07:30 AM	1	100	39	3	74	6	82	107	7	18	27	78	542
07:45 AM	10	85	27	8	62	10	74	88	11	19	39	77	510
<b>Total</b>	<b>33</b>	<b>344</b>	<b>114</b>	<b>32</b>	<b>251</b>	<b>42</b>	<b>244</b>	<b>313</b>	<b>39</b>	<b>69</b>	<b>181</b>	<b>286</b>	<b>1948</b>
08:00 AM	1	83	22	5	74	6	77	94	10	17	36	50	475
08:15 AM	10	56	27	5	68	4	77	79	8	22	51	56	463
08:30 AM	14	89	23	5	80	10	82	98	12	28	62	64	567
08:45 AM	6	93	28	5	68	14	76	105	5	26	48	57	531
<b>Total</b>	<b>31</b>	<b>321</b>	<b>100</b>	<b>20</b>	<b>290</b>	<b>34</b>	<b>312</b>	<b>376</b>	<b>35</b>	<b>93</b>	<b>197</b>	<b>227</b>	<b>2036</b>
<b>Grand Total</b>	<b>64</b>	<b>665</b>	<b>214</b>	<b>52</b>	<b>541</b>	<b>76</b>	<b>556</b>	<b>689</b>	<b>74</b>	<b>162</b>	<b>378</b>	<b>513</b>	<b>3984</b>
Apprch %	6.8	70.5	22.7	7.8	80.9	11.4	42.2	52.2	5.6	15.4	35.9	48.7	
Total %	1.6	16.7	5.4	1.3	13.6	1.9	14	17.3	1.9	4.1	9.5	12.9	

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	1	83	22	106	5	74	6	85	77	94	10	181	17	36	50	103	475
08:15 AM	10	56	27	93	5	68	4	77	77	79	8	164	22	51	56	129	463
08:30 AM	14	89	23	126	5	80	10	95	82	98	12	192	28	62	64	154	567
08:45 AM	6	93	28	127	5	68	14	87	76	105	5	186	26	48	57	131	531
<b>Total Volume</b>	<b>31</b>	<b>321</b>	<b>100</b>	<b>452</b>	<b>20</b>	<b>290</b>	<b>34</b>	<b>344</b>	<b>312</b>	<b>376</b>	<b>35</b>	<b>723</b>	<b>93</b>	<b>197</b>	<b>227</b>	<b>517</b>	<b>2036</b>
% App. Total	6.9	71	22.1		5.8	84.3	9.9		43.2	52	4.8		18	38.1	43.9		
PHF	.554	.863	.893	.890	1.00	.906	.607	.905	.951	.895	.729	.941	.830	.794	.887	.839	.898



# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Main St From North			Nahant St From East			Main St From South			North Ave From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	2	0	0	0	0	4	1	0	1	2	0	10
07:15 AM	1	7	0	0	1	0	1	0	3	1	2	1	17
07:30 AM	0	2	0	1	1	1	3	5	0	4	3	6	26
07:45 AM	0	2	0	1	3	0	0	5	0	1	1	1	14
<b>Total</b>	<b>1</b>	<b>13</b>	<b>0</b>	<b>2</b>	<b>5</b>	<b>1</b>	<b>8</b>	<b>11</b>	<b>3</b>	<b>7</b>	<b>8</b>	<b>8</b>	<b>67</b>
08:00 AM	0	3	1	0	3	0	3	0	0	0	0	3	13
08:15 AM	0	1	0	0	1	1	1	2	0	0	0	1	7
08:30 AM	0	2	1	0	1	0	1	6	0	0	1	3	15
08:45 AM	0	3	0	0	0	0	1	1	0	0	2	1	8
<b>Total</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>6</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>8</b>	<b>43</b>
<b>Grand Total</b>	<b>1</b>	<b>22</b>	<b>2</b>	<b>2</b>	<b>10</b>	<b>2</b>	<b>14</b>	<b>20</b>	<b>3</b>	<b>7</b>	<b>11</b>	<b>16</b>	<b>110</b>
Apprch %	4	88	8	14.3	71.4	14.3	37.8	54.1	8.1	20.6	32.4	47.1	
Total %	0.9	20	1.8	1.8	9.1	1.8	12.7	18.2	2.7	6.4	10	14.5	

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
<b>Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1</b>																	
<b>Peak Hour for Entire Intersection Begins at 07:15 AM</b>																	
07:15 AM	1	7	0	8	0	1	0	1	1	0	3	4	1	2	1	4	17
07:30 AM	0	2	0	2	1	1	1	3	3	5	0	8	4	3	6	13	26
07:45 AM	0	2	0	2	1	3	0	4	0	5	0	5	1	1	1	3	14
08:00 AM	0	3	1	4	0	3	0	3	3	0	0	3	0	0	3	3	13
<b>Total Volume</b>	<b>1</b>	<b>14</b>	<b>1</b>	<b>16</b>	<b>2</b>	<b>8</b>	<b>1</b>	<b>11</b>	<b>7</b>	<b>10</b>	<b>3</b>	<b>20</b>	<b>6</b>	<b>6</b>	<b>11</b>	<b>23</b>	<b>70</b>
% App. Total	6.2	87.5	6.2		18.2	72.7	9.1		35	50	15		26.1	26.1	47.8		
PHF	.250	.500	.250	.500	.500	.667	.250	.688	.583	.500	.250	.625	.375	.500	.458	.442	.673

# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 10

## Groups Printed- Bikes Peds

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2	4	0	4
07:15 AM	0	1	0	3	0	0	0	2	0	0	0	0	0	0	0	4	9	1	10
07:30 AM	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	1	6	0	6
07:45 AM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	1	6	0	6
<b>Total</b>	0	1	0	8	0	0	0	8	0	0	0	1	0	0	0	8	25	1	26
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
08:15 AM	0	0	0	2	0	0	0	2	0	0	0	1	0	0	0	2	7	0	7
08:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	3	0	3
<b>Total</b>	0	0	0	2	0	0	0	3	0	1	0	3	0	0	0	4	12	1	13
<b>Grand Total</b>	0	1	0	10	0	0	0	11	0	1	0	4	0	0	0	12	37	2	39
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0				
Total %	0	50	0		0	0	0		0	50	0		0	0	0		94.9	5.1	

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
<b>Total Volume</b>	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
<b>% App. Total</b>	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.500

# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Main St From North			Nahant St From East			Main St From South			North Ave From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	12	75	24	8	57	24	84	111	9	37	44	84	569
02:15 PM	18	94	29	10	54	17	65	110	11	42	55	87	592
02:30 PM	16	97	35	8	60	18	59	98	8	41	57	80	577
02:45 PM	9	83	25	9	65	18	59	108	11	31	51	69	538
<b>Total</b>	<b>55</b>	<b>349</b>	<b>113</b>	<b>35</b>	<b>236</b>	<b>77</b>	<b>267</b>	<b>427</b>	<b>39</b>	<b>151</b>	<b>207</b>	<b>320</b>	<b>2276</b>
03:00 PM	14	78	27	4	58	27	74	106	8	40	60	75	571
03:15 PM	10	90	28	3	67	15	60	121	10	33	69	70	576
03:30 PM	11	93	30	5	55	10	65	122	8	33	59	61	552
03:45 PM	13	83	30	5	60	8	72	123	7	29	75	78	583
<b>Total</b>	<b>48</b>	<b>344</b>	<b>115</b>	<b>17</b>	<b>240</b>	<b>60</b>	<b>271</b>	<b>472</b>	<b>33</b>	<b>135</b>	<b>263</b>	<b>284</b>	<b>2282</b>
04:00 PM	11	71	21	3	69	17	58	107	8	33	81	74	553
04:15 PM	12	87	35	6	55	15	63	134	11	32	95	67	612
04:30 PM	17	104	23	5	66	14	57	141	5	35	86	72	625
04:45 PM	8	98	26	7	61	14	77	135	5	32	88	78	629
<b>Total</b>	<b>48</b>	<b>360</b>	<b>105</b>	<b>21</b>	<b>251</b>	<b>60</b>	<b>255</b>	<b>517</b>	<b>29</b>	<b>132</b>	<b>350</b>	<b>291</b>	<b>2419</b>
05:00 PM	14	86	27	5	57	16	79	147	5	33	81	83	633
05:15 PM	25	91	19	5	68	13	67	132	6	34	83	70	613
05:30 PM	10	85	23	3	66	16	73	128	15	36	92	87	634
05:45 PM	11	83	29	4	51	8	76	126	5	25	67	70	555
<b>Total</b>	<b>60</b>	<b>345</b>	<b>98</b>	<b>17</b>	<b>242</b>	<b>53</b>	<b>295</b>	<b>533</b>	<b>31</b>	<b>128</b>	<b>323</b>	<b>310</b>	<b>2435</b>
<b>Grand Total</b>	<b>211</b>	<b>1398</b>	<b>431</b>	<b>90</b>	<b>969</b>	<b>250</b>	<b>1088</b>	<b>1949</b>	<b>132</b>	<b>546</b>	<b>1143</b>	<b>1205</b>	<b>9412</b>
Apprch %	10.3	68.5	21.1	6.9	74	19.1	34.3	61.5	4.2	18.9	39.5	41.6	
Total %	2.2	14.9	4.6	1	10.3	2.7	11.6	20.7	1.4	5.8	12.1	12.8	
Cars	209	1377	427	89	950	244	1081	1931	129	544	1125	1195	9301
% Cars	99.1	98.5	99.1	98.9	98	97.6	99.4	99.1	97.7	99.6	98.4	99.2	98.8
Trucks	2	21	4	1	19	6	7	18	3	2	18	10	111
% Trucks	0.9	1.5	0.9	1.1	2	2.4	0.6	0.9	2.3	0.4	1.6	0.8	1.2

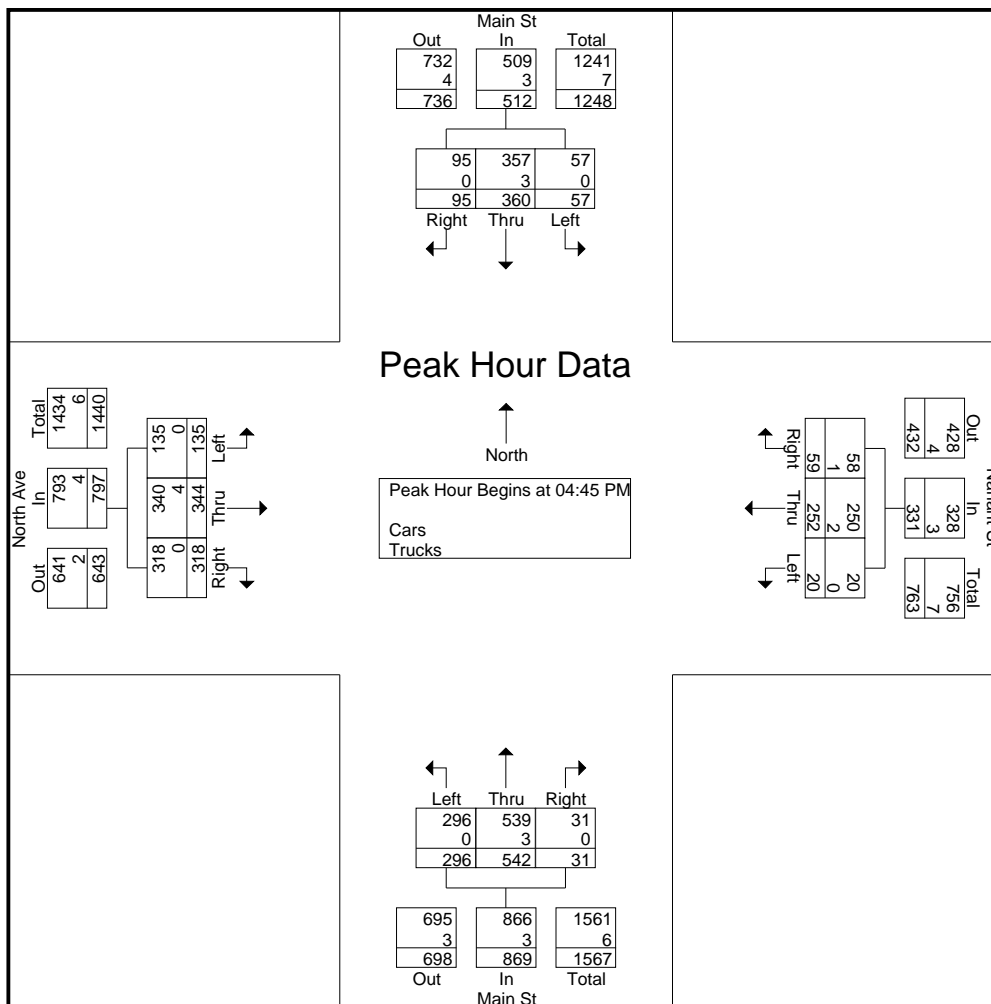
Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	8	<b>98</b>	26	132	<b>7</b>	61	14	82	77	135	5	217	32	88	78	198	629
05:00 PM	14	86	<b>27</b>	127	5	57	<b>16</b>	78	<b>79</b>	<b>147</b>	5	<b>231</b>	33	81	83	197	633
05:15 PM	<b>25</b>	91	19	<b>135</b>	5	<b>68</b>	13	<b>86</b>	67	132	6	205	34	83	70	187	613
05:30 PM	10	85	23	118	3	66	16	85	73	128	<b>15</b>	216	<b>36</b>	<b>92</b>	<b>87</b>	<b>215</b>	<b>634</b>
Total Volume	57	360	95	512	20	252	59	331	296	542	31	869	135	344	318	797	2509
% App. Total	11.1	70.3	18.6		6	76.1	17.8		34.1	62.4	3.6		16.9	43.2	39.9		
PHF	.570	.918	.880	.948	.714	.926	.922	.962	.937	.922	.517	.940	.938	.935	.914	.927	.989
Cars	57	357	95	509	20	250	58	328	296	539	31	866	135	340	318	793	2496
% Cars	100	99.2	100	99.4	100	99.2	98.3	99.1	100	99.4	100	99.7	100	98.8	100	99.5	99.5
Trucks	0	3	0	3	0	2	1	3	0	3	0	3	0	4	0	4	13
% Trucks	0	0.8	0	0.6	0	0.8	1.7	0.9	0	0.6	0	0.3	0	1.2	0	0.5	0.5

# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 2



**Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1**

**Peak Hour for Each Approach Begins at:**

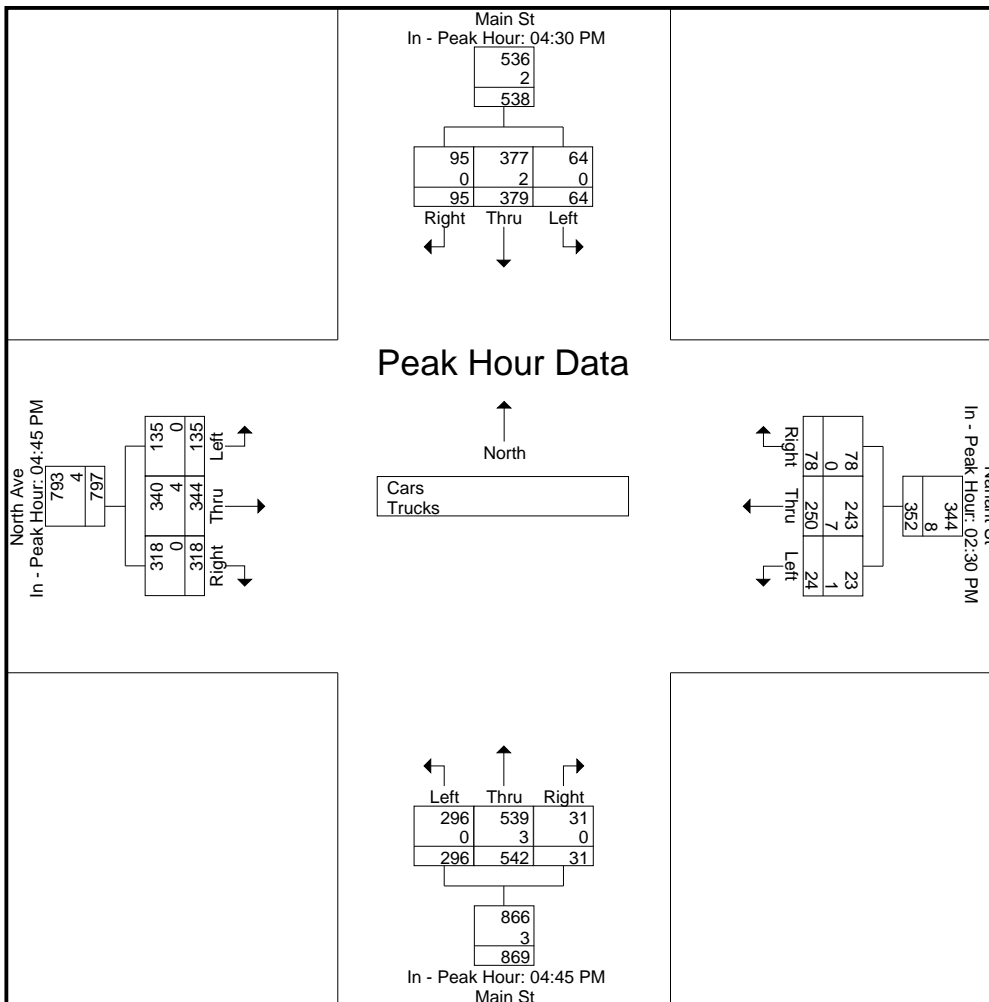
	04:30 PM				02:30 PM				04:45 PM				04:45 PM			
+0 mins.	17	<b>104</b>	23	<b>144</b>	8	60	18	86	77	135	5	217	32	88	78	198
+15 mins.	8	98	26	132	<b>9</b>	65	18	<b>92</b>	<b>79</b>	<b>147</b>	5	<b>231</b>	33	81	83	197
+30 mins.	14	86	<b>27</b>	127	4	58	<b>27</b>	89	67	132	6	205	34	83	70	187
+45 mins.	<b>25</b>	91	19	135	3	<b>67</b>	15	85	73	128	<b>15</b>	216	<b>36</b>	<b>92</b>	<b>87</b>	<b>215</b>
Total Volume	64	379	95	538	24	250	78	352	296	542	31	869	135	344	318	797
% App. Total	11.9	70.4	17.7		6.8	71	22.2		34.1	62.4	3.6		16.9	43.2	39.9	
PHF	.640	.911	.880	.934	.667	.933	.722	.957	.937	.922	.517	.940	.938	.935	.914	.927
Cars	64	377	95	536	23	243	78	344	296	539	31	866	135	340	318	793
% Cars	100	99.5	100	99.6	95.8	97.2	100	97.7	100	99.4	100	99.7	100	98.8	100	99.5
Trucks	0	2	0	2	1	7	0	8	0	3	0	3	0	4	0	4
% Trucks	0	0.5	0	0.4	4.2	2.8	0	2.3	0	0.6	0	0.3	0	1.2	0	0.5

# Accurate Counts

978-664-2565

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Main St From North			Nahant St From East			Main St From South			North Ave From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	12	72	23	8	56	21	84	109	8	37	43	84	557
02:15 PM	17	92	29	10	52	17	65	109	11	42	53	85	582
02:30 PM	16	94	35	8	60	18	57	96	8	41	56	77	566
02:45 PM	9	80	25	8	61	18	57	107	11	31	51	67	525
<b>Total</b>	<b>54</b>	<b>338</b>	<b>112</b>	<b>34</b>	<b>229</b>	<b>74</b>	<b>263</b>	<b>421</b>	<b>38</b>	<b>151</b>	<b>203</b>	<b>313</b>	<b>2230</b>
03:00 PM	14	77	27	4	56	27	74	106	7	40	59	75	566
03:15 PM	10	87	26	3	66	15	58	119	10	33	68	70	565
03:30 PM	11	93	30	5	55	10	65	119	8	33	58	61	548
03:45 PM	12	83	30	5	58	8	72	123	7	29	73	78	578
<b>Total</b>	<b>47</b>	<b>340</b>	<b>113</b>	<b>17</b>	<b>235</b>	<b>60</b>	<b>269</b>	<b>467</b>	<b>32</b>	<b>135</b>	<b>258</b>	<b>284</b>	<b>2257</b>
04:00 PM	11	70	20	3	67	16	58	105	8	33	77	73	541
04:15 PM	12	86	35	6	52	14	63	134	10	31	95	67	605
04:30 PM	17	104	23	5	66	14	56	139	5	34	86	71	620
04:45 PM	8	96	26	7	61	14	77	134	5	32	86	78	624
<b>Total</b>	<b>48</b>	<b>356</b>	<b>104</b>	<b>21</b>	<b>246</b>	<b>58</b>	<b>254</b>	<b>512</b>	<b>28</b>	<b>130</b>	<b>344</b>	<b>289</b>	<b>2390</b>
05:00 PM	14	86	27	5	57	16	79	146	5	33	80	83	631
05:15 PM	25	91	19	5	68	13	67	132	6	34	83	70	613
05:30 PM	10	84	23	3	64	15	73	127	15	36	91	87	628
05:45 PM	11	82	29	4	51	8	76	126	5	25	66	69	552
<b>Total</b>	<b>60</b>	<b>343</b>	<b>98</b>	<b>17</b>	<b>240</b>	<b>52</b>	<b>295</b>	<b>531</b>	<b>31</b>	<b>128</b>	<b>320</b>	<b>309</b>	<b>2424</b>
<b>Grand Total</b>	<b>209</b>	<b>1377</b>	<b>427</b>	<b>89</b>	<b>950</b>	<b>244</b>	<b>1081</b>	<b>1931</b>	<b>129</b>	<b>544</b>	<b>1125</b>	<b>1195</b>	<b>9301</b>
Apprch %	10.4	68.4	21.2	6.9	74	19	34.4	61.5	4.1	19	39.3	41.7	
Total %	2.2	14.8	4.6	1	10.2	2.6	11.6	20.8	1.4	5.8	12.1	12.8	

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	8	<b>96</b>	26	130	<b>7</b>	61	14	82	77	134	5	216	32	86	78	196	624
05:00 PM	14	86	<b>27</b>	127	5	57	<b>16</b>	78	<b>79</b>	<b>146</b>	5	<b>230</b>	33	80	83	196	<b>631</b>
05:15 PM	<b>25</b>	91	19	<b>135</b>	5	<b>68</b>	13	<b>86</b>	67	132	6	205	34	83	70	187	613
05:30 PM	10	84	23	117	3	64	15	82	73	127	<b>15</b>	215	<b>36</b>	<b>91</b>	<b>87</b>	<b>214</b>	628
Total Volume	57	357	95	509	20	250	58	328	296	539	31	866	135	340	318	793	2496
% App. Total	11.2	70.1	18.7		6.1	76.2	17.7		34.2	62.2	3.6		17	42.9	40.1		
PHF	.570	.930	.880	.943	.714	.919	.906	.953	.937	.923	.517	.941	.938	.934	.914	.926	.989

# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 7

## Groups Printed- Trucks

Start Time	Main St From North			Nahant St From East			Main St From South			North Ave From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	0	3	1	0	1	3	0	2	1	0	1	0	12
02:15 PM	1	2	0	0	2	0	0	1	0	0	2	2	10
02:30 PM	0	3	0	0	0	0	2	2	0	0	1	3	11
02:45 PM	0	3	0	1	4	0	2	1	0	0	0	2	13
<b>Total</b>	<b>1</b>	<b>11</b>	<b>1</b>	<b>1</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>7</b>	<b>46</b>
03:00 PM	0	1	0	0	2	0	0	0	1	0	1	0	5
03:15 PM	0	3	2	0	1	0	2	2	0	0	1	0	11
03:30 PM	0	0	0	0	0	0	0	3	0	0	1	0	4
03:45 PM	1	0	0	0	2	0	0	0	0	0	2	0	5
<b>Total</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>2</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>25</b>
04:00 PM	0	1	1	0	2	1	0	2	0	0	4	1	12
04:15 PM	0	1	0	0	3	1	0	0	1	1	0	0	7
04:30 PM	0	0	0	0	0	0	1	2	0	1	0	1	5
04:45 PM	0	2	0	0	0	0	0	1	0	0	2	0	5
<b>Total</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>6</b>	<b>2</b>	<b>29</b>
05:00 PM	0	0	0	0	0	0	0	1	0	0	1	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	2	1	0	1	0	0	1	0	6
05:45 PM	0	1	0	0	0	0	0	0	0	0	1	1	3
<b>Total</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>11</b>
<b>Grand Total</b>	<b>2</b>	<b>21</b>	<b>4</b>	<b>1</b>	<b>19</b>	<b>6</b>	<b>7</b>	<b>18</b>	<b>3</b>	<b>2</b>	<b>18</b>	<b>10</b>	<b>111</b>
Apprch %	7.4	77.8	14.8	3.8	73.1	23.1	25	64.3	10.7	6.7	60	33.3	
Total %	1.8	18.9	3.6	0.9	17.1	5.4	6.3	16.2	2.7	1.8	16.2	9	

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	0	3	1	4	0	1	3	4	0	2	1	3	0	1	0	1	12
02:15 PM	1	2	0	3	0	2	0	2	0	1	0	1	0	2	2	4	10
02:30 PM	0	3	0	3	0	0	0	0	2	2	0	4	0	1	3	4	11
02:45 PM	0	3	0	3	1	4	0	5	2	1	0	3	0	0	2	2	13
<b>Total Volume</b>	<b>1</b>	<b>11</b>	<b>1</b>	<b>13</b>	<b>1</b>	<b>7</b>	<b>3</b>	<b>11</b>	<b>4</b>	<b>6</b>	<b>1</b>	<b>11</b>	<b>0</b>	<b>4</b>	<b>7</b>	<b>11</b>	<b>46</b>
% App. Total	7.7	84.6	7.7		9.1	63.6	27.3		36.4	54.5	9.1		0	36.4	63.6		
PHF	.250	.917	.250	.813	.250	.438	.250	.550	.500	.750	.250	.688	.000	.500	.583	.688	.885

# Accurate Counts

978-664-2565

N/S Street : Main Street  
 E/W Street : Nahant St / North Ave  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560001  
 Site Code : 98560001  
 Start Date : 12/20/2023  
 Page No : 10

## Groups Printed- Bikes Peds

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
02:00 PM	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	2	1	3
02:15 PM	0	0	0	5	0	0	0	15	0	0	0	0	0	0	0	5	25	0	25
02:30 PM	0	0	0	0	0	0	0	10	0	1	0	1	0	0	0	1	12	1	13
02:45 PM	0	0	0	6	0	0	0	2	1	0	0	1	0	0	0	4	13	1	14
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>52</b>	<b>3</b>	<b>55</b>
03:00 PM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	1	6	0	6
03:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
03:30 PM	0	0	0	2	0	0	0	6	0	1	0	2	0	0	0	0	10	1	11
03:45 PM	0	0	0	1	0	0	0	8	0	0	0	0	0	0	0	1	10	0	10
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>27</b>	<b>1</b>	<b>28</b>
04:00 PM	0	0	0	0	0	0	0	2	0	0	0	3	0	0	0	2	7	0	7
04:15 PM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	5	0	5
04:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	0	2
<b>Total</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>14</b>	<b>1</b>	<b>15</b>
05:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	1	0	0	0	2	0	1	0	0	0	0	0	0	3	1	4
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>5</b>
<b>Grand Total</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>59</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>97</b>	<b>6</b>	<b>103</b>
Apprch %	0	100	0		0	0	0		20	80	0		0	0	0				
Total %	0	16.7	0		0	0	0		16.7	66.7	0		0	0	0		94.2	5.8	

Start Time	Main St From North				Nahant St From East				Main St From South				North Ave From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
02:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33.3</b>	<b>66.7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.500	.000	.750	.000	.000	.000	.000	.750



# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Traverse St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	1	3	71	2	0	84	161
07:15 AM	10	3	97	3	1	108	222
07:30 AM	2	3	111	9	2	55	182
07:45 AM	3	0	119	4	2	67	195
<b>Total</b>	<b>16</b>	<b>9</b>	<b>398</b>	<b>18</b>	<b>5</b>	<b>314</b>	<b>760</b>
08:00 AM	1	5	94	2	2	61	165
08:15 AM	5	3	93	2	2	76	181
08:30 AM	3	0	118	9	1	91	222
08:45 AM	0	1	85	0	3	67	156
<b>Total</b>	<b>9</b>	<b>9</b>	<b>390</b>	<b>13</b>	<b>8</b>	<b>295</b>	<b>724</b>
<b>Grand Total</b>	<b>25</b>	<b>18</b>	<b>788</b>	<b>31</b>	<b>13</b>	<b>609</b>	<b>1484</b>
Apprch %	58.1	41.9	96.2	3.8	2.1	97.9	
Total %	1.7	1.2	53.1	2.1	0.9	41	
Cars	25	18	776	31	13	592	1455
% Cars	100	100	98.5	100	100	97.2	98
Trucks	0	0	12	0	0	17	29
% Trucks	0	0	1.5	0	0	2.8	2

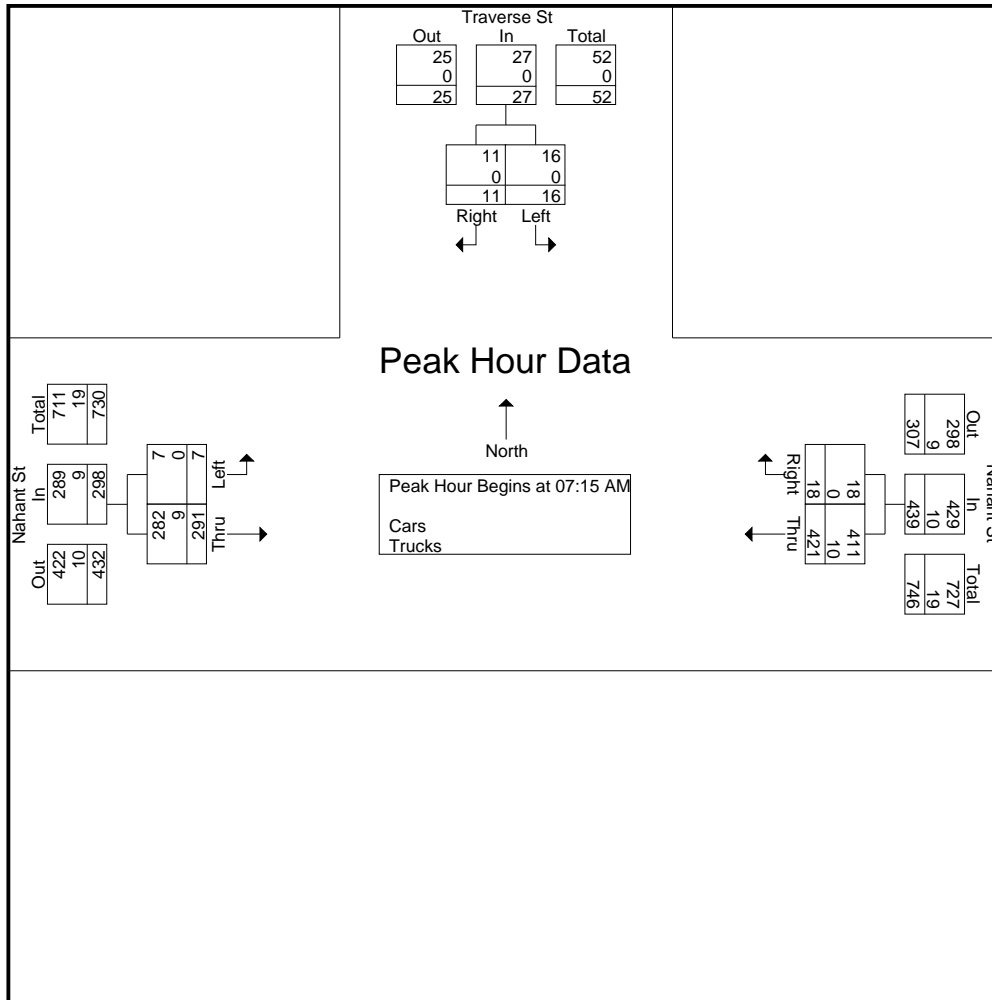
Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	<b>10</b>	3	<b>13</b>	97	3	100	1	<b>108</b>	<b>109</b>	<b>222</b>
07:30 AM	2	3	5	111	9	120	2	55	57	182
07:45 AM	3	0	3	<b>119</b>	4	<b>123</b>	2	67	69	195
08:00 AM	1	<b>5</b>	6	94	2	96	2	61	63	165
Total Volume	16	11	27	421	18	439	7	291	298	764
% App. Total	59.3	40.7		95.9	4.1		2.3	97.7		
PHF	.400	.550	.519	.884	.500	.892	.875	.674	.683	.860
Cars	16	11	27	411	18	429	7	282	289	745
% Cars	100	100	100	97.6	100	97.7	100	96.9	97.0	97.5
Trucks	0	0	0	10	0	10	0	9	9	19
% Trucks	0	0	0	2.4	0	2.3	0	3.1	3.0	2.5

# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 2



**Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1**

Peak Hour for Each Approach Begins at:

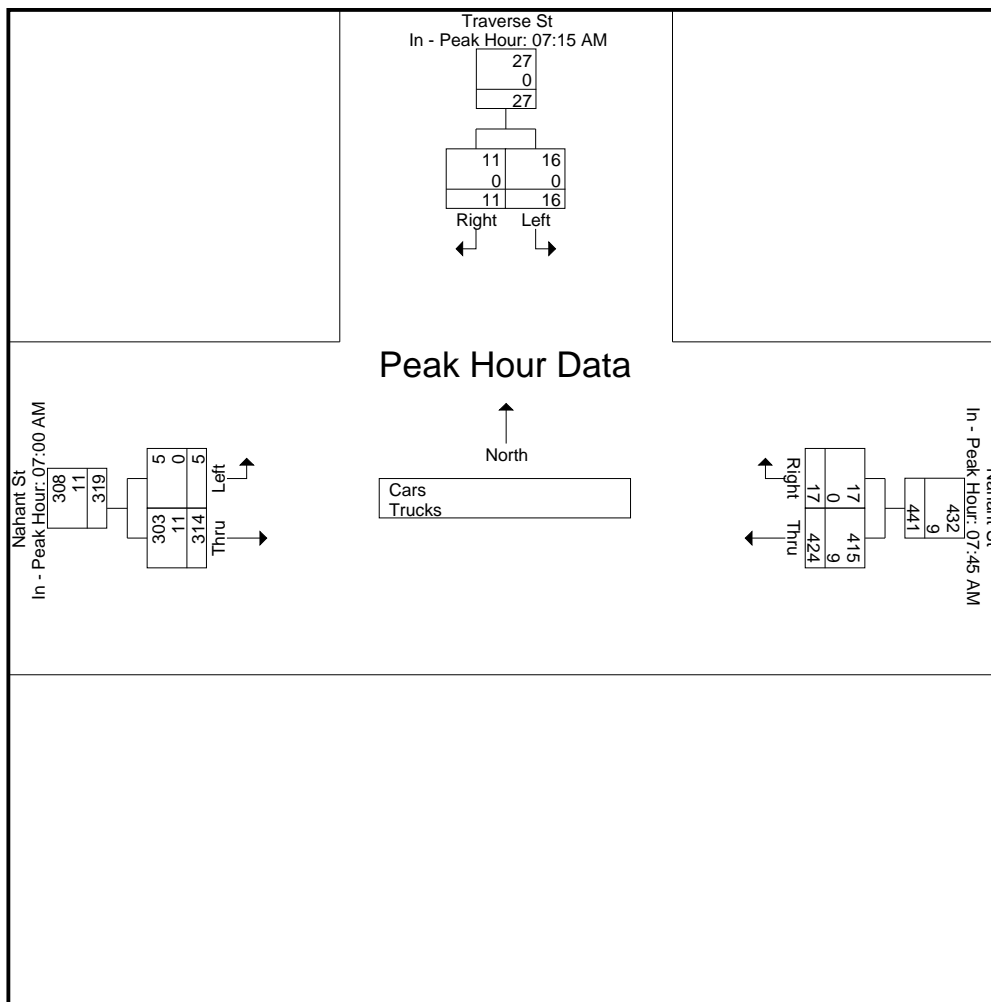
	07:15 AM			07:45 AM			07:00 AM		
+0 mins.	<b>10</b>	3	<b>13</b>	<b>119</b>	4	123	0	84	84
+15 mins.	2	3	5	94	2	96	1	<b>108</b>	<b>109</b>
+30 mins.	3	0	3	93	2	95	2	55	57
+45 mins.	1	<b>5</b>	6	118	<b>9</b>	<b>127</b>	2	67	69
Total Volume	16	11	27	424	17	441	5	314	319
% App. Total	59.3	40.7		96.1	3.9		1.6	98.4	
PHF	.400	.550	.519	.891	.472	.868	.625	.727	.732
Cars	16	11	27	415	17	432	5	303	308
% Cars	100	100	100	97.9	100	98	100	96.5	96.6
Trucks	0	0	0	9	0	9	0	11	11
% Trucks	0	0	0	2.1	0	2	0	3.5	3.4

# Accurate Counts

978-664-2565

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Traverse St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	1	3	71	2	0	81	158
07:15 AM	10	3	95	3	1	103	215
07:30 AM	2	3	110	9	2	52	178
07:45 AM	3	0	115	4	2	67	191
<b>Total</b>	<b>16</b>	<b>9</b>	<b>391</b>	<b>18</b>	<b>5</b>	<b>303</b>	<b>742</b>
08:00 AM	1	5	91	2	2	60	161
08:15 AM	5	3	92	2	2	75	179
08:30 AM	3	0	117	9	1	89	219
08:45 AM	0	1	85	0	3	65	154
<b>Total</b>	<b>9</b>	<b>9</b>	<b>385</b>	<b>13</b>	<b>8</b>	<b>289</b>	<b>713</b>
<b>Grand Total</b>	<b>25</b>	<b>18</b>	<b>776</b>	<b>31</b>	<b>13</b>	<b>592</b>	<b>1455</b>
Apprch %	58.1	41.9	96.2	3.8	2.1	97.9	
Total %	1.7	1.2	53.3	2.1	0.9	40.7	

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	3	0	3	115	4	119	2	67	69	191
08:00 AM	1	5	6	91	2	93	2	60	62	161
08:15 AM	5	3	8	92	2	94	2	75	77	179
08:30 AM	3	0	3	117	9	126	1	89	90	219
<b>Total Volume</b>	<b>12</b>	<b>8</b>	<b>20</b>	<b>415</b>	<b>17</b>	<b>432</b>	<b>7</b>	<b>291</b>	<b>298</b>	<b>750</b>
% App. Total	60	40		96.1	3.9		2.3	97.7		
PHF	.600	.400	.625	.887	.472	.857	.875	.817	.828	.856

# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Traverse St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	0	0	0	0	0	3	3
07:15 AM	0	0	2	0	0	5	7
07:30 AM	0	0	1	0	0	3	4
07:45 AM	0	0	4	0	0	0	4
<b>Total</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>18</b>
08:00 AM	0	0	3	0	0	1	4
08:15 AM	0	0	1	0	0	1	2
08:30 AM	0	0	1	0	0	2	3
08:45 AM	0	0	0	0	0	2	2
<b>Total</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>11</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>29</b>
Apprch %	0	0	100	0	0	100	
Total %	0	0	41.4	0	0	58.6	

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	2	0	2	0	5	5	7
07:30 AM	0	0	0	1	0	1	0	3	3	4
07:45 AM	0	0	0	4	0	4	0	0	0	4
08:00 AM	0	0	0	3	0	3	0	1	1	4
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>19</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>100</b>	<b>100</b>
PHF	.000	.000	.000	.625	.000	.625	.000	.450	.450	.679



# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Traverse St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
02:00 PM	1	1	106	8	2	71	189
02:15 PM	5	8	112	6	3	87	221
02:30 PM	5	3	87	2	5	95	197
02:45 PM	4	0	110	2	7	76	199
<b>Total</b>	<b>15</b>	<b>12</b>	<b>415</b>	<b>18</b>	<b>17</b>	<b>329</b>	<b>806</b>
03:00 PM	3	1	98	6	5	102	215
03:15 PM	3	2	71	2	2	100	180
03:30 PM	3	5	83	5	4	94	194
03:45 PM	2	1	101	0	6	126	236
<b>Total</b>	<b>11</b>	<b>9</b>	<b>353</b>	<b>13</b>	<b>17</b>	<b>422</b>	<b>825</b>
04:00 PM	1	2	93	3	0	118	217
04:15 PM	1	2	104	3	6	127	243
04:30 PM	4	2	71	2	1	105	185
04:45 PM	2	5	86	0	1	115	209
<b>Total</b>	<b>8</b>	<b>11</b>	<b>354</b>	<b>8</b>	<b>8</b>	<b>465</b>	<b>854</b>
05:00 PM	1	2	82	2	2	109	198
05:15 PM	2	1	95	4	2	147	251
05:30 PM	2	2	98	2	2	114	220
05:45 PM	1	3	70	3	3	113	193
<b>Total</b>	<b>6</b>	<b>8</b>	<b>345</b>	<b>11</b>	<b>9</b>	<b>483</b>	<b>862</b>
<b>Grand Total</b>	<b>40</b>	<b>40</b>	<b>1467</b>	<b>50</b>	<b>51</b>	<b>1699</b>	<b>3347</b>
Apprch %	50	50	96.7	3.3	2.9	97.1	
Total %	1.2	1.2	43.8	1.5	1.5	50.8	
Cars	38	40	1445	50	50	1674	3297
% Cars	95	100	98.5	100	98	98.5	98.5
Trucks	2	0	22	0	1	25	50
% Trucks	5	0	1.5	0	2	1.5	1.5

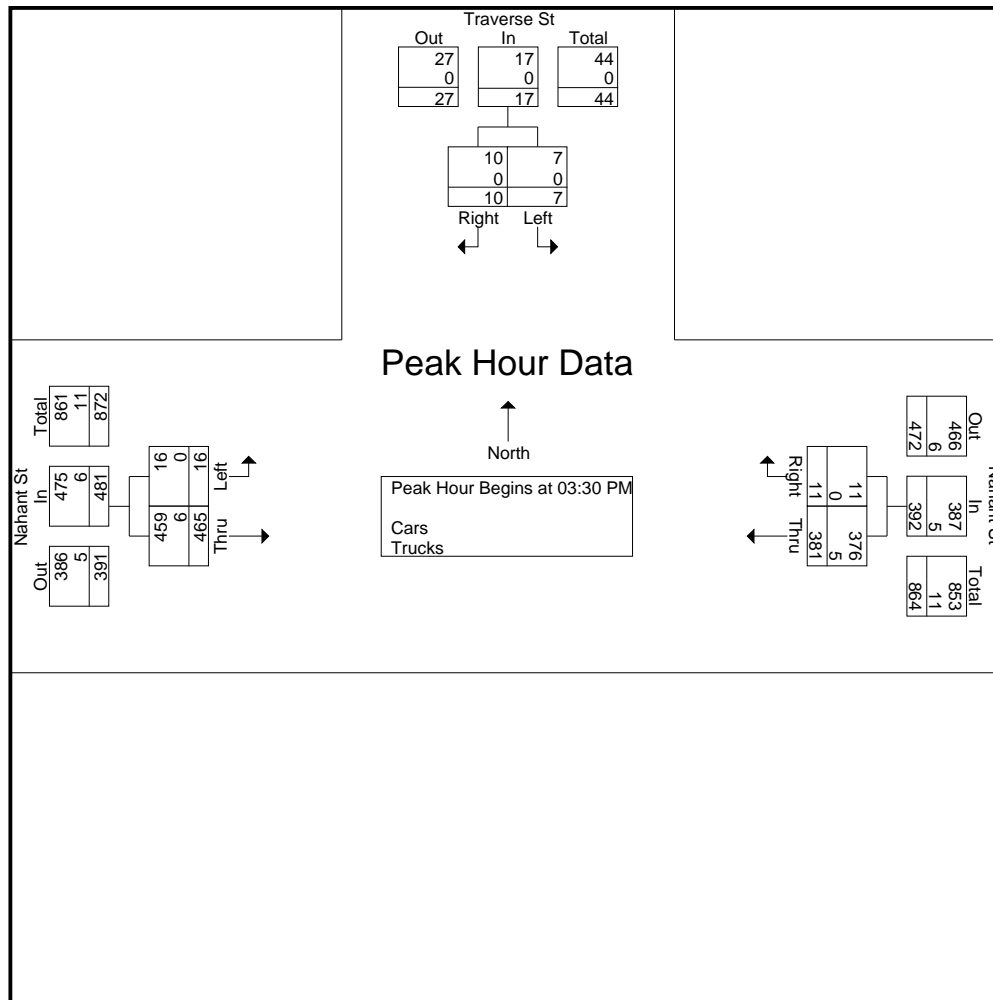
Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:30 PM										
03:30 PM	<b>3</b>	<b>5</b>	<b>8</b>	83	<b>5</b>	88	4	94	98	194
03:45 PM	2	1	3	101	0	101	<b>6</b>	126	132	236
04:00 PM	1	2	3	93	3	96	0	118	118	217
04:15 PM	1	2	3	<b>104</b>	3	<b>107</b>	6	<b>127</b>	<b>133</b>	<b>243</b>
Total Volume	7	10	17	381	11	392	16	465	481	890
% App. Total	41.2	58.8		97.2	2.8		3.3	96.7		
PHF	.583	.500	.531	.916	.550	.916	.667	.915	.904	.916
Cars	7	10	17	376	11	387	16	459	475	879
% Cars	100	100	100	98.7	100	98.7	100	98.7	98.8	98.8
Trucks	0	0	0	5	0	5	0	6	6	11
% Trucks	0	0	0	1.3	0	1.3	0	1.3	1.2	1.2

# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 2



**Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1**

Peak Hour for Each Approach Begins at:

	02:15 PM			02:00 PM			04:45 PM		
+0 mins.	5	8	13	106	8	114	1	115	116
+15 mins.	5	3	8	112	6	118	2	109	111
+30 mins.	4	0	4	87	2	89	2	147	149
+45 mins.	3	1	4	110	2	112	2	114	116
Total Volume	17	12	29	415	18	433	7	485	492
% App. Total	58.6	41.4		95.8	4.2		1.4	98.6	
PHF	.850	.375	.558	.926	.563	.917	.875	.825	.826
Cars	16	12	28	405	18	423	7	481	488
% Cars	94.1	100	96.6	97.6	100	97.7	100	99.2	99.2
Trucks	1	0	1	10	0	10	0	4	4
% Trucks	5.9	0	3.4	2.4	0	2.3	0	0.8	0.8

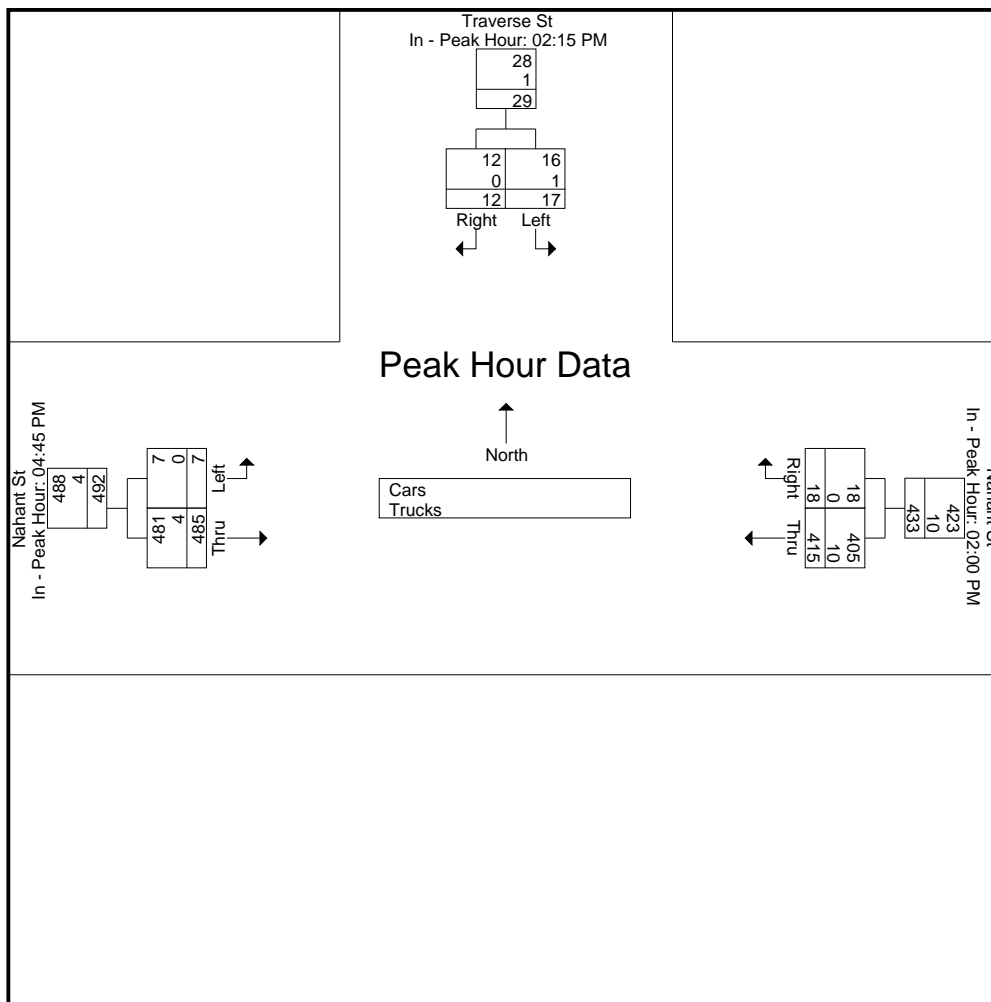


# Accurate Counts

978-664-2565

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 4

### Groups Printed- Cars

Start Time	Traverse St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
02:00 PM	1	1	102	8	2	68	182
02:15 PM	5	8	111	6	3	85	218
02:30 PM	4	3	86	2	5	93	193
02:45 PM	4	0	106	2	7	74	193
<b>Total</b>	<b>14</b>	<b>12</b>	<b>405</b>	<b>18</b>	<b>17</b>	<b>320</b>	<b>786</b>
03:00 PM	3	1	96	6	4	99	209
03:15 PM	3	2	69	2	2	99	177
03:30 PM	3	5	83	5	4	93	193
03:45 PM	2	1	100	0	6	123	232
<b>Total</b>	<b>11</b>	<b>9</b>	<b>348</b>	<b>13</b>	<b>16</b>	<b>414</b>	<b>811</b>
04:00 PM	1	2	92	3	0	116	214
04:15 PM	1	2	101	3	6	127	240
04:30 PM	4	2	71	2	1	104	184
04:45 PM	2	5	86	0	1	113	207
<b>Total</b>	<b>8</b>	<b>11</b>	<b>350</b>	<b>8</b>	<b>8</b>	<b>460</b>	<b>845</b>
05:00 PM	1	2	82	2	2	107	196
05:15 PM	1	1	95	4	2	147	250
05:30 PM	2	2	95	2	2	114	217
05:45 PM	1	3	70	3	3	112	192
<b>Total</b>	<b>5</b>	<b>8</b>	<b>342</b>	<b>11</b>	<b>9</b>	<b>480</b>	<b>855</b>
<b>Grand Total</b>	<b>38</b>	<b>40</b>	<b>1445</b>	<b>50</b>	<b>50</b>	<b>1674</b>	<b>3297</b>
Apprch %	48.7	51.3	96.7	3.3	2.9	97.1	
Total %	1.2	1.2	43.8	1.5	1.5	50.8	

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:30 PM										
03:30 PM	<b>3</b>	<b>5</b>	<b>8</b>	83	<b>5</b>	88	4	93	97	193
03:45 PM	2	1	3	100	0	100	<b>6</b>	123	129	232
04:00 PM	1	2	3	92	3	95	0	116	116	214
04:15 PM	1	2	3	<b>101</b>	3	<b>104</b>	6	<b>127</b>	<b>133</b>	<b>240</b>
<b>Total Volume</b>	<b>7</b>	<b>10</b>	<b>17</b>	376	11	387	16	459	475	879
% App. Total	41.2	58.8		97.2	2.8		3.4	96.6		
PHF	.583	.500	.531	.931	.550	.930	.667	.904	.893	.916

# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Traverse St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
02:00 PM	0	0	4	0	0	3	7
02:15 PM	0	0	1	0	0	2	3
02:30 PM	1	0	1	0	0	2	4
02:45 PM	0	0	4	0	0	2	6
<b>Total</b>	<b>1</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>20</b>
03:00 PM	0	0	2	0	1	3	6
03:15 PM	0	0	2	0	0	1	3
03:30 PM	0	0	0	0	0	1	1
03:45 PM	0	0	1	0	0	3	4
<b>Total</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>14</b>
04:00 PM	0	0	1	0	0	2	3
04:15 PM	0	0	3	0	0	0	3
04:30 PM	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	2	2
<b>Total</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>9</b>
05:00 PM	0	0	0	0	0	2	2
05:15 PM	1	0	0	0	0	0	1
05:30 PM	0	0	3	0	0	0	3
05:45 PM	0	0	0	0	0	1	1
<b>Total</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>7</b>
<b>Grand Total</b>	<b>2</b>	<b>0</b>	<b>22</b>	<b>0</b>	<b>1</b>	<b>25</b>	<b>50</b>
Apprch %	100	0	100	0	3.8	96.2	
Total %	4	0	44	0	2	50	

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	4	0	4	0	3	3	7
02:15 PM	0	0	0	1	0	1	0	2	2	3
02:30 PM	1	0	1	1	0	1	0	2	2	4
02:45 PM	0	0	0	4	0	4	0	2	2	6
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>20</b>
% App. Total	100	0		100	0		0	100		
PHF	.250	.000	.250	.625	.000	.625	.000	.750	.750	.714

# Accurate Counts

978-664-2565

N/S Street : Traverse Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560002  
 Site Code : 98560002  
 Start Date : 12/20/2023  
 Page No : 10

### Groups Printed- Bikes Peds

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds			
02:00 PM	0	0	0	1	0	1	0	0	0	1	1	2
02:15 PM	0	0	9	0	0	0	0	0	0	9	0	9
02:30 PM	0	0	3	0	1	0	0	0	0	3	1	4
02:45 PM	0	0	8	0	0	2	0	0	0	10	0	10
<b>Total</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>2</b>	<b>25</b>
03:00 PM	0	0	3	0	0	0	0	0	0	3	0	3
03:15 PM	0	0	2	0	0	1	0	0	0	3	0	3
03:30 PM	0	0	1	0	0	0	0	0	0	1	0	1
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>7</b>
04:00 PM	0	0	3	0	0	0	0	0	0	3	0	3
04:15 PM	0	0	2	0	0	0	0	0	0	2	0	2
04:30 PM	0	0	3	0	0	1	0	0	0	4	0	4
04:45 PM	0	0	1	0	0	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>35</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>2</b>	<b>42</b>
Apprch %	0	0		50	50		0	0				
Total %	0	0		50	50		0	0		95.2	4.8	

Start Time	Traverse St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	1	0	1	0	0	0	1
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	1	1	0	0	0	1
02:45 PM	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>50</b>
<b>PHF</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.250</b>	<b>.250</b>	<b>.500</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.500</b>

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Middlesex St From North			Nahant St From East			Site Driveway From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	76	0	2	0	0	0	84	0	162
07:15 AM	0	0	0	0	96	0	1	0	0	0	120	0	217
07:30 AM	0	0	1	0	117	0	0	0	0	0	57	1	176
07:45 AM	1	0	1	0	122	0	0	0	0	1	68	0	193
<b>Total</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>411</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>329</b>	<b>1</b>	<b>748</b>
08:00 AM	0	0	0	0	96	0	0	0	0	0	62	0	158
08:15 AM	0	0	1	0	97	0	0	0	0	0	81	0	179
08:30 AM	0	0	0	0	124	0	0	0	0	0	94	0	218
08:45 AM	0	0	0	1	84	0	1	0	1	0	66	1	154
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>401</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>303</b>	<b>1</b>	<b>709</b>
<b>Grand Total</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>812</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>632</b>	<b>2</b>	<b>1457</b>
Apprch %	25	0	75	0.1	99.9	0	80	0	20	0.2	99.5	0.3	
Total %	0.1	0	0.2	0.1	55.7	0	0.3	0	0.1	0.1	43.4	0.1	
Cars	1	0	3	1	801	0	4	0	1	1	619	2	1433
% Cars	100	0	100	100	98.6	0	100	0	100	100	97.9	100	98.4
Trucks	0	0	0	0	11	0	0	0	0	0	13	0	24
% Trucks	0	0	0	0	1.4	0	0	0	0	0	2.1	0	1.6

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	76	0	76	2	0	0	2	0	84	0	84	162
07:15 AM	0	0	0	0	0	96	0	96	1	0	0	1	0	120	0	120	217
07:30 AM	0	0	1	1	0	117	0	117	0	0	0	0	0	57	1	58	176
07:45 AM	1	0	1	2	0	122	0	122	0	0	0	0	1	68	0	69	193
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>411</b>	<b>0</b>	<b>411</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>329</b>	<b>1</b>	<b>331</b>	<b>748</b>
% App. Total	33.3	0	66.7		0	100	0		100	0	0		0.3	99.4	0.3		
PHF	.250	.000	.500	.375	.000	.842	.000	.842	.375	.000	.000	.375	.250	.685	.250	.690	.862
Cars	1	0	2	3	0	404	0	404	3	0	0	3	1	319	1	321	731
% Cars	100	0	100	100	0	98.3	0	98.3	100	0	0	100	100	97.0	100	97.0	97.7
Trucks	0	0	0	0	0	7	0	7	0	0	0	0	0	10	0	10	17
% Trucks	0	0	0	0	0	1.7	0	1.7	0	0	0	0	0	3.0	0	3.0	2.3

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy

E/W Street : Nahant Street

City/State : Wakefield, MA

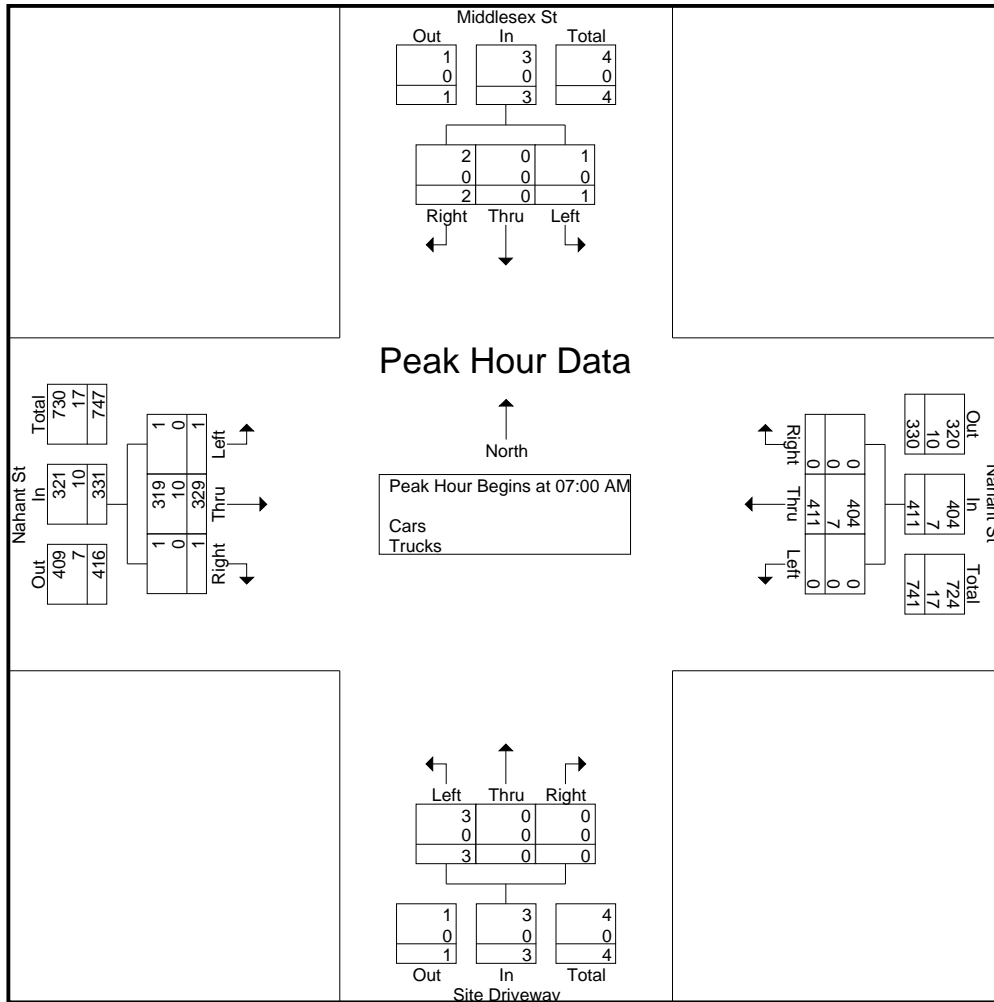
Weather : Clear

File Name : 98560003

Site Code : 98560003

Start Date : 12/20/2023

Page No : 2



**Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1**

**Peak Hour for Each Approach Begins at:**

	07:30 AM				07:45 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	1	1	0	122	0	122	2	0	0	2	0	84	0	84
+15 mins.	1	0	1	2	0	96	0	96	1	0	0	1	0	120	0	120
+30 mins.	0	0	0	0	0	97	0	97	0	0	0	0	0	57	1	58
+45 mins.	0	0	1	1	0	124	0	124	0	0	0	0	1	68	0	69
Total Volume	1	0	3	4	0	439	0	439	3	0	0	3	1	329	1	331
% App. Total	25	0	75		0	100	0		100	0	0		0.3	99.4	0.3	
PHF	.250	.000	.750	.500	.000	.885	.000	.885	.375	.000	.000	.375	.250	.685	.250	.690
Cars	1	0	3	4	0	431	0	431	3	0	0	3	1	319	1	321
% Cars	100	0	100	100	0	98.2	0	98.2	100	0	0	100	100	97	100	97
Trucks	0	0	0	0	0	8	0	8	0	0	0	0	0	10	0	10
% Trucks	0	0	0	0	0	1.8	0	1.8	0	0	0	0	0	3	0	3

# Accurate Counts

978-664-2565

File Name : 98560003

Site Code : 98560003

Start Date : 12/20/2023

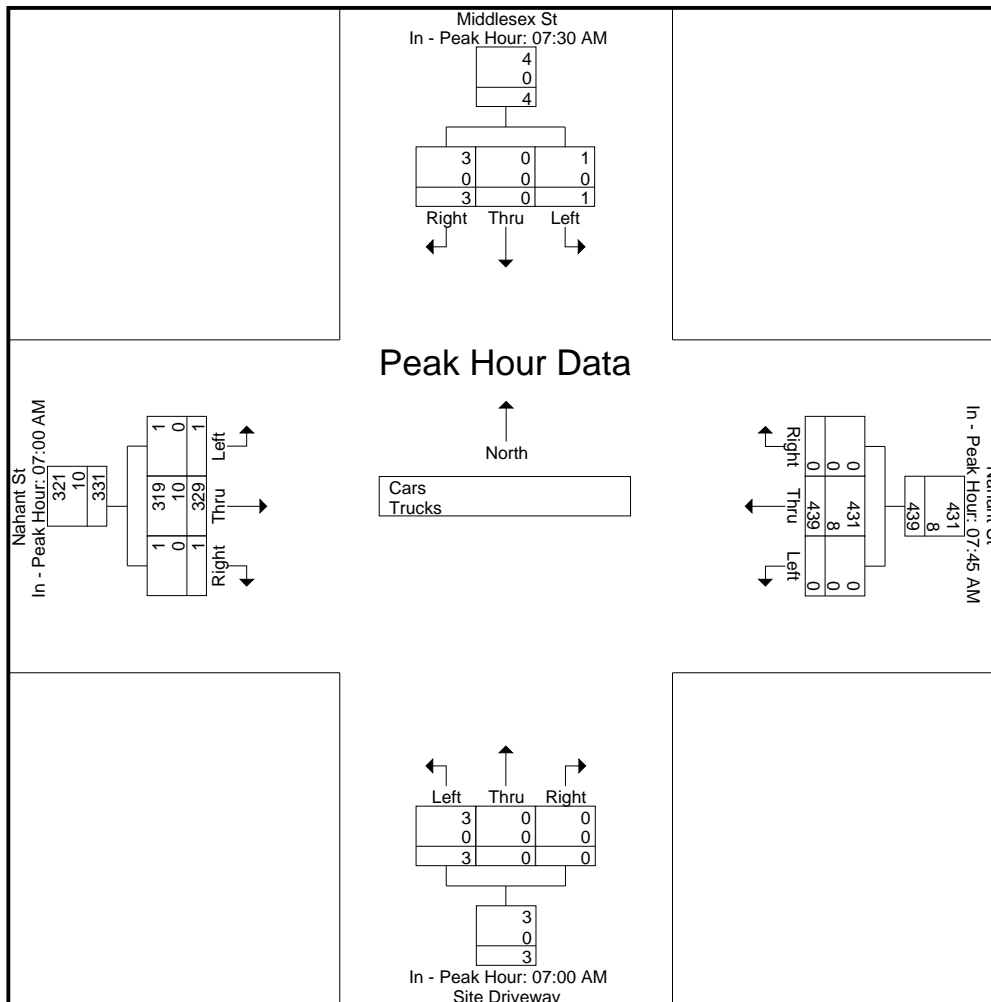
Page No : 3

N/S Street : Middlesex St / Site Dwy

E/W Street : Nahant Street

City/State : Wakefield, MA

Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Middlesex St From North			Nahant St From East			Site Driveway From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	76	0	2	0	0	0	82	0	160
07:15 AM	0	0	0	0	94	0	1	0	0	0	115	0	210
07:30 AM	0	0	1	0	116	0	0	0	0	0	54	1	172
07:45 AM	1	0	1	0	118	0	0	0	0	1	68	0	189
<b>Total</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>404</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>319</b>	<b>1</b>	<b>731</b>
08:00 AM	0	0	0	0	93	0	0	0	0	0	61	0	154
08:15 AM	0	0	1	0	97	0	0	0	0	0	81	0	179
08:30 AM	0	0	0	0	123	0	0	0	0	0	93	0	216
08:45 AM	0	0	0	1	84	0	1	0	1	0	65	1	153
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>397</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>300</b>	<b>1</b>	<b>702</b>
<b>Grand Total</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>801</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>619</b>	<b>2</b>	<b>1433</b>
Apprch %	25	0	75	0.1	99.9	0	80	0	20	0.2	99.5	0.3	
Total %	0.1	0	0.2	0.1	55.9	0	0.3	0	0.1	0.1	43.2	0.1	

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	1	0	1	2	0	118	0	118	0	0	0	0	1	68	0	69	189
08:00 AM	0	0	0	0	0	93	0	93	0	0	0	0	0	61	0	61	154
08:15 AM	0	0	1	1	0	97	0	97	0	0	0	0	0	81	0	81	179
08:30 AM	0	0	0	0	0	123	0	123	0	0	0	0	0	93	0	93	216
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>431</b>	<b>0</b>	<b>431</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>303</b>	<b>0</b>	<b>304</b>	<b>738</b>
<b>% App. Total</b>	<b>33.3</b>	<b>0</b>	<b>66.7</b>		<b>0</b>	<b>100</b>	<b>0</b>		<b>0</b>	<b>0</b>	<b>0</b>		<b>0.3</b>	<b>99.7</b>	<b>0</b>		
PHF	.250	.000	.500	.375	.000	.876	.000	.876	.000	.000	.000	.000	.250	.815	.000	.817	.854



# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Middlesex St From North			Nahant St From East			Site Driveway From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	2
07:15 AM	0	0	0	0	2	0	0	0	0	0	5	0	7
07:30 AM	0	0	0	0	1	0	0	0	0	0	3	0	4
07:45 AM	0	0	0	0	4	0	0	0	0	0	0	0	4
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>17</b>
08:00 AM	0	0	0	0	3	0	0	0	0	0	1	0	4
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	1	0	0	0	0	0	1	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>7</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>24</b>
Apprch %	0	0	0	0	100	0	0	0	0	0	100	0	
Total %	0	0	0	0	45.8	0	0	0	0	0	54.2	0	

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	5	0	5	7
07:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	3	4
07:45 AM	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	4
08:00 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	1	0	1	4
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>19</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>0</b>
PHF	.000	.000	.000	.000	.000	.625	.000	.625	.000	.000	.000	.000	.000	.450	.000	.450	.679

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 10

### Groups Printed- Bikes Peds

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
07:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
07:30 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	0	0	0	2	0	0	0	0	0	0	0	1	0	1	0	0	3	1	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Grand Total</b>	0	0	0	3	0	0	0	0	0	0	0	1	0	1	0	0	4	1	5
Apprch %	0	0	0		0	0	0		0	0	0		0	100	0				
Total %	0	0	0		0	0	0		0	0	0		0	100	0		80	20	

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
<b>% App. Total</b>	0	0	0		0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Middlesex St From North			Nahant St From East			Site Driveway From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	0	0	0	0	114	0	0	0	0	0	73	0	187
02:15 PM	0	0	0	0	122	0	0	0	0	0	91	0	213
02:30 PM	0	0	0	2	87	0	1	0	2	0	99	0	191
02:45 PM	0	0	0	0	110	0	0	0	0	0	80	0	190
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>433</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>343</b>	<b>0</b>	<b>781</b>
03:00 PM	0	0	0	0	104	0	0	0	0	0	105	0	209
03:15 PM	0	0	0	0	71	0	0	0	0	0	104	0	175
03:30 PM	0	0	0	0	89	0	0	0	0	0	95	0	184
03:45 PM	0	0	0	0	99	0	1	0	0	0	129	0	229
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>363</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>433</b>	<b>0</b>	<b>797</b>
04:00 PM	0	0	0	0	99	0	0	0	0	0	119	0	218
04:15 PM	0	0	1	0	107	0	0	0	0	2	124	1	235
04:30 PM	0	0	1	0	74	1	0	0	0	0	109	0	185
04:45 PM	0	0	0	0	83	0	0	0	0	0	118	1	202
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>363</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>470</b>	<b>2</b>	<b>840</b>
05:00 PM	0	0	0	0	84	0	1	0	0	0	109	0	194
05:15 PM	0	0	0	0	97	0	0	0	0	0	149	0	246
05:30 PM	0	0	0	0	100	0	0	0	0	0	114	0	214
05:45 PM	0	0	0	0	73	1	0	0	0	0	114	0	188
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>354</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>486</b>	<b>0</b>	<b>842</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1513</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1732</b>	<b>2</b>	<b>3260</b>
Apprch %	0	0	100	0.1	99.7	0.1	60	0	40	0.1	99.8	0.1	
Total %	0	0	0.1	0.1	46.4	0.1	0.1	0	0.1	0.1	53.1	0.1	
Cars	0	0	2	2	1491	2	3	0	2	2	1711	2	3217
% Cars	0	0	100	100	98.5	100	100	0	100	100	98.8	100	98.7
Trucks	0	0	0	0	22	0	0	0	0	0	21	0	43
% Trucks	0	0	0	0	1.5	0	0	0	0	0	1.2	0	1.3

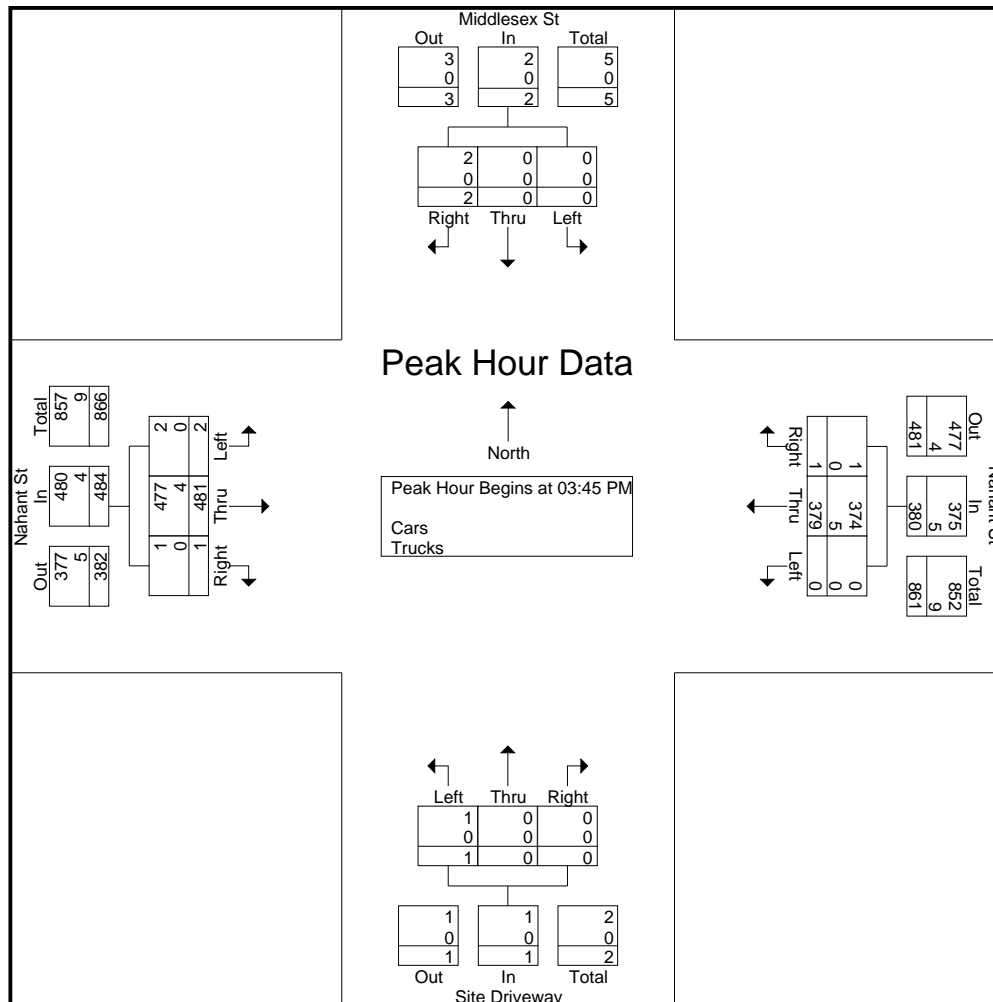
Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:45 PM																	
03:45 PM	0	0	0	0	0	99	0	99	1	0	0	1	0	129	0	129	229
04:00 PM	0	0	0	0	0	99	0	99	0	0	0	0	0	119	0	119	218
04:15 PM	0	0	1	1	0	107	0	107	0	0	0	0	2	124	1	127	235
04:30 PM	0	0	1	1	0	74	1	75	0	0	0	0	0	109	0	109	185
Total Volume	0	0	2	2	0	379	1	380	1	0	0	1	2	481	1	484	867
% App. Total	0	0	100		0	99.7	0.3		100	0	0		0.4	99.4	0.2		
PHF	.000	.000	.500	.500	.000	.886	.250	.888	.250	.000	.000	.250	.250	.932	.250	.938	.922
Cars	0	0	2	2	0	374	1	375	1	0	0	1	2	477	1	480	858
% Cars	0	0	100	100	0	98.7	100	98.7	100	0	0	100	100	99.2	100	99.2	99.0
Trucks	0	0	0	0	0	5	0	5	0	0	0	0	0	4	0	4	9
% Trucks	0	0	0	0	0	1.3	0	1.3	0	0	0	0	0	0.8	0	0.8	1.0

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 2



**Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1**

**Peak Hour for Each Approach Begins at:**

	03:45 PM				02:00 PM				02:00 PM				04:45 PM			
+0 mins.	0	0	0	0	0	114	0	114	0	0	0	0	0	118	1	119
+15 mins.	0	0	0	0	0	<b>122</b>	0	<b>122</b>	0	0	0	0	0	109	0	109
+30 mins.	0	0	<b>1</b>	<b>1</b>	<b>2</b>	87	0	89	<b>1</b>	0	<b>2</b>	<b>3</b>	0	<b>149</b>	0	<b>149</b>
+45 mins.	0	0	1	1	0	110	0	110	0	0	0	0	0	114	0	114
Total Volume	0	0	2	2	2	433	0	435	1	0	2	3	0	490	1	491
% App. Total	0	0	100		0.5	99.5	0		33.3	0	66.7		0	99.8	0.2	
PHF	.000	.000	.500	.500	.250	.887	.000	.891	.250	.000	.250	.250	.000	.822	.250	.824
Cars	0	0	2	2	2	422	0	424	1	0	2	3	0	486	1	487
% Cars	0	0	100	100	100	97.5	0	97.5	100	0	100	100	0	99.2	100	99.2
Trucks	0	0	0	0	0	11	0	11	0	0	0	0	0	4	0	4
% Trucks	0	0	0	0	0	2.5	0	2.5	0	0	0	0	0	0.8	0	0.8

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy

E/W Street : Nahant Street

City/State : Wakefield, MA

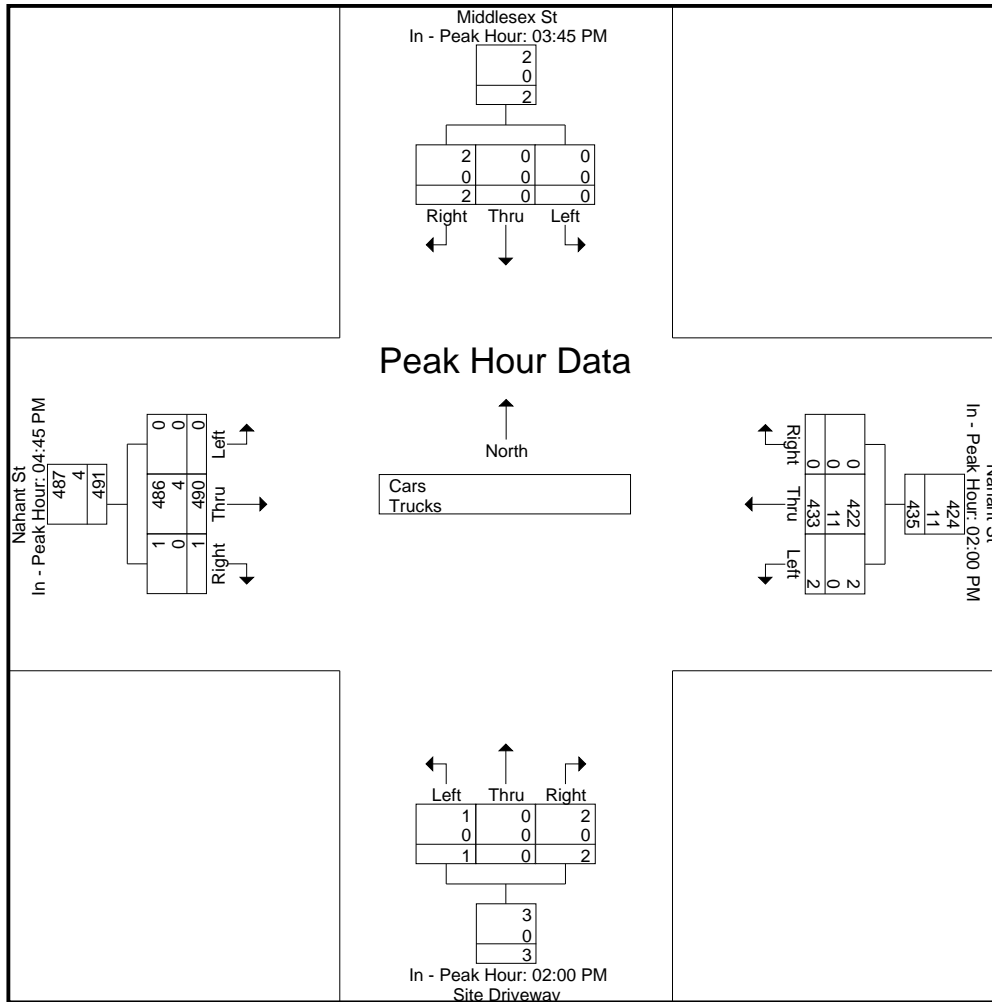
Weather : Clear

File Name : 98560003

Site Code : 98560003

Start Date : 12/20/2023

Page No : 3



# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Middlesex St From North			Nahant St From East			Site Driveway From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	0	0	0	0	110	0	0	0	0	0	70	0	180
02:15 PM	0	0	0	0	121	0	0	0	0	0	90	0	211
02:30 PM	0	0	0	2	86	0	1	0	2	0	97	0	188
02:45 PM	0	0	0	0	105	0	0	0	0	0	78	0	183
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>422</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>335</b>	<b>0</b>	<b>762</b>
03:00 PM	0	0	0	0	103	0	0	0	0	0	103	0	206
03:15 PM	0	0	0	0	69	0	0	0	0	0	103	0	172
03:30 PM	0	0	0	0	89	0	0	0	0	0	94	0	183
03:45 PM	0	0	0	0	98	0	1	0	0	0	127	0	226
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>359</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>427</b>	<b>0</b>	<b>787</b>
04:00 PM	0	0	0	0	97	0	0	0	0	0	118	0	215
04:15 PM	0	0	1	0	105	0	0	0	0	2	124	1	233
04:30 PM	0	0	1	0	74	1	0	0	0	0	108	0	184
04:45 PM	0	0	0	0	83	0	0	0	0	0	117	1	201
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>359</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>467</b>	<b>2</b>	<b>833</b>
05:00 PM	0	0	0	0	84	0	1	0	0	0	108	0	193
05:15 PM	0	0	0	0	97	0	0	0	0	0	147	0	244
05:30 PM	0	0	0	0	97	0	0	0	0	0	114	0	211
05:45 PM	0	0	0	0	73	1	0	0	0	0	113	0	187
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>351</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>482</b>	<b>0</b>	<b>835</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1491</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1711</b>	<b>2</b>	<b>3217</b>
Apprch %	0	0	100	0.1	99.7	0.1	60	0	40	0.1	99.8	0.1	
Total %	0	0	0.1	0.1	46.3	0.1	0.1	0	0.1	0.1	53.2	0.1	

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:45 PM																	
03:45 PM	0	0	0	0	0	98	0	98	1	0	0	1	0	127	0	127	226
04:00 PM	0	0	0	0	0	97	0	97	0	0	0	0	0	118	0	118	215
04:15 PM	0	0	1	1	0	105	0	105	0	0	0	0	2	124	1	127	233
04:30 PM	0	0	1	1	0	74	1	75	0	0	0	0	0	108	0	108	184
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>374</b>	<b>1</b>	<b>375</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>477</b>	<b>1</b>	<b>480</b>	<b>858</b>
% App. Total	0	0	100		0	99.7	0.3		100	0	0		0.4	99.4	0.2		
PHF	.000	.000	.500	.500	.000	.890	.250	.893	.250	.000	.000	.250	.250	.939	.250	.945	.921

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 7

## Groups Printed- Trucks

Start Time	Middlesex St From North			Nahant St From East			Site Driveway From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	0	0	0	0	4	0	0	0	0	0	3	0	7
02:15 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
02:30 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
02:45 PM	0	0	0	0	5	0	0	0	0	0	2	0	7
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>19</b>
03:00 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
03:15 PM	0	0	0	0	2	0	0	0	0	0	1	0	3
03:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
03:45 PM	0	0	0	0	1	0	0	0	0	0	2	0	3
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>10</b>
04:00 PM	0	0	0	0	2	0	0	0	0	0	1	0	3
04:15 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>7</b>
05:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
05:30 PM	0	0	0	0	3	0	0	0	0	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>7</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>0</b>	<b>43</b>
Apprch %	0	0	0	0	100	0	0	0	0	0	100	0	
Total %	0	0	0	0	51.2	0	0	0	0	0	48.8	0	

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	0	0	0	0	0	4	0	4	0	0	0	0	0	3	0	3	7
02:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
02:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	2	3
02:45 PM	0	0	0	0	0	5	0	5	0	0	0	0	0	2	0	2	7
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>8</b>	<b>19</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	
PHF	.000	.000	.000	.000	.000	.550	.000	.550	.000	.000	.000	.000	.000	.667	.000	.667	.679

# Accurate Counts

978-664-2565

N/S Street : Middlesex St / Site Dwy  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560003  
 Site Code : 98560003  
 Start Date : 12/20/2023  
 Page No : 10

## Groups Printed- Bikes Peds

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
02:00 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2
02:15 PM	0	0	0	8	0	0	0	0	0	0	0	1	0	0	0	0	9	0	9
02:30 PM	0	0	0	8	0	2	0	0	0	0	0	0	0	0	0	0	8	2	10
02:45 PM	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	12	0	12
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>31</b>	<b>2</b>	<b>33</b>
03:00 PM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
03:15 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	3	0	3
03:30 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	3	0	3
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>
04:00 PM	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	4	0	4
04:15 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	2	1	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
04:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>1</b>	<b>9</b>
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>49</b>	<b>3</b>	<b>52</b>
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0				
Total %	0	0	0		0	66.7	0		0	0	0		0	33.3	0		94.2	5.8	

Start Time	Middlesex St From North				Nahant St From East				Site Driveway From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250



# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Hart St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	0	7	69	1	2	82	161
07:15 AM	0	15	81	0	7	113	216
07:30 AM	0	15	100	1	10	46	172
07:45 AM	1	7	115	0	5	64	192
<b>Total</b>	<b>1</b>	<b>44</b>	<b>365</b>	<b>2</b>	<b>24</b>	<b>305</b>	<b>741</b>
08:00 AM	0	6	92	0	1	61	160
08:15 AM	1	8	88	0	6	76	179
08:30 AM	2	10	113	0	7	90	222
08:45 AM	1	7	79	1	7	60	155
<b>Total</b>	<b>4</b>	<b>31</b>	<b>372</b>	<b>1</b>	<b>21</b>	<b>287</b>	<b>716</b>
<b>Grand Total</b>	<b>5</b>	<b>75</b>	<b>737</b>	<b>3</b>	<b>45</b>	<b>592</b>	<b>1457</b>
Apprch %	6.2	93.8	99.6	0.4	7.1	92.9	
Total %	0.3	5.1	50.6	0.2	3.1	40.6	
Cars	5	74	729	3	45	582	1438
% Cars	100	98.7	98.9	100	100	98.3	98.7
Trucks	0	1	8	0	0	10	19
% Trucks	0	1.3	1.1	0	0	1.7	1.3

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	1	7	8	115	0	115	5	64	69	192
08:00 AM	0	6	6	92	0	92	1	61	62	160
08:15 AM	1	8	9	88	0	88	6	76	82	179
08:30 AM	2	10	12	113	0	113	7	90	97	222
Total Volume	4	31	35	408	0	408	19	291	310	753
% App. Total	11.4	88.6		100	0		6.1	93.9		
PHF	.500	.775	.729	.887	.000	.887	.679	.808	.799	.848
Cars	4	30	34	402	0	402	19	289	308	744
% Cars	100	96.8	97.1	98.5	0	98.5	100	99.3	99.4	98.8
Trucks	0	1	1	6	0	6	0	2	2	9
% Trucks	0	3.2	2.9	1.5	0	1.5	0	0.7	0.6	1.2

# Accurate Counts

978-664-2565

File Name : 98560004

Site Code : 98560004

Start Date : 12/20/2023

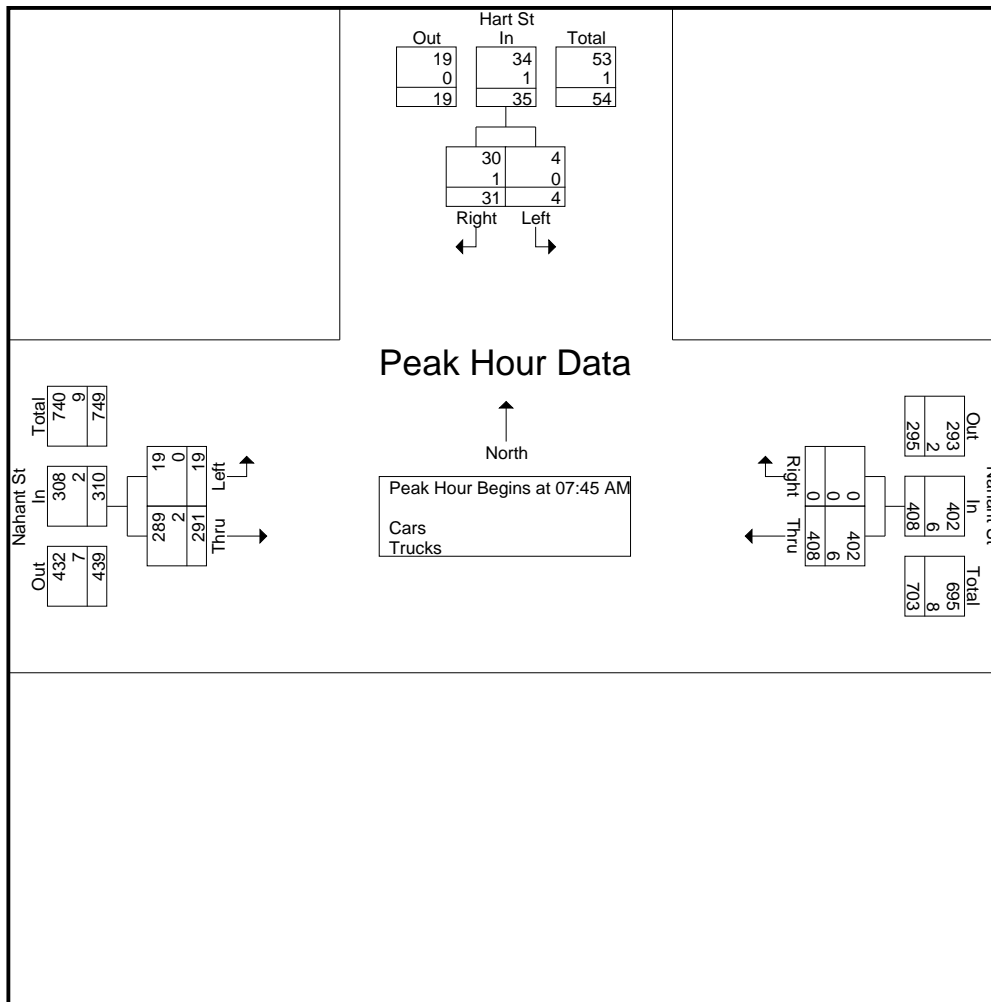
Page No : 2

N/S Street : Hart Street

E/W Street : Nahant Street

City/State : Wakefield, MA

Weather : Clear



**Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1**

Peak Hour for Each Approach Begins at:

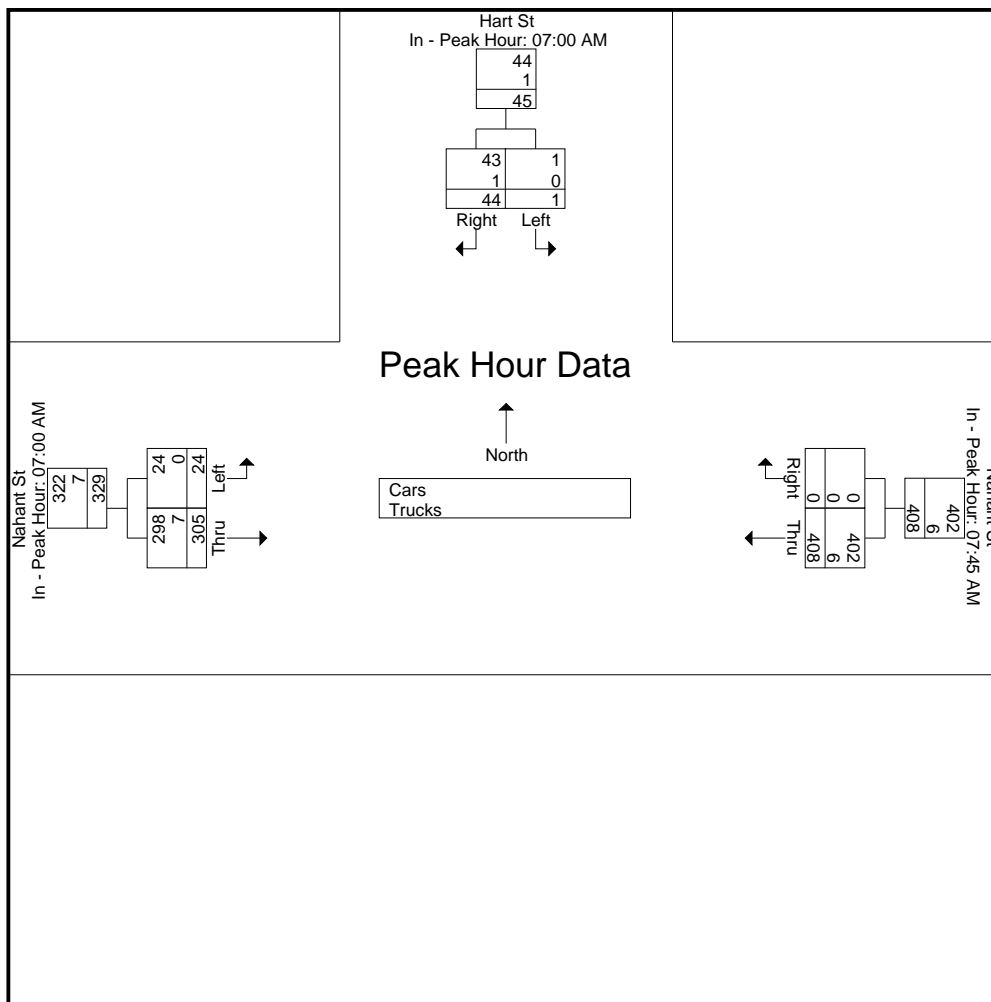
	07:00 AM			07:45 AM			07:00 AM		
+0 mins.	0	7	7	<b>115</b>	0	<b>115</b>	2	82	84
+15 mins.	0	<b>15</b>	<b>15</b>	92	0	92	7	<b>113</b>	<b>120</b>
+30 mins.	0	15	15	88	0	88	<b>10</b>	46	56
+45 mins.	<b>1</b>	7	8	113	0	113	5	64	69
Total Volume	1	44	45	408	0	408	24	305	329
% App. Total	2.2	97.8		100	0		7.3	92.7	
PHF	.250	.733	.750	.887	.000	.887	.600	.675	.685
Cars	1	43	44	402	0	402	24	298	322
% Cars	100	97.7	97.8	98.5	0	98.5	100	97.7	97.9
Trucks	0	1	1	6	0	6	0	7	7
% Trucks	0	2.3	2.2	1.5	0	1.5	0	2.3	2.1

# Accurate Counts

978-664-2565

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 4

### Groups Printed- Cars

Start Time	Hart St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	0	7	69	1	2	81	160
07:15 AM	0	15	80	0	7	110	212
07:30 AM	0	15	99	1	10	43	168
07:45 AM	1	6	112	0	5	64	188
<b>Total</b>	<b>1</b>	<b>43</b>	<b>360</b>	<b>2</b>	<b>24</b>	<b>298</b>	<b>728</b>
08:00 AM	0	6	90	0	1	60	157
08:15 AM	1	8	88	0	6	75	178
08:30 AM	2	10	112	0	7	90	221
08:45 AM	1	7	79	1	7	59	154
<b>Total</b>	<b>4</b>	<b>31</b>	<b>369</b>	<b>1</b>	<b>21</b>	<b>284</b>	<b>710</b>
<b>Grand Total</b>	<b>5</b>	<b>74</b>	<b>729</b>	<b>3</b>	<b>45</b>	<b>582</b>	<b>1438</b>
Apprch %	6.3	93.7	99.6	0.4	7.2	92.8	
Total %	0.3	5.1	50.7	0.2	3.1	40.5	

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	1	6	7	112	0	112	5	64	69	188
08:00 AM	0	6	6	90	0	90	1	60	61	157
08:15 AM	1	8	9	88	0	88	6	75	81	178
08:30 AM	2	10	12	112	0	112	7	90	97	221
<b>Total Volume</b>	<b>4</b>	<b>30</b>	<b>34</b>	<b>402</b>	<b>0</b>	<b>402</b>	<b>19</b>	<b>289</b>	<b>308</b>	<b>744</b>
% App. Total	11.8	88.2		100	0		6.2	93.8		
PHF	.500	.750	.708	.897	.000	.897	.679	.803	.794	.842

# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Hart St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	0	0	0	0	0	1	1
07:15 AM	0	0	1	0	0	3	4
07:30 AM	0	0	1	0	0	3	4
07:45 AM	0	1	3	0	0	0	4
<b>Total</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>13</b>
08:00 AM	0	0	2	0	0	1	3
08:15 AM	0	0	0	0	0	1	1
08:30 AM	0	0	1	0	0	0	1
08:45 AM	0	0	0	0	0	1	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>6</b>
<b>Grand Total</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>19</b>
Apprch %	0	100	100	0	0	100	
Total %	0	5.3	42.1	0	0	52.6	

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	1	0	1	0	3	3	4
07:30 AM	0	0	0	1	0	1	0	3	3	4
07:45 AM	0	1	1	3	0	3	0	0	0	4
08:00 AM	0	0	0	2	0	2	0	1	1	3
<b>Total Volume</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>15</b>
<b>% App. Total</b>	<b>0</b>	<b>100</b>		<b>100</b>	<b>0</b>		<b>0</b>	<b>100</b>		
PHF	.000	.250	.250	.583	.000	.583	.000	.583	.583	.938

# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 10

### Groups Printed- Bikes Peds

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds			
07:00 AM	0	0	0	0	0	0	0	1	0	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	0	0	0	0	0	0	0	1	0	0	1	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	1	0	0	0	0	0	0	1	0	1
<b>Total</b>	0	0	1	0	0	0	0	0	0	1	0	1
<b>Grand Total</b>	0	0	1	0	0	0	0	1	0	1	1	2
Apprch %	0	0		0	0		0	100				
Total %	0	0		0	0		0	100		50	50	

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	1	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	0	0	0	0	0	0	0	1	1	1
<b>% App. Total</b>	0	0		0	0		0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.250	.250	.250

# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Hart St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
02:00 PM	1	11	103	2	6	68	191
02:15 PM	3	7	117	0	7	84	218
02:30 PM	0	7	81	0	15	87	190
02:45 PM	0	7	104	2	11	72	196
<b>Total</b>	<b>4</b>	<b>32</b>	<b>405</b>	<b>4</b>	<b>39</b>	<b>311</b>	<b>795</b>
03:00 PM	0	6	96	0	11	92	205
03:15 PM	0	0	71	1	5	98	175
03:30 PM	0	11	78	0	13	82	184
03:45 PM	0	10	90	1	13	115	229
<b>Total</b>	<b>0</b>	<b>27</b>	<b>335</b>	<b>2</b>	<b>42</b>	<b>387</b>	<b>793</b>
04:00 PM	1	5	94	1	8	112	221
04:15 PM	0	11	93	1	13	107	225
04:30 PM	1	4	72	0	7	104	188
04:45 PM	1	9	72	0	3	115	200
<b>Total</b>	<b>3</b>	<b>29</b>	<b>331</b>	<b>2</b>	<b>31</b>	<b>438</b>	<b>834</b>
05:00 PM	0	4	80	1	8	101	194
05:15 PM	1	4	92	2	11	134	244
05:30 PM	0	9	91	1	9	108	218
05:45 PM	2	5	69	1	4	108	189
<b>Total</b>	<b>3</b>	<b>22</b>	<b>332</b>	<b>5</b>	<b>32</b>	<b>451</b>	<b>845</b>
<b>Grand Total</b>	<b>10</b>	<b>110</b>	<b>1403</b>	<b>13</b>	<b>144</b>	<b>1587</b>	<b>3267</b>
Apprch %	8.3	91.7	99.1	0.9	8.3	91.7	
Total %	0.3	3.4	42.9	0.4	4.4	48.6	
Cars	10	110	1380	13	144	1570	3227
% Cars	100	100	98.4	100	100	98.9	98.8
Trucks	0	0	23	0	0	17	40
% Trucks	0	0	1.6	0	0	1.1	1.2

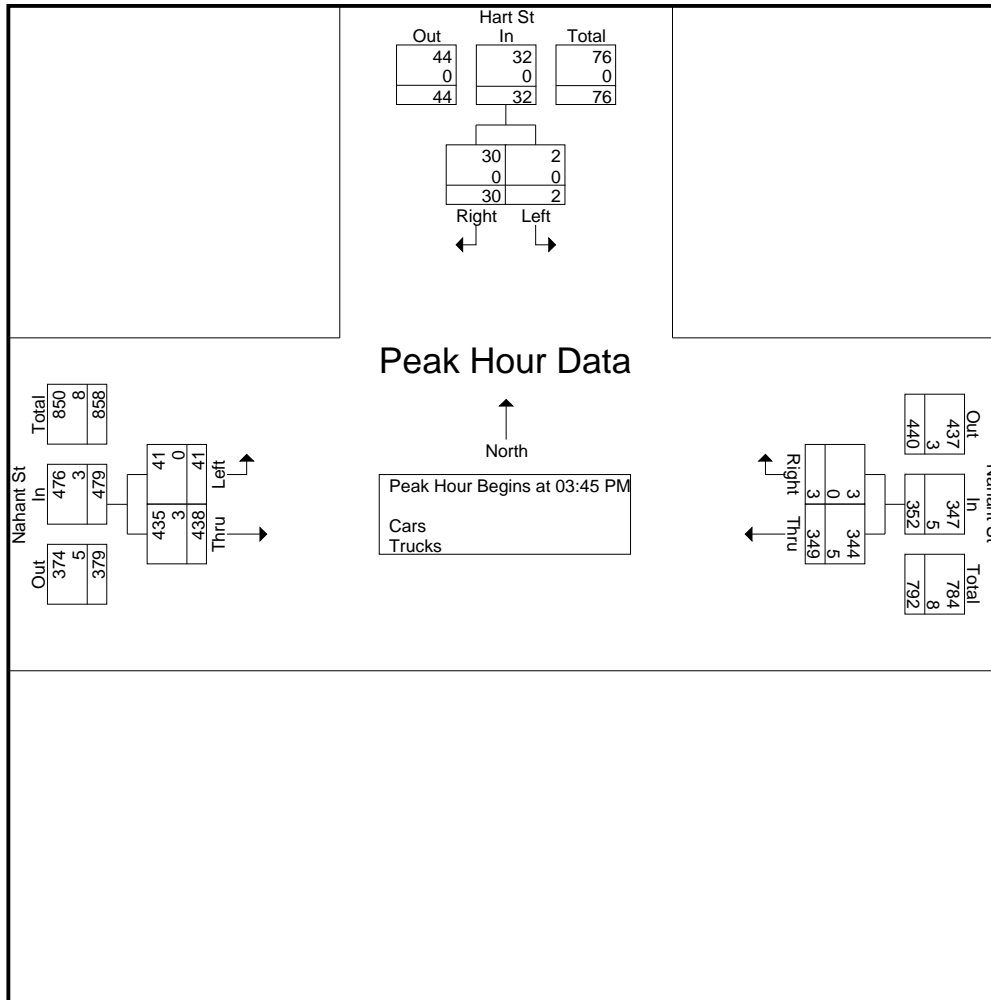
Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:45 PM										
03:45 PM	0	10	10	90	1	91	13	115	128	229
04:00 PM	1	5	6	94	1	95	8	112	120	221
04:15 PM	0	11	11	93	1	94	13	107	120	225
04:30 PM	1	4	5	72	0	72	7	104	111	188
Total Volume	2	30	32	349	3	352	41	438	479	863
% App. Total	6.2	93.8		99.1	0.9		8.6	91.4		
PHF	.500	.682	.727	.928	.750	.926	.788	.952	.936	.942
Cars	2	30	32	344	3	347	41	435	476	855
% Cars	100	100	100	98.6	100	98.6	100	99.3	99.4	99.1
Trucks	0	0	0	5	0	5	0	3	3	8
% Trucks	0	0	0	1.4	0	1.4	0	0.7	0.6	0.9

# Accurate Counts

978-664-2565

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 2

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear



**Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1**

Peak Hour for Each Approach Begins at:

	03:30 PM			02:00 PM			04:45 PM		
+0 mins.	0	11	11	103	2	105	3	115	118
+15 mins.	0	10	10	117	0	117	8	101	109
+30 mins.	1	5	6	81	0	81	11	134	145
+45 mins.	0	11	11	104	2	106	9	108	117
<b>Total Volume</b>	1	37	38	405	4	409	31	458	489
<b>% App. Total</b>	2.6	97.4		99	1		6.3	93.7	
PHF	.250	.841	.864	.865	.500	.874	.705	.854	.843
Cars	1	37	38	394	4	398	31	455	486
% Cars	100	100	100	97.3	100	97.3	100	99.3	99.4
Trucks	0	0	0	11	0	11	0	3	3
% Trucks	0	0	0	2.7	0	2.7	0	0.7	0.6

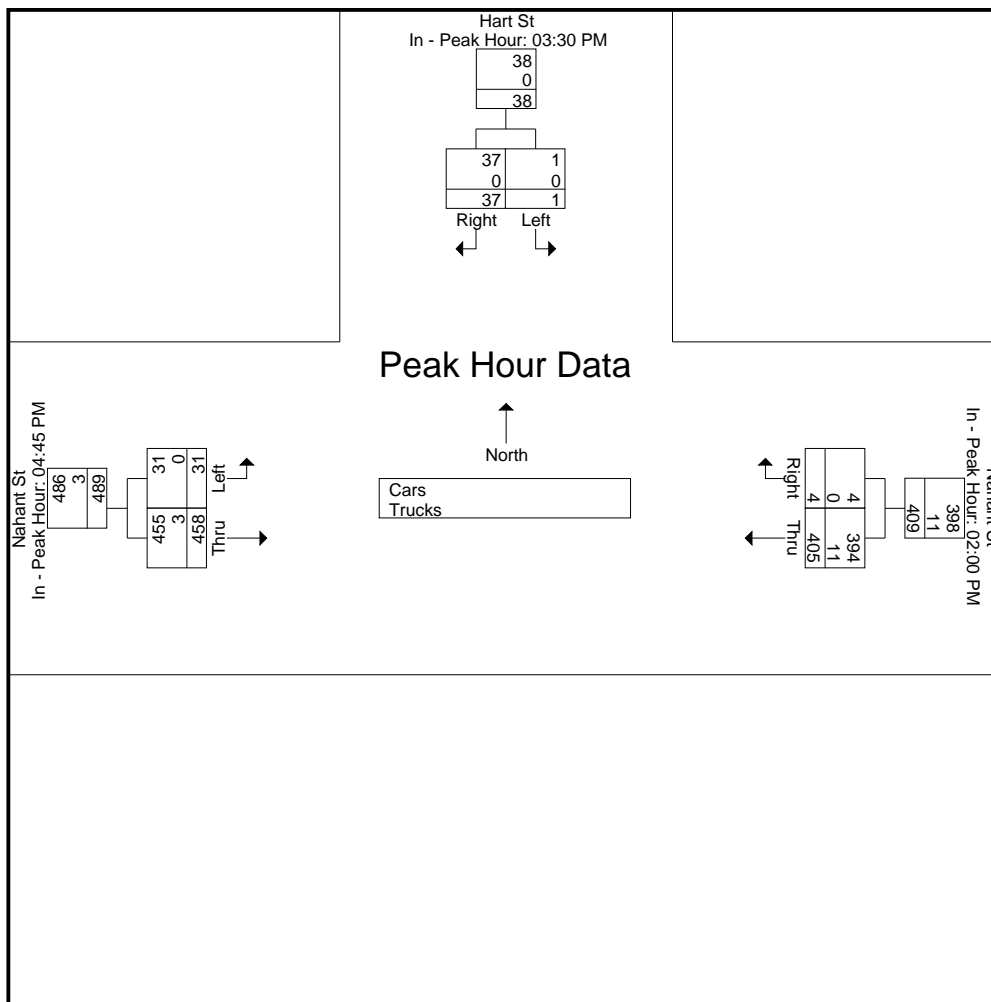


# Accurate Counts

978-664-2565

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Hart St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
02:00 PM	1	11	99	2	6	67	186
02:15 PM	3	7	116	0	7	84	217
02:30 PM	0	7	80	0	15	83	185
02:45 PM	0	7	99	2	11	70	189
<b>Total</b>	<b>4</b>	<b>32</b>	<b>394</b>	<b>4</b>	<b>39</b>	<b>304</b>	<b>777</b>
03:00 PM	0	6	95	0	11	90	202
03:15 PM	0	0	69	1	5	98	173
03:30 PM	0	11	78	0	13	81	183
03:45 PM	0	10	89	1	13	114	227
<b>Total</b>	<b>0</b>	<b>27</b>	<b>331</b>	<b>2</b>	<b>42</b>	<b>383</b>	<b>785</b>
04:00 PM	1	5	92	1	8	111	218
04:15 PM	0	11	91	1	13	107	223
04:30 PM	1	4	72	0	7	103	187
04:45 PM	1	9	72	0	3	113	198
<b>Total</b>	<b>3</b>	<b>29</b>	<b>327</b>	<b>2</b>	<b>31</b>	<b>434</b>	<b>826</b>
05:00 PM	0	4	80	1	8	101	194
05:15 PM	1	4	92	2	11	134	244
05:30 PM	0	9	87	1	9	107	213
05:45 PM	2	5	69	1	4	107	188
<b>Total</b>	<b>3</b>	<b>22</b>	<b>328</b>	<b>5</b>	<b>32</b>	<b>449</b>	<b>839</b>
<b>Grand Total</b>	<b>10</b>	<b>110</b>	<b>1380</b>	<b>13</b>	<b>144</b>	<b>1570</b>	<b>3227</b>
Apprch %	8.3	91.7	99.1	0.9	8.4	91.6	
Total %	0.3	3.4	42.8	0.4	4.5	48.7	

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:45 PM										
03:45 PM	0	10	10	89	1	90	13	114	127	227
04:00 PM	1	5	6	92	1	93	8	111	119	218
04:15 PM	0	11	11	91	1	92	13	107	120	223
04:30 PM	1	4	5	72	0	72	7	103	110	187
<b>Total Volume</b>	<b>2</b>	<b>30</b>	<b>32</b>	<b>344</b>	<b>3</b>	<b>347</b>	<b>41</b>	<b>435</b>	<b>476</b>	<b>855</b>
<b>% App. Total</b>	<b>6.2</b>	<b>93.8</b>		<b>99.1</b>	<b>0.9</b>		<b>8.6</b>	<b>91.4</b>		
<b>PHF</b>	<b>.500</b>	<b>.682</b>	<b>.727</b>	<b>.935</b>	<b>.750</b>	<b>.933</b>	<b>.788</b>	<b>.954</b>	<b>.937</b>	<b>.942</b>

# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Hart St From North		Nahant St From East		Nahant St From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
02:00 PM	0	0	4	0	0	1	5
02:15 PM	0	0	1	0	0	0	1
02:30 PM	0	0	1	0	0	4	5
02:45 PM	0	0	5	0	0	2	7
<b>Total</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>18</b>
03:00 PM	0	0	1	0	0	2	3
03:15 PM	0	0	2	0	0	0	2
03:30 PM	0	0	0	0	0	1	1
03:45 PM	0	0	1	0	0	1	2
<b>Total</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>8</b>
04:00 PM	0	0	2	0	0	1	3
04:15 PM	0	0	2	0	0	0	2
04:30 PM	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	2	2
<b>Total</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>8</b>
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	4	0	0	1	5
05:45 PM	0	0	0	0	0	1	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>6</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>40</b>
Apprch %	0	0	100	0	0	100	
Total %	0	0	57.5	0	0	42.5	

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	4	0	4	0	1	1	5
02:15 PM	0	0	0	1	0	1	0	0	0	1
02:30 PM	0	0	0	1	0	1	0	4	4	5
02:45 PM	0	0	0	5	0	5	0	2	2	7
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>18</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>
PHF	.000	.000	.000	.550	.000	.550	.000	.438	.438	.643

# Accurate Counts

978-664-2565

N/S Street : Hart Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560004  
 Site Code : 98560004  
 Start Date : 12/20/2023  
 Page No : 10

### Groups Printed- Bikes Peds

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds			
02:00 PM	0	0	2	0	0	1	0	0	1	4	0	4
02:15 PM	0	0	9	0	0	0	0	0	0	9	0	9
02:30 PM	0	0	6	0	0	0	0	0	0	6	0	6
02:45 PM	0	0	6	0	0	1	0	0	0	7	0	7
<b>Total</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>26</b>	<b>0</b>	<b>26</b>
03:00 PM	0	0	2	0	0	0	0	0	0	2	0	2
03:15 PM	0	0	1	0	0	0	0	0	0	1	0	1
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>3</b>
04:00 PM	0	0	3	0	0	0	0	0	0	3	0	3
04:15 PM	0	0	0	0	0	0	1	0	0	0	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>4</b>
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>32</b>	<b>1</b>	<b>33</b>
Apprch %	0	0		0	0		100	0				
Total %	0	0		0	0		100	0		97	3	

Start Time	Hart St From North			Nahant St From East			Nahant St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:30 PM										
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	1	0	1	1
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>PHF</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.250</b>	<b>.000</b>	<b>.250</b>	<b>.250</b>

# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	75	68	32	15	10	13	39	68	52	24	31	40	467
07:15 AM	74	90	33	13	8	24	35	76	99	30	42	27	551
07:30 AM	49	93	27	44	16	34	40	60	95	14	28	30	530
07:45 AM	13	79	42	52	31	33	47	67	61	19	20	37	501
<b>Total</b>	<b>211</b>	<b>330</b>	<b>134</b>	<b>124</b>	<b>65</b>	<b>104</b>	<b>161</b>	<b>271</b>	<b>307</b>	<b>87</b>	<b>121</b>	<b>134</b>	<b>2049</b>
08:00 AM	3	65	26	15	9	8	45	62	15	20	7	37	312
08:15 AM	5	76	20	4	4	2	69	73	12	40	3	42	350
08:30 AM	12	84	61	5	2	3	64	88	9	47	6	48	429
08:45 AM	3	67	20	5	5	6	55	60	6	16	0	52	295
<b>Total</b>	<b>23</b>	<b>292</b>	<b>127</b>	<b>29</b>	<b>20</b>	<b>19</b>	<b>233</b>	<b>283</b>	<b>42</b>	<b>123</b>	<b>16</b>	<b>179</b>	<b>1386</b>
<b>Grand Total</b>	<b>234</b>	<b>622</b>	<b>261</b>	<b>153</b>	<b>85</b>	<b>123</b>	<b>394</b>	<b>554</b>	<b>349</b>	<b>210</b>	<b>137</b>	<b>313</b>	<b>3435</b>
Apprch %	20.9	55.7	23.4	42.4	23.5	34.1	30.4	42.7	26.9	31.8	20.8	47.4	
Total %	6.8	18.1	7.6	4.5	2.5	3.6	11.5	16.1	10.2	6.1	4	9.1	
Cars	226	602	261	102	82	105	389	535	316	206	131	312	3267
% Cars	96.6	96.8	100	66.7	96.5	85.4	98.7	96.6	90.5	98.1	95.6	99.7	95.1
Trucks	8	20	0	51	3	18	5	19	33	4	6	1	168
% Trucks	3.4	3.2	0	33.3	3.5	14.6	1.3	3.4	9.5	1.9	4.4	0.3	4.9

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	<b>75</b>	68	32	175	15	10	13	38	39	68	52	159	24	31	<b>40</b>	95	467
07:15 AM	74	90	33	<b>197</b>	13	8	24	45	35	<b>76</b>	<b>99</b>	<b>210</b>	<b>30</b>	<b>42</b>	27	<b>99</b>	<b>551</b>
07:30 AM	49	<b>93</b>	27	169	44	16	<b>34</b>	94	40	60	95	195	14	28	30	72	530
07:45 AM	13	79	<b>42</b>	134	<b>52</b>	<b>31</b>	<b>33</b>	<b>116</b>	<b>47</b>	67	61	175	19	20	37	76	501
<b>Total Volume</b>	<b>211</b>	<b>330</b>	<b>134</b>	<b>675</b>	<b>124</b>	<b>65</b>	<b>104</b>	<b>293</b>	<b>161</b>	<b>271</b>	<b>307</b>	<b>739</b>	<b>87</b>	<b>121</b>	<b>134</b>	<b>342</b>	<b>2049</b>
% App. Total	31.3	48.9	19.9		42.3	22.2	35.5		21.8	36.7	41.5		25.4	35.4	39.2		
PHF	.703	.887	.798	.857	.596	.524	.765	.631	.856	.891	.775	.880	.725	.720	.838	.864	.930
Cars	206	318	134	658	80	63	87	230	159	261	284	704	86	115	134	335	1927
% Cars	97.6	96.4	100	97.5	64.5	96.9	83.7	78.5	98.8	96.3	92.5	95.3	98.9	95.0	100	98.0	94.0
Trucks	5	12	0	17	44	2	17	63	2	10	23	35	1	6	0	7	122
% Trucks	2.4	3.6	0	2.5	35.5	3.1	16.3	21.5	1.2	3.7	7.5	4.7	1.1	5.0	0	2.0	6.0

# Accurate Counts

978-664-2565

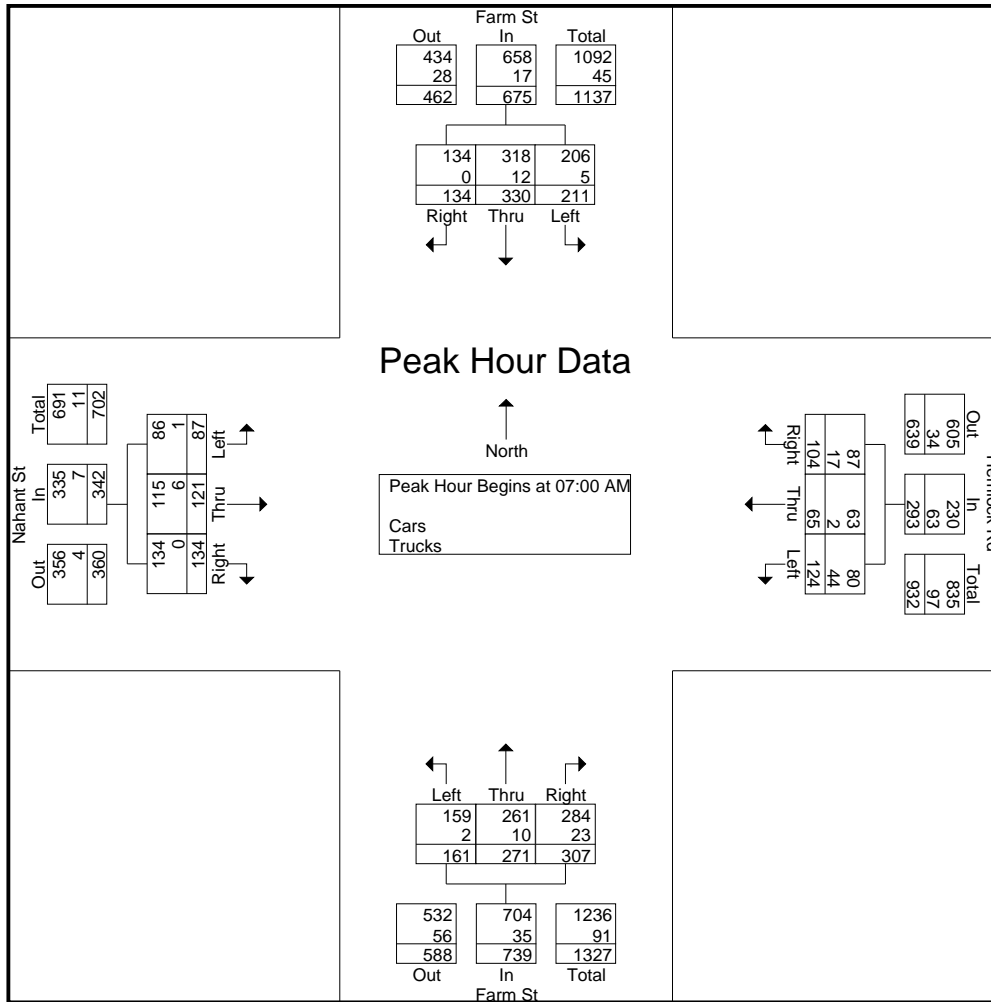
File Name : 98560005

Site Code : 98560005

Start Date : 12/20/2023

Page No : 2

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

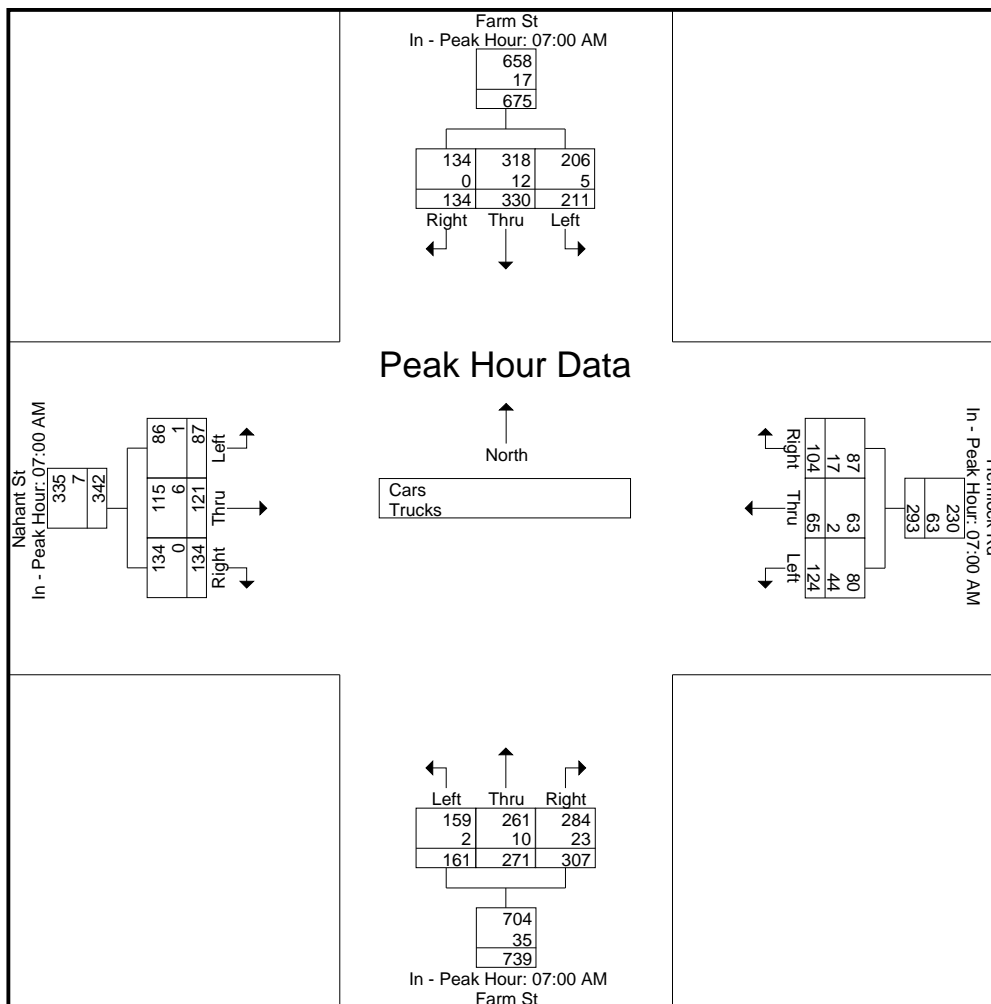
	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	<b>75</b>	68	32	175	15	10	13	38	39	68	52	159	24	31	<b>40</b>	95
+15 mins.	74	90	33	<b>197</b>	13	8	24	45	35	<b>76</b>	<b>99</b>	<b>210</b>	<b>30</b>	<b>42</b>	27	<b>99</b>
+30 mins.	49	<b>93</b>	27	169	44	16	<b>34</b>	94	40	60	95	195	14	28	30	72
+45 mins.	13	79	<b>42</b>	134	<b>52</b>	<b>31</b>	33	<b>116</b>	<b>47</b>	67	61	175	19	20	37	76
Total Volume	211	330	134	675	124	65	104	293	161	271	307	739	87	121	134	342
% App. Total	31.3	48.9	19.9		42.3	22.2	35.5		21.8	36.7	41.5		25.4	35.4	39.2	
PHF	.703	.887	.798	.857	.596	.524	.765	.631	.856	.891	.775	.880	.725	.720	.838	.864
Cars	206	318	134	658	80	63	87	230	159	261	284	704	86	115	134	335
% Cars	97.6	96.4	100	97.5	64.5	96.9	83.7	78.5	98.8	96.3	92.5	95.3	98.9	95	100	98
Trucks	5	12	0	17	44	2	17	63	2	10	23	35	1	6	0	7
% Trucks	2.4	3.6	0	2.5	35.5	3.1	16.3	21.5	1.2	3.7	7.5	4.7	1.1	5	0	2

# Accurate Counts

978-664-2565

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 4

### Groups Printed- Cars

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	74	65	32	6	10	10	39	65	50	24	29	40	444
07:15 AM	74	84	33	9	8	15	35	74	89	30	40	27	518
07:30 AM	45	93	27	26	16	30	40	57	87	13	26	30	490
07:45 AM	13	76	42	39	29	32	45	65	58	19	20	37	475
<b>Total</b>	<b>206</b>	<b>318</b>	<b>134</b>	<b>80</b>	<b>63</b>	<b>87</b>	<b>159</b>	<b>261</b>	<b>284</b>	<b>86</b>	<b>115</b>	<b>134</b>	<b>1927</b>
08:00 AM	3	63	26	15	8	7	44	61	15	20	7	36	305
08:15 AM	4	75	20	3	4	2	69	72	7	39	3	42	340
08:30 AM	11	83	61	2	2	3	63	84	7	46	6	48	416
08:45 AM	2	63	20	2	5	6	54	57	3	15	0	52	279
<b>Total</b>	<b>20</b>	<b>284</b>	<b>127</b>	<b>22</b>	<b>19</b>	<b>18</b>	<b>230</b>	<b>274</b>	<b>32</b>	<b>120</b>	<b>16</b>	<b>178</b>	<b>1340</b>
<b>Grand Total</b>	<b>226</b>	<b>602</b>	<b>261</b>	<b>102</b>	<b>82</b>	<b>105</b>	<b>389</b>	<b>535</b>	<b>316</b>	<b>206</b>	<b>131</b>	<b>312</b>	<b>3267</b>
Apprch %	20.8	55.3	24	35.3	28.4	36.3	31.4	43.1	25.5	31.7	20.2	48.1	
Total %	6.9	18.4	8	3.1	2.5	3.2	11.9	16.4	9.7	6.3	4	9.6	

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
<b>Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1</b>																	
<b>Peak Hour for Entire Intersection Begins at 07:00 AM</b>																	
07:00 AM	<b>74</b>	65	32	171	6	10	10	26	39	65	50	154	24	29	<b>40</b>	93	444
07:15 AM	74	84	33	<b>191</b>	9	8	15	32	35	<b>74</b>	<b>89</b>	<b>198</b>	<b>30</b>	<b>40</b>	27	<b>97</b>	<b>518</b>
07:30 AM	45	<b>93</b>	27	165	26	16	30	72	40	57	87	184	13	26	30	69	490
07:45 AM	13	76	<b>42</b>	131	<b>39</b>	<b>29</b>	<b>32</b>	<b>100</b>	<b>45</b>	65	58	168	19	20	37	76	475
<b>Total Volume</b>	206	318	134	658	80	63	87	230	159	261	284	704	86	115	134	335	1927
<b>% App. Total</b>	31.3	48.3	20.4		34.8	27.4	37.8		22.6	37.1	40.3		25.7	34.3	40		
PHF	.696	.855	.798	.861	.513	.543	.680	.575	.883	.882	.798	.889	.717	.719	.838	.863	.930



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 7

### Groups Printed- Trucks

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	1	3	0	9	0	3	0	3	2	0	2	0	23
07:15 AM	0	6	0	4	0	9	0	2	10	0	2	0	33
07:30 AM	4	0	0	18	0	4	0	3	8	1	2	0	40
07:45 AM	0	3	0	13	2	1	2	2	3	0	0	0	26
<b>Total</b>	<b>5</b>	<b>12</b>	<b>0</b>	<b>44</b>	<b>2</b>	<b>17</b>	<b>2</b>	<b>10</b>	<b>23</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>122</b>
08:00 AM	0	2	0	0	1	1	1	1	0	0	0	1	7
08:15 AM	1	1	0	1	0	0	0	1	5	1	0	0	10
08:30 AM	1	1	0	3	0	0	1	4	2	1	0	0	13
08:45 AM	1	4	0	3	0	0	1	3	3	1	0	0	16
<b>Total</b>	<b>3</b>	<b>8</b>	<b>0</b>	<b>7</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>9</b>	<b>10</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>46</b>
<b>Grand Total</b>	<b>8</b>	<b>20</b>	<b>0</b>	<b>51</b>	<b>3</b>	<b>18</b>	<b>5</b>	<b>19</b>	<b>33</b>	<b>4</b>	<b>6</b>	<b>1</b>	<b>168</b>
Apprch %	28.6	71.4	0	70.8	4.2	25	8.8	33.3	57.9	36.4	54.5	9.1	
Total %	4.8	11.9	0	30.4	1.8	10.7	3	11.3	19.6	2.4	3.6	0.6	

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
<b>Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1</b>																	
<b>Peak Hour for Entire Intersection Begins at 07:00 AM</b>																	
07:00 AM	1	3	0	4	9	0	3	12	0	<b>3</b>	2	5	0	<b>2</b>	0	2	23
07:15 AM	0	<b>6</b>	0	<b>6</b>	4	0	<b>9</b>	13	0	2	<b>10</b>	<b>12</b>	0	2	0	2	33
07:30 AM	<b>4</b>	0	0	4	<b>18</b>	0	4	<b>22</b>	0	3	8	11	<b>1</b>	2	0	<b>3</b>	<b>40</b>
07:45 AM	0	3	0	3	13	<b>2</b>	1	16	<b>2</b>	2	3	7	0	0	0	0	26
<b>Total Volume</b>	<b>5</b>	<b>12</b>	<b>0</b>	<b>17</b>	<b>44</b>	<b>2</b>	<b>17</b>	<b>63</b>	<b>2</b>	<b>10</b>	<b>23</b>	<b>35</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>7</b>	<b>122</b>
<b>% App. Total</b>	<b>29.4</b>	<b>70.6</b>	<b>0</b>		<b>69.8</b>	<b>3.2</b>	<b>27</b>		<b>5.7</b>	<b>28.6</b>	<b>65.7</b>		<b>14.3</b>	<b>85.7</b>	<b>0</b>		
PHF	.313	.500	.000	.708	.611	.250	.472	.716	.250	.833	.575	.729	.250	.750	.000	.583	.763

# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 10

## Groups Printed- Bikes Peds

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
07:15 AM	0	0	0	2	0	0	0	19	0	0	0	0	0	0	0	0	21	0	21
07:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2
07:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	0	0	0	4	0	0	0	19	0	0	0	0	0	0	0	2	25	0	25
08:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
08:15 AM	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	4	0	4
08:30 AM	0	0	0	3	0	0	0	3	0	0	0	1	0	0	0	0	7	0	7
08:45 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2	0	2
<b>Total</b>	0	0	0	8	0	0	0	5	0	0	0	1	0	0	0	0	14	0	14
<b>Grand Total</b>	0	0	0	12	0	0	0	24	0	0	0	1	0	0	0	2	39	0	39
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>% App. Total</b>	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	15	73	51	26	19	27	58	73	12	13	13	34	414
02:15 PM	20	81	25	17	31	35	65	68	28	20	12	48	450
02:30 PM	15	78	15	59	38	50	38	106	12	43	9	47	510
02:45 PM	6	103	55	58	35	26	35	69	12	15	8	45	467
<b>Total</b>	<b>56</b>	<b>335</b>	<b>146</b>	<b>160</b>	<b>123</b>	<b>138</b>	<b>196</b>	<b>316</b>	<b>64</b>	<b>91</b>	<b>42</b>	<b>174</b>	<b>1841</b>
03:00 PM	9	96	25	25	19	43	57	122	13	18	4	68	499
03:15 PM	19	82	23	17	16	30	42	118	10	16	7	71	451
03:30 PM	18	111	22	29	18	26	50	157	11	19	10	54	525
03:45 PM	18	98	20	11	13	18	63	147	19	20	9	76	512
<b>Total</b>	<b>64</b>	<b>387</b>	<b>90</b>	<b>82</b>	<b>66</b>	<b>117</b>	<b>212</b>	<b>544</b>	<b>53</b>	<b>73</b>	<b>30</b>	<b>269</b>	<b>1987</b>
04:00 PM	14	99	25	10	13	16	57	148	6	28	6	70	492
04:15 PM	13	120	18	6	17	26	56	123	6	32	8	75	500
04:30 PM	7	122	16	4	11	18	50	135	6	19	9	81	478
04:45 PM	10	122	20	3	7	13	51	141	10	30	6	80	493
<b>Total</b>	<b>44</b>	<b>463</b>	<b>79</b>	<b>23</b>	<b>48</b>	<b>73</b>	<b>214</b>	<b>547</b>	<b>28</b>	<b>109</b>	<b>29</b>	<b>306</b>	<b>1963</b>
05:00 PM	6	122	31	3	3	6	53	112	5	12	8	87	448
05:15 PM	7	123	21	6	4	12	68	154	8	27	10	89	529
05:30 PM	12	111	35	6	4	3	51	125	12	18	6	86	469
05:45 PM	12	113	19	17	11	11	42	114	2	27	14	75	457
<b>Total</b>	<b>37</b>	<b>469</b>	<b>106</b>	<b>32</b>	<b>22</b>	<b>32</b>	<b>214</b>	<b>505</b>	<b>27</b>	<b>84</b>	<b>38</b>	<b>337</b>	<b>1903</b>
<b>Grand Total</b>	<b>201</b>	<b>1654</b>	<b>421</b>	<b>297</b>	<b>259</b>	<b>360</b>	<b>836</b>	<b>1912</b>	<b>172</b>	<b>357</b>	<b>139</b>	<b>1086</b>	<b>7694</b>
Apprch %	8.8	72.7	18.5	32.4	28.3	39.3	28.6	65.5	5.9	22.6	8.8	68.6	
Total %	2.6	21.5	5.5	3.9	3.4	4.7	10.9	24.9	2.2	4.6	1.8	14.1	
Cars	195	1639	417	272	246	339	832	1888	145	349	130	1079	7531
% Cars	97	99.1	99	91.6	95	94.2	99.5	98.7	84.3	97.8	93.5	99.4	97.9
Trucks	6	15	4	25	13	21	4	24	27	8	9	7	163
% Trucks	3	0.9	1	8.4	5	5.8	0.5	1.3	15.7	2.2	6.5	0.6	2.1

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	<b>18</b>	111	22	<b>151</b>	<b>29</b>	<b>18</b>	<b>26</b>	<b>73</b>	50	<b>157</b>	11	218	19	<b>10</b>	54	83	<b>525</b>
03:45 PM	18	98	20	136	11	13	18	42	<b>63</b>	147	<b>19</b>	<b>229</b>	20	9	<b>76</b>	105	512
04:00 PM	14	99	<b>25</b>	138	10	13	16	39	57	148	6	211	28	6	70	104	492
04:15 PM	13	<b>120</b>	18	151	6	17	26	49	56	123	6	185	<b>32</b>	8	75	<b>115</b>	500
Total Volume	63	428	85	576	56	61	86	203	226	575	42	843	99	33	275	407	2029
% App. Total	10.9	74.3	14.8		27.6	30	42.4		26.8	68.2	5		24.3	8.1	67.6		
PHF	.875	.892	.850	.954	.483	.847	.827	.695	.897	.916	.553	.920	.773	.825	.905	.885	.966
Cars	63	422	84	569	52	57	84	193	225	569	36	830	94	30	274	398	1990
% Cars	100	98.6	98.8	98.8	92.9	93.4	97.7	95.1	99.6	99.0	85.7	98.5	94.9	90.9	99.6	97.8	98.1
Trucks	0	6	1	7	4	4	2	10	1	6	6	13	5	3	1	9	39
% Trucks	0	1.4	1.2	1.2	7.1	6.6	2.3	4.9	0.4	1.0	14.3	1.5	5.1	9.1	0.4	2.2	1.9

# Accurate Counts

978-664-2565

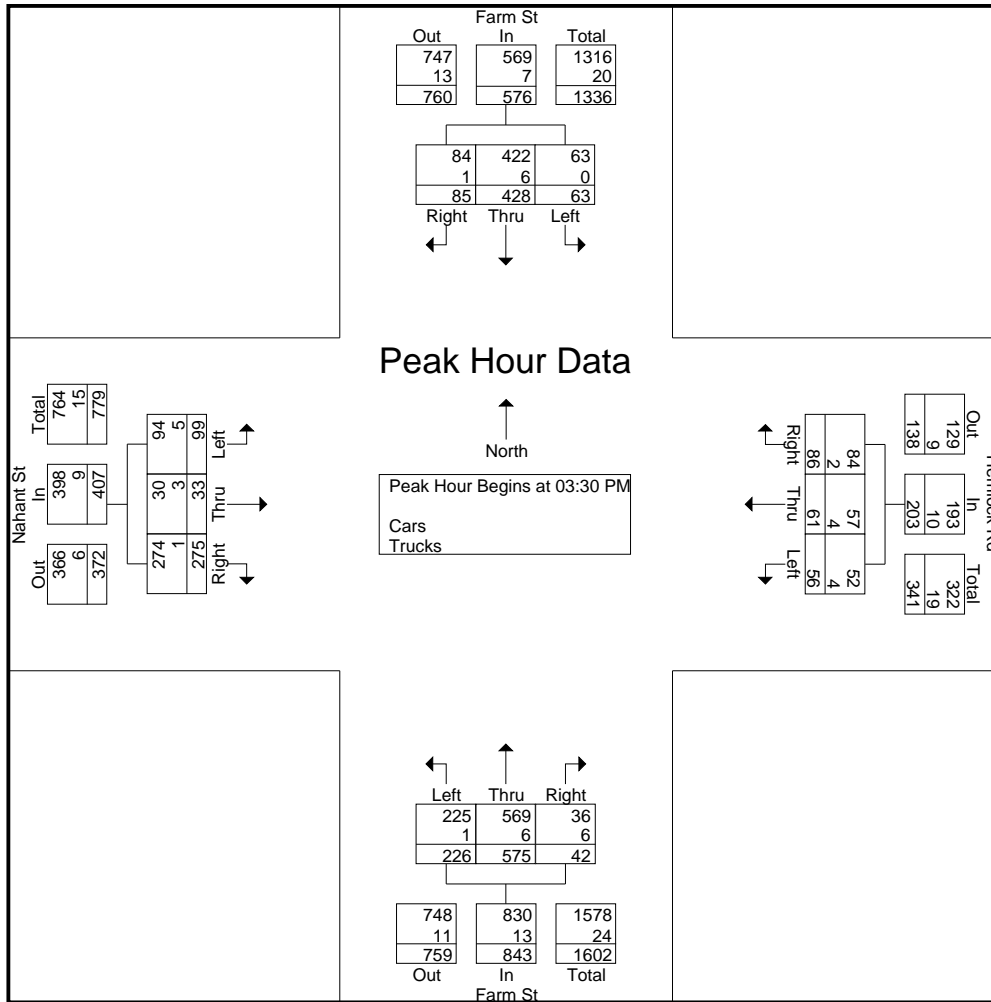
File Name : 98560005

Site Code : 98560005

Start Date : 12/20/2023

Page No : 2

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear



**Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1**

**Peak Hour for Each Approach Begins at:**

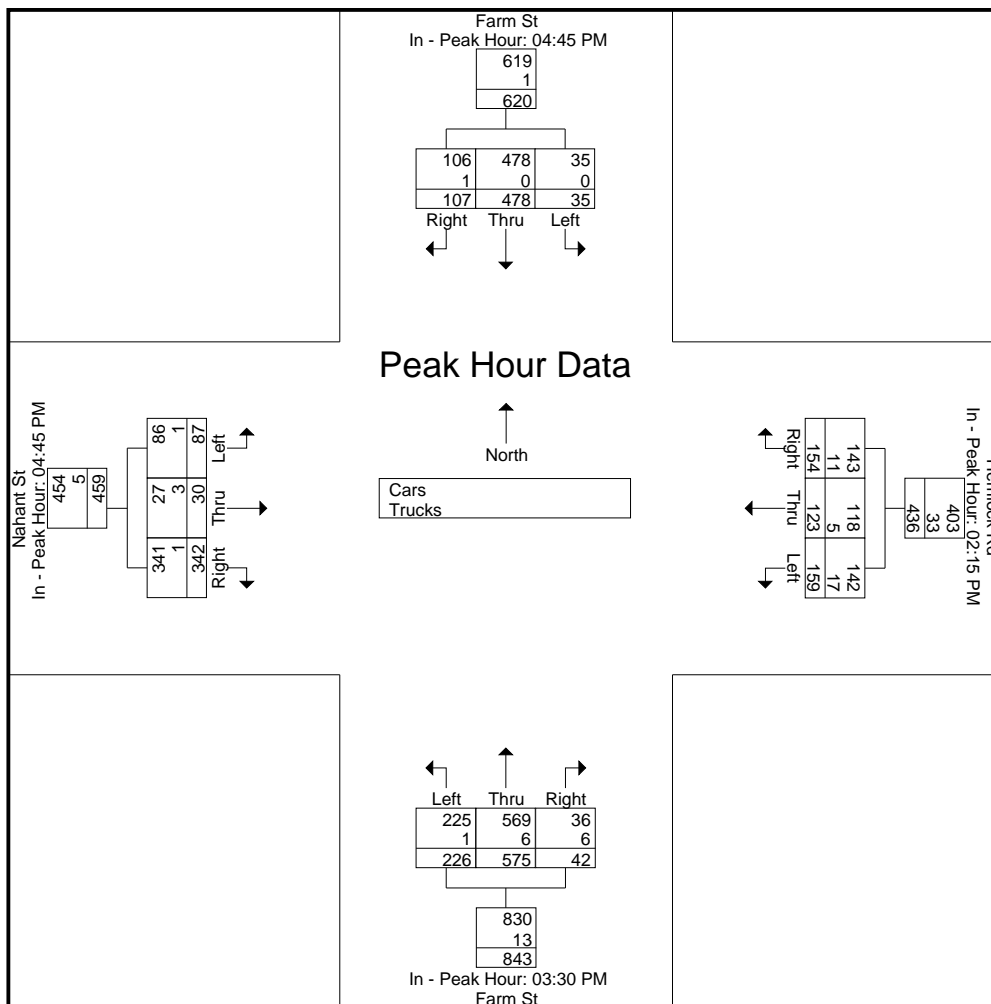
	04:45 PM				02:15 PM				03:30 PM				04:45 PM			
+0 mins.	10	122	20	152	17	31	35	83	50	<b>157</b>	11	218	<b>30</b>	6	80	116
+15 mins.	6	122	31	<b>159</b>	<b>59</b>	<b>38</b>	<b>50</b>	<b>147</b>	<b>63</b>	147	<b>19</b>	<b>229</b>	12	8	87	107
+30 mins.	7	<b>123</b>	21	151	58	35	26	119	57	148	6	211	27	<b>10</b>	<b>89</b>	<b>126</b>
+45 mins.	<b>12</b>	111	<b>35</b>	158	25	19	43	87	56	123	6	185	18	6	86	110
Total Volume	35	478	107	620	159	123	154	436	226	575	42	843	87	30	342	459
% App. Total	5.6	77.1	17.3		36.5	28.2	35.3		26.8	68.2	5		19	6.5	74.5	
PHF	.729	.972	.764	.975	.674	.809	.770	.741	.897	.916	.553	.920	.725	.750	.961	.911
Cars	35	478	106	619	142	118	143	403	225	569	36	830	86	27	341	454
% Cars	100	100	99.1	99.8	89.3	95.9	92.9	92.4	99.6	99	85.7	98.5	98.9	90	99.7	98.9
Trucks	0	0	1	1	17	5	11	33	1	6	6	13	1	3	1	5
% Trucks	0	0	0.9	0.2	10.7	4.1	7.1	7.6	0.4	1	14.3	1.5	1.1	10	0.3	1.1

# Accurate Counts

978-664-2565

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 3

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 4

## Groups Printed- Cars

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	14	71	50	25	18	24	57	70	7	13	11	34	394
02:15 PM	18	79	25	15	31	32	65	67	23	20	12	48	435
02:30 PM	12	77	15	55	37	46	38	104	12	41	8	46	491
02:45 PM	6	101	55	49	31	22	33	66	8	15	8	45	439
<b>Total</b>	<b>50</b>	<b>328</b>	<b>145</b>	<b>144</b>	<b>117</b>	<b>124</b>	<b>193</b>	<b>307</b>	<b>50</b>	<b>89</b>	<b>39</b>	<b>173</b>	<b>1759</b>
03:00 PM	9	96	25	23	19	43	57	120	10	18	4	67	491
03:15 PM	19	82	22	17	15	27	42	116	10	16	7	69	442
03:30 PM	18	111	22	29	18	26	50	156	7	18	10	54	519
03:45 PM	18	96	20	8	12	16	63	145	17	19	8	76	498
<b>Total</b>	<b>64</b>	<b>385</b>	<b>89</b>	<b>77</b>	<b>64</b>	<b>112</b>	<b>212</b>	<b>537</b>	<b>44</b>	<b>71</b>	<b>29</b>	<b>266</b>	<b>1950</b>
04:00 PM	14	96	24	9	11	16	56	147	6	27	4	69	479
04:15 PM	13	119	18	6	16	26	56	121	6	30	8	75	494
04:30 PM	7	120	16	4	11	18	50	134	6	19	9	81	475
04:45 PM	10	122	20	3	7	13	51	140	9	29	6	80	490
<b>Total</b>	<b>44</b>	<b>457</b>	<b>78</b>	<b>22</b>	<b>45</b>	<b>73</b>	<b>213</b>	<b>542</b>	<b>27</b>	<b>105</b>	<b>27</b>	<b>305</b>	<b>1938</b>
05:00 PM	6	122	31	3	3	5	53	112	5	12	6	87	445
05:15 PM	7	123	20	6	4	12	68	152	7	27	9	88	523
05:30 PM	12	111	35	6	2	3	51	124	11	18	6	86	465
05:45 PM	12	113	19	14	11	10	42	114	1	27	14	74	451
<b>Total</b>	<b>37</b>	<b>469</b>	<b>105</b>	<b>29</b>	<b>20</b>	<b>30</b>	<b>214</b>	<b>502</b>	<b>24</b>	<b>84</b>	<b>35</b>	<b>335</b>	<b>1884</b>
<b>Grand Total</b>	<b>195</b>	<b>1639</b>	<b>417</b>	<b>272</b>	<b>246</b>	<b>339</b>	<b>832</b>	<b>1888</b>	<b>145</b>	<b>349</b>	<b>130</b>	<b>1079</b>	<b>7531</b>
Apprch %	8.7	72.8	18.5	31.7	28.7	39.6	29	65.9	5.1	22.4	8.3	69.3	
Total %	2.6	21.8	5.5	3.6	3.3	4.5	11	25.1	1.9	4.6	1.7	14.3	

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	<b>18</b>	111	22	<b>151</b>	<b>29</b>	<b>18</b>	<b>26</b>	<b>73</b>	50	<b>156</b>	7	213	18	<b>10</b>	54	82	<b>519</b>
03:45 PM	18	96	20	134	8	12	16	36	<b>63</b>	145	<b>17</b>	<b>225</b>	19	8	<b>76</b>	103	498
04:00 PM	14	96	<b>24</b>	134	9	11	16	36	56	147	6	209	27	4	69	100	479
04:15 PM	13	<b>119</b>	18	150	6	16	26	48	56	121	6	183	<b>30</b>	8	75	<b>113</b>	494
Total Volume	63	422	84	569	52	57	84	193	225	569	36	830	94	30	274	398	1990
% App. Total	11.1	74.2	14.8		26.9	29.5	43.5		27.1	68.6	4.3		23.6	7.5	68.8		
PHF	.875	.887	.875	.942	.448	.792	.808	.661	.893	.912	.529	.922	.783	.750	.901	.881	.959

# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 7

## Groups Printed- Trucks

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Nahant St From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
02:00 PM	1	2	1	1	1	3	1	3	5	0	2	0	20
02:15 PM	2	2	0	2	0	3	0	1	5	0	0	0	15
02:30 PM	3	1	0	4	1	4	0	2	0	2	1	1	19
02:45 PM	0	2	0	9	4	4	2	3	4	0	0	0	28
<b>Total</b>	<b>6</b>	<b>7</b>	<b>1</b>	<b>16</b>	<b>6</b>	<b>14</b>	<b>3</b>	<b>9</b>	<b>14</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>82</b>
03:00 PM	0	0	0	2	0	0	0	2	3	0	0	1	8
03:15 PM	0	0	1	0	1	3	0	2	0	0	0	2	9
03:30 PM	0	0	0	0	0	0	0	1	4	1	0	0	6
03:45 PM	0	2	0	3	1	2	0	2	2	1	1	0	14
<b>Total</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>7</b>	<b>9</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>37</b>
04:00 PM	0	3	1	1	2	0	1	1	0	1	2	1	13
04:15 PM	0	1	0	0	1	0	0	2	0	2	0	0	6
04:30 PM	0	2	0	0	0	0	0	1	0	0	0	0	3
04:45 PM	0	0	0	0	0	0	0	1	1	1	0	0	3
<b>Total</b>	<b>0</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>25</b>
05:00 PM	0	0	0	0	0	1	0	0	0	0	2	0	3
05:15 PM	0	0	1	0	0	0	0	2	1	0	1	1	6
05:30 PM	0	0	0	0	2	0	0	1	1	0	0	0	4
05:45 PM	0	0	0	3	0	1	0	0	1	0	0	1	6
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>2</b>	<b>19</b>
<b>Grand Total</b>	<b>6</b>	<b>15</b>	<b>4</b>	<b>25</b>	<b>13</b>	<b>21</b>	<b>4</b>	<b>24</b>	<b>27</b>	<b>8</b>	<b>9</b>	<b>7</b>	<b>163</b>
Apprch %	24	60	16	42.4	22	35.6	7.3	43.6	49.1	33.3	37.5	29.2	
Total %	3.7	9.2	2.5	15.3	8	12.9	2.5	14.7	16.6	4.9	5.5	4.3	

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	1	2	1	4	1	1	3	5	1	3	5	9	0	2	0	2	20
02:15 PM	2	2	0	4	2	0	3	5	0	1	5	6	0	0	0	0	15
02:30 PM	3	1	0	4	4	1	4	9	0	2	0	2	2	1	1	4	19
02:45 PM	0	2	0	2	9	4	4	17	2	3	4	9	0	0	0	0	28
<b>Total Volume</b>	<b>6</b>	<b>7</b>	<b>1</b>	<b>14</b>	<b>16</b>	<b>6</b>	<b>14</b>	<b>36</b>	<b>3</b>	<b>9</b>	<b>14</b>	<b>26</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>6</b>	<b>82</b>
% App. Total	42.9	50	7.1		44.4	16.7	38.9		11.5	34.6	53.8		33.3	50	16.7		
PHF	.500	.875	.250	.875	.444	.375	.875	.529	.375	.750	.700	.722	.250	.375	.250	.375	.732

# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant St / Hemlock Rd  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 98560005  
 Site Code : 98560005  
 Start Date : 12/20/2023  
 Page No : 10

## Groups Printed- Bikes Peds

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
02:00 PM	0	0	0	46	0	0	0	0	0	0	0	0	0	0	0	10	56	0	56
02:15 PM	0	0	0	6	0	0	0	2	0	0	0	0	0	0	0	2	10	0	10
02:30 PM	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	2	6	0	6
02:45 PM	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>65</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>82</b>	<b>0</b>	<b>82</b>
03:00 PM	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	4	0	4
03:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
03:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
03:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>9</b>	<b>0</b>	<b>9</b>
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>72</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>92</b>	<b>0</b>	<b>92</b>
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

Start Time	Farm St From North				Hemlock Rd From East				Farm St From South				Nahant St From West				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 02:00 PM																		
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



SEASONAL ADJUSTMENT DATA

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Massachusetts Highway Department  
Statewide Traffic Data Collection  
2019 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.22	1.14	1.12	1.06	1.00	0.96	0.87	0.85	0.96	0.99	1.04	1.12	0.85
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.15	1.06	1.07	1.00	0.89	0.88	0.89	0.89	0.95	0.92	1.02	1.01	0.97
R4-R7	1.09	1.09	1.11	1.02	0.96	0.92	0.89	0.89	0.99	0.98	1.09	1.13	0.98
U1-Boston	1.03	1.01	0.98	0.94	0.94	0.92	0.95	0.93	0.94	0.94	0.97	1.04	0.96
U1-Essex	1.09	1.06	1.03	0.99	0.94	0.90	0.88	0.86	0.93	0.94	0.99	1.06	0.93
U1-Southeast	1.06	1.05	1.01	0.97	0.95	0.93	0.93	0.90	0.94	0.94	0.98	1.04	0.98
U1-West	1.19	1.14	1.09	0.95	0.92	0.89	0.89	0.86	0.91	0.95	0.97	1.07	0.84
U1-Worcester	1.02	1.04	0.97	0.94	0.93	0.91	0.95	0.91	0.93	0.92	0.95	1.10	0.88
U2	1.01	1.00	0.94	0.93	0.91	0.89	0.93	0.90	0.90	0.91	0.94	1.02	0.99
U3	1.06	1.03	0.98	0.94	0.93	0.91	0.95	0.91	0.92	0.93	0.97	1.00	0.98
U4-U7	1.01	1.00	0.95	0.92	0.88	0.86	0.92	0.91	0.92	0.94	0.99	1.04	0.99
Rec - East	1.04	1.16	1.12	0.98	0.92	0.88	0.77	0.81	0.94	1.02	1.08	1.12	0.99
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.98

Round off:

0-999 = 10

>1000 = 100

U = Urban

R = Rural

1 - Interstate

2 - Freeway and Expressway

3 - Other Principal Arterial

4 - Minor Arterial

5 - Major Collector

6 - Minor Collector

7 - Local Road and Street

**Recreational - East Group** - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

**Recreational - West Group** - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113, 1114,1116,2196,2197 and 2198.

PUBLIC TRANSPORTATION SCHEDULES

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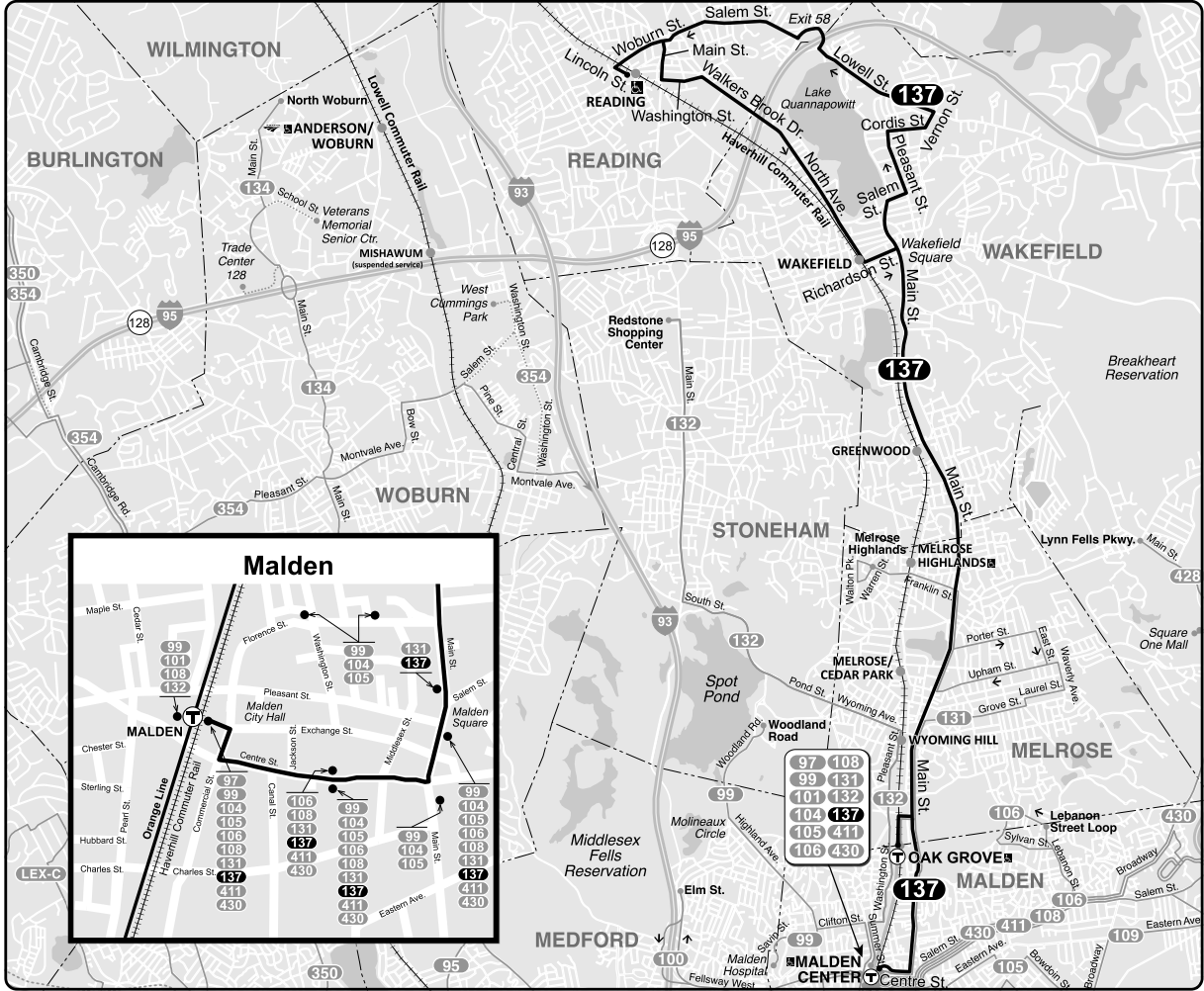
Effective August 27, 2023

Replaces July 2023

# 137 Reading Depot – Malden Ctr Sta

## Schedule Change

Weekday, Saturday and Sunday



## Connections

ORANGE LINE

HAVERHILL LINE



Information **617-222-3200**  
 Lost and Found **617-222-2229**  
 TTY **617-222-5146**

Realtime arrival information, maps, and more

**mbta.com**

A126-3-22.1

- Transfer to bus/subway available on CharlieCard—good for 2 hours, pay fare difference.
- Children 11 & under ride free with a paying customer.
- ♿ All MBTA buses are accessible to people with disabilities.

	CharlieCard	Cash on board	Reduced fare
<b>Bus</b>	<b>\$1.70</b>	<b>\$1.70</b>	<b>\$0.85</b>
<b>Bus + Subway</b>	<b>\$2.40</b>	<b>\$4.10</b>	<b>\$1.10</b>

Complete fare/pass rules and free/reduced fare eligibility:  
[mbta.com/fares](http://mbta.com/fares) or call **617-222-3200**

**Weekday 137**

Inbound				Outbound			
Reading Depot	Wakefield Square	Oak Grove Station	Malden Center Station	Malden Center Station	Oak Grove Station	Wakefield Square	Reading Depot
5:25	5:33	5:49	5:57	4:45	4:52	5:07	5:22
6:10	6:22	6:42	6:56	5:29	5:36	5:51	6:06
6:55	7:07	7:27	-	6:27	6:36	6:56	7:12
7:15	7:27	7:47	-	7:07	7:16	7:36	7:52
7:35	7:47	8:07	-	-	7:36	7:56	8:12
7:55	8:07	8:26	-	-	7:56	8:16	8:32
8:15	8:27	8:46	-	-	8:16	8:36	8:52
8:35	8:47	9:06	-	-	8:30	8:50	9:06
8:55	9:07	9:26	9:38	-	8:51	9:11	9:27
9:30	9:42	10:01	10:13	-	9:23	9:43	9:59
10:02	10:14	10:33	10:45	9:45	9:54	10:13	10:32
10:35	10:47	11:06	11:19	10:20	10:30	10:48	11:07
11:10	11:23	11:44	11:57	10:55	11:04	11:23	11:42
11:45	11:58	<b>12:19</b>	<b>12:32</b>	11:30	11:38	11:57	<b>12:16</b>
<b>12:19</b>	<b>12:32</b>	<b>12:53</b>	<b>1:05</b>	<b>12:05</b>	<b>12:14</b>	<b>12:34</b>	<b>12:53</b>
<b>12:56</b>	<b>1:07</b>	<b>1:24</b>	<b>1:36</b>	<b>12:40</b>	<b>12:49</b>	<b>1:10</b>	<b>1:29</b>
<b>1:32</b>	<b>1:43</b>	<b>2:00</b>	<b>2:15</b>	<b>1:13</b>	<b>1:23</b>	<b>1:43</b>	<b>2:02</b>
<b>2:05</b>	<b>2:17</b>	<b>2:43</b>	<b>2:58</b>	<b>1:45</b>	<b>1:55</b>	<b>2:15</b>	<b>2:34</b>
<b>2:37</b>	<b>2:49</b>	<b>3:10</b>	<b>3:24</b>	<b>2:25</b>	<b>2:35</b>	<b>2:56</b>	<b>3:15</b>
<b>3:18</b>	<b>3:30</b>	<b>3:48</b>	<b>4:02</b>	<b>3:05</b>	<b>3:15</b>	<b>3:36</b>	<b>3:55</b>
<b>3:58</b>	<b>4:10</b>	<b>4:28</b>	-	<b>3:40</b>	<b>3:50</b>	<b>4:11</b>	<b>4:30</b>
<b>4:33</b>	<b>4:45</b>	<b>5:03</b>	-	-	<b>4:20</b>	<b>4:41</b>	<b>5:00</b>
<b>5:03</b>	<b>5:15</b>	<b>5:33</b>	-	-	<b>4:45</b>	<b>5:06</b>	<b>5:25</b>
<b>5:28</b>	<b>5:40</b>	<b>5:58</b>	-	-	<b>5:10</b>	<b>5:31</b>	<b>5:50</b>
<b>5:53</b>	<b>6:05</b>	<b>6:22</b>	-	-	<b>5:37</b>	<b>5:58</b>	<b>6:17</b>
<b>6:20</b>	<b>6:31</b>	<b>6:48</b>	-	-	<b>6:02</b>	<b>6:23</b>	<b>6:42</b>
<b>6:45</b>	<b>6:56</b>	<b>7:13</b>	-	-	<b>6:27</b>	<b>6:48</b>	<b>7:07</b>
<b>7:10</b>	<b>7:21</b>	<b>7:38</b>	-	-	<b>6:52</b>	<b>7:11</b>	<b>7:30</b>
<b>7:33</b>	<b>7:44</b>	<b>8:01</b>	-	-	<b>7:17</b>	<b>7:34</b>	<b>7:53</b>
<b>7:56</b>	<b>8:07</b>	<b>8:24</b>	-	<b>7:35</b>	<b>7:44</b>	<b>8:01</b>	<b>8:20</b>
<b>8:23</b>	<b>8:34</b>	<b>8:51</b>	<b>9:04</b>	<b>8:10</b>	<b>8:19</b>	<b>8:37</b>	<b>8:56</b>
<b>8:59</b>	<b>9:08</b>	<b>9:26</b>	<b>9:39</b>	<b>9:10</b>	<b>9:19</b>	<b>9:35</b>	<b>9:54</b>
<b>9:57</b>	<b>10:06</b>	<b>10:20</b>	<b>10:30</b>	<b>9:50</b>	<b>9:59</b>	<b>10:15</b>	<b>10:30</b>
<b>10:33</b>	<b>10:42</b>	<b>10:56</b>	<b>11:06</b>				

**Saturday 137**

Inbound				Outbound			
Reading Depot	Wakefield Square	Oak Grove Station	Malden Center Station	Malden Center Station	Oak Grove Station	Wakefield Square	Reading Depot
6:00	6:09	6:24	6:36	6:00	6:08	6:25	6:39
6:42	6:51	7:06	7:18	6:55	7:03	7:20	7:34
7:37	7:46	8:02	8:15	7:50	7:58	8:15	8:29
8:32	8:42	8:58	9:11	8:45	8:53	9:12	9:27
9:30	9:41	9:59	10:12	9:40	9:50	10:09	10:24
10:27	10:38	10:56	11:09	10:30	10:40	10:59	11:18
11:21	11:34	11:53	<b>12:06</b>	11:30	11:41	<b>12:02</b>	<b>12:18</b>
<b>12:21</b>	<b>12:34</b>	<b>12:53</b>	<b>1:06</b>	<b>12:25</b>	<b>12:36</b>	<b>12:57</b>	<b>1:13</b>
<b>1:16</b>	<b>1:29</b>	<b>1:48</b>	<b>2:01</b>	<b>1:20</b>	<b>1:31</b>	<b>1:52</b>	<b>2:08</b>
<b>2:11</b>	<b>2:24</b>	<b>2:43</b>	<b>2:56</b>	<b>2:15</b>	<b>2:26</b>	<b>2:47</b>	<b>3:03</b>
<b>3:06</b>	<b>3:18</b>	<b>3:38</b>	<b>3:50</b>	<b>3:10</b>	<b>3:21</b>	<b>3:42</b>	<b>3:58</b>
<b>4:01</b>	<b>4:13</b>	<b>4:33</b>	<b>4:45</b>	<b>4:05</b>	<b>4:15</b>	<b>4:33</b>	<b>4:50</b>
<b>4:53</b>	<b>5:05</b>	<b>5:24</b>	<b>5:36</b>	<b>5:00</b>	<b>5:10</b>	<b>5:28</b>	<b>5:45</b>
<b>5:48</b>	<b>5:59</b>	<b>6:18</b>	<b>6:30</b>	<b>5:55</b>	<b>6:05</b>	<b>6:23</b>	<b>6:40</b>
<b>6:43</b>	<b>6:54</b>	<b>7:10</b>	<b>7:22</b>	<b>6:50</b>	<b>7:00</b>	<b>7:18</b>	<b>7:35</b>
<b>7:38</b>	<b>7:48</b>	<b>8:04</b>	<b>8:16</b>	<b>7:45</b>	<b>7:55</b>	<b>8:13</b>	<b>8:30</b>
-	<b>9:15</b>	<b>9:30</b>	<b>9:41</b>	<b>8:40</b>	<b>8:50</b>	<b>9:08</b>	--

PM times are **bold**

Information in this timetable is subject to change without notice. Traffic and weather may affect running times.

Always check bus destination signs before boarding. Some buses may only serve a part, or skip portions of this route.

**Sunday 137**

Inbound				Outbound			
Reading Depot	Wakefield Square	Oak Grove Station	Malden Center Station	Malden Center Station	Oak Grove Station	Wakefield Square	Reading Depot
8:00	8:10	8:26	8:39	8:45	8:53	9:12	9:27
9:30	9:41	9:59	10:12	10:30	10:40	10:59	11:18
11:21	11:34	11:53	<b>12:06</b>	<b>12:15</b>	<b>12:26</b>	<b>12:47</b>	<b>1:03</b>
<b>1:06</b>	<b>1:19</b>	<b>1:38</b>	<b>1:51</b>	<b>2:00</b>	<b>2:11</b>	<b>2:32</b>	<b>2:48</b>
<b>2:51</b>	<b>3:04</b>	<b>3:24</b>	<b>3:36</b>	<b>3:45</b>	<b>3:56</b>	<b>4:15</b>	<b>4:32</b>
<b>4:35</b>	<b>4:47</b>	<b>5:06</b>	<b>5:18</b>	<b>5:30</b>	<b>5:40</b>	<b>5:58</b>	<b>6:15</b>
<b>6:18</b>	<b>6:29</b>	<b>6:48</b>	<b>7:00</b>				

**2023 Holidays**

- SAT** Patriots' Day
- SUN** Thanksgiving
- SUN** Memorial Day
- SUN** Christmas Day
- SUN** Independence Day
- SUN** New Year's Eve
- SUN** Labor Day
- SUN** New Year's Day
- SAT** Indigenous People's Day

# HAVERHILL LINE FALL/WINTER SCHEDULE

Effective November 6, 2023

Monday to Friday

Inbound to Boston

ZONE	STATION	TRAIN #	AM										PM											
			280	200	202	282	204	284	206	286	208	288	210	290	212	292	214	294	216	218	296	298	220	224
	Bikes Allowed																							
7	Haverhill		---	5:27	6:12	-	7:25	-	8:27	-	9:57	-	11:27	-	12:57	-	2:27	-	3:57	5:20	-	-	6:57	9:15
7	Bradford		---	5:29	6:14	-	7:27	-	8:29	-	<b>f 9:59</b>	-	<b>f 11:29</b>	-	<b>f 12:59</b>	-	<b>f 2:29</b>	-	<b>f 3:59</b>	<b>f 5:22</b>	-	-	<b>f 6:59</b>	9:17
6	Lawrence		4:51	5:36	6:21	-	7:34	-	8:36	-	10:06	-	11:36	-	1:06	-	2:36	-	4:06	5:29	-	-	7:06	9:24
5	Andover		4:58	5:43	6:28	-	7:41	-	8:43	-	<b>f 10:13</b>	-	<b>f 11:43</b>	-	<b>f 1:13</b>	-	<b>f 2:43</b>	-	<b>f 4:13</b>	<b>f 5:36</b>	-	-	<b>f 7:13</b>	9:31
4	Ballardvale		5:03	5:48	6:33	-	7:46	-	8:48	-	<b>f 10:18</b>	-	<b>f 11:48</b>	-	<b>f 1:18</b>	-	<b>f 2:48</b>	-	<b>f 4:18</b>	<b>f 5:41</b>	-	-	<b>f 7:18</b>	9:36
3	North Wilmington		5:11	5:56	6:41	-	-	-	8:56	-	<b>f 10:26</b>	-	<b>f 11:56</b>	-	<b>f 1:26</b>	-	<b>f 2:56</b>	-	<b>f 4:26</b>	-	-	-	<b>f 7:26</b>	9:43
2	Reading		5:18	6:03	6:48	7:33	-	8:18	9:03	9:48	10:33	11:18	12:03	12:48	1:33	2:18	3:03	3:48	4:33	-	6:03	6:48	7:33	9:50
2	Wakefield		5:24	6:09	6:54	7:39	-	8:24	9:09	9:54	10:39	11:24	12:09	12:54	1:39	2:24	3:09	3:54	4:39	-	<b>f 6:09</b>	<b>f 6:54</b>	<b>f 7:39</b>	9:56
2	Greenwood		5:27	6:12	6:57	7:42	-	8:27	9:12	<b>f 9:57</b>	<b>f 10:42</b>	<b>f 11:27</b>	<b>f 12:12</b>	<b>f 12:57</b>	<b>f 1:42</b>	<b>f 2:27</b>	<b>f 3:12</b>	<b>f 3:57</b>	<b>f 4:42</b>	-	<b>f 6:12</b>	<b>f 6:57</b>	<b>f 7:42</b>	9:59
1	Melrose Highlands		5:29	6:14	6:59	7:44	-	8:29	9:14	9:59	10:44	11:29	12:14	12:59	1:44	2:29	3:14	3:59	4:44	-	<b>f 6:14</b>	<b>f 6:59</b>	<b>f 7:44</b>	10:01
1	Melrose/Cedar Park		5:31	6:16	7:01	7:46	-	8:31	9:16	<b>f 10:01</b>	<b>f 10:46</b>	<b>f 11:31</b>	<b>f 12:16</b>	<b>f 1:01</b>	<b>f 1:46</b>	<b>f 2:31</b>	<b>f 3:16</b>	<b>f 4:01</b>	<b>f 4:46</b>	-	<b>f 6:16</b>	<b>f 7:01</b>	<b>f 7:46</b>	10:03
1	Wyoming Hill		5:33	6:18	7:03	7:48	-	8:33	9:18	<b>f 10:03</b>	<b>f 10:48</b>	<b>f 11:33</b>	<b>f 12:18</b>	<b>f 1:03</b>	<b>f 1:48</b>	<b>f 2:33</b>	<b>f 3:18</b>	<b>f 4:03</b>	<b>f 4:48</b>	-	<b>f 6:18</b>	<b>f 7:03</b>	<b>f 7:48</b>	10:05
1A	Oak Grove		5:35	6:20	7:05	7:50	-	8:35	9:20	<b>f 10:05</b>	<b>f 10:50</b>	<b>f 11:35</b>	<b>f 12:20</b>	<b>f 1:05</b>	<b>f 1:50</b>	<b>f 2:35</b>	<b>f 3:20</b>	<b>f 4:05</b>	<b>f 4:50</b>	-	<b>f 6:20</b>	<b>f 7:05</b>	<b>f 7:50</b>	10:07
1A	Malden Center		<b>L 5:38</b>	<b>L 6:23</b>	<b>L 7:08</b>	<b>L 7:53</b>	-	<b>L 8:38</b>	<b>L 9:23</b>	<b>L 10:08</b>	<b>L 10:53</b>	<b>L 11:38</b>	<b>L 12:23</b>	<b>L 1:08</b>	<b>L 1:53</b>	<b>L 2:38</b>	<b>L 3:23</b>	<b>L 4:08</b>	<b>L 4:53</b>	-	<b>L 6:23</b>	<b>L 7:08</b>	<b>L 7:53</b>	<b>L 10:10</b>
1A	North Station		5:54	6:41	7:26	8:10	8:25	8:55	9:40	10:24	11:09	11:54	12:39	1:24	2:09	2:54	3:39	4:24	5:09	6:19	6:39	7:24	8:09	10:26

Monday to Friday

Outbound from Boston

ZONE	STATION	TRAIN #	AM										PM											
			201	281	283	203	285	205	287	207	289	209	291	211	293	213	215	295	217	297	219	221	223	225
	Bikes Allowed																							
1A	North Station		5:55	6:40	7:25	8:10	8:55	9:40	10:25	11:10	11:55	12:40	1:25	2:10	2:55	3:40	4:25	5:10	5:35	5:55	6:40	7:30	9:40	11:40
1A	Malden Center		<b>f 6:06</b>	<b>f 6:51</b>	<b>f 7:36</b>	<b>f 8:21</b>	<b>f 9:06</b>	<b>f 9:51</b>	<b>f 10:36</b>	<b>f 11:21</b>	<b>f 12:06</b>	<b>f 12:51</b>	<b>f 1:36</b>	<b>f 2:21</b>	<b>f 3:06</b>	3:51	4:36	5:21	-	6:06	6:51	<b>f 7:41</b>	<b>f 9:51</b>	11:51
1A	Oak Grove		<b>f 6:08</b>	<b>f 6:53</b>	<b>f 7:38</b>	<b>f 8:23</b>	<b>f 9:08</b>	<b>f 9:53</b>	<b>f 10:38</b>	<b>f 11:23</b>	<b>f 12:08</b>	<b>f 12:53</b>	<b>f 1:38</b>	<b>f 2:23</b>	<b>f 3:08</b>	3:53	4:38	5:23	-	6:08	6:53	<b>f 7:43</b>	<b>f 9:53</b>	11:53
1	Wyoming Hill		<b>f 6:10</b>	<b>f 6:55</b>	<b>f 7:40</b>	<b>f 8:25</b>	<b>f 9:10</b>	<b>f 9:55</b>	<b>f 10:40</b>	<b>f 11:25</b>	<b>f 12:10</b>	<b>f 12:55</b>	<b>f 1:40</b>	<b>f 2:25</b>	<b>f 3:10</b>	3:55	4:40	5:25	-	6:10	6:55	<b>f 7:45</b>	<b>f 9:55</b>	11:55
1	Melrose/Cedar Park		<b>f 6:12</b>	<b>f 6:57</b>	<b>f 7:42</b>	<b>f 8:27</b>	<b>f 9:12</b>	<b>f 9:57</b>	<b>f 10:42</b>	<b>f 11:27</b>	<b>f 12:12</b>	<b>f 12:57</b>	<b>f 1:42</b>	<b>f 2:27</b>	<b>f 3:12</b>	3:57	4:42	5:27	-	6:12	6:57	<b>f 7:47</b>	<b>f 9:57</b>	11:57
1	Melrose Highlands		<b>f 6:15</b>	<b>f 7:00</b>	<b>f 7:45</b>	<b>f 8:30</b>	<b>f 9:15</b>	10:00	10:45	11:30	12:15	1:00	1:45	2:30	3:15	4:00	4:45	5:30	-	6:15	7:00	7:50	<b>f 10:00</b>	12:00
2	Greenwood		<b>f 6:18</b>	<b>f 7:03</b>	<b>f 7:48</b>	<b>f 8:33</b>	<b>f 9:18</b>	<b>f 10:03</b>	<b>f 10:48</b>	<b>f 11:33</b>	<b>f 12:18</b>	<b>f 1:03</b>	<b>f 1:48</b>	<b>f 2:33</b>	<b>f 3:18</b>	4:03	4:48	5:33	-	6:18	7:03	<b>f 7:53</b>	<b>f 10:03</b>	12:03
2	Wakefield		<b>f 6:22</b>	<b>f 7:07</b>	<b>f 7:52</b>	<b>f 8:37</b>	<b>f 9:22</b>	10:07	10:52	11:37	12:22	1:07	1:52	2:37	3:22	4:07	4:52	5:37	-	6:22	7:07	7:57	<b>f 10:07</b>	12:07
2	Reading		6:28	7:16	8:01	8:43	9:31	10:13	11:01	11:43	12:31	1:13	2:01	2:43	3:31	4:13	4:58	5:46	-	6:31	7:13	8:03	10:13	12:13
3	North Wilmington		<b>f 6:34</b>	-	-	<b>f 8:49</b>	-	<b>f 10:19</b>	-	<b>f 11:49</b>	-	<b>f 1:19</b>	-	<b>f 2:49</b>	-	4:19	5:05	-	-	-	7:19	<b>f 8:09</b>	<b>f 10:19</b>	12:19
4	Ballardvale		<b>f 6:42</b>	-	-	<b>f 8:57</b>	-	<b>f 10:27</b>	-	<b>f 11:57</b>	-	<b>f 1:27</b>	-	<b>f 2:57</b>	-	4:27	5:13	-	6:07	-	7:27	8:17	<b>f 10:26</b>	12:26
5	Andover		<b>f 6:47</b>	-	-	<b>f 9:02</b>	-	<b>f 10:32</b>	-	<b>f 12:02</b>	-	<b>f 1:32</b>	-	<b>f 3:02</b>	-	4:32	5:18	-	6:12	-	7:32	8:22	<b>f 10:31</b>	12:31
6	Lawrence		6:54	-	-	9:09	-	10:39	-	12:09	-	1:39	-	3:09	-	4:39	5:25	-	6:19	-	7:39	8:29	10:38	12:38
7	Bradford		<b>f 7:02</b>	-	-	<b>f 9:17</b>	-	<b>L 10:49</b>	-	<b>L 12:19</b>	-	<b>L 1:49</b>	-	<b>L 3:19</b>	-	<b>L 4:50</b>	<b>L 5:37</b>	-	<b>L 6:31</b>	-	<b>L 7:50</b>	<b>L 8:39</b>	<b>f 10:46</b>	12:46
7	Haverhill		7:10	-	-	9:25	-	10:55	-	12:25	-	1:55	-	3:25	-	4:57	5:44	-	6:38	-	7:57	8:45	10:54	12:54

Weekend

Inbound to Boston

ZONE	STATION	SATURDAY TRAIN #	SUNDAY TRAIN #	AM				PM						
				1200	1202	1204	1206	1208	1210	1212	1214			
	Bikes Allowed													
7	Haverhill		5:35	8:35	10:50	12:50	2:50	4:50	6:50	9:50				
7	Bradford		5:37	8:37	10:52	12:52	2:52	4:52	6:52	9:52				
6	Lawrence		5:44	8:44	10:59	12:59	2:59	4:59	6:59	9:59				
5	Andover		<b>f 5:51</b>	<b>f 8:51</b>	<b>f 11:06</b>	<b>f 1:06</b>	<b>f 3:06</b>	<b>f 5:06</b>	<b>f 7:06</b>	10:06				
4	Ballardvale		<b>f 5:56</b>	<b>f 8:56</b>	<b>f 11:11</b>	<b>f 1:11</b>	<b>f 3:11</b>	<b>f 5:11</b>	<b>f 7:11</b>	10:11				
3	North Wilmington		<b>f 6:03</b>	<b>f 9:03</b>	<b>f 11:18</b>	<b>f 1:18</b>	<b>f 3:18</b>	<b>f 5:18</b>	<b>f 7:18</b>	10:18				
2	Reading		6:10	9:10	11:25	1:25	3:25	5:25	7:25	10:25				
2	Wakefield		6:16	9:16	11:31	1:31	3:31	5:31	7:31	10:31				
2	Greenwood		<b>f 6:19</b>	<b>f 9:19</b>	<b>f 11:34</b>	<b>f 1:34</b>	<b>f 3:34</b>	<b>f 5:34</b>	<b>f 7:34</b>	10:34				
1	Melrose Highlands		6:21	9:21	11:36	1:36	3:36	5:36	7:36	10:36				
1	Melrose/Cedar Park		<b>f 6:23</b>	<b>f 9:23</b>	<b>f 11:38</b>	<b>f 1:38</b>	<b>f 3:38</b>	<b>f 5:38</b>	<b>f 7:38</b>	10:38				
1	Wyoming Hill		<b>f 6:25</b>	<b>f 9:25</b>	<b>f 11:40</b>	<b>f 1:40</b>	<b>f 3:40</b>	<b>f 5:40</b>	<b>f 7:40</b>	10:40				
1A	Oak Grove		<b>f 6:27</b>	<b>f 9:27</b>	<b>f 11:43</b>	<b>f 1:43</b>	<b>f 3:43</b>	<b>f 5:43</b>	<b>f 7:43</b>	10:43				
1A	Malden Center		<b>L 6:30</b>	<b>L 9:30</b>	<b>L 11:45</b>	<b>L 1:45</b>	<b>L 3:45</b>	<b>L 5:45</b>	<b>L 7:45</b>	<b>L 10:45</b>				
1A	North Station		6:45	9:45	12:00	2:00	4:00	6:00	8:00	11:00				

Weekend

Outbound from Boston

ZONE	STATION	SATURDAY TRAIN #	SUNDAY TRAIN #	AM				PM					
				1201	1203	1205	1207	1209	1211	1213	1215		
	Bikes Allowed												
1A	North Station		7:00	9:00	11:15	1:15	3:15	5:15	8:15	11:30			
1A	Malden Center		<b>f 7:11</b>	<b>f 9:11</b>	<b>f 11:26</b>	<b>f 1:26</b>	<b>f 3:26</b>	<b>f 5:26</b>	<b>f 8:26</b>	11:41			
1A	Oak Grove		<b>f 7:13</b>	<b>f 9:13</b>	<b>f 11:28</b>	<b>f 1:28</b>	<b>f 3:28</b>	<b>f 5:28</b>	<b>f 8:28</b>	11:43			

MASSDOT CRASH RATE WORKSHEETS

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# INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wakefield COUNT DATE : Dec-23

DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Farm Street

MINOR STREET(S) : Nahant Street

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM) :	422	203	875	596		2,096

" K " FACTOR :  INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

TOTAL # OF CRASHES :  # OF YEARS :  AVERAGE # OF CRASHES PER YEAR ( A ) :

**CRASH RATE CALCULATION :**  RATE =  $\frac{(A * 1,000,000)}{(V * 365)}$

Comments : Below Statewide and District Crash Rates

Project Title & Date: Proposed Residential Development

VEHICLE SPEED DATA

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Accurate Counts  
978-664-2565

Location : Nahant Street  
 Location : East of Middlesex Street  
 City/State: Wakefield, MA  
 Direction: EB

Site Code: 98560001

12/21/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total	
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH		
12:00 AM	0	0	0	0	0	2	1	2	2	0	0	0	0	0	7	
1:00	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2	
2:00	0	0	0	1	0	1	0	0	1	0	0	1	0	0	4	
3:00	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	
4:00	0	0	0	0	1	2	4	5	2	1	1	1	0	0	17	
5:00	0	0	0	0	4	3	2	8	13	3	2	1	0	0	36	
6:00	0	0	1	2	2	9	20	16	26	12	16	6	3	1	114	
7:00	0	0	1	4	9	12	51	57	69	45	26	18	10	4	306	
8:00	0	0	0	5	13	13	28	51	54	40	19	5	8	3	239	
9:00	0	0	1	0	10	12	30	41	38	16	20	4	3	1	176	
10:00	0	0	1	2	11	11	31	42	54	28	17	3	7	1	208	
11:00	0	0	0	4	7	12	23	37	47	23	24	10	4	4	195	
12:00 PM	0	0	0	3	11	10	21	39	58	32	20	12	3	4	213	
1:00	0	0	0	5	8	11	30	47	48	36	18	12	9	7	231	
2:00	0	0	3	6	14	41	58	57	65	47	27	8	11	8	345	
3:00	0	0	3	5	19	34	75	69	90	45	26	16	6	2	390	
4:00	0	0	8	13	20	52	89	113	82	45	18	10	1	1	452	
5:00	0	0	3	3	29	23	80	114	88	41	28	9	2	2	422	
6:00	0	0	1	4	21	22	49	85	82	32	22	8	3	2	331	
7:00	0	0	1	3	10	14	34	33	25	17	2	5	3	2	149	
8:00	0	0	1	1	7	11	22	23	26	10	6	3	0	0	110	
9:00	0	0	0	0	10	9	10	15	20	8	5	4	3	0	84	
10:00	0	0	1	0	11	6	5	9	5	4	2	0	1	1	45	
11:00	0	0	0	0	0	0	1	0	1	1	0	1	0	0	4	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>61</b>	<b>218</b>	<b>310</b>	<b>664</b>	<b>863</b>	<b>898</b>	<b>487</b>	<b>299</b>	<b>137</b>	<b>77</b>	<b>43</b>	<b>4082</b>	
Percentile		15th		50th	85th	95th										
Speed		18		24	30	34										
Mean Speed (Average)		24.9														
10 MPH Pace Speed		18-27														
Number in Pace		2581														
Percent in Pace		63.2%														
Number > 24 MPH		1941														
Percent > 24 MPH		47.6%														
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>68</b>	<b>159</b>	<b>479</b>	<b>661</b>	<b>1272</b>	<b>1838</b>	<b>1786</b>	<b>951</b>	<b>517</b>	<b>232</b>	<b>142</b>	<b>82</b>	<b>8187</b>	
Stats		Percentile		15th	50th	85th	95th									
Speed		17		24	29	34										
Mean Speed (Average)		24.5														
10 MPH Pace Speed		18-27														
Number in Pace		5203														
Percent in Pace		63.6%														
Number > 24 MPH		3710														
Percent > 24 MPH		45.3%														

Accurate Counts  
978-664-2565

Location : Nahant Street  
 Location : East of Middlesex Street  
 City/State: Wakefield, MA  
 Direction: WB

Site Code: 98560001

12/21/2023	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	1	5	5	2	3	0	0	0	0	16
1:00	0	0	0	0	1	0	0	6	3	1	0	0	0	0	11
2:00	0	0	0	0	0	0	1	0	1	0	1	0	0	0	3
3:00	0	0	0	0	0	0	1	2	0	2	0	0	0	0	5
4:00	0	0	0	0	1	4	3	5	6	1	2	0	1	0	23
5:00	0	0	0	0	3	5	16	27	6	7	3	4	0	0	71
6:00	0	0	0	0	4	8	43	82	46	12	5	0	0	0	200
7:00	0	0	1	4	7	18	67	113	83	37	7	0	1	1	339
8:00	0	0	0	1	3	22	51	114	109	35	11	1	3	0	350
9:00	0	0	0	2	7	14	40	82	80	25	6	2	0	1	259
10:00	0	0	0	0	0	14	47	81	58	18	3	4	2	1	228
11:00	0	0	0	2	9	11	55	86	71	26	9	1	0	0	270
12:00 PM	0	0	1	2	6	13	56	112	58	24	9	0	1	1	283
1:00	0	0	0	0	5	16	71	117	85	29	4	3	2	1	333
2:00	0	0	0	1	2	16	82	145	121	43	12	3	0	0	425
3:00	0	0	1	4	8	20	106	163	68	30	5	2	4	2	413
4:00	0	0	1	0	8	14	79	117	81	26	11	4	2	2	345
5:00	0	0	0	3	7	18	78	131	89	21	7	2	1	0	357
6:00	0	0	0	1	0	21	62	100	77	16	2	0	0	1	280
7:00	0	0	0	1	5	9	34	72	42	13	1	0	2	0	179
8:00	0	0	0	1	8	7	28	47	37	9	3	0	0	0	140
9:00	0	0	0	0	0	5	19	37	26	7	1	1	0	1	97
10:00	0	0	0	0	1	4	13	22	23	5	1	0	0	1	70
11:00	0	0	0	0	1	0	1	0	5	2	0	0	0	0	9
<b>Total</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>22</b>	<b>86</b>	<b>240</b>	<b>958</b>	<b>1666</b>	<b>1177</b>	<b>392</b>	<b>103</b>	<b>27</b>	<b>19</b>	<b>12</b>	<b>4706</b>

Percentile	15th	50th	85th	95th
Speed	19	23	27	29
Mean Speed (Average)	23.3			
10 MPH Pace Speed	18-27			
Number in Pace	3927			
Percent in Pace	83.4%			
Number > 24 MPH	1730			
Percent > 24 MPH	36.8%			

<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>51</b>	<b>196</b>	<b>539</b>	<b>2112</b>	<b>3323</b>	<b>2221</b>	<b>742</b>	<b>178</b>	<b>56</b>	<b>37</b>	<b>16</b>	<b>9489</b>
Stats															
Percentile				15th	50th	85th	95th								
Speed				19	22	26	29								
Mean Speed (Average)				22.9											
10 MPH Pace Speed				18-27											
Number in Pace				7897											
Percent in Pace				83.2%											
Number > 24 MPH				3250											
Percent > 24 MPH				34.2%											

## GROWTH RATE DATA

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**General Background Traffic Growth - Daily Traffic Volumes**

<b>CITY/TOWN</b>	<b>ROUTE/STREET</b>	<b>LOCATION</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>Average Annual</b>
Wakefield	Main Street	North of Water Street	15,739	15,911	14,627	15,330	15,547	16,402	16,582	16,798	12,400	12,574	12,924	<b>-1.85%</b>
Wakefield	Main Street	At Melrose City Line	13,049	13,192	12,841	13,211	13,418	12,186	12,320	12,480	13,207	13,392	13,446	<b>0.16%</b>
Wakefield	Yankee Division Highway	North of Main Street	133,096	130,226	122,700	135,088	137,350	133,916	134,579	138,422	140,727	139,400	142,046	<b>0.92%</b>
Wakefield	Yankee Division Highway	North of Route 28		141,000					137,541	148,269	147,824	146,684	144,478	<b>0.77%</b>
Wakefield	Yankee Division Highway	South of Ramp Walnut Street	124,859	127,229	124,187	130,074	129,565	128,788	134,300	134,844	132,277	137,999	140,822	<b>1.14%</b>
														<b>0.23%</b>

TRIP GENERATION DATA

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**Institute of Transportation Engineers (ITE)**  
**Trip Generation, 11th Edition**  
**Land Use Code (LUC) 221 - Multifamily Housing (Mid-Rise) Not Close to Rail Transit**

Average Vehicle Trips Ends vs: Dwelling Units  
Independent Variable (X): 32

**AVERAGE WEEKDAY DAILY**

$T = 4.54 * (X)$   
 $T = 4.54 * 32$   
 $T = 145.28$   
 $T = 146.00$   
 $T = 146$  vehicle trips  
with 50% ( 73 vpd) entering and 50% ( 73 vpd) exiting.

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$T = 0.37 * (X)$   
 $T = 0.37 * 32$   
 $T = 11.84$   
 $T = 12$  vehicle trips  
with 23% ( 3 vph) entering and 77% ( 9 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$T = 0.39 * (X)$   
 $T = 0.39 * 32$   
 $T = 12.48$   
 $T = 12.00$   
 $T = 12$  vehicle trips  
with 61% ( 8 vph) entering and 39% ( 4 vph) exiting.

TRIP DISTRIBUTION DATA

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Proposed Residential Development  
Wakefield, Massachusetts

Residence	Workplace	Number	Main Street (North)	Traverse Street (North)	Hart Street (North)	Farm Street (North)	Main Street (South)	Farm Street (South)	North Avenue (West)							
Wakefield town	Boston city	2,756	0	0	0	0	67%	1847	33%	909	0					
Wakefield town	Wakefield town	2,443	18%	440	1%	24	1%	24	16%	391	23%	562	20%	489	21%	513
Wakefield town	Woburn city	816	0	0	0	0	33%	269	0	0	67%	547				
Wakefield town	Cambridge city	683	0	0	0	0	34%	232	32%	219	34%	232				
Wakefield town	Reading town	624	0	0	0	0	0	0	100%	624						
Wakefield town	Burlington town	458	0	0	0	0	33%	151	0	0	67%	307				
Wakefield town	Waltham city	362	0	0	0	0	50%	181	0	0	50%	181				
Wakefield town	Melrose city	357	0	0	0	0	67%	239	33%	118	0					
Wakefield town	Beverly city	251	0	0	0	100%	251	0	0	0						
Wakefield town	Danvers town	247	0	0	0	100%	247	0	0	0						
Wakefield town	Wilmington town	244	0	33%	81	0	0	0	0	0	67%	163				
Wakefield town	Medford city	240	0	0	0	0	100%	240	0	0	0					
Wakefield town	Saugus town	225	0	0	0	50%	113	0	50%	113	0					
Wakefield town	Andover town	217	0	67%	145	0	0	0	0	0	33%	72				
Wakefield town	Peabody city	215	0	0	0	100%	215	0	0	0	0					
Wakefield town	Stoneham town	206	0	0	0	0	33%	68	0	0	67%	138				
Wakefield town	Somerville city	202	0	0	0	0	67%	135	33%	67	0					
Wakefield town	Malden city	198	0	0	0	0	67%	133	33%	65	0					
Wakefield town	Newton city	191	0	0	0	0	33%	63	33%	63	34%	65				
Wakefield town	Salem city	175	0	0	0	100%	175	0	0	0	0					
Wakefield town	Everett city	171	0	0	0	0	33%	56	67%	115	0					
Wakefield town	Bedford town	167	0	0	0	0	0	0	0	0	100%	167				
Wakefield town	Lexington town	167	0	0	0	0	33%	55	0	0	67%	112				
Wakefield town	Winchester town	165	0	0	0	0	67%	111	0	0	33%	54				
Wakefield town	Chelsea city	159	0	0	0	0	33%	52	67%	107	0					
Wakefield town	Lynnfield town	152	0	67%	102	0	33%	50	0	0	0					
Wakefield town	Chelmsford town	117	0	0	0	0	0	0	0	0	100%	117				
Wakefield town	Framingham town	101	0	0	0	0	33%	33	33%	33	34%	34				
Wakefield town	North Reading town	101	33%	33	67%	68	0	0	0	0	0					
Wakefield town	Billerica town	100	0	0	0	0	0	0	0	0	100%	100				
Wakefield town	Portsmouth city	83	0	0	0	55%	46	0	0	0	45%	37				
Wakefield town	Tewksbury town	81	33%	27	0	0	0	33%	27	0	0	34%	28			
Wakefield town	Watertown Town city	81	0	0	0	0	33%	27	33%	27	34%	28				
Wakefield town	Lynn city	75	0	0	0	33%	25	0	67%	50	0					
			0	0	0	0	0	0	0	0	0					
			0	0	0	0	0	0	0	0	0					
			0	0	0	0	0	0	0	0	0					
			0	0	0	0	0	0	0	0	0					
		12,830	500	420	24	1,512	4,482	2,373	3,519							
			3.9%	3.3%	0.2%	11.8%	34.9%	18.5%	27.4%							
		<u>SAY</u>	<b>4%</b>	<b>3%</b>	<b>0%</b>	<b>12%</b>	<b>35%</b>	<b>19%</b>	<b>27%</b>							

## PARKING ANALYSIS

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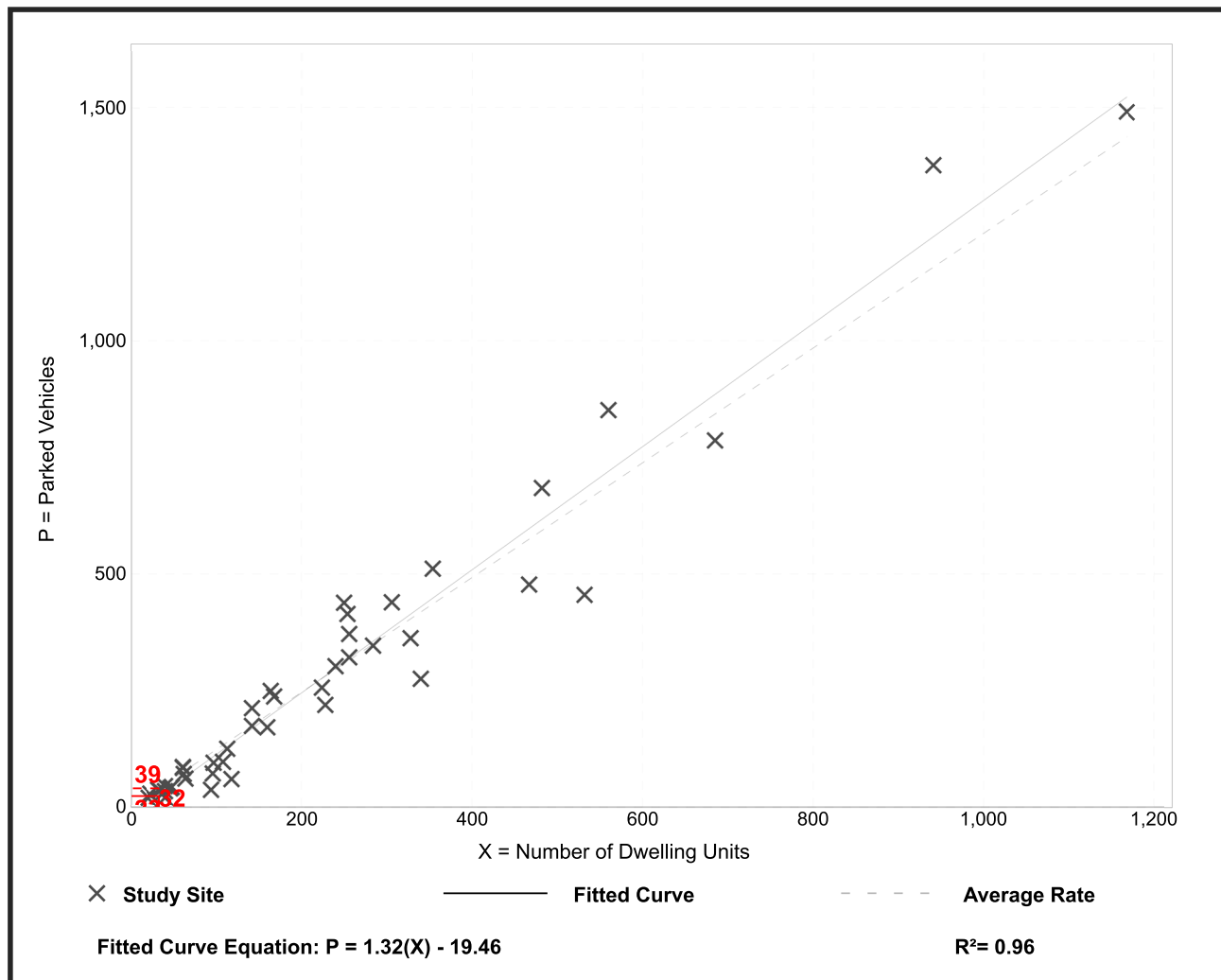
# Multifamily Housing - 2+ BR (Mid-Rise) - Not Close to Rail Transit (221)

**Peak Period Parking Demand vs: Dwelling Units**  
**On a: Weekday (Monday - Friday)**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 44  
 Avg. Num. of Dwelling Units: 231

## Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.23	0.39 - 1.75	0.98 / 1.45	1.15 - 1.31	0.27 (22%)

## Data Plot and Equation



## CAPACITY ANALYSIS

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2024 Baseline Weekday Morning Peak Hour  
2024 Baseline Weekday Evening Peak Hour  
2031 No-Build Weekday Morning Peak Hour  
2031 No-Build Weekday Evening Peak Hour  
2031 Build Weekday Morning Peak Hour  
2031 Build Weekday Evening Peak Hour





2024 Baseline Weekday Morning Peak Hour

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2024 Baseline Weekday Morning Peak Hour  
1: Main Street & North Avenue/Nahant Street

02/12/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	179	297	28	285	45	301	384	43	26	385	123
Future Volume (vph)	77	179	297	28	285	45	301	384	43	26	385	123
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850		0.983			0.985			0.964	
Flt Protected	0.950				0.996		0.950			0.950		
Satd. Flow (prot)	1616	1766	1501	0	1803	0	1770	1810	0	1678	3370	0
Flt Permitted	0.382				0.955		0.220			0.481		
Satd. Flow (perm)	650	1766	1501	0	1728	0	410	1810	0	849	3370	0
Satd. Flow (RTOR)			338		5			6			31	
Adj. Flow (vph)	88	203	338	29	291	46	350	447	50	29	428	137
Lane Group Flow (vph)	88	203	338	0	366	0	350	497	0	29	565	0
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2	13		6		13	10				14
Permitted Phases	2		2	6			10			14		
Detector Phase	2	2	13	6	6		13	10		14	14	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0	14.0	8.0	14.0	14.0		8.0	11.0		11.0	11.0	
Total Split (s)	39.0	39.0	28.0	39.0	39.0		28.0	66.0		38.0	38.0	
Total Split (%)	29.3%	29.3%	21.1%	29.3%	29.3%		21.1%	49.6%		28.6%	28.6%	
Maximum Green (s)	30.0	30.0	25.0	30.0	30.0		25.0	60.0		32.0	32.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		4.0	4.0	
All-Red Time (s)	6.0	6.0	0.0	6.0	6.0		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	9.0	9.0	3.0		9.0		3.0	6.0		6.0	6.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	None	Min	Min		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	28.3	28.3	56.9		28.3		52.3	49.1		23.7	23.7	
Actuated g/C Ratio	0.26	0.26	0.53		0.26		0.49	0.46		0.22	0.22	
v/c Ratio	0.52	0.44	0.36		0.80		0.73	0.60		0.16	0.74	
Control Delay	52.8	40.8	2.2		54.1		30.0	26.5		40.3	44.5	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	52.8	40.8	2.2		54.1		30.0	26.5		40.3	44.5	
LOS	D	D	A		D		C	C		D	D	
Approach Delay		21.7			54.1			28.0			44.3	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	50	112	0		223		132	218		16	174	
Queue Length 95th (ft)	#131	230	25		#501		270	405		49	287	
Internal Link Dist (ft)		395			1456			1087			1014	
Turn Bay Length (ft)	140		150				150			75		
Base Capacity (vph)	189	514	994		506		528	1057		263	1068	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	

2024 Baseline Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	21%
Maximum Green (s)	26.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	7.0
Flash Dont Walk (s)	19.0
Pedestrian Calls (#/hr)	21
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

2024 Baseline Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

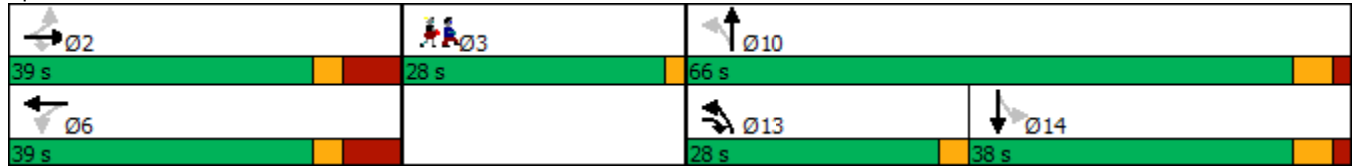


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.47	0.39	0.34		0.72		0.66	0.47		0.11	0.53	

Intersection Summary

Cycle Length: 133	
Actuated Cycle Length: 107.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 34.3	Intersection LOS: C
Intersection Capacity Utilization 83.3%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & North Avenue/Nahant Street



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Lane Group	Ø3
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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2024 Baseline Weekday Morning Peak Hour  
2: Nahant Street & Traverse Street

02/12/2024

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	7	326	438	19	18	11
Future Vol, veh/h	7	326	438	19	18	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	89	89	52	52
Heavy Vehicles, %	0	3	2	0	0	0
Mvmt Flow	10	479	492	21	35	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	513	0	-	0	1002 503
Stage 1	-	-	-	-	503 -
Stage 2	-	-	-	-	499 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1063	-	-	-	271 573
Stage 1	-	-	-	-	612 -
Stage 2	-	-	-	-	614 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1063	-	-	-	267 573
Mov Cap-2 Maneuver	-	-	-	-	267 -
Stage 1	-	-	-	-	604 -
Stage 2	-	-	-	-	614 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	17.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1063	-	-	-	335
HCM Lane V/C Ratio	0.01	-	-	-	0.166
HCM Control Delay (s)	8.4	0	-	-	17.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.6

2024 Baseline Weekday Morning Peak Hour  
 3: Private Driveway/Middlesex Street & Nahant Street

02/12/2024

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	342	1	0	456	0	1	0	2	3	0	0
Future Vol, veh/h	1	342	1	0	456	0	1	0	2	3	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	84	84	84	38	38	38	38	38	38
Heavy Vehicles, %	0	3	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	1	496	1	0	543	0	3	0	5	8	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	543	0	0	497	0	0	1042	1042	497	1044	1042	543
Stage 1	-	-	-	-	-	-	499	499	-	543	543	-
Stage 2	-	-	-	-	-	-	543	543	-	501	499	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1036	-	-	1077	-	-	210	232	577	209	232	544
Stage 1	-	-	-	-	-	-	557	547	-	528	523	-
Stage 2	-	-	-	-	-	-	528	523	-	556	547	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1036	-	-	1077	-	-	210	232	577	207	232	544
Mov Cap-2 Maneuver	-	-	-	-	-	-	210	232	-	207	232	-
Stage 1	-	-	-	-	-	-	556	546	-	527	523	-
Stage 2	-	-	-	-	-	-	528	523	-	550	546	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			15.1			23.1		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	365	1036	-	-	1077	-	-	207
HCM Lane V/C Ratio	0.022	0.001	-	-	-	-	-	0.038
HCM Control Delay (s)	15.1	8.5	0	-	0	-	-	23.1
HCM Lane LOS	C	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

2024 Baseline Weekday Morning Peak Hour  
4: Nahant Street & Hart Street

02/12/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	21	326	424	0	4	32
Future Vol, veh/h	21	326	424	0	4	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	89	89	73	73
Heavy Vehicles, %	0	1	2	0	0	3
Mvmt Flow	26	408	476	0	5	44

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	476	0	-	0	936 476
Stage 1	-	-	-	-	476 -
Stage 2	-	-	-	-	460 -
Critical Hdwy	4.1	-	-	-	6.4 6.23
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.327
Pot Cap-1 Maneuver	1097	-	-	-	297 587
Stage 1	-	-	-	-	629 -
Stage 2	-	-	-	-	640 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1097	-	-	-	288 587
Mov Cap-2 Maneuver	-	-	-	-	288 -
Stage 1	-	-	-	-	610 -
Stage 2	-	-	-	-	640 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1097	-	-	-	526
HCM Lane V/C Ratio	0.024	-	-	-	0.094
HCM Control Delay (s)	8.4	0	-	-	12.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3



2024 Baseline Weekday Morning Peak Hour  
5: Farm Street & Nahant Street

02/12/2024

Intersection						
Int Delay, s/veh	35.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	90	260	232	386	554	139
Future Vol, veh/h	90	260	232	386	554	139
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	88	88	86	86
Heavy Vehicles, %	1	2	2	7	3	0
Mvmt Flow	105	302	264	439	644	162

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1692	725	806	0	-	0
Stage 1	725	-	-	-	-	-
Stage 2	967	-	-	-	-	-
Critical Hdwy	6.41	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	~ 103	425	819	-	-	-
Stage 1	481	-	-	-	-	-
Stage 2	370	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 59	425	819	-	-	-
Mov Cap-2 Maneuver	~ 59	-	-	-	-	-
Stage 1	276	-	-	-	-	-
Stage 2	370	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	157.6	4.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	819	-	59	425	-	-
HCM Lane V/C Ratio	0.322	-	1.774	0.711	-	-
HCM Control Delay (s)	11.5	0\$	521.2	31.8	-	-
HCM Lane LOS	B	A	F	D	-	-
HCM 95th %tile Q(veh)	1.4	-	9.7	5.5	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

2024 Baseline Weekday Morning Peak Hour  
6: Farm Street & Hemlock Road

02/12/2024

Intersection						
Int Delay, s/veh	690.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T		Y	T
Traffic Vol, veh/h	124	169	449	307	332	482
Future Vol, veh/h	124	169	449	307	332	482
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	63	63	88	88	86	86
Heavy Vehicles, %	36	11	3	8	3	3
Mvmt Flow	197	268	510	349	386	560

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2017	685	0	0	859	0
Stage 1	685	-	-	-	-	-
Stage 2	1332	-	-	-	-	-
Critical Hdwy	6.76	6.31	-	-	4.13	-
Critical Hdwy Stg 1	5.76	-	-	-	-	-
Critical Hdwy Stg 2	5.76	-	-	-	-	-
Follow-up Hdwy	3.824	3.399	-	-	2.227	-
Pot Cap-1 Maneuver	~ 52	433	-	-	778	-
Stage 1	443	-	-	-	-	-
Stage 2	209	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 26	433	-	-	778	-
Mov Cap-2 Maneuver	~ 26	-	-	-	-	-
Stage 1	443	-	-	-	-	-
Stage 2	~ 105	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, \$	3360.3	0	5.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	57	778
HCM Lane V/C Ratio	-	-	8.159	0.496
HCM Control Delay (s)	-	\$	3360.3	14.1
HCM Lane LOS	-	-	F	B
HCM 95th %tile Q(veh)	-	-	54.2	2.8

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

2024 Baseline Weekday Evening Peak Hour

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2024 Baseline Weekday Evening Peak Hour  
1: Main Street & North Avenue/Nahant Street

02/12/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	358	331	21	262	61	308	564	32	59	374	99
Future Volume (vph)	140	358	331	21	262	61	308	564	32	59	374	99
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850		0.976			0.992			0.969	
Flt Protected	0.950				0.997		0.950			0.950		
Satd. Flow (prot)	1745	1818	1561	0	1828	0	1805	1867	0	1745	3471	0
Flt Permitted	0.445				0.899		0.255			0.365		
Satd. Flow (perm)	817	1818	1561	0	1649	0	484	1867	0	670	3471	0
Satd. Flow (RTOR)			324		8			3			23	
Adj. Flow (vph)	151	385	356	22	273	64	328	600	34	62	394	104
Lane Group Flow (vph)	151	385	356	0	359	0	328	634	0	62	498	0
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2	13		6		13	10			14	
Permitted Phases	2		2	6			10			14		
Detector Phase	2	2	13	6	6		13	10		14	14	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0	14.0	8.0	14.0	14.0		8.0	11.0		11.0	11.0	
Total Split (s)	39.0	39.0	28.0	39.0	39.0		28.0	66.0		38.0	38.0	
Total Split (%)	29.3%	29.3%	21.1%	29.3%	29.3%		21.1%	49.6%		28.6%	28.6%	
Maximum Green (s)	30.0	30.0	25.0	30.0	30.0		25.0	60.0		32.0	32.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		4.0	4.0	
All-Red Time (s)	6.0	6.0	0.0	6.0	6.0		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	9.0	9.0	3.0		9.0		3.0	6.0		6.0	6.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	None	Min	Min		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	30.9	30.9	56.0		30.9		44.9	41.8		19.7	19.7	
Actuated g/C Ratio	0.31	0.31	0.57		0.31		0.45	0.42		0.20	0.20	
v/c Ratio	0.59	0.68	0.35		0.69		0.69	0.80		0.47	0.70	
Control Delay	44.8	40.2	2.3		40.6		26.6	33.8		49.6	41.5	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	44.8	40.2	2.3		40.6		26.6	33.8		49.6	41.5	
LOS	D	D	A		D		C	C		D	D	
Approach Delay		25.9			40.6			31.4			42.4	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	73	192	5		176		121	309		32	137	
Queue Length 95th (ft)	#247	#525	38		#499		255	599		93	251	
Internal Link Dist (ft)		395			1456			1087			1014	
Turn Bay Length (ft)	140		150				150			75		
Base Capacity (vph)	255	567	1109		520		563	1166		223	1171	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	

2024 Baseline Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	21%
Maximum Green (s)	26.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Min
Walk Time (s)	7.0
Flash Dont Walk (s)	19.0
Pedestrian Calls (#/hr)	6
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

2024 Baseline Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

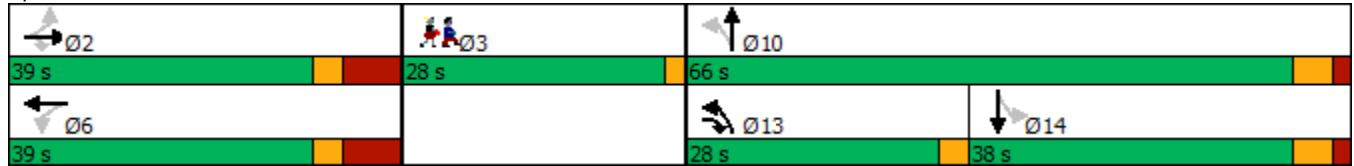


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.59	0.68	0.32		0.69		0.58	0.54		0.28	0.43	

Intersection Summary

Cycle Length: 133	
Actuated Cycle Length: 98.9	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 33.0	Intersection LOS: C
Intersection Capacity Utilization 98.3%	ICU Level of Service F
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & North Avenue/Nahant Street



Lane Group	Ø3
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

2024 Baseline Weekday Evening Peak Hour  
2: Nahant Street & Traverse Street

02/12/2024

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	17	496	396	11	7	10
Future Vol, veh/h	17	496	396	11	7	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	92	92	53	53
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	19	551	430	12	13	19

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	442	0	-	0	1025 436
Stage 1	-	-	-	-	436 -
Stage 2	-	-	-	-	589 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1129	-	-	-	263 625
Stage 1	-	-	-	-	656 -
Stage 2	-	-	-	-	558 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1129	-	-	-	257 625
Mov Cap-2 Maneuver	-	-	-	-	257 -
Stage 1	-	-	-	-	640 -
Stage 2	-	-	-	-	558 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	15
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1129	-	-	-	393
HCM Lane V/C Ratio	0.017	-	-	-	0.082
HCM Control Delay (s)	8.2	0	-	-	15
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3



2024 Baseline Weekday Evening Peak Hour  
 3: Private Driveway/Middlesex Street & Nahant Street

02/12/2024

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	500	1	0	404	1	1	0	0	0	0	2
Future Vol, veh/h	2	500	1	0	404	1	1	0	0	0	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	89	89	89	25	25	25	25	50	50
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	2	532	1	0	454	1	4	0	0	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	455	0	0	533	0	0	994	992	533	992	992	455
Stage 1	-	-	-	-	-	-	537	537	-	455	455	-
Stage 2	-	-	-	-	-	-	457	455	-	537	537	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1116	-	-	1045	-	-	226	248	551	227	248	609
Stage 1	-	-	-	-	-	-	532	526	-	589	572	-
Stage 2	-	-	-	-	-	-	587	572	-	532	526	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1116	-	-	1045	-	-	224	247	551	227	247	609
Mov Cap-2 Maneuver	-	-	-	-	-	-	224	247	-	227	247	-
Stage 1	-	-	-	-	-	-	530	524	-	587	572	-
Stage 2	-	-	-	-	-	-	583	572	-	530	524	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			21.4			11		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	224	1116	-	-	1045	-	-	609
HCM Lane V/C Ratio	0.018	0.002	-	-	-	-	-	0.007
HCM Control Delay (s)	21.4	8.2	0	-	0	-	-	11
HCM Lane LOS	C	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

2024 Baseline Weekday Evening Peak Hour  
4: Nahant Street & Hart Street

02/12/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	43	457	374	3	2	31
Future Vol, veh/h	43	457	374	3	2	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	93	93	73	73
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	46	486	402	3	3	42

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	405	0	-	0	982
Stage 1	-	-	-	-	404
Stage 2	-	-	-	-	578
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1165	-	-	-	279
Stage 1	-	-	-	-	679
Stage 2	-	-	-	-	565
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1165	-	-	-	264
Mov Cap-2 Maneuver	-	-	-	-	264
Stage 1	-	-	-	-	642
Stage 2	-	-	-	-	565

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1165	-	-	-	598
HCM Lane V/C Ratio	0.039	-	-	-	0.076
HCM Control Delay (s)	8.2	0	-	-	11.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

2024 Baseline Weekday Evening Peak Hour  
5: Farm Street & Nahant Street

02/12/2024

Intersection						
Int Delay, s/veh	92.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	103	319	296	684	508	88
Future Vol, veh/h	103	319	296	684	508	88
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	50	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	92	92	95	95
Heavy Vehicles, %	5	1	2	1	1	1
Mvmt Flow	116	358	322	743	535	93

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1969	582	628	0	-	0
Stage 1	582	-	-	-	-	-
Stage 2	1387	-	-	-	-	-
Critical Hdwy	6.45	6.21	4.12	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.309	2.218	-	-	-
Pot Cap-1 Maneuver	~ 68	515	954	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	228	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 29	515	954	-	-	-
Mov Cap-2 Maneuver	~ 29	-	-	-	-	-
Stage 1	235	-	-	-	-	-
Stage 2	228	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	416.4	3.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	954	-	29	515	-	-
HCM Lane V/C Ratio	0.337	-	3.991	0.696	-	-
HCM Control Delay (s)	10.7	\$	1624.1	26.5	-	-
HCM Lane LOS	B	A	F	D	-	-
HCM 95th %tile Q(veh)	1.5	-	14	5.4	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

2024 Baseline Weekday Evening Peak Hour  
6: Farm Street & Hemlock Road

02/12/2024

Intersection						
Int Delay, s/veh	67.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	56	147	833	42	96	731
Future Vol, veh/h	56	147	833	42	96	731
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	70	92	92	95	95
Heavy Vehicles, %	7	4	1	14	5	1
Mvmt Flow	80	210	905	46	101	769

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1899	928	0	0	951
Stage 1	928	-	-	-	-
Stage 2	971	-	-	-	-
Critical Hdwy	6.47	6.24	-	-	4.15
Critical Hdwy Stg 1	5.47	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-
Follow-up Hdwy	3.563	3.336	-	-	2.245
Pot Cap-1 Maneuver	~ 74	322	-	-	710
Stage 1	377	-	-	-	-
Stage 2	360	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	~ 63	322	-	-	710
Mov Cap-2 Maneuver	~ 63	-	-	-	-
Stage 1	377	-	-	-	-
Stage 2	309	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	\$ 488	0	1.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	151	710
HCM Lane V/C Ratio	-	-	1.921	0.142
HCM Control Delay (s)	-	-	\$ 488	10.9
HCM Lane LOS	-	-	F	B
HCM 95th %tile Q(veh)	-	-	22.3	0.5

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

2031 No-Build Weekday Morning Peak Hour

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2031 No-Build Weekday Morning Peak Hour  
1: Main Street & North Avenue/Nahant Street

02/12/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	201	323	39	319	49	323	413	49	28	415	133
Future Volume (vph)	92	201	323	39	319	49	323	413	49	28	415	133
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850		0.984			0.984			0.964	
Flt Protected	0.950				0.995		0.950			0.950		
Satd. Flow (prot)	1616	1766	1501	0	1802	0	1770	1808	0	1678	3370	0
Flt Permitted	0.375				0.939		0.205			0.479		
Satd. Flow (perm)	638	1766	1501	0	1700	0	382	1808	0	846	3370	0
Satd. Flow (RTOR)			351		6			6			37	
Adj. Flow (vph)	100	218	351	42	347	53	351	449	53	30	451	145
Lane Group Flow (vph)	100	218	351	0	442	0	351	502	0	30	596	0
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2	13		6		13	10			14	
Permitted Phases	2		2	6			10			14		
Detector Phase	2	2	13	6	6		13	10		14	14	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0	14.0	8.0	14.0	14.0		8.0	11.0		11.0	11.0	
Total Split (s)	33.0	33.0	17.0	33.0	33.0		17.0	39.0		22.0	22.0	
Total Split (%)	33.0%	33.0%	17.0%	33.0%	33.0%		17.0%	39.0%		22.0%	22.0%	
Maximum Green (s)	24.0	24.0	14.0	24.0	24.0		14.0	33.0		16.0	16.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		4.0	4.0	
All-Red Time (s)	6.0	6.0	0.0	6.0	6.0		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	9.0	9.0	3.0		9.0		3.0	6.0		6.0	6.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	Min	Min		Min	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	24.6	24.6	47.2		24.6		36.9	33.9		16.4	16.4	
Actuated g/C Ratio	0.30	0.30	0.57		0.30		0.44	0.41		0.20	0.20	
v/c Ratio	0.53	0.42	0.35		0.87		0.86	0.68		0.18	0.86	
Control Delay	41.9	29.8	2.0		50.3		43.8	29.1		36.5	46.6	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	41.9	29.8	2.0		50.3		43.8	29.1		36.5	46.6	
LOS	D	C	A		D		D	C		D	D	
Approach Delay		17.0			50.3			35.1			46.1	
Approach LOS		B			D			D			D	
Queue Length 50th (ft)	35	73	0		172		91	157		11	123	
Queue Length 95th (ft)	#137	196	25		#507		#367	#466		45	#320	
Internal Link Dist (ft)		395			1456			1087			1014	
Turn Bay Length (ft)	140		150				150			75		
Base Capacity (vph)	188	522	1003		507		408	739		167	694	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	

2031 No-Build Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	28%
Maximum Green (s)	26.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	19.0
Pedestrian Calls (#/hr)	21
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

2031 No-Build Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.53	0.42	0.35		0.87		0.86	0.68		0.18	0.86	

Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 83.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 35.7	Intersection LOS: D
Intersection Capacity Utilization 89.4%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & North Avenue/Nahant Street





Lane Group	Ø3
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

2031 No-Build Weekday Morning Peak Hour  
2: Nahant Street & Traverse Street

02/12/2024

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	8	364	489	21	19	12
Future Vol, veh/h	8	364	489	21	19	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	89	89	52	52
Heavy Vehicles, %	0	3	2	0	0	0
Mvmt Flow	12	535	549	24	37	23

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	573	0	-	0	1120
Stage 1	-	-	-	-	561
Stage 2	-	-	-	-	559
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1010	-	-	-	231
Stage 1	-	-	-	-	575
Stage 2	-	-	-	-	576
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1010	-	-	-	227
Mov Cap-2 Maneuver	-	-	-	-	227
Stage 1	-	-	-	-	565
Stage 2	-	-	-	-	576

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	20.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1010	-	-	-	292
HCM Lane V/C Ratio	0.012	-	-	-	0.204
HCM Control Delay (s)	8.6	0	-	-	20.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.8

2031 No-Build Weekday Morning Peak Hour  
 3: Private Driveway/Middlesex Street & Nahant Street

02/12/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	380	7	3	491	0	9	0	7	3	0	0
Future Vol, veh/h	1	380	7	3	491	0	9	0	7	3	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	84	84	84	38	38	38	38	38	38
Heavy Vehicles, %	0	3	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	1	551	10	4	585	0	24	0	18	8	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	585	0	0	561	0	0	1151	1151	556	1160	1156	585
Stage 1	-	-	-	-	-	-	558	558	-	593	593	-
Stage 2	-	-	-	-	-	-	593	593	-	567	563	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1000	-	-	1020	-	-	177	200	534	174	198	515
Stage 1	-	-	-	-	-	-	518	515	-	496	497	-
Stage 2	-	-	-	-	-	-	496	497	-	512	512	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1000	-	-	1020	-	-	176	199	534	167	197	515
Mov Cap-2 Maneuver	-	-	-	-	-	-	176	199	-	167	197	-
Stage 1	-	-	-	-	-	-	517	514	-	496	494	-
Stage 2	-	-	-	-	-	-	493	494	-	494	511	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			22.4			27.6		
HCM LOS							C			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	249	1000	-	-	1020	-	-	167
HCM Lane V/C Ratio	0.169	0.001	-	-	0.004	-	-	0.047
HCM Control Delay (s)	22.4	8.6	0	-	8.5	0	-	27.6
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1

2031 No-Build Weekday Morning Peak Hour  
4: Nahant Street & Hart Street

02/12/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	23	367	459	0	4	35
Future Vol, veh/h	23	367	459	0	4	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	89	89	73	73
Heavy Vehicles, %	0	1	2	0	0	3
Mvmt Flow	29	459	516	0	5	48

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	516	0	-	0	1033 516
Stage 1	-	-	-	-	516 -
Stage 2	-	-	-	-	517 -
Critical Hdwy	4.1	-	-	-	6.4 6.23
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.327
Pot Cap-1 Maneuver	1060	-	-	-	260 557
Stage 1	-	-	-	-	603 -
Stage 2	-	-	-	-	603 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1060	-	-	-	250 557
Mov Cap-2 Maneuver	-	-	-	-	250 -
Stage 1	-	-	-	-	581 -
Stage 2	-	-	-	-	603 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1060	-	-	-	495
HCM Lane V/C Ratio	0.027	-	-	-	0.108
HCM Control Delay (s)	8.5	0	-	-	13.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

# LANE SUMMARY

 Site: 8975 [Andover (Site Folder: General)]

2030 No-Build Weekday Morning Peak Hour MassWorks Grant Alternative

Site Category: (None)

Stop (Two-Way)

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	[ HV ] %						[ Veh	[ Dist ] ft				
South: Dundee Park Drive													
Lane 1	24	0.0	270	0.089	100	19.6	LOS C	0.3	7.4	Full	1600	0.0	0.0
Approach	24	0.0		0.089		19.6	LOS C	0.3	7.4				
East: Essex Street													
Lane 1	578	2.6	1795	0.322	100	3.1	LOS A	0.5	13.8	Full	1600	0.0	0.0
Approach	578	2.6		0.322		3.1	NA	0.5	13.8				
North: Railroad Street													
Lane 1	205	0.7	273	0.753	100	49.7	LOS E	6.3	159.4	Full	1600	0.0	0.0
Approach	205	0.7		0.753		49.7	LOS E	6.3	159.4				
West: Essex Street													
Lane 1	508	0.8	1662	0.306	100	4.1	LOS A	1.4	35.3	Full	1600	0.0	0.0
Approach	508	0.8		0.306		4.1	NA	1.4	35.3				
Intersection	1315	1.6		0.753		11.1	NA	6.3	159.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Minor Road Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road lanes.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Approach Lane Flows (veh/h)											
South: Dundee Park Drive											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	v/c	Util. %	SL %	Lane No.	
Lane 1	4	13	7	24	0.0	270	0.089	100	NA	NA	
Approach	4	13	7	24	0.0		0.089				
East: Essex Street											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	v/c	Util. %	SL %	Lane No.	
Lane 1	33	439	106	578	2.6	1795	0.322	100	NA	NA	
Approach	33	439	106	578	2.6		0.322				
North: Railroad Street											

Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N To Exit:	E	S	W			veh/h	Satn v/c	Util. %	SL %	Lane No.
Lane 1	110	27	69	205	0.7	273	0.753	100	NA	NA
Approach	110	27	69	205	0.7		0.753			
West: Essex Street										
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit:	N	E	S			veh/h	Satn v/c	Util. %	SL %	Lane No.
Lane 1	95	400	13	508	0.8	1662	0.306	100	NA	NA
Approach	95	400	13	508	0.8		0.306			
Total %HV Deg.Satn (v/c)										
Intersection	1315	1.6					0.753			

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Dundee Park Drive Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
East Exit: Essex Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
North Exit: Railroad Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
West Exit: Essex Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.

2031 No-Build Weekday Evening Peak Hour

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2031 No-Build Weekday Evening Peak Hour  
1: Main Street & North Avenue/Nahant Street

02/12/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	395	358	26	291	67	335	609	42	65	405	109
Future Volume (vph)	156	395	358	26	291	67	335	609	42	65	405	109
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850		0.976			0.990			0.968	
Flt Protected	0.950				0.997		0.950			0.950		
Satd. Flow (prot)	1745	1818	1561	0	1829	0	1805	1864	0	1745	3467	0
Flt Permitted	0.396				0.799		0.316			0.225		
Satd. Flow (perm)	727	1818	1561	0	1465	0	600	1864	0	413	3467	0
Satd. Flow (RTOR)			272		7			3			23	
Adj. Flow (vph)	170	429	389	28	316	73	364	662	46	71	440	118
Lane Group Flow (vph)	170	429	389	0	417	0	364	708	0	71	558	0
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2	13		6		13	10			14	
Permitted Phases	2		2	6			10			14		
Detector Phase	2	2	13	6	6		13	10		14	14	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0	14.0	8.0	14.0	14.0		8.0	11.0		11.0	11.0	
Total Split (s)	54.0	54.0	18.0	54.0	54.0		18.0	68.0		50.0	50.0	
Total Split (%)	36.0%	36.0%	12.0%	36.0%	36.0%		12.0%	45.3%		33.3%	33.3%	
Maximum Green (s)	45.0	45.0	15.0	45.0	45.0		15.0	62.0		44.0	44.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		4.0	4.0	
All-Red Time (s)	6.0	6.0	0.0	6.0	6.0		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	9.0	9.0	3.0		9.0		3.0	6.0		6.0	6.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	None	Min	Min		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	45.3	45.3	69.0		45.3		65.4	62.4		44.3	44.3	
Actuated g/C Ratio	0.36	0.36	0.54		0.36		0.51	0.49		0.35	0.35	
v/c Ratio	0.66	0.67	0.40		0.80		0.81	0.78		0.50	0.46	
Control Delay	50.5	42.3	5.5		49.9		37.4	35.1		50.4	33.6	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	50.5	42.3	5.5		49.9		37.4	35.1		50.4	33.6	
LOS	D	D	A		D		D	D		D	C	
Approach Delay		29.2			49.9			35.9			35.5	
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	110	277	41		282		161	426		43	167	
Queue Length 95th (ft)	#282	523	89		#609		#456	#900		#131	294	
Internal Link Dist (ft)		395			1456			1087			1014	
Turn Bay Length (ft)	140		150				150			75		
Base Capacity (vph)	258	645	969		524		450	913		143	1219	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	



2031 No-Build Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	19%
Maximum Green (s)	26.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	19.0
Pedestrian Calls (#/hr)	6
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

2031 No-Build Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/12/2024

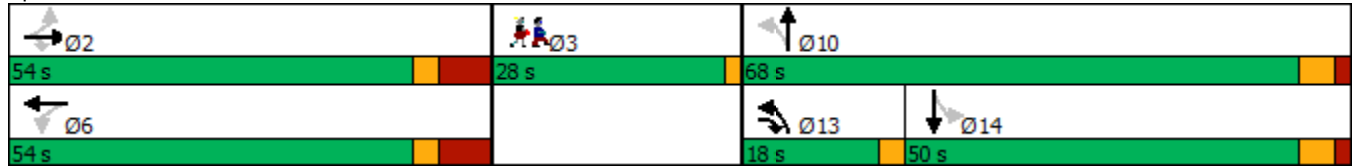


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.66	0.67	0.40		0.80		0.81	0.78		0.50	0.46	

Intersection Summary

Cycle Length: 150	
Actuated Cycle Length: 127.6	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 35.6	Intersection LOS: D
Intersection Capacity Utilization 105.4%	ICU Level of Service G
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & North Avenue/Nahant Street



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Lane Group	Ø3
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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2031 No-Build Weekday Evening Peak Hour  
2: Nahant Street & Traverse Street

02/12/2024

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	18	549	440	12	9	11
Future Vol, veh/h	18	549	440	12	9	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	92	92	53	53
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	20	610	478	13	17	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	491	0	-	0	1135 485
Stage 1	-	-	-	-	485 -
Stage 2	-	-	-	-	650 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1083	-	-	-	226 586
Stage 1	-	-	-	-	623 -
Stage 2	-	-	-	-	523 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1083	-	-	-	220 586
Mov Cap-2 Maneuver	-	-	-	-	220 -
Stage 1	-	-	-	-	606 -
Stage 2	-	-	-	-	523 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	17.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1083	-	-	-	335
HCM Lane V/C Ratio	0.018	-	-	-	0.113
HCM Control Delay (s)	8.4	0	-	-	17.1
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

2031 No-Build Weekday Evening Peak Hour  
 3: Private Driveway/Middlesex Street & Nahant Street

02/12/2024

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	541	17	7	441	1	5	0	3	0	0	2
Future Vol, veh/h	2	541	17	7	441	1	5	0	3	0	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	89	89	89	25	25	25	25	50	50
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	2	576	18	8	496	1	20	0	12	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	497	0	0	594	0	0	1104	1102	585	1108	1111	497
Stage 1	-	-	-	-	-	-	589	589	-	513	513	-
Stage 2	-	-	-	-	-	-	515	513	-	595	598	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1077	-	-	992	-	-	190	213	515	189	211	577
Stage 1	-	-	-	-	-	-	498	499	-	548	539	-
Stage 2	-	-	-	-	-	-	546	539	-	494	494	-
Platoon blocked, %		-	-	-	-	-						
Mov Cap-1 Maneuver	1077	-	-	992	-	-	187	210	515	183	208	577
Mov Cap-2 Maneuver	-	-	-	-	-	-	187	210	-	183	208	-
Stage 1	-	-	-	-	-	-	497	498	-	546	533	-
Stage 2	-	-	-	-	-	-	536	533	-	481	493	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			21.8			11.3		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	246	1077	-	-	992	-	-	577
HCM Lane V/C Ratio	0.13	0.002	-	-	0.008	-	-	0.007
HCM Control Delay (s)	21.8	8.3	0	-	8.7	0	-	11.3
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0

2031 No-Build Weekday Evening Peak Hour  
4: Nahant Street & Hart Street

02/12/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	46	498	416	3	2	33
Future Vol, veh/h	46	498	416	3	2	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	93	93	73	73
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	49	530	447	3	3	45

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	450	0	-	0	1077 449
Stage 1	-	-	-	-	449 -
Stage 2	-	-	-	-	628 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1121	-	-	-	245 614
Stage 1	-	-	-	-	647 -
Stage 2	-	-	-	-	536 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1121	-	-	-	230 614
Mov Cap-2 Maneuver	-	-	-	-	230 -
Stage 1	-	-	-	-	607 -
Stage 2	-	-	-	-	536 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1121	-	-	-	561
HCM Lane V/C Ratio	0.044	-	-	-	0.085
HCM Control Delay (s)	8.4	0	-	-	12
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

# LANE SUMMARY

**Site: 101 [Farm Street at Nahant Street Hemlock Road (Site Folder: General)]**

2031 No-Build Weekday Evening Peak Hour  
 Site Category: (None)  
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %						[ Veh	Dist ] ft				
South: Farm Street													
Lane 1 <sup>d</sup>	1025	1.6	1072	0.956	100	37.5	LOS D	44.5	1125.9	Full	1600	0.0	0.0
Approach	1025	1.6		0.956		37.5	LOS D	44.5	1125.9				
East: Hemlock Road													
Lane 1 <sup>d</sup>	221	4.9	312	0.708	100	38.9	LOS D	7.4	193.1	Full	1600	0.0	0.0
Approach	221	4.9		0.708		38.9	LOS D	7.4	193.1				
North: Farm Street													
Lane 1 <sup>d</sup>	697	0.9	864	0.806	100	23.0	LOS C	16.4	413.6	Full	1600	0.0	0.0
Approach	697	0.9		0.806		23.0	LOS C	16.4	413.6				
West: Nahant Street													
Lane 1 <sup>d</sup>	497	2.6	730	0.680	100	18.2	LOS B	8.0	204.3	Full	1600	0.0	0.0
Approach	497	2.6		0.680		18.2	LOS B	8.0	204.3				
Intersection	2439	1.9		0.956		29.6	LOS C	44.5	1125.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: SIDRA Standard.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Farm Street											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%	%	No.
Lane 1	283	697	46	1025	1.6	1072	0.956	100	NA	NA	
Approach	283	697	46	1025	1.6		0.956				
East: Hemlock Road											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%	%	No.
Lane 1	61	66	93	221	4.9	312	0.708	100	NA	NA	
Approach	61	66	93	221	4.9		0.708				

North: Farm Street											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From N To Exit:	E	S	W			veh/h	Satn v/c	Util. %	SL %	Lane No.	
Lane 1	68	518	110	697	0.9	864	0.806	100	NA	NA	
Approach	68	518	110	697	0.9		0.806				
West: Nahant Street											
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.	
From W To Exit:	N	E	S			veh/h	Satn v/c	Util. %	SL %	Lane No.	
Lane 1	123	36	338	497	2.6	730	0.680	100	NA	NA	
Approach	123	36	338	497	2.6		0.680				
Total %HV Deg.Satn (v/c)											
Intersection	2439	1.9					0.956				

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Farm Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1			Merge Analysis not applied.								
East Exit: Hemlock Road Merge Type: <b>Not Applied</b>												
Full Length Lane	1			Merge Analysis not applied.								
North Exit: Farm Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1			Merge Analysis not applied.								
West Exit: Nahant Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1			Merge Analysis not applied.								



2031 Build Weekday Morning Peak Hour

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2031 Build Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/13/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	202	323	42	322	49	323	413	50	28	415	133
Future Volume (vph)	92	202	323	42	322	49	323	413	50	28	415	133
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850		0.984			0.984			0.964	
Flt Protected	0.950				0.995		0.950			0.950		
Satd. Flow (prot)	1616	1766	1501	0	1801	0	1770	1808	0	1678	3370	0
Flt Permitted	0.370				0.933		0.205			0.479		
Satd. Flow (perm)	629	1766	1501	0	1689	0	382	1808	0	846	3370	0
Satd. Flow (RTOR)			351		6			6			37	
Adj. Flow (vph)	100	220	351	46	350	53	351	449	54	30	451	145
Lane Group Flow (vph)	100	220	351	0	449	0	351	503	0	30	596	0
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2	13		6		13	10			14	
Permitted Phases	2		2	6			10			14		
Detector Phase	2	2	13	6	6		13	10		14	14	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0	14.0	8.0	14.0	14.0		8.0	11.0		11.0	11.0	
Total Split (s)	33.0	33.0	17.0	33.0	33.0		17.0	39.0		22.0	22.0	
Total Split (%)	33.0%	33.0%	17.0%	33.0%	33.0%		17.0%	39.0%		22.0%	22.0%	
Maximum Green (s)	24.0	24.0	14.0	24.0	24.0		14.0	33.0		16.0	16.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		4.0	4.0	
All-Red Time (s)	6.0	6.0	0.0	6.0	6.0		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	9.0	9.0	3.0		9.0		3.0	6.0		6.0	6.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	Min	Min	Min		Min	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	24.6	24.6	47.2		24.6		36.9	33.9		16.4	16.4	
Actuated g/C Ratio	0.30	0.30	0.57		0.30		0.44	0.41		0.20	0.20	
v/c Ratio	0.54	0.42	0.35		0.89		0.86	0.68		0.18	0.86	
Control Delay	42.6	29.9	2.0		52.8		43.8	29.2		36.5	46.6	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	42.6	29.9	2.0		52.8		43.8	29.2		36.5	46.6	
LOS	D	C	A		D		D	C		D	D	
Approach Delay		17.2			52.8			35.2			46.1	
Approach LOS		B			D			D			D	
Queue Length 50th (ft)	35	73	0		176		91	158		11	123	
Queue Length 95th (ft)	#138	197	25		#518		#367	#468		45	#320	
Internal Link Dist (ft)		395			456			1087			1014	
Turn Bay Length (ft)	140		150				150			75		
Base Capacity (vph)	185	522	1003		504		408	739		167	694	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	

2031 Build Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/13/2024

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	28%
Maximum Green (s)	26.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	19.0
Pedestrian Calls (#/hr)	21
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

2031 Build Weekday Morning Peak Hour  
 1: Main Street & North Avenue/Nahant Street

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.54	0.42	0.35		0.89		0.86	0.68		0.18	0.86	

Intersection Summary

Cycle Length: 100	
Actuated Cycle Length: 83.2	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 36.2	Intersection LOS: D
Intersection Capacity Utilization 89.8%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & North Avenue/Nahant Street



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Lane Group	Ø3
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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2031 Build Weekday Morning Peak Hour  
2: Nahant Street & Traverse Street

02/13/2024

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	8	367	490	21	19	12
Future Vol, veh/h	8	367	490	21	19	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	89	89	52	52
Heavy Vehicles, %	0	3	2	0	0	0
Mvmt Flow	12	540	551	24	37	23

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	575	0	-	0	1127 563
Stage 1	-	-	-	-	563 -
Stage 2	-	-	-	-	564 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1008	-	-	-	228 530
Stage 1	-	-	-	-	574 -
Stage 2	-	-	-	-	573 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1008	-	-	-	224 530
Mov Cap-2 Maneuver	-	-	-	-	224 -
Stage 1	-	-	-	-	564 -
Stage 2	-	-	-	-	573 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	20.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1008	-	-	-	288
HCM Lane V/C Ratio	0.012	-	-	-	0.207
HCM Control Delay (s)	8.6	0	-	-	20.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.8

2031 Build Weekday Morning Peak Hour  
 3: Private Driveway/Middlesex Street & Nahant Street

02/13/2024

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	383	7	3	492	0	9	0	7	3	0	0
Future Vol, veh/h	1	383	7	3	492	0	9	0	7	3	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	84	84	84	38	38	38	38	38	38
Heavy Vehicles, %	0	3	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	1	555	10	4	586	0	24	0	18	8	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	586	0	0	565	0	0	1156	1156	560	1165	1161	586
Stage 1	-	-	-	-	-	-	562	562	-	594	594	-
Stage 2	-	-	-	-	-	-	594	594	-	571	567	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	999	-	-	1017	-	-	175	198	532	173	197	514
Stage 1	-	-	-	-	-	-	515	513	-	495	496	-
Stage 2	-	-	-	-	-	-	495	496	-	509	510	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	999	-	-	1017	-	-	174	197	532	166	196	514
Mov Cap-2 Maneuver	-	-	-	-	-	-	174	197	-	166	196	-
Stage 1	-	-	-	-	-	-	514	512	-	495	493	-
Stage 2	-	-	-	-	-	-	492	493	-	491	509	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			22.5			27.8		
HCM LOS							C			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	247	999	-	-	1017	-	-	166
HCM Lane V/C Ratio	0.17	0.001	-	-	0.004	-	-	0.048
HCM Control Delay (s)	22.5	8.6	0	-	8.6	0	-	27.8
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1

2031 Build Weekday Morning Peak Hour  
4: Nahant Street & Hart Street

02/13/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	23	370	460	0	4	35
Future Vol, veh/h	23	370	460	0	4	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	89	89	73	73
Heavy Vehicles, %	0	1	2	0	0	3
Mvmt Flow	29	463	517	0	5	48

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	517	0	-	0	1038 517
Stage 1	-	-	-	-	517 -
Stage 2	-	-	-	-	521 -
Critical Hdwy	4.1	-	-	-	6.4 6.23
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.327
Pot Cap-1 Maneuver	1059	-	-	-	258 556
Stage 1	-	-	-	-	603 -
Stage 2	-	-	-	-	600 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1059	-	-	-	248 556
Mov Cap-2 Maneuver	-	-	-	-	248 -
Stage 1	-	-	-	-	581 -
Stage 2	-	-	-	-	600 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1059	-	-	-	493
HCM Lane V/C Ratio	0.027	-	-	-	0.108
HCM Control Delay (s)	8.5	0	-	-	13.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4



# LANE SUMMARY

**Site: 101 [Farm Street at Nahant Street Hemlock Road (Site Folder: General)]**

2031 Build Weekday Morning Peak Hour  
 Site Category: (None)  
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %						[ Veh	Dist ] ft				
South: Farm Street													
Lane 1 <sup>d</sup>	861	4.9	894	0.963	100	43.0	LOS D	32.7	848.5	Full	1600	0.0	0.0
Approach	861	4.9		0.963		43.0	LOS D	32.7	848.5				
East: Hemlock Road													
Lane 1 <sup>d</sup>	318	21.6	513	0.620	100	20.9	LOS C	6.0	174.5	Full	1600	0.0	0.0
Approach	318	21.6		0.620		20.9	LOS C	6.0	174.5				
North: Farm Street													
Lane 1 <sup>d</sup>	793	2.6	841	0.944	100	40.9	LOS D	30.5	778.5	Full	1600	0.0	0.0
Approach	793	2.6		0.944		40.9	LOS D	30.5	778.5				
West: Nahant Street													
Lane 1 <sup>d</sup>	421	1.8	606	0.694	100	21.8	LOS C	8.1	204.4	Full	1600	0.0	0.0
Approach	421	1.8		0.694		21.8	LOS C	8.1	204.4				
Intersection	2393	5.8		0.963		35.6	LOS D	32.7	848.5				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Lane LOS values are based on average delay per lane.  
 Intersection and Approach LOS values are based on average delay for all lanes.  
 Roundabout Capacity Model: SIDRA Standard.  
 Delay Model: HCM Delay Formula (Geometric Delay is not included).  
 Queue Model: HCM Queue Formula.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Farm Street											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%		No.
Lane 1	199	328	334	861	4.9	894	0.963	100	NA	NA	
Approach	199	328	334	861	4.9		0.963				
East: Hemlock Road											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%		No.
Lane 1	135	71	113	318	21.6	513	0.620	100	NA	NA	
Approach	135	71	113	318	21.6		0.620				

North: Farm Street										
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N To Exit:	E	S	W			veh/h	Satn v/c	Util. %	SL %	Lane No.
Lane 1	229	400	164	793	2.6	841	0.944	100	NA	NA
Approach	229	400	164	793	2.6		0.944			
West: Nahant Street										
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit:	N	E	S			veh/h	Satn v/c	Util. %	SL %	Lane No.
Lane 1	114	132	175	421	1.8	606	0.694	100	NA	NA
Approach	114	132	175	421	1.8		0.694			
Total %HV Deg.Satn (v/c)										
Intersection	2393	5.8					0.963			

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Farm Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1										Merge Analysis not applied.	
East Exit: Hemlock Road Merge Type: <b>Not Applied</b>												
Full Length Lane	1										Merge Analysis not applied.	
North Exit: Farm Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1										Merge Analysis not applied.	
West Exit: Nahant Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1										Merge Analysis not applied.	

2031 Build Weekday Morning Peak Hour  
7: Nahant Street & Project Site Driveway

02/13/2024

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	2	278	407	1	3	6
Future Vol, veh/h	2	278	407	1	3	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	5	3	0	0	0
Mvmt Flow	2	302	442	1	3	7

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	443	0	-	0	749
Stage 1	-	-	-	-	443
Stage 2	-	-	-	-	306
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1128	-	-	-	382
Stage 1	-	-	-	-	651
Stage 2	-	-	-	-	751
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1128	-	-	-	381
Mov Cap-2 Maneuver	-	-	-	-	381
Stage 1	-	-	-	-	650
Stage 2	-	-	-	-	751

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1128	-	-	-	512
HCM Lane V/C Ratio	0.002	-	-	-	0.019
HCM Control Delay (s)	8.2	0	-	-	12.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

2031 Build Weekday Evening Peak Hour

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2031 Build Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/13/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	397	358	28	292	67	335	609	45	65	405	109
Future Volume (vph)	156	397	358	28	292	67	335	609	45	65	405	109
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850		0.977			0.990			0.968	
Flt Protected	0.950				0.996		0.950			0.950		
Satd. Flow (prot)	1745	1818	1561	0	1829	0	1805	1864	0	1745	3467	0
Flt Permitted	0.394				0.776		0.316			0.222		
Satd. Flow (perm)	724	1818	1561	0	1425	0	600	1864	0	408	3467	0
Satd. Flow (RTOR)			270		7			3			23	
Adj. Flow (vph)	170	432	389	30	317	73	364	662	49	71	440	118
Lane Group Flow (vph)	170	432	389	0	420	0	364	711	0	71	558	0
Turn Type	Perm	NA	pm+ov	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2	13		6		13	10			14	
Permitted Phases	2		2	6			10			14		
Detector Phase	2	2	13	6	6		13	10		14	14	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	14.0	14.0	8.0	14.0	14.0		8.0	11.0		11.0	11.0	
Total Split (s)	54.0	54.0	18.0	54.0	54.0		18.0	68.0		50.0	50.0	
Total Split (%)	36.0%	36.0%	12.0%	36.0%	36.0%		12.0%	45.3%		33.3%	33.3%	
Maximum Green (s)	45.0	45.0	15.0	45.0	45.0		15.0	62.0		44.0	44.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	4.0		4.0	4.0	
All-Red Time (s)	6.0	6.0	0.0	6.0	6.0		0.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	9.0	9.0	3.0		9.0		3.0	6.0		6.0	6.0	
Lead/Lag			Lead				Lead			Lag	Lag	
Lead-Lag Optimize?			Yes				Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min	None	Min	Min		None	Min		Min	Min	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	45.3	45.3	69.0		45.3		65.4	62.4		44.3	44.3	
Actuated g/C Ratio	0.36	0.36	0.54		0.36		0.51	0.49		0.35	0.35	
v/c Ratio	0.66	0.67	0.40		0.82		0.81	0.78		0.50	0.46	
Control Delay	50.7	42.5	5.6		52.4		37.4	35.3		50.7	33.6	
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay	50.7	42.5	5.6		52.4		37.4	35.3		50.7	33.6	
LOS	D	D	A		D		D	D		D	C	
Approach Delay		29.4			52.4			36.0			35.5	
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	110	280	42		288		161	430		43	167	
Queue Length 95th (ft)	#283	527	90		#628		#456	#906		#132	294	
Internal Link Dist (ft)		395			446			1087			1014	
Turn Bay Length (ft)	140		150				150			75		
Base Capacity (vph)	257	645	968		510		450	913		141	1219	
Starvation Cap Reductn	0	0	0		0		0	0		0	0	
Spillback Cap Reductn	0	0	0		0		0	0		0	0	

2031 Build Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

02/13/2024

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Adj. Flow (vph)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	19%
Maximum Green (s)	26.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	19.0
Pedestrian Calls (#/hr)	6
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	

2031 Build Weekday Evening Peak Hour  
 1: Main Street & North Avenue/Nahant Street

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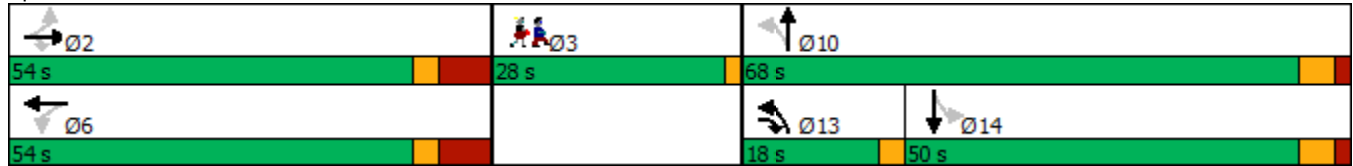


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0	0		0		0	0		0	0	
Reduced v/c Ratio	0.66	0.67	0.40		0.82		0.81	0.78		0.50	0.46	

Intersection Summary

Cycle Length: 150	
Actuated Cycle Length: 127.6	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 36.0	Intersection LOS: D
Intersection Capacity Utilization 105.8%	ICU Level of Service G
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 1: Main Street & North Avenue/Nahant Street



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Lane Group	Ø3
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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2031 Build Weekday Evening Peak Hour  
2: Nahant Street & Traverse Street

02/13/2024

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	18	550	443	12	9	11
Future Vol, veh/h	18	550	443	12	9	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	92	92	53	53
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	20	611	482	13	17	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	495	0	-	0	1140 489
Stage 1	-	-	-	-	489 -
Stage 2	-	-	-	-	651 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1079	-	-	-	224 583
Stage 1	-	-	-	-	621 -
Stage 2	-	-	-	-	523 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1079	-	-	-	218 583
Mov Cap-2 Maneuver	-	-	-	-	218 -
Stage 1	-	-	-	-	604 -
Stage 2	-	-	-	-	523 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	17.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1079	-	-	-	332
HCM Lane V/C Ratio	0.019	-	-	-	0.114
HCM Control Delay (s)	8.4	0	-	-	17.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

2031 Build Weekday Evening Peak Hour  
 3: Private Driveway/Middlesex Street & Nahant Street

02/13/2024

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	542	17	7	444	1	5	0	3	0	0	2
Future Vol, veh/h	2	542	17	7	444	1	5	0	3	0	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	89	89	89	25	25	25	25	50	50
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	2	577	18	8	499	1	20	0	12	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	500	0	0	595	0	0	1108	1106	586	1112	1115	500
Stage 1	-	-	-	-	-	-	590	590	-	516	516	-
Stage 2	-	-	-	-	-	-	518	516	-	596	599	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1075	-	-	991	-	-	189	212	514	188	210	575
Stage 1	-	-	-	-	-	-	497	498	-	546	538	-
Stage 2	-	-	-	-	-	-	544	538	-	494	494	-
Platoon blocked, %		-	-	-	-	-						
Mov Cap-1 Maneuver	1075	-	-	991	-	-	186	209	514	182	207	575
Mov Cap-2 Maneuver	-	-	-	-	-	-	186	209	-	182	207	-
Stage 1	-	-	-	-	-	-	496	497	-	544	532	-
Stage 2	-	-	-	-	-	-	534	532	-	481	493	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			21.9			11.3		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	245	1075	-	-	991	-	-	575
HCM Lane V/C Ratio	0.131	0.002	-	-	0.008	-	-	0.007
HCM Control Delay (s)	21.9	8.4	0	-	8.7	0	-	11.3
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0

2031 Build Weekday Evening Peak Hour  
4: Nahant Street & Hart Street

02/13/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	46	499	419	3	2	33
Future Vol, veh/h	46	499	419	3	2	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	93	93	73	73
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	49	531	451	3	3	45

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	454	0	-	0	1082
Stage 1	-	-	-	-	453
Stage 2	-	-	-	-	629
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1117	-	-	-	243
Stage 1	-	-	-	-	645
Stage 2	-	-	-	-	535
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1117	-	-	-	228
Mov Cap-2 Maneuver	-	-	-	-	228
Stage 1	-	-	-	-	605
Stage 2	-	-	-	-	535

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1117	-	-	-	557
HCM Lane V/C Ratio	0.044	-	-	-	0.086
HCM Control Delay (s)	8.4	0	-	-	12.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

# LANE SUMMARY

**Site: 101 [Farm Street at Nahant Street Hemlock Road (Site Folder: General)]**

2031 Build Weekday Evening Peak Hour  
 Site Category: (None)  
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %]						[ Veh	Dist ] ft				
South: Farm Street													
Lane 1 <sup>d</sup>	1027	1.6	1072	0.958	100	37.9	LOS D	45.0	1139.3	Full	1600	0.0	0.0
Approach	1027	1.6		0.958		37.9	LOS D	45.0	1139.3				
East: Hemlock Road													
Lane 1 <sup>d</sup>	221	4.9	310	0.711	100	39.3	LOS D	7.5	194.5	Full	1600	0.0	0.0
Approach	221	4.9		0.711		39.3	LOS D	7.5	194.5				
North: Farm Street													
Lane 1 <sup>d</sup>	698	0.9	862	0.809	100	23.3	LOS C	16.6	418.5	Full	1600	0.0	0.0
Approach	698	0.9		0.809		23.3	LOS C	16.6	418.5				
West: Nahant Street													
Lane 1 <sup>d</sup>	498	2.6	730	0.682	100	18.3	LOS B	8.1	206.0	Full	1600	0.0	0.0
Approach	498	2.6		0.682		18.3	LOS B	8.1	206.0				
Intersection	2443	1.9		0.958		29.9	LOS C	45.0	1139.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: SIDRA Roundabout LOS.  
 Lane LOS values are based on average delay per lane.  
 Intersection and Approach LOS values are based on average delay for all lanes.  
 Roundabout Capacity Model: SIDRA Standard.  
 Delay Model: HCM Delay Formula (Geometric Delay is not included).  
 Queue Model: HCM Queue Formula.  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Farm Street											
Mov.	L2	T1	R2	Total	%HV						
From S						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	W	N	E			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%		No.
Lane 1	285	697	46	1027	1.6	1072	0.958	100	NA	NA	
Approach	285	697	46	1027	1.6		0.958				
East: Hemlock Road											
Mov.	L2	T1	R2	Total	%HV						
From E						Cap.	Deg.	Lane	Prob.	Ov.	
To Exit:	S	W	N			veh/h	Satn	Util.	SL	Ov.	Lane
							v/c	%	%		No.
Lane 1	61	66	93	221	4.9	310	0.711	100	NA	NA	
Approach	61	66	93	221	4.9		0.711				

North: Farm Street											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From N To Exit:	E	S	W			Cap. veh/h	Satn v/c	Util. %	SL %	Lane No.	
Lane 1	68	518	111	698	0.9	862	0.809	100	NA	NA	
Approach	68	518	111	698	0.9		0.809				
West: Nahant Street											
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.	
From W To Exit:	N	E	S			Cap. veh/h	Satn v/c	Util. %	SL %	Lane No.	
Lane 1	123	36	339	498	2.6	730	0.682	100	NA	NA	
Approach	123	36	339	498	2.6		0.682				
Total %HV Deg.Satn (v/c)											
Intersection	2443	1.9					0.958				

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Farm Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
East Exit: Hemlock Road Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
North Exit: Farm Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
West Exit: Nahant Street Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.

2031 Build Weekday Evening Peak Hour  
7: Nahant Street & Project Site Driveway

02/13/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	5	502	384	3	1	3
Future Vol, veh/h	5	502	384	3	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	5	546	417	3	1	3

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	420	0	-	0	975 419
Stage 1	-	-	-	-	419 -
Stage 2	-	-	-	-	556 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1150	-	-	-	281 638
Stage 1	-	-	-	-	668 -
Stage 2	-	-	-	-	578 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1150	-	-	-	279 638
Mov Cap-2 Maneuver	-	-	-	-	279 -
Stage 1	-	-	-	-	664 -
Stage 2	-	-	-	-	578 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1150	-	-	-	483
HCM Lane V/C Ratio	0.005	-	-	-	0.009
HCM Control Delay (s)	8.1	0	-	-	12.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

## No Idling Law at Schools in Massachusetts

### 1. State Law and Implementing Regulations

Massachusetts General Law (MGL) Chapter 90, Section 16B (Idling of a Motor Vehicle Engine on School Property; Adoption of Regulations) and 540 CMR 27.00 (Regulation of Motor Vehicle Idling on School Grounds) address no idling laws on school grounds.

MGL Chapter 90, Section 16B(c) directs the Registrar of Motor Vehicles, in consultation with various state departments, to adopt regulations to implement this section. The last sentence of Section 16B(c) indicates that the regulation shall prescribe templates for "no idling" signage to be posted at schools.

540 CMR 27.00 was adopted by the Registrar of Motor Vehicles pursuant to MGL Chapter 90, Section 16B.

Specifically, 540 CMR 27.05: Signage states: Each public or private accredited preschool, accredited Head Start facility, elementary, vocational, secondary school, school district or municipality shall erect and maintain in a conspicuous location on school grounds "NO IDLING" permanent signage as described below. All such signage shall be sized and contain appropriate sized font so as to be visible from a distance of 50 feet.

NO IDLING.

PENALTIES OF \$100 FOR FIRST OFFENSE AND \$500  
FOR SECOND AND SUBSEQUENT OFFENSES  
M.G.L. C. 90, § 16B and 540 CMR 27.00

**2. Authority to Erect and Maintain Official Traffic Signs in Wakefield.** See ECode Division 2, Chapter 211: Traffic Rules and Orders.

In 1961, the Wakefield Board of Selectmen (BOS) adopted Chapter 211 in order to regulate traffic rules and orders. The BOS authorized itself to place and maintain all official traffic signs, signals, markings and safety zones.

Chapter 211-1 defines Official Traffic Signs as “[a]ll signs, markings and devices other than signals, not inconsistent with these rules and orders, and which conform to the standards prescribed by the Department of Public Works of the Commonwealth of Massachusetts and placed or erected by authority of a public body or official having jurisdictions, for the purpose of guiding, directing, warning or regulating traffic”.

**Note:** Department of Public Works of the Commonwealth of Massachusetts is now the Massachusetts Department of Transportation.

Chapter 211-10 is entitled Traffic Signs, Signals, Marking and Zones. A states, in part, “The Town Council is hereby authorized and as to those signs and signals required hereunder it shall be its duty, to place and maintain or cause to be placed and maintained all official traffic signs, signals, markings and safety zones”.

**3. Authority to Erect and Maintain “No Idling” Signs at Wakefield Schools.**

Wakefield Town Charter Section 8-4(b) is entitled School Department Real Property. It directs that the custody and control of all real property and buildings under the School Committee or School Department shall be transferred to the Town Council.