
Electrical System Impact Analysis



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Memorandum

To: Town of Wellesley Planning Board

Date: October 7, 2008

Project No.: 09733.26

From: VHB Land Development

Re: Wellesley CVS - PSI
Electrical Impact Analysis

This memorandum summarizes the analysis of Project-generated impacts on the Wellesley Municipal Light Plant electrical system.

The proposed CVS/Pharmacy will be served by the Wellesley Municipal Light Plant. The projected proposed demand for this project is approximately 800,000 kw hr/yr.

Based on a preliminary discussion of the project on 7-31-08, Don Newell of the Wellesley Municipal Light Plant did not anticipate issues in servicing the proposed development. The proponent will continue to work with the WMLP throughout the permitting, design and construction process to ensure that the requirements of the WMLP are met in full.

*Proposed CVS Pharmacy
980 Worcester Turnpike
(Route 9)*

Wellesley, Massachusetts

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Introduction

Vanasse Hangen Brustlin, Inc. (VHB) has completed a detailed Traffic Impact and Access Study to evaluate the traffic impacts associated with the proposed CVS Pharmacy to be located at the intersection of Worcester Turnpike (Route 9)/ Overbrook Drive in Wellesley, Massachusetts. A site location map is provided in Figure 1.

It is the finding of this assessment that the proposed CVS Pharmacy will not have a significant impact to traffic operations in the study area.

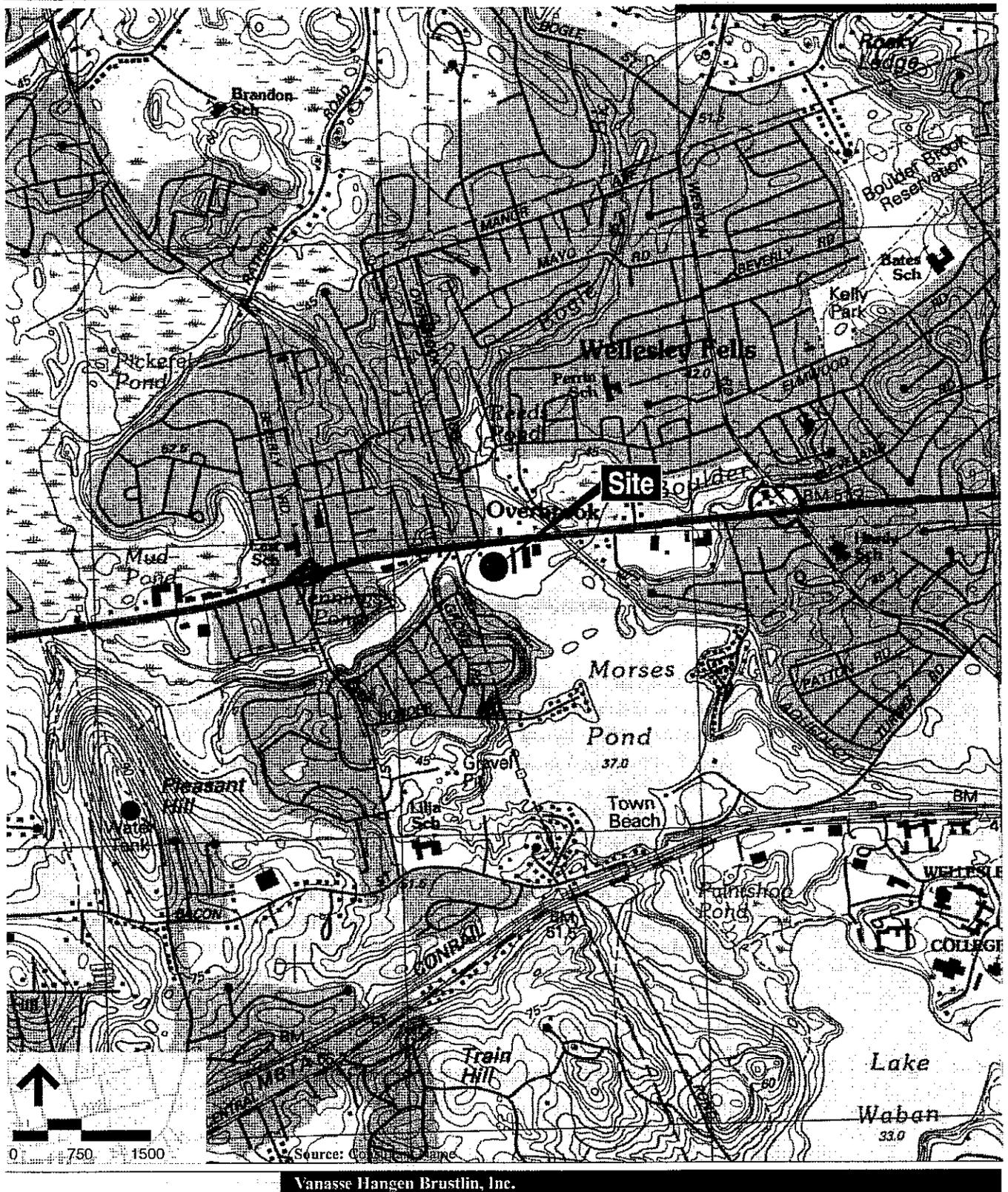
Project Description

The project site is located on the southern side of the intersection of Worcester Turnpike (Route 9) /Overbrook Drive in Wellesley, Massachusetts. The existing site contains three vacant buildings totaling 11,218 square feet. Two buildings were formerly used as an automotive dealership and a third accessory building is used for storage. The site is bounded to the east by the former Wellesley Travel Inn at 978 Worcester Turnpike, to the west and south by Bogle Brook, and to the north by Route 9.

The proposed redevelopment of the site includes leveling the existing buildings on site and replacing the existing uses with a 12,900 square-foot CVS Pharmacy (including a 1,693 square foot non-sales mezzanine area) featuring a dual drive-through operation along with accompanying parking and landscaped areas.

The dual prescription pick-up/drop-off window operation will only be available for use by customers dropping off or picking up prescription orders; no retail sales will be conducted through the window. The drive-through operation will be located at the southern side of the building to the rear of the site away from Route 9.

To accommodate the anticipated parking demand a total of 65 on-site parking spaces will be provided.



Vanasse Hangen Brustlin, Inc.

Site Location Map

Figure 1

Proposed CVS Pharmacy
Wellesley, Massachusetts

Access to the site will be provided via the existing traffic signal at Route 9 and Overbrook Drive. The signal operation will also be modified as part of this project to allow for exiting traffic onto Route 9 in both directions from a reconfigured site driveway, as compared to the enter-only condition that currently exists. A restricted right-turn exit onto Route 9 eastbound also is proposed at the northeast corner of the site.

Allowing for exiting traffic at the signal will require MassHighway approval. Detailed concepts have already been prepared by the proponent to start this process and VHB has had preliminary meetings with MassHighway District 3. Single entering and exiting lanes will be provided at this driveway which will be located opposite Overbrook Drive.

In addition, VHB has also analyzed the effects of a potential cross-connection between the proposed site and the adjacent parcel to the east (978 Worcester Turnpike) which would allow both sites to access Route 9 westbound at the proposed traffic signal at Overbrook Drive.

Study Methodology

This traffic assessment has been conducted in three stages. The first stage involved an assessment of existing traffic conditions within the project area including an inventory of existing roadway geometry, observations of traffic flow, daily and peak period traffic counts, and a review of traffic safety in the area.

The second stage of the study established the framework for evaluating the transportation impacts of the proposed project. Specific travel demand forecasts for the project were assessed along with future traffic demands on the study area roadways due to projected background traffic growth and other proposed area development that will occur independent of the proposed development. The year 2013 (a five-year time horizon), was selected as the design year for analysis for the preparation of this traffic impact and access assessment in conformance with Executive Office of Energy and Environmental Affairs/Executive Office of Transportation (EOEEA/EOT) and the Massachusetts Highway Department (MassHighway) guidelines. The traffic analysis conducted in the second stage identified both existing and projected future roadway capacities and demands.

The third and final stage of the study discusses possible measures to improve existing and future traffic operations in the area and offsetting the traffic-related impacts associated with the development of the proposed project.

Existing Conditions

Evaluation of the transportation impacts associated with the proposed project requires a thorough understanding of the existing transportation conditions in the project study area. Existing transportation conditions in the study area include roadway geometry, traffic controls, daily and peak hour traffic flow, and traffic safety data. Each of these elements is described in detail below.

Study Area

To effectively evaluate the transportation impacts associated with the proposed development, it is necessary to review the existing roadway system in the vicinity of the site. Based on Wellesley PSI guidelines, the study area for this analysis includes Worcester Turnpike (Route 9) and Overbrook Drive in addition to Route 9/Weston Road. The following intersections were included in this assessment:

- Worcester Turnpike (Route 9)/Overbrook Drive/Site Drive
- Weston Road/Worcester Turnpike (Route 9) eastbound ramp
- Worcester Turnpike (Route 9) eastbound/Weston Road ramp
- Worcester Turnpike (Route 9) westbound/Weston Road ramp (Service Road)
- Worcester Turnpike (Route 9) westbound/Weston Road Ramp (Amherst Avenue)

The existing conditions analysis consisted of an inventory of the traffic control, roadway, driveway and intersection geometrics in the study area, the collection of daily and peak hour traffic volumes, and a review of recent accident history. The signalized intersection of Worcester Turnpike (Route 9) at Oak Street has not been studied as it is the subject of planned improvement by MassHighway.



Roadway Geometry

Descriptions of the study area roadways and intersections are included below.

■

Roadways

Worcester Turnpike (Route 9)

Worcester Turnpike (Route 9) is a state-owned highway, running in an east-west direction from Boston to the New York state line. Near the site, Worcester Turnpike (Route 9) is a four-lane, median-divided highway.

■

Intersections

Worcester Turnpike (Route 9)/ Overbrook Drive/ Site Drive

- Three-way signalized intersection;
- Worcester Turnpike (Route 9) runs east-west; Overbrook Drive intersects from the north; Site Drive located on south side;
- Worcester Turnpike (Route 9) both eastbound and westbound consists of an exclusive left/U-turn lane; a through lane and a shared through/right turn lane;
- Overbrook Drive southbound consists of one shared lane;
- The Site Drive has three curb cuts, but does not have any signal indications approaching the intersection;
- Turn "bubbles" are present on the north and south side of Worcester Turnpike (Route 9) to accommodate U-turning trucks;
- Pedestrian accommodations include sidewalks on both side of Route 9 and Overbrook Drive, and a substandard crosswalk across the western leg of Worcester Turnpike (Route 9);
- Land use in the area is primarily commercial.



Weston Road/ Worcester Turnpike (Route 9) eastbound ramp

- Three-way unsignalized intersection;
- Weston Road runs north-south; Worcester Turnpike (Route 9) eastbound ramp approaches from west;
- Weston Road consists of a single lane in each direction;
- Worcester Turnpike (Route 9) eastbound consists of one shared lane and is Stop controlled;
- On-street parking occurs on both sides of Weston Road, north of the intersection;
- Pedestrian accommodations include sidewalks on both side of Weston Road and a crosswalk across the Worcester Turnpike (Route 9) eastbound ramp approach;
- Land use in the area is primarily residential with a school on Weston Road, south of the intersection.

Worcester Turnpike (Route 9) eastbound/ Weston Road ramp

- Three-way unsignalized intersection;
- Worcester Turnpike (Route 9) is median divided and runs east-west, Weston Road ramp approaches from the south;
- Worcester Turnpike (Route 9) eastbound consists of two approach lanes;
- Weston Road ramp consists of a single right turn only lane;
- Weston Road ramp is Stop controlled;
- Pedestrian accommodations include a sidewalk along the south side of Route 9 and a crosswalk across the Weston Road northbound ramp approach;
- Land use in the area is primarily commercial.

Worcester Turnpike (Route 9) westbound/ Weston Road ramp (Service Road)

- Three-way unsignalized intersection;
- Worcester Turnpike (Route 9) is median divided and runs east-west, the ramp (Service Road) approaches from the north;
- Worcester Turnpike (Route 9) westbound consists of two approach lanes;



- Ramp (Service Road) ramp consists of a single right turn only lane;
- Ramp (Service Road) ramp is Stop controlled;
- Pedestrian accommodations include a sidewalk along the north side of Route 9, a paved walkway leading through a park-like area to Weston Road, and a crosswalk across the Weston Road northbound ramp approach;
- Land use in the area is a mix of commercial and residential.

Worcester Turnpike (Route 9) westbound/ Amherst Road (Weston Road ramp)

- Three-way unsignalized intersection;
- Worcester Turnpike (Route 9) is median divided and runs east-west, Amherst Road approaches from the north;
- Worcester Turnpike (Route 9) westbound consists of two approach lanes;
- Amherst Road ramp consists of a single right turn only lane;
- Amherst Road ramp is Stop controlled;
- Pedestrian accommodations include a sidewalk along the north side of Route 9, a short sidewalk segment to an office building on the east side of Amherst Road, and a crosswalk across the Weston Road northbound ramp approach;
- Land use in the area is commercial east of the intersection and woods west of the intersection.

Traffic Volumes

Traffic volumes for the study area roadways and intersections were recorded in April 2008. Peak hour turning movement and classification (TMC) counts were collected on a weekday from 4:00 PM to 6:00 PM and on a Saturday from 11:00AM to 2:00 PM at the study area intersections. Concurrent with the TMCs, one automatic traffic recorder (ATR) count was conducted for a period of 72 hours on Worcester Turnpike (Route 9) near the proposed site.

Based on the TMC data, the peak hours of traffic operations for the study area intersections were determined to be 4:45 to 5:45 PM on a typical weekday evening and 1:00 to 2:00 PM on a typical Saturday midday. The ATR data indicate that the weekday morning peak hour occurs between 8:00 to 9:00 AM. While exact hours of operation have not yet been established for this proposed CVS Pharmacy, most CVS Pharmacies are just opening at this time, and generate

far less traffic at this time than during later times in the day. Accordingly, the weekday evening and Saturday midday peak hours are the critical analysis periods for this evaluation. A summary of the ATR traffic data is presented in Table 1.

Table 1
Observed Traffic Volumes
Worcester Turnpike (Route 9)

Daily		Peak Hour								
Weekday (vpd) ¹	Saturday (vpd) ¹	Weekday Morning			Weekday Evening			Saturday Midday		
		Vol. (vph) ²	"K" Factor ³	Directional Flow ⁴	Vol. (vph) ²	"K" Factor	Directional Flow ⁴	Vol. (vph) ²	"K" Factor	Directional Flow ⁴
53,000	47,300	4,205	7.9%	58% EB	3,880	7.3%	52% EB	3,560	7.5%	55% WB

Source: Automatic Traffic Recorder (ATR) counts conducted by VHB in April 2008 on Route 9 to the east of Overbrook Drive.

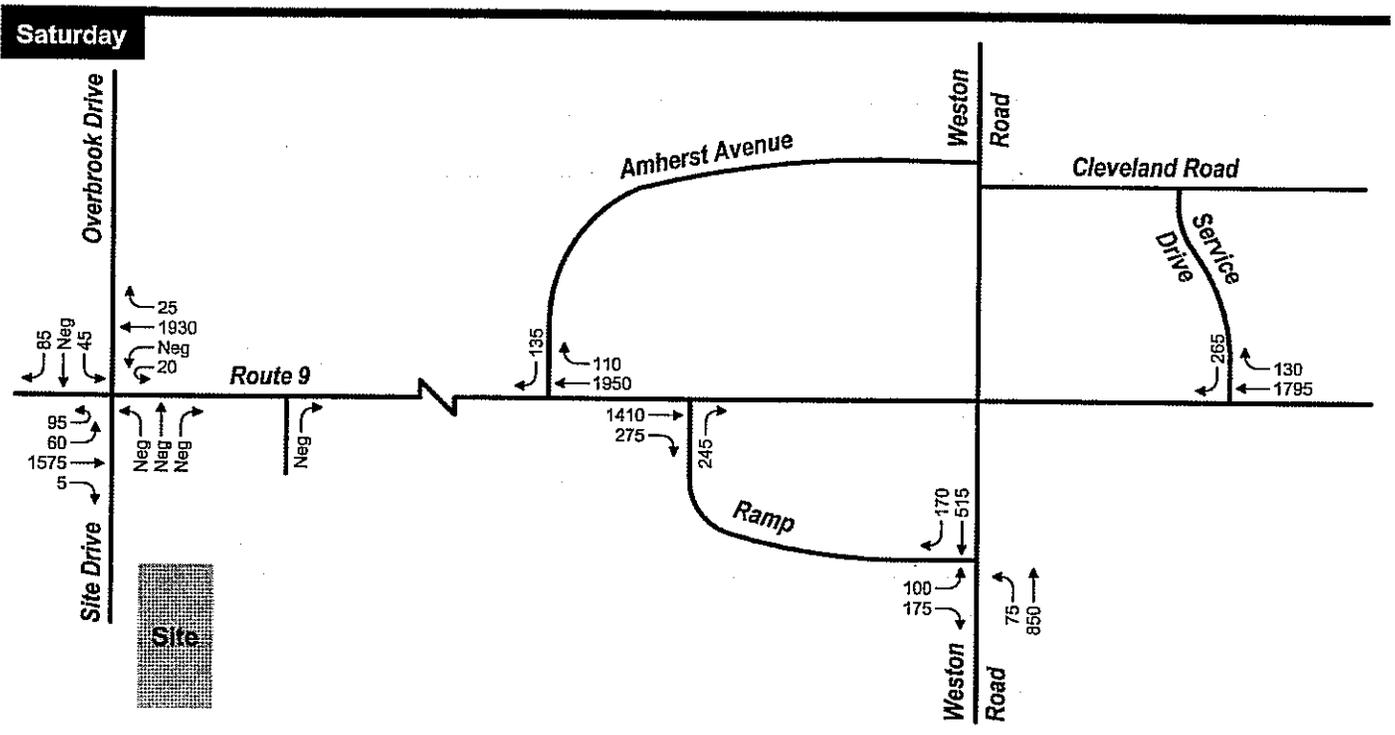
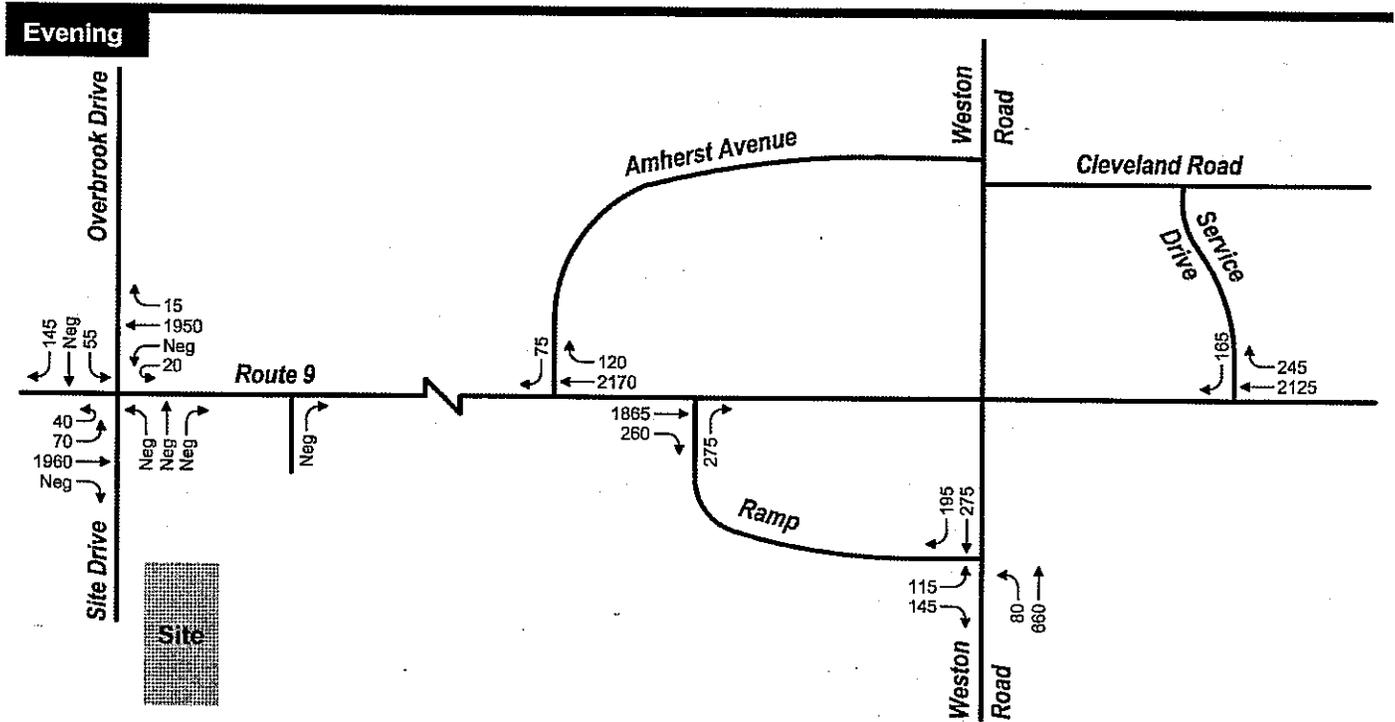
- 1 Daily traffic expressed in vehicles per day.
- 2 Peak hour volumes expressed in vehicles per hour.
- 3 Percent of daily traffic that occurs during the peak hour.
- 4 directional distribution of peak hour traffic

Notes: EB = eastbound, WB = westbound, Peak hours do not necessarily coincide with the peak hours of the turning movement counts.

Table 1 indicates that the average daily traffic on Worcester Turnpike adjacent to the proposed site was observed to be approximately 53,000 and 47,300 vehicles per day on a typical weekday and Saturday, respectively. Peak hour traffic accounts for between approximately 7.3 percent of the daily traffic during weekdays and 7.5 percent during Saturdays.

■
Seasonal Adjustment

The traffic volume data collected for this project were obtained during the month of April. To quantify the seasonal variation of traffic volumes in the area, seasonal adjustment factors were obtained from the MassHighway 2006 Weekday Seasonal Factors worksheet. According to the worksheet, April traffic volumes in the area are approximately 7% higher than average month conditions. Therefore, to be conservative, the traffic volumes were not adjusted downward to reflect average month conditions. The resulting 2008 existing traffic volume networks are presented in Figure 2 for the Weekday evening and Saturday midday peak hours.



↑
Not to Scale

Vanasse Hangen Brustlin, Inc.

2008 Existing
Weekday Evening and Saturday Midday
Peak Hour Traffic Volumes

Figure 2

Proposed CVS Pharmacy
Wellesley, Massachusetts

Sight Distance

Sight distance analyses, in conformance with guidelines of the American Association of State Highway and Transportation Officials (AASHTO)¹ were performed for the signalized site drive. The posted speed limit on Worcester Turnpike (Route 9) is 50 mph. Due to queues associated with the traffic signal at Worcester Turnpike (Route 9)/Overbrook Drive, travel speeds can not be recorded accurately in the immediate area. Therefore, the posted speeds were used to calculate the required stopping sight distance (SSD) for Worcester Turnpike (Route 9) traffic approaching the site driveway. Intersection sight distance (ISD) is considered as a desirable visibility criterion for the safe operation of an unsignalized intersection and is not applicable for signalized intersections.

SSD is the distance required for a vehicle approaching an intersection from either direction to perceive, react and come to a complete stop before colliding with the exiting vehicle from a driveway. In this respect, SSD can be considered as the minimum visibility criterion for the safe operation of an unsignalized intersection.

Table 2
Sight Distance Analysis Summary

Intersection	Stopping Sight Distance		
	Traveling	Required	Measured
Worcester Turnpike (Route 9) at site driveway (signalized)	Eastbound	425	>1,000
	Westbound	425	>1,000
Worcester Turnpike (Route 9) at Right-turn exit (unsignalized)	Eastbound	425	>1,000
	Westbound	N/A	N/A

a calculated site distance expressed in feet based on posted speed limit of 50 mph

e measured site distance expressed in feet

Table 2 above indicates that adequate stopping sight distance SSD is available at the proposed site driveway. While not tabulated in the table, the available intersection sight distance looking from the right-turn only driveway looking to the west easily exceeds the 480-foot requirement.

¹ A Policy on the Geometric Design of Highways and Streets; American Association of State Highway and Transportation Officials; Washington, D.C.; 2001.

Accident History

To identify potential vehicle crash trends, reported vehicular crash data for the study-area locations was obtained from MassHighway for the years 2005-2007. In addition data were obtained from the Wellesley Police Department for the years 2004 through December 2007. It was found that the Wellesley Police Department data did not include accidents in close proximity to the intersections that listed only an address. Therefore, MassHighway data was utilized for this analysis and is included in the Appendix. A summary of the vehicle crash history is presented in Table 3.

The MassHighway average crash rates for signalized and unsignalized intersections for District 3 [the MassHighway district designation for Wellesley] are 0.87 and 0.69, respectively.

The Worcester Turnpike (Route 9) /Weston Road interchange experienced a total of 75 vehicular crashes over three years. At this interchange, many of the crash records (using both MassHighway and Wellesley Police Department data) do not differentiate which ramp the accident may have occurred at. At these locations, a crash rate can not be calculated.

The intersection of Worcester Turnpike (Route 9) /Overbrook Drive experienced a total of 30 vehicular crashes over three years. The crash rate for this intersection is 0.58 acc/mev, which is significantly lower than the District 3 average crash rate for unsignalized intersections.

Table 3
Vehicular Crash Summary (2005- 2007)

Signalized?	Worcester Turnpike (Route 9)/ Overbrook Drive	Worcester Turnpike (Route 9)/ Weston Road (entire interchange)
	Yes	No
Year		
2005	10	28
2006	5	21
<u>2007</u>	<u>15</u>	<u>26</u>
Total	30	75
Average Annual	10	25
Collision Type		
Angle	5	16
Head-on	0	1
Rear-end	19	49
Sideswipe	2	4
Single-vehicle crash	2	5
<u>Unknown</u>	<u>2</u>	<u>0</u>
Total	30	75
Severity		
Fatal	0	0
Injury Accident	5	16
Property Only	25	57
<u>Unknown</u>	<u>0</u>	<u>2</u>
Total	30	75
Time of day		
Weekday 7:00 AM - 9:00 AM	7	12
Weekday 4:00 PM - 6:00 PM	2	12
Saturday 11:00 AM-2:00 PM	1	2
Weekday, other time	15	43
<u>Weekend, other time</u>	<u>5</u>	<u>6</u>
Total	30	75
Pavement Conditions		
Dry	23	54
Wet	6	15
Snowy	0	2
Ice/Slush	1	2
<u>Unknown</u>	<u>0</u>	<u>2</u>
Total	30	75
MassHighway Crash Rates	0.58	N/A

Future Conditions

Traffic volumes in the study area were projected to the year 2013, which reflects a five-year traffic-planning horizon. Independent of the proposed project, volumes on the roadway network under year 2013 No-Build conditions were assumed to include existing traffic and new traffic resulting from background traffic growth. Anticipated site-generated traffic volumes were added to the 2013 No-Build traffic volume networks to reflect the year 2013 Build conditions within the project study area.

Background Traffic Growth

Traffic growth on area roadways is a function of the expected land development, economic activity, and changes in demographics. Several methods can be used to estimate this growth. A procedure frequently employed is to estimate an annual percentage increase and apply that increase to study area traffic volumes. An alternative procedure is to identify estimated traffic generated by planned new major developments that would be expected to impact the project study area roadways. For the purpose of this assessment, both methods were utilized.

Historic Traffic Growth

To be consistent with other recent studies performed in the area, the existing traffic volumes were increased by 1.5 percent per year to account for potential future traffic growth not associated with identified planned/approved developments.

Site-Specific Growth

Traffic volumes in the area can be affected by other nearby developments. In addition to accounting for background growth, the traffic associated with other planned and/or approved developments near the site were considered. Based on discussions with the Town of Wellesley and Town of Natick planning departments, there are currently eight developments (either planned, under construction, or built

as summarized in Table 4) which could generate additional traffic through the study area. Other planned small projects, with relatively low traffic volume generation, are accounted through the use of the 1.5 percent annual background traffic growth factor.

**Table 4
Local Development Projects Summary**

Project Name	Location	Land Use Type	Size
Wellesley Travel Inn	Worcester Turnpike (Wellesley)	Mixed use	36 condominium units, 6,000 sf restaurant, 2,000 sf Starbucks, 12,000 sf med. office, 4,000 sf bank
St James Church site	Worcester Turnpike (Wellesley)	Residential	30 units residential
Linden Square*	Linden Street (Wellesley)	Mixed use	49,999 sf grocery 10,976 sf office 98,000 sf retail 4 units residential 3,206 sf gas station
Natick Mall*	Speen Street (Natick)	Residential	215 Units residential
Natick Paperboard Redevelopment	North Main Street (Natick)	Residential	150 Units residential
Cloverleaf Mall Apartments	Speen Street (Natick)	Residential	183 Units residential
MathWorks	Apple Hill Drive (Natick)	Office	169,000 sf
Chrysler Road Apartments	Speen Street (Natick)	Residential	404 Units residential

* Note: Projects have completed construction since data collection for the CVS Pharmacy was conducted. Projected background volumes were added to No-Build base volumes to account for traffic generated by these projects. Additional retail development occurred at Natick Mall prior to the traffic data collection for this study and is already accounted for in existing conditions volumes.

The current analysis assumed that all of the developments listed in Table 4 would be constructed and in operation by the year 2013. Traffic related to these developments were assigned to the study area roadways, as appropriate, using information available in recent traffic studies for the projects, or based on Institute of Transportation Engineers (ITE) guidelines for estimating trip generation for various types of land uses.

A summary of the peak period site-generated traffic volumes associated with these developments is provided in the Appendix of this report. The 2013 No-Build traffic

volumes, including all background growth, are shown in Figure 3 for the Weekday evening and Saturday midday peak hours.

Future Roadway Conditions

In assessing future traffic conditions, the following proposed roadway improvements within the study area were considered.

MassHighway Improvements

MassHighway, in cooperation with the Towns of Natick and Wellesley, is planning future improvements to the intersections of Route 9/Oak Street and Route 9/Overbrook Drive. Improvements are likely to consist of geometry and signal improvements and are not expected to involve grade separation. The design effort for this work is currently underway, with the plans being generally at the 25% level.

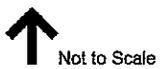
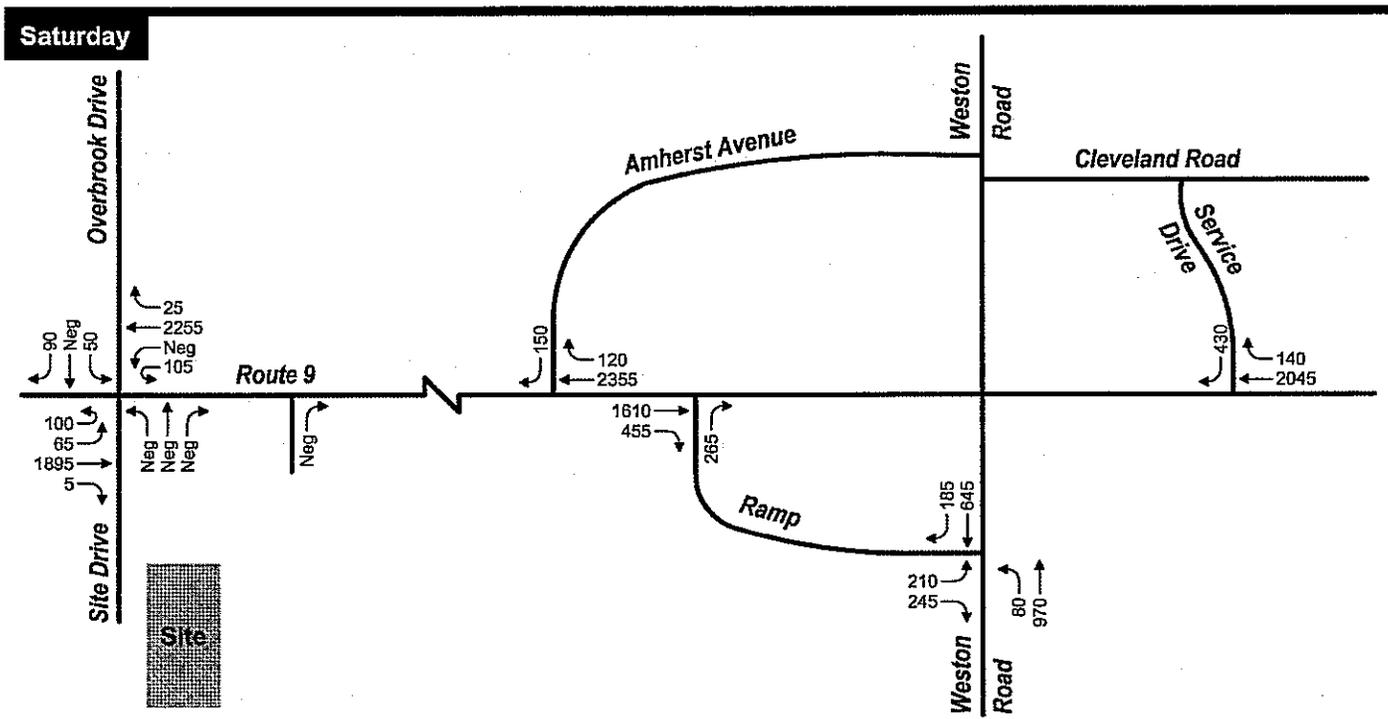
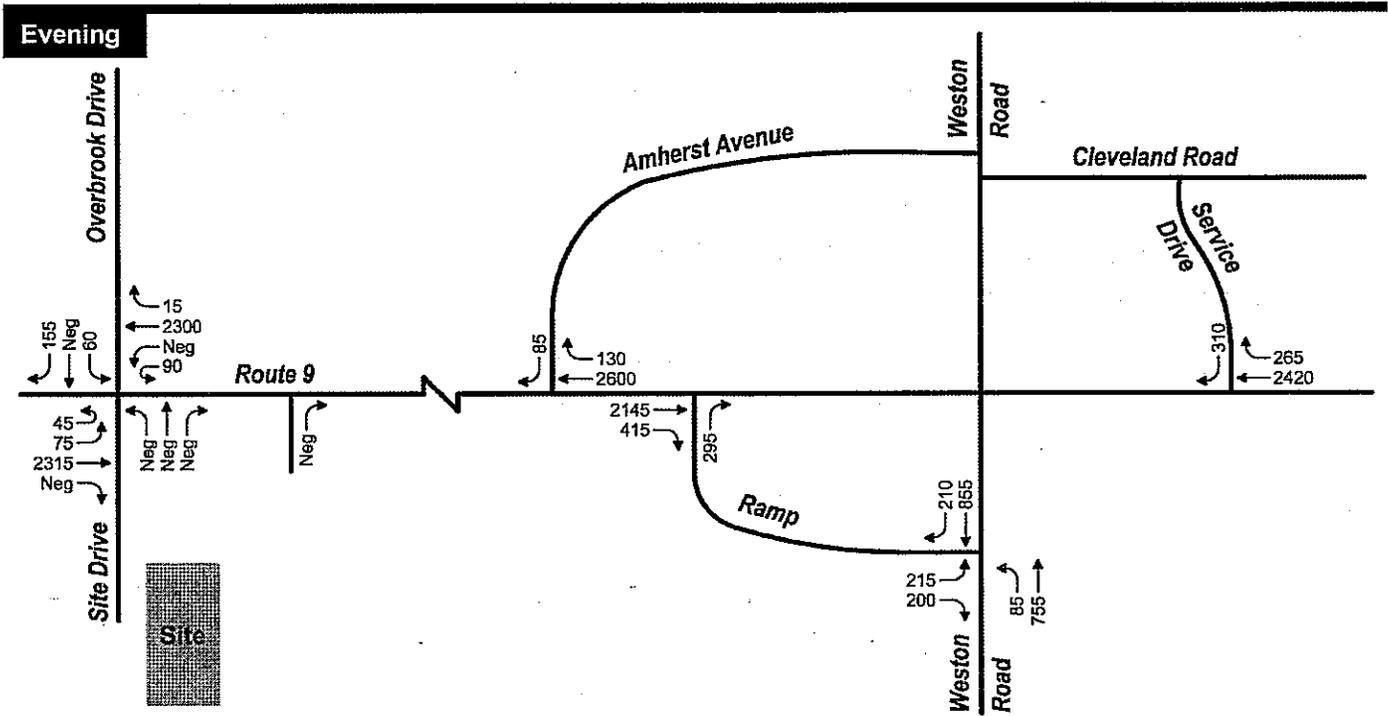
A nearby development project in Natick (MathWorks) is proposing interim improvements at the intersection of Route 9/Oak Street. These will include signal timing adjustments, updated pavement markings and signage modifications. This work will also involve providing an interconnection to a new signal that will be installed approximately 1,300 feet to the west of that intersection. The design plans for this effort have completed the 25% level and are advancing toward a 75/100% design submittal. The limits of these interim improvements do not extend to the Route 9/Overbrook Drive intersection.

As the design work for these future improvements is still in various stages of development the exact details of the improvements are not known at this time. Therefore, the future conditions analysis was conservatively conducted without assuming any roadway improvements. As the proposed CVS improvements advance the Proponent will coordinate with MassHighway and others to properly coordinate the design and construction efforts in the vicinity of the site.

Wellesley Travel Inn Related Improvements

The development at the adjacent Wellesley Travel Inn located at 978 Worcester Turnpike is permitted at this time. Improvements at Route 9/Overbrook Drive related to that development consist of the following;

- Replacing traffic signal controller;
- Replacing all incandescent signal heads with LED lights;
- Installing new wheelchair ramps, crosswalk lines, pavement markings,



Vanasse Hangen Brustlin, Inc.

2013 No-Build
Weekday Evening and Saturday Midday
Peak Hour Traffic Volumes

Figure 3

Proposed CVS Pharmacy
Wellesley, Massachusetts

- push buttons and emergency pre-emption system;
- Replacing or installing loop detectors as necessary; and
- Coordinating this intersection with the Oak Street at Route 9 intersection either by radio or GPS system control.

In addition, the developer of the Wellesley Travel Inn will be required to repair sidewalks on the south side of Worcester Turnpike from Grove Road in Natick to a point 600 feet east of the project and the north side from Ottaway Circle to 951 Worcester Turnpike. As the signal improvements identified as part of the Wellesley Travel Inn project will overlap with changes needed by CVS to add the fourth approach to the intersection of Worcester Turnpike/Overbrook Drive, the No-Build analysis was conducted without assuming any roadway improvements. However, these improvements are included in the Build analysis in conjunction with the CVS-related improvements summarized below.



CVS Related Improvements

As part of the proposed CVS project, the proponent is proposing signaling the site access, essentially adding a fourth approach to the Worcester Road/Overbrook traffic signal. The driveway will be aligned opposite Overbrook Drive, allowing these two approaches to operate on the same phase. If the improvements proposed as part of the Wellesley Travel Inn are not in place at this time, a new traffic signal controller assembly will be required. Since this improvement will be implemented as part of the development, this fourth leg is not analyzed in the No Build scenario, but is included in all Build analysis. Additional improvements, such as traffic signal timing adjustments, are discussed in the mitigation section.

Cross-Connection

The Town of Wellesley has expressed a desire to provide a cross-connection between the proposed CVS and the development at the Wellesley Travel Inn site. The Planning Board, in its PSI Decision for 978 Worcester Turnpike, states that the "Applicant shall work cooperatively toward implementation of a connector road between the site and the... [Kehoe Property] to the west." Providing this connection would allow vehicles exiting the adjacent Wellesley Travel Inn parcel to travel through the CVS site and take a left onto Route 9 Westbound at a signal instead of reversing direction at the Route 9/Weston Road ramps. The effect of this cross connection is analyzed as a separate section in the Mitigation chapter of this document.

Site-Generated Traffic Volumes

Design year 2013 Build traffic volumes for study area roadways were determined by estimating site-generated traffic volumes and distributing these volumes over the study area roadways. These site-generated volumes were added to the No-Build traffic volumes to create the year 2013 Build traffic volume networks. The following sections describe the procedures used to develop the Build condition traffic volume networks.

Existing Use Trip Generation

The car dealership that previously occupied the site is no longer in operation. Therefore, the trips associated with the former car dealership are not included in the existing traffic data. However, as this is a permitted use, the Pharmacy trips will be replacing the car dealership. For comparison purposes, we have provided an estimate on the previous traffic generated by the previous use on site.

Based on data compiled in the Institute of Transportation Engineers (ITE) Trip Generation manual, the trip generation for a scenario involving reoccupying the existing car dealership (11,218 sf) was calculated and included in Table 5 below.

Table 5
As-of-Right Trip Generation

Time Period	Movement	Vehicle Trips
		Car Dealership
Weekday Evening Peak Hour ^a	Enter	12
	Exit	18
	Total	30
Saturday Midday Peak Hour ^a	Enter	17
	Exit	16
	Total	33

Source: Trip Generation, 8th Edition; Institute of Transportation Engineers [ITE]; Washington, D.C. [2008]; land use code 841 New Car sales (11,218 sf)

a vehicles per hour

The volumes above have been presented strictly for comparison purposes. In analyzing future Build conditions, all of the traffic associated with the CVS was added to the roadway network, without applying any reduction or credit to account for the traffic previously generated by the site.

CVS Pharmacy Trip Generation

To estimate the volume of traffic generated by the proposed CVS Pharmacy, ITE trip

generation rates for pharmacy/drugstore with prescription pick-up window (land use code 881) were used. This data was also supplemented with ITE information for retail uses (shopping centers; land use code 820). As noted earlier, the proposed CVS Pharmacy will be 12,900 square feet, including 1,693 square feet of non-sales mezzanine area (storage, office space, etc.).

Pharmacy/drugstore with prescription pick-up window is the most appropriate land use code provided by ITE; however, while this category provides a sufficient trip generation database for the weekday daily and weekday peak hour periods, the extent of the available Saturday database is not as adequate. To estimate the traffic generation for the pharmacy on a Saturday, ITE data for shopping centers were referenced to determine the relationship between weekday and Saturday data. This temporal relationship was applied to the ITE pharmacy weekday data to calculate trip generation rates for Saturdays.

**Table 6
Trip Generation Summary -- Total Trips**

Time Period	Movement	CVS Total Vehicle Trips
Weekday Daily ^a	Enter	645
	Exit	645
	Total	1,290
Weekday Morning Peak Hour ^b	Enter	20
	Exit	20
	Total	40
Weekday Evening Peak Hour ^b	Enter	60
	Exit	65
	Total	120
Saturday Daily ^a	Enter	750
	Exit	750
	Total	1,500
Saturday Midday Peak Hour ^b	Enter	85
	Exit	80
	Total	165

Source: Trip Generation, 8th Edition; Institute of Transportation Engineers (ITE); Washington, D.C. (2008). Land Use Code 881 (Pharmacy/Drugstore with Drive-Through Window) for 14,593 sf CVS, including mezzanine space. Saturday trip generation developed by applying ratio of weekday to Saturday trip generation, as calculated using Land Use Code 820 (Shopping Center) for 14,593 sf of total building area, to the CVS weekday trip generation.

- a vehicles per day
- b vehicles per hour

Pass-By Trips

Not all of the traffic generated by the site will be new traffic on the study area roadways. A portion of the vehicle-trips generated by the proposed site will be drawn from the existing traffic passing the site in the form of pass-by traffic or from roadways in the vicinity of the site in the form of diverted-link traffic. ITE data

suggest that between 44 and 54 percent of the traffic generated by a retail establishment could be pass-by traffic. A significant amount of the business in a CVS is retail-based; however, to present a conservative analysis, it has been assumed in this analysis that only 25 percent of the traffic generated by the site would be pass-by trips. The resulting trip generation is presented in Table 7.

**Table 7
CVS Trip Generation Summary**

Time Period	Movement	CVS Total Vehicle Trips	CVS Pass-by Vehicle Trips ^a	Net New Vehicle Trips
Weekday Daily ^b	Enter	645	160	485
	Exit	645	160	485
	Total	1,290	320	970
Weekday Morning Peak Hour ^c	Enter	20	5	15
	Exit	20	5	15
	Total	40	10	30
Weekday Evening Peak Hour ^c	Enter	60	15	45
	Exit	65	15	50
	Total	120	30	95
Saturday Daily ^b	Enter	750	185	565
	Exit	750	185	565
	Total	1,500	370	1,130
Saturday Midday Peak Hour ^c	Enter	85	20	65
	Exit	80	20	60
	Total	165	40	125

Source: Trip Generation, 8th Edition; Institute of Transportation Engineers (ITE); Washington, D.C. (2008). Land Use Code 881 (Pharmacy/Drugstore with Drive-Through Window) for 14,593 sf CVS, including mezzanine space. Saturday trip generation developed by applying ratio of weekday to Saturday trip generation, as calculated using Land Use Code 820 (Shopping Center) for 14,593 sf of total building area, to the CVS weekday trip generation.

- a represents 25 percent pass-by rate
- b vehicles per day
- c vehicles per hour

The current analysis also assumes that the traffic generated by the site would be comprised of only new or pass-by traffic. Diverted link trips were assumed to represent new traffic on all area roadways.

Trip Distribution and Assignment

The directional distribution of traffic approaching and departing the development is a function of several variables. These include population densities, shopping opportunities, competing uses, existing travel patterns, and the efficiency of the roadways leading to the site.

The trip distribution for the proposed shopping center is based on the distribution patterns of the existing roadway network. The anticipated trip distribution for the site-generated traffic is summarized in Table 8 and shown in Figure 4.

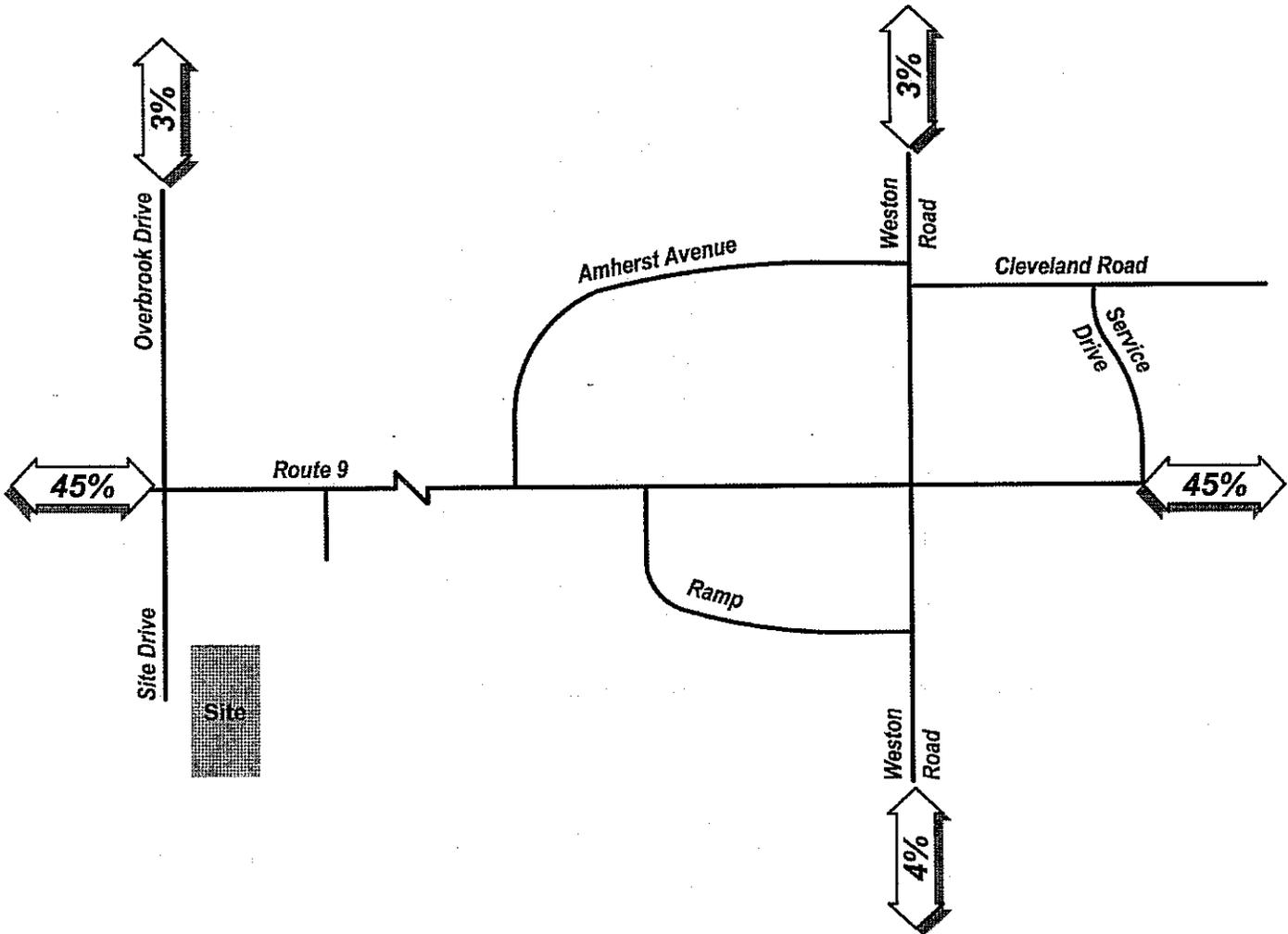
Table 8
Trip Distribution Summary

Direction (To/From)	Travel Route	Percent of New Site-Generated Traffic Assigned to Route
West	Worcester Turnpike (Route 9)	45 percent
East	Worcester Turnpike (Route 9)	45 percent
North	Overbrook Drive	3 percent
North	Weston Road	3 percent
<u>South</u>	<u>Weston Road</u>	<u>4 percent</u>
Total	All Routes	100 percent

The site generated traffic volumes for the critical weekday evening and Saturday midday peak hours were assigned to the roadway network and combined with the 2013 No-Build traffic volumes to develop the 2013 Build peak hour traffic volume conditions. The 2013 Build traffic volume networks are illustrated in Figure 5 for the weekday evening and Saturday midday peak hours.

Parking Demand

As noted earlier, a total of 65 on-site parking spaces are proposed to accommodate the anticipated demand associated with the CVS Pharmacy. VHB had previously conducted peak period parking accumulation studies at two sites in Massachusetts. These CVS Pharmacies, which are similar in size to the proposed Wellesley CVS, are located in Athol and West Boylston, Massachusetts. The observed parking accumulation at these two sites is summarized in Table 9, along with the estimated parking demand based on ITE data.



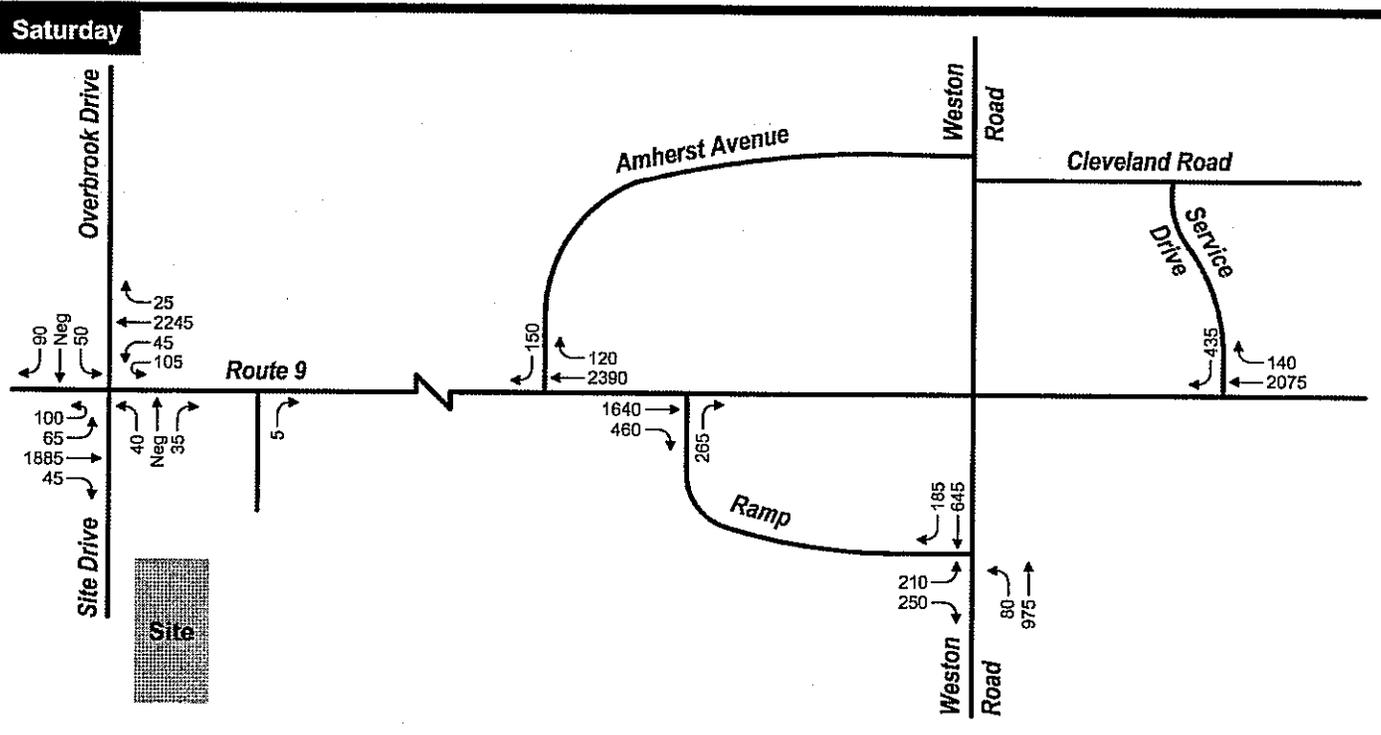
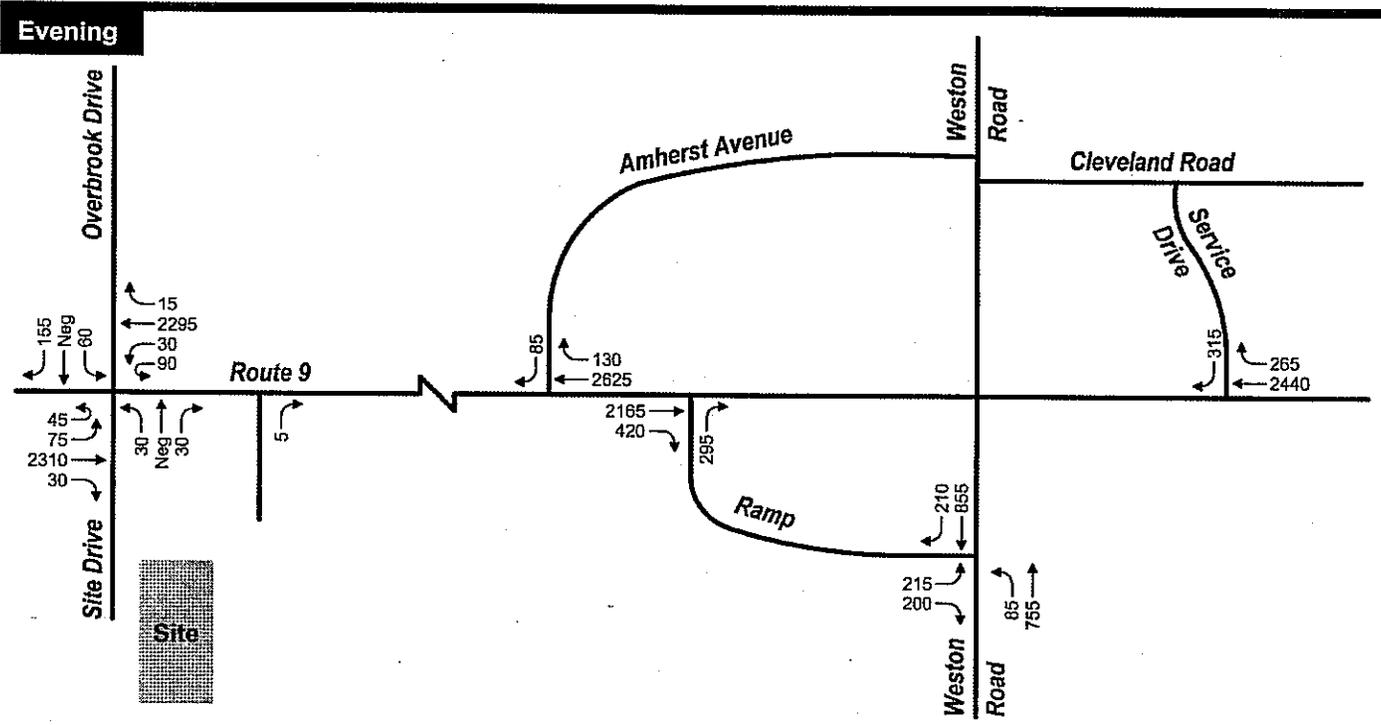
↑
Not to Scale

Vanasse Hangen Brustlin, Inc.

Trip Distribution

Figure 4

Proposed CVS Pharmacy
Wellesley, Massachusetts



↑
Not to Scale

Vanasse Hangen Brustlin, Inc.

2013 Build
Weekday Evening and Saturday Midday
Peak Hour Traffic Volumes

Figure 5

Proposed CVS Pharmacy
Wellesley, Massachusetts

**Table 9
Observed CVS Parking Accumulation Summary**

Location	Period	Total Spaces	Average Demand	Peak Demand
Athol, MA 1665 Main Street	Weekday	66	24	32
	Saturday		20	24
West Boylston, MA 264 West Boylston Street	Weekday	62	30	40
	Saturday		28	37
Average	Weekday		27	36
	Saturday		24	31
ITE *	Weekday	n/a	30 ¹	37 ²
	Saturday		31 ¹	38 ²

Note: Athol data collected for VHB on January 8, 2008 and January 12, 2008. West Boylston data collected for VHB on March 10, 2007 and March 13, 2007

* Source: *Parking Generation*, 3rd Edition, Institute of Transportation Engineers, 2004.

1 Based on average peak period parking demand rates for Land Use Code (LUC) 881 for 14,718 sf

2 Based on 85th percentile parking demand rates for LUC 881 for 14,718 sf

As shown in Table 9, the observed peak parking demand at the two facilities studied was 40 vehicles at the West Boylston store on a weekday. The average parking demand between the two stores was approximately 27 vehicles on a weekday and 24 vehicles on Saturday. On average the peak parking demand was observed to be 36 vehicles on a weekday and 31 vehicles on Saturday. These parking demand numbers are well below the planned 65 parking spaces at the proposed Wellesley CVS site. Even using the projected demand based on ITE results in only a slightly higher parking demand. Accordingly, the proposed parking supply is expected to be more than adequate for the anticipated demand based on both ITE data and observed conditions at existing CVS sites in Massachusetts.