Planning Office for Urban Affairs
ARCHDIOCESE OF BOSTON

May 9, 2023

Joshua Wernig, Chair
Zoning Board of Appeals
Town of Wayland
41 Cochituate Road
Wayland, MA 01778

RE: 124 Cochituate Road - Application for Comprehensive Permit

Dear Chair Wernig and other Board Members:

On behalf of the Planning Office for Urban Affairs (POUA), I am pleased to submit the enclosed Comprehensive Permit Application with supporting documentation for the Saint Ann's Senior Village project. The Applicant, POUA, proposes to develop 60 units of affordable rental housing for seniors age 62+ at 124 Cochituate Road in Wayland. The site is located adjacent to Saint Ann's Church of the Good Shephard Parish. The site will continue to be owned by The Roman Catholic Archbishop of Boston, A Corporation Sole, and developed under a long-term ground lease.

The Planning Office for Urban Affairs has worked collaboratively with the Town Planning Board, Select Board, Municipal Affordable Housing Trust Fund Board, and Housing Partnership Committee to develop a site plan and building design that conforms to the site's existing terrain, is harmonious with the surrounding neighborhood, and is consistent with both the Town's Housing Production Plan and Climate Action Plan.

The Town of Wayland officials with whom we have communicated have expressed support of the project as evidenced by a commitment of $250,000 in funding approved by the Town's Municipal Affordable Housing Trust Fund Board on January 10, 2023, and we anticipate additional funds from the WestMetro HOME Consortium in the coming year. We have also received letters of support from the Select Board and the Housing Partnership.

On behalf of the Planning Office for Urban Affairs and its project team, we look forward to working with the Zoning Board of Appeals, other Town officials, and the public in the review process for this Application.

Thank you in advance for reviewing our application.

Sincerely,

William H. Grogan
President

Cc: Michael McCall, Town Manager
Cherry C. Karlson, Chair, Select Board
Trudy L. Reid, CMMC, Town Clerk

Comprehensive Permit Application

Filed Pursuant to M.G.L. c.40B, §§ 20-23, and 760 CMR 56.00 et seq:

Saint Ann's Senior Village
124 Cochituate Road, Wayland

Submitted By:
The Planning Office for Urban Affairs, Inc. (the "Applicant")
May 9, 2023

Saint Ann's Senior Village
124 Cochituate Road, Wayland

TABLE OF CONTENTS

I. APPLICATION

Enclosed herewith is the Town of Wayland Zoning Board of Appeals Application for Hearing, along with other materials filed in support of this Application for Comprehensive Permit.

II. SUMMARY OF THE APPLICANT, PROJECT PROPOSAL, LOCAL NEED AND PERMIT REQUEST

A. Description of Applicant

Established in 1969 by the Roman Catholic Archdiocese of Boston, the Planning Office for Urban Affairs, Inc. ("POUA") is a non-profit social justice ministry that strives to create vibrant communities through the development of high quality affordable and mixed income housing, where people of modest means can live with dignity and respect in homes they can afford. POUA has more than 3,000 units of affordable and mixed income housing, with approximately 750 more units under development, providing homes for more than 11,000 people and becoming one of the most productive non-profit housing developers in the region.

POUA, as the Applicant, will form a single purpose entity controlled by the Applicant which will be subject to the limited dividend requirements, and is qualified to undertake the planning and development of multifamily housing under Chapter 40B in Wayland. POUA is led by William Grogan, its President, and the project lead will be Shaina Korman-Houston, its Real Estate Director, as well as support from staff. POUA has extensive experience developing multifamily housing throughout Massachusetts. For our proposed Saint Ann's Senior Village project, POUA has assembled a strong team with extensive experience in multifamily and 40B housing development. Our architect, landscape architect, and civil engineer have recent experience developing in Wayland.

B. General Project Overview

Saint Ann's Senior Village (the "Project") will transform underutilized land at 124 Cochituate Road into a 60-unit senior (62+) rental development contained within a single building, along with parking, landscaping and other improvements shown on the site plans attached to this Application (the Project). The Project will be located on a 9.2-acre portion (the Property or Site) of 124 Cochituate Road, which is the location of Saint Ann's Catholic Church in Wayland. All 60 units will be affordable, one-bedroom units that will be marketed and rented to eligible households having annual income of 30% and 60% of Area Median Income ("AMI"), adjusted for household size, as determined by the US Department of Housing and Urban Development, along with other Massachusetts Department of Housing and Community Development (DHCD) requirements as further described below. All of the proposed Project residential units would be eligible for listing on the Town of Wayland's Subsidized Housing Inventory (SHI) as the units are being rented to Income Eligible Households earning no more than 80% of Area Median Income (AMI) for the Boston-Cambridge-Quincy, MA HUD Metro Fair Market Rents (FMR) area, as determined by the DHCD. This percentage of SHI Eligible Housing in the Project is well in excess of the 20-25% required under Chapter 40B. Affordability will be preserved for the maximum period permitted by law through a Regulatory Agreement/Use Restriction. At the Board's option, a total of up to 70% of the Low or Moderate Income housing units, or the maximum number of units allowed by law, may be marketed for initial lease up under local preference in accordance with an Affirmative Fair Marketing Plan conforming to the 40B Regulations, subject to approval by DHCD.

The new building will consist of a total of three (3) floors. Notably, because the Site slopes away and downward from Cochituate Road toward the east (or rear of the Site), the building will present as only two stories facing Cochituate Road, with main access to the building on the south-facing elevation interior to the Site, facing the church, established beyond a retaining wall. The first floor will feature community and common space amenities in addition to ten one-bedroom apartments. The second and third floors will be served by an elevator, and each floor will feature twenty-five additional one-bedroom apartments. The building will be served by at least 60 parking spaces, including three spaces with electric vehicle charging stations, as well as outdoor bicycle parking racks and an indoor bicycle storage room. Of the 60 units being created, 15 of the units (25%) will be for households earning at 30% or below of AMI, and the remaining 45 units for households earning at 60% or below of AMI. At least three units will be Group 2 accessible, and the entire Property will be visitable. The Project will provide much needed affordable senior rental housing for Wayland. As described in the Town's 2022 Housing Production Plan ("HPP"), seniors comprise over 20% of Wayland's population. Further, the HPP finds that there is an "extreme dearth" of rental housing opportunities in Wayland. Saint Ann's Senior Village will also provide a local preference up to 70% for eligible residents of Wayland and/or other approved preference categories as determined by the Board and approved by the DHCD.

A summary and tabulation of the proposed building program for the Project is below:

Address	Leased Area Size	Gross Building Area	# of Rental Units	Unit Size	Accessible Units	Population	# Affordable**
124 Cochituate Rd., Wayland	9.2 acres*	52,716 sf	60	645 sf	At least 3	Senior (62+)	60 (100%)

** Development site includes the majority of Assessors Map 34, Lot 4, along with shared use of a portion of Assessors Map 34, Lot 5 for parking, access and related improvements, for a ground-leased site area of 9.2 acres.*
*** All units will be affordable at or below 60% of area median income*

The Project is to be constructed in accordance with a set of preliminary plans, consisting of 2 sheets, entitled, "Saint Ann's Senior Village, 124 Cochituate Road, Wayland, MA" dated April 21, 2023, prepared by Samiotes Consultants, Inc. (the "Civil Plans").

The architectural, design, layout and elevations for Saint Ann's Senior Village are shown on a set of plans, consisting of eleven (11) sheets entitled "ST. ANN'S VILLAGE, WAYLAND, MA,", dated April 21, 2023, prepared by The Architectural Team, Inc. (the "Architectural Plans"). The Architectural Plans are attached hereto in **Section V.A**. The Project landscape design is depicted on a landscape plan, consisting of one sheet, entitled "OVERALL PROPOSED LANDSCAPE PLAN, ST. ANN'S VILLAGE, WAYLAND, MA,", dated April 21, 2023, prepared by RBLA Design, LLC. (the "Landscaping Plan"). Collectively, the Civil Plans, Architectural Plans, and Landscaping Plan, the "Site Plans." The Site Plans are attached as **Exhibit V.A.**

The on-site amenities are designed to enrich the lives of the residents and provide a strong sense of community. Site amenities will include a community room, living room, indoor and outdoor bicycle parking, staffed management office, and on-site laundry facilities. There will be two programmed outdoor spaces in a resident courtyard and a patio, allowing for flexibility for strolling, gathering, gardening, therapy, and resident and guest events. The proposed plant palette will focus on native, naturalized, and/or drought tolerant plantings, with plants to screen views from the street and residential abutters. Existing wooded areas will be maintained to the extent practicable, creating a "borrowed" landscape and opportunities for on-site walking paths and connections to extensive walking trails and passive recreation on the adjacent Sudbury Valley Trustees land. With the Greenways

Conservation Land within a short walk, off-site recreational opportunities are also available. The Wayland Public Library and Senior Center are a short drive from the site.

C. Local Need

According to the latest published Massachusetts DHCD Subsidized Housing Inventory, dated as of December 21, 2020, the Town of Wayland's subsidized housing inventory includes 330 Low or Moderate Income Housing units, which constitutes 7.4% of Wayland's total housing stock, and below the 10% threshold established by Chapter 40B and 760 CMR 56.03(3)(a). However, as noted in the Town of Wayland Housing Production Plan 2022-2027 ("HPP"), Wayland achieved one of its most important affordable housing goals when the Subsidized Housing Inventory exceeded 11 percent of the total year-round housing supply. Since that time, however, the HPP notes that "as of May 2022, both Cascade Wayland and Windsor Place 40B Projects have been removed from Wayland's SHI, leaving a total of 4,957 subsidized units, or 9.62 percent of year-round units." Moreover, the Project is consistent with a number of Town goals as articulated by the HPP. First, the Project will meet the goal of providing community scale multifamily housing, given that rental units can be affordable to households with a wider range of incomes and can accommodate individuals living alone. Second, the Project will serve to bring the Town above the 10% statutory affordable housing minimum under Chapter 40B by the addition of 60 age-restricted (62+) units to Wayland, all of which will count toward Wayland's SHI. Third, the Project provides the Town with the unique opportunity to not only provide age-restricted (62+) housing to the Town, but to also provide such housing at a deeper subsidy level not typically offered through the Chapter 40B process. Lastly, the Project serves to promote sustainability, consistent with the objectives articulated in the HPP, by addressing sustainability through design, both of structures and site design by reducing the use of impervious surfaces, maximizing energy efficiency in the building, and increasing density to reduce the area disturbed by development.

In summary, the Project fulfills a number of important objectives to advance affordable housing goals in Wayland:

- By developing high quality, sustainable buildings that will provide a healthy and cost efficient environment for senior (62+) residents;
- By developing a building and layout design that will work in scale and character within the character of the neighborhood, integrating a residential feel to blend into the residential neighborhood;
- By developing new, senior rental options for the community, thereby fulfilling an important housing need within the Town of Wayland; and
- By providing an additional 60 units of SHI eligible housing to allow the Town to meet and exceed the 10% affordable housing stock and thereby giving the Town the ability to determine future affordable housing projects, whether under Chapter 40B or other proposals.

D. Proposed Findings of Fact

The Applicant respectfully requests the Zoning Board of Appeals (the Board or ZBA) to make the following proposed findings of fact in connection with this Application:

1. The Applicant is eligible to receive a Subsidy from a Subsidizing Agency (Federal Low Income Housing Tax Credit Program administered through the DHCD) after a Comprehensive Permit has been issued

and which, unless otherwise governed by a federal act or regulation, complies with the requirements of the Subsidizing Agency (DHCD) relative to a reasonable return for the Project. The Applicant intends to assign the Comprehensive Permit Decision issued to it to an affiliated single purpose entity in order to facilitate the Applicant's receipt of Project subsidy, including but not limited to, Federal Low Income Housing Tax Credit funding;

2. The Project is fundable by a Subsidizing Agency within the meaning of Section 56.04(1)(b) of the Chapter 40B Regulations since the Subsidizing Agency, DHCD, issued a written Determination of Project Eligibility under a Low or Moderate Income Housing subsidy program;

3. The DHCD will be the Subsidizing Agency within the meaning of Section 56.02 of the Chapter 40B Regulations (760 CMR §56.02);

4. The Applicant controls the site sufficient to qualify it as a recipient of a Comprehensive Permit for this Project since a related entity owns the site and has such other interest in the site as is deemed by the Subsidizing Agency to be sufficient to control the site as required under Section 56.04(1)(c) of the Chapter 40B Regulations; and,

5. The Project as proposed in the Application and other supporting documentation is "Consistent With Local Needs" within the meaning of Massachusetts General Laws, Chapter 40B, Section 20, and Section 56.02 of the Chapter 40B Regulations (760 CMR §56.02).

E. Request for Comprehensive Permit

The Applicant, the Property and the Project are more particularly described in the plans, drawings and other exhibits included with this Application, and also submitted under separate cover with this Application, and which may be supplemented by the Applicant during the hearing process, all of which are incorporated herein by reference and constitute the documents required to be submitted by the 40B Regulations (760 CMR § 56.05), as well as the requirements of the Town of Wayland Zoning Board of Appeals.

For the reasons presented in this Application, and the additional reasons that the Applicant will present at the scheduled public hearing on the Application, the Applicant respectfully requests that the Zoning Board of Appeals, after complying with the procedures as required by law, including G.L. c.40B, §§20-23, and 760 CMR 56.00 et seq. vote to make the Findings of Fact set forth in Section I.D above, and issue a Comprehensive Permit to the Applicant for the proposed Project.

Respectfully submitted,
Planning Office for Urban Affairs, Inc.

____
By: William H. Grogan
Its: President, duly authorized.

II. JURISDICTIONAL REQUIREMENTS

A. The Applicant

Established in 1969 by the Roman Catholic Archdiocese of Boston, the Planning Office for Urban Affairs, Inc. ("POUA") is a non-profit social justice ministry that strives to create vibrant communities through the development of high quality affordable and mixed income housing, where people of modest means can live with dignity and respect in homes they can afford. With respect to the Project proposed herein, POUA agrees to abide by the terms and conditions imposed upon it under M.G.L. c.40B, its Regulations and to conform to the requirements of the subsidy, the Low Income Housing Tax Credit Program as administered by the DHCD. In that regard, POUA, through an affiliated single purpose entity will enter into a Regulatory Agreement with DHCD, which will be finalized, signed and resubmitted to the Zoning Board of Appeals as part of Final Approval after the issuance of a Comprehensive Permit, but prior to the commencement of construction, as required by Section 56.04(7) of the 40B Regulations.

B. Site Control

The Applicant's control of the Property within the meaning of 760 CMR 56.04(1)(c) of the 40B Regulations, is evidenced by the DHCD's issuance of a written determination of Project Eligibility, and is further evidenced by the fact that an entity related to the Applicant owns the Site and has such other interest in the Site as is deemed by the DHCD, as the Subsidizing Agency, to be sufficient to control the Site as required under Section 56.04(1)(c) of the Chapter 40B Regulations. A copy of the deeds to the Property are attached hereto in **Section V.D**.

C. Project Eligibility

As evidenced by the written determination of Project Eligibility, dated May 3, 2023, issued by the DHCD pursuant to 760 CMR § 56.04(7), the Project is presumed fundable under the Federal Low Income Housing Tax Credit Program administered through the DHCD. A copy of the DHCD Project Eligibility Letter is attached in **Section V.E** herein.

III. SITE/EXISTING CONDITIONS REPORT

A. Site Location, Access and Topography

The proposed Project is located at 124 Cochituate Road (State Route 27), about 1.5 miles south of Wayland Town Center, on the property of Saint Ann's Catholic Church, of the Good Shepherd Parish. The subject Property combines portions of two parcels to create a ground lease area of approximately 9.2 acres of mostly undeveloped wooded area (Assessors Map 34, Lots 4 and 5). A two-story rectory is located adjacent to the southwest corner of the lease area, which fronts on Cochituate Road. St. Ann's Church is just to the south of the rectory, also located at 124 Cochituate Road. Much of the eastern portion of the Site is undevelopable due to wetlands and steeply descending topography. The Site abuts single family homes on Windy Hill Lane to the north and Sudbury Valley Trustees conservation land to the northeast, with heavy vegetative screening. The Site is approximately 1.5 miles from retail and grocery amenities located off Boston Post Road and is approximately 0.8 miles from Town Hall. The immediate vicinity of the subject Property consists of residential, recreational, and institutional uses. The Site is located within the Single Residence (40,000 s.f.) Zoning District within which multifamily residential use is not a permitted use under Chapter 198 (Zoning) of the Wayland Town Code. The Applicant has requested certain waivers from certain Zoning Code and other waivers from local Town of Wayland requirements listed and attached hereto in **Section V.F**. Other than the requested waivers detailed in Section V.F., the Project will comply with all other local bylaws, regulations and other local requirements, and must comply with applicable federal and state laws, regulations, and policies.

A single access driveway extending from Cochituate Road easterly into the site currently serves both the Church and rectory. The Project will include an improved access drive which will use the existing driveway, and extend the same easterly by looping around the proposed new building northerly, and then westerly back to a second access point onto Cochituate Road.

B. Utilities.

The Site is currently served by public water service and electrical services from Cochituate Road, and is currently served by a subsurface sewage disposal system to serve the needs of the Church and Rectory. The Project will extend new water and electrical utilities to the Property through new water and electrical connections extending from Cochituate Road. Moreover, a new shared subsurface sewage disposal system will be designed and installed to serve and accommodate the needs of both the Project and existing Church and Rectory.

C. Wetland Features/Estimated Habitat

A Wetland Delineation Report was completed on April 24, 2023 by Environmental Consulting & Restoration, LLC ("ECR"), and is attached in **Section V.I.**. ECR performed wetland delineation activities on January 7, 2023 and April 12, 2023 at the Site during fair weather conditions suitable for field work. Delineation of the wetlands and the relationship to the building's footprint and associated Project improvements can be found in the Site Plans attached in **Section V.A**.

The Bordering Vegetated Wetlands were identified on the eastern portion of the site, as well as an Isolated Vegetated Wetland identified on the southeastern part of the site. There is a limited scope of work proposed within the 100 foot wetland buffer.

Based upon a review of the most recent edition of the (15th Edition) Natural Heritage Atlas, dated August 1, 2021, the Property is not located within any mapped Priority & Estimated Habitats. The site does not contain Certified Vernal Pools and does not contain areas mapped as Land Subject to Flooding according to FEMA Maps. Lastly, the report found that the site is not located within an Area of Environmental Concern.

D. Stormwater Management

A Stormwater Management Report was also commissioned and completed on April 21, 2023, by Samiotes Consultants, Inc., a copy of which is attached in **Section V.H**. The analysis utilized HydroCAD software, curve numbers, times of concentration, and peak discharge rates for both the existing conditions and the proposed conditions. The results of the study determined that there will be no material difference between post-development and existing conditions with regards to the peak rates of runoff.

The Project will be designed in compliance with the Massachusetts stormwater management standards in accordance with 310 CMR 10.05(6)(k) through (q) and defined in detail in the Mass. DEP Stormwater

Management Handbook. The stormwater management system incorporates Best Management Practices to facilitate Total Suspended Solids (TSS) removal and detention of stormwater flows. Stormwater shall be managed in accordance with the Massachusetts Stormwater Management requirements contained within 310 CMR 10.00, as well as the Wetlands Order of Conditions to be issued by the Wayland Conservation Commission."

E. Traffic and Parking

A traffic and parking analysis entitled "Traffic Impact Study," dated May 5, 2023, was prepared by Vanasse & Associates, Inc. (the "Traffic Report"), a copy of which is attached in **<u>Section V.J.</u>**. As further described in the Traffic Report, the analysis was conducted to determine the potential impacts on the transportation infrastructure associated with the construction of the project. The Traffic Report evaluated the project's access requirements, potential off-site improvements, and safety considerations. The Traffic Report was performed in accordance with MassDOT's Transportation Impact Assessment Guidelines and the standards of the Traffic Engineering and Transportation Planning professions. The analysis was conducted in three phases; the first stage was an assessment of existing conditions in the study area, the second stage was to project future traffic demand using a seven-year time horizon, and the third stage was to evaluate measures to address deficiencies in the transportation infrastructure identified in stage two. The study found that the existing traffic volume on Cochituate Road, in the vicinity of the project was found to accommodate approximately 9,970 vehicles on an average weekday. The project is expected to generate approximately 194 vehicle trips on an average weekday.

The Traffic Report concluded that there will be no significant increase on motorist delays or vehicle queuing. The Traffic Report found all movements exiting the northern driveway to the Saint Ann Catholic Church at a level of service consistent with negligible vehicle queuing.

Based upon the analysis of the Project by Vanasse & Associates, the Traffic Report made the following recommendations:

- The Project site driveway should be a minimum of 24 feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.
- The emergency vehicle access should be a minimum of 20-feet in width and constructed of a material that will support travel by the largest anticipated responding emergency vehicle under all weather conditions and should be secured by means of a gate or other device deemed appropriate by the Wayland Fire Department.
- Where perpendicular parking is proposed the drive aisle behind the parking should be a minimum of 23 feet in order to facilitate parking maneuvers.
- Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided.
- All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the Manual on Uniform Traffic Control Devices (MUTCD).10
- Americans with Disabilities Act (ADA)-compliant wheelchair ramps should be provided at pedestrian crossings to be constructed or modified in conjunction with the Project.
- Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site driveway should be designed and maintained so as not to

restrict lines of sight.
- Existing trees and vegetation located within the sight triangle areas of the Project site driveway should be selectively trimmed or removed and maintained so as to provided the necessary sight lines for the driveway to operate in a safe manner.
- Snow accumulations (windrows) within sight triangle areas should be promptly removed where such accumulations would impede sight lines.
- Secure bicycle parking should be provided proximate to the residential building.
- Implementation of Transportation Demand Management will be implemented to include a transportation coordinator, a welcome packet for new residents detailing available transportation options, and secure bicycle parking for residents and visitors.

These recommendations and related mitigation have been incorporated into the Project Site Plans. Additionally, and although not required to mitigate the potential impacts of the Project, the Traffic Report also identified an intersection approximately one mile from the site which was identified as currently having a vehicle crash history that warrants review and improvement. As an accommodation to the Town, the Applicant is committed to the preparation of a Road Safety Audit (RSA) of that area for use by the Town of Wayland.

F. Approach to Site and Building Design

The material selections and detailing of the proposed building is contextual in nature taking cues from the typical architecture found throughout the area using high-quality cladding materials including cement fiber profiles, horizontal clapboard, and panel. Massing and details use familiar traditional New England design with gable forms, lap siding and covered porches. Double-hung style window selections reflect the residential occupancy of the structure and again recall a rural aesthetic. The height and architectural style of the proposed project is intended to integrate with the surrounding context and minimize any visual impacts to abutters. A resident courtyard is strategically placed to break up the massing and create a tranquil space for future tenants. Detailing is kept clean and straightforward providing a welcoming, refined, overall building appearance.

The Project will be designed to contain elements of green, sustainable, and climate resilient design and will promote the conservation of energy resources. Furthermore, the Project will be aligned with the Commonwealth's sustainable development principles as well as climate change goals. The Project Team has sought to design a building to be as energy efficient as feasible and contain features such as Energy Star rated kitchen appliances. As previously stated, the Project will provide electric vehicle parking spaces and bicycle parking spaces. This is consistent with the Town's Climate Action Plan goal of encouraging the use of electric vehicles and other modes of transportation in Wayland.

IV. NARRATIVES AND EXHIBITS

A. Preliminary Site Civil, Architectural and Landscape Plans

As required under Section 56.05(2)(a) and (2)(f) of the 40B Regulations, attached are preliminary site development plans showing the locations and outlines of proposed buildings; the lot division; the proposed locations, general dimensions and materials for drives, parking areas, walks and paved areas, and proposed landscaping, prepared by a registered architect or engineer. As required under Section 56.05(2)(c) of the Chapter 40B Regulations, also attached are preliminary, scaled, architectural drawings. The drawings for the Building have been prepared by a registered architect and include typical floor plans, typical elevations, and sections, and identify construction type and exterior finishes as required under the Chapter 40B Regulations.

B. Tabulation Data

As required under Section 56.05(2)(d) of the Chapter 40B Regulations, below is a tabulation of the proposed buildings, including type, size (number of bedrooms, floor area) and ground coverage, and a summary showing the percentage of each tract to be occupied by buildings, by parking and other paved vehicular areas, and by open areas.

A summary and tabulation of the proposed building program for the Project is below:

Address	Leased Land Area Size	Lot Coverage	Gross Building Area	# of Rental Units	Unit Size	Accessible Units	Population	# Affordable**
124 Cochituate Rd., Wayland	9.2 acres*	5.4%	52,716 sf	60	645 sf	At least 3	Senior (62+)	60 (100%)

** Development site includes the majority of Assessors Map 34, Lot 4, along with shared use of a portion of Assessors Map 34, Lot 5 for parking, access and related improvements, for a ground-leased site area of 9.2 acres.*

*** All units will be affordable at or below 60% of area median income*

C. Applicant Entity Information

Although Section 56.04(6) of the 40B Regulations states that the issuance of a Determination of Project Eligibility shall be considered Board as conclusive evidence that the Project and the Applicant have satisfied the Project Eligibility requirements of 760 CMR 56.04(1), the Applicant has attached information demonstrating its nonprofit corporate status.

POUA, as the Applicant, is requesting the Board to include as a condition within the Decision, to allow the Applicant to assign all rights under the Comprehensive Permit Decision to a single purpose entity in order to facilitate the Applicant's receipt of Project funding, including but not limited to Low Income Housing Tax Credit funding, which should not be considered a "substantial change" within the meaning of 760 CMR 56.05(12)(b), provided that the Applicant maintains a relationship with the new entity to be formed. It is anticipated that the new entity will be formed prior to submission of financing or transfer of the Property, and prior to closing on any financing and prior to construction. The entity will be compliant as a limited dividend organization as required by 760 CMR 56.04.

D. Evidence of Site Control

Although Section 56.04(6) of the 40B Regulations states that the issuance of a Determination of Project Eligibility shall be considered by the Zoning Board of Appeals as conclusive evidence that the Project and the Applicant have satisfied the Project Eligibility requirements of 760 CMR 56.04(1), POUA has attached deeds evidencing ownership of the property by an affiliated entity.

E. Determination of Project Eligibility

See attached Project Eligibility Letter issued by DHCD, dated May 3, 2023.

F. Waivers

As required under Section 56.05(2)(h) of the 40B Regulations, the following is a list of requested Waivers to Local Requirements and Regulations, and the Applicant requests approval of the following Waivers from certain local requirements of the Town of Wayland, including the Wayland Zoning Code, and other Local Requirements and Regulations as defined under Section 56.02 of the Chapter 40B Regulations, including all local legislative, regulatory, or other actions which are more restrictive than state requirements, if any, including local zoning and wetlands bylaws, subdivision and board of health rules, and other local ordinances, codes, and regulations, in each case which are in effect on the date of the Project's application to the Board. In addition to the following list of requested Waivers listed below, the Applicant requests an exception from each and every provision or requirement of all Local Requirements and Regulations issued by a "Local Board" (defined under the Chapter 40B Regulations as meaning any local board or official, including, but not limited to any board of survey; board of health; planning board; conservation commission; historical commission; water, sewer, or other commission or district; fire, police, traffic, or other department; building inspector or similar official or board; city council, as well as all boards, regardless of their geographical jurisdiction or their source of authority [that is, including boards created by special acts of the legislature or by other legislative action] if such local board perform functions usually performed by locally created boards) with which any aspect of its Comprehensive Permit application, including but not limited to its proposed site development plans and any other information hereinafter submitted to the Board, is inconsistent.

See Waiver List addendum attached hereto.

G. Applicant and Project Team

Applicant:	The Planning Office for Urban Affairs 84 State Street, Suite 600, Boston, MA 02109 William H. Grogan, President whg@poua.org (617)-350-8889 Shaina Korman-Houston, Real Estate Director shainakh@poua.org (202) 412-6385
Owner:	Roman Catholic Archbishop of Boston, A Corporation Sole 66 Brooks Drive, Braintree, MA 02184 (617) 254-0100
Architect:	The Architectural Team (TAT) 50 Commandants Way, Chelsea, MA 02150 Jay Szymanski, Principal jszymanski@architectualteam.com (617) 889-4402 ext.118
Landscape Architect:	RBLA Design, LLC 78 Greenlodge Street, Dedham, MA 02026 Rebecca Bachand, Principal rebecca@rbladesign.com (781) 686-4486
Civil Engineers & Survey:	Samiotes Consulting, Inc. 20 A Street, Framingham, MA 01701 Stephen Garvin, President sgarvin@samiotes.com (508) 877-6688 ext.13
Legal Counsel:	Smolak & Vaughan LLP 21 High Street, Suite 301, North Andover, MA 01845 Robert L. Brennan, Jr., Of Counsel (617) 233-4897 rbrennan@smolakvaughan.com John Smolak, Partner jsmolak@smolakvaughan.com (978) 327-5215
Owner's Representative	Waypoint KLA 8 Glover Road, Wayland, MA 01778 Ray Mitrano, Principal raymitrano@waypointkla.com (617) 875-2501

H. Stormwater Report

I. Wetland Report

J. Traffic Impact Study

K. Support Letters

L. Certified Abutter Lists

*Please note the attachment is a list of abutters within 300’ of the Project’s site utilizing the Town’s GIS website tool. A certified list of abutters was requested from the assessor’s office and is pending receipt.

M. Site Photographs

TOWN OF WAYLAND

MASSACHUSETTS
01778

BOARD OF APPEALS

TOWN BUILDING
41 COCHITUATE ROAD
TELEPHONE: (508) 358-3600
FAX: (508) 358-3606

ZONING BOARD OF APPEALS APPLICATION FOR HEARING

CASE #___________

LOCATION OF SUBJECT PROPERTY

# Street Name	Map	Parcel	Year Built
124 Cochituate Road	34-004 & 34-005	5399	1962 (Rectory)

ZONING INFORMATION

Zoning District: R40

Overlay District (as applicable): N/A

Present Use: Religious Rectory/ Vacant Land

Proposed Use: Multi-family Housing

	Required	Existing	Proposed
Lot Area	40,000	See attached comprehensive permit application.	~401,387
Lot Coverage	20%		5.4%
Frontage	180'		399'
Building Height	Lesser of 2.5 stories or 35'		3 stories / 45'
Front Yard Setbacks	30'		25'
ROW Setbacks	55'		40,000
Side Yard Setbacks	25'		75'
Rear Yard Setbacks	30'		650'+
Gross Floor Area	N/A		52,716 sf
% of Increase of Gross Floor Area	N/A	N/A	N/A

Does the proposed project comply with § 193-4 Storm water and Land Disturbance ByLaw? ☐**Yes** ☐**No**

See attached comprehensive permit application

OWNER INFORMATION

Name: Roman Catholic Archbishop of Boston

Telephone Number: 617-254-0100

Address: 66 Brooks Drive, Braintree, MA 02184

Email: ____________

APPLICANT INFORMATION (if different from owner information)

Name: The Planning Office for Urban Affairs

Telephone Number: 617-350-8885

Address: 84 State Street, Suite 600, Boston, MA 02109

Email: whg@poua.org

ATTORNEY/AGENT INFORMATION (if applicable)

Name: Smolak & Vaughan LLP

Telephone Number: 978-327-5215

Address: 21 High Street, Suite 301, North Andover, MA 01845

Email: jsmolak@smolakvaughan.com

SPECIFY REQUESTED BOARD ACTION

☐**SPECIAL PERMIT** ☐**VARIANCE** ☒**OTHER (explain in narrative)**

NARRATIVE (describe proposal and include supporting Zoning ByLaw(s))

See attached narrative.

SIGNS (if applicable) see separate instruction sheet for additional required information

Business Name See comprehensive permit application

Telephone Number N/A

Address N/A

Email N/A

Type of Business N/A

Hours of Operation N/A

APPLICANT TO COMPLETE

I have submitted nine (9) sets, each including the following: Submitted documents as required by the town's supplemental rules for comprehensive permits.

☐**Application** ☐**Certified Plot Plan** ☐**Schematic Architectural Plans** ☐**Board of Health Approval**

☐**Narrative** ☐**List of Submitted Documents** ☐**Miscellaneous Additional Information**

I hereby request a hearing before the Zoning Board of Appeals with reference to the above application, with supporting documentation submitted, and that the proposed work is authorized by the Owner of Records and I have been authorized by the owner to make this application as the agent. I hereby consent to the Building Commissioner and Zoning Board of Appeals members' entry upon the exterior areas of the premises for the purpose of viewing and inspecting the property, which is the subject of the application.

Authorized Agent/Owner____________________ Date 5/9/2023

OFFICE USE ONLY

Received By _______________
Date_______________
Fee Paid_______________

Received and Recorded by the Town Clerk:

____
Signature of Town Clerk

Comments:

ORIGINAL DOCUMENT PRINTED ON CHEMICAL REACTIVE PAPER WITH MICROPRINTED BORDER

POUA/HOLDINGS LLC
C/O PLANNING OFFICE FOR URBAN AFFAIRS, INC.
84 STATE STREET
BOSTON, MA 02109

Bank of America.
Massachusetts
5-13/110

1138

5/8/2023

PAY TO THE ORDER OF Town of Wayland $ **350.00

Three Hundred Fifty and 00/100** DOLLARS

Town of Wayland
41 Cochituate Rd
Wayland, MA 01778

AUTHORIZED SIGNATURE

MEMO ZBA Filing fee

THIS DOCUMENT CONTAINS HEAT SENSITIVE INK. TOUCH OR PRESS HERE - RED IMAGE DISAPPEARS WITH HEAT.

Security Features Included. Details on back.

SAFEGUARD SECURE

[redacted]

POUA/HOLDINGS LLC
C/O PLANNING OFFICE FOR URBAN AFFAIRS, INC.

1138

Town of Wayland		5/8/2023	
	Zoning Application Fee		350.00

Bank of America ...63	ZBA Filing fee	350.00

A. Preliminary Site Civil, Architectural and Landscape Plans

C. Applicant Entity Information

JOHN F. X. DAVOREN

C. D. 180 (Rev.) 15M-1-67-944308

The Commonwealth of Massachusetts

K[redacted]OHN F. X. DAVOREN
Secretary of the Commonwealth
STATE HOUSE
BOSTON, MASS.

ARTICLES OF ORGANIZATION

We, (Rev.) Michael F. Groden, President David F. Dalton, Treasurer,

Vincent A. Fulmer, Clerk ~~or Secretary~~, and David F. Dalton, Vincent A. Fulmer, Michael F. Groden, Leonard D. McCarthy, Faine McMullen, David S. Nelson and Robert E. O'Brien

being a majority of the directors (or officers having the power of directors)

of Planning Office for Urban Affairs, Inc.

elected at its first meeting, in compliance with the requirements of General Laws, Chapter 180, Section 3, hereby certify that the following is a true copy of the agreement of association to form said corporation, with the names of the subscribers thereto:

We, whose names are hereto subscribed, do, by this agreement, associate ourselves with the intention of forming a corporation under the provisions of General Laws, Chapter 180.

The name by which the corporation shall be known is
Planning Office for Urban Affairs, Inc.

The location of the principal office of the corporation in Massachusetts is to be the ~~Town or~~ City of Boston, 7 Marshall Street

The purposes for which the corporation is formed are as follows:

To design, develop and articulate plans forthe future role of the Archdiocese of Boston in urban affairs; to develop programs of an educational nature to effectuate the aforesaid plans; and to encourage and promote co-operation and mutual assistance through the exchange of ideas among all organizations and individuals that work towards the improvement of urban communities; and to buy, sell, hold, lease, rent, mortgage or otherwise deal in real estate or personal property as required to accomplish the foregoing purposes.

(Continued on attached sheet "A")

If provisions for which the space provided is not sufficient additions should be set out on continuation sheets which shall be 8½" x 11" paper and must have a left hand margin 1" wide for binding. Use only 1 side of sheet.

The Commonwealth of Massachusetts

JOHN F. X DAVOREN

(If seven days' notice is waived, fill in the following waiver.)

We hereby waive all requirements of the General Laws of Massachusetts for notice of the first meeting for organization, and appoint the 21st day of June, 1969 at 10:00 o'clock A. M., at Scituate, Massachusetts

as the time and place for holding such first meeting.

IN WITNESS WHEREOF we hereto sign our names, this 21st day of June, 1969.

(Type or plainly print the name and address of each incorporator in space below.)

NAME	RESIDENCE Give Number and Street, City or Town
David F. Dalton	145 Pinckney Street, Boston
Vincent A. Fulmer	26 Kimball Road, Arlington
Michael F. Groden (Rev.)	85 Regent Street, Boston
Leonard D. McCarthy	6 Durant Road, Wellesley
Faine McMullen (Sr.)	885 Centre Street, Newton
David S. Nelson (Esq.)	42 Munroe Street, Boston
Robert E. O'Brien	62 Norfolk Road, Arlington

[illegible] meeting of the subscribers to said agreement was held on [illegible] in the year 19 69

A

Provided, however, that no part of the net earnings or assets of the corporation shall be used except in furtherance of the purposes for which it is formed and that no substantial part of the activities of this corporation shall be the carrying-on of propoganda or otherwise attempting to influence legislation, and no part of the net earnings or assets of this corporation shall inure, upon dissolution or at any other time or under any other circumstances to the benefit of the incorporators or any member or director of this corporation, or any other person except as reasonable compensation for services actually rendered in furtherance of its purposes, and provided further, that this corporation shall not participate in, or intervene in (including the publishing or distribution of statements). any political campaign in behalf of or in opposition to any candidate for public office; and in general to do all things necessary and proper to carry out the aforesaid purposes, and to have and exercise all of the powers conferred by the Commonwealth of Massachusetts upon corporations created under the General Laws of the Commonealth of Massachusetts, Chapter 180, as said General Laws may now or hereafter be amended.

The name, residence, and post office address of each of the officers of the corporation is as follows:

	NAME	CITY OR TOWN OF RESIDENCE Actual place of domicile must be given	POST OFFICE ADDRESS HOME OR BUSINESS
President	Michael F. Groden	85 Regent Street, Roxbury,	same
Treasurer	David F. Dalton	145 Pinckney Street, Boston,	same
Clerk / ~~Secretary~~	Vincent A. Fulmer	26 Kimball Road, Arlington,	same

Directors (or officers having the power of directors)

David F. Dalton, Boston, 145 Pinckney Street (Boston, Mass. 02114)
Vincent A. Fulmer, Arlington, 26 Kimball Road (Arlington, Mass. 02172)
Michael F. Groden, ~~XXXXXXXX~~ Boston, 25 Regent Street(Roxbury, Mass. 02119)
Leonard D. McCarthy, Wellesley, 6 Durant Road (Wellesley, Mass. 02181)
Faine McMullen, Newton, 885 Centre Street (Newton, Mass. 02159)
David S. Nelson, Boston, 42 Munroe Street (Roxbury, Mass. 02119)
Robert E. O'Brien, Arlington. 62 Norfolk Road (Arlington, Mass. 02172)

We, being a majority of the directors of

(Name of Corporation)

Planning Office for Urban Affairs, Inc.

do hereby certify that the provisions of sections eight and nine of Chapter 156 relative to the calling and holding of the first meeting of the corporation, and the election of a temporary clerk, the adoption of by-laws and the election of officers have been complied with.

IN WITNESS WHEREOF AND UNDER THE PENALTIES OF PERJURY, we hereto sign our names,

this 21st day of June , 19 69 .

(President, Treasurer, Clerk or Secretary, and majority of Directors or of Board, sign in space below.)

√ Michael F. Groden
√ Vincent A. Fulmer
√ Robt E. O'Brien
√ David F. Dalton
[illegible]
√ David S. Nelson
√ Leonard D. McCarthy

√ Faine McMullen

9487

THE COMMONWEALTH OF MASSACHUSETTS

ARTICLES OF ORGANIZATION

GENERAL LAWS, CHAPTER 180

1969

I hereby certify that, upon an examination of the within-written articles of organization, duly submitted to me, it appears that the provisions of the General Laws relative to the organization of corporations have been complied with, and I hereby approve said articles and cause them to be recorded and filed when validated.

RECEIVED
$25 CK.
AUG 4 1969
CORPORATION DIVISION
SECRETARY'S OFFICE

John F. X. Davoren
Secretary of the Commonwealth

CHARTER TO BE SENT TO

Michael A. Lauranc, Esquire
Crane, Inker & Oteri
20 Ashburton Place
Boston, Massachusetts 02108

CHARTER MAILED 10-21-69

DELIVERED

NOTIFICATION SENT TO Boston, Arlington, Newton and Wollesley 8-19-69

Internal Revenue Service

District
Director

Department of the Treasury

35 Tillary St., Brooklyn, NY 11201

Date: APR 2 5 1990

Planning Office for Urban Affairs
25 Union Street
Boston, MA 02108
Attn: Chris Ravenscroft, Esq

Person to Contact:
Clifton G. Belnavis
Contact Telephone Number:
(718) 780-4501
Re: 23-7089722

Dear Sir or Madam:

Reference is made to your request for verification of the tax exempt status of Planning Office for Urban Affairs.

A determination or ruling letter issued to an organization granting exemption under the Internal Revenue Code of 1954 or under a prior or subsequent Revenue Act remains in effect until exempt status has been terminated, revoked or modified.

Our records indicate that exemption was granted as shown below.

Sincerely yours,

Eileen Jannazzo
District Disclosure Officer

Name of Organization: Planning Office for Urban Affairs , Inc.

Date of Exemption Letter: November, 1970

Exemption granted pursuant to 1954 Code section 501(c)(3) or its predecessor Code section.

Foundation Classification (if applicable): Not a private foundation as you are an organization described in sections 509(a)(1) and 170(b)(1)(A)(vi) of the Internal Revenue Code.

BOS-EO-70-779

US Treasury Department

Date: NOV 1 0 1970

In reply refer to: AU:EO:[illegible]

District Director
Internal Revenue Service
JFK Federal Bldg., Boston, Mass. 02203

Planning Office For Urban Affairs, Inc.
7 Marshall Street
Boston, Mass. 02108

Gentlemen:

Purpose: Charitable

Accounting Period Ending: December 31

This refers to your application for exemption under section 501 (c)(3) of the Code.

Pending issuance of regulations under section 509 of the Code, we are unable to make a determination as to whether you are a private foundation as defined in that section. Upon issuance of the regulations we will evaluate your application and make a determination as to whether you are a private foundation.

Based on information supplied, and assuming your operations will be as stated in your exemption application, we have determined that you are exempt from Federal income tax under section 501(c)(3) of the Internal Revenue Code. Any change in your purposes, character, or method of operation must be reported to the District Director, address shown above which is your key district for exempt organization matters, so he may consider the effect of the change on your exempt status. You must also report any change in your name and address.

You are required to file the annual return, Form 990, on or before the 15th day of the 5th month after the end of your annual accounting period. Failure to file the Form 990 by this date may subject you to a penalty of $10 for each day during which such failure continues, up to a maximum of $5,000.

D. Evidence of Site Control

WGP:mws 5/28/59

5-04

JUN -8-59 AM 11:16 232RE***5.00

DEED

I, VIRGINIA L. PAINE, of Wayland, Middlesex County, Commonwealth of Massachusetts, the unmarried widow of Frank C. Paine, FOR CONSIDERATION PAID grant to the ROMAN CATHOLIC ARCHBISHOP OF BOSTON, Massachusetts, a corporation sole, with Quitclaim Covenants, all of my right, title and interest in and to a tract of land situated on the Easterly side of Cochituate Road in the Town of Wayland, County of Middlesex, Commonwealth of Massachusetts, bounded and described as follows:

Beginning on the highway leading from Framingham to Boston known as "Old Connecticut Path";

Thence running from the land now or formerly of Robert Cumming Southwesterly along said road to land now or formerly of Francis Shaw;

Thence Northwesterly to the highway leading from Wayland to Cochituate known as "Cochituate Road";

Thence Northerly by said road to land formerly of Joseph Bullard now or formerly of Helen C. Morgan;

Thence Easterly by said land now or formerly of said Helen C. Morgan to the corner of a stone wall;

Thence Southeasterly to the point of beginning.

There is excepted from this conveyance so much of the above-described premises as have heretofore been taken by or conveyed to the Commonwealth of Massachusetts and other grantees as appears of record and also excepting from this conveyance the Northeasterly portion of the above-described premises containing a square area of 85/100ths acres, more or less, conveyed by Elizabeth M. Rutter to said Helen C. Morgan by deed dated June 27, 1939, and recorded in Middlesex South District Deeds, Book 6305, Page 21.

The premises conveyed hereby contain twelve (12) acres, more or less.

This conveyance is made subject to and with the benefit of all easements, restrictions of record, if any there be, and subject to the real estate taxes of the Town of Wayland for the year 1959.

This conveyance is further specifically made subject to the following restrictions which shall remain in force for a period of fifty (50) years from the date hereof:

1. That during said period the premises shall be used only for a church and a rectory thereon, and

2. That during said period the premises shall not be sold, conveyed, or otherwise transferred.

For title reference may be had to the deed of John B. Paine, Jr., et al, Trustees, to me, dated May 21st, 1959, and recorded ~~immediately~~ preceding this deed, as Document #165 of June 3, 1959.

No documentary stamps are affixed as none are required by law.

WITNESS my hand and seal this 2nd day of June, 1959.

Virginia L. Paine
Virginia L. Paine

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss. June 2nd, 1959

Then personally appeared the above named Virginia L. Paine and acknowledged the foregoing instrument to be her free act and deed,

Before me,

Chas. M. Gibson
Charles M. Gibson Notary Public

My commission expires

My commission expires Sept. 24, 1959

E. Determination of Project Eligibility

May 3, 2023

Mr. William H. Grogan
President
Planning Office for Urban Affairs
84 State Street, Suite 600
Boston, MA 02109

Re: St. Ann's Village, Wayland, MA– Project Eligibility Letter

Dear Mr. Grogan:

We are pleased to inform you that your application for project eligibility determination for the proposed St. Ann's Senior Village project located in Wayland, Massachusetts, has been approved under the Low Income Housing Tax Credit (LIHTC) program. The property is located at 124 Cochituate Road, Wayland, Massachusetts. This approval indicates that the proposed plan is for 60 units of rental housing for senior households, 60 (100%) of which will be affordable at no more than 60% of area median income. The proposed development will consist of 60 one-bedroom units. The rental structure as described in the application is generally consistent with the standards for affordable housing to be included in the community's Chapter 40B affordable housing stock. This approval does not constitute a guarantee that LIHTC funds will be allocated to the St. Ann's Senior Village project. It does create a presumption of fundability under 760 CMR 56.04 and allows Planning Office for Urban Affairs to apply to the Wayland Zoning Board of Appeals for a comprehensive permit. The sponsor should note that a One Stop + submission for funding for this project must conform to all Department of Housing and Community Development (DHCD) program limits and requirements in effect at the time of submission.

As part of the review process, DHCD has made the following findings:

1. The proposed project appears generally eligible under the requirements of the Low Income Housing Tax Credit program.

2. DHCD has performed an on-site inspection of the proposed St. Ann's Senior Village project and has determined that the proposed site is an appropriate location for the project. The site abuts single family homes and the Good Shepherd Parish as well as Sudbury Valley Trustees conservation land. It is 1.5 miles south of the Wayland town center.

3. The proposed housing design is appropriate for the site. Massing and details will reflect traditional New England design. The one-bedroom units will be visitable. There will also be a community room, a laundry, and programmed outdoor recreational space.

4. The proposed project appears financially feasible in the context of the Wayland housing market. The proposal includes 60 units for senior households earning up to 60% AMI, with 15 units to be reserved for senior households earning at or below 30% of AMI.

5. The initial proforma for the project appears financially feasible and consistent with the requirements for cost examination and limitations on profits on the basis of estimated development and operating costs. Please note again that a One Stop+ submission for funding for this project must conform to all DHCD program limits and requirements in effect at the time of submission.

6. An as-is appraisal has been commissioned. The Low-Income Housing Tax Credit Program Guidelines state that the allowable acquisition value of a site with a comprehensive permit must be equal to or less than the value under pre-existing zoning, plus reasonable carrying costs. If this project applies for funding under the Low-Income Housing Tax Credit Program, the acquisition price in the proposed budget should reflect these program guidelines.

7. The ownership entity will be a single-purpose entity controlled by the applicants and subject to limited dividend requirements. The ownership entity meet the general eligibility standards of the Low Income Housing Tax Credit program. The applicant will need to demonstrate sufficient capacity to successfully develop the project under the Low-Income Housing Tax Credit program.

8. Planning Office for Urban Affairs (or an affiliated entity) will be entering a long-term ground lease with the Roman Catholic Archbishop of Boston, a Corporation Sole. They are negotiating the final details of this non-related party agreement.

9. The Town of Wayland has submitted additional comments on the project.

The proposed St. Ann's Senior Village project will have to comply with all state and local codes not specifically exempted by a comprehensive permit. In applying for a comprehensive permit, the project sponsor should identify all aspects of the proposal that will not comply with local requirements.

If a comprehensive permit is granted, construction of this project may not commence without DHCD's issuance of final approval pursuant to 760 CMR 56.04 (7) and an award of LIHTC funds. This project eligibility determination letter is not transferable to any other project sponsor or housing program without the express written consent of DHCD. When construction is complete, a Chapter 40B cost certification and an executed and recorded 40B regulatory agreement in compliance with DHCD's requirements pertaining to Chapter 40B must be submitted and approved by DHCD prior to the release of a Low-Income Housing Tax Credit form 8609.

This letter shall expire two years from this date, or on May 3, 2025, unless a comprehensive permit has been issued.

We congratulate you on your efforts to work with the town of Wayland to increase its supply of affordable housing. If you have any questions as you proceed with the project, please feel free to call or email Rebecca Frawley Wachtel at (617) 573-1318 or at Rebecca.Frawley@mass.gov.

Sincerely,

Catherine Racer
Director

cc: Cherry C. Karlson, Chair of the Wayland Select Board

F. Waivers

LIST OF WAIVERS

The Applicant requests that a Comprehensive Permit for the Project, as shown on the Plans, be issued in lieu of the requirement that the Applicant apply to the individual local boards, departments and officials separately and that waivers from Local Requirement and Regulations, as defined under Section 56.02 of the Chapter 40B Regulations (760 CMR 56.00), be granted as set forth below.

Applicant seeks waivers for the proposed St. Ann's Village Project, a 60-unit rental project ("Project"), as shown on the plans submitted by the Applicant (and as they may be revised during the public hearing process and the conditions contained within the Comprehensive Permit Decision) (the "Final Plans"), from the Town of Wayland's Local Requirements and Regulations in effect as of the date of the filing of the Comprehensive Permit Application with the Town of Wayland Zoning Board of Appeals, as set forth below, for all municipal Boards and Departments, including, but not limited to, the following Boards: Board of Health, Select Board, Conservation Commission, Historic Commission, Historic District Commission, Planning Board and the Zoning Board of Appeals and the following Departments: Building Department, Fire Department, Police Department, Planning Department, Health Department, and Department of Public Works.

The Applicant reserves the right to amend the requested Waivers during the public hearing process.

The Applicant requests the following specific waivers from the Zoning Board of Appeals ("ZBA") for the Project from the following Local Requirements and Regulations:

Note 1: Pursuant to the Chapter 40B Rules described under 760 CMR 56.05(7), "Zoning waivers are required solely from the 'as-of-right' requirements of the zoning district where the project site is located; there shall be no requirement to obtain waivers from the special permit requirements of the district." Accordingly, any waivers which reference special permit requirements are included for informational purposes only.

TOWN OF WAYLAND ZONING BYLAWS (AS AMENDED THROUGH MAY 1, 2023)				
BYLAW/REG.	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
Article 2 §198-205	Administration and Enforcement	Enforcement	No building permit may be issued for construction of any building or structure if, as constructed, would be in violation of this Zoning Bylaw. No building permit may be issued under any application of any kind unless the intended use of any building, structure or lot under such permit, shall be in conformity with the Zoning Bylaw	Waived to the limited extent that Zoning Bylaw is modified by waivers granted in the Comprehensive Permit Decision pursuant to G.L. c. 40B. Building Inspector to maintain authority to enforce the Comprehensive Permit Decision, as well as portions of the Zoning Bylaw not waived by this Comprehensive Permit.

TOWN OF WAYLAND ZONING BYLAWS (AS AMENDED THROUGH MAY 1, 2023)				
BYLAW/REG.	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
Article 5 §198-501.1	General Regulations	Signs and Exterior Lighting	Only those signs and exterior lighting as pertain to buildings, structures, or uses permitted in this Zoning Bylaw and on the same lot are permitted subject to yard requirements. Signage in residential districts shall be limited to that which is permitted by other sections of this Bylaw. Signage in districts other than residential districts may not exceed 40 square feet of area and 15 feet in height, including supporting structures and light sources. Signs attached to buildings may not rise above the front roofline of the building to which it is attached. Signage in excess of that which is permitted may be allowed with a special permit issued by the special permit granting authority with appropriate jurisdictional responsibility for site plan approval, as provided for in § 198-603. The sign dimensions set forth in this Zoning Bylaw apply in the aggregate to all signs on the lot.	Waived. Signs and lighting to be as depicted on the final Site Plans and are to be governed by Comprehensive Permit.

TOWN OF WAYLAND ZONING BYLAWS (AS AMENDED THROUGH MAY 1, 2023)				
BYLAW/REG.	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
Article 5 §198-502	General Regulations	Temporary Signs	Real estate signs are permitted in all districts as of right, but shall refer only to the building, structure, or lot on which they are located and have an area not exceeding six square feet. One contractors sign, not exceeding nine square feet in area, maintained on the lot while a building is actually under construction or being renovated is permitted. No more than one contractors sign may be on the lot at any one time. Nonresidential site development signs either one wall-mounted or freestanding sign, erected at the development entrance from a street. The sign shall not exceed 15 square feet, and may bear decorative or logo devices, but no commercial advertisement. For nonresidential site development, the sign shall not be erected prior to the issuance of a building permit and shall be removed upon completion of construction or the issuance of a certificate of occupancy, whichever comes first.	Waived to allow developer and general contractor place multiple mandated signs for compliance with DEP, OSHA, ingress/egress, contacts, safety, team/financing identity.

TOWN OF WAYLAND ZONING BYLAWS (AS AMENDED THROUGH MAY 1, 2023)				
BYLAW/REG.	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
Article 5 §198-504	General Regulations	Earth Movement	No earth in excess of 1,500 cubic yards may be moved on any lot in any district which requires a minimum lot area of 40,000 square feet or more unless a special permit from the ZBA is obtained in accordance with the procedure provided in § 198-203, and only under such conditions as the ZBA may impose, except where the amount of earth to be moved is limited to the volume of the foundation and basement of the principal building or structure, or installation of septic systems, driveways, and walkways. The quantity of material to be moved shall be certified by a registered professional engineer or land surveyor.	Waived. Comprehensive Permit Decision shall provide all local permits per M.G.L. Chapter 40B. Any required earth removal to be approved by the ZBA as part of the Comprehensive Permit Decision. See also Note 1 above.

TOWN OF WAYLAND ZONING BYLAWS (AS AMENDED THROUGH MAY 1, 2023)				
BYLAW/REG.	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
Article 5 §198-506, including §198-506.1.10 §198-506.5 (location) §198-506.7 (design standards) §198-506.8 (landscaping)	General Regulations	Off-street Parking	506.1. Project parking space requirements are as determined by the Site Plan Approval Granting Authority. 506.5.1. Off-street parking facilities may be required either on the same lot with the parking-generating activity or on any lot or premises a substantial portion of which is, at least, within 300 feet of such activity. 506.7.3. If lighting is provided, the source of light shall be so arranged and shielded as to prevent direct glare from the light source into any public street or onto adjacent lots. 506.7.4. For off-street parking facilities of 10 or more spaces, bicycle racks facilitating locking, shall be provided to accommodate one bicycle per 10 parking spaces. 506.8.1. Parking facilities immediately adjacent to a residence district shall be adequately screened year round from view from said residence district by trees, hedges or a tight fence. 506.8.2. For all off-street parking facilities that are not enclosed within a building or structure, 10% of the parking facility shall be landscaped.	Waived. Project will provide a total of no less than 60 off-street parking spaces, or an average of at least 1.0 space per unit, as located, designed and landscaped as shown on the Site Plan.

TOWN OF WAYLAND ZONING BYLAWS (AS AMENDED THROUGH MAY 1, 2023)				
BYLAW/REG.	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
Article 5 §198-508 §198-508.4	General Regulations	Design Review Board	All applications for building permits, site plan approval, special permits or variances for all nonresidential uses involving new construction and all commercial signs shall be submitted to the Design Review Board.	Waived, if applicable. To be governed by Comprehensive Permit.
Article 6 §198-601 through §198-609, and Chapter 302 Site Plan Review and Approval Regulations	Site Plan Review	Site Plan Approval	601.1. No change in use of an existing structure or lot shall be permitted and no area for parking, loading or vehicular access shall be established or substantially altered unless a site plan has been approved as required by this Article 6. 602.1. SPA shall be a prerequisite to the issuance of any special permit, permit and/or variance required by this Zoning Bylaw, unless excepted from SPA by § 198-601.2.2 above. 602.2. No person shall undertake any improvement or alteration, and no building permits shall be issued for any such proposal, until SPA, as certified by the Planning Board or its agent, has been issued for such proposal or until the completed certification form referenced in § 198-601.6 above has been received by the Building Commissioner.	Waived. To be governed by Comprehensive Permit.

TOWN OF WAYLAND ZONING BYLAWS (AS AMENDED THROUGH MAY 1, 2023)				
BYLAW/REG.	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
Article 7 §198-701	Area, Yard and Bulk Regulations	Height Regulations	The limit of height of all buildings and structures in Single Residence Districts shall comply with § 198-801, Table of Dimensional Requirements, except that schools and, on lots of five acres or greater in area, dwellings may be three stories high, but may not exceed the maximum allowed heights for buildings and structures set forth in § 198-801, Table of Dimensional Requirements.	Waived. Height to be as described in waivers under Article 8, §198-801 below, and as depicted on Site Plans and as described in the Comprehensive Permit.
Article 7 §198-702	Area, Yard and Bulk Regulations	Setbacks	All buildings or structures in any district shall comply with the setbacks in § 198-801, Table of Dimensional Requirements. Exempt from the setback requirements of this paragraph are roof eaves, stoops, stairs, bulkheads, chimneys and bay windows; and fences and walls up to six feet in height from the existing natural ground level.	Waived. To be governed by setbacks as described in waivers under Article 8, §198-801 below, and as depicted on Site Plans and as described in the Comprehensive Permit.

TOWN OF WAYLAND ZONING BYLAWS (AS AMENDED THROUGH MAY 1, 2023)				
BYLAW/REG.	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
Article 7 §198-703 §198-703.1 §198-703.2	Area, Yard and Bulk Regulations	Yards	703.1. Behind every building or structure there shall be provided a backyard between the rear line of the building or structure and the rear lot line meeting the setbacks in § 198-801, Table of Dimensional Requirements.... A backyard may contain accessory buildings or structures, each of which may not be more than 1 1/2 stories high and that together may not cover more than 30% of the backyard, and none of which may extend within 10 feet of any lot line… 703.2. At each side of a building or structure there shall be a side yard meeting the setbacks in § 198-801, Table of Dimensional Requirements.	Waived. To be governed by setbacks as described in waivers under Article 8, §198-801 below, and as depicted on Site Plans and as described in the Comprehensive Permit.

TOWN OF WAYLAND ZONING BYLAWS (AS AMENDED THROUGH MAY 1, 2023)				
BYLAW/REG.	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
Article 8 §198-801	Dimension and Use Tables	Table of Dimensional Requirements	801.1. Requirements as to area, lot coverage, frontage, setbacks and height for a building or structure enlarged or erected pursuant to a permit issued on or after June 1, 1982 which is located within the Residence Zone 40,000 square feet Zoning District. Min. Lot Area: 40,000 s.f. & FN#15 Min. Frontage: 180 Feet Min. Front Yard Setback From Lot Line: 30 Feet & FN#2 Min. Front Yard Setback From ROW Center Line: 55 Feet Min. Side Yard Setback: 25 Feet Min. Rear Yard Setback: 30 Feet Max. Height: Lesser of 2.5 stories or 35 Feet from avg. grade & FN#4 Max. Lot Coverage: 20%	Waived as to the particular dimensional requirements below, and as depicted in the Site Plans. No changes are proposed to the preexisting rectory. 401,487 s.f. 399 ft. 25 ft. 50 ft. 75.2 ft. 650 ft. 45 ft., 3 stories < 20 % Lot Coverage

TOWN OF WAYLAND ZONING BYLAWS (AS AMENDED THROUGH MAY 1, 2023)				
BYLAW/REG.	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
Article 8 §198-802, 802.1.6, 803	Table of Permitted Principal Uses by Districts.	Table of Permitted Principal Uses	802.1.6. All uses set forth in this Table of Permitted Principal Uses by Districts shall conform to all other requirements contained in this Zoning Bylaw; and, in the event of a conflict between this Table of Permitted Principal Uses by Districts and any other provisions of this Zoning Bylaw, this § 198-802 shall prevail; and the Classification of Principal Uses, § 198-803, below, shall be considered as part of said section and shall likewise prevail in the event of such conflicts. The special permit requirement shall not apply to uses protected under MGL c. 40A, § 3. Use Category 19. "Earth removal" allowed only by Special Permit, and Use Category 57. "Dwelling, Multi-family" and FN2 -- Multi-family dwellings only allowed by special permit under Article 18 Conservation Cluster Development District. See Note 1. See also, Article 9 below.	Waived. Allow use of the Property for no less than a total of 60 multifamily age-restricted (62+) rental units in a single building, the removal and movement of earth necessary to allow for the construction of Project improvements, and other appurtenant uses customary to such residential uses, and associated improvements, all as may be depicted in the Final Plans. Also allow the rectory building, the church, and related building uses and parking on such real property to lawfully continue and exist and to co-exist with the Project uses and structures on the Property (including the ground leased premises).
Article 8 §198-803.5	Dimension and Use Tables	Prohibited Uses	All uses not specifically permitted by Zoning Bylaw are prohibited.	Waived. To allow uses as listed above and as provided by Comprehensive Permit.

Article 8 §198-804, §198-805.1.1	Dimension and Use Tables	Table of Accessory Uses; Accessory Use Classification	804.1.The Table of Permitted Accessory Uses by Districts sets forth the permitted accessory uses of land, buildings and structures in each zoning district as set forth in the various provisions of this Zoning Bylaw for uses commencing on or after June 1, 1982. All uses set forth in this table shall conform to all other requirements contained in this Zoning Bylaw, and in the event of a conflict between this Table of Permitted Accessory Uses by Districts and any other provisions of this Zoning Bylaw, this § 198-804 shall prevail; and the Classification of accessory uses, § 198-805, below, shall be considered as part of said section and shall likewise prevail in the event of such conflicts. 804.1.1. A use listed in said table is permitted as of right in any district under which it is denoted by the word "yes." Uses denoted by the word "no" shall be prohibited. Excluding walkways and driveways from accessory uses. 805.1.1.9. Office, provided that it is conducted as an accessory use and that there is no display of advertising, except for a small professional nameplate.	Waived. Allow accessory accessory uses, including without limitation, utilities, generator, and management/ leasing office, resident indoor and outdoor common area spaces, related customary accessory uses, parking, access, water and stormwater management improvements and appurtenances, subsurface septic system, signs, the removal and movement of earth necessary to allow for the construction of Project improvements, and other appurtenant uses customary to such residential uses, including but not limited to, bicycle facilities, and fences, all as may be depicted in the Final Plans, as further provided by the Comprehensive Permit.

TOWN OF WAYLAND ZONING BYLAWS (AS AMENDED THROUGH MAY 1, 2023)				
BYLAW/REG.	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
Article 9 §198-901.1.1.3	Single Residence District	Permitted Uses in a Single Residence District	§ 198-901. Permitted uses. 901.1. See Article 7, Area, Yard and Bulk Regulations; Article 8, Dimension and Use Tables. § 198-901. Permitted uses. 901.1.5.2. Allows housing for elderly persons of low income, and 901.1.5.3. Allows subsidized multifamily dwelling for persons of low income, including adequate parking areas therefor, as defined by MGL c. 121B, §§ 1, 38, 39 and 40, but only if constructed by the Wayland Housing Authority as permitted in the Table of Principal Uses by District, § 198-802.	Waived. Allow those principal and accessory uses as described above.
Article 22, AND WAYLAND PLANNIG BOARD RULES AND REGULATIONS For AFFORDABLE HOUSING SPECIAL PERMITS	Inclusion of Affordable Housing			Waived. Project to comply with the affordability requirements of Chapter 40B and the Subsidizing Agency as described in the Comprehensive Permit Decision.

TOWN OF WAYLAND GENERAL BYLAWS (A AMENDED THROUGH MAY 1, 2023)				
REGULATION	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
Chapter 193 Stormwater and Land Disturbance			No person shall alter land within the Town of Wayland without having obtained a Stormwater Management and Land Disturbance Permit (SMLDP) from the Conservation Commission for the property, unless exempt.	Waived. Stormwater Management to be in compliance with MADEP Stormwater Management Policy implemented through the Massachusetts Wetlands Protection Regulations, 310 CMR 10.00, as well as the requirements of the US EPA Construction General Permit for Massachusetts, all as provided in the Comprehensive Permit Decision.

Chapter 194 Wetlands and Water Resource Protection; and, "Chapter 194 RULES AND REGULATIONS (Rev. June 12, 2014).			No person shall remove, fill, dredge, build upon, discharge onto or otherwise or alter any bank, freshwater wetland, marsh, bog, wet meadow, swamp, vernal pool, creek, river, stream, pond or lake or any land under said waters, or any buffer zone, or any land subject to flooding or inundation, or riverfront area other than in the course of maintaining, repairing or replacing, but not substantially changing or enlarging, an existing and lawfully located structure or facility used in the service of the public and used to provide electric, gas, water, telephone, telegraph and other telecommunication services without first filing either a request for a determination (RDA) of applicability or a notice of intent (NOI) to so remove, fill, dredge, build upon, discharge, or otherwise alter, including such plans as may be	Waived. Project will comply with Massachusetts Wetlands Protection Act. M.G.L. c. 131 §40 and 310 CMR 10.00 et seq.

			necessary to fully describe such proposed activity and its effect on the environment and without receiving and complying with a permit issued by the Conservation Commission.	

TOWN OF WAYLAND – BOARD OF HEALTH REGULATIONS FOR ON-SITE SUBSURFACE SEWAGE DISPOSAL SYSTEMS AND WATER TREATMENT FACILITIES				
REGULATION	**TITLE**	**DESCRIPTION**	**REQUIRED**	**PROPOSED**
II. APPLICABILITY; IV. PERMITTING PROCESS; V. SEPTIC DESIGN REQUIREMENTS; and, V. SEPTIC DESIGN REQUIREMENTS			No system or facility to be used for treating, neutralizing, stabilizing, or disposing of wastewater from homes, public buildings, commercial or industrial buildings, or any other types of establishments, shall be located, constructed, altered, repaired or installed until a permit for such location, construction, alteration, repair or installation has been issued by the BOH.	Waived all procedural and substantive requirements for submittal to Board of Health as Zoning Board of Appeals is authorized to issue all local approvals. Project will comply with 310 CMR 15.00 et seq.

H. Stormwater Report

Planning Office for Urban Affairs
St. Ann's Village
Wayland, MA

STORMWATER MANAGEMENT REPORT

Submitted to:
Michael Jaillet - Tetra Tech

Applicant:
Planning Office for Urban Affairs
84 State Street, Suite 600
Boston, MA 02109

Civil Engineer/ Land Surveyor:
Samiotes Consultants, Inc.
20 A Street
Framingham, MA 01701

Architect:
TAT
50 Commandmant's Way at Admiral's Hill
Chelsea, MA 02150

March 05, 2023

ST ANN'S VILLAGE
STORMWATER MANAGEMENT NARRATIVE
WAYLAND, MA

May 2023

Results/ Summary

Results of Analysis:
Through the use of the HydroCAD Software, the curve numbers, times of concentrations, and peak discharge rates were determined for both the existing conditions and the proposed conditions. The results of the study shows that both the post-development peak rates of runoff are equal or less than the existing rates.

As shown in Tables A-C, the post development peak rates of runoff from the site will be mitigated.

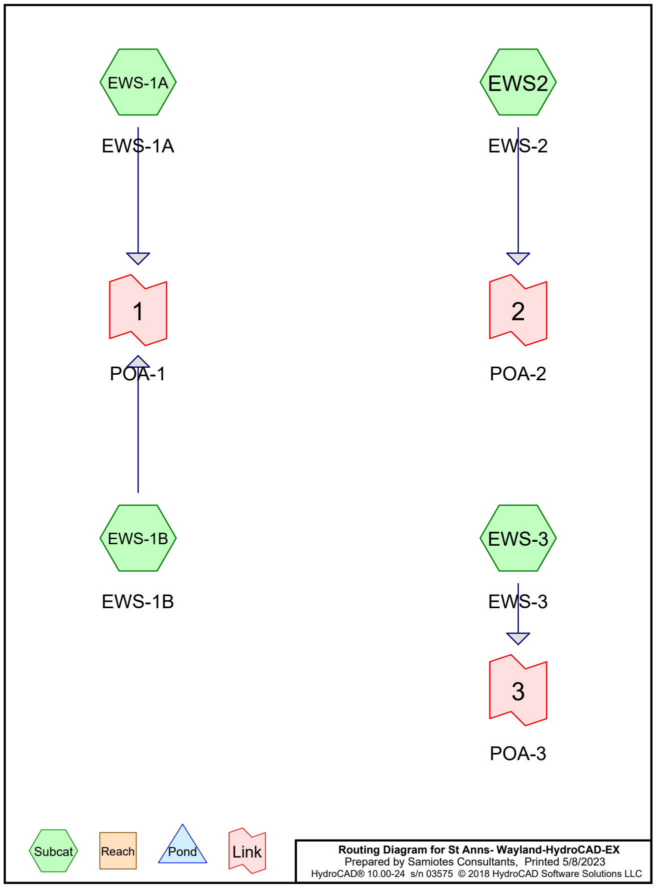
Table A – POA 1 #1 Cochituate Road Peak Rates of Runoff (cfs)					
	1" storm	2-year storm	10-year storm	25-year storm	100-year storm
Existing	0.00	0.01	0.11	0.29	0.78
Proposed	0.00	0.01	0.11	0.28	0.75

Table B – POA 2 Northeast Wetlands Peak Rates of Runoff (cfs)					
	1" storm	2-year storm	10-year storm	25-year storm	100-year storm
Existing	0.00	0.00	0.07	0.39	1.53
Proposed	0.00	0.00	0.03	0.34	1.19

Table C – POA 3 Southeast Wetlands Peak Rates of Runoff (cfs)					
	1" storm	2-year storm	10-year storm	25-year storm	100-year storm
Existing	0.00	0.00	0.01	0.06	0.32
Proposed	0.00	0.00	0.01	0.03	0.20

Table of Appendices

APPENDIX 1:
EXISTING HYDROLOGICAL CALCULATIONS



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.680	39	>75% Grass cover, Good, HSG A (EWS-1B, EWS-3, EWS2)
0.097	98	Pavement (EWS-3)
3.414	30	Woods, Good, HSG A (EWS-1A, EWS-1B, EWS-3, EWS2)
0.537	98	impervious (EWS-1B, EWS2)
4.728	**40**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
4.094	HSG A	EWS-1A, EWS-1B, EWS-3, EWS2
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.634	Other	EWS-1B, EWS-3, EWS2
4.728		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.680	0.000	0.000	0.000	0.000	0.680	>75% Grass cover, Good	EWS-1B , EWS-3, EWS2
0.000	0.000	0.000	0.000	0.097	0.097	Pavement	EWS-3
3.414	0.000	0.000	0.000	0.000	3.414	Woods, Good	EWS-1A , EWS-1B , EWS-3, EWS2
0.000	0.000	0.000	0.000	0.537	0.537	impervious	EWS-1B , EWS2
4.094	**0.000**	**0.000**	**0.000**	**0.634**	**4.728**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEWS-1A: EWS-1A Runoff Area=14,655 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=224' Tc=9.7 min CN=30 Runoff=0.00 cfs 0.000 af

SubcatchmentEWS-1B: EWS-1B Runoff Area=26,413 sf 20.66% Impervious Runoff Depth=0.00"
Flow Length=64' Slope=0.0400 '/' Tc=9.5 min CN=48 Runoff=0.00 cfs 0.000 af

SubcatchmentEWS-3: EWS-3 Runoff Area=33,749 sf 12.49% Impervious Runoff Depth=0.00"
Flow Length=146' Tc=7.2 min CN=39 Runoff=0.00 cfs 0.000 af

SubcatchmentEWS2: EWS-2 Runoff Area=131,119 sf 13.69% Impervious Runoff Depth=0.00"
Flow Length=287' Tc=13.2 min CN=41 Runoff=0.00 cfs 0.000 af

Link 1: POA-1 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link 2: POA-2 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link 3: POA-3 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 4.728 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
86.59% Pervious = 4.094 ac 13.41% Impervious = 0.634 ac

Summary for Subcatchment EWS-1A: EWS-1A

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Rainfall=1.00"

Area (sf)	CN	Description
14,655	30	Woods, Good, HSG A
14,655		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow, 50 sf woods** Woods: Light underbrush n= 0.400 P2= 3.20"
2.6	174	0.0500	1.12		**Shallow Concentrated Flow, 134 scf** Woodland Kv= 5.0 fps
9.7	224	Total			

Summary for Subcatchment EWS-1B: EWS-1B

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Rainfall=1.00"

	Area (sf)	CN	Description
	10,470	39	>75% Grass cover, Good, HSG A
*	5,458	98	impervious
	10,485	30	Woods, Good, HSG A
	26,413	48	Weighted Average
	20,955		79.34% Pervious Area
	5,458		20.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, 50' woods-sf** Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	14	0.0400	1.00		**Shallow Concentrated Flow, 75 scf** Woodland Kv= 5.0 fps
9.5	64	Total			

Summary for Subcatchment EWS-3: EWS-3

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Rainfall=1.00"

	Area (sf)	CN	Description
	27,790	30	Woods, Good, HSG A
	1,744	39	>75% Grass cover, Good, HSG A
*	4,215	98	Pavement
	33,749	39	Weighted Average
	29,534		87.51% Pervious Area
	4,215		12.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		**Sheet Flow, 50' sf** Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	96	0.1000	1.58		**Shallow Concentrated Flow, 80'-scf** Woodland Kv= 5.0 fps
7.2	146	Total			

Summary for Subcatchment EWS2: EWS-2

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Rainfall=1.00"

	Area (sf)	CN	Description
*	17,950	98	impervious
	17,400	39	>75% Grass cover, Good, HSG A
	95,769	30	Woods, Good, HSG A
	131,119	41	Weighted Average
	113,169		86.31% Pervious Area
	17,950		13.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0340	0.08		**Sheet Flow, 50' woods sf** Woods: Light underbrush n= 0.400 P2= 3.20"
3.2	237	0.0600	1.22		**Shallow Concentrated Flow, 237scf** Woodland Kv= 5.0 fps
13.2	287	Total			

Summary for Link 1: POA-1

Inflow Area = 0.943 ac, 13.29% Impervious, Inflow Depth = 0.00" for 1" event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link 2: POA-2

Inflow Area = 3.010 ac, 13.69% Impervious, Inflow Depth = 0.00" for 1" event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link 3: POA-3

Inflow Area = 0.775 ac, 12.49% Impervious, Inflow Depth = 0.00" for 1" event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEWS-1A: EWS-1A Runoff Area=14,655 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=224' Tc=9.7 min CN=30 Runoff=0.00 cfs 0.000 af

SubcatchmentEWS-1B: EWS-1B Runoff Area=26,413 sf 20.66% Impervious Runoff Depth=0.09"
Flow Length=64' Slope=0.0400 '/' Tc=9.5 min CN=48 Runoff=0.01 cfs 0.005 af

SubcatchmentEWS-3: EWS-3 Runoff Area=33,749 sf 12.49% Impervious Runoff Depth=0.00"
Flow Length=146' Tc=7.2 min CN=39 Runoff=0.00 cfs 0.000 af

SubcatchmentEWS2: EWS-2 Runoff Area=131,119 sf 13.69% Impervious Runoff Depth=0.01"
Flow Length=287' Tc=13.2 min CN=41 Runoff=0.00 cfs 0.002 af

Link 1: POA-1 Inflow=0.01 cfs 0.005 af
Primary=0.01 cfs 0.005 af

Link 2: POA-2 Inflow=0.00 cfs 0.002 af
Primary=0.00 cfs 0.002 af

Link 3: POA-3 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 4.728 ac Runoff Volume = 0.006 af Average Runoff Depth = 0.02"
86.59% Pervious = 4.094 ac 13.41% Impervious = 0.634 ac

Summary for Subcatchment EWS-1A: EWS-1A

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (sf)	CN	Description
14,655	30	Woods, Good, HSG A
14,655		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow, 50 sf woods** Woods: Light underbrush n= 0.400 P2= 3.20"
2.6	174	0.0500	1.12		**Shallow Concentrated Flow, 134 scf** Woodland Kv= 5.0 fps
9.7	224	Total			

Summary for Subcatchment EWS-1B: EWS-1B

Runoff = 0.01 cfs @ 14.62 hrs, Volume= 0.005 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

	Area (sf)	CN	Description
	10,470	39	>75% Grass cover, Good, HSG A
*	5,458	98	impervious
	10,485	30	Woods, Good, HSG A
	26,413	48	Weighted Average
	20,955		79.34% Pervious Area
	5,458		20.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, 50' woods-sf** Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	14	0.0400	1.00		**Shallow Concentrated Flow, 75 scf** Woodland Kv= 5.0 fps
9.5	64	Total			

Summary for Subcatchment EWS-3: EWS-3

Runoff = 0.00 cfs @ 24.02 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

	Area (sf)	CN	Description
	27,790	30	Woods, Good, HSG A
	1,744	39	>75% Grass cover, Good, HSG A
*	4,215	98	Pavement
	33,749	39	Weighted Average
	29,534		87.51% Pervious Area
	4,215		12.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		**Sheet Flow, 50' sf** Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	96	0.1000	1.58		**Shallow Concentrated Flow, 80'-scf** Woodland Kv= 5.0 fps
7.2	146	Total			

Summary for Subcatchment EWS2: EWS-2

Runoff = 0.00 cfs @ 22.78 hrs, Volume= 0.002 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

	Area (sf)	CN	Description
*	17,950	98	impervious
	17,400	39	>75% Grass cover, Good, HSG A
	95,769	30	Woods, Good, HSG A
	131,119	41	Weighted Average
	113,169		86.31% Pervious Area
	17,950		13.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0340	0.08		**Sheet Flow, 50' woods sf** Woods: Light underbrush n= 0.400 P2= 3.20"
3.2	237	0.0600	1.22		**Shallow Concentrated Flow, 237scf** Woodland Kv= 5.0 fps
13.2	287	Total			

Summary for Link 1: POA-1

Inflow Area = 0.943 ac, 13.29% Impervious, Inflow Depth = 0.06" for 2 yr event
Inflow = 0.01 cfs @ 14.62 hrs, Volume= 0.005 af
Primary = 0.01 cfs @ 14.62 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link 2: POA-2

Inflow Area = 3.010 ac, 13.69% Impervious, Inflow Depth = 0.01" for 2 yr event
Inflow = 0.00 cfs @ 22.78 hrs, Volume= 0.002 af
Primary = 0.00 cfs @ 22.78 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link 3: POA-3

Inflow Area = 0.775 ac, 12.49% Impervious, Inflow Depth = 0.00" for 2 yr event
Inflow = 0.00 cfs @ 24.02 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 24.02 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEWS-1A: EWS-1A Runoff Area=14,655 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=224' Tc=9.7 min CN=30 Runoff=0.00 cfs 0.000 af

SubcatchmentEWS-1B: EWS-1B Runoff Area=26,413 sf 20.66% Impervious Runoff Depth=0.41"
Flow Length=64' Slope=0.0400 '/' Tc=9.5 min CN=48 Runoff=0.11 cfs 0.021 af

SubcatchmentEWS-3: EWS-3 Runoff Area=33,749 sf 12.49% Impervious Runoff Depth=0.11"
Flow Length=146' Tc=7.2 min CN=39 Runoff=0.01 cfs 0.007 af

SubcatchmentEWS2: EWS-2 Runoff Area=131,119 sf 13.69% Impervious Runoff Depth=0.16"
Flow Length=287' Tc=13.2 min CN=41 Runoff=0.07 cfs 0.041 af

Link 1: POA-1 Inflow=0.11 cfs 0.021 af
Primary=0.11 cfs 0.021 af

Link 2: POA-2 Inflow=0.07 cfs 0.041 af
Primary=0.07 cfs 0.041 af

Link 3: POA-3 Inflow=0.01 cfs 0.007 af
Primary=0.01 cfs 0.007 af

Total Runoff Area = 4.728 ac Runoff Volume = 0.069 af Average Runoff Depth = 0.18"
86.59% Pervious = 4.094 ac 13.41% Impervious = 0.634 ac

Summary for Subcatchment EWS-1A: EWS-1A

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (sf)	CN	Description
14,655	30	Woods, Good, HSG A
14,655		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow, 50 sf woods** Woods: Light underbrush n= 0.400 P2= 3.20"
2.6	174	0.0500	1.12		**Shallow Concentrated Flow, 134 scf** Woodland Kv= 5.0 fps
9.7	224	Total			

Summary for Subcatchment EWS-1B: EWS-1B

Runoff = 0.11 cfs @ 12.36 hrs, Volume= 0.021 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
	10,470	39	>75% Grass cover, Good, HSG A
*	5,458	98	impervious
	10,485	30	Woods, Good, HSG A
	26,413	48	Weighted Average
	20,955		79.34% Pervious Area
	5,458		20.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, 50' woods-sf** Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	14	0.0400	1.00		**Shallow Concentrated Flow, 75 scf** Woodland Kv= 5.0 fps
9.5	64	Total			

Summary for Subcatchment EWS-3: EWS-3

Runoff = 0.01 cfs @ 14.73 hrs, Volume= 0.007 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
	27,790	30	Woods, Good, HSG A
	1,744	39	>75% Grass cover, Good, HSG A
*	4,215	98	Pavement
	33,749	39	Weighted Average
	29,534		87.51% Pervious Area
	4,215		12.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		**Sheet Flow, 50' sf** Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	96	0.1000	1.58		**Shallow Concentrated Flow, 80'-scf** Woodland Kv= 5.0 fps
7.2	146	Total			

Summary for Subcatchment EWS2: EWS-2

Runoff = 0.07 cfs @ 13.71 hrs, Volume= 0.041 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
*	17,950	98	impervious
	17,400	39	>75% Grass cover, Good, HSG A
	95,769	30	Woods, Good, HSG A
	131,119	41	Weighted Average
	113,169		86.31% Pervious Area
	17,950		13.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0340	0.08		**Sheet Flow, 50' woods sf** Woods: Light underbrush n= 0.400 P2= 3.20"
3.2	237	0.0600	1.22		**Shallow Concentrated Flow, 237scf** Woodland Kv= 5.0 fps
13.2	287	Total			

Summary for Link 1: POA-1

Inflow Area = 0.943 ac, 13.29% Impervious, Inflow Depth = 0.27" for 10 yr event
Inflow = 0.11 cfs @ 12.36 hrs, Volume= 0.021 af
Primary = 0.11 cfs @ 12.36 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link 2: POA-2

Inflow Area = 3.010 ac, 13.69% Impervious, Inflow Depth = 0.16" for 10 yr event
Inflow = 0.07 cfs @ 13.71 hrs, Volume= 0.041 af
Primary = 0.07 cfs @ 13.71 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link 3: POA-3

Inflow Area = 0.775 ac, 12.49% Impervious, Inflow Depth = 0.11" for 10 yr event
Inflow = 0.01 cfs @ 14.73 hrs, Volume= 0.007 af
Primary = 0.01 cfs @ 14.73 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEWS-1A: EWS-1A Runoff Area=14,655 sf 0.00% Impervious Runoff Depth=0.02"
Flow Length=224' Tc=9.7 min CN=30 Runoff=0.00 cfs 0.001 af

SubcatchmentEWS-1B: EWS-1B Runoff Area=26,413 sf 20.66% Impervious Runoff Depth=0.74"
Flow Length=64' Slope=0.0400 '/' Tc=9.5 min CN=48 Runoff=0.29 cfs 0.038 af

SubcatchmentEWS-3: EWS-3 Runoff Area=33,749 sf 12.49% Impervious Runoff Depth=0.29"
Flow Length=146' Tc=7.2 min CN=39 Runoff=0.06 cfs 0.019 af

SubcatchmentEWS2: EWS-2 Runoff Area=131,119 sf 13.69% Impervious Runoff Depth=0.38"
Flow Length=287' Tc=13.2 min CN=41 Runoff=0.39 cfs 0.094 af

Link 1: POA-1 Inflow=0.29 cfs 0.038 af
Primary=0.29 cfs 0.038 af

Link 2: POA-2 Inflow=0.39 cfs 0.094 af
Primary=0.39 cfs 0.094 af

Link 3: POA-3 Inflow=0.06 cfs 0.019 af
Primary=0.06 cfs 0.019 af

Total Runoff Area = 4.728 ac Runoff Volume = 0.151 af Average Runoff Depth = 0.38"
86.59% Pervious = 4.094 ac 13.41% Impervious = 0.634 ac

Summary for Subcatchment EWS-1A: EWS-1A

Runoff = 0.00 cfs @ 21.61 hrs, Volume= 0.001 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

	Area (sf)	CN	Description
	14,655	30	Woods, Good, HSG A
	14,655		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow, 50 sf woods** Woods: Light underbrush n= 0.400 P2= 3.20"
2.6	174	0.0500	1.12		**Shallow Concentrated Flow, 134 scf** Woodland Kv= 5.0 fps
9.7	224	Total			

Summary for Subcatchment EWS-1B: EWS-1B

Runoff = 0.29 cfs @ 12.18 hrs, Volume= 0.038 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

	Area (sf)	CN	Description
	10,470	39	>75% Grass cover, Good, HSG A
*	5,458	98	impervious
	10,485	30	Woods, Good, HSG A
	26,413	48	Weighted Average
	20,955		79.34% Pervious Area
	5,458		20.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, 50' woods-sf** Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	14	0.0400	1.00		**Shallow Concentrated Flow, 75 scf** Woodland Kv= 5.0 fps
9.5	64	Total			

Summary for Subcatchment EWS-3: EWS-3

Runoff = 0.06 cfs @ 12.43 hrs, Volume= 0.019 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

	Area (sf)	CN	Description
	27,790	30	Woods, Good, HSG A
	1,744	39	>75% Grass cover, Good, HSG A
*	4,215	98	Pavement
	33,749	39	Weighted Average
	29,534		87.51% Pervious Area
	4,215		12.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		**Sheet Flow, 50' sf** Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	96	0.1000	1.58		**Shallow Concentrated Flow, 80'-scf** Woodland Kv= 5.0 fps
7.2	146	Total			

Summary for Subcatchment EWS2: EWS-2

Runoff = 0.39 cfs @ 12.47 hrs, Volume= 0.094 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

	Area (sf)	CN	Description
*	17,950	98	impervious
	17,400	39	>75% Grass cover, Good, HSG A
	95,769	30	Woods, Good, HSG A
	131,119	41	Weighted Average
	113,169		86.31% Pervious Area
	17,950		13.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0340	0.08		**Sheet Flow, 50' woods sf** Woods: Light underbrush n= 0.400 P2= 3.20"
3.2	237	0.0600	1.22		**Shallow Concentrated Flow, 237scf** Woodland Kv= 5.0 fps
13.2	287	Total			

Summary for Link 1: POA-1

Inflow Area = 0.943 ac, 13.29% Impervious, Inflow Depth = 0.49" for 25 yr event
Inflow = 0.29 cfs @ 12.18 hrs, Volume= 0.038 af
Primary = 0.29 cfs @ 12.18 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link 2: POA-2

Inflow Area = 3.010 ac, 13.69% Impervious, Inflow Depth = 0.38" for 25 yr event
Inflow = 0.39 cfs @ 12.47 hrs, Volume= 0.094 af
Primary = 0.39 cfs @ 12.47 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link 3: POA-3

Inflow Area = 0.775 ac, 12.49% Impervious, Inflow Depth = 0.29" for 25 yr event
Inflow = 0.06 cfs @ 12.43 hrs, Volume= 0.019 af
Primary = 0.06 cfs @ 12.43 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentEWS-1A: EWS-1A Runoff Area=14,655 sf 0.00% Impervious Runoff Depth=0.21"
Flow Length=224' Tc=9.7 min CN=30 Runoff=0.01 cfs 0.006 af

SubcatchmentEWS-1B: EWS-1B Runoff Area=26,413 sf 20.66% Impervious Runoff Depth=1.49"
Flow Length=64' Slope=0.0400 '/' Tc=9.5 min CN=48 Runoff=0.78 cfs 0.075 af

SubcatchmentEWS-3: EWS-3 Runoff Area=33,749 sf 12.49% Impervious Runoff Depth=0.77"
Flow Length=146' Tc=7.2 min CN=39 Runoff=0.32 cfs 0.050 af

SubcatchmentEWS2: EWS-2 Runoff Area=131,119 sf 13.69% Impervious Runoff Depth=0.92"
Flow Length=287' Tc=13.2 min CN=41 Runoff=1.53 cfs 0.230 af

Link 1: POA-1 Inflow=0.78 cfs 0.081 af
Primary=0.78 cfs 0.081 af

Link 2: POA-2 Inflow=1.53 cfs 0.230 af
Primary=1.53 cfs 0.230 af

Link 3: POA-3 Inflow=0.32 cfs 0.050 af
Primary=0.32 cfs 0.050 af

Total Runoff Area = 4.728 ac Runoff Volume = 0.361 af Average Runoff Depth = 0.92"
86.59% Pervious = 4.094 ac 13.41% Impervious = 0.634 ac

Summary for Subcatchment EWS-1A: EWS-1A

Runoff = 0.01 cfs @ 13.83 hrs, Volume= 0.006 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (sf)	CN	Description
14,655	30	Woods, Good, HSG A
14,655		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow, 50 sf woods** Woods: Light underbrush n= 0.400 P2= 3.20"
2.6	174	0.0500	1.12		**Shallow Concentrated Flow, 134 scf** Woodland Kv= 5.0 fps
9.7	224	Total			

Summary for Subcatchment EWS-1B: EWS-1B

Runoff = 0.78 cfs @ 12.15 hrs, Volume= 0.075 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

	Area (sf)	CN	Description
	10,470	39	>75% Grass cover, Good, HSG A
*	5,458	98	impervious
	10,485	30	Woods, Good, HSG A
	26,413	48	Weighted Average
	20,955		79.34% Pervious Area
	5,458		20.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, 50' woods-sf** Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	14	0.0400	1.00		**Shallow Concentrated Flow, 75 scf** Woodland Kv= 5.0 fps
9.5	64	Total			

Summary for Subcatchment EWS-3: EWS-3

Runoff = 0.32 cfs @ 12.17 hrs, Volume= 0.050 af, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

	Area (sf)	CN	Description
	27,790	30	Woods, Good, HSG A
	1,744	39	>75% Grass cover, Good, HSG A
*	4,215	98	Pavement
	33,749	39	Weighted Average
	29,534		87.51% Pervious Area
	4,215		12.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		**Sheet Flow, 50' sf** Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	96	0.1000	1.58		**Shallow Concentrated Flow, 80'-scf** Woodland Kv= 5.0 fps
7.2	146	Total			

Summary for Subcatchment EWS2: EWS-2

Runoff = 1.53 cfs @ 12.27 hrs, Volume= 0.230 af, Depth= 0.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

	Area (sf)	CN	Description
*	17,950	98	impervious
	17,400	39	>75% Grass cover, Good, HSG A
	95,769	30	Woods, Good, HSG A
	131,119	41	Weighted Average
	113,169		86.31% Pervious Area
	17,950		13.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	50	0.0340	0.08		**Sheet Flow, 50' woods sf** Woods: Light underbrush n= 0.400 P2= 3.20"
3.2	237	0.0600	1.22		**Shallow Concentrated Flow, 237scf** Woodland Kv= 5.0 fps
13.2	287	Total			

Summary for Link 1: POA-1

Inflow Area = 0.943 ac, 13.29% Impervious, Inflow Depth = 1.03" for 100 yr event
Inflow = 0.78 cfs @ 12.15 hrs, Volume= 0.081 af
Primary = 0.78 cfs @ 12.15 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link 2: POA-2

Inflow Area = 3.010 ac, 13.69% Impervious, Inflow Depth = 0.92" for 100 yr event
Inflow = 1.53 cfs @ 12.27 hrs, Volume= 0.230 af
Primary = 1.53 cfs @ 12.27 hrs, Volume= 0.230 af, Atten= 0%, Lag= 0.0 min

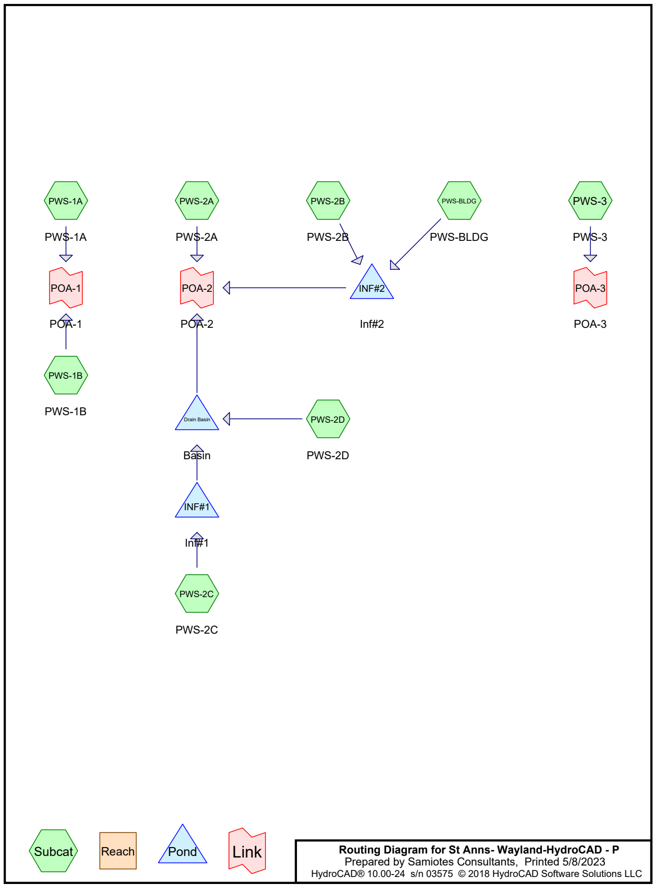
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link 3: POA-3

Inflow Area = 0.775 ac, 12.49% Impervious, Inflow Depth = 0.77" for 100 yr event
Inflow = 0.32 cfs @ 12.17 hrs, Volume= 0.050 af
Primary = 0.32 cfs @ 12.17 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

APPENDIX 2:
PROPOSED HYDROLOGICAL CALCULATIONS



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.201	39	>75% Grass cover, Good, HSG A (PWS-1A, PWS-1B, PWS-2A, PWS-2B, PWS-2C, PWS-2D, PWS-3)
0.450	98	BLDG (PWS-BLDG)
0.446	98	DRIVEWAY (PWS-2B, PWS-3)
0.836	98	IMPERVIOUS (PWS-2C)
0.130	98	Impervious (PWS-1B, PWS-2A)
0.055	98	Water Surface, HSG A (PWS-2D)
1.610	30	Woods, Good, HSG A (PWS-1A, PWS-1B, PWS-2A, PWS-2C, PWS-3)
4.728	**60**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
2.865	HSG A	PWS-1A, PWS-1B, PWS-2A, PWS-2B, PWS-2C, PWS-2D, PWS-3
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
1.862	Other	PWS-1B, PWS-2A, PWS-2B, PWS-2C, PWS-3, PWS-BLDG
4.728		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
1.201	0.000	0.000	0.000	0.000	1.201	>75% Grass cover, Good	PWS-1A, PWS-1B, PWS-2A, PWS-2B, PWS-2C, PWS-2D, PWS-3
0.000	0.000	0.000	0.000	0.450	0.450	BLDG	PWS-BLDG
0.000	0.000	0.000	0.000	0.446	0.446	DRIVEWAY	PWS-2B, PWS-3
0.000	0.000	0.000	0.000	0.836	0.836	IMPERVIOUS	PWS-2C
0.000	0.000	0.000	0.000	0.130	0.130	Impervious	PWS-1B, PWS-2A
0.055	0.000	0.000	0.000	0.000	0.055	Water Surface	PWS-2D
1.610	0.000	0.000	0.000	0.000	1.610	Woods, Good	PWS-1A, PWS-1B, PWS-2A, PWS-2C, PWS-3
2.865	**0.000**	**0.000**	**0.000**	**1.862**	**4.728**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPWS-1A: PWS-1A Runoff Area=6,470 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=76' Tc=9.1 min CN=31 Runoff=0.00 cfs 0.000 af

SubcatchmentPWS-1B: PWS-1B Runoff Area=25,471 sf 19.90% Impervious Runoff Depth=0.00"
Flow Length=50' Slope=0.0390 '/' Tc=9.4 min CN=48 Runoff=0.00 cfs 0.000 af

SubcatchmentPWS-2A: PWS-2A Runoff Area=41,182 sf 1.46% Impervious Runoff Depth=0.00"
Flow Length=250' Tc=12.3 min CN=33 Runoff=0.00 cfs 0.000 af

SubcatchmentPWS-2B: PWS-2B Runoff Area=23,303 sf 73.43% Impervious Runoff Depth=0.11"
Tc=6.0 min CN=82 Runoff=0.04 cfs 0.005 af

SubcatchmentPWS-2C: PWS-2C Runoff Area=1.263 ac 66.19% Impervious Runoff Depth=0.06"
Flow Length=181' Tc=6.0 min CN=78 Runoff=0.02 cfs 0.006 af

SubcatchmentPWS-2D: PWS-2D Runoff Area=4,253 sf 55.96% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=72 Runoff=0.00 cfs 0.000 af

SubcatchmentPWS-3: PWS-3 Runoff Area=30,626 sf 7.54% Impervious Runoff Depth=0.00"
Flow Length=168' Tc=7.0 min CN=37 Runoff=0.00 cfs 0.000 af

SubcatchmentPWS-BLDG: PWS-BLDG Runoff Area=19,615 sf 100.00% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=98 Runoff=0.40 cfs 0.030 af

Pond Drain Basin: Basin Peak Elev=161.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond INF#1: Inf#1 Peak Elev=159.90' Storage=3 cf Inflow=0.02 cfs 0.006 af
Discarded=0.02 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.006 af

Pond INF#2: Inf#2 Peak Elev=154.57' Storage=58 cf Inflow=0.43 cfs 0.035 af
Discarded=0.39 cfs 0.035 af Primary=0.00 cfs 0.000 af Outflow=0.39 cfs 0.035 af

Link POA-1: POA-1 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-2: POA-2 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-3: POA-3 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 4.728 ac Runoff Volume = 0.041 af Average Runoff Depth = 0.10"
59.45% Pervious = 2.811 ac 40.55% Impervious = 1.917 ac

Summary for Subcatchment PWS-1A: PWS-1A

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Rainfall=1.00"

	Area (sf)	CN	Description
	5,880	30	Woods, Good, HSG A
	590	39	>75% Grass cover, Good, HSG A
	6,470	31	Weighted Average
	6,470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow, 50** Woods: Light underbrush n= 0.400 P2= 3.20"
0.6	26	0.0200	0.71		**Shallow Concentrated Flow, 51' SCF WOODS** Woodland Kv= 5.0 fps
9.1	76	Total			

Summary for Subcatchment PWS-1B: PWS-1B

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Rainfall=1.00"

	Area (sf)	CN	Description
	13,423	39	>75% Grass cover, Good, HSG A
*	5,070	98	Impervious
	6,978	30	Woods, Good, HSG A
	25,471	48	Weighted Average
	20,401		80.10% Pervious Area
	5,070		19.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0390	0.09		**Sheet Flow, 50 SF** Woods: Light underbrush n= 0.400 P2= 3.20"

Summary for Subcatchment PWS-2A: PWS-2A

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Rainfall=1.00"

	Area (sf)	CN	Description
	33,500	30	Woods, Good, HSG A
	7,082	39	>75% Grass cover, Good, HSG A
*	600	98	Impervious
	41,182	33	Weighted Average
	40,582		98.54% Pervious Area
	600		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, 50 sf woods 4%** Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	200	0.0500	1.12		**Shallow Concentrated Flow, 200' scf woods 5%** Woodland Kv= 5.0 fps
12.3	250	Total			

Summary for Subcatchment PWS-2B: PWS-2B

Runoff = 0.04 cfs @ 12.14 hrs, Volume= 0.005 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Rainfall=1.00"

	Area (sf)	CN	Description
*	17,112	98	DRIVEWAY
	6,191	39	>75% Grass cover, Good, HSG A
	23,303	82	Weighted Average
	6,191		26.57% Pervious Area
	17,112		73.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWS-2C: PWS-2C

Runoff = 0.02 cfs @ 12.39 hrs, Volume= 0.006 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Rainfall=1.00"

	Area (ac)	CN	Description
	0.015	30	Woods, Good, HSG A
*	0.836	98	IMPERVIOUS
	0.412	39	>75% Grass cover, Good, HSG A
	1.263	78	Weighted Average
	0.427		33.81% Pervious Area
	0.836		66.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		**Sheet Flow, 50' SF GRASS** Grass: Short n= 0.150 P2= 3.20"
0.1	5	0.0320	1.25		**Shallow Concentrated Flow, 5** Short Grass Pasture Kv= 7.0 fps
0.0	3	0.0320	3.63		**Shallow Concentrated Flow, 3' PAVED** Paved Kv= 20.3 fps
0.3	47	0.0300	2.60		**Shallow Concentrated Flow, GRASS SCF** Grassed Waterway Kv= 15.0 fps
0.1	44	0.2100	6.87		**Shallow Concentrated Flow, 44' SCF GRASS** Grassed Waterway Kv= 15.0 fps
0.1	32	0.0500	4.54		**Shallow Concentrated Flow, 32' SCF PAVE** Paved Kv= 20.3 fps
5.3	181	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PWS-2D: PWS-2D

Runoff = 0.00 cfs @ 15.50 hrs, Volume= 0.000 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Rainfall=1.00"

Area (sf)	CN	Description
2,380	98	Water Surface, HSG A
1,873	39	>75% Grass cover, Good, HSG A
4,253	72	Weighted Average
1,873		44.04% Pervious Area
2,380		55.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWS-3: PWS-3

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Rainfall=1.00"

	Area (sf)	CN	Description
	5,203	39	>75% Grass cover, Good, HSG A
	23,113	30	Woods, Good, HSG A
*	2,310	98	DRIVEWAY
	30,626	37	Weighted Average
	28,316		92.46% Pervious Area
	2,310		7.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		**Sheet Flow, 50' sf woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.4	38	0.1000	1.58		**Shallow Concentrated Flow, 38' scf woods** Woodland Kv= 5.0 fps
0.2	43	0.0500	3.35		**Shallow Concentrated Flow, 43' scf** Grassed Waterway Kv= 15.0 fps
0.2	37	0.2500	2.50		**Shallow Concentrated Flow, 37' scf woods** Woodland Kv= 5.0 fps
7.0	168	Total			

Summary for Subcatchment PWS-BLDG: PWS-BLDG

Runoff = 0.40 cfs @ 12.08 hrs, Volume= 0.030 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1" Rainfall=1.00"

	Area (sf)	CN	Description
*	19,615	98	BLDG
	19,615		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond Drain Basin: Basin

Inflow Area = 1.361 ac, 65.46% Impervious, Inflow Depth = 0.00" for 1" event
Inflow = 0.00 cfs @ 15.50 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 15.75 hrs, Volume= 0.000 af, Atten= 1%, Lag= 14.8 min
Discarded = 0.00 cfs @ 15.75 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.50' @ 15.75 hrs Surf.Area= 54 sf Storage= 0 cf

Plug-Flow detention time= 14.2 min calculated for 0.000 af (100% of inflow)
Center-of-Mass det. time= 14.3 min (1,133.6 - 1,119.4)

Volume	Invert	Avail.Storage	Storage Description
#1	161.50'	2,610 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.50	54	0	0
162.00	108	41	41
163.00	313	211	251
164.00	603	458	709
165.00	934	769	1,478
166.00	1,330	1,132	2,610

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.50'	**6.0" Round Culvert** L= 37.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.50' / 162.00' S= 0.0405 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Primary	165.50'	**12.0" Round Culvert** L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.50' / 164.50' S= 0.0769 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.00 cfs @ 15.75 hrs HW=161.50' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.50' (Free Discharge)
├─**2=Culvert** (Controls 0.00 cfs)
└─**3=Culvert** (Controls 0.00 cfs)

Summary for Pond INF#1: Inf#1

Inflow Area = 1.263 ac, 66.19% Impervious, Inflow Depth = 0.06" for 1" event
Inflow = 0.02 cfs @ 12.39 hrs, Volume= 0.006 af
Outflow = 0.02 cfs @ 12.44 hrs, Volume= 0.006 af, Atten= 2%, Lag= 2.6 min
Discarded = 0.02 cfs @ 12.44 hrs, Volume= 0.006 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 159.90' @ 12.44 hrs Surf.Area= 1,931 sf Storage= 3 cf

Plug-Flow detention time= 2.4 min calculated for 0.006 af (100% of inflow)
Center-of-Mass det. time= 2.4 min (981.1 - 978.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.90'	3,420 cf	**37.58'W x 51.39'L x 7.00'H Field A** 13,520 cf Overall - 4,971 cf Embedded = 8,549 cf x 40.0% Voids
#2A	160.90'	4,971 cf	**ADS_StormTech MC-4500 +Cap** x 44 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 44 Chambers in 4 Rows Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		8,391 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	159.90'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	163.65'	**4.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.65' / 163.40' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf

Discarded OutFlow Max=0.37 cfs @ 12.44 hrs HW=159.90' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.90' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)

Pond INF#1: Inf#1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

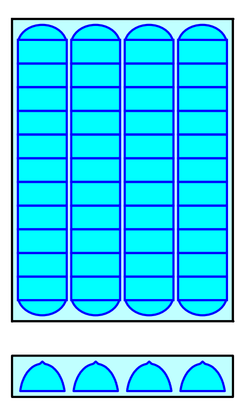
11 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 49.39' Row Length +12.0" End Stone x 2 = 51.39' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

44 Chambers x 106.5 cf + 35.7 cf of Cap Volume x 2 x 4 Rows = 4,971.2 cf Chamber Storage

13,520.3 cf of Field - 4,971.2 cf of Chambers = 8,549.1 cf of Stone x 40.0% Voids = 3,419.6 cf of Stone Storage

Chamber Storage + Stone Storage = 8,390.8 cf = 0.193 af
Overall Storage Efficiency = 62.1%
Overall System Size = 51.39' x 37.58' x 7.00'

44 Chambers
500.8 cy Field
316.6 cy Stone



Summary for Pond INF#2: Inf#2

Inflow Area = 0.985 ac, 85.57% Impervious, Inflow Depth = 0.42" for 1" event
Inflow = 0.43 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.39 cfs @ 12.12 hrs, Volume= 0.035 af, Atten= 9%, Lag= 1.8 min
Discarded = 0.39 cfs @ 12.12 hrs, Volume= 0.035 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 154.57' @ 12.13 hrs Surf.Area= 2,038 sf Storage= 58 cf

Plug-Flow detention time= 2.4 min calculated for 0.035 af (100% of inflow)
Center-of-Mass det. time= 2.4 min (810.8 - 808.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	154.50'	3,577 cf	**28.50'W x 71.52'L x 7.00'H Field A** 14,268 cf Overall - 5,326 cf Embedded = 8,942 cf x 40.0% Voids
#2A	155.50'	5,326 cf	**ADS_StormTech MC-4500 +Cap** x 48 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 48 Chambers in 3 Rows Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
		8,902 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	156.00'	**12.0" Round Culvert** L= 43.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 156.00' / 154.00' S= 0.0465 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#3	Device 2	160.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	157.30'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	159.33'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.39 cfs @ 12.12 hrs HW=154.57' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.39 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=154.50' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond INF#2: Inf#2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

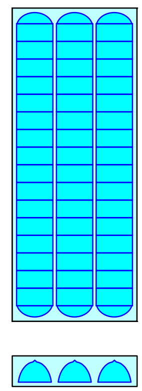
16 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 69.52' Row Length +12.0" End Stone x 2 = 71.52' Base Length
3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

48 Chambers x 106.5 cf + 35.7 cf of Cap Volume x 2 x 3 Rows = 5,325.7 cf Chamber Storage

14,267.6 cf of Field - 5,325.7 cf of Chambers = 8,941.8 cf Stone x 40.0% Voids = 3,576.7 cf Stone Storage

Chamber Storage + Stone Storage = 8,902.5 cf = 0.204 af
Overall Storage Efficiency = 62.4%
Overall System Size = 71.52' x 28.50' x 7.00'

48 Chambers
528.4 cy Field
331.2 cy Stone



Summary for Link POA-1: POA-1

Inflow Area = 0.733 ac, 15.87% Impervious, Inflow Depth = 0.00" for 1" event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link POA-2: POA-2

Inflow Area = 3.291 ac, 53.10% Impervious, Inflow Depth = 0.00" for 1" event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link POA-3: POA-3

Inflow Area = 0.703 ac, 7.54% Impervious, Inflow Depth = 0.00" for 1" event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPWS-1A: PWS-1A Runoff Area=6,470 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=76' Tc=9.1 min CN=31 Runoff=0.00 cfs 0.000 af

SubcatchmentPWS-1B: PWS-1B Runoff Area=25,471 sf 19.90% Impervious Runoff Depth=0.09"
Flow Length=50' Slope=0.0390 '/' Tc=9.4 min CN=48 Runoff=0.01 cfs 0.004 af

SubcatchmentPWS-2A: PWS-2A Runoff Area=41,182 sf 1.46% Impervious Runoff Depth=0.00"
Flow Length=250' Tc=12.3 min CN=33 Runoff=0.00 cfs 0.000 af

SubcatchmentPWS-2B: PWS-2B Runoff Area=23,303 sf 73.43% Impervious Runoff Depth=1.54"
Tc=6.0 min CN=82 Runoff=0.96 cfs 0.069 af

SubcatchmentPWS-2C: PWS-2C Runoff Area=1.263 ac 66.19% Impervious Runoff Depth=1.27"
Flow Length=181' Tc=6.0 min CN=78 Runoff=1.85 cfs 0.134 af

SubcatchmentPWS-2D: PWS-2D Runoff Area=4,253 sf 55.96% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=72 Runoff=0.10 cfs 0.008 af

SubcatchmentPWS-3: PWS-3 Runoff Area=30,626 sf 7.54% Impervious Runoff Depth=0.00"
Flow Length=168' Tc=7.0 min CN=37 Runoff=0.00 cfs 0.000 af

SubcatchmentPWS-BLDG: PWS-BLDG Runoff Area=19,615 sf 100.00% Impervious Runoff Depth=2.97"
Tc=6.0 min CN=98 Runoff=1.40 cfs 0.111 af

Pond Drain Basin: Basin Peak Elev=162.51' Storage=122 cf Inflow=0.10 cfs 0.008 af
Discarded=0.01 cfs 0.008 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.008 af

Pond INF#1: Inf#1 Peak Elev=161.34' Storage=1,486 cf Inflow=1.85 cfs 0.134 af
Discarded=0.37 cfs 0.134 af Primary=0.00 cfs 0.000 af Outflow=0.37 cfs 0.134 af

Pond INF#2: Inf#2 Peak Elev=156.27' Storage=2,136 cf Inflow=2.36 cfs 0.180 af
Discarded=0.39 cfs 0.180 af Primary=0.00 cfs 0.000 af Outflow=0.39 cfs 0.180 af

Link POA-1: POA-1 Inflow=0.01 cfs 0.004 af
Primary=0.01 cfs 0.004 af

Link POA-2: POA-2 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA-3: POA-3 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 4.728 ac Runoff Volume = 0.326 af Average Runoff Depth = 0.83"
59.45% Pervious = 2.811 ac 40.55% Impervious = 1.917 ac

Summary for Subcatchment PWS-1A: PWS-1A

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (sf)	CN	Description
5,880	30	Woods, Good, HSG A
590	39	>75% Grass cover, Good, HSG A
6,470	31	Weighted Average
6,470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow, 50** Woods: Light underbrush n= 0.400 P2= 3.20"
0.6	26	0.0200	0.71		**Shallow Concentrated Flow, 51' SCF WOODS** Woodland Kv= 5.0 fps
9.1	76	Total			

Summary for Subcatchment PWS-1B: PWS-1B

Runoff = 0.01 cfs @ 14.59 hrs, Volume= 0.004 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

	Area (sf)	CN	Description
	13,423	39	>75% Grass cover, Good, HSG A
*	5,070	98	Impervious
	6,978	30	Woods, Good, HSG A
	25,471	48	Weighted Average
	20,401		80.10% Pervious Area
	5,070		19.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0390	0.09		**Sheet Flow, 50 SF** Woods: Light underbrush n= 0.400 P2= 3.20"

Summary for Subcatchment PWS-2A: PWS-2A

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

	Area (sf)	CN	Description
	33,500	30	Woods, Good, HSG A
	7,082	39	>75% Grass cover, Good, HSG A
*	600	98	Impervious
	41,182	33	Weighted Average
	40,582		98.54% Pervious Area
	600		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, 50 sf woods 4%** Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	200	0.0500	1.12		**Shallow Concentrated Flow, 200' scf woods 5%** Woodland Kv= 5.0 fps
12.3	250	Total			

Summary for Subcatchment PWS-2B: PWS-2B

Runoff = 0.96 cfs @ 12.09 hrs, Volume= 0.069 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

	Area (sf)	CN	Description
*	17,112	98	DRIVEWAY
	6,191	39	>75% Grass cover, Good, HSG A
	23,303	82	Weighted Average
	6,191		26.57% Pervious Area
	17,112		73.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWS-2C: PWS-2C

Runoff = 1.85 cfs @ 12.09 hrs, Volume= 0.134 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

	Area (ac)	CN	Description
	0.015	30	Woods, Good, HSG A
*	0.836	98	IMPERVIOUS
	0.412	39	>75% Grass cover, Good, HSG A
	1.263	78	Weighted Average
	0.427		33.81% Pervious Area
	0.836		66.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		**Sheet Flow, 50' SF GRASS** Grass: Short n= 0.150 P2= 3.20"
0.1	5	0.0320	1.25		**Shallow Concentrated Flow, 5** Short Grass Pasture Kv= 7.0 fps
0.0	3	0.0320	3.63		**Shallow Concentrated Flow, 3' PAVED** Paved Kv= 20.3 fps
0.3	47	0.0300	2.60		**Shallow Concentrated Flow, GRASS SCF** Grassed Waterway Kv= 15.0 fps
0.1	44	0.2100	6.87		**Shallow Concentrated Flow, 44' SCF GRASS** Grassed Waterway Kv= 15.0 fps
0.1	32	0.0500	4.54		**Shallow Concentrated Flow, 32' SCF PAVE** Paved Kv= 20.3 fps
5.3	181	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PWS-2D: PWS-2D

Runoff = 0.10 cfs @ 12.10 hrs, Volume= 0.008 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

Area (sf)	CN	Description
2,380	98	Water Surface, HSG A
1,873	39	>75% Grass cover, Good, HSG A
4,253	72	Weighted Average
1,873		44.04% Pervious Area
2,380		55.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWS-3: PWS-3

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

	Area (sf)	CN	Description
	5,203	39	>75% Grass cover, Good, HSG A
	23,113	30	Woods, Good, HSG A
*	2,310	98	DRIVEWAY
	30,626	37	Weighted Average
	28,316		92.46% Pervious Area
	2,310		7.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		**Sheet Flow, 50' sf woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.4	38	0.1000	1.58		**Shallow Concentrated Flow, 38' scf woods** Woodland Kv= 5.0 fps
0.2	43	0.0500	3.35		**Shallow Concentrated Flow, 43' scf** Grassed Waterway Kv= 15.0 fps
0.2	37	0.2500	2.50		**Shallow Concentrated Flow, 37' scf woods** Woodland Kv= 5.0 fps
7.0	168	Total			

Summary for Subcatchment PWS-BLDG: PWS-BLDG

Runoff = 1.40 cfs @ 12.08 hrs, Volume= 0.111 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.20"

	Area (sf)	CN	Description
*	19,615	98	BLDG
	19,615		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond Drain Basin: Basin

Inflow Area = 1.361 ac, 65.46% Impervious, Inflow Depth = 0.07" for 2 yr event
Inflow = 0.10 cfs @ 12.10 hrs, Volume= 0.008 af
Outflow = 0.01 cfs @ 13.08 hrs, Volume= 0.008 af, Atten= 88%, Lag= 58.8 min
Discarded = 0.01 cfs @ 13.08 hrs, Volume= 0.008 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 162.51' @ 13.08 hrs Surf.Area= 212 sf Storage= 122 cf

Plug-Flow detention time= 127.8 min calculated for 0.008 af (100% of inflow)
Center-of-Mass det. time= 127.8 min (996.5 - 868.8)

Volume	Invert	Avail.Storage	Storage Description
#1	161.50'	2,610 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.50	54	0	0
162.00	108	41	41
163.00	313	211	251
164.00	603	458	709
165.00	934	769	1,478
166.00	1,330	1,132	2,610

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.50'	**6.0" Round Culvert** L= 37.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.50' / 162.00' S= 0.0405 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Primary	165.50'	**12.0" Round Culvert** L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.50' / 164.50' S= 0.0769 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.01 cfs @ 13.08 hrs HW=162.51' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.50' (Free Discharge)
├**2=Culvert** (Controls 0.00 cfs)
└**3=Culvert** (Controls 0.00 cfs)

Summary for Pond INF#1: Inf#1

Inflow Area = 1.263 ac, 66.19% Impervious, Inflow Depth = 1.27" for 2 yr event
Inflow = 1.85 cfs @ 12.09 hrs, Volume= 0.134 af
Outflow = 0.37 cfs @ 11.85 hrs, Volume= 0.134 af, Atten= 80%, Lag= 0.0 min
Discarded = 0.37 cfs @ 11.85 hrs, Volume= 0.134 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.34' @ 12.56 hrs Surf.Area= 1,931 sf Storage= 1,486 cf

Plug-Flow detention time= 25.6 min calculated for 0.134 af (100% of inflow)
Center-of-Mass det. time= 25.6 min (874.8 - 849.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.90'	3,420 cf	**37.58'W x 51.39'L x 7.00'H Field A** 13,520 cf Overall - 4,971 cf Embedded = 8,549 cf x 40.0% Voids
#2A	160.90'	4,971 cf	**ADS_StormTech MC-4500 +Cap** x 44 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 44 Chambers in 4 Rows Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		8,391 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	159.90'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	163.65'	**4.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.65' / 163.40' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf

Discarded OutFlow Max=0.37 cfs @ 11.85 hrs HW=159.97' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.90' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond INF#1: Inf#1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

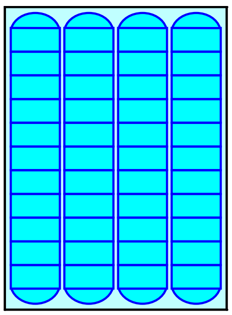
11 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 49.39' Row Length +12.0" End Stone x 2 = 51.39' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

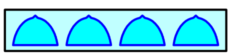
44 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 4 Rows = 4,971.2 cf Chamber Storage

13,520.3 cf Field - 4,971.2 cf Chambers = 8,549.1 cf of Stone x 40.0% Voids = 3,419.6 cf Stone Storage

Chamber Storage + Stone Storage = 8,390.8 cf = 0.193 af
Overall Storage Efficiency = 62.1%
Overall System Size = 51.39' x 37.58' x 7.00'

44 Chambers
500.8 cy Field
316.6 cy Stone





Summary for Pond INF#2: Inf#2

Inflow Area = 0.985 ac, 85.57% Impervious, Inflow Depth = 2.19" for 2 yr event
Inflow = 2.36 cfs @ 12.09 hrs, Volume= 0.180 af
Outflow = 0.39 cfs @ 11.72 hrs, Volume= 0.180 af, Atten= 83%, Lag= 0.0 min
Discarded = 0.39 cfs @ 11.72 hrs, Volume= 0.180 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 156.27' @ 12.56 hrs Surf.Area= 2,038 sf Storage= 2,136 cf

Plug-Flow detention time= 33.0 min calculated for 0.180 af (100% of inflow)
Center-of-Mass det. time= 33.0 min (819.8 - 786.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	154.50'	3,577 cf	**28.50'W x 71.52'L x 7.00'H Field A** 14,268 cf Overall - 5,326 cf Embedded = 8,942 cf x 40.0% Voids
#2A	155.50'	5,326 cf	**ADS_StormTech MC-4500 +Cap** x 48 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 48 Chambers in 3 Rows Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
		8,902 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	156.00'	**12.0" Round Culvert** L= 43.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 156.00' / 154.00' S= 0.0465 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#3	Device 2	160.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	157.30'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	159.33'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.39 cfs @ 11.72 hrs HW=154.57' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.39 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=154.50' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
  ├**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Pond INF#2: Inf#2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

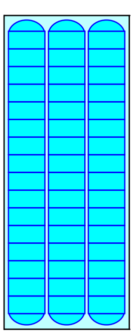
16 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 69.52' Row Length +12.0" End Stone x 2 = 71.52' Base Length
3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

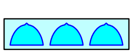
48 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 3 Rows = 5,325.7 cf Chamber Storage

14,267.6 cf Field - 5,325.7 cf Chambers = 8,941.8 cf of Stone x 40.0% Voids = 3,576.7 cf Stone Storage

Chamber Storage + Stone Storage = 8,902.5 cf = 0.204 af
Overall Storage Efficiency = 62.4%
Overall System Size = 71.52' x 28.50' x 7.00'

48 Chambers
528.4 cy Field
331.2 cy Stone





Summary for Link POA-1: POA-1

Inflow Area = 0.733 ac, 15.87% Impervious, Inflow Depth = 0.07" for 2 yr event
Inflow = 0.01 cfs @ 14.59 hrs, Volume= 0.004 af
Primary = 0.01 cfs @ 14.59 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link POA-2: POA-2

Inflow Area = 3.291 ac, 53.10% Impervious, Inflow Depth = 0.00" for 2 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link POA-3: POA-3

Inflow Area = 0.703 ac, 7.54% Impervious, Inflow Depth = 0.00" for 2 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPWS-1A: PWS-1A Runoff Area=6,470 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=76' Tc=9.1 min CN=31 Runoff=0.00 cfs 0.000 af

SubcatchmentPWS-1B: PWS-1B Runoff Area=25,471 sf 19.90% Impervious Runoff Depth=0.41"
Flow Length=50' Slope=0.0390 '/' Tc=9.4 min CN=48 Runoff=0.11 cfs 0.020 af

SubcatchmentPWS-2A: PWS-2A Runoff Area=41,182 sf 1.46% Impervious Runoff Depth=0.01"
Flow Length=250' Tc=12.3 min CN=33 Runoff=0.00 cfs 0.001 af

SubcatchmentPWS-2B: PWS-2B Runoff Area=23,303 sf 73.43% Impervious Runoff Depth=2.64"
Tc=6.0 min CN=82 Runoff=1.65 cfs 0.118 af

SubcatchmentPWS-2C: PWS-2C Runoff Area=1.263 ac 66.19% Impervious Runoff Depth=2.29"
Flow Length=181' Tc=6.0 min CN=78 Runoff=3.39 cfs 0.241 af

SubcatchmentPWS-2D: PWS-2D Runoff Area=4,253 sf 55.96% Impervious Runoff Depth=1.82"
Tc=6.0 min CN=72 Runoff=0.20 cfs 0.015 af

SubcatchmentPWS-3: PWS-3 Runoff Area=30,626 sf 7.54% Impervious Runoff Depth=0.07"
Flow Length=168' Tc=7.0 min CN=37 Runoff=0.01 cfs 0.004 af

SubcatchmentPWS-BLDG: PWS-BLDG Runoff Area=19,615 sf 100.00% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=98 Runoff=1.98 cfs 0.160 af

Pond Drain Basin: Basin Peak Elev=163.09' Storage=282 cf Inflow=0.20 cfs 0.015 af
Discarded=0.02 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.015 af

Pond INF#1: Inf#1 Peak Elev=162.78' Storage=3,733 cf Inflow=3.39 cfs 0.241 af
Discarded=0.37 cfs 0.241 af Primary=0.00 cfs 0.000 af Outflow=0.37 cfs 0.241 af

Pond INF#2: Inf#2 Peak Elev=157.41' Storage=4,016 cf Inflow=3.63 cfs 0.278 af
Discarded=0.39 cfs 0.276 af Primary=0.03 cfs 0.001 af Outflow=0.42 cfs 0.278 af

Link POA-1: POA-1 Inflow=0.11 cfs 0.020 af
Primary=0.11 cfs 0.020 af

Link POA-2: POA-2 Inflow=0.03 cfs 0.002 af
Primary=0.03 cfs 0.002 af

Link POA-3: POA-3 Inflow=0.01 cfs 0.004 af
Primary=0.01 cfs 0.004 af

Total Runoff Area = 4.728 ac Runoff Volume = 0.558 af Average Runoff Depth = 1.42"
59.45% Pervious = 2.811 ac 40.55% Impervious = 1.917 ac

Summary for Subcatchment PWS-1A: PWS-1A

Runoff = 0.00 cfs @ 24.03 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

Area (sf)	CN	Description
5,880	30	Woods, Good, HSG A
590	39	>75% Grass cover, Good, HSG A
6,470	31	Weighted Average
6,470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow, 50** Woods: Light underbrush n= 0.400 P2= 3.20"
0.6	26	0.0200	0.71		**Shallow Concentrated Flow, 51' SCF WOODS** Woodland Kv= 5.0 fps
9.1	76	Total			

Summary for Subcatchment PWS-1B: PWS-1B

Runoff = 0.11 cfs @ 12.35 hrs, Volume= 0.020 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
	13,423	39	>75% Grass cover, Good, HSG A
*	5,070	98	Impervious
	6,978	30	Woods, Good, HSG A
	25,471	48	Weighted Average
	20,401		80.10% Pervious Area
	5,070		19.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0390	0.09		**Sheet Flow, 50 SF** Woods: Light underbrush n= 0.400 P2= 3.20"

Summary for Subcatchment PWS-2A: PWS-2A

Runoff = 0.00 cfs @ 22.92 hrs, Volume= 0.001 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
	33,500	30	Woods, Good, HSG A
	7,082	39	>75% Grass cover, Good, HSG A
*	600	98	Impervious
	41,182	33	Weighted Average
	40,582		98.54% Pervious Area
	600		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, 50 sf woods 4%** Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	200	0.0500	1.12		**Shallow Concentrated Flow, 200' scf woods 5%** Woodland Kv= 5.0 fps
12.3	250	Total			

Summary for Subcatchment PWS-2B: PWS-2B

Runoff = 1.65 cfs @ 12.09 hrs, Volume= 0.118 af, Depth= 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
*	17,112	98	DRIVEWAY
	6,191	39	>75% Grass cover, Good, HSG A
	23,303	82	Weighted Average
	6,191		26.57% Pervious Area
	17,112		73.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWS-2C: PWS-2C

Runoff = 3.39 cfs @ 12.09 hrs, Volume= 0.241 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (ac)	CN	Description
	0.015	30	Woods, Good, HSG A
*	0.836	98	IMPERVIOUS
	0.412	39	>75% Grass cover, Good, HSG A
	1.263	78	Weighted Average
	0.427		33.81% Pervious Area
	0.836		66.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		**Sheet Flow, 50' SF GRASS** Grass: Short n= 0.150 P2= 3.20"
0.1	5	0.0320	1.25		**Shallow Concentrated Flow, 5** Short Grass Pasture Kv= 7.0 fps
0.0	3	0.0320	3.63		**Shallow Concentrated Flow, 3' PAVED** Paved Kv= 20.3 fps
0.3	47	0.0300	2.60		**Shallow Concentrated Flow, GRASS SCF** Grassed Waterway Kv= 15.0 fps
0.1	44	0.2100	6.87		**Shallow Concentrated Flow, 44' SCF GRASS** Grassed Waterway Kv= 15.0 fps
0.1	32	0.0500	4.54		**Shallow Concentrated Flow, 32' SCF PAVE** Paved Kv= 20.3 fps
5.3	181	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PWS-2D: PWS-2D

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
	2,380	98	Water Surface, HSG A
	1,873	39	>75% Grass cover, Good, HSG A
	4,253	72	Weighted Average
	1,873		44.04% Pervious Area
	2,380		55.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWS-3: PWS-3

Runoff = 0.01 cfs @ 15.30 hrs, Volume= 0.004 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
	5,203	39	>75% Grass cover, Good, HSG A
	23,113	30	Woods, Good, HSG A
*	2,310	98	DRIVEWAY
	30,626	37	Weighted Average
	28,316		92.46% Pervious Area
	2,310		7.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		**Sheet Flow, 50' sf woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.4	38	0.1000	1.58		**Shallow Concentrated Flow, 38' scf woods** Woodland Kv= 5.0 fps
0.2	43	0.0500	3.35		**Shallow Concentrated Flow, 43' scf** Grassed Waterway Kv= 15.0 fps
0.2	37	0.2500	2.50		**Shallow Concentrated Flow, 37' scf woods** Woodland Kv= 5.0 fps
7.0	168	Total			

Summary for Subcatchment PWS-BLDG: PWS-BLDG

Runoff = 1.98 cfs @ 12.08 hrs, Volume= 0.160 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 yr Rainfall=4.50"

	Area (sf)	CN	Description
*	19,615	98	BLDG
	19,615		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond Drain Basin: Basin

Inflow Area = 1.361 ac, 65.46% Impervious, Inflow Depth = 0.13" for 10 yr event
Inflow = 0.20 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.02 cfs @ 13.39 hrs, Volume= 0.015 af, Atten= 91%, Lag= 77.7 min
Discarded = 0.02 cfs @ 13.39 hrs, Volume= 0.015 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 163.09' @ 13.39 hrs Surf.Area= 340 sf Storage= 282 cf

Plug-Flow detention time= 191.3 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 191.3 min (1,039.4 - 848.1)

Volume	Invert	Avail.Storage	Storage Description
#1	161.50'	2,610 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.50	54	0	0
162.00	108	41	41
163.00	313	211	251
164.00	603	458	709
165.00	934	769	1,478
166.00	1,330	1,132	2,610

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.50'	**6.0" Round Culvert** L= 37.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.50' / 162.00' S= 0.0405 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Primary	165.50'	**12.0" Round Culvert** L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.50' / 164.50' S= 0.0769 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.02 cfs @ 13.39 hrs HW=163.09' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.50' (Free Discharge)
├─**2=Culvert** (Controls 0.00 cfs)
└─**3=Culvert** (Controls 0.00 cfs)

Summary for Pond INF#1: Inf#1

Inflow Area =	1.263 ac, 66.19% Impervious, Inflow Depth = 2.29" for 10 yr event		
Inflow =	3.39 cfs @ 12.09 hrs,	Volume=	0.241 af
Outflow =	0.37 cfs @ 11.68 hrs,	Volume=	0.241 af, Atten= 89%, Lag= 0.0 min
Discarded =	0.37 cfs @ 11.68 hrs,	Volume=	0.241 af
Primary =	0.00 cfs @ 0.00 hrs,	Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 162.78' @ 12.94 hrs Surf.Area= 1,931 sf Storage= 3,733 cf

Plug-Flow detention time= 82.3 min calculated for 0.241 af (100% of inflow)
Center-of-Mass det. time= 82.3 min (914.3 - 831.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.90'	3,420 cf	**37.58'W x 51.39'L x 7.00'H Field A** 13,520 cf Overall - 4,971 cf Embedded = 8,549 cf x 40.0% Voids
#2A	160.90'	4,971 cf	**ADS_StormTech MC-4500 +Cap** x 44 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 44 Chambers in 4 Rows Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		8,391 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	159.90'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	163.65'	**4.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.65' / 163.40' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf

Discarded OutFlow Max=0.37 cfs @ 11.68 hrs HW=159.97' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=159.90' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)

Pond INF#1: Inf#1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

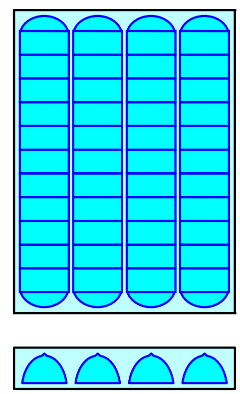
11 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 49.39' Row Length +12.0" End Stone x 2 = 51.39' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

44 Chambers x 106.5 cf + 35.7 cf of Cap Volume x 2 x 4 Rows = 4,971.2 cf Chamber Storage

13,520.3 cf of Field - 4,971.2 cf of Chambers = 8,549.1 cf of Stone x 40.0% Voids = 3,419.6 cf of Stone Storage

Chamber Storage + Stone Storage = 8,390.8 cf = 0.193 af
Overall Storage Efficiency = 62.1%
Overall System Size = 51.39' x 37.58' x 7.00'

44 Chambers
500.8 cy Field
316.6 cy Stone



Summary for Pond INF#2: Inf#2

Inflow Area =	0.985 ac, 85.57% Impervious, Inflow Depth = 3.38" for 10 yr event		
Inflow =	3.63 cfs @ 12.09 hrs,	Volume=	0.278 af
Outflow =	0.42 cfs @ 12.75 hrs,	Volume=	0.278 af, Atten= 88%, Lag= 39.8 min
Discarded =	0.39 cfs @ 11.60 hrs,	Volume=	0.276 af
Primary =	0.03 cfs @ 12.75 hrs,	Volume=	0.001 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 157.41' @ 12.75 hrs Surf.Area= 2,038 sf Storage= 4,016 cf

Plug-Flow detention time= 71.8 min calculated for 0.278 af (100% of inflow)
Center-of-Mass det. time= 71.8 min (851.7 - 779.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	154.50'	3,577 cf	**28.50'W x 71.52'L x 7.00'H Field A** 14,268 cf Overall - 5,326 cf Embedded = 8,942 cf x 40.0% Voids
#2A	155.50'	5,326 cf	**ADS_StormTech MC-4500 +Cap** x 48 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 48 Chambers in 3 Rows Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
		8,902 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	156.00'	**12.0" Round Culvert** L= 43.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 156.00' / 154.00' S= 0.0465 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#3	Device 2	160.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	157.30'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	159.33'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.39 cfs @ 11.60 hrs HW=154.57' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.39 cfs)

Primary OutFlow Max=0.03 cfs @ 12.75 hrs HW=157.41' (Free Discharge)
└─**2=Culvert** (Passes 0.03 cfs of 2.85 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
  ├─**4=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.13 fps)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Pond INF#2: Inf#2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

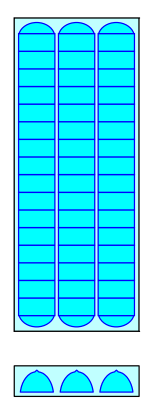
16 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 69.52' Row Length +12.0" End Stone x 2 = 71.52' Base Length
3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

48 Chambers x 106.5 cf + 35.7 cf of Cap Volume x 2 x 3 Rows = 5,325.7 cf Chamber Storage

14,267.6 cf of Field - 5,325.7 cf of Chambers = 8,941.8 cf of Stone x 40.0% Voids = 3,576.7 cf of Stone Storage

Chamber Storage + Stone Storage = 8,902.5 cf = 0.204 af
Overall Storage Efficiency = 62.4%
Overall System Size = 71.52' x 28.50' x 7.00'

48 Chambers
528.4 cy Field
331.2 cy Stone



Summary for Link POA-1: POA-1

Inflow Area = 0.733 ac, 15.87% Impervious, Inflow Depth = 0.33" for 10 yr event
Inflow = 0.11 cfs @ 12.35 hrs, Volume= 0.020 af
Primary = 0.11 cfs @ 12.35 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link POA-2: POA-2

Inflow Area = 3.291 ac, 53.10% Impervious, Inflow Depth = 0.01" for 10 yr event
Inflow = 0.03 cfs @ 12.75 hrs, Volume= 0.002 af
Primary = 0.03 cfs @ 12.75 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link POA-3: POA-3

Inflow Area = 0.703 ac, 7.54% Impervious, Inflow Depth = 0.07" for 10 yr event
Inflow = 0.01 cfs @ 15.30 hrs, Volume= 0.004 af
Primary = 0.01 cfs @ 15.30 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPWS-1A: PWS-1A Runoff Area=6,470 sf 0.00% Impervious Runoff Depth=0.04"
Flow Length=76' Tc=9.1 min CN=31 Runoff=0.00 cfs 0.000 af

SubcatchmentPWS-1B: PWS-1B Runoff Area=25,471 sf 19.90% Impervious Runoff Depth=0.74"
Flow Length=50' Slope=0.0390 '/' Tc=9.4 min CN=48 Runoff=0.28 cfs 0.036 af

SubcatchmentPWS-2A: PWS-2A Runoff Area=41,182 sf 1.46% Impervious Runoff Depth=0.08"
Flow Length=250' Tc=12.3 min CN=33 Runoff=0.01 cfs 0.007 af

SubcatchmentPWS-2B: PWS-2B Runoff Area=23,303 sf 73.43% Impervious Runoff Depth=3.44"
Tc=6.0 min CN=82 Runoff=2.15 cfs 0.153 af

SubcatchmentPWS-2C: PWS-2C Runoff Area=1.263 ac 66.19% Impervious Runoff Depth=3.05"
Flow Length=181' Tc=6.0 min CN=78 Runoff=4.53 cfs 0.321 af

SubcatchmentPWS-2D: PWS-2D Runoff Area=4,253 sf 55.96% Impervious Runoff Depth=2.51"
Tc=6.0 min CN=72 Runoff=0.29 cfs 0.020 af

SubcatchmentPWS-3: PWS-3 Runoff Area=30,626 sf 7.54% Impervious Runoff Depth=0.21"
Flow Length=168' Tc=7.0 min CN=37 Runoff=0.03 cfs 0.012 af

SubcatchmentPWS-BLDG: PWS-BLDG Runoff Area=19,615 sf 100.00% Impervious Runoff Depth=5.16"
Tc=6.0 min CN=98 Runoff=2.38 cfs 0.194 af

Pond Drain Basin: Basin Peak Elev=163.70' Storage=544 cf Inflow=0.29 cfs 0.029 af
Discarded=0.03 cfs 0.022 af Primary=0.09 cfs 0.007 af Outflow=0.12 cfs 0.029 af

Pond INF#1: Inf#1 Peak Elev=163.94' Storage=5,414 cf Inflow=4.53 cfs 0.321 af
Discarded=0.37 cfs 0.313 af Primary=0.11 cfs 0.009 af Outflow=0.48 cfs 0.321 af

Pond INF#2: Inf#2 Peak Elev=158.05' Storage=5,029 cf Inflow=4.53 cfs 0.347 af
Discarded=0.39 cfs 0.317 af Primary=0.32 cfs 0.030 af Outflow=0.71 cfs 0.347 af

Link POA-1: POA-1 Inflow=0.28 cfs 0.037 af
Primary=0.28 cfs 0.037 af

Link POA-2: POA-2 Inflow=0.34 cfs 0.043 af
Primary=0.34 cfs 0.043 af

Link POA-3: POA-3 Inflow=0.03 cfs 0.012 af
Primary=0.03 cfs 0.012 af

Total Runoff Area = 4.728 ac Runoff Volume = 0.744 af Average Runoff Depth = 1.89"
59.45% Pervious = 2.811 ac 40.55% Impervious = 1.917 ac

Summary for Subcatchment PWS-1A: PWS-1A

Runoff = 0.00 cfs @ 17.16 hrs, Volume= 0.000 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

	Area (sf)	CN	Description
	5,880	30	Woods, Good, HSG A
	590	39	>75% Grass cover, Good, HSG A
	6,470	31	Weighted Average
	6,470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow, 50** Woods: Light underbrush n= 0.400 P2= 3.20"
0.6	26	0.0200	0.71		**Shallow Concentrated Flow, 51' SCF WOODS** Woodland Kv= 5.0 fps
9.1	76	Total			

Summary for Subcatchment PWS-1B: PWS-1B

Runoff = 0.28 cfs @ 12.18 hrs, Volume= 0.036 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

	Area (sf)	CN	Description
	13,423	39	>75% Grass cover, Good, HSG A
*	5,070	98	Impervious
	6,978	30	Woods, Good, HSG A
	25,471	48	Weighted Average
	20,401		80.10% Pervious Area
	5,070		19.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0390	0.09		**Sheet Flow, 50 SF** Woods: Light underbrush n= 0.400 P2= 3.20"

Summary for Subcatchment PWS-2A: PWS-2A

Runoff = 0.01 cfs @ 15.32 hrs, Volume= 0.007 af, Depth= 0.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

	Area (sf)	CN	Description
	33,500	30	Woods, Good, HSG A
	7,082	39	>75% Grass cover, Good, HSG A
*	600	98	Impervious
	41,182	33	Weighted Average
	40,582		98.54% Pervious Area
	600		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, 50 sf woods 4%** Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	200	0.0500	1.12		**Shallow Concentrated Flow, 200' scf woods 5%** Woodland Kv= 5.0 fps
12.3	250	Total			

Summary for Subcatchment PWS-2B: PWS-2B

Runoff = 2.15 cfs @ 12.09 hrs, Volume= 0.153 af, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

	Area (sf)	CN	Description
*	17,112	98	DRIVEWAY
	6,191	39	>75% Grass cover, Good, HSG A
	23,303	82	Weighted Average
	6,191		26.57% Pervious Area
	17,112		73.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWS-2C: PWS-2C

Runoff = 4.53 cfs @ 12.09 hrs, Volume= 0.321 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

	Area (ac)	CN	Description
	0.015	30	Woods, Good, HSG A
*	0.836	98	IMPERVIOUS
	0.412	39	>75% Grass cover, Good, HSG A
	1.263	78	Weighted Average
	0.427		33.81% Pervious Area
	0.836		66.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		**Sheet Flow, 50' SF GRASS** Grass: Short n= 0.150 P2= 3.20"
0.1	5	0.0320	1.25		**Shallow Concentrated Flow, 5** Short Grass Pasture Kv= 7.0 fps
0.0	3	0.0320	3.63		**Shallow Concentrated Flow, 3' PAVED** Paved Kv= 20.3 fps
0.3	47	0.0300	2.60		**Shallow Concentrated Flow, GRASS SCF** Grassed Waterway Kv= 15.0 fps
0.1	44	0.2100	6.87		**Shallow Concentrated Flow, 44' SCF GRASS** Grassed Waterway Kv= 15.0 fps
0.1	32	0.0500	4.54		**Shallow Concentrated Flow, 32' SCF PAVE** Paved Kv= 20.3 fps
5.3	181	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PWS-2D: PWS-2D

Runoff = 0.29 cfs @ 12.09 hrs, Volume= 0.020 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

Area (sf)	CN	Description
2,380	98	Water Surface, HSG A
1,873	39	>75% Grass cover, Good, HSG A
4,253	72	Weighted Average
1,873		44.04% Pervious Area
2,380		55.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWS-3: PWS-3

Runoff = 0.03 cfs @ 12.50 hrs, Volume= 0.012 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

	Area (sf)	CN	Description
	5,203	39	>75% Grass cover, Good, HSG A
	23,113	30	Woods, Good, HSG A
*	2,310	98	DRIVEWAY
	30,626	37	Weighted Average
	28,316		92.46% Pervious Area
	2,310		7.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		**Sheet Flow, 50' sf woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.4	38	0.1000	1.58		**Shallow Concentrated Flow, 38' scf woods** Woodland Kv= 5.0 fps
0.2	43	0.0500	3.35		**Shallow Concentrated Flow, 43' scf** Grassed Waterway Kv= 15.0 fps
0.2	37	0.2500	2.50		**Shallow Concentrated Flow, 37' scf woods** Woodland Kv= 5.0 fps
7.0	168	Total			

Summary for Subcatchment PWS-BLDG: PWS-BLDG

Runoff = 2.38 cfs @ 12.08 hrs, Volume= 0.194 af, Depth= 5.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=5.40"

	Area (sf)	CN	Description
*	19,615	98	BLDG
	19,615		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond Drain Basin: Basin

[79] Warning: Submerged Pond INF#1 Primary device # 2 INLET by 0.05'

Inflow Area = 1.361 ac, 65.46% Impervious, Inflow Depth = 0.26" for 25 yr event
Inflow = 0.29 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.12 cfs @ 13.19 hrs, Volume= 0.029 af, Atten= 58%, Lag= 66.2 min
Discarded = 0.03 cfs @ 13.19 hrs, Volume= 0.022 af
Primary = 0.09 cfs @ 13.19 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 163.70' @ 13.19 hrs Surf.Area= 517 sf Storage= 544 cf

Plug-Flow detention time= 178.3 min calculated for 0.029 af (100% of inflow)
Center-of-Mass det. time= 178.3 min (1,001.4 - 823.1)

Volume	Invert	Avail.Storage	Storage Description
#1	161.50'	2,610 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.50	54	0	0
162.00	108	41	41
163.00	313	211	251
164.00	603	458	709
165.00	934	769	1,478
166.00	1,330	1,132	2,610

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.50'	**6.0" Round Culvert** L= 37.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.50' / 162.00' S= 0.0405 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Primary	165.50'	**12.0" Round Culvert** L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.50' / 164.50' S= 0.0769 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.03 cfs @ 13.19 hrs HW=163.70' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.09 cfs @ 13.19 hrs HW=163.70' (Free Discharge)
2=Culvert (Inlet Controls 0.09 cfs @ 1.22 fps)
3=Culvert (Controls 0.00 cfs)

Summary for Pond INF#1: Inf#1

Inflow Area = 1.263 ac, 66.19% Impervious, Inflow Depth = 3.05" for 25 yr event
Inflow = 4.53 cfs @ 12.09 hrs, Volume= 0.321 af
Outflow = 0.48 cfs @ 12.93 hrs, Volume= 0.321 af, Atten= 89%, Lag= 50.2 min
Discarded = 0.37 cfs @ 11.59 hrs, Volume= 0.313 af
Primary = 0.11 cfs @ 12.93 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 163.94' @ 12.93 hrs Surf.Area= 1,931 sf Storage= 5,414 cf

Plug-Flow detention time= 121.4 min calculated for 0.321 af (100% of inflow)
Center-of-Mass det. time= 121.4 min (945.1 - 823.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.90'	3,420 cf	**37.58'W x 51.39'L x 7.00'H Field A** 13,520 cf Overall - 4,971 cf Embedded = 8,549 cf x 40.0% Voids
#2A	160.90'	4,971 cf	**ADS_StormTech MC-4500 +Cap** x 44 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 44 Chambers in 4 Rows Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		8,391 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	159.90'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	163.65'	**4.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.65' / 163.40' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf

Discarded OutFlow Max=0.37 cfs @ 11.59 hrs HW=159.97' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.37 cfs)

Primary OutFlow Max=0.11 cfs @ 12.93 hrs HW=163.94' (Free Discharge)
2=Culvert (Inlet Controls 0.11 cfs @ 1.44 fps)

Pond INF#1: Inf#1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

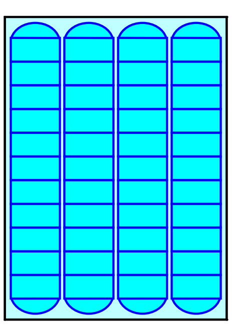
11 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 49.39' Row Length +12.0" End Stone x 2 = 51.39' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

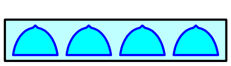
44 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 4 Rows = 4,971.2 cf Chamber Storage

13,520.3 cf of Field - 4,971.2 cf of Chambers = 8,549.1 cf of Stone x 40.0% Voids = 3,419.6 cf of Stone Storage

Chamber Storage + Stone Storage = 8,390.8 cf = 0.193 af
Overall Storage Efficiency = 62.1%
Overall System Size = 51.39' x 37.58' x 7.00'

44 Chambers
500.8 cy Field
316.6 cy Stone





Summary for Pond INF#2: Inf#2

Inflow Area = 0.985 ac, 85.57% Impervious, Inflow Depth = 4.23" for 25 yr event
Inflow = 4.53 cfs @ 12.09 hrs, Volume= 0.347 af
Outflow = 0.71 cfs @ 12.57 hrs, Volume= 0.347 af, Atten= 84%, Lag= 29.0 min
Discarded = 0.39 cfs @ 11.41 hrs, Volume= 0.317 af
Primary = 0.32 cfs @ 12.57 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 158.05' @ 12.57 hrs Surf.Area= 2,038 sf Storage= 5,029 cf

Plug-Flow detention time= 75.5 min calculated for 0.347 af (100% of inflow)
Center-of-Mass det. time= 75.5 min (851.6 - 776.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	154.50'	3,577 cf	**28.50'W x 71.52'L x 7.00'H Field A** 14,268 cf Overall - 5,326 cf Embedded = 8,942 cf x 40.0% Voids
#2A	155.50'	5,326 cf	**ADS_StormTech MC-4500 +Cap** x 48 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 48 Chambers in 3 Rows Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
		8,902 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	156.00'	**12.0" Round Culvert** L= 43.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 156.00' / 154.00' S= 0.0465 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#3	Device 2	160.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	157.30'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	159.33'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.39 cfs @ 11.41 hrs HW=154.57' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.39 cfs)

Primary OutFlow Max=0.32 cfs @ 12.57 hrs HW=158.05' (Free Discharge)
2=Culvert (Passes 0.32 cfs of 3.72 cfs potential flow)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
4=Orifice/Grate (Orifice Controls 0.32 cfs @ 3.69 fps)
5=Orifice/Grate (Controls 0.00 cfs)

Pond INF#2: Inf#2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

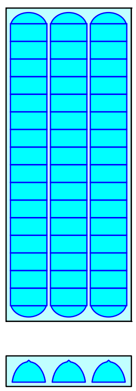
16 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 69.52' Row Length +12.0" End Stone x 2 = 71.52' Base Length
3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

48 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 3 Rows = 5,325.7 cf Chamber Storage

14,267.6 cf Field - 5,325.7 cf Chambers = 8,941.8 cf Stone x 40.0% Voids = 3,576.7 cf Stone Storage

Chamber Storage + Stone Storage = 8,902.5 cf = 0.204 af
Overall Storage Efficiency = 62.4%
Overall System Size = 71.52' x 28.50' x 7.00'

48 Chambers
528.4 cy Field
331.2 cy Stone



Summary for Link POA-1: POA-1

Inflow Area = 0.733 ac, 15.87% Impervious, Inflow Depth = 0.60" for 25 yr event
Inflow = 0.28 cfs @ 12.18 hrs, Volume= 0.037 af
Primary = 0.28 cfs @ 12.18 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link POA-2: POA-2

Inflow Area = 3.291 ac, 53.10% Impervious, Inflow Depth = 0.16" for 25 yr event
Inflow = 0.34 cfs @ 13.00 hrs, Volume= 0.043 af
Primary = 0.34 cfs @ 13.00 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link POA-3: POA-3

Inflow Area = 0.703 ac, 7.54% Impervious, Inflow Depth = 0.21" for 25 yr event
Inflow = 0.03 cfs @ 12.50 hrs, Volume= 0.012 af
Primary = 0.03 cfs @ 12.50 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPWS-1A: PWS-1A Runoff Area=6,470 sf 0.00% Impervious Runoff Depth=0.26"
Flow Length=76' Tc=9.1 min CN=31 Runoff=0.01 cfs 0.003 af

SubcatchmentPWS-1B: PWS-1B Runoff Area=25,471 sf 19.90% Impervious Runoff Depth=1.49"
Flow Length=50' Slope=0.0390 '/' Tc=9.4 min CN=48 Runoff=0.75 cfs 0.073 af

SubcatchmentPWS-2A: PWS-2A Runoff Area=41,182 sf 1.46% Impervious Runoff Depth=0.37"
Flow Length=250' Tc=12.3 min CN=33 Runoff=0.09 cfs 0.029 af

SubcatchmentPWS-2B: PWS-2B Runoff Area=23,303 sf 73.43% Impervious Runoff Depth=4.92"
Tc=6.0 min CN=82 Runoff=3.04 cfs 0.219 af

SubcatchmentPWS-2C: PWS-2C Runoff Area=1.263 ac 66.19% Impervious Runoff Depth=4.47"
Flow Length=181' Tc=6.0 min CN=78 Runoff=6.59 cfs 0.471 af

SubcatchmentPWS-2D: PWS-2D Runoff Area=4,253 sf 55.96% Impervious Runoff Depth=3.83"
Tc=6.0 min CN=72 Runoff=0.44 cfs 0.031 af

SubcatchmentPWS-3: PWS-3 Runoff Area=30,626 sf 7.54% Impervious Runoff Depth=0.63"
Flow Length=168' Tc=7.0 min CN=37 Runoff=0.20 cfs 0.037 af

SubcatchmentPWS-BLDG: PWS-BLDG Runoff Area=19,615 sf 100.00% Impervious Runoff Depth=6.76"
Tc=6.0 min CN=98 Runoff=3.09 cfs 0.254 af

Pond Drain Basin: Basin Peak Elev=164.15' Storage=800 cf Inflow=0.56 cfs 0.123 af
Discarded=0.04 cfs 0.028 af Primary=0.47 cfs 0.095 af Outflow=0.51 cfs 0.123 af

Pond INF#1: Inf#1 Peak Elev=166.38' Storage=7,986 cf Inflow=6.59 cfs 0.471 af
Discarded=0.37 cfs 0.379 af Primary=0.47 cfs 0.092 af Outflow=0.84 cfs 0.471 af

Pond INF#2: Inf#2 Peak Elev=159.49' Storage=7,059 cf Inflow=6.13 cfs 0.473 af
Discarded=0.39 cfs 0.379 af Primary=0.67 cfs 0.094 af Outflow=1.06 cfs 0.473 af

Link POA-1: POA-1 Inflow=0.75 cfs 0.076 af
Primary=0.75 cfs 0.076 af

Link POA-2: POA-2 Inflow=1.19 cfs 0.218 af
Primary=1.19 cfs 0.218 af

Link POA-3: POA-3 Inflow=0.20 cfs 0.037 af
Primary=0.20 cfs 0.037 af

Total Runoff Area = 4.728 ac Runoff Volume = 1.117 af Average Runoff Depth = 2.83"
59.45% Pervious = 2.811 ac 40.55% Impervious = 1.917 ac

Summary for Subcatchment PWS-1A: PWS-1A

Runoff = 0.01 cfs @ 12.54 hrs, Volume= 0.003 af, Depth= 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

	Area (sf)	CN	Description
	5,880	30	Woods, Good, HSG A
	590	39	>75% Grass cover, Good, HSG A
	6,470	31	Weighted Average
	6,470		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0500	0.10		**Sheet Flow, 50** Woods: Light underbrush n= 0.400 P2= 3.20"
0.6	26	0.0200	0.71		**Shallow Concentrated Flow, 51' SCF WOODS** Woodland Kv= 5.0 fps
9.1	76	Total			

Summary for Subcatchment PWS-1B: PWS-1B

Runoff = 0.75 cfs @ 12.15 hrs, Volume= 0.073 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

	Area (sf)	CN	Description
	13,423	39	>75% Grass cover, Good, HSG A
*	5,070	98	Impervious
	6,978	30	Woods, Good, HSG A
	25,471	48	Weighted Average
	20,401		80.10% Pervious Area
	5,070		19.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	50	0.0390	0.09		**Sheet Flow, 50 SF** Woods: Light underbrush n= 0.400 P2= 3.20"

Summary for Subcatchment PWS-2A: PWS-2A

Runoff = 0.09 cfs @ 12.51 hrs, Volume= 0.029 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

	Area (sf)	CN	Description
	33,500	30	Woods, Good, HSG A
	7,082	39	>75% Grass cover, Good, HSG A
*	600	98	Impervious
	41,182	33	Weighted Average
	40,582		98.54% Pervious Area
	600		1.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow, 50 sf woods 4%** Woods: Light underbrush n= 0.400 P2= 3.20"
3.0	200	0.0500	1.12		**Shallow Concentrated Flow, 200' scf woods 5%** Woodland Kv= 5.0 fps
12.3	250	Total			

Summary for Subcatchment PWS-2B: PWS-2B

Runoff = 3.04 cfs @ 12.09 hrs, Volume= 0.219 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

	Area (sf)	CN	Description
*	17,112	98	DRIVEWAY
	6,191	39	>75% Grass cover, Good, HSG A
	23,303	82	Weighted Average
	6,191		26.57% Pervious Area
	17,112		73.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWS-2C: PWS-2C

Runoff = 6.59 cfs @ 12.09 hrs, Volume= 0.471 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

	Area (ac)	CN	Description
	0.015	30	Woods, Good, HSG A
*	0.836	98	IMPERVIOUS
	0.412	39	>75% Grass cover, Good, HSG A
	1.263	78	Weighted Average
	0.427		33.81% Pervious Area
	0.836		66.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	50	0.0320	0.18		**Sheet Flow, 50' SF GRASS** Grass: Short n= 0.150 P2= 3.20"
0.1	5	0.0320	1.25		**Shallow Concentrated Flow, 5** Short Grass Pasture Kv= 7.0 fps
0.0	3	0.0320	3.63		**Shallow Concentrated Flow, 3' PAVED** Paved Kv= 20.3 fps
0.3	47	0.0300	2.60		**Shallow Concentrated Flow, GRASS SCF** Grassed Waterway Kv= 15.0 fps
0.1	44	0.2100	6.87		**Shallow Concentrated Flow, 44' SCF GRASS** Grassed Waterway Kv= 15.0 fps
0.1	32	0.0500	4.54		**Shallow Concentrated Flow, 32' SCF PAVE** Paved Kv= 20.3 fps
5.3	181	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment PWS-2D: PWS-2D

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

Area (sf)	CN	Description
2,380	98	Water Surface, HSG A
1,873	39	>75% Grass cover, Good, HSG A
4,253	72	Weighted Average
1,873		44.04% Pervious Area
2,380		55.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWS-3: PWS-3

Runoff = 0.20 cfs @ 12.31 hrs, Volume= 0.037 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

	Area (sf)	CN	Description
	5,203	39	>75% Grass cover, Good, HSG A
	23,113	30	Woods, Good, HSG A
*	2,310	98	DRIVEWAY
	30,626	37	Weighted Average
	28,316		92.46% Pervious Area
	2,310		7.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1100	0.13		**Sheet Flow, 50' sf woods** Woods: Light underbrush n= 0.400 P2= 3.20"
0.4	38	0.1000	1.58		**Shallow Concentrated Flow, 38' scf woods** Woodland Kv= 5.0 fps
0.2	43	0.0500	3.35		**Shallow Concentrated Flow, 43' scf** Grassed Waterway Kv= 15.0 fps
0.2	37	0.2500	2.50		**Shallow Concentrated Flow, 37' scf woods** Woodland Kv= 5.0 fps
7.0	168	Total			

Summary for Subcatchment PWS-BLDG: PWS-BLDG

Runoff = 3.09 cfs @ 12.08 hrs, Volume= 0.254 af, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 yr Rainfall=7.00"

	Area (sf)	CN	Description
*	19,615	98	BLDG
	19,615		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond Drain Basin: Basin

[79] Warning: Submerged Pond INF#1 Primary device # 2 INLET by 0.50'

Inflow Area = 1.361 ac, 65.46% Impervious, Inflow Depth = 1.09" for 100 yr event
Inflow = 0.56 cfs @ 12.46 hrs, Volume= 0.123 af
Outflow = 0.51 cfs @ 12.94 hrs, Volume= 0.123 af, Atten= 9%, Lag= 29.1 min
Discarded = 0.04 cfs @ 12.94 hrs, Volume= 0.028 af
Primary = 0.47 cfs @ 12.94 hrs, Volume= 0.095 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 164.15' @ 12.94 hrs Surf.Area= 651 sf Storage= 800 cf

Plug-Flow detention time= 60.8 min calculated for 0.123 af (100% of inflow)
Center-of-Mass det. time= 60.8 min (879.9 - 819.1)

Volume	Invert	Avail.Storage	Storage Description
#1	161.50'	2,610 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.50	54	0	0
162.00	108	41	41
163.00	313	211	251
164.00	603	458	709
165.00	934	769	1,478
166.00	1,330	1,132	2,610

Device	Routing	Invert	Outlet Devices
#1	Discarded	161.50'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	163.50'	**6.0" Round Culvert** L= 37.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.50' / 162.00' S= 0.0405 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#3	Primary	165.50'	**12.0" Round Culvert** L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 165.50' / 164.50' S= 0.0769 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.04 cfs @ 12.94 hrs HW=164.15' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.47 cfs @ 12.94 hrs HW=164.15' (Free Discharge)
├─**2=Culvert** (Inlet Controls 0.47 cfs @ 2.39 fps)
└─**3=Culvert** (Controls 0.00 cfs)

Summary for Pond INF#1: Inf#1

Inflow Area = 1.263 ac, 66.19% Impervious, Inflow Depth = 4.47" for 100 yr event
Inflow = 6.59 cfs @ 12.09 hrs, Volume= 0.471 af
Outflow = 0.84 cfs @ 12.69 hrs, Volume= 0.471 af, Atten= 87%, Lag= 36.4 min
Discarded = 0.37 cfs @ 11.22 hrs, Volume= 0.379 af
Primary = 0.47 cfs @ 12.69 hrs, Volume= 0.092 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 166.38' @ 12.69 hrs Surf.Area= 1,931 sf Storage= 7,986 cf

Plug-Flow detention time= 124.4 min calculated for 0.471 af (100% of inflow)
Center-of-Mass det. time= 124.4 min (937.2 - 812.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.90'	3,420 cf	**37.58'W x 51.39'L x 7.00'H Field A** 13,520 cf Overall - 4,971 cf Embedded = 8,549 cf x 40.0% Voids
#2A	160.90'	4,971 cf	**ADS_StormTech MC-4500 +Cap** x 44 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 44 Chambers in 4 Rows Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf
		8,391 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	159.90'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	163.65'	**4.0" Round Culvert** L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 163.65' / 163.40' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf

Discarded OutFlow Max=0.37 cfs @ 11.22 hrs HW=159.97' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Primary OutFlow Max=0.47 cfs @ 12.69 hrs HW=166.38' (Free Discharge)
└─**2=Culvert** (Barrel Controls 0.47 cfs @ 5.36 fps)

Pond INF#1: Inf#1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 4 rows = 285.6 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

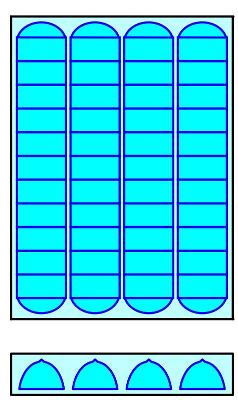
11 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 49.39' Row Length +12.0" End Stone x 2 = 51.39' Base Length
4 Rows x 100.0" Wide + 9.0" Spacing x 3 + 12.0" Side Stone x 2 = 37.58' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

44 Chambers x 106.5 cf + 35.7 cf of Cap Volume x 2 x 4 Rows = 4,971.2 cf Chamber Storage

13,520.3 cf of Field - 4,971.2 cf of Chambers = 8,549.1 cf of Stone x 40.0% Voids = 3,419.6 cf Stone Storage

Chamber Storage + Stone Storage = 8,390.8 cf = 0.193 af
Overall Storage Efficiency = 62.1%
Overall System Size = 51.39' x 37.58' x 7.00'

44 Chambers
500.8 cy Field
316.6 cy Stone



Summary for Pond INF#2: Inf#2

Inflow Area = 0.985 ac, 85.57% Impervious, Inflow Depth = 5.76" for 100 yr event
Inflow = 6.13 cfs @ 12.08 hrs, Volume= 0.473 af
Outflow = 1.06 cfs @ 12.54 hrs, Volume= 0.473 af, Atten= 83%, Lag= 27.6 min
Discarded = 0.39 cfs @ 11.09 hrs, Volume= 0.379 af
Primary = 0.67 cfs @ 12.54 hrs, Volume= 0.094 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 159.49' @ 12.54 hrs Surf.Area= 2,038 sf Storage= 7,059 cf

Plug-Flow detention time= 80.0 min calculated for 0.473 af (100% of inflow)
Center-of-Mass det. time= 80.0 min (850.8 - 770.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	154.50'	3,577 cf	**28.50'W x 71.52'L x 7.00'H Field A** 14,268 cf Overall - 5,326 cf Embedded = 8,942 cf x 40.0% Voids
#2A	155.50'	5,326 cf	**ADS_StormTech MC-4500 +Cap** x 48 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 48 Chambers in 3 Rows Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
		8,902 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	154.50'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	156.00'	**12.0" Round Culvert** L= 43.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 156.00' / 154.00' S= 0.0465 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#3	Device 2	160.50'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 2	157.30'	**4.0" Vert. Orifice/Grate** C= 0.600
#5	Device 2	159.33'	**5.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.39 cfs @ 11.09 hrs HW=154.57' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.39 cfs)

Primary OutFlow Max=0.67 cfs @ 12.54 hrs HW=159.49' (Free Discharge)
└─**2=Culvert** (Passes 0.67 cfs of 5.17 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)
  ├─**4=Orifice/Grate** (Orifice Controls 0.60 cfs @ 6.86 fps)
  └─**5=Orifice/Grate** (Orifice Controls 0.07 cfs @ 1.38 fps)

Pond INF#2: Inf#2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-4500 +Cap (ADS StormTech®MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

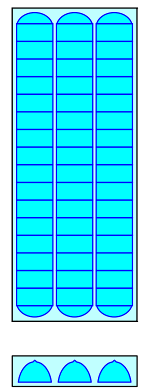
16 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 69.52' Row Length +12.0" End Stone x 2 = 71.52' Base Length
3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

48 Chambers x 106.5 cf + 35.7 cf of Cap Volume x 2 x 3 Rows = 5,325.7 cf Chamber Storage

14,267.6 cf of Field - 5,325.7 cf of Chambers = 8,941.8 cf Stone x 40.0% Voids = 3,576.7 cf Stone Storage

Chamber Storage + Stone Storage = 8,902.5 cf = 0.204 af
Overall Storage Efficiency = 62.4%
Overall System Size = 71.52' x 28.50' x 7.00'

48 Chambers
528.4 cy Field
331.2 cy Stone



Summary for Link POA-1: POA-1

Inflow Area = 0.733 ac, 15.87% Impervious, Inflow Depth = 1.24" for 100 yr event
Inflow = 0.75 cfs @ 12.15 hrs, Volume= 0.076 af
Primary = 0.75 cfs @ 12.15 hrs, Volume= 0.076 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link POA-2: POA-2

Inflow Area = 3.291 ac, 53.10% Impervious, Inflow Depth = 0.79" for 100 yr event
Inflow = 1.19 cfs @ 12.56 hrs, Volume= 0.218 af
Primary = 1.19 cfs @ 12.56 hrs, Volume= 0.218 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Link POA-3: POA-3

Inflow Area = 0.703 ac, 7.54% Impervious, Inflow Depth = 0.63" for 100 yr event
Inflow = 0.20 cfs @ 12.31 hrs, Volume= 0.037 af
Primary = 0.20 cfs @ 12.31 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

APPENDIX 3:
SOIL REPORT

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for
Middlesex County, Massachusetts

February 7, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:2,720 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 40, 80, 160, 240

Feet: 0, 100, 200, 400, 600

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 22, Sep 9, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	1.4	5.0%
52A	Freetown muck, 0 to 1 percent slopes	2.2	7.8%
106C	Narragansett-Hollis-Rock outcrop complex, 3 to 15 percent slopes	3.1	10.7%
106D	Narragansett-Hollis-Rock outcrop complex, 15 to 25 percent slopes	0.3	1.2%
251B	Haven silt loam, 3 to 8 percent slopes	0.2	0.6%
253E	Hinckley loamy sand, 25 to 35 percent slopes	6.1	21.1%
416C	Narragansett silt loam, 8 to 15 percent slopes, very stony	13.3	46.3%
653	Udorthents, sandy	2.1	7.3%
Totals for Area of Interest		**28.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Middlesex County, Massachusetts

1—Water

Map Unit Setting

National map unit symbol: 996p
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Setting

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

52A—Freetown muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2t2q9
Elevation: 0 to 1,110 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Freetown and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Freetown

Setting

Landform: Depressions, depressions, swamps, kettles, marshes, bogs
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material

Typical profile

Oe - 0 to 2 inches: mucky peat
Oa - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Minor Components

Whitman

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Swansea

Percent of map unit: 5 percent
Landform: Bogs, swamps, marshes, depressions, depressions, kettles
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

106C—Narragansett-Hollis-Rock outcrop complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 98yk
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 110 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Narragansett and similar soils: 45 percent
Hollis and similar soils: 20 percent
Rock outcrop: 10 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Narragansett

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable silty eolian deposits and/or friable loamy eolian deposits over loose sandy glaciofluvial deposits derived from metamorphic rock and/or friable sandy basal till derived from metamorphic rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: silt loam
Bw - 7 to 35 inches: silt loam
2C1 - 35 to 60 inches: very gravelly loamy sand
2C2 - 60 to 65 inches: very gravelly loamy sand

Properties and qualities

Slope: 3 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 18 to 35 inches to strongly contrasting textural stratification
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Head slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till over granite and gneiss

Typical profile

H1 - 0 to 2 inches: fine sandy loam
H2 - 2 to 14 inches: fine sandy loam
H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 8 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Ledges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Granite and gneiss

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Minor Components

Canton

Percent of map unit: 9 percent
Landform: Hills
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Charlton

Percent of map unit: 6 percent
Landform: Hills, swales
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Unnamed

Percent of map unit: 5 percent

Scituate

Percent of map unit: 5 percent
Landform: Depressions, hillslopes
Landform position (two-dimensional): Summit, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

106D—Narragansett-Hollis-Rock outcrop complex, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 98yl
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 110 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Narragansett and similar soils: 45 percent
Hollis and similar soils: 20 percent

Rock outcrop: 10 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Narragansett

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable silty eolian deposits and/or friable loamy eolian deposits over loose sandy glaciofluvial deposits derived from metamorphic rock and/or friable sandy basal till derived from metamorphic rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: silt loam
Bw - 7 to 35 inches: silt loam
2C1 - 35 to 60 inches: very gravelly loamy sand
2C2 - 60 to 65 inches: very gravelly loamy sand

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 18 to 35 inches to strongly contrasting textural stratification
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Head slope, crest
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till over granite and gneiss

Typical profile

H1 - 0 to 2 inches: fine sandy loam
H2 - 2 to 14 inches: fine sandy loam
H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 8 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Ledges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Granite and gneiss

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Minor Components

Unnamed

Percent of map unit: 9 percent

Canton

Percent of map unit: 8 percent
Landform: Hills
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Charlton

Percent of map unit: 8 percent
Landform: Hills, swales
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Convex

Across-slope shape: Convex
Hydric soil rating: No

251B—Haven silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 990d
Elevation: 30 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Haven and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Haven

Setting

Landform: Terraces, plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over loose sandy glaciofluvial deposits

Typical profile

H1 - 0 to 2 inches: silt loam
H2 - 2 to 20 inches: silt loam
H3 - 20 to 32 inches: very fine sandy loam
H4 - 32 to 65 inches: stratified coarse sand to sand to fine sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F144AY023CT - Well Drained Outwash
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 9 percent
Landform: Terraces, plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread, rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Scio

Percent of map unit: 5 percent
Landform: Depressions, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

253E—Hinckley loamy sand, 25 to 35 percent slopes

Map Unit Setting

National map unit symbol: 2svmf
Elevation: 0 to 1,200 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash terraces, moraines, eskers, kames, outwash plains, kame terraces, outwash deltas

Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 10 percent
Landform: Moraines, eskers, kames, outwash deltas, outwash terraces, outwash plains, kame terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Merrimac

Percent of map unit: 3 percent
Landform: Kame terraces, outwash terraces, kames, outwash plains, moraines, eskers
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear

Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 2 percent
Landform: Outwash deltas, moraines, outwash plains, kame terraces, outwash terraces
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

416C—Narragansett silt loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 9941
Elevation: 0 to 1,000 feet
Mean annual precipitation: 45 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Narragansett and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Narragansett

Setting

Landform: Ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable silty eolian deposits and/or friable loamy eolian deposits over loose sandy glaciofluvial deposits derived from metamorphic rock and/or friable sandy basal till derived from metamorphic rock

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: silt loam
Bw - 7 to 35 inches: silt loam
2C1 - 35 to 60 inches: very gravelly loamy sand
2C2 - 60 to 65 inches: very gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 18 to 35 inches to strongly contrasting textural stratification
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Charlton

Percent of map unit: 10 percent
Landform: Ground moraines, drumlins
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Canton

Percent of map unit: 7 percent
Landform: Hills
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Side slope, base slope
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Scituate

Percent of map unit: 3 percent
Landform: Hillslopes, depressions
Landform position (two-dimensional): Summit, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

653—Udorthents, sandy

Map Unit Setting

National map unit symbol: vr1k
Elevation: 0 to 3,000 feet

Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, sandy, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Sandy

Setting

Parent material: Loamy alluvium and/or sandy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy marine deposits and/or loamy basal till and/or loamy lodgment till

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Udorthents, loamy

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 5 percent

Urban land

Percent of map unit: 5 percent
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear

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Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Good Shepherd Parish
Owner Name

124 Cochituate Road — Street Address
34/005 — Map/Lot #

Wayland — City
MA — State
01778 — Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey: NRCS Web Soil Survey (Source); 416C (Soil Map Unit); Narragansett Sil Loam (Soil Series)

   Ground Moraine (Landform); N/A (Soil Limitations)

   Friable silty eolian deposits and/or friable loamy eolian deposits over loose sandy glaciofluvial deposits derived from metamorphic rock and/or friable sandy basal till derived from metamorphic rock

3. Surficial Geological Report: 2018 Stone and Stone (Year Published/Source); Thin till (Map Unit)

   Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered pebble, cobble, and boulder clasts.
   Description of Geologic Map Unit:

4. Flood Rate Insurance Map — Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No — If yes, MassGIS Wetland Data Layer: NA (Wetland Type)

7. Current Water Resource Conditions (USGS): 2/22/23 (Month/Day/ Year) — Range: ☐ Above Normal ☒ Normal ☐ Below Normal

8. Other references reviewed: Not in Zone II
   (Zone II, IWPA, Zone A, EEA Data Portal, etc.)

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP#1 (Hole #) | 02-23-23 (Date) | 8:00am (Time) | Rain/ snow (Weather) | 42.35117 (Latitude) | -71.35710 (Longitude)

1. Land Use: Parking Lot (e.g., woodland, agricultural field, vacant lot, etc.) | None (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 2-5% (Slope (%))

Description of Location: Rectory Parking Lot

2. Soil Parent Material: Friable sandy basal till | Drumlin (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body 100'+ feet | Drainage Way 100'+ feet | Wetlands 100'+ feet
   Property Line 10'+ feet | Drinking Water Well 100'+ feet | Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth to Weeping in Hole ______ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-15	Fill				Cnc : Dpl:						
15-28	Bw	Loamy Sand	10YR 5/6		Cnc : Dpl:		5%	2%	Massive	Friable	
28-120	C1	Loamy Sand	2.5Y 5/4		Cnc : Dpl:		5%	5%	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
NRCS Soil Classification A; ESHGW = 167.80

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP#2 (Hole #) 2-23-23 (Date) 9:00am (Time) Rain/ snow (Weather) 42.35117 (Latitude) -71.35710 (Longitude)

1. Land Use: Parking Lot (e.g., woodland, agricultural field, vacant lot, etc.) None (Vegetation) NA (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 2-5% (Slope (%))

   Description of Location: Rectory Parking Lot

2. Soil Parent Material: Friable sandy basal till Drumlin (Landform) SH (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body 100'+ feet Drainage Way 100'+ feet Wetlands 100'+ feet

   Property Line 10'+ feet Drinking Water Well 100'+ feet Other ______ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth to Weeping in Hole ______ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-24	Fill				Cnc : Dpl:						
24-48	C1	Fine Sand	2.5Y 5/4		Cnc : Dpl:				Massive	Friable	
48-156	C2	Sand	10YR 5/4		Cnc : Dpl:		10%	5%	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
NRCS Soil Classification A; ESHGW = 164.00

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used (Choose one):

	Obs. Hole # TP#1	Obs. Hole # TP#2
☐ Depth to soil redoximorphic features	_____ inches	_____ inches
☒ Depth to observed standing water in observation hole	>120 inches	>156 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

Index Well Number ____________ Reading Date ____________

$S_h = S_c - [S_r \times (OW_c - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: Varies inches Lower boundary: Varies inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

David Scharlacken	02/23/23
Signature of Soil Evaluator	Date
David Scharlacken / SE14279	12/01/24
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
Darren MacCaughey	Wayland Board of Health
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams:
Use this area for field diagrams:

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Good Shepherd Parish
Owner Name

124 Cochituate Road — Street Address
34/005 — Map/Lot #

Wayland — City
MA — State
01778 — Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey: NRCS Web Soil Survey (Source) — 416C (Soil Map Unit) — Narragansett Sil Loam (Soil Series)

   Ground Moraine (Landform) — N/A (Soil Limitations)

   Friable silty eolian deposits and/or friable loamy eolian deposits over loose sandy glaciofluvial deposits derived from metamorphic rock and/or friable sandy basal till derived from metamorphic rock

3. Surficial Geological Report: 2018 Stone and Stone (Year Published/Source) — Thin till (Map Unit)

   Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered pebble, cobble, and boulder clasts.
   Description of Geologic Map Unit:

4. Flood Rate Insurance Map — Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No — If yes, MassGIS Wetland Data Layer: NA (Wetland Type)

7. Current Water Resource Conditions (USGS): 2/22/23 (Month/Day/ Year) — Range: ☐ Above Normal ☒ Normal ☐ Below Normal

8. Other references reviewed: Not in Zone II
   (Zone II, IWPA, Zone A, EEA Data Portal, etc.)

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP#3 (Hole #) | 02-23-23 (Date) | 10:00pm (Time) | Rain/ snow (Weather) | 42.35117 (Latitude) | -71.35710 (Longitude)

1. Land Use: Parking Lot (e.g., woodland, agricultural field, vacant lot, etc.) | None (Vegetation) | N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 2-5% (Slope (%))

Description of Location: Proposed Septic System

2. Soil Parent Material: Friable sandy basal till | Drumlin (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body 100'+ feet | Drainage Way 100'+ feet | Wetlands 100'+ feet
   Property Line 10'+ feet | Drinking Water Well 100'+ feet | Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth to Weeping in Hole ______ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-16	Fill				Cnc : Dpl:						
16-84	C1	Fine Sand	2.5Y 5/4		Cnc : Dpl:				Massive	Friable	
84-126	C2	Loamy Sand	10YR 5/4		Cnc : Dpl:		10%	5%	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
NRCS Soil Classification A; ESHGW = 165.00

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP#4 (Hole #) | 2-23-23 (Date) | 11:00am (Time) | Rain/ snow (Weather) | 42.35117 (Latitude) | -71.35710 (Longitude)

1. Land Use: Woods (e.g., woodland, agricultural field, vacant lot, etc.) | None (Vegetation) | NA (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 2-5% (Slope (%))

   Description of Location: Proposed Infiltration System

2. Soil Parent Material: Friable sandy basal till | Drumlin (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body 100'+ feet | Drainage Way 100'+ feet | Wetlands 100'+ feet
   Property Line 10'+ feet | Drinking Water Well 100'+ feet | Other ______ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth to Weeping in Hole ______ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-36	Fill				Cnc : Dpl:						
36-84	C1	Fine Sand	2.5Y 5/4		Cnc : Dpl:				Massive	Friable	
84-120	C2	Sand	10YR 5/4		Cnc : Dpl:		5%	2%	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
NRCS Soil Classification A; ESHGW = 164.50

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used (Choose one):

	Obs. Hole # TP#3	Obs. Hole # TP#4
☐ Depth to soil redoximorphic features	_____ inches	_____ inches
☒ Depth to observed standing water in observation hole	>126 inches	>120 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

_____________________ Index Well Number

_____________________ Reading Date

$S_h = S_c - [S_r \times (OW_c - OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

   a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

   ☒ Yes ☐ No

   b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: Varies inches Lower boundary: Varies inches

   c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

David Scharlacken	02/23/23
Signature of Soil Evaluator	Date
David Scharlacken / SE14279	12/01/24
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
Darren MacCaughey	Wayland Board of Health
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Good Shepherd Parish
Owner Name

124 Cochituate Road — Street Address
34/005 — Map/Lot #

Wayland — City
MA — State
01778 — Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade

2. Soil Survey: NRCS Web Soil Survey (Source); 416C (Soil Map Unit); Narragansett Sil Loam (Soil Series)

   Ground Moraine (Landform); N/A (Soil Limitations)

   Friable silty eolian deposits and/or friable loamy eolian deposits over loose sandy glaciofluvial deposits derived from metamorphic rock and/or friable sandy basal till derived from metamorphic rock

3. Surficial Geological Report: 2018 Stone and Stone (Year Published/Source); Thin till (Map Unit)

   Nonsorted, nonstratified matrix of sand, some silt, and little clay containing scattered pebble, cobble, and boulder clasts.
   Description of Geologic Map Unit:

4. Flood Rate Insurance Map — Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No — If yes, MassGIS Wetland Data Layer: NA (Wetland Type)

7. Current Water Resource Conditions (USGS): 2/22/23 (Month/Day/ Year) — Range: ☐ Above Normal ☒ Normal ☐ Below Normal

8. Other references reviewed: Not in Zone II
   (Zone II, IWPA, Zone A, EEA Data Portal, etc.)

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP#5 (Hole #) 02-23-23 (Date) 12:00pm (Time) Rain/ snow (Weather) 42.35117 (Latitude) -71.35710 (Longitude)

1. Land Use Woods (e.g., woodland, agricultural field, vacant lot, etc.) None (Vegetation) N/A (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 2-5% (Slope (%))

Description of Location: Proposed Drainage Basin

2. Soil Parent Material: Friable sandy basal till Drumlin (Landform) SH (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body 100'+ feet Drainage Way 100'+ feet Wetlands 100'+ feet
   Property Line 10'+ feet Drinking Water Well 100'+ feet Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth to Weeping in Hole ______ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-10	A	Loam	10YR 3/2		Cnc : Dpl:				Granular	Friable	
10-36	Bw	Sandy Loam	10YR 5/6		Cnc : Dpl:		5%	2%	Massive	Friable	
36-120	C1	Loamy Sand	10YR 5/4		Cnc : Dpl:		5%	5%	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
NRCS Soil Classification A; ESHGW = 159.00

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP#6 (Hole #) | 2-23-23 (Date) | 12:30pm (Time) | Rain/ snow (Weather) | 42.35117 (Latitude) | -71.35710 (Longitude)

1. Land Use: Woods (e.g., woodland, agricultural field, vacant lot, etc.) | None (Vegetation) | NA (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 2-5% (Slope (%))

   Description of Location: Proposed Infiltration System

2. Soil Parent Material: Friable sandy basal till | Drumlin (Landform) | SH (Position on Landscape (SU, SH, BS, FS, TS, Plain))

3. Distances from: Open Water Body 100'+ feet | Drainage Way 100'+ feet | Wetlands 100'+ feet

   Property Line 10'+ feet | Drinking Water Well 100'+ feet | Other ______ feet

4. Unsuitable Materials Present: ☒ Yes ☐ No If Yes: ☒ Disturbed Soil/Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth to Weeping in Hole ______ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-48	Fill				Cnc : Dpl:						
48-60	Ab	Loam	10YR3/2		Cnc : Dpl:				Granular	Friable	
60-78	Bw	Sandy Loam	10YR 5/6		Cnc : Dpl:		5%	2%	Massive	Friable	
78-120	C	Loamy Sand	10YR 5/4		Cnc : Dpl:		5%	5%	Massive	Friable	
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
NRCS Soil Classification A; ESHGW = 150.50

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used (Choose one):	Obs. Hole # TP#5	Obs. Hole # TP#6
☐ Depth to soil redoximorphic features	_____ inches	_____ inches
☒ Depth to observed standing water in observation hole	>120 inches	>120 inches
☐ Depth to adjusted seasonal high groundwater (S_h) (USGS methodology)	_____ inches	_____ inches

______________________ Index Well Number

______________________ Reading Date

$S_h = S_c – [S_r \times (OW_c – OW_{max})/OW_r]$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude O, A, and E Horizons)? Upper boundary: Varies inches Lower boundary: Varies inches

c. If no, at what depth was impervious material observed? Upper boundary: _____ inches Lower boundary: _____ inches

Commonwealth of Massachusetts
City/Town of Wayland

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

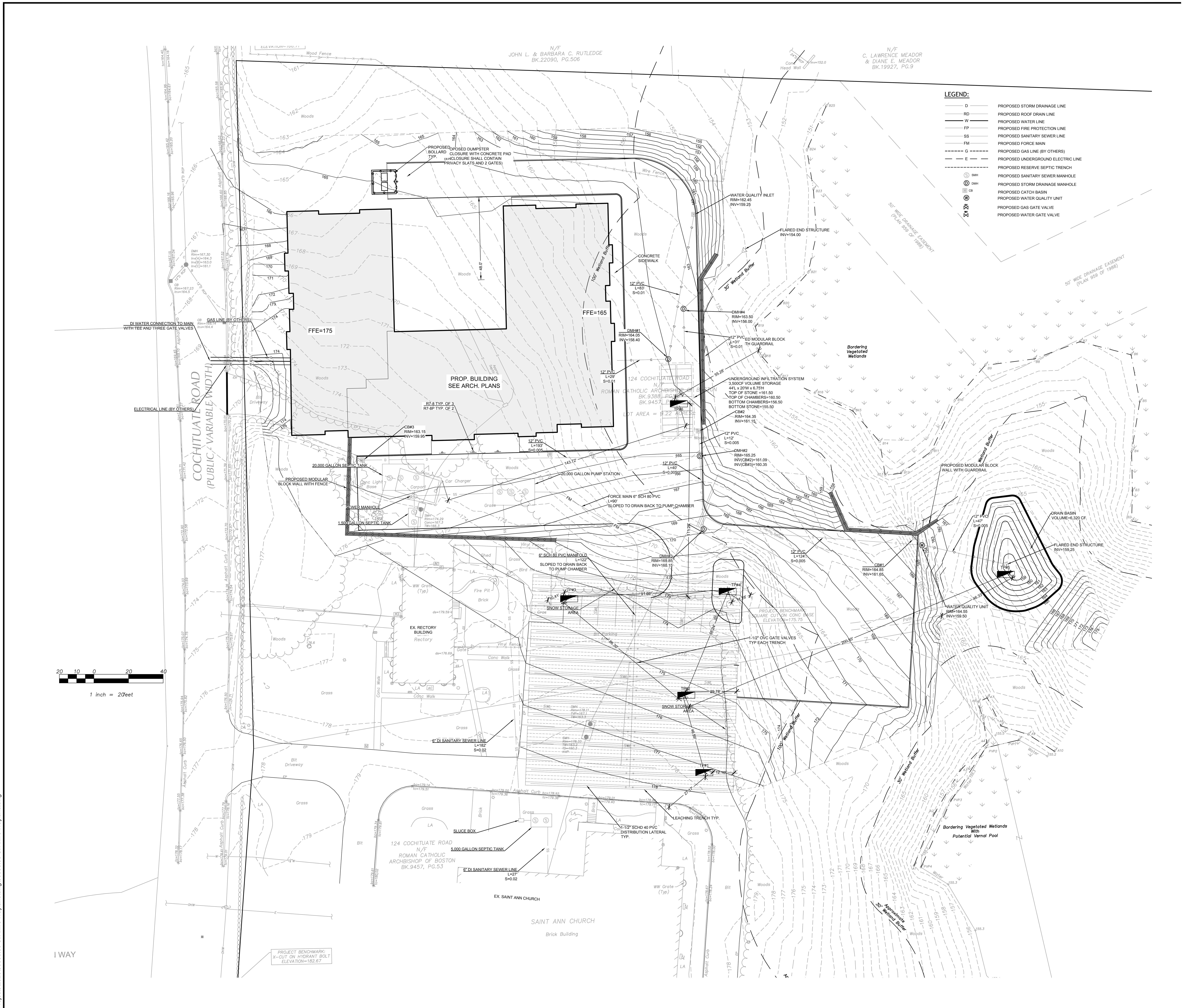
F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

David Scharlacken	02/23/23
Signature of Soil Evaluator	Date
David Scharlacken / SE14279	12/01/24
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
Darren MacCaughey	Wayland Board of Health
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:



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www.samiotes.com

Revision:

Engineer of Record:

Drawn: DJS

Checked: SRG

Scale: AS SHOWN

Key Plan:

Project Name:

ST. ANN'S VILLAGE
WAYLAND, MA

124 COCHITUATE ROAD,
WAYLAND, MA 01778

Sheet Name:

TEST PIT PLAN

Project Number:

50006.00

Issue Date:

JANUARY 31, 2023

Sheet Number:

C-TP

Wednesday, February 22, 2023 4:40:59 PM
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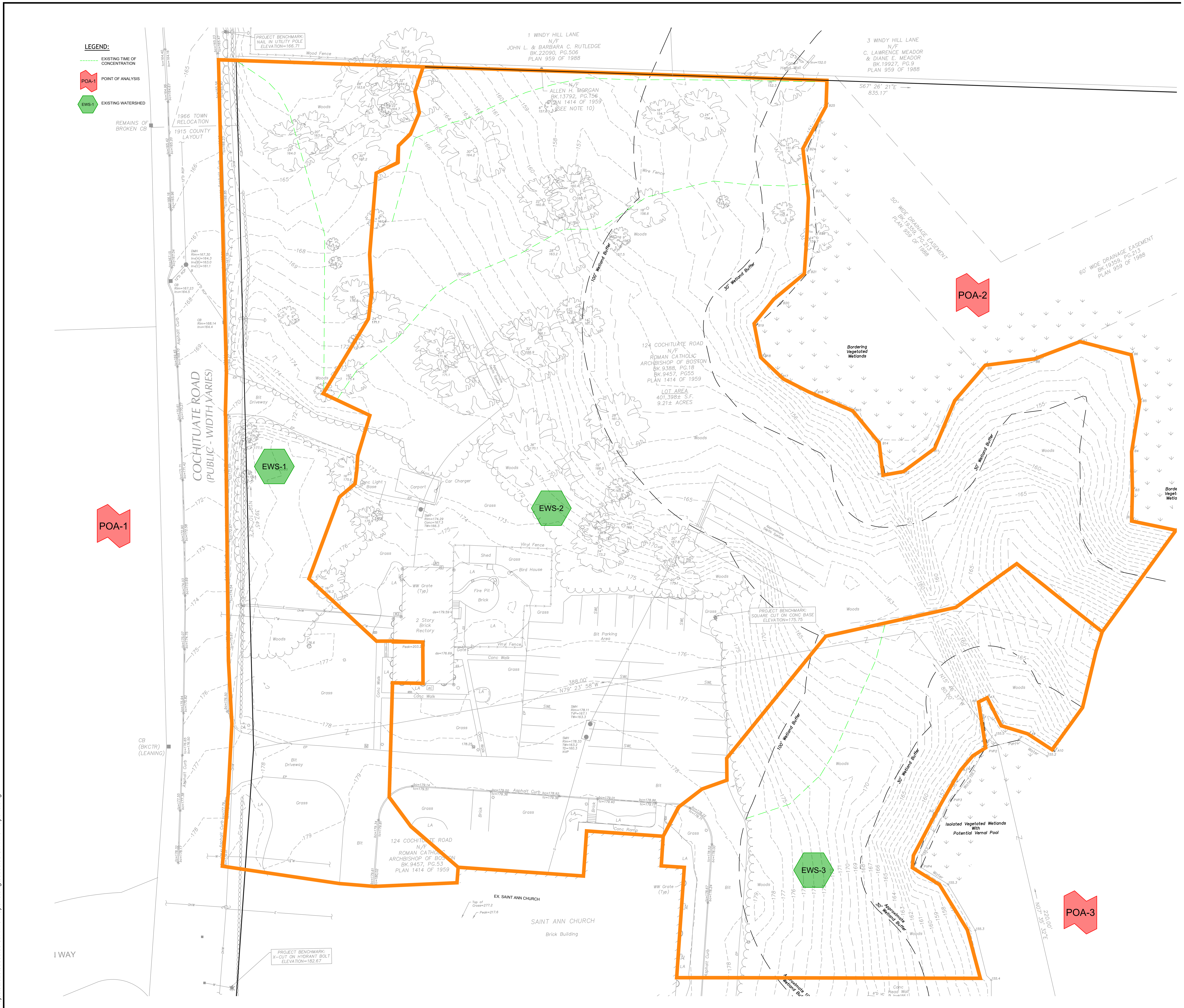
APPENDIX 4:
SKETCHES/MAPS



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Revision:

Engineer of Record:

Drawn: DJS

Checked: SRG

Scale: AS SHOWN

Key Plan:

Project Name:

ST. ANN'S VILLAGE
WAYLAND, MA

124 COCHITUATE ROAD,
WAYLAND, MA 01778

Sheet Name:

EXISTING HYDROLOGY MAP

Project Number:

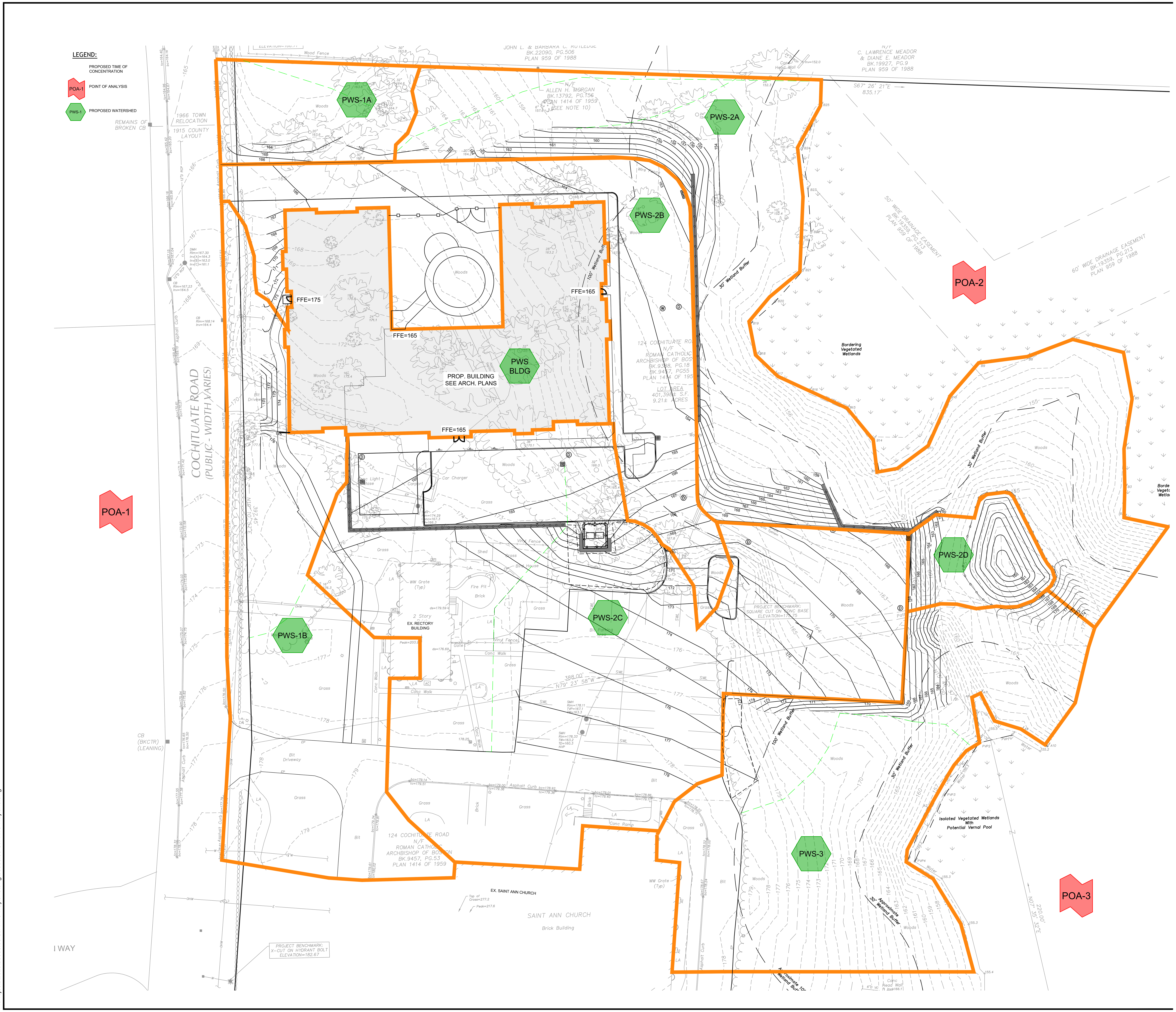
50006.00

Issue Date:

APRIL 21, 2023

Sheet Number:

EX-HYD



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Revision:

Engineer of Record:

Drawn: DJS

Checked: SRG

Scale: AS SHOWN

Key Plan:

Project Name:

ST. ANN'S VILLAGE
WAYLAND, MA

124 COCHITUATE ROAD,
WAYLAND, MA 01778

Sheet Name:

PROPOSED HYDROLOGY MAP

Project Number:

50006.00

Issue Date:

APRIL 21, 2023

Sheet Number:

PR-HYD

Thursday, April 20, 2023 11:26:51 AM
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I. Wetland Report

ECR

Environmental Consulting & Restoration, LLC

WETLAND DELINEATION REPORT

TO: Samiotes Consultants, Inc.

FROM: Brad Holmes @ ECR, LLC

DATE: April 24, 2023

RE: 124 Cochituate Road, Wayland

Per your request, Environmental Consulting & Restoration, LLC (ECR) performed wetland delineation activities on January 7, 2023 and April 12, 2023 at St. Ann's Church at 124 Cochituate Road in Wayland (the Site). The delineation events covered both parcels of land referenced as 124 Cohituate Road, which consists of the church with associated parking lot and the residence building with associated forested woodland. The weather during the delineation events consisted of fair-weather conditions suitable for field work.

Wetland Delineation

ECR located the landward limits of the vegetated wetlands on and near the site. Wetland flags consisting of pink & black striped ribbons were placed at the landward limit of the following wetland areas:

Isolated Vegetated Wetland (IVW) #A1 to #A10, #A1-1 to #A1-22 connecting to #A10 – this marks the landward limit of an isolated vegetated wetland to the east of the parking lot. This wetland is isolated and does not connect to other wetland resource areas.

Potential Vernal Pool #PVP1 to #PVP19 – Mean Annual High Water line of a Potential Vernal Pool within the A series IVW. The PVP was holding water during the April 12th review. Although ECR did not find evidence of vernal pool indicators such as Wood Frog egg masses, Salamander egg masses, etc., ECR would classify this wetland as a Potential Vernal Pool since the physical evidence of holding water long enough during the vernal pool season is present.

Bordering Vegetated Wetland (BVW) #B1 to #B25, #B1-1 to #B1-27 – this marks the limit of a large wetland system on and near the northeastern portion of the site. This wetland merges into a pond.

ECR walked and reviewed the remaining portions of the site and confirms that the rest of the site is upland.

Wetland Delineation Methodology

The vegetated wetlands were delineated following the methodology established by the Massachusetts Department of Environmental Protection (DEP) regulations found at 310 CMR 10.55 pertaining to the delineation of Bordering Vegetated Wetlands. The delineation was performed by analyzing vegetation, hydrology within 12 inches of the surface, and soil conditions within 20 inches of the surface. The vegetated wetlands contain hydric soils, saturated soils, and dominant wetland indicator plants. One transect with two examination plots (yellow numbered plastic ribbons) was conducted in order to verify the accuracy of this wetland delineation (please refer to the DEP BVW Field Data Sheets attached).

As a result of ECR's field work and review of available environmental databases, ECR is able to confirm that the site contains the following wetland resource areas and areas of Conservation Commission jurisdiction:

- Isolated Vegetated Wetland (IVW)
- Bordering Vegetated Wetlands (BVW)
- 100-foot buffer zone to BVW & IVW

ECR
Environmental Consulting & Restoration, LLC

<u>Notes</u>:
1. The site <u>is not located</u> within Estimated/Priority Habitat for Rare Species according to the Massachusetts Natural Heritage & Endangered Species Program (MaNHESP).
2. The site <u>does not contain</u> Certified Vernal Pools according to the MaNHESP. There Potential Vernal Pool flagged at the site is mapped by MaNHESP as a Potential Vernal Pool.
3. The site <u>does not contain</u> areas mapped as Land Subject to Flooding according to the FEMA maps.
4. The site <u>is not located</u> within an Area of Critical Environmental Concern.

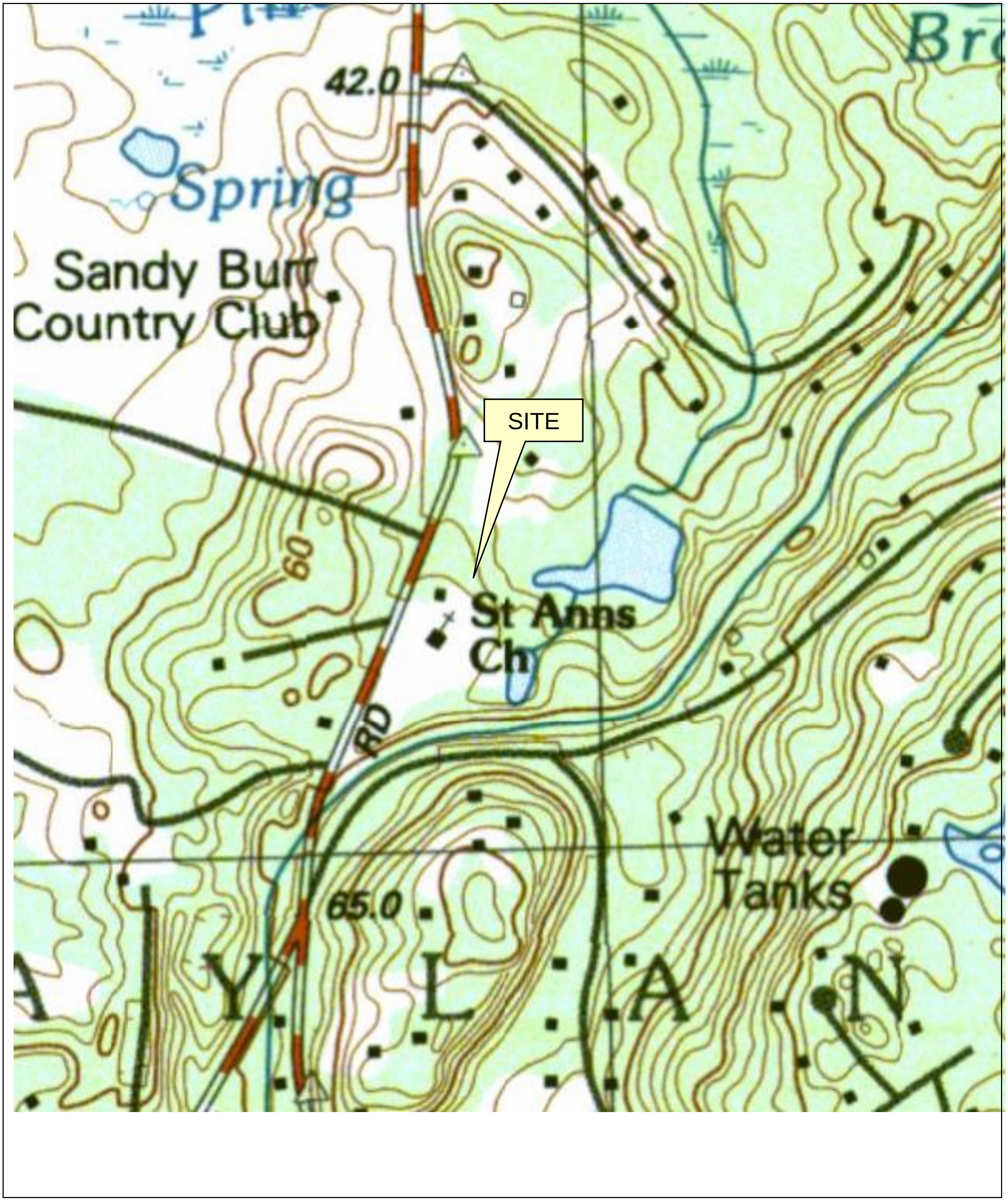
<u>Attachments</u>
- USGS locus map
- FEMA map
- NHESP map
- DEP BVW field data forms

Upon review of this wetland delineation report, please contact me at (617) 529 – 3792 or Brad@ecrwetlands.com with any questions or requests for additional information.

Sincerely yours,
Environmental Consulting & Restoration, LLC

Brad Holmes, PWS, MCA
Manager

P.O. Box 4012, Plymouth, Massachusetts 02361 617-529-3792 | www.ecrwetlands.com



USGS SITE LOCUS MAP
124 Cochituate Road
Wayland, Massachusetts

Source: MassGIS Mass Mapper

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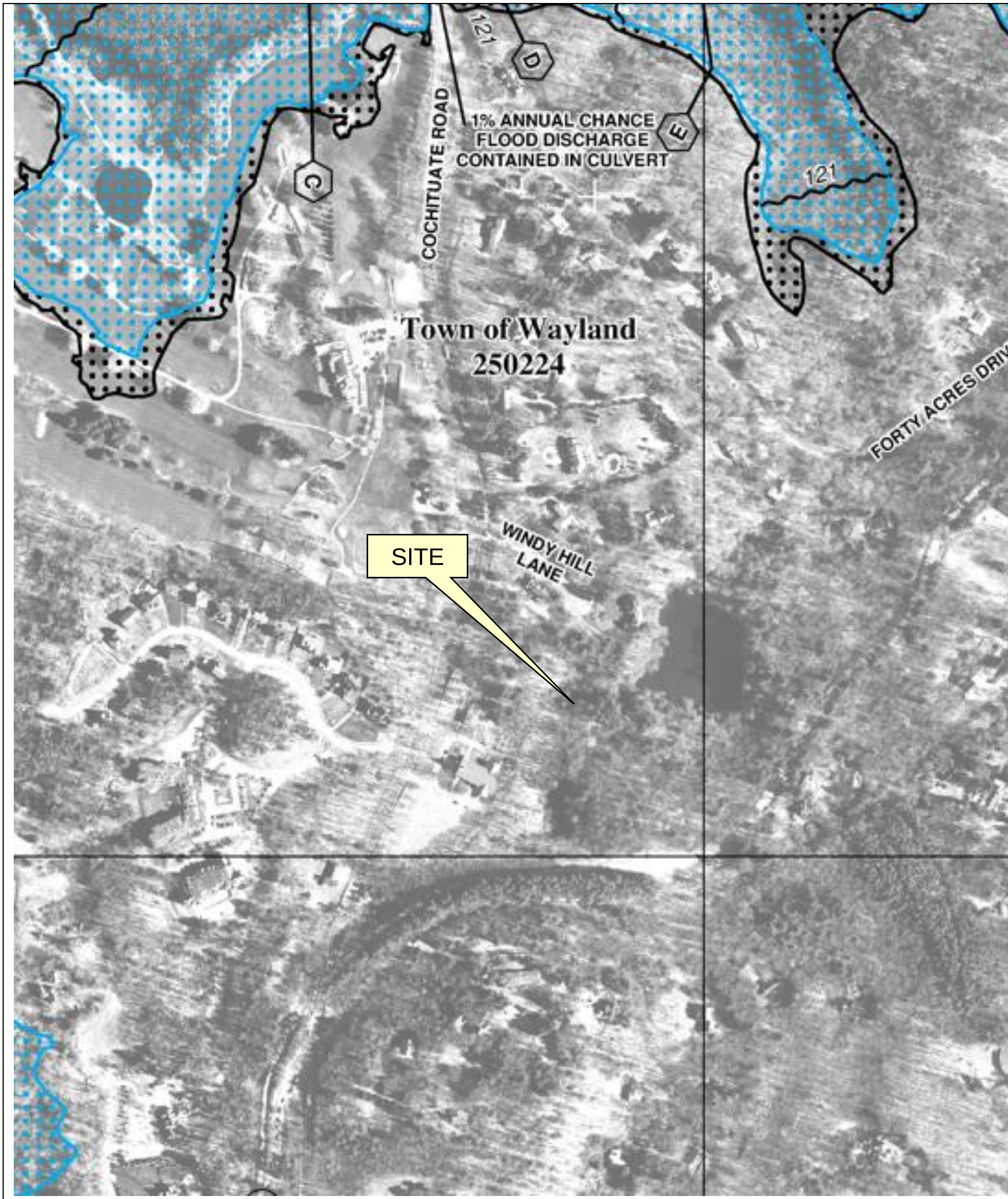

FEMA F.I.R.M MAP
124 Cochituate Road
Wayland, Massachusetts

Source: FEMA Map 25017C0526F Eff: 07/07/2014

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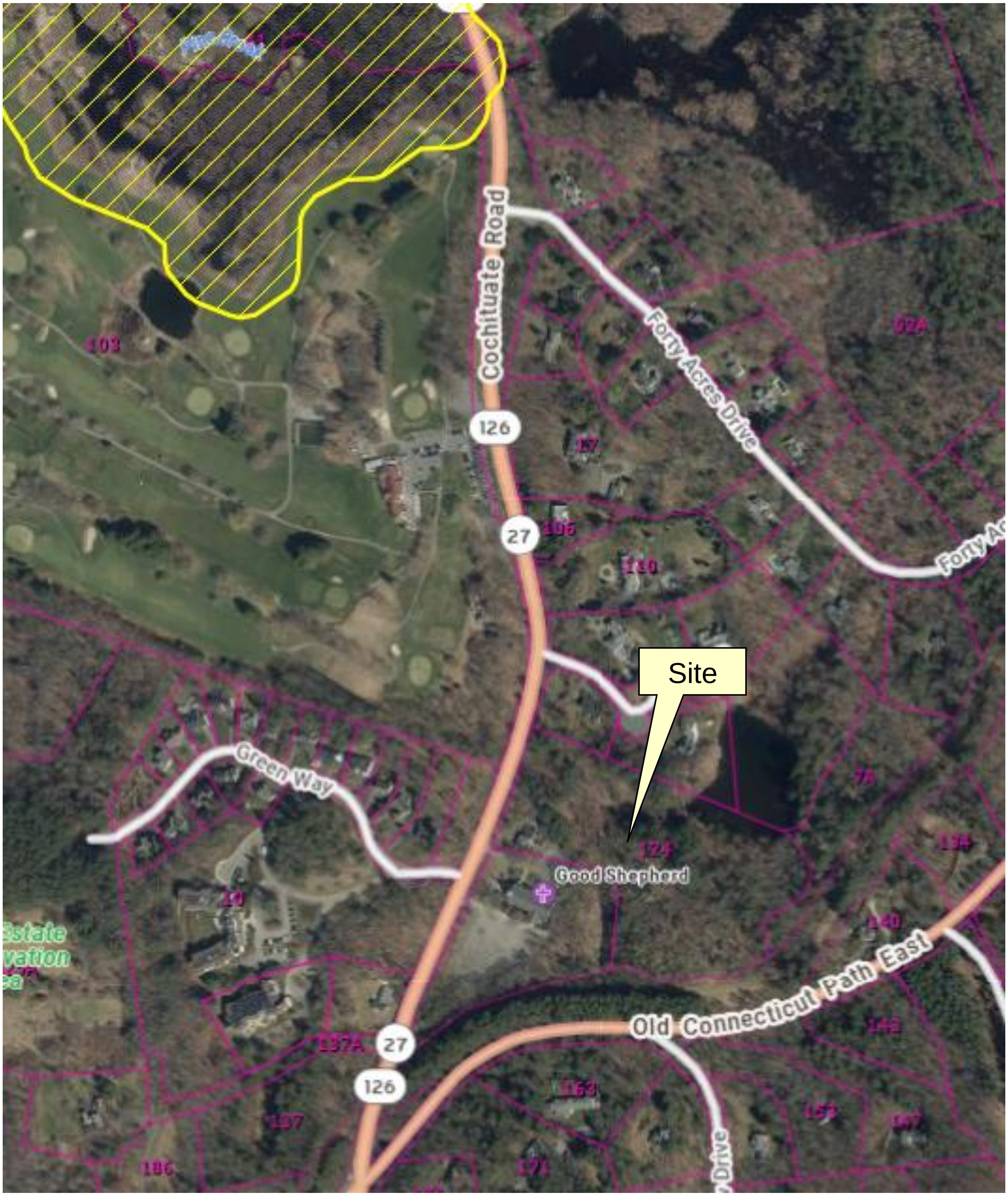

Priority Habitat of Rare Species, Estimated Habitat of Rare Wildlife & Certified Vernal Pool Map
124 Cochituate Road
Wayland, Massachusetts

Source: MassGIS Mass Mapper

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Applicant: Prepared by: Brad Holmes, Environmental Consulting & Restoration, LLC Project Location: 124 Cochituate Road Wayland, MA

Check all that apply:

- ☐ Vegetation alone presumed adequate to delineate BVW boundary:fill out Section I only
- ☑ Vegetation and other indications of hydrology used to delineate BVW boundary: fill out sections I and II
- ☐ Method other than dominance test used (attach additional information)

Section I. Vegetation	Transect B		Plot 1	Date: 1/7/23		
A. Sample Layer and Plant Species			**B. Basal Area (or percent cover)**	**C. Percent Dominance**	**D. Dominant Plant**	**Wetland Indicator Status**
Trees	White Pine	*Pinus strobus*	16,26=736.7	67.0%	Yes	FACU
	Red Maple	*Acer rubrum*	8,10,10,12=319	33.0%	Yes	FAC*
Saplings	None					
Shrubs	Glossy Buckthorn	*Rhamnus frangula*	60.0%	100.0%	Yes	FAC
Herbaceous	Spinulose Wood Fern	*Dryopteris carthusiana*	40.0%	50.0%	Yes	FACW
	Bittersweet	*Celastrus orbiculatus*	20.0%	25.0%	Yes	FACU
	Glossy Buckthorn	*Rhamnus frangula*	20.0%	25.0%	Yes	FAC
Vines	Bittersweet	*Celastrus orbiculatus*	10.0%	100.0%	Yes	FACU

* Use an asterisk to mark wetland indicator plants: plant species listed in the Wetlands Protection Act (MGL c. 131, s. 40); plants in the genus Sphagnum; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

** Use to identify plants that are acting as Hydrophytes (buttress roots, adventitous buds, etc.)

Vegetation Conclusion

Number of dominant wetland indicator plants: 4

Number of dominant non-wetland indicator plants: 3

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? Yes

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent.

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? ☑ Yes ☐ No

title/date:	http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx
map number:	MA 017
soil type map:	Freetown muck, Hinckley loamy sand, Narragansett silt loam
hydric soil inclusions:	Yes, Freetown

Are field observations consistent with soil survey? ☑ Yes ☐ No

Remarks:

2. Soil Description

Horizon	Depth	Matrix	Texture	Redoximorphic Features
	1-0"	Fibric		
	0-2"	10YR 2/2		
	2-20"	10YR 4/2-4/3		

3. Other

Is soil hydric? ☑ Yes ☐ No

Other Indicators of Hydrology (check all that apply)

Site inundated?	No
Depth to free water in observation hole:	At 6"
Depth to soil saturation in observation hole:	at surface
Water lines:	No
Drift Marks:	No
Sediment Deposits:	No
Drainage Patterns in BVW:	No
Oxidized Rhizospheres:	No
Water Stained Leaves:	No
Recorded data (stream, tidal gauge; aerial photo; other)	
Other:	Plot is in wetland below wetland flag #B15
Evidence of flooding	

Number of wetland plants > than number of non-wetland plants? ☑ Yes ☐ No

Wetland hydrology present:

- hydric soil ☑ Yes ☐ No
- other indicators ☑ Yes ☐ No

SAMPLE PLOT IS IN A BVW ☑ YES ☐ NO

Applicant: Prepared by: Brad Holmes, Environmental Consulting & Restoration, LLC Project Location: 124 Cochituate Road Wayland, MA

Check all that apply:

- [ ] Vegetation alone presumed adequate to delineate BVW boundary:fill out Section I only
- [x] Vegetation and other indications of hydrology used to delineate BVW boundary: fill out sections I and II
- [ ] Method other than dominance test used (attach additional information)

Section I. Vegetation		Transect B	Plot 2	Date: 1/7/23		
A. Sample Layer and Plant Species			**B. Basal Area (or percent cover)**	**C. Percent Dominance**	**D. Dominant Plant**	**Wetland Indicator Status**
Trees	White Pine	*Pinus strobus*	10,14=232.3	65.0%	Yes	FACU
	Red Maple	*Acer rubrum*	5,6,10=126.5	35.0%	Yes	FAC*
Saplings	White Pine	*Pinus strobus*	5.0%	100.0%	Yes	FACU
Shrubs	Glossy Buckthorn	*Rhamnus frangula*	70.0%	93.8%	Yes	FAC
	Burning Bush	*Euonymus atropurpureus*	5.0%	6.2%	No	FACU
Herbaceous	Glossy Buckthorn	*Rhamnus frangula*	25.0%	33.0%	Yes	FAC
	Hayscent Fern	*Dennstaedtia punctilobula*	10.0%	13.0%	No	UPL
	Cinnamon Fern	*Osmunda cinnamomeum*	5.0%	7.0%	No	FACW
	White Pine	*Pinus strobus*	5.0%	7.0%	No	FACU
	Bittersweet	*Celastrus orbiculatus*	30.0%	40.0%	Yes	FACU
Vines	Bittersweet	*Celastrus orbiculatus*	20.0%	100.0%	Yes	FACU

** Use to identify plants that are acting as Hydrophytes (buttress roots, adventitous buds, etc.)

Vegetation Conclusion

Number of dominant wetland indicator plants: 3 Number of dominant non-wetland indicator plants: 4

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? No

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent.

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? [x] Yes [ ] **No**

title/date: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

map number: MA 017

soil type map: Freetown muck, Hinckley loamy sand, Narragansett silt loam

hydric soil inclusions: Yes, Freetown

Are field observations consistent with soil survey? [x] Yes [ ] No

Remarks:

2. Soil Description

Horizon	Depth	Matrix	Texture	Redoximorphic Features
	1-0	Fibric		
	0-1"	10YR3/2		
	1-4"	10YR 4/3		
	4-20"	10YR 5/4-5/3		

3. Other

Is soil hydric? [ ] Yes [x] No

Other Indicators of Hydrology (check all that apply)

Site inundated?	No
Depth to free water in observation hole:	None
Depth to soil saturation in observation hole:	None
Water lines:	No
Drift Marks:	No
Sediment Deposits:	No
Drainage Patterns in BVW:	No
Oxidized Rhizospheres:	No
Water Stained Leaves:	No
Recorded data (stream, tidal gauge; aerial photo; other)	
Other:	Plot is in upland above wetland flag #B15

Number of wetland plants > than number of non-wetland plants? [ ] Yes [x] No

Wetland hydrology present:

hydric soil [ ] Yes [x] No

other indicators [ ] Yes [x] No

SAMPLE PLOT IS IN A BVW [ ] YES [x] NO

J. Traffic Impact Study

MEMORANDUM

TO: Ms. Shaina Korman-Houston
Director of Real Estate
Planning Office for Urban Affairs
84 State Street, Suite 600
Boston, MA 02109

FROM: Mr. Jeffrey S. Dirk, P.E.*, PTOE, FITE JSD
Managing Partner *and*
Mr. Daniel C. LaCivita
Transportation Engineer
Vanasse & Associates, Inc.
35 New England Business Center Drive
Suite 140
Andover, MA 01810-1066
(978) 269-6830
jdirk@rdva.com
**Professional Engineer in CT, MA, ME, NH, RI and VA*

DATE: May 5, 2023

RE: 9599

SUBJECT: Transportation Impact Assessment
Residences at Saint Ann – 124 Cochituate Road (Route 27 and 126)
Wayland, Massachusetts

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of an age-qualified residential development to be located at 124 Cochituate Road (Route 27 and 126) in Wayland, Massachusetts (hereafter referred to as the "Project"). This study evaluates the following specific areas as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; and identifies and analyzes existing traffic conditions and future traffic conditions, both with and without the Project along Cochituate Road and at major intersections along this roadway through which Project-related traffic will travel. Based on this assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the Institute of Transportation Engineers (ITE),[1] the Project is expected to generate approximately 194 vehicle trips on an average weekday (two-way, 24-hour volume), with 12 vehicle trips expected during the weekday morning peak-hour and 15 vehicle trips expected during the weekday evening peak-hour;

2. The Project will not result in a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), acknowledging that one or more movements at the signalized study area intersections are currently operating or are predicted to operate at or over capacity (i.e., level-of-service (LOS) "E" or "F", respectively) independent of the Project;

3. All movements exiting the northern driveway to the Saint Ann Catholic Church (the "Project site driveway") to Cochituate Road are predicted to operate at LOS D during the weekday morning peak-hour and at LOS C during the weekday evening peak-hour with negligible vehicle queuing

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[1] *Trip Generation,* 11th Edition; Institute of Transportation Engineers; Washington, DC; 2021.

predicted. All movements along Cochituate Road are predicted to operate at LOS A, also with negligible vehicle queuing;

4. Independent of the Project, the Boston Post Road (Route 20)/Cochituate Road intersection was found to have a motor vehicle crash rate that is above the MassDOT average crash rate for similar intersections. As such, specific recommendations have been provided to advance safety-related improvements at the intersection; and

5. Lines of sight at the Project site driveway intersection with Cochituate Road were found to exceed or can be made to exceed the recommended minimum distance for the intersection to operate in a safe and efficient manner based on the appropriate approach speed.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with the implementation of the recommendations defined herein.

The following details our assessment of the Project.

PROJECT DESCRIPTION

The Project will entail the construction of a 60±-unit, age-qualified, multifamily residential development to be located on a portion of the property located at 124 Cochituate Road (Route 27 and 126) in Wayland, Massachusetts. The Project site encompasses approximately 10.05± acres of land bound by residential properties and areas of open and wooded space to the north; the Weston Aqueduct to the south; areas of open and wooded space and the Weston Aqueduct to the east; and Cochituate Road to the west. The Project will be located in the northern portion of the subject property; the southern portion of the property is occupied by Saint Ann Catholic Church and associated rectory and parking area, all of which will be retained with the construction of the Project. The areas that will be developed to accommodate the Project consists primarily of areas of wooded space, with a carport and associated driveway to Cochituate Road, both of which will be removed in conjunction with the Project. Figure 1 depicts the Project site location in relation to the existing roadway network.

Access to the Project site will be provided by way of a new drive that will intersect the north side of the drive aisle to the north of the Saint Ann Catholic Church sanctuary (between the sanctuary and the rectory). Secondary access for emergency vehicles will be provided by way of a new driveway that will intersect the east side of Cochituate Road approximately 300 feet south of Windy Hill Road. The existing driveway that serves the Saint Ann Catholic Church to the south of the sanctuary will be retained.

Off-street parking will be provided for the Project separate from the church parking lots that will afford parking for 66 vehicles, or a parking ratio of 1.1 parking spaces per unit.

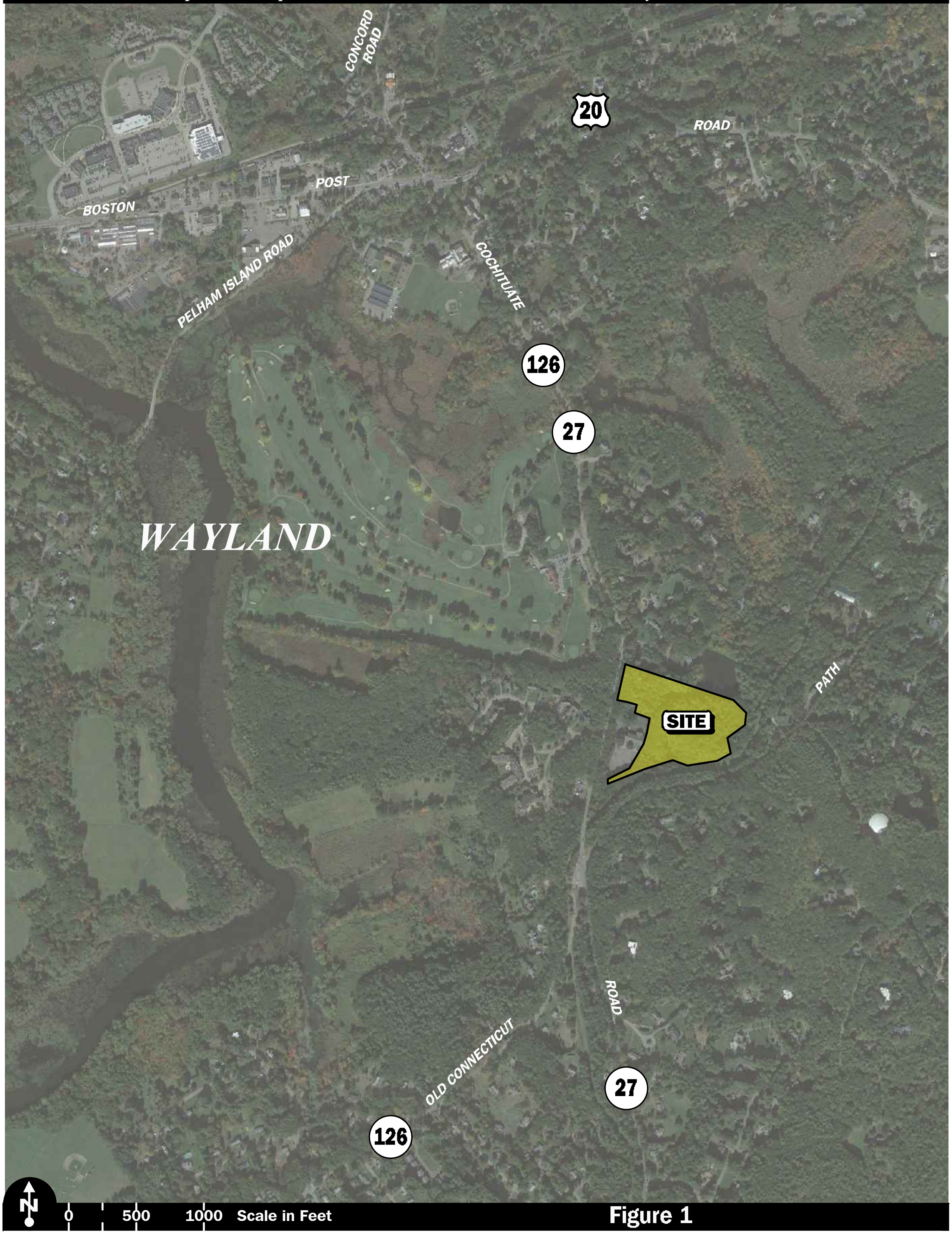

Figure 1

Site Location Map

Vanasse & Associates inc

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STUDY METHODOLOGY

This study was prepared in consultation with MassDOT and the Town of Wayland; was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines* and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports; and was conducted in three distinct stages.

The first stage involved an assessment of existing conditions in the study area and included an inventory of roadway geometrics; pedestrian and bicycle facilities; on-street parking; public transportation services; observations of traffic flow; and collection of pedestrian, bicycle, and vehicle 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 analyses consistent with MassDOT guidelines. The analysis conducted in stage two identifies existing or projected future capacity, safety, and access issues, as these areas relate to the transportation infrastructure.

The third stage of the study presents and evaluates measures to address deficiencies in the transportation infrastructure, if any, identified in stage two of the study.

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions within the study area was conducted in January 2023. This inventory included the collection of traffic-volume data and vehicle travel speed measurements, as well as a review of existing pedestrian and bicycle accommodations, public transportation services, and motor vehicle crash data. The following summarizes existing conditions within the study area.

Roadway

Cochituate Road (Route 27 and 126)

Cochituate Road is a two-lane, urban principal arterial roadway that traverses the study area in a general north-south direction and is under Town jurisdiction. In the vicinity of the Project site, Cochituate Road provides two 11 to 12-foot-wide lanes that are separated by a double yellow centerline, with 3 to 4-foot-wide marked shoulders and additional travel lanes provided at major intersections. The posted speed limit in the vicinity of the Project site is 35 miles per hour (mph). A sidewalk is provided along the west side of the roadway between Boston Post Road (Route 20) and Old Connecticut Path. Illumination is provided intermittently by way of street lights mounted on wooden poles. Land use along Cochituate Road within the study area consists of the Project site, residential properties, the Saint Ann church, the Sandy Burr Country Club and areas of open and wooded space.

Intersections

Table 1 and Figure 2 summarize existing lane use, traffic control, and pedestrian and bicycle accommodations at the study area intersections as observed in January 2023.

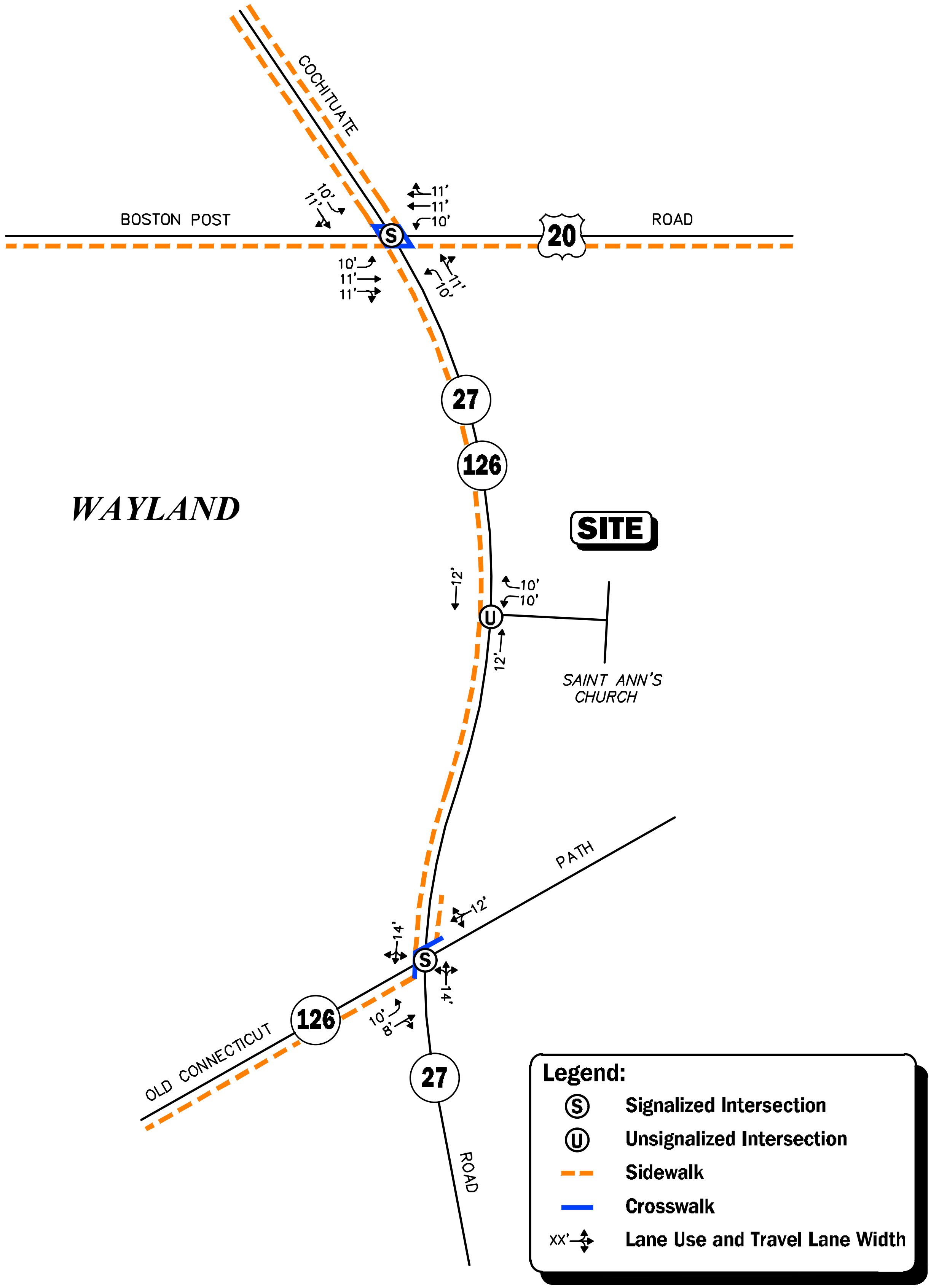


Figure 2

Existing Intersection Lane Use, Travel Lane Width, and Pedestrian Facilities

Vanasse & Associates inc

Table 1
STUDY AREA INTERSECTION DESCRIPTION

Intersection	Traffic Control Type[a]	No. of Travel Lanes Provided	Shoulder Provided? (Yes/No/Width)	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/Description)
Rte. 20/ Cochituate Rd.	TS	1 left-turn lane, 1 through lane, and 1 through/right-turn lane provided on Rte. 20 approaches; 1 left-turn lane and 1 through/right-turn lane provided on Cochituate Rd. approaches	Yes; 1 to 3-feet on all legs	Yes; sidewalks are provided along both sides Cochituate Rd. north of the intersection, the west side of Cochituate Rd. south of the intersection, and the south side of Rte. 20, with marked crosswalks provided for crossing all legs of the intersection; pedestrian traffic signal equipment and phasing (exclusive) provided	Yes; shared-traveled-way[b] on Cochituate Rd. south of the intersection
Cochituate Rd./ Old Connecticut Path	TS	1 general-purpose travel lane provided on Cochituate Rd. and Old Connecticut Path westbound approaches, 1 left-turn lane and 1 through/right-turn lane provided on Old Connecticut Path eastbound approach	Yes; 1 to 3-feet on all approaches	Yes; sidewalks are provided along both sides of Cochituate Rd. north of the intersection for approximately 150 ft and the south side Old Connecticut Path west of the intersection; with marked crosswalks provided for crossing the Cochituate Rd. north leg and Old Connecticut Path west leg; and pedestrian traffic signal equipment and phasing (exclusive) provided	Yes; shared-traveled-way on all approaches

[a]TS = Traffic signal control.
[b]Combined shoulder and travel lane width equal to or exceed 14 feet.

Existing Traffic Volumes

In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts, turning movement counts (TMCs), and vehicle classification counts were completed in January and February 2022. The ATR counts were conducted on Cochituate Road, south of Windy Hill Lane, on January 31st through February 1st, 2023 (Tuesday through Wednesday, inclusive) in order to record weekday traffic conditions over an extended period, with weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak-period TMCs performed at the study intersections on January 31st, 2023 (Tuesday). These time periods were selected for analysis purposes as they are representative of the peak-traffic-volume hours for both the Project and the adjacent roadway network.

In order to evaluate the potential for seasonal fluctuation of traffic volumes within the study area, MassDOT weekday seasonal factors for Urban Group 3 (principal arterial roadways, the functional classification of both Cochituate Road and Route 20) were reviewed.[2] Based on a review of this data, it was determined that traffic volumes for the month of January are 6.0 percent *below* average-month conditions. As such, the January traffic volumes were adjusted upwards by 6.0 percent in order to be representative of average-month conditions in accordance with MassDOT standards.

MassDOT does not require pandemic-related adjustment of traffic counts performed after March 2022, except in locations where the predominant land use consists of offices or similar uses.[3] Given that the predominant land use within the study area is residential, a pandemic-related adjustment was not required.

The 2023 Existing traffic volumes are summarized in Table 2, with the weekday morning and evening peak-hour traffic volumes graphically depicted on Figures 3 and 4, respectively. Note that the peak-hour traffic volumes presented in Table 2 were obtained from the TMCs and are reflected on the aforementioned figures.

Table 2
2023 EXISTING TRAFFIC VOLUMES

Location/Peak-Hour	AWT[a]	VPH[b]	K Factor[c]	Directional Distribution[d]
Cochituate Road, south of Windy Hill Lane:	9,970	--	--	--
Weekday Morning (7:45 – 8:45 AM)	--	1,286	12.9	52.3% NB
Weekday Evening (4:00 – 5:00 PM)	--	1,146	11.5	56.2% NB

[a]Average weekday traffic in vehicles per day.
[b]Vehicles per hour.
[c]Percent of daily traffic occurring during the peak-hour.
[d]Percent traveling in peak direction.
NB = northbound.

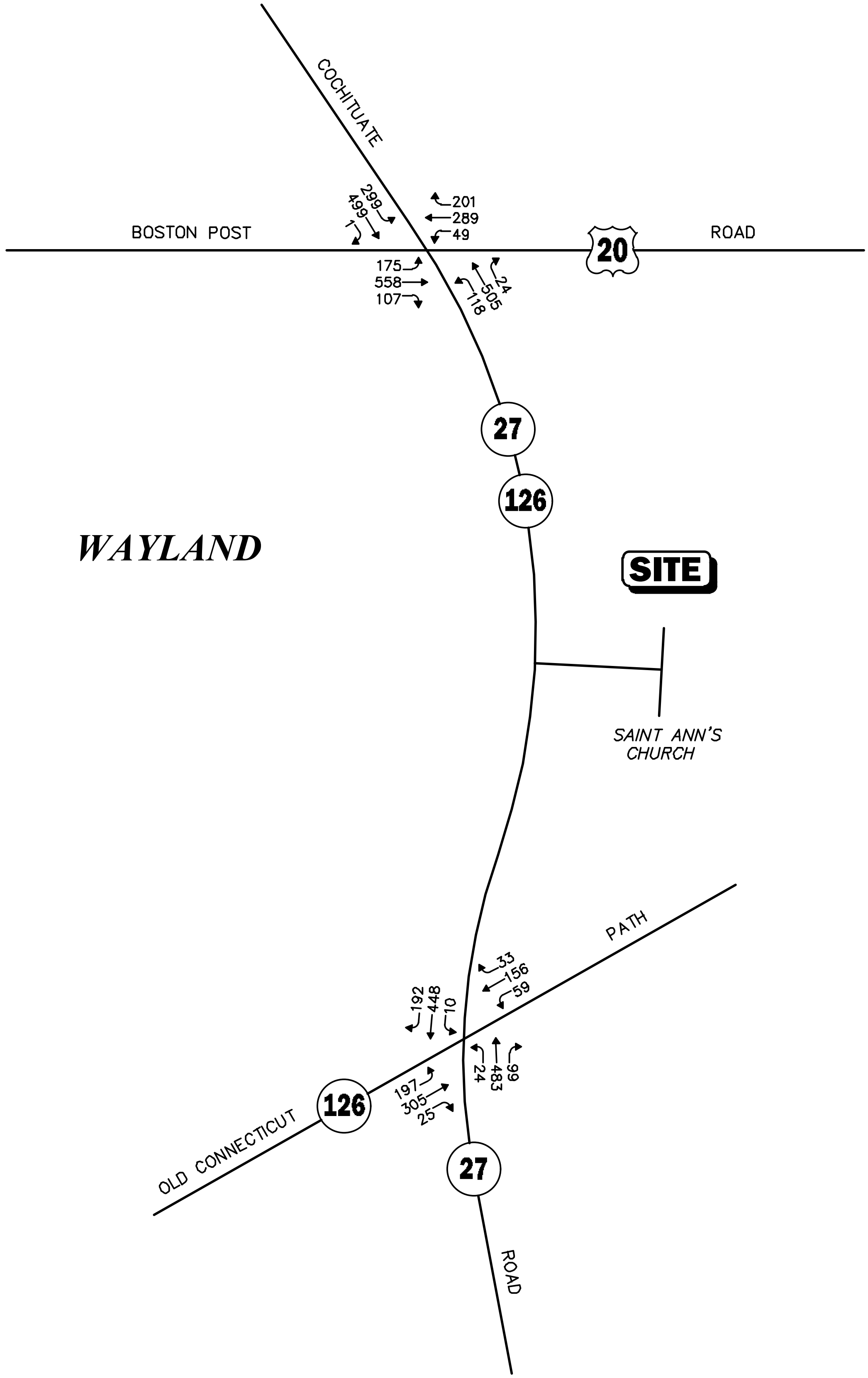
As can be seen in Table 2, Cochituate Road, in the vicinity of the Project site, was found to accommodate approximately 9,970 vehicles on an average weekday (two-way, 24-hour volume), with approximately 1,286 vehicles per hour (vph) during the weekday morning peak-hour and 1,146 vph during the weekday evening peak-hour.

Pedestrian and Bicycle Facilities

A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in January 2023. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study roadways and at the study intersections, as well as the location of existing and planned future bicycle facilities. As detailed on Figure 2, sidewalks are generally provided along one or both sides of the study area roadways with marked crosswalks provided for crossing one or more legs of the signalized study area intersections that include pedestrian traffic signal equipment and phasing.

Formal bicycle facilities are not provided within the study area; however, Cochituate Road south of Route 20 and Old Connecticut Path generally provide sufficient width (combined travel lane and shoulder) to support bicycle travel in a shared traveled-way configuration (i.e., motor vehicles and bicyclists sharing

[2]MassDOT statewide Traffic Data Collection; 2019 Weekday Seasonal Factors, Group U3.
[3]*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

Vanasse & Associates inc

2023 Existing Weekday Morning Peak-Hour Traffic Volumes

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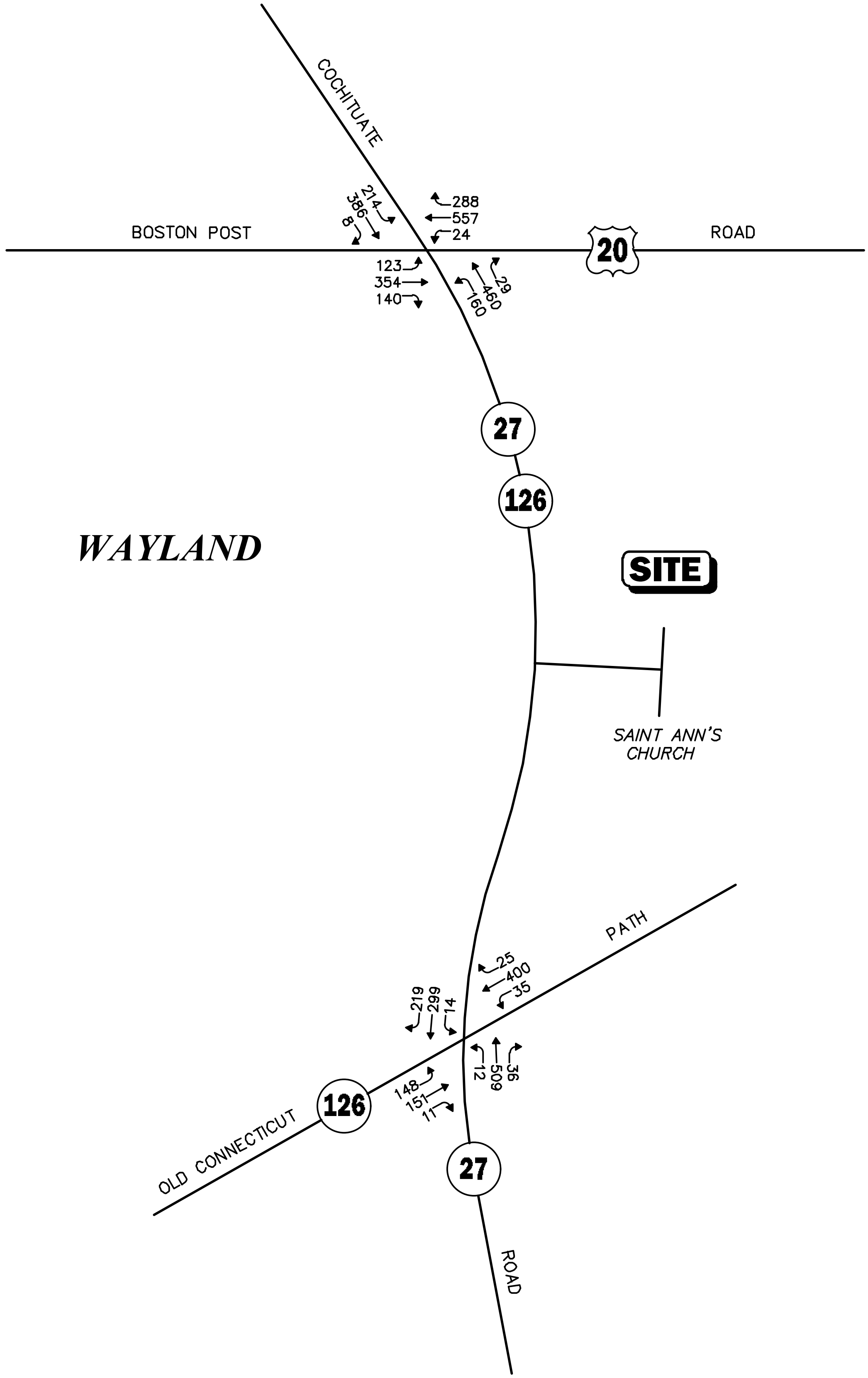

Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 4

Vanasse & Associates inc

2023 Existing Weekday Evening Peak-Hour Traffic Volumes

the roadway).[4] To the north of the Project site, the Mass Central Rail-Trail shared-use pathway traverses the alignment of the former Mass Central Railroad corridor between Wayland and Weston, with a trail-head located off Andrew Avenue and accessible from within the Wayland Town Center shopping center.

Public Transportation

Regularly scheduled public transportation services are not currently provided within the study area. To the south of the Project site, the MetroWest Regional Transit Authority (MWRTA) provides fixed-route bus service to and within the Natick Mall area by way of bus Routes 10 and 11.

Spot Speed Measurements

Vehicle travel speed measurements were performed on Cochituate Road in the vicinity of the Project site in conjunction with the ATR counts. Table 3 summarizes the vehicle travel speed measurements.

Table 3
VEHICLE TRAVEL SPEED MEASUREMENTS

	Cochituate Road	
	Northbound	Southbound
Mean Travel Speed (mph)	31	35
85th Percentile Speed (mph)	35	40
Posted Speed Limit (mph)	35	35

mph = miles per hour.

As can be seen in Table 3, the mean vehicle travel speed along Cochituate Road in the vicinity of the Project site was found to be 31 mph in the northbound direction and 35 mph southbound. The measured 85th percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles traveled at or below, was found to be 35 mph in the northbound direction and 40 mph westbound, with the northbound speed consisted with the posted speed limit (35 mph) in the vicinity of the Project site and the southbound travel speed 5 mph above the posted speed limit. The 85th percentile speed is used as the basis of engineering design and in the evaluation of sight distances and is often used in establishing posted speed limits.

Motor Vehicle Crash Data

Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2016 through 2020, inclusive) to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, severity, roadway and weather conditions, and day of occurrence, and is presented in Table 4.

[4] A minimum combined travel lane and paved shoulder width of 14-feet is required to support bicycle travel in a shared traveled-way condition.

Table 4
MOTOR VEHICLE CRASH DATA SUMMARY[a]

	Route 20/ Cochituate Rd.	Cochituate Rd./Old Connecticut Path	Cochituate Rd./ St. Ann Driveway
Traffic Control Type[b]	S	S	U
Year:			
2016	13	11	0
2017	10	10	0
2018	14	1	0
2019	13	4	0
2020	2	3	0
Total	52	29	0
Average	10.40	5.80	0.00
Crash Rate[c]	0.91	0.70	0.00
MassDOT Crash Rate:[d]	0.78/0.89	0.78/0.89	0.57/0.61
Significant?[e]	Yes	No	No
Type:			
Angle	10	6	0
Head-On	1	1	0
Rear-End	33	17	0
Rear-to-Rear	0	0	0
Sideswipe	5	1	0
Fixed Object	0	1	0
Pedestrian/Bicycle	0	0	0
Unknown/Other	3	3	0
Total	52	29	0
Conditions:			
Clear	31	18	0
Cloudy	7	6	0
Rain	10	4	0
Snow/Ice	3	1	0
Not Reported/Other	1	0	0
Total	52	29	0
Lighting:			
Daylight	41	22	0
Dawn/Dusk	5	1	0
Dark (Road Lit)	6	5	0
Dark (Road Unlit)	0	1	0
Total	52	29	0
Day of Week:			
Monday-Friday	41	22	0
Saturday	7	5	0
Sunday	4	2	0
Total	52	29	0
Severity:			
Property Damage Only	44	23	0
Non-fatal Injury	7	5	0
Fatalities	0	0	0
Not Reported	1	1	0
Total	52	29	0

[a]Source: MassDOT Safety Management/Traffic Operations Unit records, 2016 through 2020.
[b]Traffic Control Type: S = signalized; U = unsignalized.
[c]Crash rate per million vehicles entering the intersection.
[d]Statewide/District crash rate.
[e]The intersection crash rate is significant if it is found to exceed the MassDOT crash rate for the MassDOT Highway Division District in which the Project is located (District 3).

As can be seen in Table 4, no (0) reported motor vehicle crashes were reported to have occurred at the Cochituate Road/Saint Ann driveway intersection over the five-year review period. The Cochituate Road/ Old Connecticut Path intersection was found to have experienced 29 reported motor vehicle crashes over the five-year review period, or an average of 5.8 crashes per year, and was identified to have a motor vehicle crash rate *below* both the MassDOT Statewide and District average crash rates for similar intersections for the MassDOT Highway Division District in which the intersections are located (District 3). The majority of the crashes occurred on a weekday; during daylight; under clear weather conditions; and involved rear-end collisions that resulted in property damage only.

The Route 20/Cochituate Road intersection was found to have experienced 52 reported motor vehicle crashes per year over the five-year review period, or an average of 10.4 crashes per year, the majority of which occurred on a weekday; during daylight; under clear weather conditions; and involved rear-end collisions that resulted in property damage only. The intersection was identified to have a motor vehicle crash rate that was *above* the MassDOT statewide and District average crash rates for similar intersections. As such, recommendations have been provided to advance safety-related improvements at this intersection (discussed in the *Recommendations* section of this assessment).

A review of the MassDOT statewide High Crash Location List indicated that there are no Highway Safety Improvement Program (HSIP) eligible high crash locations within the study area. In addition, no fatal motor vehicle crashes were reported to have occurred at the study area intersections over the five-year review period.

The detailed MassDOT Crash Rate Worksheets are attached.

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2030, which reflects a seven-year planning horizon consistent with MassDOT guidelines. Independent of the Project, traffic volumes on the roadway network in the year 2030 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2030 No-Build traffic volumes reflect 2030 Build traffic-volume conditions with the Project.

Future Traffic Growth

Future traffic growth is a function of the expected land development in the immediate area and the surrounding region. Several methods can be used to estimate this growth. A procedure frequently employed estimates an annual percentage increase in traffic growth and applies that percentage to all 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.

An alternative procedure identifies the location and type of planned development, estimates the traffic to be generated, and assigns it to the area roadway network. This procedure produces a more realistic estimate of growth for local traffic; however, potential population growth and development external to the study area would not be accounted for in the resulting traffic projections.

To provide a conservative analysis framework, both procedures were used, the salient components of which are described below.

Specific Development by Others

The Town of Wayland Planning Department was consulted in order to determine if there were any projects that would have an impact on future traffic volumes at the study intersections. Based on this consultation, the following project was identified for inclusion in this assessment:

- ***Proposed Residential Development, 297 Boston Post Road (Route 20), Wayland, Massachusetts.*** This project entails the construction of a 175±-unit multifamily residential development to be located at 297 Boston Post Road to the north of the Project site. Traffic volumes associated with this project were estimated using trip-generation statistics published by the ITE[5] and were assigned onto the study area roadway network based on existing traffic patterns.

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 (discussion follows).

General Background Traffic Growth

Traffic-volume data compiled by MassDOT from permanent count stations located in Wayland were reviewed in order to determine general traffic growth trends in the area. This data indicates that annual traffic volumes have fluctuated over the past several years, with the average growth rate found to be approximately 0.96 percent per year. As such, a slightly higher 1.0 percent per year compounded annual background traffic growth rate was used in order to account for future traffic growth and presently unforeseen development within the study area.

Roadway Improvement Projects

The Town of Wayland and MassDOT were contacted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2030 within the study area. Based on these discussions, no 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 2030 No-Build condition peak-hour traffic volumes were developed by: i) applying the 1.0 percent per year compounded annual background traffic growth rate to the 2023 Existing peak-hour traffic volumes; and ii) adding the traffic volumes associated with the specific development project by others (297 Boston Post Road). Traffic volumes entering and exiting the Project site driveway were generated using statistics published by the ITE and were applied to the Cochituate Road/Project site driveway intersection based on exiting traffic patterns. The resulting 2030 No-Build weekday morning and evening peak-hour traffic volumes are shown on Figures 5 and 6, respectively.

Project-Generated Traffic

Design year (2030 Build) traffic volumes for the study area roadways were determined by estimating Project-generated traffic volumes and assigning those volumes on the study roadways. The following sections describe the methodology used to develop the anticipated traffic characteristics of the Project.

As proposed, the Project will entail the construction of a 60±-unit, age-qualified, multifamily residential development. In order to develop the traffic characteristics of the Project, trip-generation statistics

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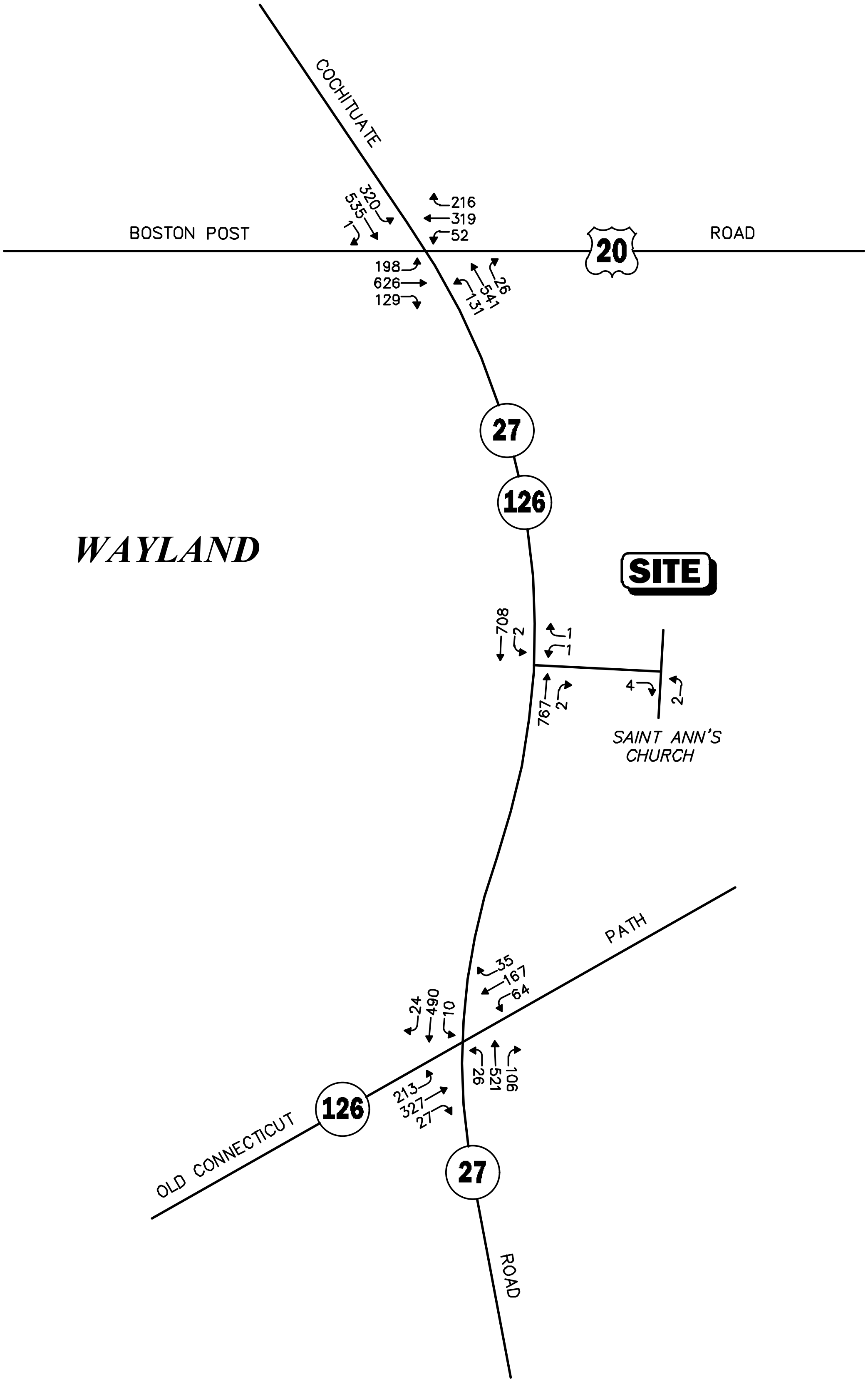
[5]Ibid 1.



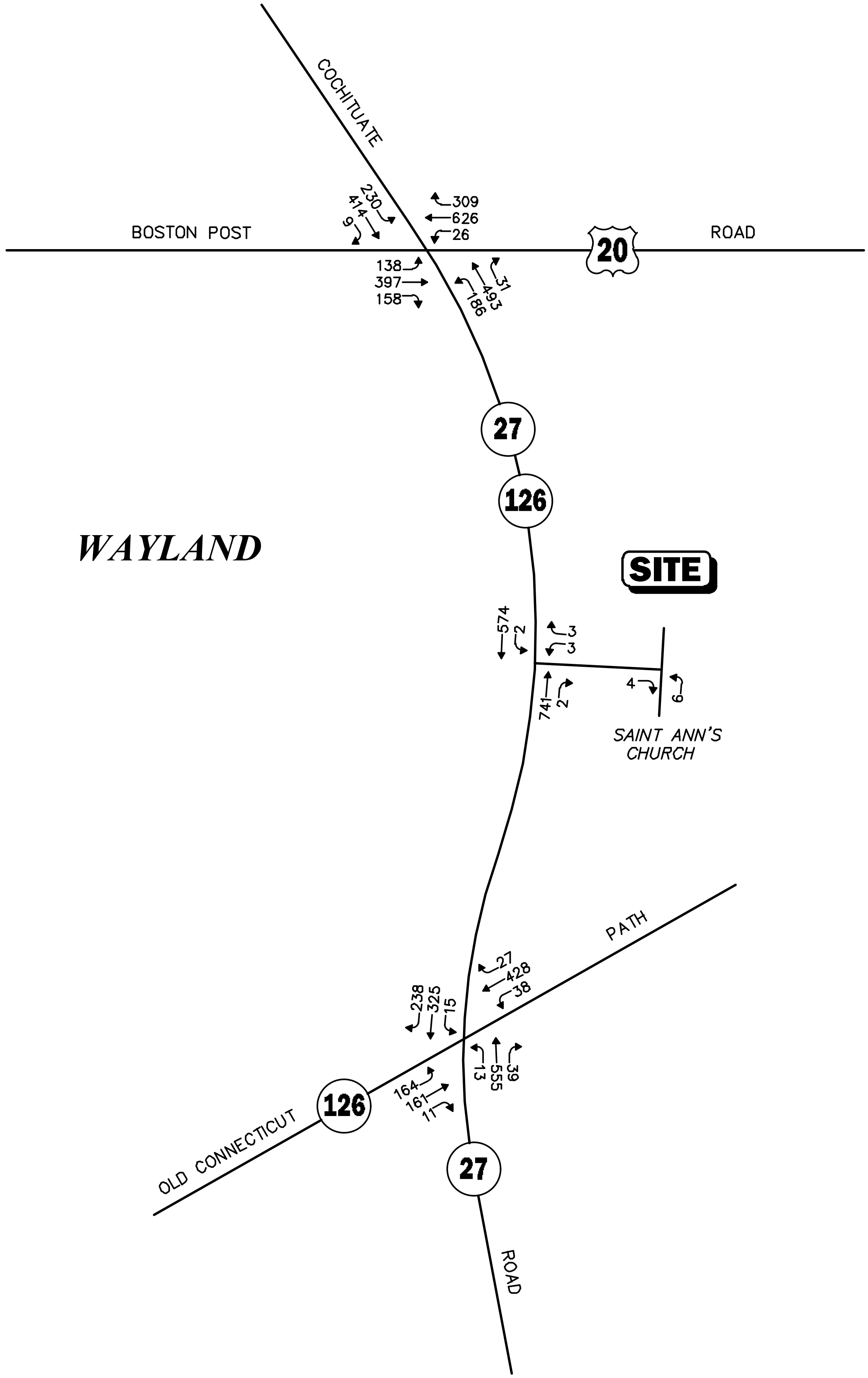
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 5

Vanasse & Associates inc

2030 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

Vanasse & Associates inc

2030 No-Build Weekday Evening Peak-Hour Traffic Volumes

published by the ITE[6] for a similar land use as that proposed were used. ITE Land Use Code (LUC) 252, *Senior Adult Housing – Multifamily*, was used to develop the traffic characteristics of the Project, the results of which are summarized in Table 5.

Table 5
TRIP GENERATION SUMMARY

Time Period	**Vehicle Trips[a]**		
	Entering	**Exiting**	**Total**
Average Weekday:	97	97	194
Weekday Morning Peak-Hour:	4	8	12
Weekday Evening Peak-Hour:	8	7	15

[a]Based on ITE LUC 252, *Senior Adult Housing – Multifamily* (60 units).

Project-Generated Traffic-Volume Summary

As can be seen in Table 5, the Project is expected to generate approximately 194 vehicle trips on an average weekday (two-way, 24-hour volume, or 97 vehicles entering and 97 exiting), with 12 vehicle trips (4 vehicles entering and 8 exiting) expected during the weekday morning peak-hour and 15 vehicle trips (8 vehicles entering and 7 exiting) expected during the weekday evening peak-hour.

Trip Distribution and Assignment

The directional distribution of generated trips to and from the Project site was determined based on a review of U.S. Census Journey-to-Work data for the Town of Wayland and then refined based on a review of existing traffic patterns within the study area. The general trip distribution for the Project is graphically depicted on Figure 7, with the additional traffic that is expected to be generated by the Project assigned on the study area roadway network as shown on Figures 8 and 9.

Build Traffic Volumes

The 2030 Build condition traffic volumes consist of the 2030 No-Build traffic volumes with the addition of the traffic expected to be generated by the Project. The 2030 Build weekday morning and evening peak-hour traffic volumes are graphically depicted on Figures 10 and 11, respectively.

TRAFFIC OPERATIONS ANALYSIS

In order to assess the potential impact of the Project on the roadway network, a detailed traffic operations analysis (motorist delays, vehicle queuing and level-of-service) was performed for the study intersections. Capacity analyses provide an indication of how well transportation 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.

[6]Ibid 1.

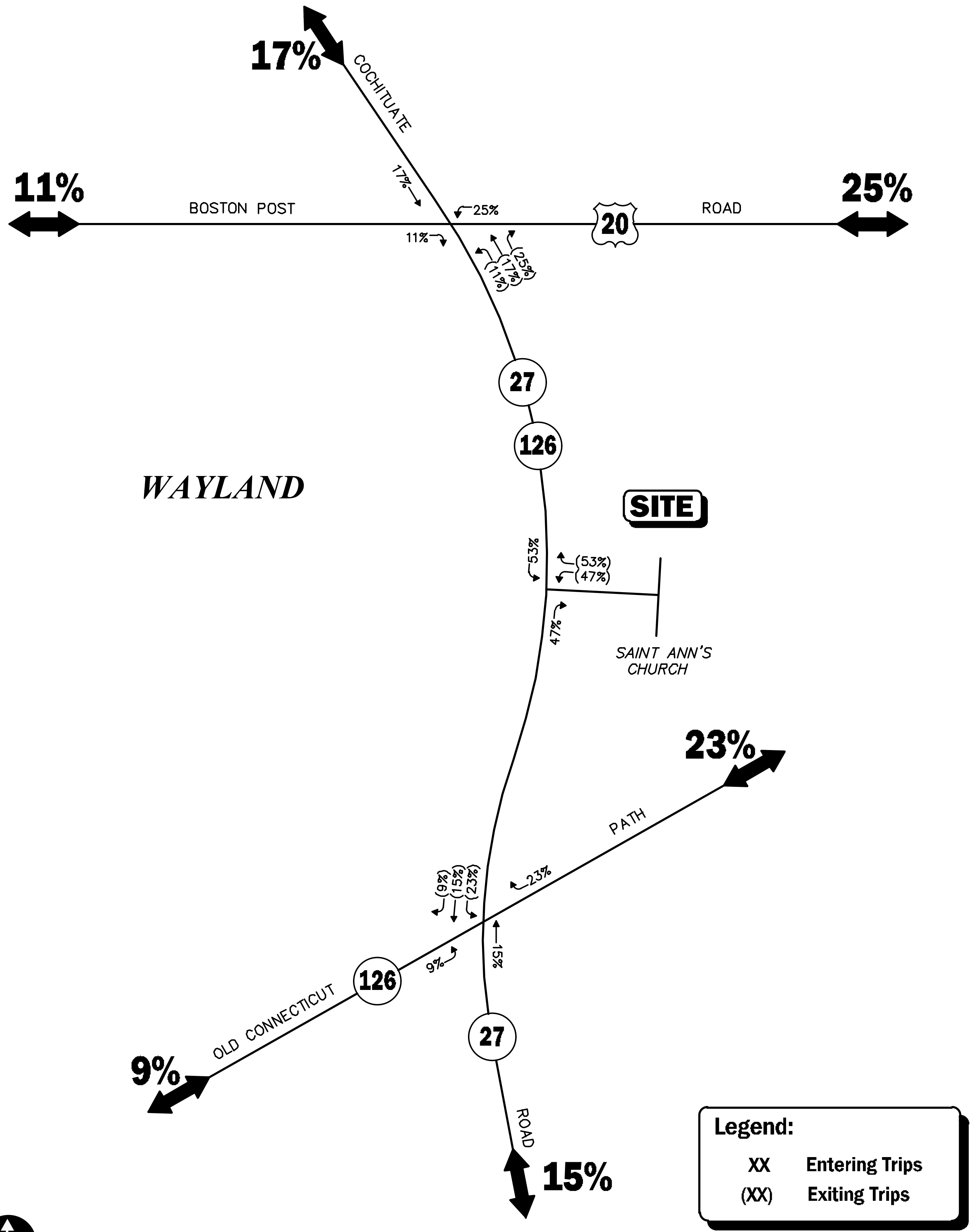


Figure 7

Trip Distribution Map

Vanasse & Associates inc

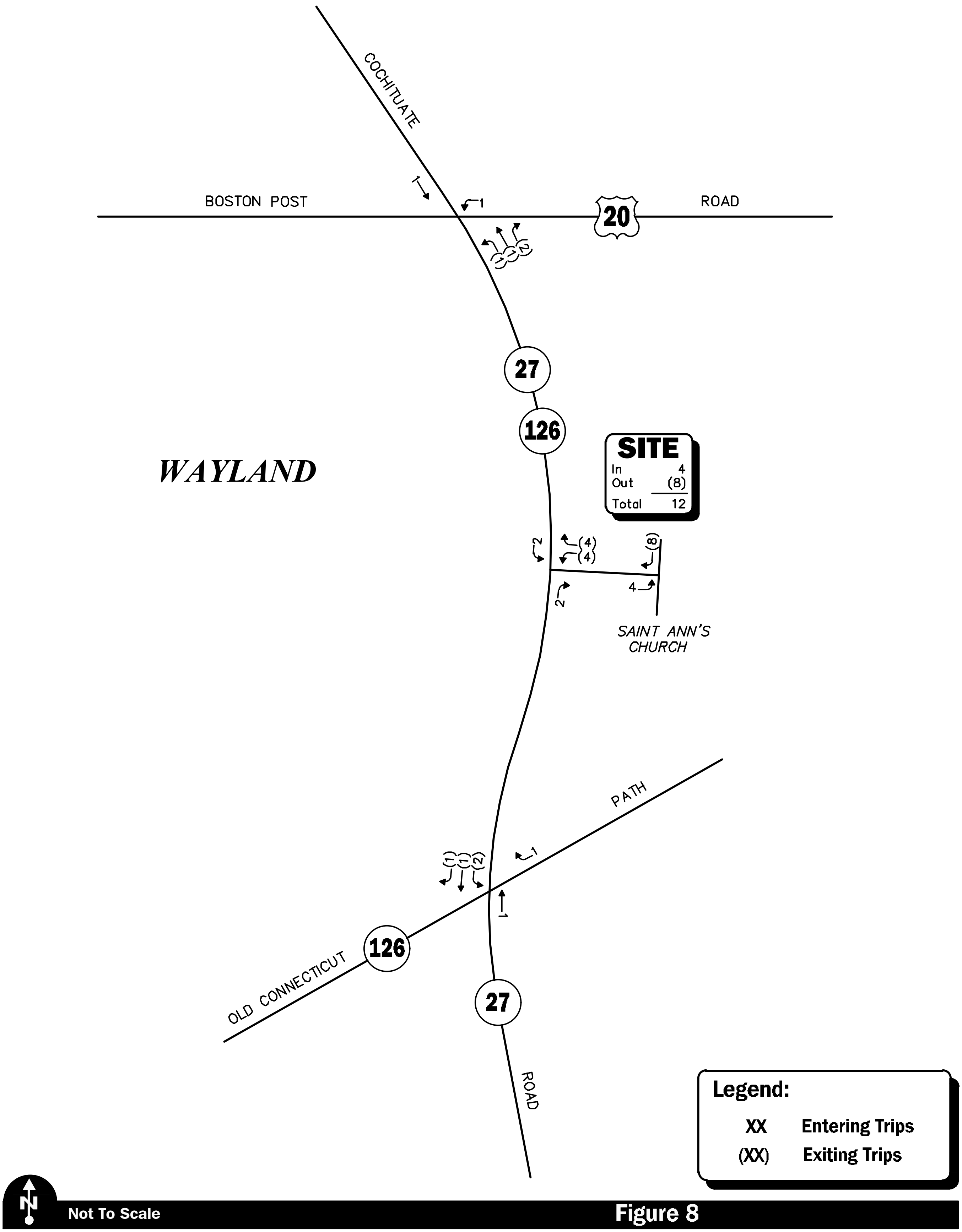


Figure 8

Project-Generated Weekday Morning Peak-Hour Traffic Volumes

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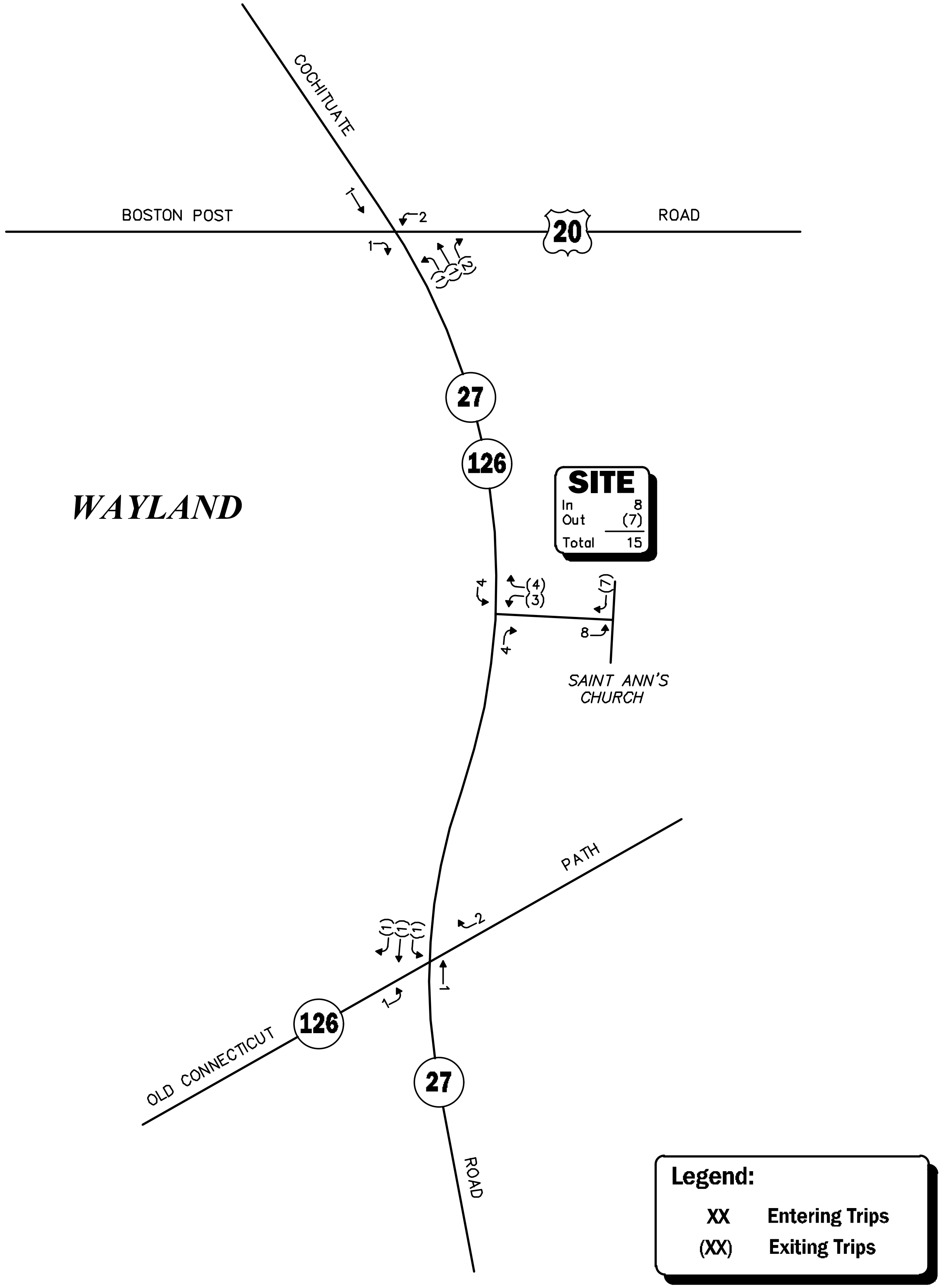
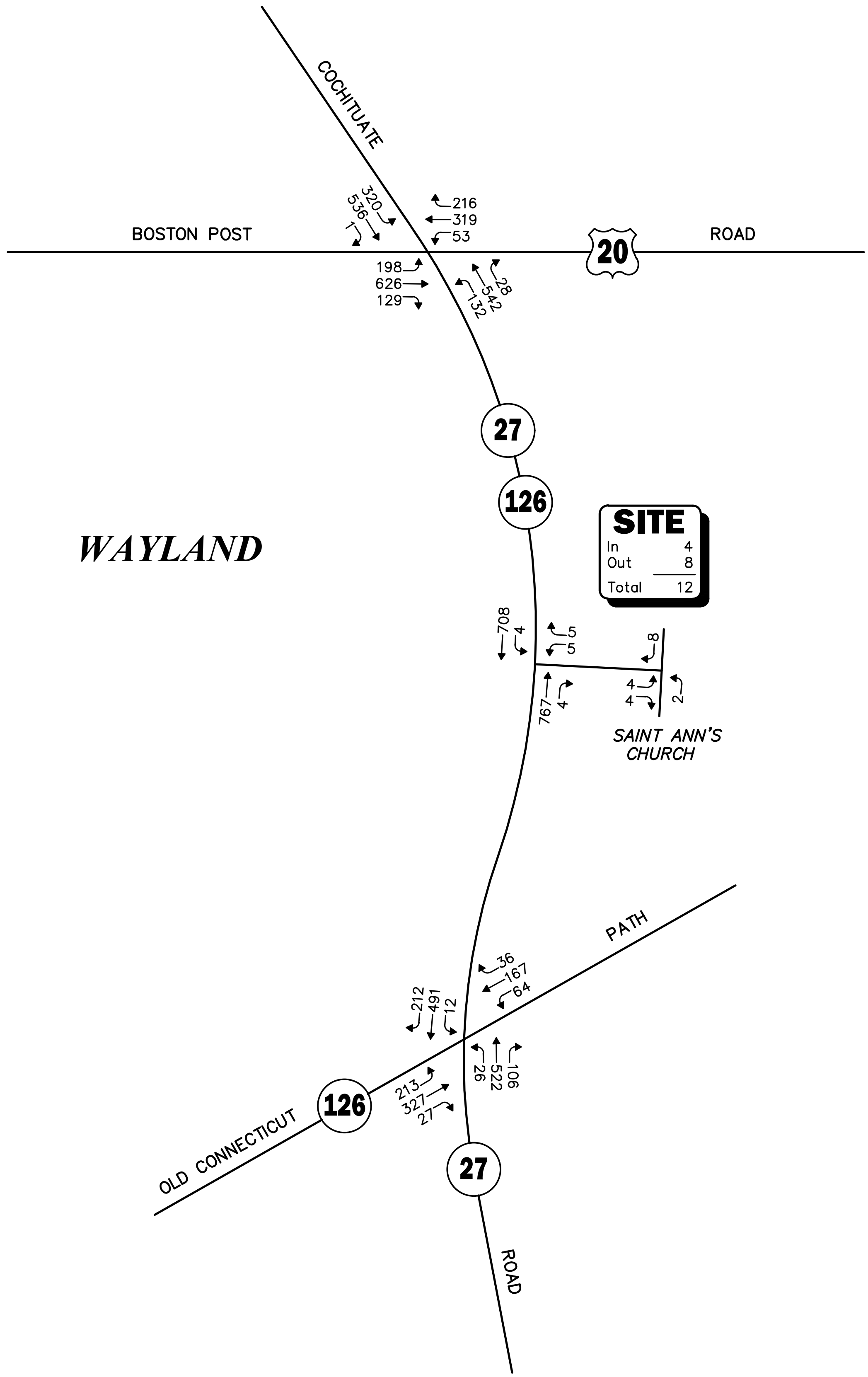


Figure 9

Project-Generated Weekday Evening Peak-Hour Traffic Volumes

Vanasse & Associates inc



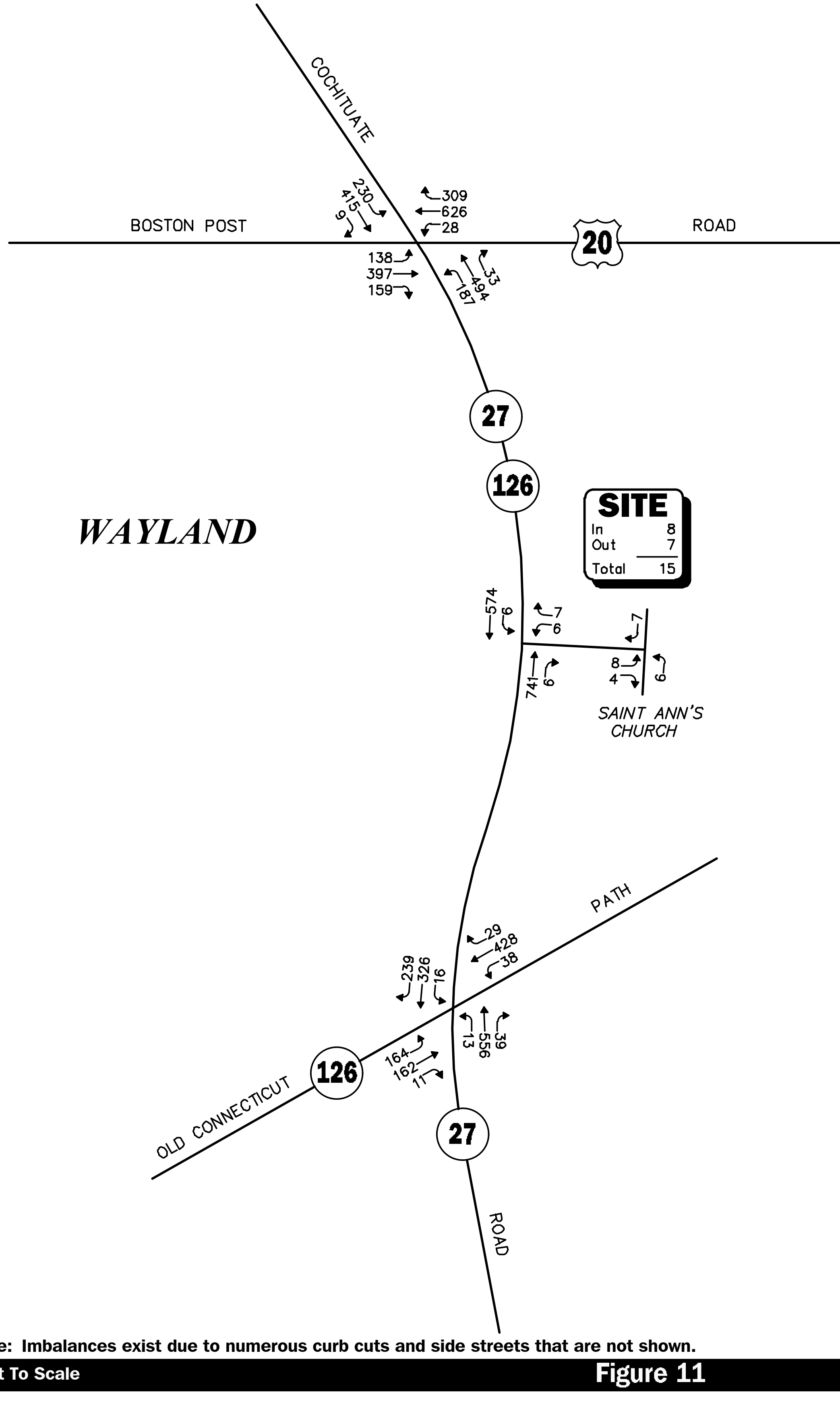
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Figure 10

Vanasse & Associates inc

2030 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

Vanasse & Associates inc

2030 Build Weekday Evening Peak-Hour Traffic Volumes

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In brief, six levels of service are defined for each type of facility. They are given letter designations ranging from A to F, with LOS "A" representing the best operating conditions and LOS "F" representing congested or constrained operations. An LOS of "E" is representative of a transportation facility that is operating at its design capacity with an LOS of "D" generally defined as the limit of "acceptable" traffic operations. Since the level-of-service of a traffic facility is a function of the 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 the year. The Synchro® intersection capacity analysis software, which is based on the analysis methodologies and procedures presented in the 2010 *Highway Capacity Manual* (HCM)[7] for unsignalized intersections, and in the *Highway Capacity Manual 6th Edition*, for signalized intersections, was used to complete the level-of-service and vehicle queue analyses.

Analysis Results

Level-of-service and vehicle queue analysis were conducted for 2023 Existing, 2030 No-Build, and 2030 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized in Tables 6 and 7, with the detailed analysis results attached.

The following is a summary of the level-of-service and vehicle queue analyses for intersections within the study area. For context, we note that an LOS of "D" or better is generally defined as "acceptable" operating conditions.

Route 20 at Cochituate Road

No change in overall level-of-service is predicted to occur over No-Build conditions, with Project-related impacts generally defined as a predicted increase in average motorist delay of up to 6.2 seconds that resulted in an increase in vehicle queuing of up to one (1) vehicle. Independent of the Project, overall intersection operations were identified to be at or over capacity (i.e., LOS "E" or "F", respectively) during the weekday evening peak-hour, with the following specific movements also identified to be operating at or over capacity: Cochituate Road northbound through/right-turn movements (weekday morning and evening peak hours); Cochituate Road southbound through/right-turn movements (weekday morning and evening peak hours); and Route 20 westbound through/right-turn movements (weekday evening peak-hour).

Cochituate Road at Old Connecticut Path

No change in overall level-of-service is predicted to occur over No-Build conditions, with Project-related impacts generally defined as a predicted increase in average motorist delay of up to 2.5 seconds that resulted in an increase in vehicle queuing of up to one (1) vehicle. Focusing on specific movements, the Cochituate Road southbound approach was shown to experience an increase in average motorist delay of 2.1 seconds during the weekday evening peak-hour that resulted in a change in level of service from LOS D to LOS E. Independent of the Project, overall intersection operations were identified to be at capacity during both peak hours under 2030 No-Build conditions, with the following specific movements identified to be operating at or over capacity: Old Connecticut Road westbound (weekday morning and evening peak hours); Cochituate Road northbound (weekday morning peak-hour); and Cochituate Road southbound (weekday morning peak-hour).

[7] *Highway Capacity Manual*, Transportation Research Board; Washington, DC; 2010.

Cochituate Road at the Project Site Driveway

All movements exiting the Project site driveway to Cochituate Road were shown to operate at LOS D during the weekday morning peak-hour and at LOS C during the weekday evening peak-hour with negligible vehicle queuing predicted. All movements along Cochituate Road approaching the driveway were shown to operate at LOS A, also with negligible vehicle queuing predicted.

Table 6
SIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

	2023 Existing				2030 No-Build				2030 Build			
Signalized Intersection/Peak-hour/Movement	V/C[a]	Delay[b]	LOS[c]	Queue[d] 50th/95th	V/C	Delay	LOS	Queue 50th/95th	V/C	Delay	LOS	Queue 50th/95th
Route 20 at Cochituate Road												
Weekday Morning:												
Route 20 EB LT	0.65	27.9	C	3/8	0.75	34.8	C	3/11	0.75	34.6	C	3/11
Route 20 EB TH/RT	0.72	33.3	C	8/16	0.81	37.4	D	9/19	0.81	37.4	D	9/20
Route 20 WB LT	0.31	27.3	C	1/3	0.35	28.5	C	1/3	0.35	28.5	C	1/3
Route 20 WB TH/RT	0.64	34.9	C	5/9	0.70	37.7	D	6/10	0.70	37.7	D	6/10
Cochituate Road NB LT	0.53	26.3	C	2/5	0.58	29.8	C	2/5	0.58	29.8	C	2/5
Cochituate Road NB TH/RT	1.33	>80.0	F	17/36	1.49	>80.0	F	20/39	1.50	>80.0	F	21/39
Cochituate Road SB LT	0.80	33.2	C	4/14	0.82	36.6	D	5/16	0.82	36.5	D	5/16
Cochituate Road SB TH/RT	0.87	43.8	D	11/29	0.94	56.1	E	12/32	0.95	56.7	E	12/32
Overall	--	**66.1**	**E**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--
Weekday Evening:												
Route 20 EB LT	0.52	23.2	C	2/5	0.58	25.1	C	2/6	0.58	25.1	C	2/6
Route 20 EB TH/RT	0.41	22.6	C	4/10	0.50	25.0	C	6/11	0.50	25.1	C	6/11
Route 20 WB LT	0.10	24.3	C	1/2	0.12	24.2	C	1/2	0.13	24.2	C	1/2
Route 20 WB TH/RT	0.94	49.2	D	11/23	1.08	>80.0	F	14/27	1.08	>80.0	F	14/27
Cochituate Road NB LT	0.64	29.9	C	3/6	0.70	32.5	C	3/7	0.71	32.7	C	3/7
Cochituate Road NB TH/RT	1.30	>80.0	F	16/33	1.41	>80.0	F	18/36	1.41	>80.0	F	18/36
Cochituate Road SB LT	0.78	35.8	D	4/9	0.80	36.5	D	4/11	0.80	36.5	D	4/11
Cochituate Road SB TH/RT	0.94	63.2	E	10/25	1.02	>80.0	F	11/28	1.02	>80.0	F	11/28
Overall	--	**68.1**	**E**	--	--	**>80.0**	**F**	--	--	**>80.0**	**F**	--
Cochituate Road at Old Connecticut Path												
Weekday Morning:												
Old Connecticut Path EB LT	0.76	31.7	C	3/10	0.83	40.2	D	4/12	0.84	40.7	D	4/12
Old Connecticut Path EB TH/RT	0.61	21.6	C	6/15	0.65	22.8	C	7/16	0.65	22.8	C	7/16
Old Connecticut Path WB LT/TH/RT	0.83	44.2	D	6/16	0.92	57.3	E	6/17	0.92	58.1	E	6/17
Cochituate Road NB LT/TH/RT	0.99	55.0	E	12/36	1.08	>80.0	F	14/40	1.08	>80.0	F	14/40
Cochituate Road SB LT/TH/RT	0.90	37.0	D	11/38	0.99	53.5	D	13/42	0.99	55.6	E	13/42
Overall	--	**40.0**	**D**	--	--	**55.4**	**E**	--	--	**56.5**	**E**	--
Weekday Evening:												
Old Connecticut Path EB LT	0.66	27.1	C	2/8	0.73	31.5	C	2/9	0.73	31.5	C	2/9
Old Connecticut Path EB TH/RT	0.26	17.1	B	2/7	0.28	17.3	B	2/8	0.28	17.3	B	3/8
Old Connecticut Path WB LT/TH/RT	1.12	>80.0	F	11/31	1.20	>80.0	F	13/33	1.21	>80.0	F	13/33
Cochituate Road NB LT/TH/RT	0.71	23.7	C	8/28	0.78	26.4	C	9/31	0.78	26.4	C	9/31
Cochituate Road SB LT/TH/RT	0.72	24.0	C	8/28	0.78	26.7	C	9/31	0.79	26.9	C	9/31
Overall	--	**45.9**	**D**	--	--	**55.7**	**E**	--	--	**56.4**	**E**	--

[a]Volume-to-capacity ratio.
[b]Percentile delay per vehicle in seconds.
[c]Level-of-Service.
[d]Queue length in vehicles.
NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

Table 7
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/Peak-Hour/Movement	2023 Existing				2030 No-Build				2030 Build			
	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Cochituate Road at the Project Site Driveway												
Weekday Morning:												
Project Site Driveway WB: LT/RT	--	--	--	--	2	29.4	D	0	10	31.4	D	0
Cochituate Road NB: TH/RT	--	--	--	--	769	0.0	A	0	771	0.0	A	0
Cochituate Road SB: LT/TH	--	--	--	--	710	0.0	A	0	712	0.1	A	0
Weekday Evening:												
Project Site Driveway WB: LT/RT	--	--	--	--	6	21.6	C	0	10	22.2	C	0
Cochituate Road NB: TH/RT	--	--	--	--	743	0.0	A	0	745	0.0	A	0
Cochituate Road SB: LT/TH	--	--	--	--	576	0.0	A	0	578	0.1	A	0

[a]Demand in vehicles per hour.
[b]Average control delay per vehicle (in seconds).
[c]Level of service.
[d]Queue length in vehicles.
NB = northbound, EB = eastbound; SB = southbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

SIGHT DISTANCE ASSESSMENT

Sight distance measurements were performed at the Project site driveway (Saint Ann Church northern driveway) intersection with Cochituate Road in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)[8] requirements. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance required 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 or corner sight distance (CSD) is the sight distance required by a driver entering or crossing an intersecting roadway to perceive an oncoming 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 required SSD value for the appropriate design speed, the intersection can operate in a safe manner. Table 8 presents the measured SSD and ISD at the subject intersection.

Table 8
SIGHT DISTANCE MEASUREMENTS[a]

Intersection/Sight Distance Measurement	Feet		
	Required Minimum (SSD)	Desirable (ISD)[b]	Measured
Cochituate Road at the Saint Ann Northern Driveway			
Stopping Sight Distance:			
Cochituate Road approaching from the north	305	--	466
Cochituate Road approaching from the south	305	--	500+
Intersection Sight Distance:			
Looking to the north from the Saint Ann Driveway	305	445	482
Looking to the south from the Sain Ann Driveway	305	385	77/500+[c]

[a]Recommended minimum values obtained from *A Policy on Geometric Design of Highways and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018; and based on a 40 mph approach speed on Cochituate Road.
[b]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.
[c]Available sight distance with the selective trimming/removal of trees and vegetation located within the sight triangle areas.

As can be seen in Table 8, with the selective trimming/removal of trees and vegetation located within the sight triangle area of the Project site driveway, the available lines of sight to and from the Project site driveway intersection with Cochituate Road will exceed the recommended minimum sight distance to function in a safe (SSD) and efficient (ISD) manner based on a 40 mph approach speed, which is above or consistent with the measured 85th percentile vehicle travel speed (35/40 mph) and above the posted speed limit (35 mph) in the vicinity of the Project site.

[8]*A Policy on Geometric Design of Highway and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.

SUMMARY

VAI has completed a detailed assessment of the potential impacts on the transportation infrastructure associated with the proposed construction of an age-qualified, multifamily residential development to be located at 124 Cochituate Road in Wayland, Massachusetts. The following specific areas have been evaluated as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; under existing and future conditions, both with and without the Project. Based on this assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the ITE,[9] the Project is expected to generate approximately 194 vehicle trips on an average weekday (two-way, 24-hour volume), with 12 vehicle trips expected during the weekday morning peak-hour and 15 vehicle trips expected during the weekday evening peak-hour;

2. The Project will not result in a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), acknowledging that one or more movements at the signalized study area intersections are currently operating or are predicted to operate at or over capacity (i.e., LOS "E" or "F", respectively) independent of the Project;

3. All movements exiting the Project site driveway to Cochituate Road are predicted to operate at LOS D during the weekday morning peak-hour and at LOS C during the weekday evening peak-hour with negligible vehicle queuing predicted. All movements along Cochituate Road are predicted to operate at LOS A, also with negligible vehicle queuing;

4. Independent of the Project, the Boston Post Road (Route 20)/Cochituate Road intersection was found to have a motor vehicle crash rate that is above the MassDOT average crash rate for similar intersections. As such, specific recommendations have been provided to advance safety-related improvements at the intersection; and

5. Lines of sight at the Project site driveway intersection with Cochituate Road were found to exceed or can be made to exceed the recommended minimum distance for the intersection to operate in a safe and efficient manner based on the appropriate approach speed.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with the implementation of the recommendations that follow.

RECOMMENDATIONS

A detailed transportation improvement program has been developed that is designed to provide safe and efficient access to the Project site and address any deficiencies identified as a part of this assessment. The following improvements have been recommended as a part of this evaluation and, where applicable, will be completed in conjunction with the Project subject to receipt of all necessary rights, permits, and approvals.

[9] Ibid 1.

Project Access

Access to the Project site will be provided by way of a new drive that will intersect the north side of the drive aisle to the north of the Saint Ann Catholic Church sanctuary (between the sanctuary and the rectory). Secondary access for emergency vehicles will be provided by way of a new driveway that will intersect the east side of Cochituate Road approximately 300 feet south of Windy Hill Road. The existing driveway that serves the Saint Ann Catholic Church to the south of the sanctuary will be retained. The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation:

- The Project site driveway should be a minimum of 24 feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.
- The emergency vehicle access should be a minimum of 20-feet in width and constructed of a material that will support travel by the largest anticipated responding emergency vehicle under all weather conditions and should be secured by means of a gate or other device deemed appropriate by the Wayland Fire Department.
- Where perpendicular parking is proposed the drive aisle behind the parking should be a minimum of 23 feet in order to facilitate parking maneuvers.
- Vehicles exiting the Project site should be placed under STOP-sign control with a marked STOP-line provided.
- All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[10]
- Americans with Disabilities Act (ADA)-compliant wheelchair ramps should be provided at pedestrian crossings to be constructed or modified in conjunction with the Project.
- Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site driveway should be designed and maintained so as not to restrict lines of sight.
- Existing trees and vegetation located within the sight triangle areas of the Project site driveway should be selectively trimmed or removed and maintained so as to provided the necessary sight lines for the driveway to operate in a safe manner.
- Snow accumulations (windrows) within sight triangle areas should be promptly removed where such accumulations would impede sight lines.
- Secure bicycle parking should be provided proximate to the residential building.

Off-Site

Route 20 at Cochituate Road

Independent of the Project, one or more movements at the Route 20/Cochituate Road intersection are currently or are predicted to operate at or over capacity during the peak hours. Absent improvement, motorist delays are expected to further increase in the future, again, independent of the Project. In addition

[10] *Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.

to and also independent of the Project, the intersection was identified to have a motor vehicle crash history that warrants further review and the advancement of specific improvements to enhance safety. In an effort to identify both safety and capacity improvements for this intersection, the Project proponent will facilitate the completion of a Road Safety Audit (RSA). The RSA will be completed prior to the issuance of a Certificate of Occupancy for the Project and can be used by the Town to support state grant applications for the implementation of the suggested improvements that will be an outcome of the RSA.

Transportation Demand Management

In an effort to encourage the use of alternative modes of transportation to single-occupant vehicles (SOVs), the follow Transportation Demand Management (TDM) measures will be implemented as part of the Project:

- A transportation coordinator will be assigned for the Project to coordinate the TDM program and serve as a point of contact with the Wayland Council on Aging (COA);
- A "welcome packet" will be provided to residents detailing available transportation options; and
- Secure bicycle parking will be provided for residents and visitors.

With implementation of the aforementioned recommendations, safe and efficient access will be provided to the Project site and the Project can be accommodated within the confines of the existing and improved transportation system.

cc: File

ATTACHMENTS

PROJECT SITE PLAN
AUTOMATIC TRAFFIC RECORDER COUNT DATA
TURNING MOVEMENT COUNT DATA
SEASONAL ADJUSTMENT DATA
VEHICLE TRAVEL SPEED DATA
MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING
GENERAL BACKGROUND TRAFFIC GROWTH
BACKGROUND DEVELOPMENT NETWORKS
TRIP-GENERATION CALCULATIONS
TRIP DISTRIBUTION
CAPACITY ANALYSIS WORKSHEETS

PROJECT SITE PLAN

LEGEND:

CC	PROPOSED CONCRETE CURB
129	PROPOSED INTERMEDIATE CONTOUR
130	PROPOSED INDEX CONTOUR
130.0 ×	PROPOSED SPOT GRADE
TW=131.87 BW=130.50 ×	PROPOSED TOP/BOTTOM OF WALL (NOT FOUNDATION)
TC=131.87 BC=130.50 ×	PROPOSED TOP/BOTTOM OF CURB

ZONING TABLE BASED ON ZONING BYLAWS

ZONING DISTRICT: RESIDENCE ZONE 40,000 – 180' FRONT

REQUIREMENTS	REQUIRED/ALLOWED	PROPOSED
FRONT YARD SETBACK	30 FT	25 FT
SIDE YARD SETBACK	25 FT	75.2 FT
REAR YARD SETBACK	30 FT	650 FT
MINIMUM FRONTAGE	180 FT	399 FT
MINIMUM LOT AREA	40,000 SF	401,387 SF (9.2 AC)
MAXIMUM BUILDING HEIGHT	35 FT	45
MAXIMUM NUMBER OF STORIES	2.5	3

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Revision:

Engineer of Record:

Drawn: DJS

Checked: SRG

Scale: AS SHOWN

Key Plan:

Project Name:

ST. ANN'S VILLAGE WAYLAND, MA

124 COCHITUATE ROAD, WAYLAND, MA 01778

Sheet Name:

SITE LAYOUT AND GRADING

Project Number:

50006.00

Issue Date:

JANUARY 31, 2023

Sheet Number:

C-1.1

AUTOMATIC TRAFFIC RECORDER COUNT DATA

Accurate Counts
978-664-2565

Location : Cochituate Road 95990001
Location : South of Windy Hill Lane
City/State: Wayland, MA

1/31/2023	NB		Hour Totals		SB		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	2	40			6	92				
12:15	1	36			1	68				
12:30	0	48			2	91				
12:45	1	41	4	165	1	94	10	345	14	510
1:00	0	35			4	68				
1:15	0	51			1	85				
1:30	0	60			0	78				
1:45	0	56	0	202	1	96	6	327	6	529
2:00	0	63			0	86				
2:15	0	63			0	84				
2:30	0	76			0	108				
2:45	1	76	1	278	1	108	1	386	2	664
3:00	0	71			1	125				
3:15	0	117			0	113				
3:30	2	92			1	142				
3:45	1	86	3	366	0	113	2	493	5	859
4:00	3	81			0	158				
4:15	1	98			2	100				
4:30	3	90			6	119				
4:45	1	107	8	376	5	132	13	509	21	885
5:00	2	93			5	113				
5:15	6	71			7	129				
5:30	8	80			10	95				
5:45	9	98	25	342	23	125	45	462	70	804
6:00	6	75			28	99				
6:15	17	67			30	82				
6:30	32	59			47	96				
6:45	30	48	85	249	79	74	184	351	269	600
7:00	31	41			93	64				
7:15	41	50			109	70				
7:30	55	41			135	53				
7:45	63	34	190	166	155	65	492	252	682	418
8:00	67	26			149	43				
8:15	74	14			159	58				
8:30	62	15			125	31				
8:45	50	17	253	72	113	24	546	156	799	228
9:00	46	24			124	34				
9:15	38	15			101	20				
9:30	41	11			83	15				
9:45	42	7	167	57	89	13	397	82	564	139
10:00	45	11			77	15				
10:15	38	3			74	5				
10:30	37	2			71	5				
10:45	53	2	173	18	72	6	294	31	467	49
11:00	52	2			59	7				
11:15	28	2			81	5				
11:30	44	1			99	7				
11:45	49	0	173	5	114	6	353	25	526	30
Total	1082	2296			2343	3419			3425	5715
Percent	32.0%	68.0%			40.7%	59.3%			37.5%	62.5%

Location : Cochituate Road 95990001
Location : South of Windy Hill Lane
City/State: Wayland, MA

2/1/2023	NB		Hour Totals		SB		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	41			5	131				
12:15	1	63			0	111				
12:30	1	81			3	92				
12:45	0	49	2	234	1	88	9	422	11	656
1:00	0	61			0	97				
1:15	0	48			0	101				
1:30	0	75			0	103				
1:45	0	67	0	251	0	101	0	402	0	653
2:00	0	58			0	101				
2:15	0	56			0	99				
2:30	0	78			1	109				
2:45	1	95	1	287	0	98	1	407	2	694
3:00	0	80			1	132				
3:15	0	86			0	134				
3:30	1	70			1	156				
3:45	1	100	2	336	0	111	2	533	4	869
4:00	3	74			1	167				
4:15	0	87			2	145				
4:30	1	70			6	120				
4:45	1	64	5	295	9	143	18	575	23	870
5:00	5	71			3	142				
5:15	7	72			6	123				
5:30	11	78			12	103				
5:45	9	76	32	297	27	88	48	456	80	753
6:00	3	62			31	119				
6:15	15	60			36	85				
6:30	40	50			53	70				
6:45	37	52	95	224	60	75	180	349	275	573
7:00	37	34			81	61				
7:15	56	49			109	61				
7:30	75	36			135	30				
7:45	101	35	269	154	142	41	467	193	736	347
8:00	76	19			145	40				
8:15	81	26			144	44				
8:30	102	25			113	53				
8:45	67	24	326	94	91	47	493	184	819	278
9:00	53	26			112	39				
9:15	65	12			90	28				
9:30	56	6			87	22				
9:45	58	14	232	58	71	11	360	100	592	158
10:00	40	7			72	15				
10:15	58	3			80	9				
10:30	48	10			71	7				
10:45	59	4	205	24	89	10	312	41	517	65
11:00	61	1			98	7				
11:15	72	5			90	8				
11:30	42	4			128	6				
11:45	56	0	231	10	118	1	434	22	665	32
Total	1400	2264			2324	3684			3724	5948
Percent	38.2%	61.8%			38.7%	61.3%			38.5%	61.5%
Grand Total	2482	4560			4667	7103			7149	11663
Percent	35.2%	64.8%			39.7%	60.3%			38.0%	62.0%
ADT		ADT: 9,406		AADT: 9,406						

Accurate Counts
978-664-2565

Location : Cochituate Road 95990001
Location : South of Windy Hill Lane
City/State: Wayland, MA

1/30/2023	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
Time	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	*	*	4	10	2	9	*	*	*	*	*	*	*	*	3	10
1:00	*	*	0	6	0	0	*	*	*	*	*	*	*	*	0	3
2:00	*	*	1	1	1	1	*	*	*	*	*	*	*	*	1	1
3:00	*	*	3	2	2	2	*	*	*	*	*	*	*	*	2	2
4:00	*	*	8	13	5	18	*	*	*	*	*	*	*	*	6	16
5:00	*	*	25	45	32	48	*	*	*	*	*	*	*	*	28	46
6:00	*	*	85	184	95	180	*	*	*	*	*	*	*	*	90	182
7:00	*	*	190	492	269	467	*	*	*	*	*	*	*	*	230	480
8:00	*	*	253	546	326	493	*	*	*	*	*	*	*	*	290	520
9:00	*	*	167	397	232	360	*	*	*	*	*	*	*	*	200	378
10:00	*	*	173	294	205	312	*	*	*	*	*	*	*	*	189	303
11:00	*	*	173	353	231	434	*	*	*	*	*	*	*	*	202	394
12:00 PM	*	*	165	345	234	422	*	*	*	*	*	*	*	*	200	384
1:00	*	*	202	327	251	402	*	*	*	*	*	*	*	*	226	364
2:00	*	*	278	386	287	407	*	*	*	*	*	*	*	*	282	396
3:00	*	*	366	493	336	533	*	*	*	*	*	*	*	*	351	513
4:00	*	*	376	509	295	575	*	*	*	*	*	*	*	*	336	542
5:00	*	*	342	462	297	456	*	*	*	*	*	*	*	*	320	459
6:00	*	*	249	351	224	349	*	*	*	*	*	*	*	*	236	350
7:00	*	*	166	252	154	193	*	*	*	*	*	*	*	*	160	222
8:00	*	*	72	156	94	184	*	*	*	*	*	*	*	*	83	170
9:00	*	*	57	82	58	100	*	*	*	*	*	*	*	*	58	91
10:00	*	*	18	31	24	41	*	*	*	*	*	*	*	*	21	36
11:00	*	*	5	25	1	7	*	*	*	*	*	*	*	*	3	16
Total	0	0	3378	5762	3655	5993	0	0	0	0	0	0	0	0	3517	5878
Day	0		9140		9648		0		0		0		0		9395	
AM Peak			8:00	8:00	8:00	8:00									8:00	8:00
Volume			253	546	326	493									290	520
PM Peak			4:00	4:00	3:00	4:00									3:00	4:00
Volume			376	509	336	575									351	542
Comb Total	0		9140		9648		0		0		0		0		9395	
ADT	ADT: 9,406		AADT: 9,406													

TURNING MOVEMENT COUNT DATA

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 1

Groups Printed- Cars - Trucks

	Route 27 From North			Old Connecticut Path From East			Route 27 From South			Old Connecticut Path From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	4	74	10	1	19	0	0	57	10	30	78	1	284
07:15 AM	5	97	16	8	10	0	0	55	13	29	100	3	336
07:30 AM	4	114	19	5	28	1	0	81	6	49	95	3	405
07:45 AM	3	116	27	12	29	9	5	96	18	43	109	11	478
Total	16	401	72	26	86	10	5	289	47	151	382	18	1503
08:00 AM	0	114	52	15	37	6	1	118	18	54	57	2	474
08:15 AM	5	89	69	14	54	8	15	135	20	35	58	4	506
08:30 AM	1	104	33	15	27	8	2	107	37	54	64	7	459
08:45 AM	3	93	22	13	21	8	0	96	24	18	70	0	368
Total	9	400	176	57	139	30	18	456	99	161	249	13	1807
Grand Total	25	801	248	83	225	40	23	745	146	312	631	31	3310
Apprch %	2.3	74.6	23.1	23.9	64.7	11.5	2.5	81.5	16	32	64.8	3.2	
Total %	0.8	24.2	7.5	2.5	6.8	1.2	0.7	22.5	4.4	9.4	19.1	0.9	
Cars	25	781	240	82	218	39	23	712	139	306	630	29	3224
% Cars	100	97.5	96.8	98.8	96.9	97.5	100	95.6	95.2	98.1	99.8	93.5	97.4
Trucks	0	20	8	1	7	1	0	33	7	6	1	2	86
% Trucks	0	2.5	3.2	1.2	3.1	2.5	0	4.4	4.8	1.9	0.2	6.5	2.6

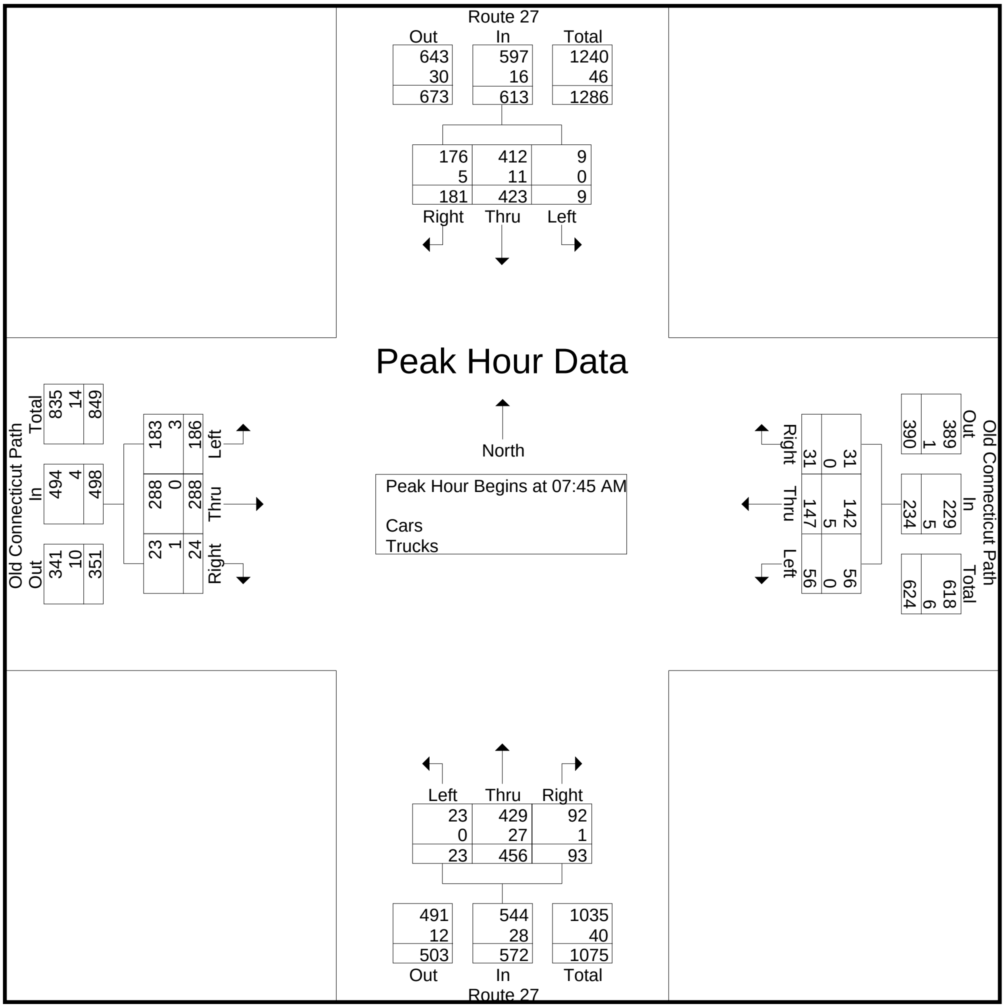
	Route 27 From North				Old Connecticut Path From East				Route 27 From South				Old Connecticut Path From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	3	**116**	27	146	12	29	**9**	50	5	96	18	119	43	**109**	**11**	**163**	478
08:00 AM	0	114	52	**166**	**15**	37	6	58	1	118	18	137	**54**	57	2	113	474
08:15 AM	**5**	89	**69**	163	14	**54**	8	**76**	**15**	**135**	20	**170**	35	58	4	97	**506**
08:30 AM	1	104	33	138	15	27	8	50	2	107	**37**	146	54	64	7	125	459
Total Volume	9	423	181	613	56	147	31	234	23	456	93	572	186	288	24	498	1917
% App. Total	1.5	69	29.5		23.9	62.8	13.2		4	79.7	16.3		37.3	57.8	4.8		
PHF	.450	.912	.656	.923	.933	.681	.861	.770	.383	.844	.628	.841	.861	.661	.545	.764	.947
Cars	9	412	176	597	56	142	31	229	23	429	92	544	183	288	23	494	1864
% Cars	100	97.4	97.2	97.4	100	96.6	100	97.9	100	94.1	98.9	95.1	98.4	100	95.8	99.2	97.2
Trucks	0	11	5	16	0	5	0	5	0	27	1	28	3	0	1	4	53
% Trucks	0	2.6	2.8	2.6	0	3.4	0	2.1	0	5.9	1.1	4.9	1.6	0	4.2	0.8	2.8

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
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:

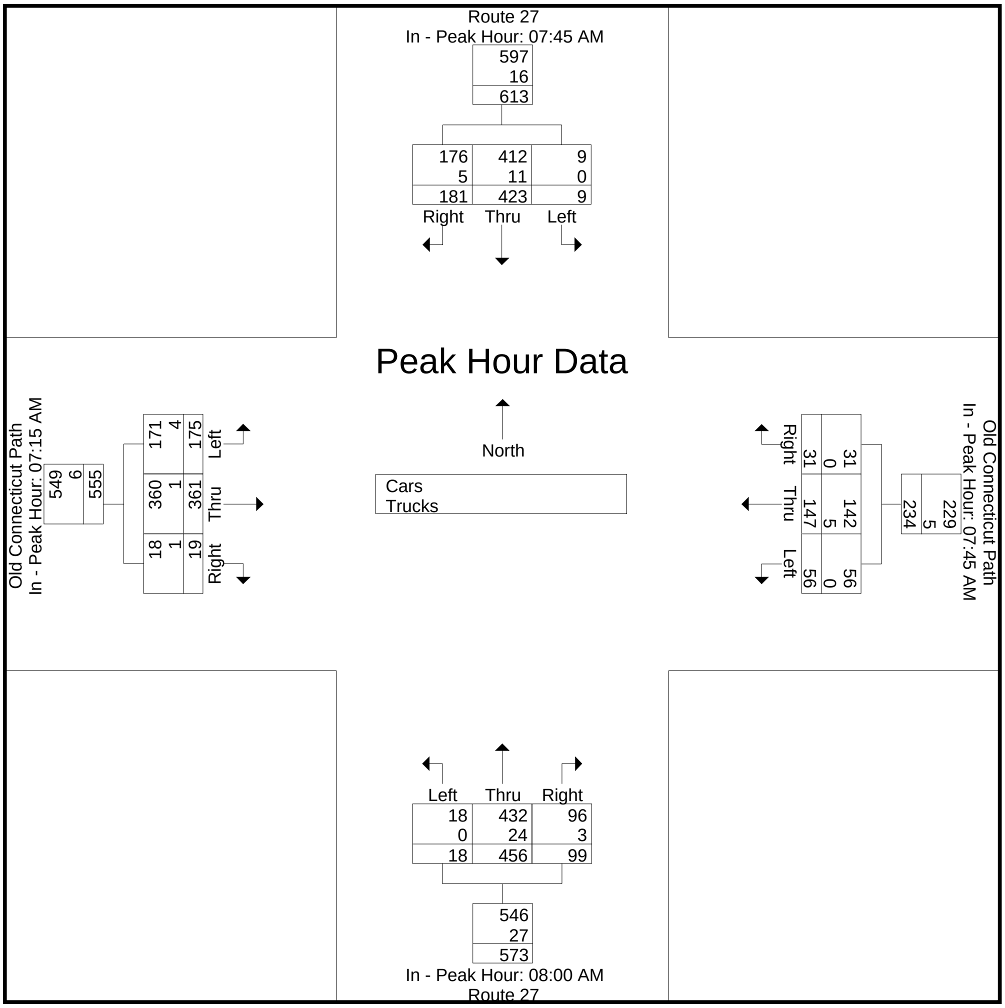
	07:45 AM				07:45 AM				08:00 AM				07:15 AM			
+0 mins.	3	**116**	27	146	12	29	**9**	50	1	118	18	137	29	100	3	132
+15 mins.	0	114	52	**166**	**15**	37	6	58	**15**	**135**	20	**170**	49	95	3	147
+30 mins.	**5**	89	**69**	163	14	**54**	8	**76**	2	107	**37**	146	43	**109**	**11**	**163**
+45 mins.	1	104	33	138	15	27	8	50	0	96	24	120	**54**	57	2	113
Total Volume	9	423	181	613	56	147	31	234	18	456	99	573	175	361	19	555
% App. Total	1.5	69	29.5		23.9	62.8	13.2		3.1	79.6	17.3		31.5	65	3.4	
PHF	.450	.912	.656	.923	.933	.681	.861	.770	.300	.844	.669	.843	.810	.828	.432	.851
Cars	9	412	176	597	56	142	31	229	18	432	96	546	171	360	18	549
% Cars	100	97.4	97.2	97.4	100	96.6	100	97.9	100	94.7	97	95.3	97.7	99.7	94.7	98.9
Trucks	0	11	5	16	0	5	0	5	0	24	3	27	4	1	1	6
% Trucks	0	2.6	2.8	2.6	0	3.4	0	2.1	0	5.3	3	4.7	2.3	0.3	5.3	1.1

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023



Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 4

Groups Printed- Cars

	Route 27 From North			Old Connecticut Path From East			Route 27 From South			Old Connecticut Path From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	4	73	10	1	18	0	0	57	9	29	78	0	279
07:15 AM	5	94	15	8	10	0	0	54	11	28	100	3	328
07:30 AM	4	109	17	5	27	1	0	78	5	48	94	3	391
07:45 AM	3	114	27	12	29	9	5	91	18	41	109	10	468
Total	16	390	69	26	84	10	5	280	43	146	381	16	1466
08:00 AM	0	111	48	15	34	6	1	115	18	54	57	2	461
08:15 AM	5	88	68	14	52	8	15	133	20	34	58	4	499
08:30 AM	1	99	33	15	27	8	2	90	36	54	64	7	436
08:45 AM	3	93	22	12	21	7	0	94	22	18	70	0	362
Total	9	391	171	56	134	29	18	432	96	160	249	13	1758
Grand Total	25	781	240	82	218	39	23	712	139	306	630	29	3224
Apprch %	2.4	74.7	22.9	24.2	64.3	11.5	2.6	81.5	15.9	31.7	65.3	3	
Total %	0.8	24.2	7.4	2.5	6.8	1.2	0.7	22.1	4.3	9.5	19.5	0.9	

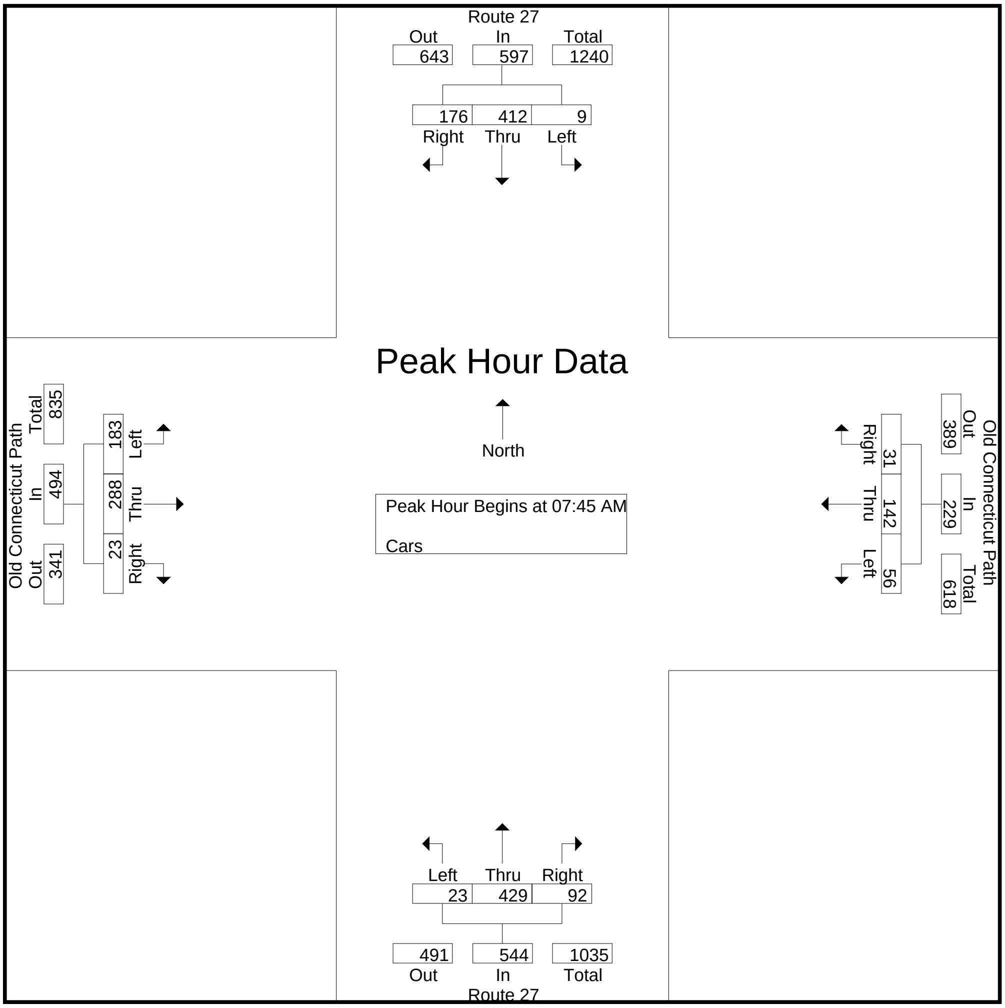
	Route 27 From North				Old Connecticut Path From East				Route 27 From South				Old Connecticut Path From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	3	**114**	27	144	12	29	**9**	50	5	91	18	114	41	**109**	**10**	**160**	468
08:00 AM	0	111	48	159	**15**	34	6	55	1	115	18	134	**54**	57	2	113	461
08:15 AM	**5**	88	**68**	**161**	14	**52**	8	**74**	**15**	**133**	20	**168**	34	58	4	96	**499**
08:30 AM	1	99	33	133	15	27	8	50	2	90	**36**	128	54	64	7	125	436
Total Volume	9	412	176	597	56	142	31	229	23	429	92	544	183	288	23	494	1864
% App. Total	1.5	69	29.5		24.5	62	13.5		4.2	78.9	16.9		37	58.3	4.7		
PHF	.450	.904	.647	.927	.933	.683	.861	.774	.383	.806	.639	.810	.847	.661	.575	.772	.934

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 5



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

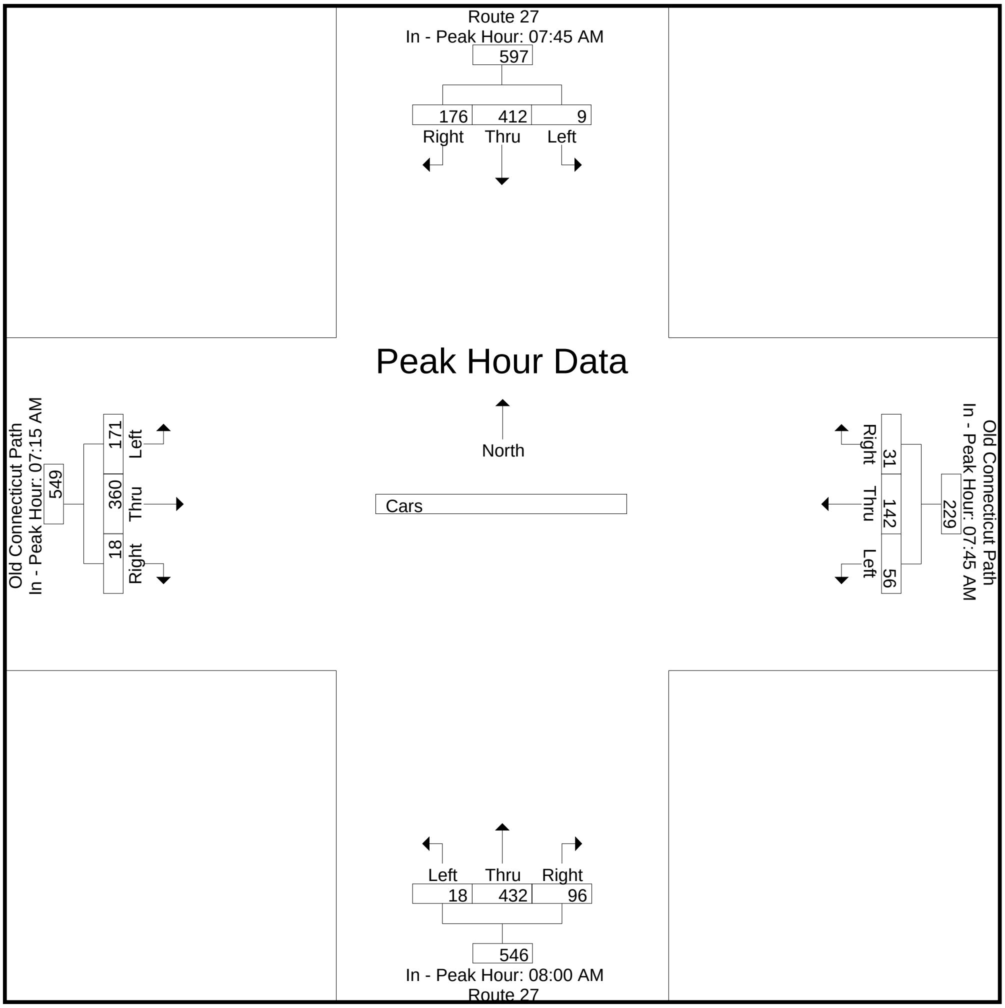
	07:45 AM				07:45 AM				08:00 AM				07:15 AM			
+0 mins.	3	**114**	27	144	12	29	**9**	50	1	115	18	134	28	100	3	131
+15 mins.	0	111	48	159	**15**	34	6	55	**15**	**133**	20	**168**	48	94	3	145
+30 mins.	**5**	88	**68**	**161**	14	**52**	8	**74**	2	90	**36**	128	41	**109**	**10**	**160**
+45 mins.	1	99	33	133	15	27	8	50	0	94	22	116	**54**	57	2	113
Total Volume	9	412	176	597	56	142	31	229	18	432	96	546	171	360	18	549
% App. Total	1.5	69	29.5		24.5	62	13.5		3.3	79.1	17.6		31.1	65.6	3.3	
PHF	.450	.904	.647	.927	.933	.683	.861	.774	.300	.812	.667	.813	.792	.826	.450	.858

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 6



Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 7

Groups Printed- Trucks

	Route 27 From North			Old Connecticut Path From East			Route 27 From South			Old Connecticut Path From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	1	0	0	1	0	0	0	1	1	0	1	5
07:15 AM	0	3	1	0	0	0	0	1	2	1	0	0	8
07:30 AM	0	5	2	0	1	0	0	3	1	1	1	0	14
07:45 AM	0	2	0	0	0	0	0	5	0	2	0	1	10
Total	0	11	3	0	2	0	0	9	4	5	1	2	37
08:00 AM	0	3	4	0	3	0	0	3	0	0	0	0	13
08:15 AM	0	1	1	0	2	0	0	2	0	1	0	0	7
08:30 AM	0	5	0	0	0	0	0	17	1	0	0	0	23
08:45 AM	0	0	0	1	0	1	0	2	2	0	0	0	6
Total	0	9	5	1	5	1	0	24	3	1	0	0	49
Grand Total	0	20	8	1	7	1	0	33	7	6	1	2	86
Apprch %	0	71.4	28.6	11.1	77.8	11.1	0	82.5	17.5	66.7	11.1	22.2	
Total %	0	23.3	9.3	1.2	8.1	1.2	0	38.4	8.1	7	1.2	2.3	

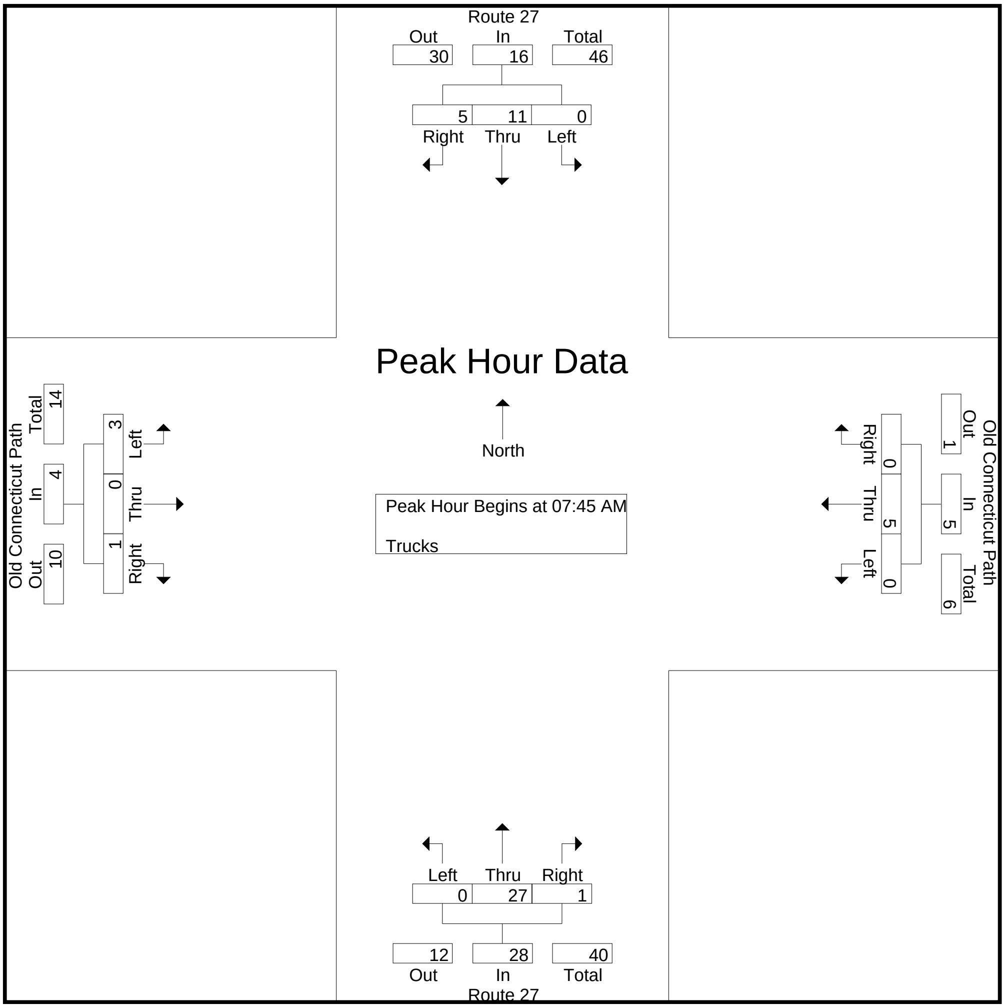
	Route 27 From North				Old Connecticut Path From East				Route 27 From South				Old Connecticut Path From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	2	0	2	0	0	0	0	0	5	0	5	**2**	0	**1**	**3**	10
08:00 AM	0	3	**4**	**7**	0	**3**	0	**3**	0	3	0	3	0	0	0	0	13
08:15 AM	0	1	1	2	0	2	0	2	0	2	0	2	1	0	0	1	7
08:30 AM	0	**5**	0	5	0	0	0	0	0	**17**	**1**	**18**	0	0	0	0	**23**
Total Volume	0	11	5	16	0	5	0	5	0	27	1	28	3	0	1	4	53
% App. Total	0	68.8	31.2		0	100	0		0	96.4	3.6		75	0	25		
PHF	.000	.550	.313	.571	.000	.417	.000	.417	.000	.397	.250	.389	.375	.000	.250	.333	.576

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 8



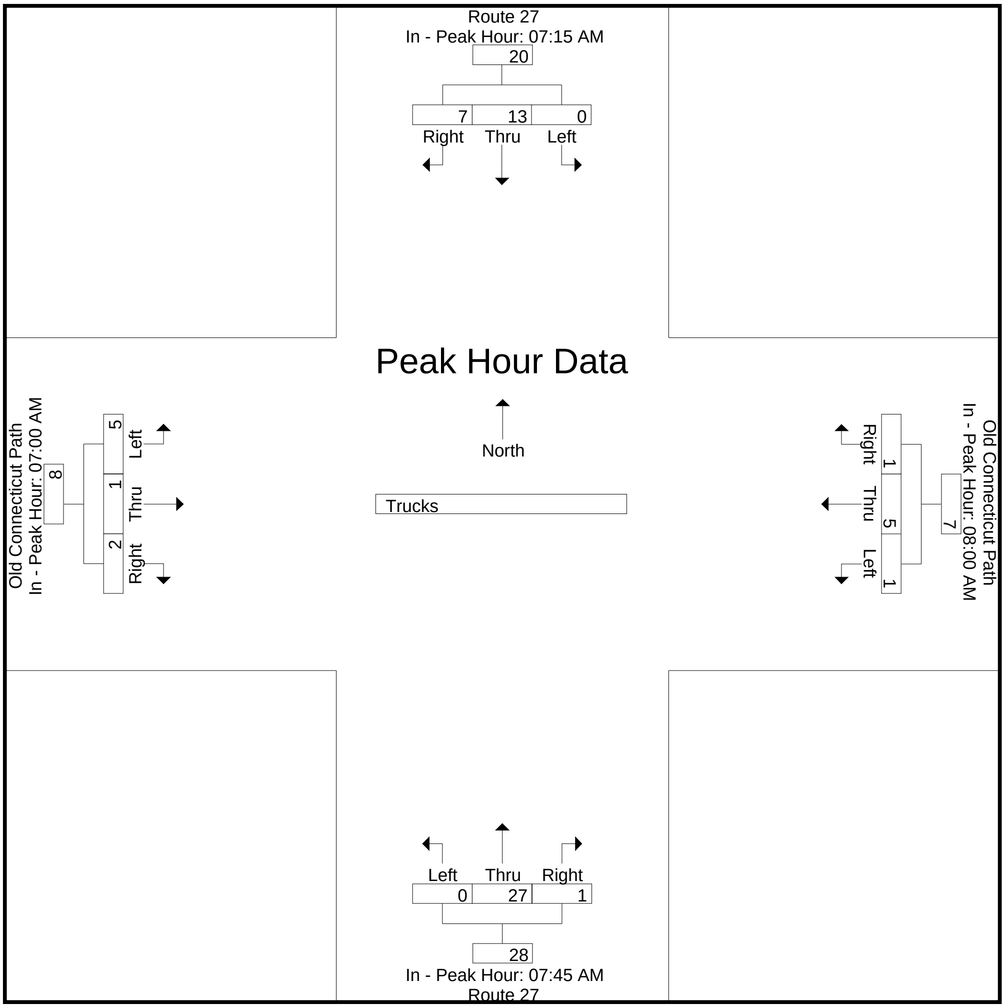
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				08:00 AM				07:45 AM				07:00 AM			
+0 mins.	0	3	1	4	0	**3**	0	**3**	0	5	0	5	1	0	**1**	2
+15 mins.	0	**5**	2	**7**	0	2	0	2	0	3	0	3	1	0	0	1
+30 mins.	0	2	0	2	0	0	0	0	0	2	0	2	1	**1**	0	2
+45 mins.	0	3	**4**	7	**1**	0	**1**	2	0	**17**	**1**	**18**	**2**	0	1	**3**
Total Volume	0	13	7	20	1	5	1	7	0	27	1	28	5	1	2	8
% App. Total	0	65	35		14.3	71.4	14.3		0	96.4	3.6		62.5	12.5	25	
PHF	.000	.650	.438	.714	.250	.417	.250	.583	.000	.397	.250	.389	.625	.250	.500	.667

Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 9



Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 10

Groups Printed- Bikes Peds

	Route 27 From North				Old Connecticut Path From East				Route 27 From South				Old Connecticut Path From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	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	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1
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	1	1	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
Grand Total	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	2
Apprch %	0	0	0		0	0	0		0	0	100		0	0	0				
Total %	0	0	0		0	0	0		0	0	100		0	0	0		50	50	

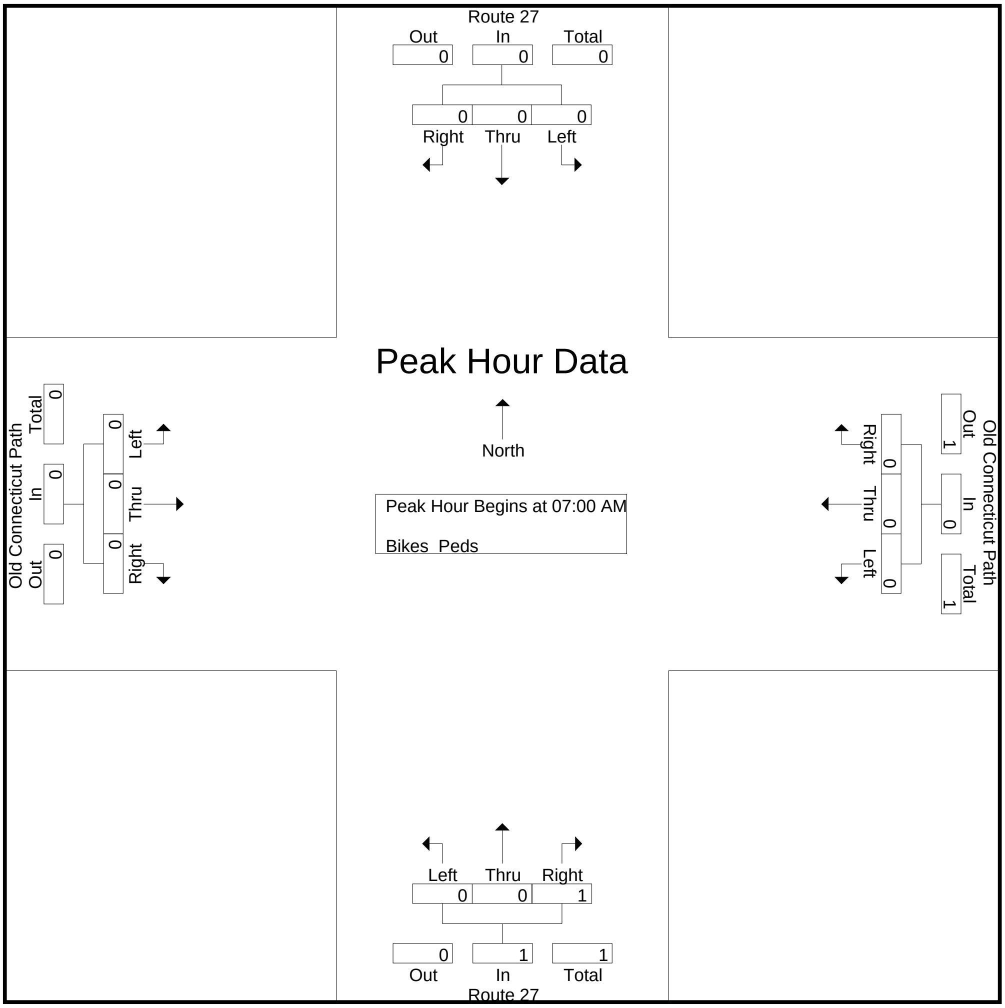
	Route 27 From North				Old Connecticut Path From East				Route 27 From South				Old Connecticut Path From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 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	**1**	**1**	0	0	0	0	**1**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
% App. Total	0	0	0		0	0	0		0	0	100		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.250

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 11

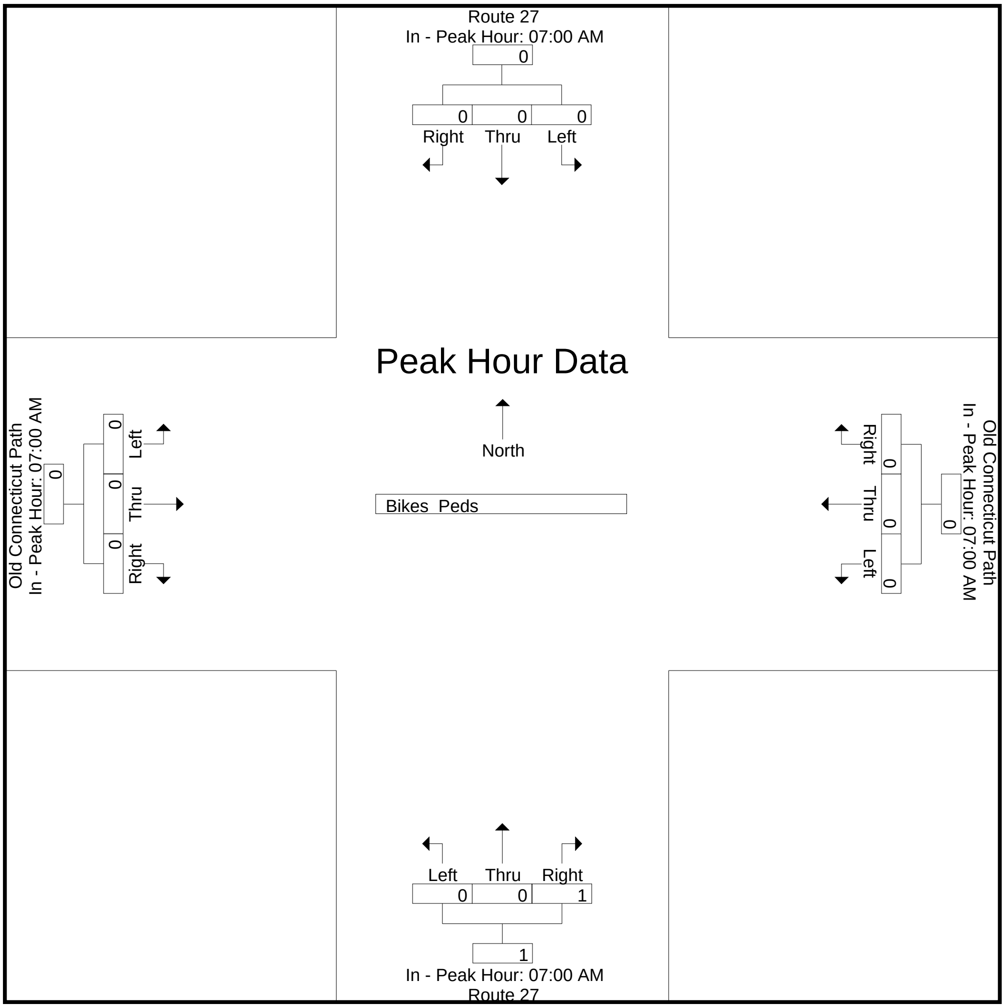


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	100		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Route 27	File Name : 95990001
E/W Street : Old Connecticut Path	Site Code : 95990001
City/State : Wayland, MA	Start Date : 1/31/2023
Weather : Cloudy	Page No : 12



Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 1

Groups Printed- Cars - Trucks

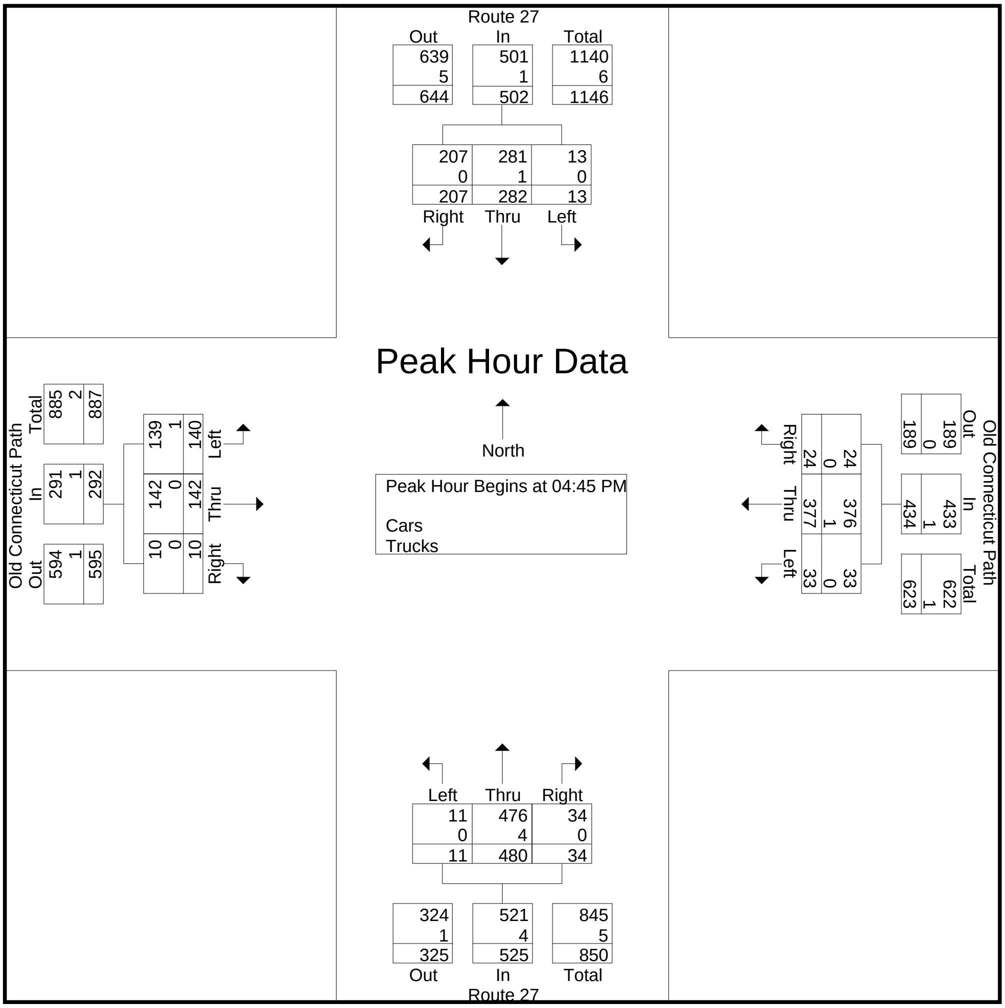
	Route 27 From North			Old Connecticut Path From East			Route 27 From South			Old Connecticut Path From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	4	91	40	17	88	8	2	92	9	34	37	1	423
04:15 PM	1	89	41	16	84	11	1	120	11	29	31	1	435
04:30 PM	1	77	42	7	83	8	1	130	8	30	25	0	412
04:45 PM	3	78	48	8	80	8	4	125	4	46	37	2	443
Total	9	335	171	48	335	35	8	467	32	139	130	4	1713
05:00 PM	3	64	67	5	102	5	3	118	13	29	36	1	446
05:15 PM	5	76	45	11	109	6	4	113	10	33	35	3	450
05:30 PM	2	64	47	9	86	5	0	124	7	32	34	4	414
05:45 PM	2	71	52	10	89	7	2	101	15	37	42	2	430
Total	12	275	211	35	386	23	9	456	45	131	147	10	1740
Grand Total	21	610	382	83	721	58	17	923	77	270	277	14	3453
Apprch %	2.1	60.2	37.7	9.6	83.6	6.7	1.7	90.8	7.6	48.1	49.4	2.5	
Total %	0.6	17.7	11.1	2.4	20.9	1.7	0.5	26.7	2.2	7.8	8	0.4	
Cars	21	606	381	83	720	58	17	911	77	268	277	14	3433
% Cars	100	99.3	99.7	100	99.9	100	100	98.7	100	99.3	100	100	99.4
Trucks	0	4	1	0	1	0	0	12	0	2	0	0	20
% Trucks	0	0.7	0.3	0	0.1	0	0	1.3	0	0.7	0	0	0.6

	Route 27 From North				Old Connecticut Path From East				Route 27 From South				Old Connecticut Path From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	3	**78**	48	129	8	80	**8**	96	**4**	**125**	4	133	**46**	**37**	2	**85**	443
05:00 PM	3	64	**67**	**134**	5	102	5	112	3	118	**13**	**134**	29	36	1	66	446
05:15 PM	**5**	76	45	126	**11**	**109**	6	**126**	4	113	10	127	33	35	3	71	**450**
05:30 PM	2	64	47	113	9	86	5	100	0	124	7	131	32	34	**4**	70	414
Total Volume	13	282	207	502	33	377	24	434	11	480	34	525	140	142	10	292	1753
% App. Total	2.6	56.2	41.2		7.6	86.9	5.5		2.1	91.4	6.5		47.9	48.6	3.4		
PHF	.650	.904	.772	.937	.750	.865	.750	.861	.688	.960	.654	.979	.761	.959	.625	.859	.974
Cars	13	281	207	501	33	376	24	433	11	476	34	521	139	142	10	291	1746
% Cars	100	99.6	100	99.8	100	99.7	100	99.8	100	99.2	100	99.2	99.3	100	100	99.7	99.6
Trucks	0	1	0	1	0	1	0	1	0	4	0	4	1	0	0	1	7
% Trucks	0	0.4	0	0.2	0	0.3	0	0.2	0	0.8	0	0.8	0.7	0	0	0.3	0.4

Accurate Counts

978-664-2565

N/S Street : Route 27	File Name : 95990001
E/W Street : Old Connecticut Path	Site Code : 95990001
City/State : Wayland, MA	Start Date : 1/31/2023
Weather : Cloudy	Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

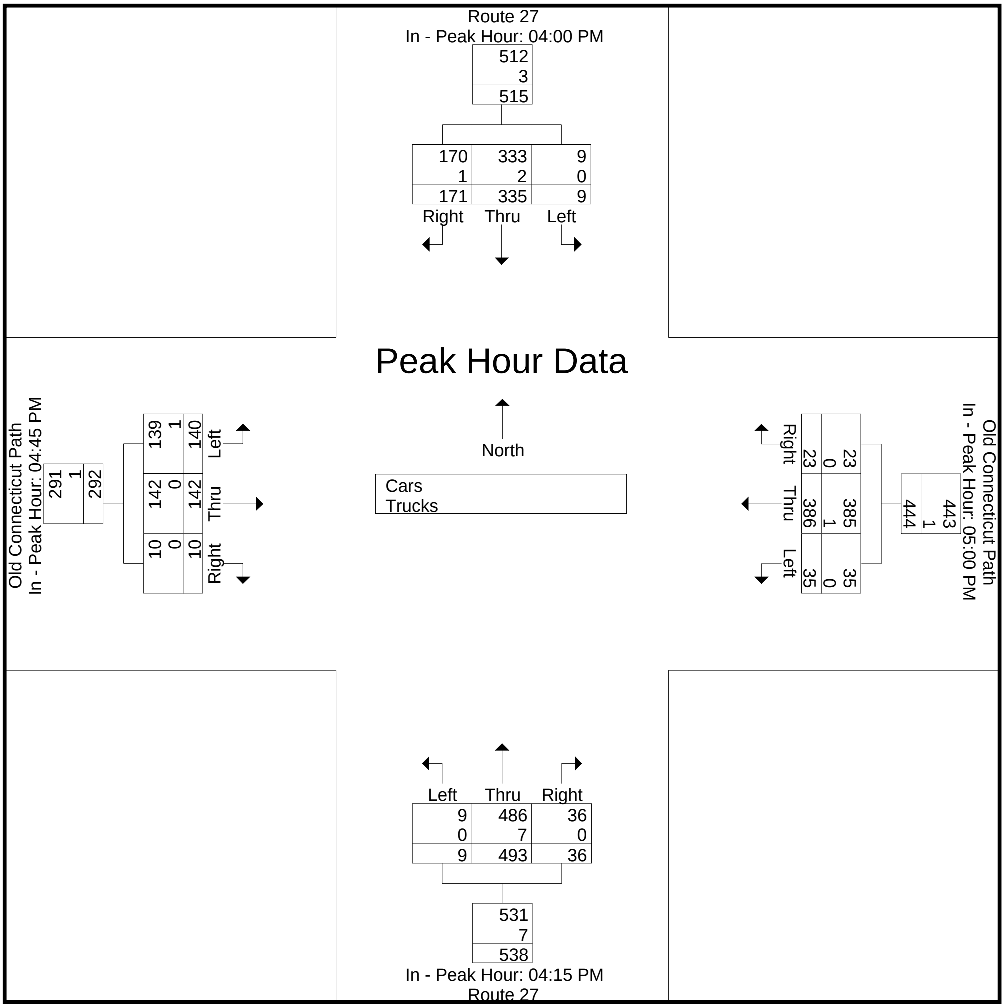
Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				04:15 PM				04:45 PM			
+0 mins.	**4**	**91**	40	**135**	5	102	5	112	1	120	11	132	**46**	**37**	2	**85**
+15 mins.	1	89	41	131	**11**	**109**	6	**126**	1	**130**	8	**139**	29	36	1	66
+30 mins.	1	77	42	120	9	86	5	100	**4**	125	4	133	33	35	3	71
+45 mins.	3	78	**48**	129	10	89	**7**	106	3	118	**13**	134	32	34	**4**	70
Total Volume	9	335	171	515	35	386	23	444	9	493	36	538	140	142	10	292
% App. Total	1.7	65	33.2		7.9	86.9	5.2		1.7	91.6	6.7		47.9	48.6	3.4	
PHF	.563	.920	.891	.954	.795	.885	.821	.881	.563	.948	.692	.968	.761	.959	.625	.859
Cars	9	333	170	512	35	385	23	443	9	486	36	531	139	142	10	291
% Cars	100	99.4	99.4	99.4	100	99.7	100	99.8	100	98.6	100	98.7	99.3	100	100	99.7
Trucks	0	2	1	3	0	1	0	1	0	7	0	7	1	0	0	1
% Trucks	0	0.6	0.6	0.6	0	0.3	0	0.2	0	1.4	0	1.3	0.7	0	0	0.3

Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 4

Groups Printed- Cars

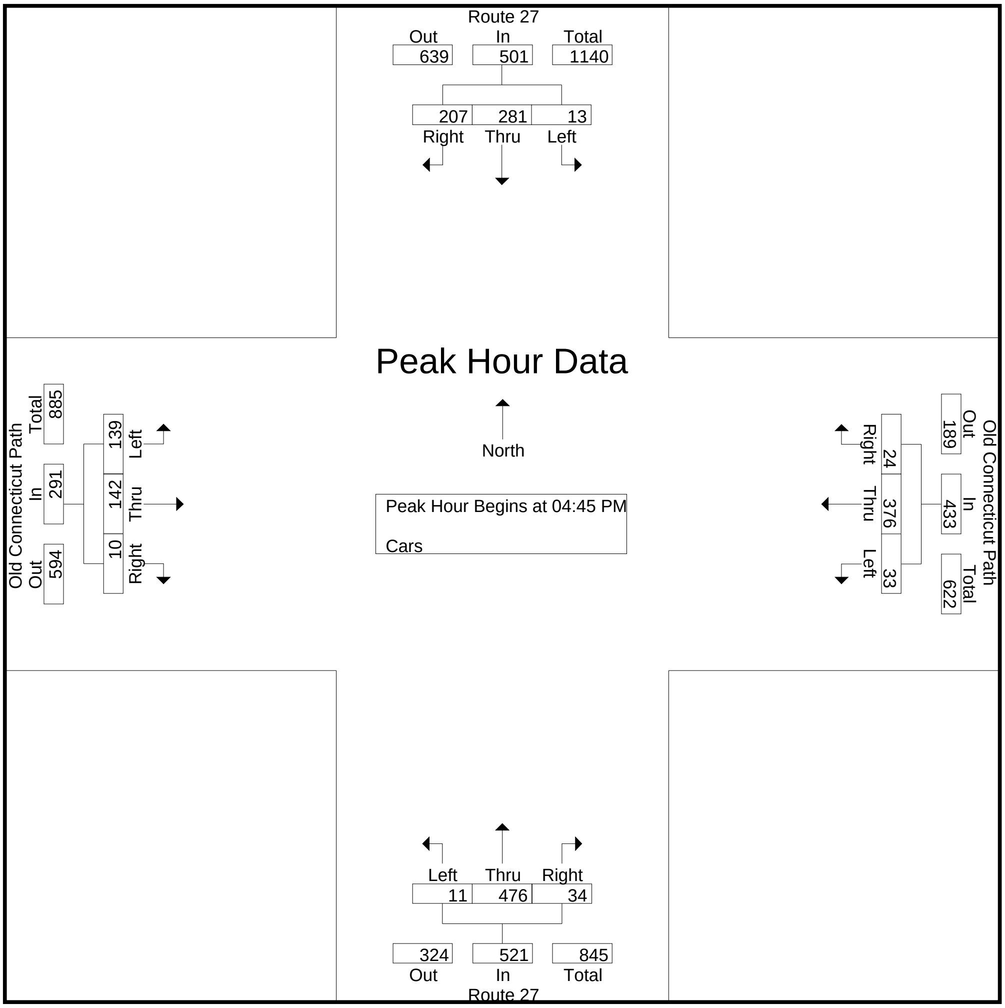
	Route 27 From North			Old Connecticut Path From East			Route 27 From South			Old Connecticut Path From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	4	89	40	17	88	8	2	89	9	34	37	1	418
04:15 PM	1	89	41	16	84	11	1	118	11	28	31	1	432
04:30 PM	1	77	41	7	83	8	1	129	8	30	25	0	410
04:45 PM	3	78	48	8	80	8	4	121	4	46	37	2	439
Total	9	333	170	48	335	35	8	457	32	138	130	4	1699
05:00 PM	3	64	67	5	102	5	3	118	13	28	36	1	445
05:15 PM	5	75	45	11	108	6	4	113	10	33	35	3	448
05:30 PM	2	64	47	9	86	5	0	124	7	32	34	4	414
05:45 PM	2	70	52	10	89	7	2	99	15	37	42	2	427
Total	12	273	211	35	385	23	9	454	45	130	147	10	1734
Grand Total	21	606	381	83	720	58	17	911	77	268	277	14	3433
Apprch %	2.1	60.1	37.8	9.6	83.6	6.7	1.7	90.6	7.7	47.9	49.6	2.5	
Total %	0.6	17.7	11.1	2.4	21	1.7	0.5	26.5	2.2	7.8	8.1	0.4	

	Route 27 From North				Old Connecticut Path From East				Route 27 From South				Old Connecticut Path From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	3	**78**	48	129	8	80	**8**	96	**4**	121	4	129	**46**	**37**	2	**85**	439
05:00 PM	3	64	**67**	**134**	5	102	5	112	3	118	**13**	**134**	28	36	1	65	445
05:15 PM	**5**	75	45	125	**11**	**108**	6	**125**	4	113	10	127	33	35	3	71	**448**
05:30 PM	2	64	47	113	9	86	5	100	0	**124**	7	131	32	34	**4**	70	414
Total Volume	13	281	207	501	33	376	24	433	11	476	34	521	139	142	10	291	1746
% App. Total	2.6	56.1	41.3		7.6	86.8	5.5		2.1	91.4	6.5		47.8	48.8	3.4		
PHF	.650	.901	.772	.935	.750	.870	.750	.866	.688	.960	.654	.972	.755	.959	.625	.856	.974

Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 5

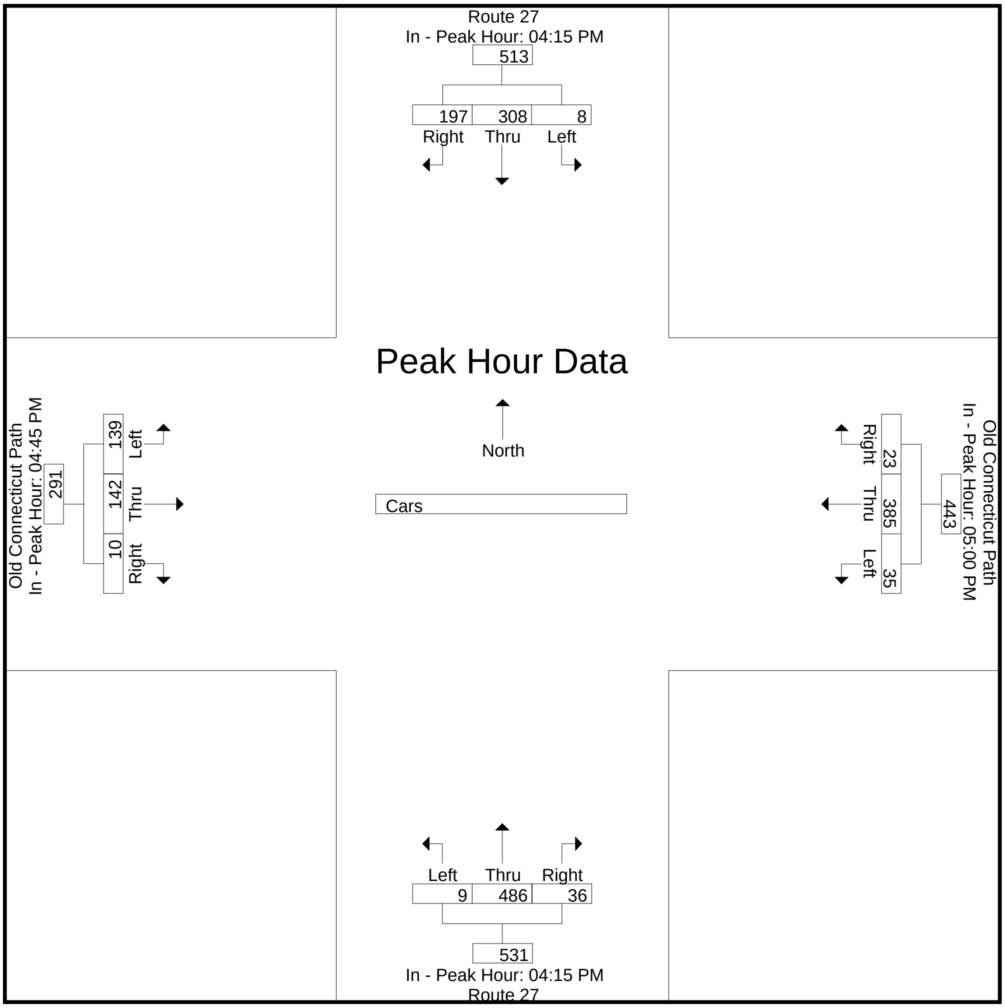


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				05:00 PM				04:15 PM				04:45 PM			
+0 mins.	1	**89**	41	131	5	102	5	112	1	118	11	130	**46**	**37**	2	**85**
+15 mins.	1	77	41	119	**11**	**108**	6	**125**	1	**129**	8	**138**	28	36	1	65
+30 mins.	**3**	78	48	129	9	86	5	100	**4**	121	4	129	33	35	3	71
+45 mins.	3	64	**67**	**134**	10	89	**7**	106	3	118	**13**	134	32	34	**4**	70
Total Volume	8	308	197	513	35	385	23	443	9	486	36	531	139	142	10	291
% App. Total	1.6	60	38.4		7.9	86.9	5.2		1.7	91.5	6.8		47.8	48.8	3.4	
PHF	.667	.865	.735	.957	.795	.891	.821	.886	.563	.942	.692	.962	.755	.959	.625	.856

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 6



Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 7

Groups Printed- Trucks

	Route 27 From North			Old Connecticut Path From East			Route 27 From South			Old Connecticut Path From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	2	0	0	0	0	0	3	0	0	0	0	5
04:15 PM	0	0	0	0	0	0	0	2	0	1	0	0	3
04:30 PM	0	0	1	0	0	0	0	1	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	4	0	0	0	0	4
Total	0	2	1	0	0	0	0	10	0	1	0	0	14
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
05:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	1	0	0	0	0	0	2	0	0	0	0	3
Total	0	2	0	0	1	0	0	2	0	1	0	0	6
Grand Total	0	4	1	0	1	0	0	12	0	2	0	0	20
Apprch %	0	80	20	0	100	0	0	100	0	100	0	0	
Total %	0	20	5	0	5	0	0	60	0	10	0	0	

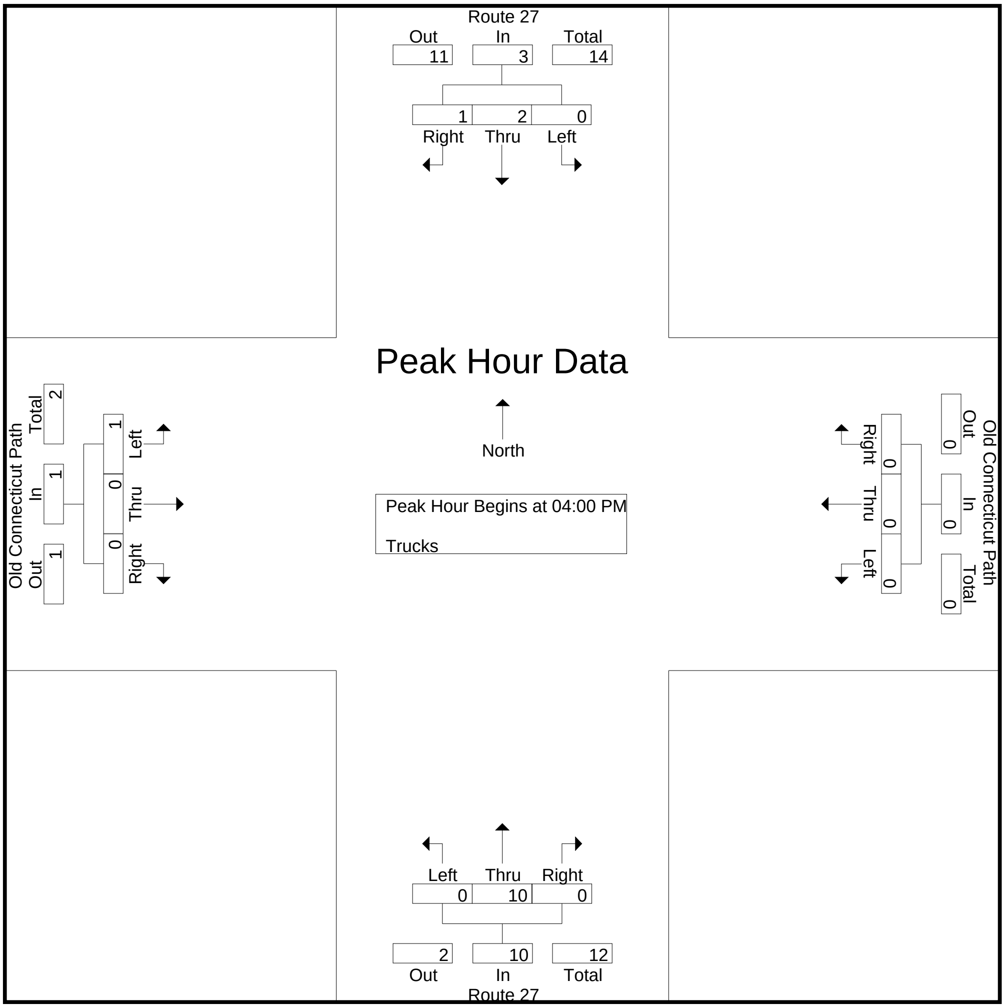
	Route 27 From North				Old Connecticut Path From East				Route 27 From South				Old Connecticut Path From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**2**	0	**2**	0	0	0	0	0	3	0	3	0	0	0	0	**5**
04:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	**1**	0	0	**1**	3
04:30 PM	0	0	**1**	1	0	0	0	0	0	1	0	1	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	**4**	0	**4**	0	0	0	0	4
Total Volume	0	2	1	3	0	0	0	0	0	10	0	10	1	0	0	1	14
% App. Total	0	66.7	33.3		0	0	0		0	100	0		100	0	0		
PHF	.000	.250	.250	.375	.000	.000	.000	.000	.000	.625	.000	.625	.250	.000	.000	.250	.700

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 8



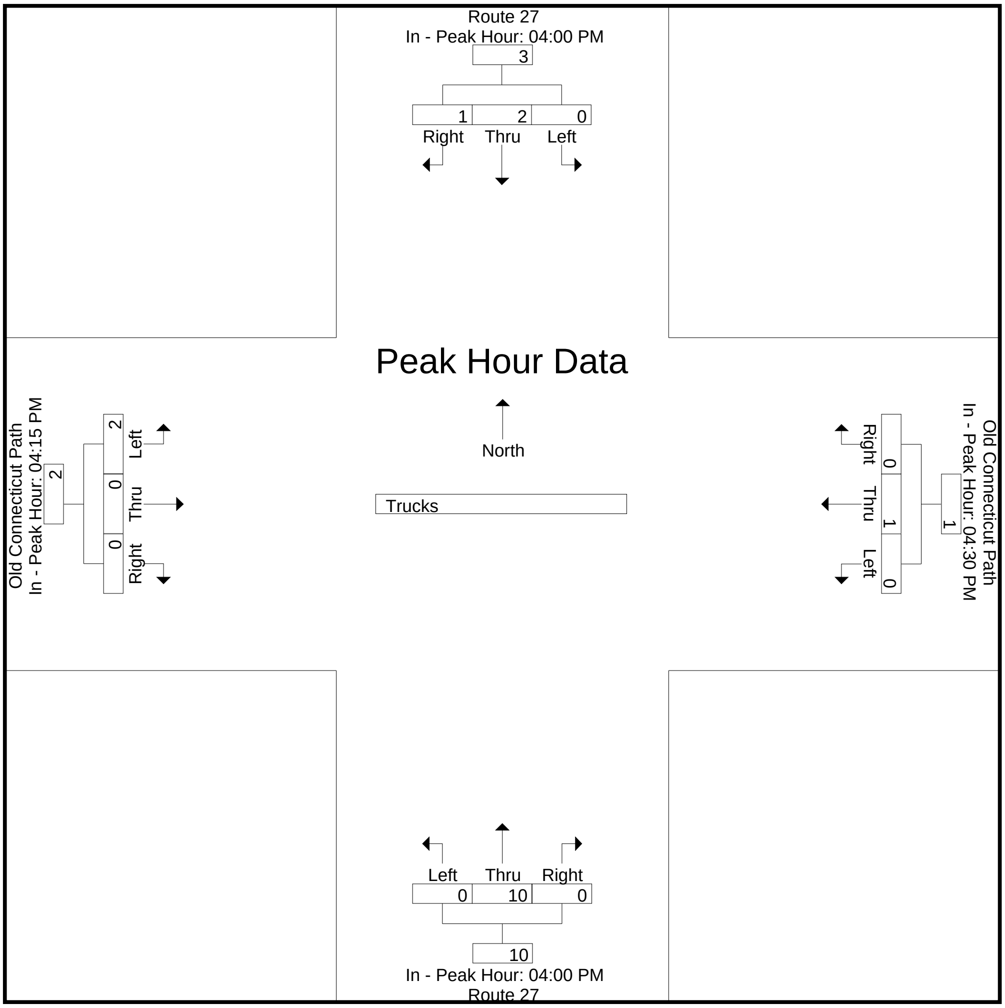
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:30 PM				04:00 PM				04:15 PM			
+0 mins.	0	**2**	0	**2**	0	0	0	0	0	3	0	3	**1**	0	0	**1**
+15 mins.	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0
+30 mins.	0	0	**1**	1	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	0	0	0	0	**1**	0	**1**	0	**4**	0	**4**	1	0	0	1
Total Volume	0	2	1	3	0	1	0	1	0	10	0	10	2	0	0	2
% App. Total	0	66.7	33.3		0	100	0		0	100	0		100	0	0	
PHF	.000	.250	.250	.375	.000	.250	.000	.250	.000	.625	.000	.625	.500	.000	.000	.500

Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 10

Groups Printed- Bikes Peds

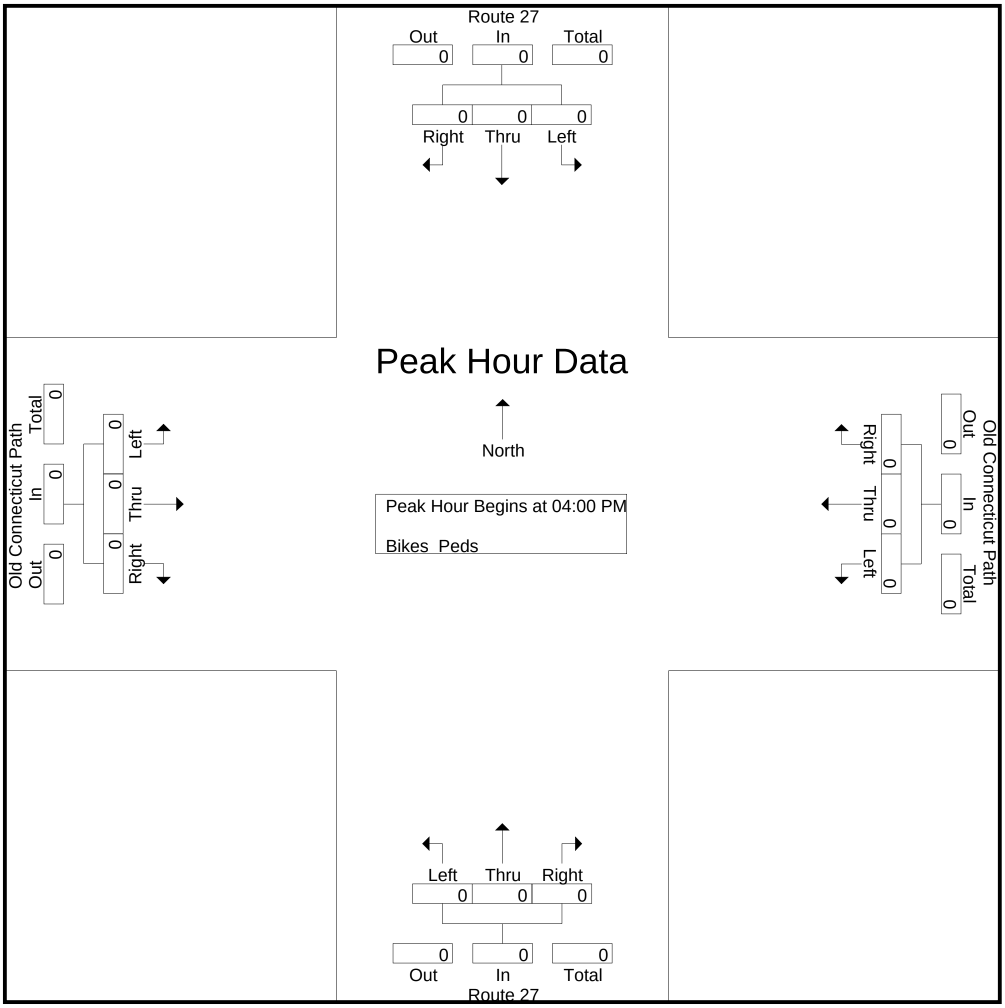
	Route 27 From North				Old Connecticut Path From East				Route 27 From South				Old Connecticut Path From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 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
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	1	1	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

	Route 27 From North				Old Connecticut Path From East				Route 27 From South				Old Connecticut Path From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	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
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	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 : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 11



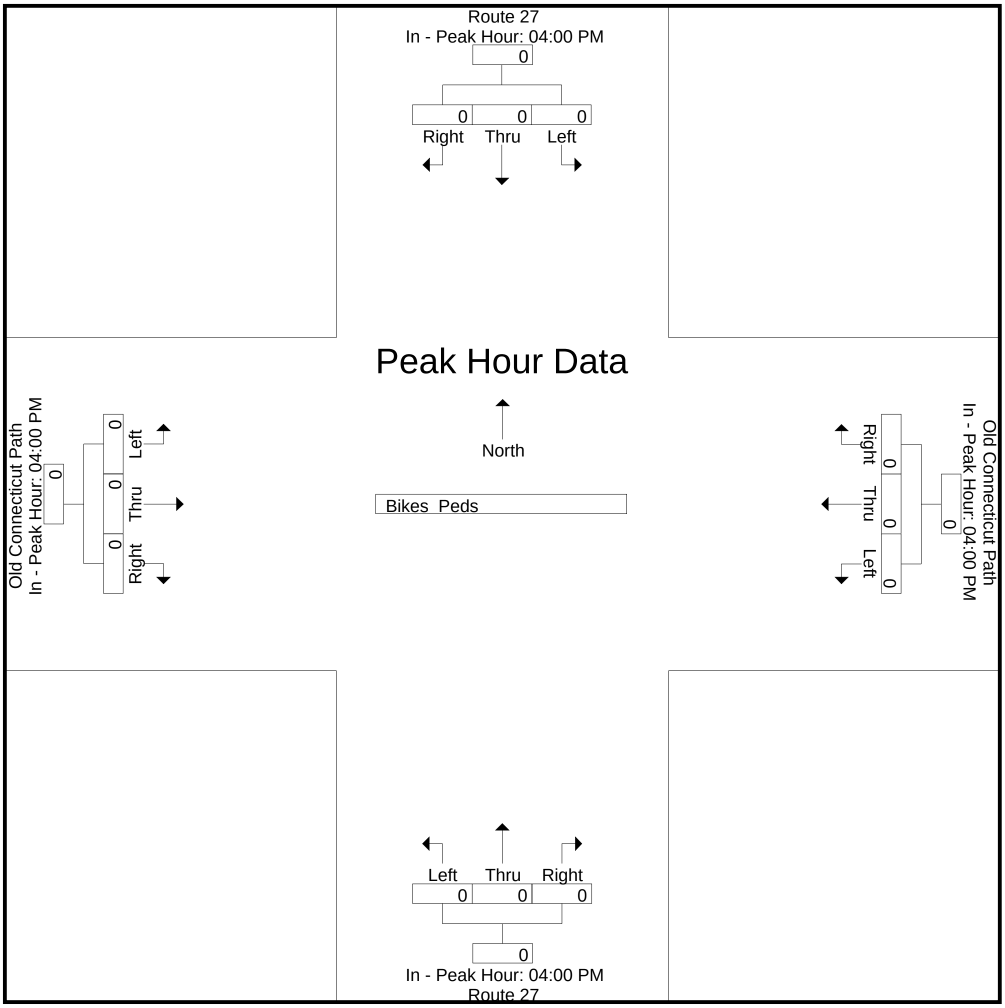
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	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

Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Old Connecticut Path
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990001
Site Code : 95990001
Start Date : 1/31/2023
Page No : 12



Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 1

Groups Printed- Cars - Trucks

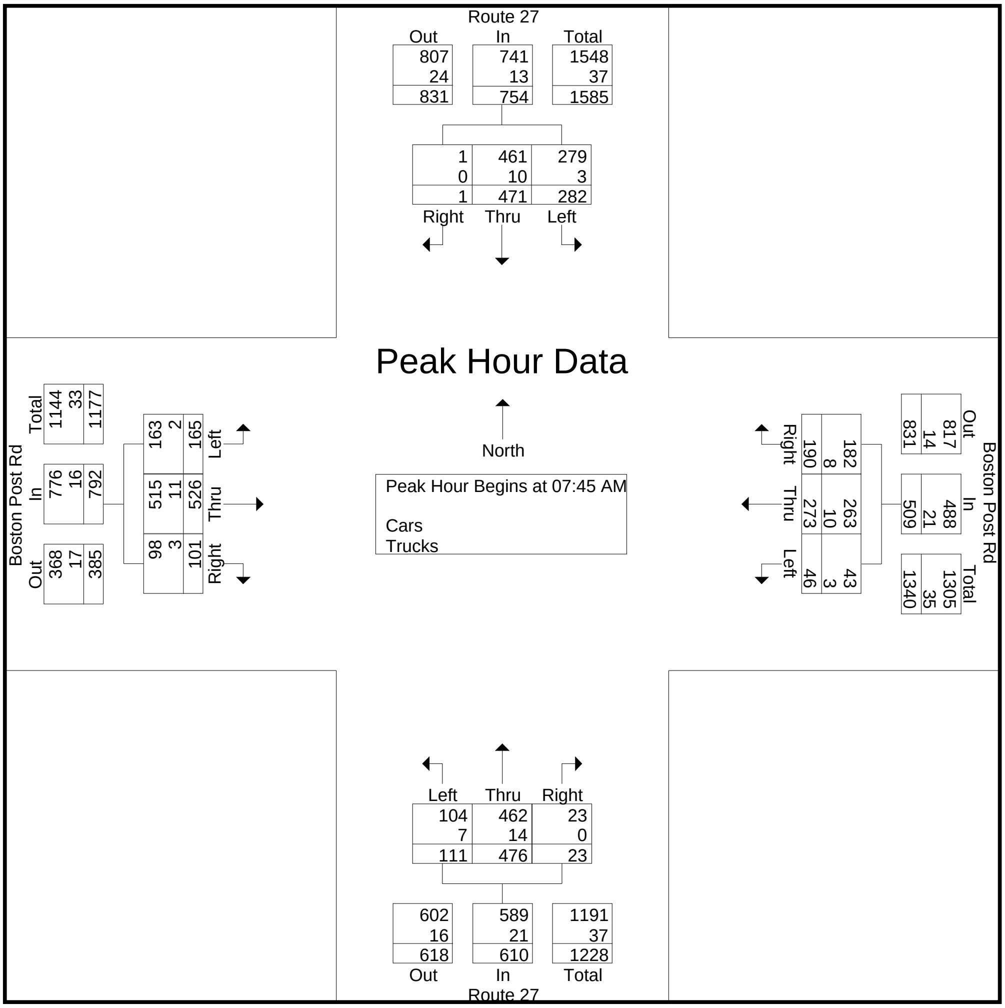
	Route 27 From North			Boston Post Rd From East			Route 27 From South			Boston Post Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	86	70	0	8	41	30	9	71	3	33	132	16	499
07:15 AM	56	98	2	2	62	39	12	72	2	40	116	16	517
07:30 AM	52	104	0	7	87	41	11	98	4	61	103	18	586
07:45 AM	62	127	0	10	67	48	23	117	2	45	122	25	648
Total	256	399	2	27	257	158	55	358	11	179	473	75	2250
08:00 AM	58	120	1	18	60	42	22	116	5	53	134	22	651
08:15 AM	69	122	0	10	80	56	32	118	7	35	136	34	699
08:30 AM	93	102	0	8	66	44	34	125	9	32	134	20	667
08:45 AM	97	87	3	6	84	28	29	83	10	33	145	27	632
Total	317	431	4	42	290	170	117	442	31	153	549	103	2649
Grand Total	573	830	6	69	547	328	172	800	42	332	1022	178	4899
Apprch %	40.7	58.9	0.4	7.3	57.9	34.7	17	78.9	4.1	21.7	66.7	11.6	
Total %	11.7	16.9	0.1	1.4	11.2	6.7	3.5	16.3	0.9	6.8	20.9	3.6	
Cars	568	812	6	64	523	312	164	779	42	323	993	172	4758
% Cars	99.1	97.8	100	92.8	95.6	95.1	95.3	97.4	100	97.3	97.2	96.6	97.1
Trucks	5	18	0	5	24	16	8	21	0	9	29	6	141
% Trucks	0.9	2.2	0	7.2	4.4	4.9	4.7	2.6	0	2.7	2.8	3.4	2.9

	Route 27 From North				Boston Post Rd From East				Route 27 From South				Boston Post Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. 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	62	**127**	0	189	10	67	48	125	23	117	2	142	45	122	25	192	648
08:00 AM	58	120	**1**	179	**18**	60	42	120	22	116	5	143	**53**	134	22	**209**	651
08:15 AM	69	122	0	191	10	**80**	**56**	**146**	32	118	7	157	35	**136**	**34**	205	**699**
08:30 AM	**93**	102	0	**195**	8	66	44	118	**34**	**125**	**9**	**168**	32	134	20	186	667
Total Volume	282	471	1	754	46	273	190	509	111	476	23	610	165	526	101	792	2665
% App. Total	37.4	62.5	0.1		9	53.6	37.3		18.2	78	3.8		20.8	66.4	12.8		
PHF	.758	.927	.250	.967	.639	.853	.848	.872	.816	.952	.639	.908	.778	.967	.743	.947	.953
Cars	279	461	1	741	43	263	182	488	104	462	23	589	163	515	98	776	2594
% Cars	98.9	97.9	100	98.3	93.5	96.3	95.8	95.9	93.7	97.1	100	96.6	98.8	97.9	97.0	98.0	97.3
Trucks	3	10	0	13	3	10	8	21	7	14	0	21	2	11	3	16	71
% Trucks	1.1	2.1	0	1.7	6.5	3.7	4.2	4.1	6.3	2.9	0	3.4	1.2	2.1	3.0	2.0	2.7

Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

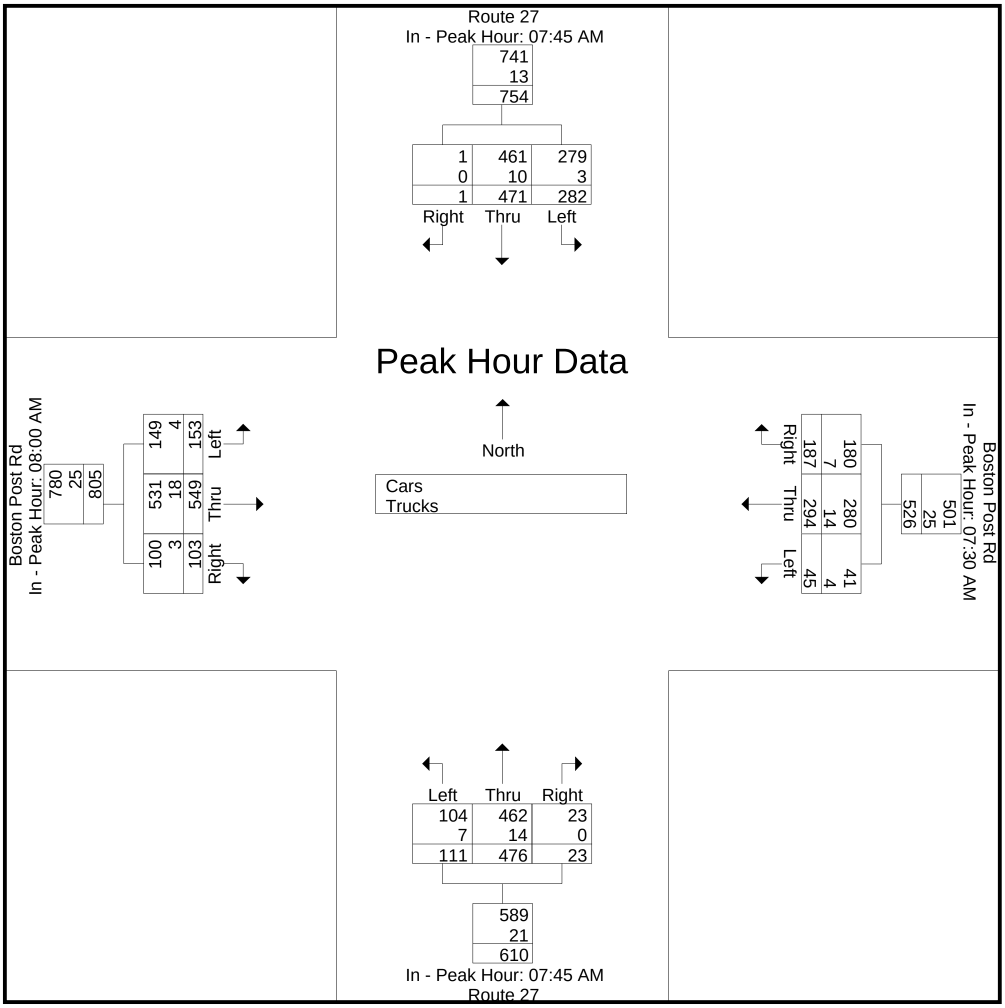
	07:45 AM				07:30 AM				07:45 AM				08:00 AM			
+0 mins.	62	**127**	0	189	7	**87**	41	135	23	117	2	142	**53**	134	22	**209**
+15 mins.	58	120	**1**	179	10	67	48	125	22	116	5	143	35	136	**34**	205
+30 mins.	69	122	0	191	**18**	60	42	120	32	118	7	157	32	134	20	186
+45 mins.	**93**	102	0	**195**	10	80	**56**	**146**	**34**	**125**	**9**	**168**	33	**145**	27	205
Total Volume	282	471	1	754	45	294	187	526	111	476	23	610	153	549	103	805
% App. Total	37.4	62.5	0.1		8.6	55.9	35.6		18.2	78	3.8		19	68.2	12.8	
PHF	.758	.927	.250	.967	.625	.845	.835	.901	.816	.952	.639	.908	.722	.947	.757	.963
Cars	279	461	1	741	41	280	180	501	104	462	23	589	149	531	100	780
% Cars	98.9	97.9	100	98.3	91.1	95.2	96.3	95.2	93.7	97.1	100	96.6	97.4	96.7	97.1	96.9
Trucks	3	10	0	13	4	14	7	25	7	14	0	21	4	18	3	25
% Trucks	1.1	2.1	0	1.7	8.9	4.8	3.7	4.8	6.3	2.9	0	3.4	2.6	3.3	2.9	3.1

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 3



Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 4

Groups Printed- Cars

	Route 27 From North			Boston Post Rd From East			Route 27 From South			Boston Post Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	86	69	0	8	40	29	9	70	3	29	128	15	486
07:15 AM	56	94	2	2	60	36	12	69	2	39	111	14	497
07:30 AM	52	101	0	5	79	38	11	95	4	61	101	18	565
07:45 AM	60	126	0	9	67	46	21	113	2	45	122	25	636
Total	254	390	2	24	246	149	53	347	11	174	462	72	2184
08:00 AM	58	114	1	17	57	41	21	113	5	52	129	21	629
08:15 AM	69	121	0	10	77	55	31	116	7	35	133	33	687
08:30 AM	92	100	0	7	62	40	31	120	9	31	131	19	642
08:45 AM	95	87	3	6	81	27	28	83	10	31	138	27	616
Total	314	422	4	40	277	163	111	432	31	149	531	100	2574
Grand Total	568	812	6	64	523	312	164	779	42	323	993	172	4758
Apprch %	41	58.6	0.4	7.1	58.2	34.7	16.6	79.1	4.3	21.7	66.7	11.6	
Total %	11.9	17.1	0.1	1.3	11	6.6	3.4	16.4	0.9	6.8	20.9	3.6	

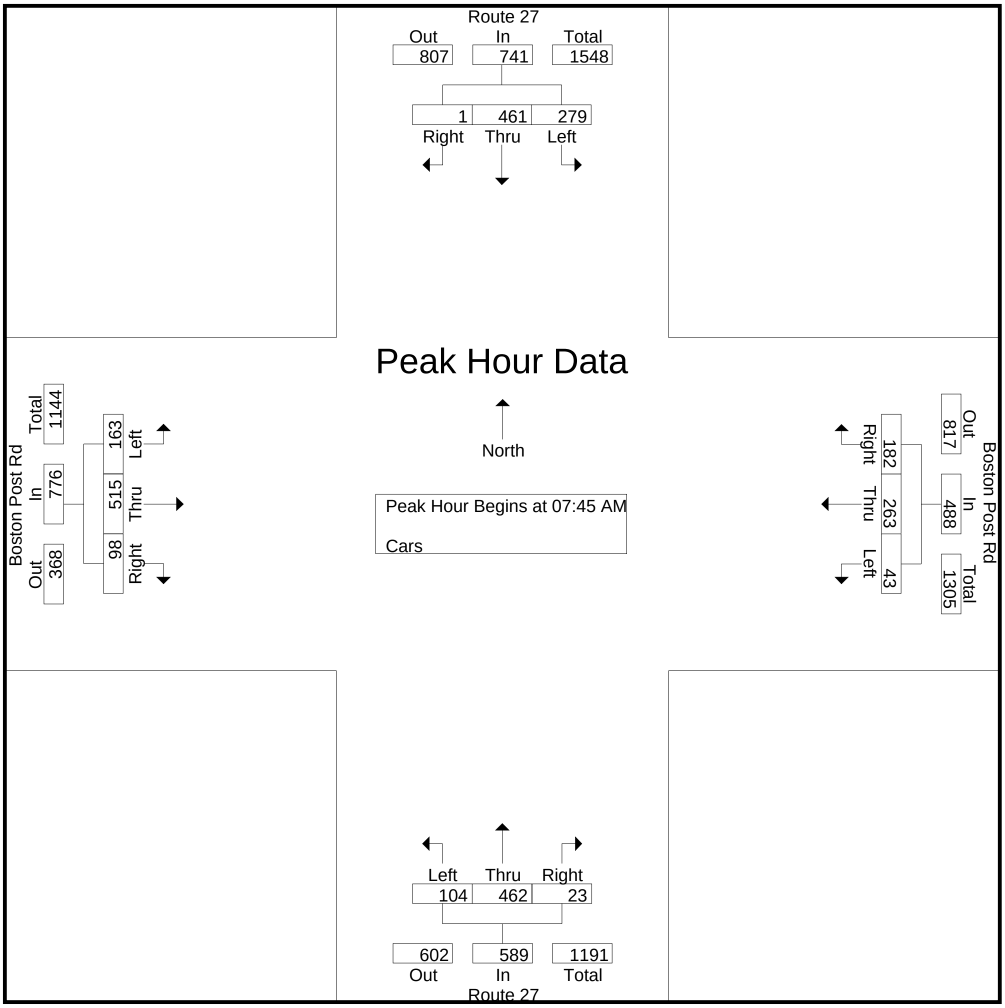
	Route 27 From North				Boston Post Rd From East				Route 27 From South				Boston Post Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	60	**126**	0	186	9	67	46	122	21	113	2	136	45	122	25	192	636
08:00 AM	58	114	**1**	173	**17**	57	41	115	21	113	5	139	**52**	129	21	**202**	629
08:15 AM	69	121	0	190	10	**77**	**55**	**142**	**31**	116	7	154	35	**133**	**33**	201	**687**
08:30 AM	**92**	100	0	**192**	7	62	40	109	31	**120**	**9**	**160**	31	131	19	181	642
Total Volume	279	461	1	741	43	263	182	488	104	462	23	589	163	515	98	776	2594
% App. Total	37.7	62.2	0.1		8.8	53.9	37.3		17.7	78.4	3.9		21	66.4	12.6		
PHF	.758	.915	.250	.965	.632	.854	.827	.859	.839	.963	.639	.920	.784	.968	.742	.960	.944

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 5



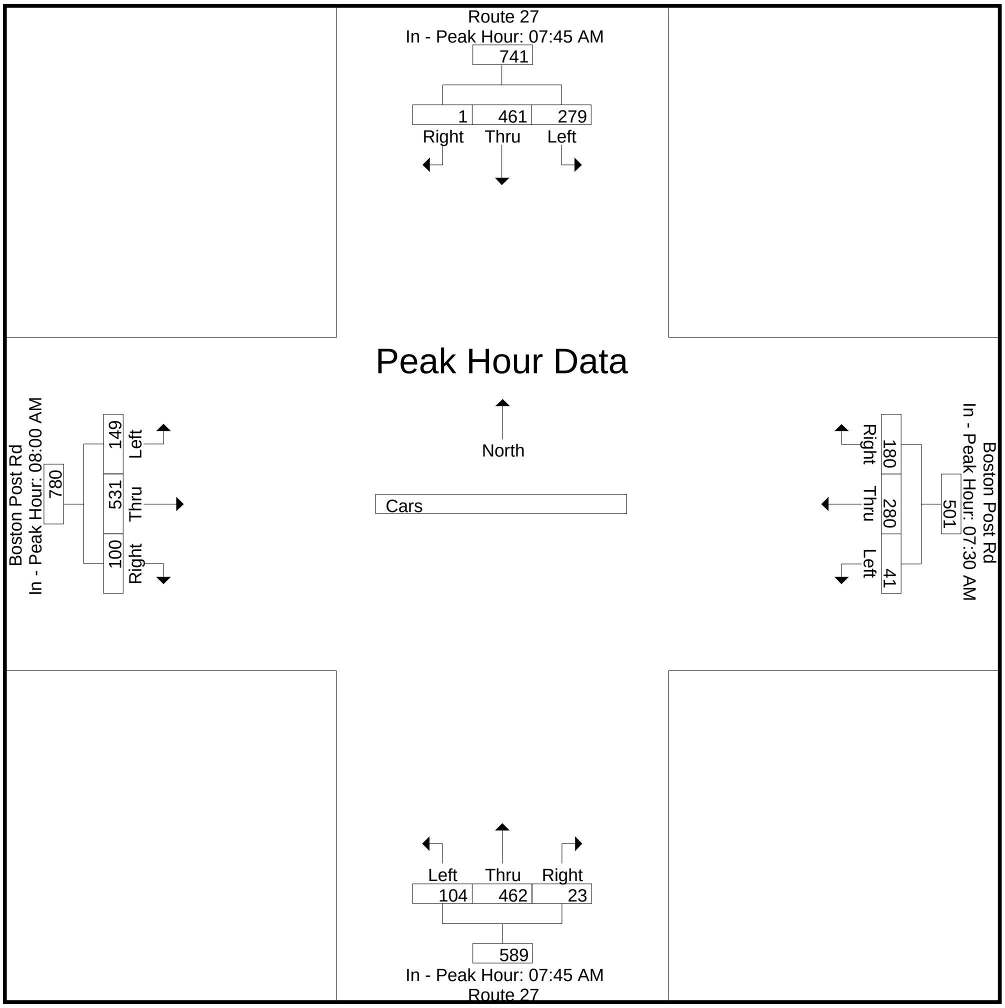
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:30 AM				07:45 AM				08:00 AM			
+0 mins.	60	**126**	0	186	5	**79**	38	122	21	113	2	136	**52**	129	21	**202**
+15 mins.	58	114	**1**	173	9	67	46	122	21	113	5	139	35	133	**33**	201
+30 mins.	69	121	0	190	**17**	57	41	115	**31**	116	7	154	31	131	19	181
+45 mins.	**92**	100	0	**192**	10	77	**55**	**142**	31	**120**	**9**	**160**	31	**138**	27	196
Total Volume	279	461	1	741	41	280	180	501	104	462	23	589	149	531	100	780
% App. Total	37.7	62.2	0.1		8.2	55.9	35.9		17.7	78.4	3.9		19.1	68.1	12.8	
PHF	.758	.915	.250	.965	.603	.886	.818	.882	.839	.963	.639	.920	.716	.962	.758	.965

Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 7

Groups Printed- Trucks

	Route 27 From North			Boston Post Rd From East			Route 27 From South			Boston Post Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	1	0	0	1	1	0	1	0	4	4	1	13
07:15 AM	0	4	0	0	2	3	0	3	0	1	5	2	20
07:30 AM	0	3	0	2	8	3	0	3	0	0	2	0	21
07:45 AM	2	1	0	1	0	2	2	4	0	0	0	0	12
Total	2	9	0	3	11	9	2	11	0	5	11	3	66
08:00 AM	0	6	0	1	3	1	1	3	0	1	5	1	22
08:15 AM	0	1	0	0	3	1	1	2	0	0	3	1	12
08:30 AM	1	2	0	1	4	4	3	5	0	1	3	1	25
08:45 AM	2	0	0	0	3	1	1	0	0	2	7	0	16
Total	3	9	0	2	13	7	6	10	0	4	18	3	75
Grand Total	5	18	0	5	24	16	8	21	0	9	29	6	141
Apprch %	21.7	78.3	0	11.1	53.3	35.6	27.6	72.4	0	20.5	65.9	13.6	
Total %	3.5	12.8	0	3.5	17	11.3	5.7	14.9	0	6.4	20.6	4.3	

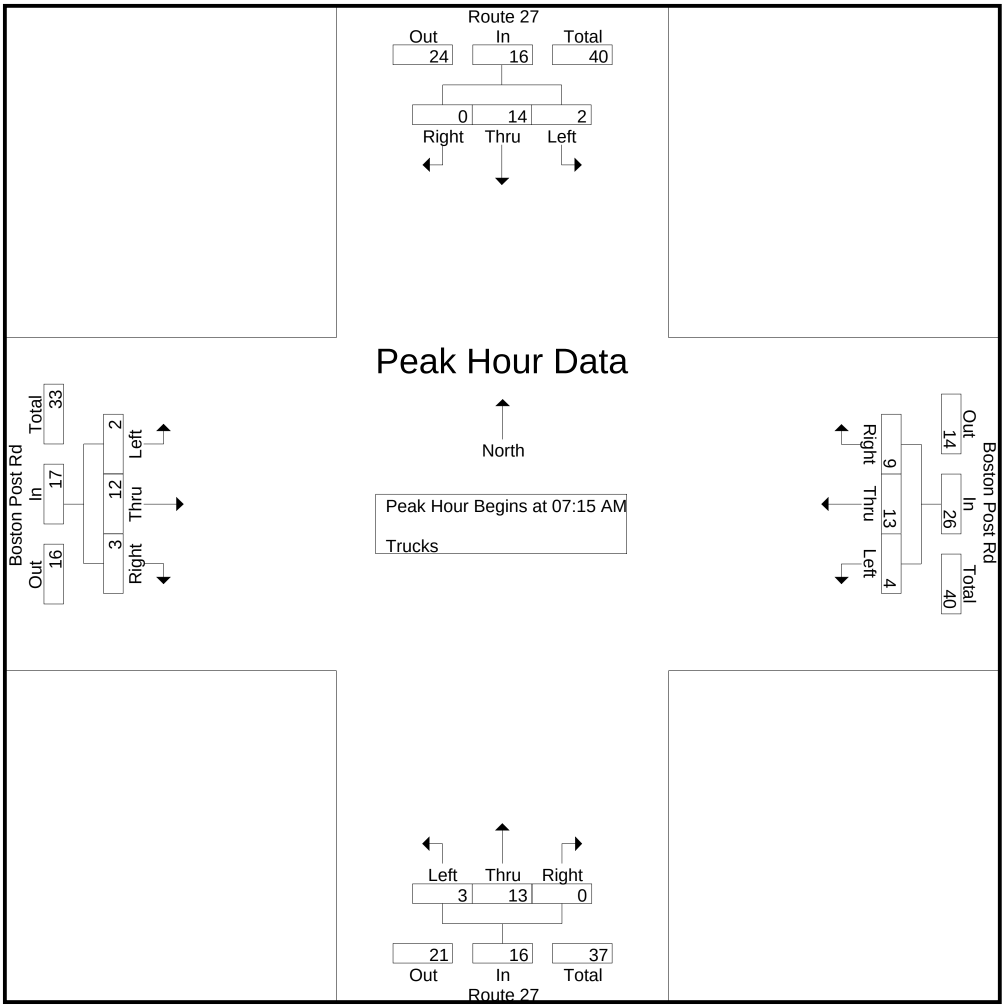
	Route 27 From North				Boston Post Rd From East				Route 27 From South				Boston Post Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	4	0	4	0	2	**3**	5	0	3	0	3	**1**	**5**	**2**	**8**	20
07:30 AM	0	3	0	3	**2**	**8**	3	**13**	0	3	0	3	0	2	0	2	21
07:45 AM	**2**	1	0	3	1	0	2	3	**2**	**4**	0	**6**	0	0	0	0	12
08:00 AM	0	**6**	0	**6**	1	3	1	5	1	3	0	4	1	5	1	7	**22**
Total Volume	2	14	0	16	4	13	9	26	3	13	0	16	2	12	3	17	75
% App. Total	12.5	87.5	0		15.4	50	34.6		18.8	81.2	0		11.8	70.6	17.6		
PHF	.250	.583	.000	.667	.500	.406	.750	.500	.375	.813	.000	.667	.500	.600	.375	.531	.852

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 8



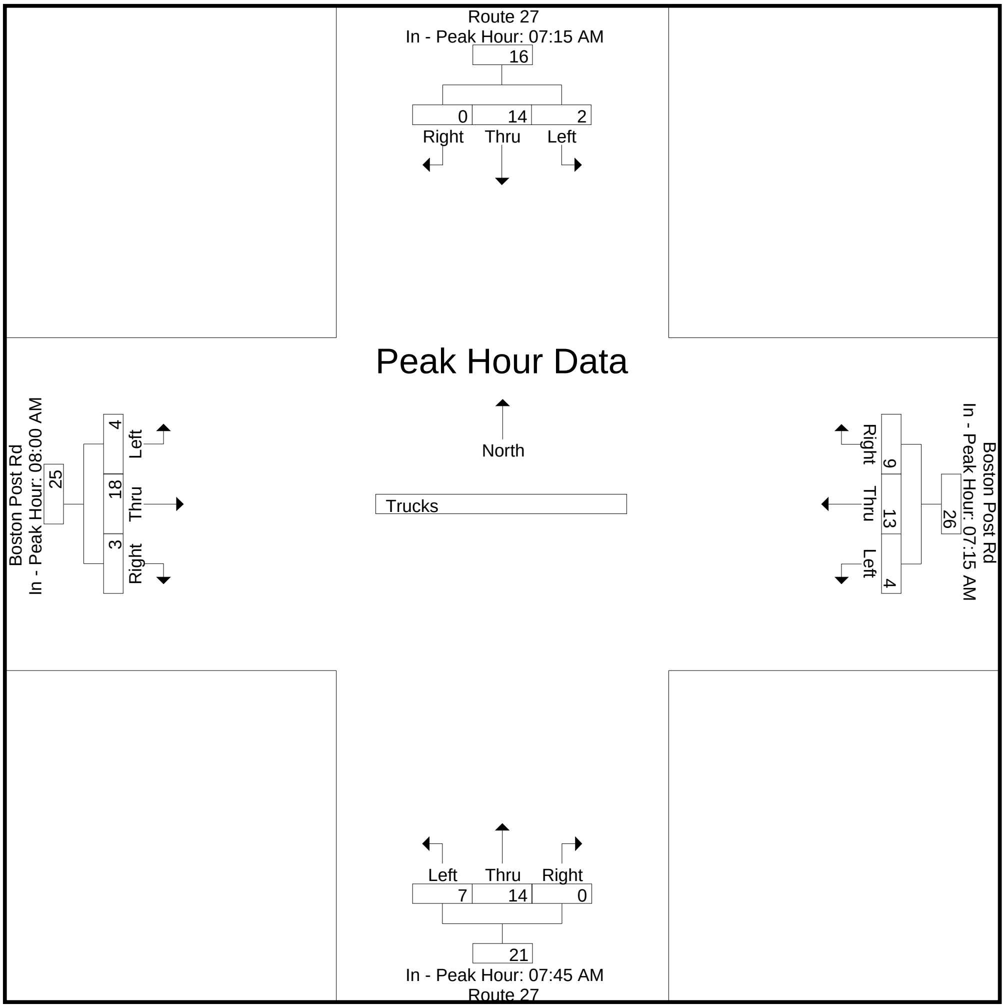
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:45 AM				08:00 AM			
+0 mins.	0	4	0	4	0	2	**3**	5	2	4	0	6	1	5	**1**	7
+15 mins.	0	3	0	3	**2**	**8**	3	**13**	1	3	0	4	0	3	1	4
+30 mins.	**2**	1	0	3	1	0	2	3	1	2	0	3	1	3	1	5
+45 mins.	0	**6**	0	**6**	1	3	1	5	**3**	**5**	0	**8**	**2**	**7**	0	**9**
Total Volume	2	14	0	16	4	13	9	26	7	14	0	21	4	18	3	25
% App. Total	12.5	87.5	0		15.4	50	34.6		33.3	66.7	0		16	72	12	
PHF	.250	.583	.000	.667	.500	.406	.750	.500	.583	.700	.000	.656	.500	.643	.750	.694

Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023



Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 10

Groups Printed- Bikes Peds

	Route 27 From North				Boston Post Rd From East				Route 27 From South				Boston Post Rd From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	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	0
07:30 AM	0	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	0
Total	0	0	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	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2	0	2
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2	0	2
Grand Total	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2	0	2
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

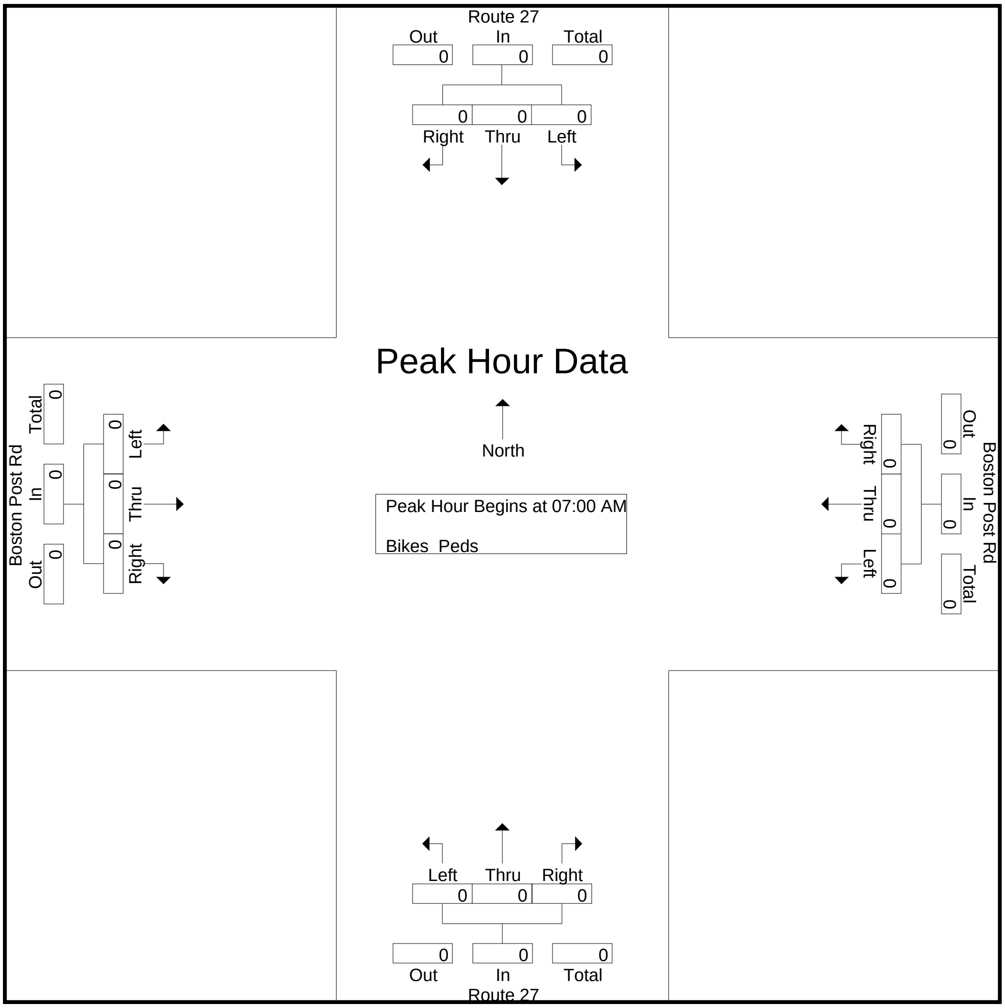
	Route 27 From North				Boston Post Rd From East				Route 27 From South				Boston Post Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
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
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	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 : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 11



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

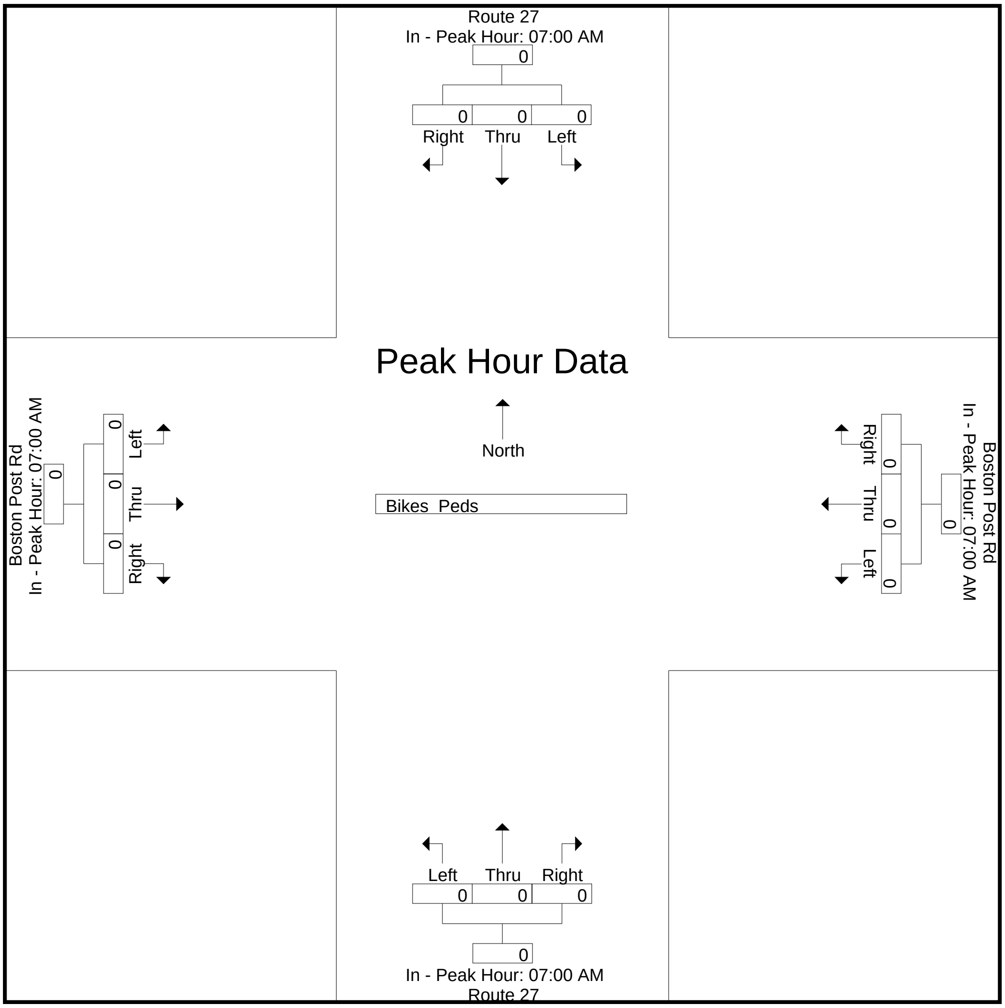
	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 12



Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023

Groups Printed- Cars - Trucks

	Route 27 From North			Boston Post Rd From East			Route 27 From South			Boston Post Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	54	105	2	12	150	72	37	85	7	25	93	40	682
04:15 PM	48	71	1	4	132	72	33	99	4	37	78	31	610
04:30 PM	55	89	3	3	113	61	38	125	10	27	80	26	630
04:45 PM	45	99	2	4	130	67	43	125	6	27	83	35	666
Total	202	364	8	23	525	272	151	434	27	116	334	132	2588
05:00 PM	40	78	1	3	128	69	32	108	5	42	105	34	645
05:15 PM	45	97	4	6	117	64	39	117	4	19	67	34	613
05:30 PM	50	73	4	9	132	63	33	109	8	28	104	21	634
05:45 PM	47	100	4	8	125	64	40	109	6	21	95	31	650
Total	182	348	13	26	502	260	144	443	23	110	371	120	2542
Grand Total	384	712	21	49	1027	532	295	877	50	226	705	252	5130
Apprch %	34.4	63.7	1.9	3	63.9	33.1	24.1	71.8	4.1	19.1	59.6	21.3	
Total %	7.5	13.9	0.4	1	20	10.4	5.8	17.1	1	4.4	13.7	4.9	
Cars	375	708	20	49	1019	527	289	867	50	226	699	251	5080
% Cars	97.7	99.4	95.2	100	99.2	99.1	98	98.9	100	100	99.1	99.6	99
Trucks	9	4	1	0	8	5	6	10	0	0	6	1	50
% Trucks	2.3	0.6	4.8	0	0.8	0.9	2	1.1	0	0	0.9	0.4	1

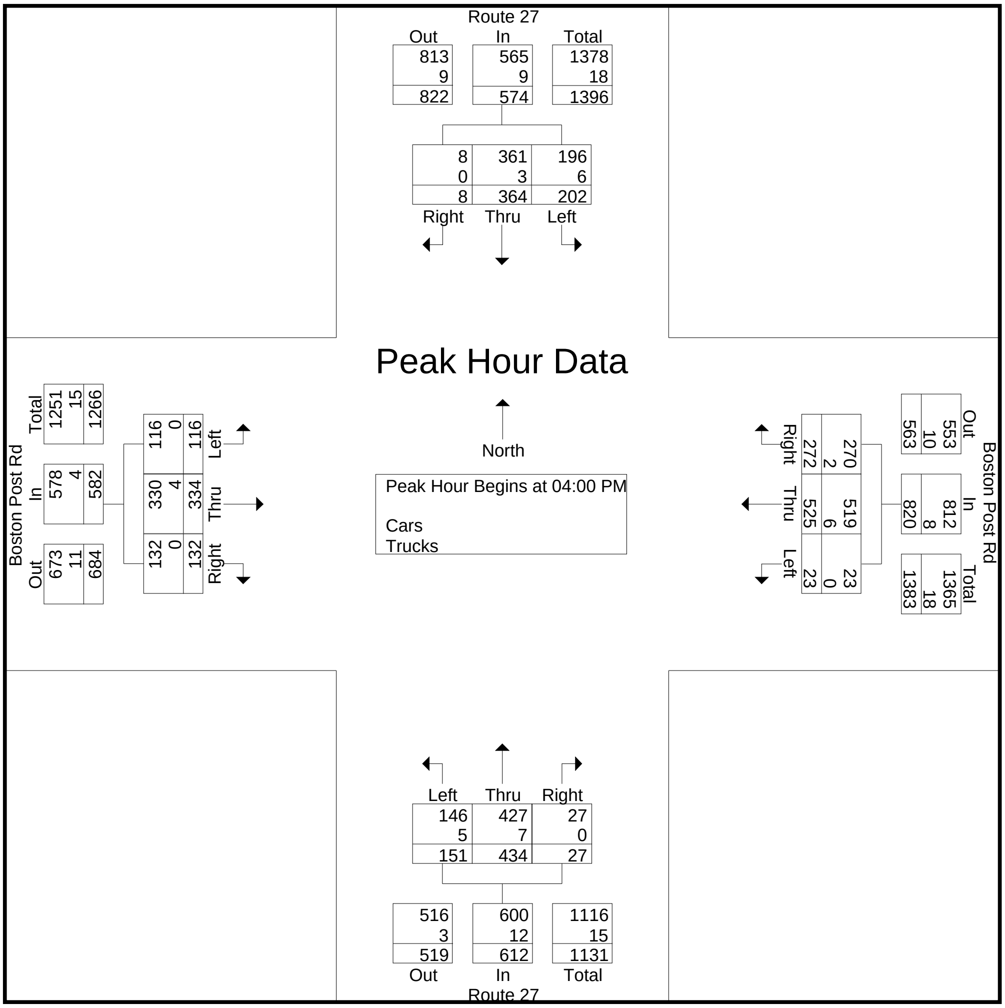
	Route 27 From North				Boston Post Rd From East				Route 27 From South				Boston Post Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	54	**105**	2	**161**	**12**	**150**	**72**	**234**	37	85	7	129	25	**93**	**40**	**158**	**682**
04:15 PM	48	71	1	120	4	132	72	208	33	99	4	136	**37**	78	31	146	610
04:30 PM	**55**	89	**3**	147	3	113	61	177	38	**125**	**10**	173	27	80	26	133	630
04:45 PM	45	99	2	146	4	130	67	201	**43**	125	6	**174**	27	83	35	145	666
Total Volume	202	364	8	574	23	525	272	820	151	434	27	612	116	334	132	582	2588
% App. Total	35.2	63.4	1.4		2.8	64	33.2		24.7	70.9	4.4		19.9	57.4	22.7		
PHF	.918	.867	.667	.891	.479	.875	.944	.876	.878	.868	.675	.879	.784	.898	.825	.921	.949
Cars	196	361	8	565	23	519	270	812	146	427	27	600	116	330	132	578	2555
% Cars	97.0	99.2	100	98.4	100	98.9	99.3	99.0	96.7	98.4	100	98.0	100	98.8	100	99.3	98.7
Trucks	6	3	0	9	0	6	2	8	5	7	0	12	0	4	0	4	33
% Trucks	3.0	0.8	0	1.6	0	1.1	0.7	1.0	3.3	1.6	0	2.0	0	1.2	0	0.7	1.3

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

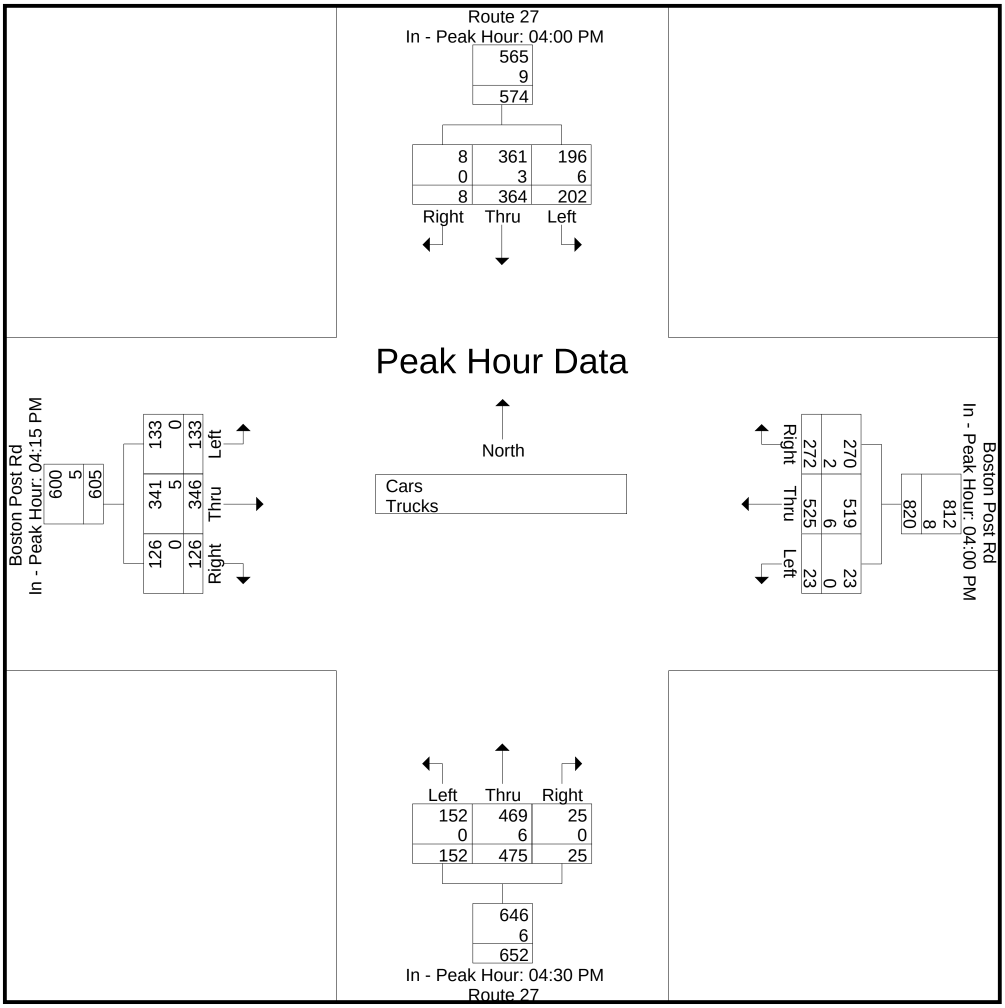
	04:00 PM				04:00 PM				04:30 PM				04:15 PM			
+0 mins.	54	**105**	2	**161**	**12**	**150**	**72**	**234**	38	**125**	**10**	173	37	78	31	146
+15 mins.	48	71	1	120	4	132	72	208	**43**	125	6	**174**	27	80	26	133
+30 mins.	**55**	89	**3**	147	3	113	61	177	32	108	5	145	27	83	**35**	145
+45 mins.	45	99	2	146	4	130	67	201	39	117	4	160	**42**	**105**	34	**181**
Total Volume	202	364	8	574	23	525	272	820	152	475	25	652	133	346	126	605
% App. Total	35.2	63.4	1.4		2.8	64	33.2		23.3	72.9	3.8		22	57.2	20.8	
PHF	.918	.867	.667	.891	.479	.875	.944	.876	.884	.950	.625	.937	.792	.824	.900	.836
Cars	196	361	8	565	23	519	270	812	152	469	25	646	133	341	126	600
% Cars	97	99.2	100	98.4	100	98.9	99.3	99	100	98.7	100	99.1	100	98.6	100	99.2
Trucks	6	3	0	9	0	6	2	8	0	6	0	6	0	5	0	5
% Trucks	3	0.8	0	1.6	0	1.1	0.7	1	0	1.3	0	0.9	0	1.4	0	0.8

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 4

Groups Printed- Cars

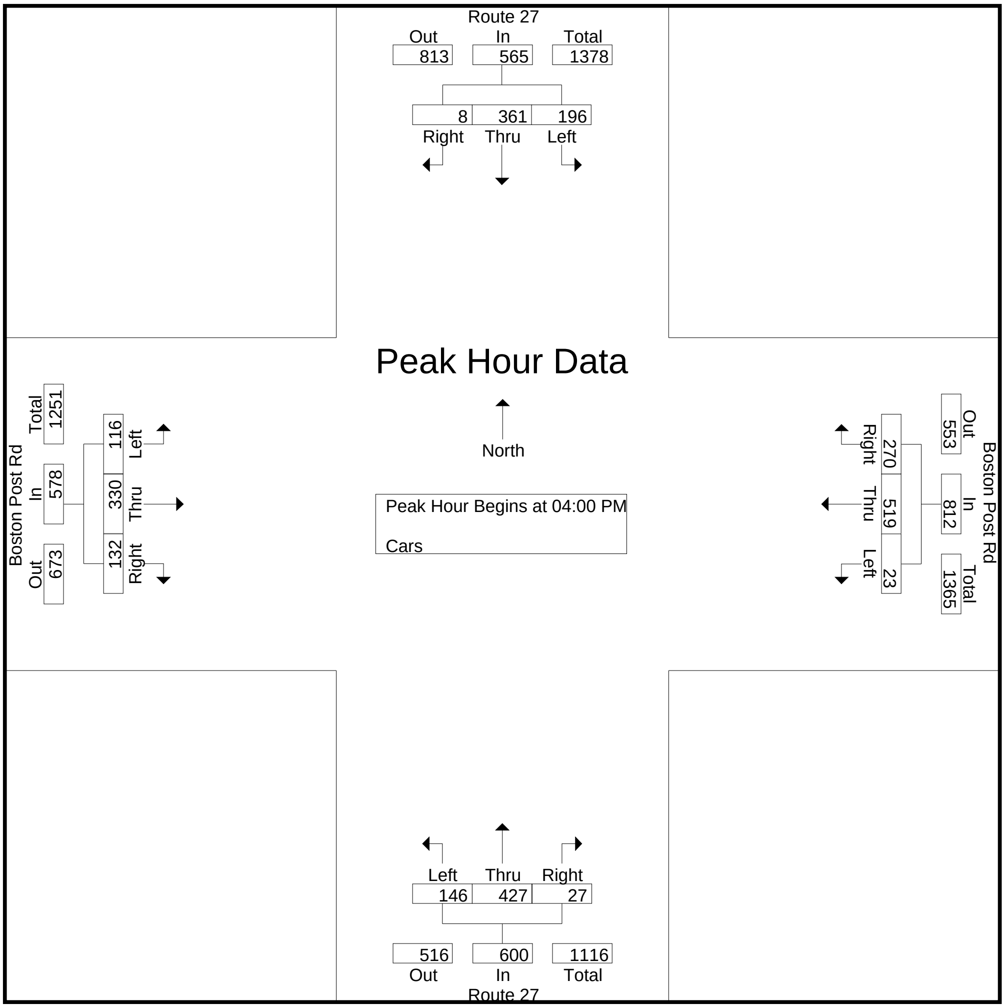
	Route 27 From North			Boston Post Rd From East			Route 27 From South			Boston Post Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	53	103	2	12	146	72	35	83	7	25	93	40	671
04:15 PM	46	71	1	4	131	71	30	98	4	37	76	31	600
04:30 PM	53	88	3	3	112	61	38	124	10	27	79	26	624
04:45 PM	44	99	2	4	130	66	43	122	6	27	82	35	660
Total	196	361	8	23	519	270	146	427	27	116	330	132	2555
05:00 PM	40	78	1	3	128	69	32	106	5	42	104	34	642
05:15 PM	44	96	4	6	116	63	39	117	4	19	66	34	608
05:30 PM	48	73	3	9	131	63	33	109	8	28	104	21	630
05:45 PM	47	100	4	8	125	62	39	108	6	21	95	30	645
Total	179	347	12	26	500	257	143	440	23	110	369	119	2525
Grand Total	375	708	20	49	1019	527	289	867	50	226	699	251	5080
Apprch %	34	64.2	1.8	3.1	63.9	33	24	71.9	4.1	19.2	59.4	21.3	
Total %	7.4	13.9	0.4	1	20.1	10.4	5.7	17.1	1	4.4	13.8	4.9	

	Route 27 From North				Boston Post Rd From East				Route 27 From South				Boston Post Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**53**	**103**	2	**158**	**12**	**146**	**72**	**230**	35	83	7	125	25	**93**	**40**	**158**	**671**
04:15 PM	46	71	1	118	4	131	71	206	30	98	4	132	**37**	76	31	144	600
04:30 PM	53	88	**3**	144	3	112	61	176	38	**124**	**10**	**172**	27	79	26	132	624
04:45 PM	44	99	2	145	4	130	66	200	**43**	122	6	171	27	82	35	144	660
Total Volume	196	361	8	565	23	519	270	812	146	427	27	600	116	330	132	578	2555
% App. Total	34.7	63.9	1.4		2.8	63.9	33.3		24.3	71.2	4.5		20.1	57.1	22.8		
PHF	.925	.876	.667	.894	.479	.889	.938	.883	.849	.861	.675	.872	.784	.887	.825	.915	.952

Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023



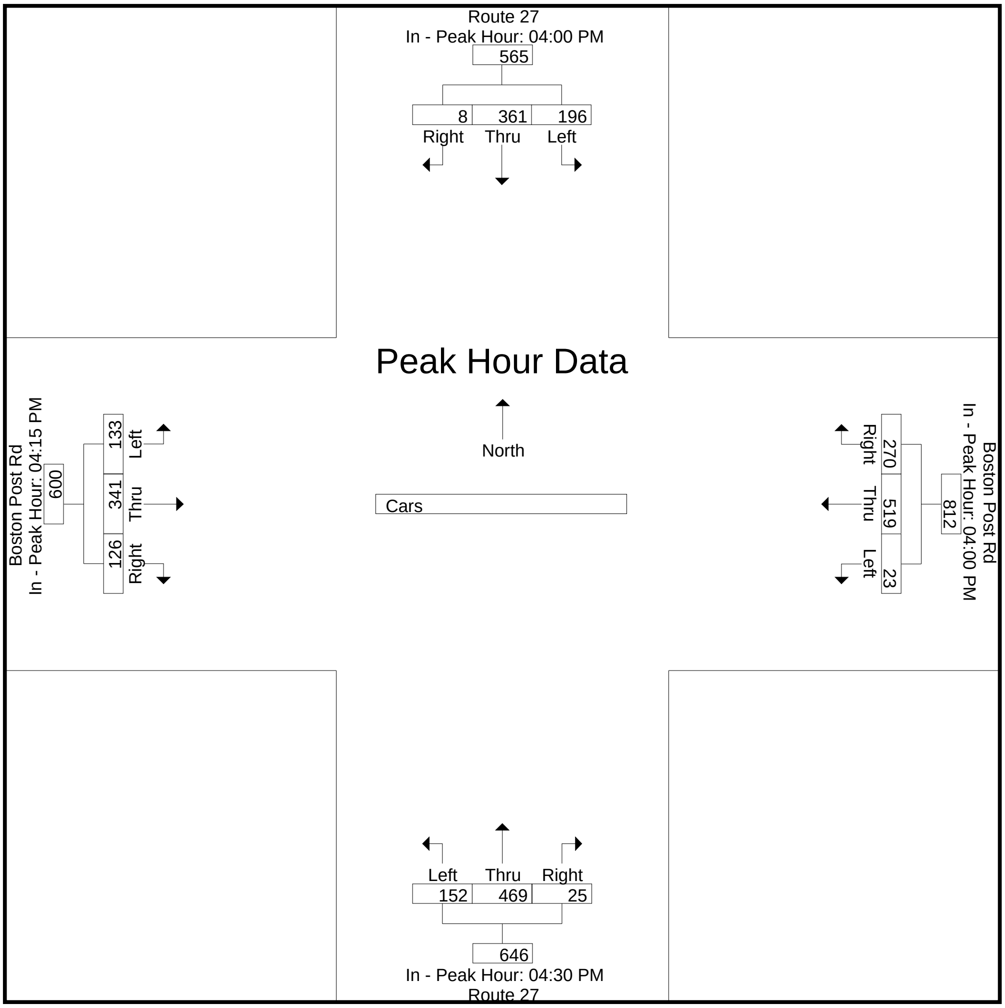
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:30 PM				04:15 PM			
+0 mins.	**53**	**103**	2	**158**	**12**	**146**	**72**	**230**	38	**124**	**10**	**172**	37	76	31	144
+15 mins.	46	71	1	118	4	131	71	206	**43**	122	6	171	27	79	26	132
+30 mins.	53	88	**3**	144	3	112	61	176	32	106	5	143	27	82	**35**	144
+45 mins.	44	99	2	145	4	130	66	200	39	117	4	160	**42**	**104**	34	**180**
Total Volume	196	361	8	565	23	519	270	812	152	469	25	646	133	341	126	600
% App. Total	34.7	63.9	1.4		2.8	63.9	33.3		23.5	72.6	3.9		22.2	56.8	21	
PHF	.925	.876	.667	.894	.479	.889	.938	.883	.884	.946	.625	.939	.792	.820	.900	.833

Accurate Counts

978-664-2565

N/S Street	: Route 27	File Name	: 95990002
E/W Street	: Boston Post Road	Site Code	: 95990002
City/State	: Wayland, MA	Start Date	: 1/31/2023
Weather	: Cloudy	Page No	: 6



Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 7

Groups Printed- Trucks

	Route 27 From North			Boston Post Rd From East			Route 27 From South			Boston Post Rd From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	1	2	0	0	4	0	2	2	0	0	0	0	11
04:15 PM	2	0	0	0	1	1	3	1	0	0	2	0	10
04:30 PM	2	1	0	0	1	0	0	1	0	0	1	0	6
04:45 PM	1	0	0	0	0	1	0	3	0	0	1	0	6
Total	6	3	0	0	6	2	5	7	0	0	4	0	33
05:00 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
05:15 PM	1	1	0	0	1	1	0	0	0	0	1	0	5
05:30 PM	2	0	1	0	1	0	0	0	0	0	0	0	4
05:45 PM	0	0	0	0	0	2	1	1	0	0	0	1	5
Total	3	1	1	0	2	3	1	3	0	0	2	1	17
Grand Total	9	4	1	0	8	5	6	10	0	0	6	1	50
Apprch %	64.3	28.6	7.1	0	61.5	38.5	37.5	62.5	0	0	85.7	14.3	
Total %	18	8	2	0	16	10	12	20	0	0	12	2	

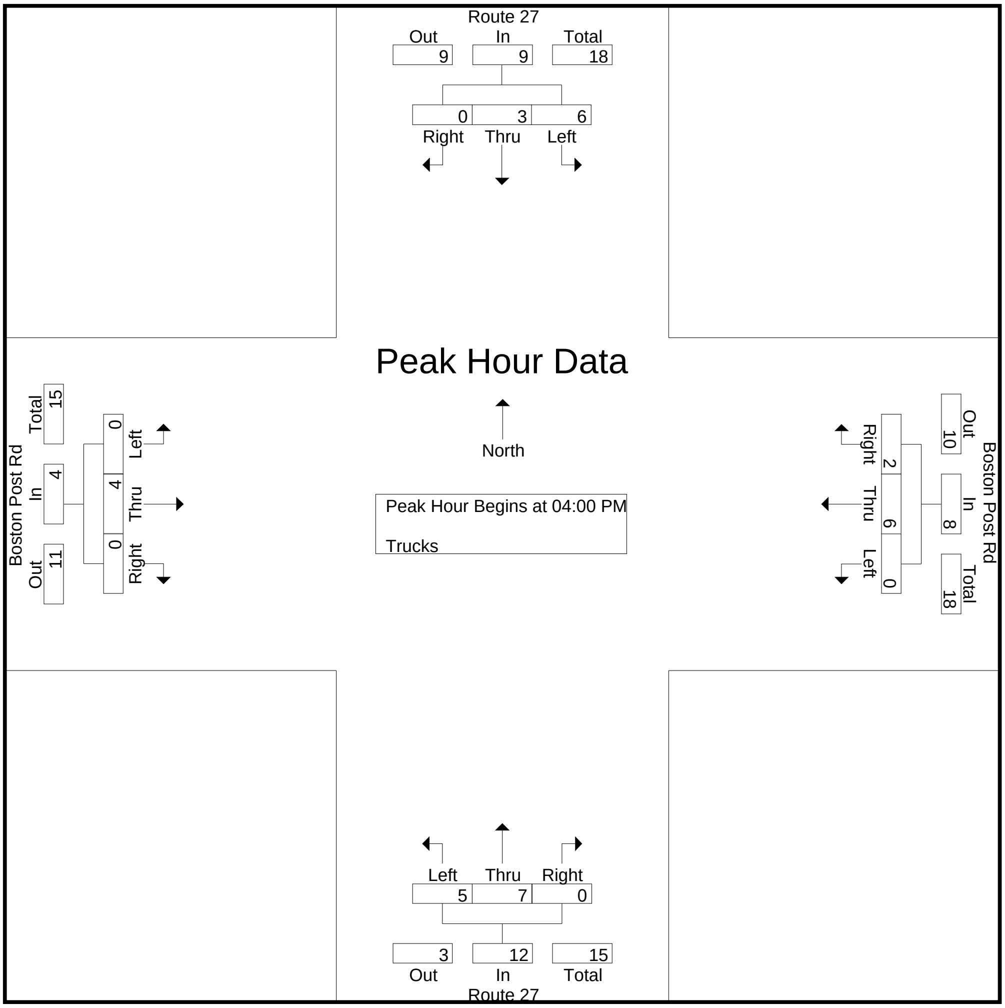
	Route 27 From North				Boston Post Rd From East				Route 27 From South				Boston Post Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	1	**2**	0	**3**	0	**4**	0	**4**	2	2	0	**4**	0	0	0	0	**11**
04:15 PM	**2**	0	0	2	0	1	**1**	2	**3**	1	0	4	0	**2**	0	**2**	10
04:30 PM	2	1	0	3	0	1	0	1	0	1	0	1	0	1	0	1	6
04:45 PM	1	0	0	1	0	0	1	1	0	**3**	0	3	0	1	0	1	6
Total Volume	6	3	0	9	0	6	2	8	5	7	0	12	0	4	0	4	33
% App. Total	66.7	33.3	0		0	75	25		41.7	58.3	0		0	100	0		
PHF	.750	.375	.000	.750	.000	.375	.500	.500	.417	.583	.000	.750	.000	.500	.000	.500	.750

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 8



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

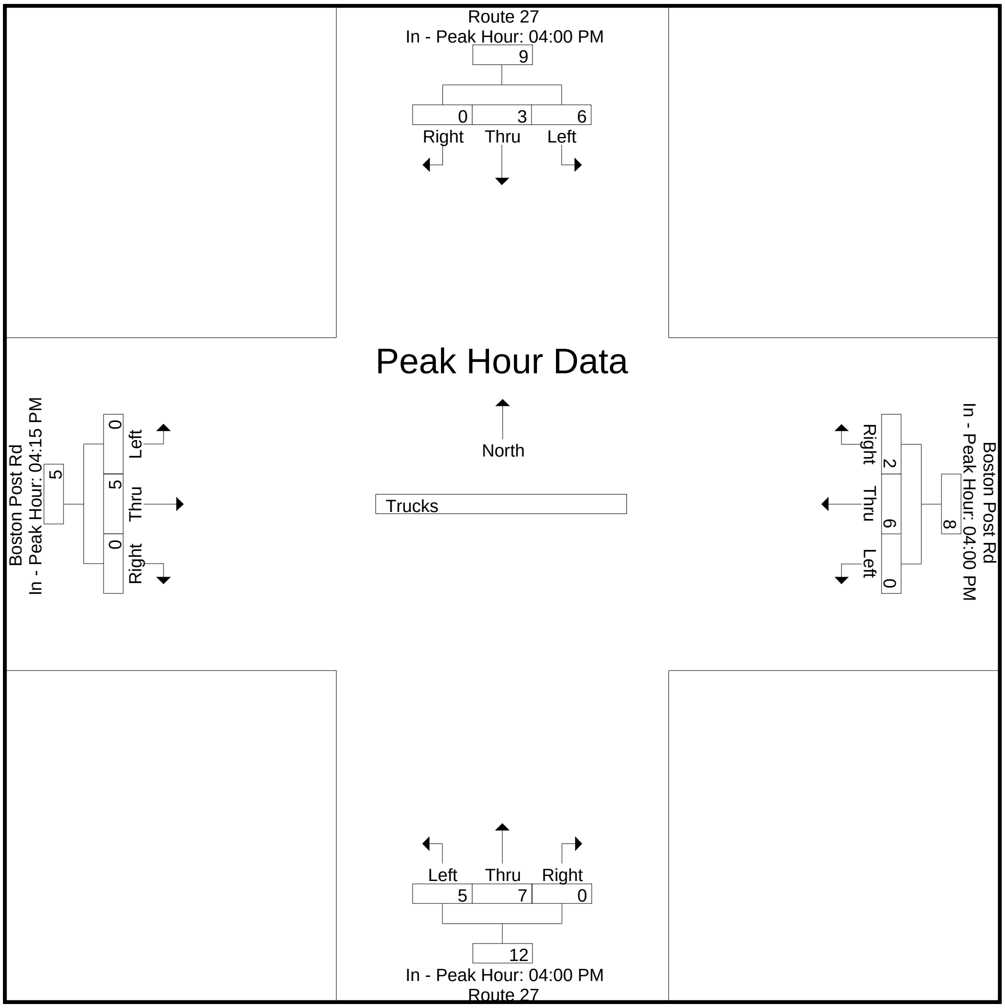
	04:00 PM				04:00 PM				04:00 PM				04:15 PM			
+0 mins.	1	**2**	0	**3**	0	**4**	0	**4**	2	2	0	**4**	0	**2**	0	**2**
+15 mins.	**2**	0	0	2	0	1	**1**	2	**3**	1	0	4	0	1	0	1
+30 mins.	2	1	0	3	0	1	0	1	0	1	0	1	0	1	0	1
+45 mins.	1	0	0	1	0	0	1	1	0	**3**	0	3	0	1	0	1
Total Volume	6	3	0	9	0	6	2	8	5	7	0	12	0	5	0	5
% App. Total	66.7	33.3	0		0	75	25		41.7	58.3	0		0	100	0	
PHF	.750	.375	.000	.750	.000	.375	.500	.500	.417	.583	.000	.750	.000	.625	.000	.625

Accurate Counts

978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 9



Accurate Counts
978-664-2565

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023
Page No : 10

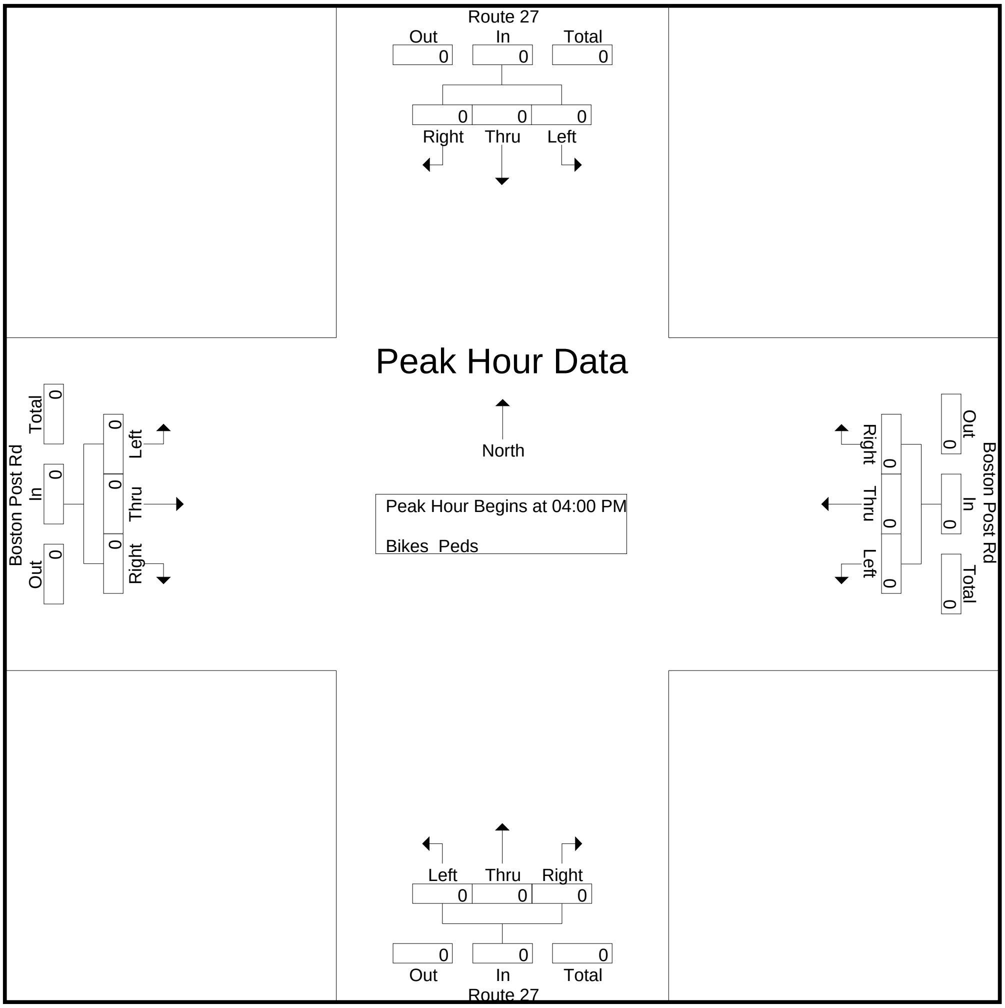
Groups Printed- Bikes Peds

	Route 27 From North				Boston Post Rd From East				Route 27 From South				Boston Post Rd From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	3	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	4	0	4
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
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	4	0	4
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

	Route 27 From North				Boston Post Rd From East				Route 27 From South				Boston Post Rd From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	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
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	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

N/S Street : Route 27
E/W Street : Boston Post Road
City/State : Wayland, MA
Weather : Cloudy

File Name : 95990002
Site Code : 95990002
Start Date : 1/31/2023

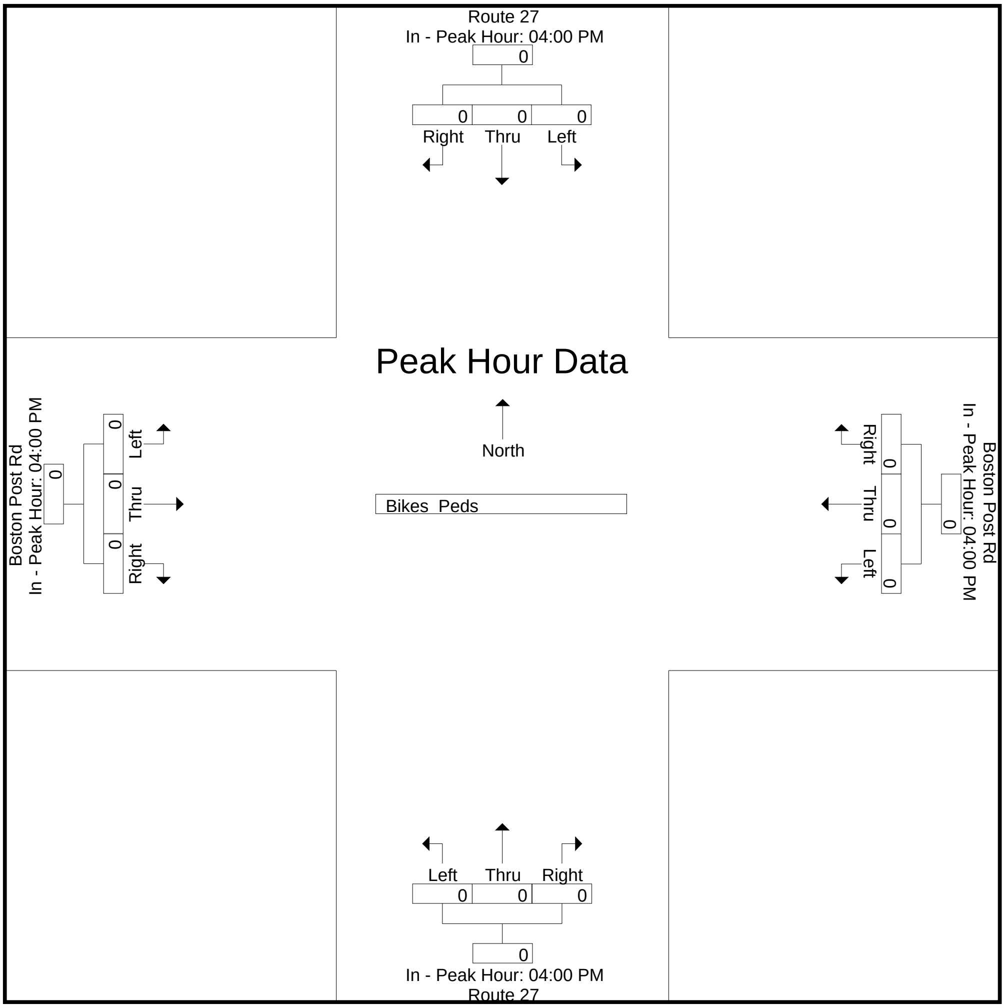


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	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

Accurate Counts
978-664-2565

N/S Street : Route 27	File Name : 95990002
E/W Street : Boston Post Road	Site Code : 95990002
City/State : Wayland, MA	Start Date : 1/31/2023
Weather : Cloudy	Page No : 12



SEASONAL ADJUSTMENT DATA

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.

9/14/2021

VEHICLE TRAVEL SPEED DATA

Location : Cochituate Road 95990001
Location : South of Windy Hill Lane
City/State: Wayland, MA
Direction: NB

1/31/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	1	1	2	0	0	0	0	0	0	0	0	4
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
3:00	0	0	0	1	0	2	0	0	0	0	0	0	0	3
4:00	0	0	1	3	0	3	0	0	1	0	0	0	0	8
5:00	0	0	1	12	10	1	1	0	0	0	0	0	0	25
6:00	0	1	1	30	40	10	3	0	0	0	0	0	0	85
7:00	0	0	2	59	94	29	5	1	0	0	0	0	0	190
8:00	2	1	10	103	107	26	3	1	0	0	0	0	0	253
9:00	0	0	4	47	91	25	0	0	0	0	0	0	0	167
10:00	0	0	8	73	72	19	1	0	0	0	0	0	0	173
11:00	3	13	5	51	70	26	4	1	0	0	0	0	0	173
12:00 PM	0	0	6	64	78	15	1	1	0	0	0	0	0	165
1:00	0	1	3	58	110	18	11	1	0	0	0	0	0	202
2:00	0	0	9	138	99	29	0	1	0	0	2	0	0	278
3:00	1	1	15	156	149	35	9	0	0	0	0	0	0	366
4:00	0	0	8	158	171	36	2	0	1	0	0	0	0	376
5:00	0	0	18	146	147	28	2	1	0	0	0	0	0	342
6:00	0	0	12	113	105	18	0	1	0	0	0	0	0	249
7:00	0	0	5	52	82	23	3	1	0	0	0	0	0	166
8:00	0	0	3	28	23	17	1	0	0	0	0	0	0	72
9:00	0	0	5	13	28	10	1	0	0	0	0	0	0	57
10:00	0	0	1	9	6	2	0	0	0	0	0	0	0	18
11:00	0	0	0	1	2	2	0	0	0	0	0	0	0	5
Total	6	17	119	1316	1486	374	47	9	2	0	2	0	0	3378

Percentile	15th	50th	85th	95th
Speed	27	30	35	38
Mean Speed (Average)	30.9			
10 MPH Pace Speed	25-34			
Number in Pace	2775			
Percent in Pace	82.1%			
Number > 35 MPH	434			
Percent > 35 MPH	12.8%			

Location : Cochituate Road 95990001
Location : South of Windy Hill Lane
City/State: Wayland, MA
Direction: NB

2/1/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	0	2	0	0	0	0	0	0	0	0	2
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
3:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2
4:00	0	0	0	0	4	0	1	0	0	0	0	0	0	5
5:00	0	0	1	10	12	9	0	0	0	0	0	0	0	32
6:00	0	0	0	42	33	14	5	1	0	0	0	0	0	95
7:00	0	0	4	71	133	48	8	2	0	0	3	0	0	269
8:00	0	0	4	93	178	46	3	2	0	0	0	0	0	326
9:00	0	0	6	66	95	57	6	2	0	0	0	0	0	232
10:00	0	0	5	58	99	32	9	0	1	1	0	0	0	205
11:00	0	0	7	90	100	28	4	0	0	0	1	0	1	231
12:00 PM	0	0	3	89	112	24	5	1	0	0	0	0	0	234
1:00	0	0	10	75	120	38	7	1	0	0	0	0	0	251
2:00	0	0	3	93	146	37	6	2	0	0	0	0	0	287
3:00	0	0	8	110	178	36	3	1	0	0	0	0	0	336
4:00	0	0	4	93	158	38	2	0	0	0	0	0	0	295
5:00	0	1	12	110	141	24	8	1	0	0	0	0	0	297
6:00	0	2	7	79	103	31	2	0	0	0	0	0	0	224
7:00	0	0	4	58	71	17	4	0	0	0	0	0	0	154
8:00	0	0	5	27	46	16	0	0	0	0	0	0	0	94
9:00	0	0	2	19	27	10	0	0	0	0	0	0	0	58
10:00	0	0	3	6	7	4	4	0	0	0	0	0	0	24
11:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Total	0	3	89	1190	1766	510	77	13	1	1	4	0	1	3655
			Percentile	15th	50th	85th	95th							
			Speed	28	31	35	38							
			Mean Speed (Average)	31.7										
			10 MPH Pace Speed	25-34										
			Number in Pace	2922										
			Percent in Pace	79.9%										
			Number > 35 MPH	607										
			Percent > 35 MPH	16.6%										
Grand Total	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%
			Percentile	15th	50th	85th	95th							
			Speed	28	31	35	38							
			Mean Speed (Average)	31.3										
			10 MPH Pace Speed	25-34										
			Number in Pace	5697										
			Percent in Pace	81.0%										
			Number > 35 MPH	1041										
			Percent > 35 MPH	14.8%										

Location : Cochituate Road 95990001
Location : South of Windy Hill Lane
City/State: Wayland, MA
Direction: SB

1/31/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	1	0	2	2	5	0	0	0	0	0	0	10
1:00	0	0	1	0	0	4	1	0	0	0	0	0	0	6
2:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3:00	0	0	0	0	0	0	2	0	0	0	0	0	0	2
4:00	0	0	0	1	5	3	3	1	0	0	0	0	0	13
5:00	0	0	2	5	15	14	9	0	0	0	0	0	0	45
6:00	0	1	3	23	65	71	21	0	0	0	0	0	0	184
7:00	0	0	10	62	198	176	39	6	0	1	0	0	0	492
8:00	13	26	39	70	167	176	50	4	1	0	0	0	0	546
9:00	0	1	13	40	111	159	65	7	1	0	0	0	0	397
10:00	0	0	8	25	92	112	50	6	1	0	0	0	0	294
11:00	0	0	17	33	117	143	37	6	0	0	0	0	0	353
12:00 PM	0	1	11	36	106	141	44	6	0	0	0	0	0	345
1:00	0	3	8	30	113	125	39	7	2	0	0	0	0	327
2:00	0	0	7	46	114	142	71	6	0	0	0	0	0	386
3:00	0	2	14	56	157	202	57	4	1	0	0	0	0	493
4:00	0	1	9	54	190	193	58	0	0	2	2	0	0	509
5:00	0	1	16	72	181	154	32	5	0	1	0	0	0	462
6:00	0	0	7	42	121	140	34	5	2	0	0	0	0	351
7:00	0	1	7	16	103	87	31	7	0	0	0	0	0	252
8:00	0	0	5	16	46	52	29	8	0	0	0	0	0	156
9:00	0	1	0	10	23	37	6	4	1	0	0	0	0	82
10:00	0	0	1	6	3	13	5	2	1	0	0	0	0	31
11:00	0	0	0	1	5	10	5	4	0	0	0	0	0	25
Total	13	38	179	644	1934	2157	693	88	10	4	2	0	0	5762

Percentile	15th	50th	85th	95th
Speed	30	35	40	42
Mean Speed (Average)	34.9			
10 MPH Pace Speed	30-39			
Number in Pace	4061			
Percent in Pace	70.5%			
Number > 35 MPH	2954			
Percent > 35 MPH	51.3%			

Accurate Counts
978-664-2565

Location : Cochituate Road 95990001
Location : South of Windy Hill Lane
City/State: Wayland, MA
Direction: SB

2/1/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	1	3	3	1	1	0	0	0	0	0	9
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1
3:00	0	0	0	0	0	1	1	0	0	0	0	0	0	2
4:00	0	0	0	1	5	7	2	3	0	0	0	0	0	18
5:00	0	0	1	0	12	18	14	2	1	0	0	0	0	48
6:00	0	0	3	11	64	77	21	4	0	0	0	0	0	180
7:00	0	3	14	45	142	179	77	7	0	0	0	0	0	467
8:00	10	15	19	55	155	177	51	8	0	3	0	0	0	493
9:00	0	4	7	18	114	133	63	18	3	0	0	0	0	360
10:00	0	5	9	39	84	108	49	16	1	1	0	0	0	312
11:00	0	2	15	41	152	145	68	9	0	2	0	0	0	434
12:00 PM	2	8	32	62	127	135	49	6	1	0	0	0	0	422
1:00	0	1	5	36	121	156	69	13	1	0	0	0	0	402
2:00	0	2	3	28	133	174	57	10	0	0	0	0	0	407
3:00	0	3	27	64	148	212	66	11	2	0	0	0	0	533
4:00	2	2	24	62	193	205	80	5	2	0	0	0	0	575
5:00	0	3	10	43	173	165	59	3	0	0	0	0	0	456
6:00	0	2	10	57	127	114	30	8	1	0	0	0	0	349
7:00	0	1	3	13	61	85	24	3	3	0	0	0	0	193
8:00	0	1	4	20	63	71	20	5	0	0	0	0	0	184
9:00	0	0	1	16	24	46	11	2	0	0	0	0	0	100
10:00	0	0	0	2	7	20	7	1	3	0	1	0	0	41
11:00	0	0	0	0	1	3	3	0	0	0	0	0	0	7
Total	14	52	187	614	1909	2234	823	135	18	6	1	0	0	5993
Percentile				15th	50th	85th	95th							
Speed				30	35	40	43							
Mean Speed (Average)				35.2										
10 MPH Pace Speed				30-39										
Number in Pace				4111										
Percent in Pace				68.6%										
Number > 35 MPH				3217										
Percent > 35 MPH				53.7%										
Grand Total	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%
Percentile				15th	50th	85th	95th							
Speed				30	35	40	43							
Mean Speed (Average)				35.0										
10 MPH Pace Speed				30-39										
Number in Pace				8171										
Percent in Pace				69.5%										
Number > 35 MPH				6171										
Percent > 35 MPH				52.5%										

Accurate Counts
978-664-2565

Location : Cochituate Road 95990001
Location : South of Windy Hill Lane
City/State: Wayland, MA
Direction: Combined

1/31/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	2	1	4	2	5	0	0	0	0	0	0	14
1:00	0	0	1	0	0	4	1	0	0	0	0	0	0	6
2:00	0	0	1	0	0	1	0	0	0	0	0	0	0	2
3:00	0	0	0	1	0	2	2	0	0	0	0	0	0	5
4:00	0	0	1	4	5	6	3	1	1	0	0	0	0	21
5:00	0	0	3	17	25	15	10	0	0	0	0	0	0	70
6:00	0	2	4	53	105	81	24	0	0	0	0	0	0	269
7:00	0	0	12	121	292	205	44	7	0	1	0	0	0	682
8:00	15	27	49	173	274	202	53	5	1	0	0	0	0	799
9:00	0	1	17	87	202	184	65	7	1	0	0	0	0	564
10:00	0	0	16	98	164	131	51	6	1	0	0	0	0	467
11:00	3	13	22	84	187	169	41	7	0	0	0	0	0	526
12:00 PM	0	1	17	100	184	156	45	7	0	0	0	0	0	510
1:00	0	4	11	88	223	143	50	8	2	0	0	0	0	529
2:00	0	0	16	184	213	171	71	7	0	0	2	0	0	664
3:00	1	3	29	212	306	237	66	4	1	0	0	0	0	859
4:00	0	1	17	212	361	229	60	0	1	2	2	0	0	885
5:00	0	1	34	218	328	182	34	6	0	1	0	0	0	804
6:00	0	0	19	155	226	158	34	6	2	0	0	0	0	600
7:00	0	1	12	68	185	110	34	8	0	0	0	0	0	418
8:00	0	0	8	44	69	69	30	8	0	0	0	0	0	228
9:00	0	1	5	23	51	47	7	4	1	0	0	0	0	139
10:00	0	0	2	15	9	15	5	2	1	0	0	0	0	49
11:00	0	0	0	2	7	12	5	4	0	0	0	0	0	30
Total	19	55	298	1960	3420	2531	740	97	12	4	4	0	0	9140

Percentile	15th	50th	85th	95th
Speed	29	34	38	42
Mean Speed (Average)	33.4			
10 MPH Pace Speed	30-39			
Number in Pace	5940			
Percent in Pace	65.0%			
Number > 35 MPH	3388			
Percent > 35 MPH	37.1%			

Location : Cochituate Road 95990001
Location : South of Windy Hill Lane
City/State: Wayland, MA
Direction: Combined

2/1/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	1	5	3	1	1	0	0	0	0	0	11
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	1	0	0	0	1	0	0	0	0	0	0	2
3:00	0	0	0	1	1	1	1	0	0	0	0	0	0	4
4:00	0	0	0	1	9	7	3	3	0	0	0	0	0	23
5:00	0	0	2	10	24	27	14	2	1	0	0	0	0	80
6:00	0	0	3	53	97	91	26	5	0	0	0	0	0	275
7:00	0	3	18	116	275	227	85	9	0	0	3	0	0	736
8:00	10	15	23	148	333	223	54	10	0	3	0	0	0	819
9:00	0	4	13	84	209	190	69	20	3	0	0	0	0	592
10:00	0	5	14	97	183	140	58	16	2	2	0	0	0	517
11:00	0	2	22	131	252	173	72	9	0	2	1	0	1	665
12:00 PM	2	8	35	151	239	159	54	7	1	0	0	0	0	656
1:00	0	1	15	111	241	194	76	14	1	0	0	0	0	653
2:00	0	2	6	121	279	211	63	12	0	0	0	0	0	694
3:00	0	3	35	174	326	248	69	12	2	0	0	0	0	869
4:00	2	2	28	155	351	243	82	5	2	0	0	0	0	870
5:00	0	4	22	153	314	189	67	4	0	0	0	0	0	753
6:00	0	4	17	136	230	145	32	8	1	0	0	0	0	573
7:00	0	1	7	71	132	102	28	3	3	0	0	0	0	347
8:00	0	1	9	47	109	87	20	5	0	0	0	0	0	278
9:00	0	0	3	35	51	56	11	2	0	0	0	0	0	158
10:00	0	0	3	8	14	24	11	1	3	0	1	0	0	65
11:00	0	0	0	0	1	4	3	0	0	0	0	0	0	8
Total	14	55	276	1804	3675	2744	900	148	19	7	5	0	1	9648

Percentile	15th	50th	85th	95th
Speed	29	34	39	42
Mean Speed (Average)	33.9			
10 MPH Pace Speed	30-39			
Number in Pace	6400			
Percent in Pace	66.3%			
Number > 35 MPH	3824			
Percent > 35 MPH	39.6%			

Grand Total	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%

Percentile	15th	50th	85th	95th
Speed	29	34	39	42
Mean Speed (Average)	33.7			
10 MPH Pace Speed	30-39			
Number in Pace	12340			
Percent in Pace	65.7%			
Number > 35 MPH	7212			
Percent > 35 MPH	38.4%			

MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING

massDOT Highway — Moving Massachusetts Forward.

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wayland

COUNT DATE : 1/31/2023

DISTRICT : 3

UNSIGNALIZED :

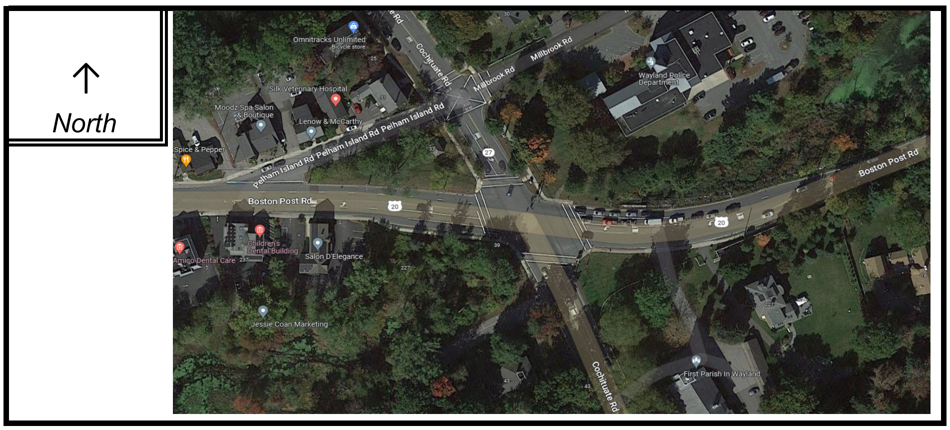
SIGNALIZED : X

~ INTERSECTION DATA ~

MAJOR STREET : Boston Post Road (Route 20)

MINOR STREET(S) : Cochituate Road (Route 27)

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM) :	647	799	840	539		**2,825**

" K " FACTOR : **0.090**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **31,389**

TOTAL # OF CRASHES : 52

OF YEARS : 5

AVERAGE # OF CRASHES PER YEAR (**A**) : **10.40**

CRASH RATE CALCULATION : **0.91**

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

Comments : Above MassDOT Statewide and District Average Crash Rates

Project Title & Date: 9599 - Proposed Age-Restricted Multifamily Residential Development massDOT Highway — Moving Massachusetts Forward.

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wayland   COUNT DATE : 1/31/2023

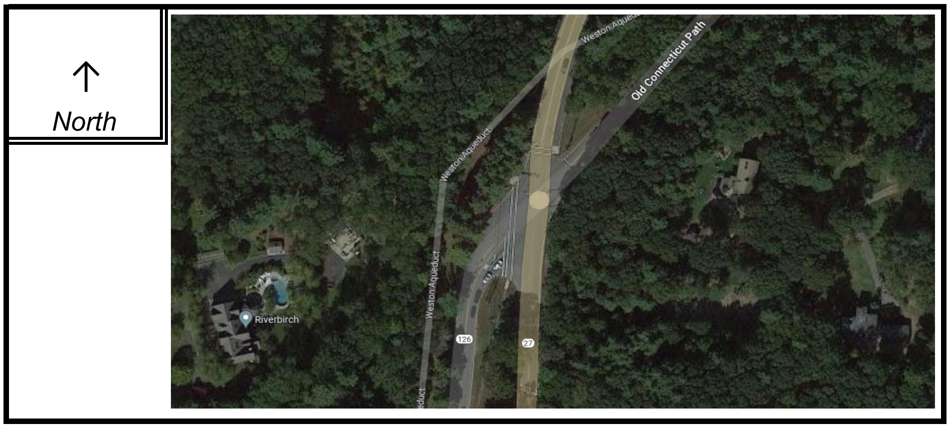
DISTRICT : 3   UNSIGNALIZED : [ ]   SIGNALIZED : X

~ INTERSECTION DATA ~

MAJOR STREET : Cochituate Road (Route 27)

MINOR STREET(S) : Old Connecticut Path

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM) :	606	650	527	248		2,031

" K " FACTOR : **0.090**   INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **22,567**

TOTAL # OF CRASHES : 29   # OF YEARS : 5   AVERAGE # OF CRASHES PER YEAR (**A**) : **5.80**

CRASH RATE CALCULATION : 0.70   RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Below MassDOT Statewide and District Average Crash Rates

Project Title & Date: 9599 - Proposed Age-Restricted Multifamily Residential Development

MassDOT Top Crash Locations

4/6/2023, 4:32:00 PM

1:18,056

0 0.13 0.25 0.5 mi

0 0.23 0.45 0.9 km

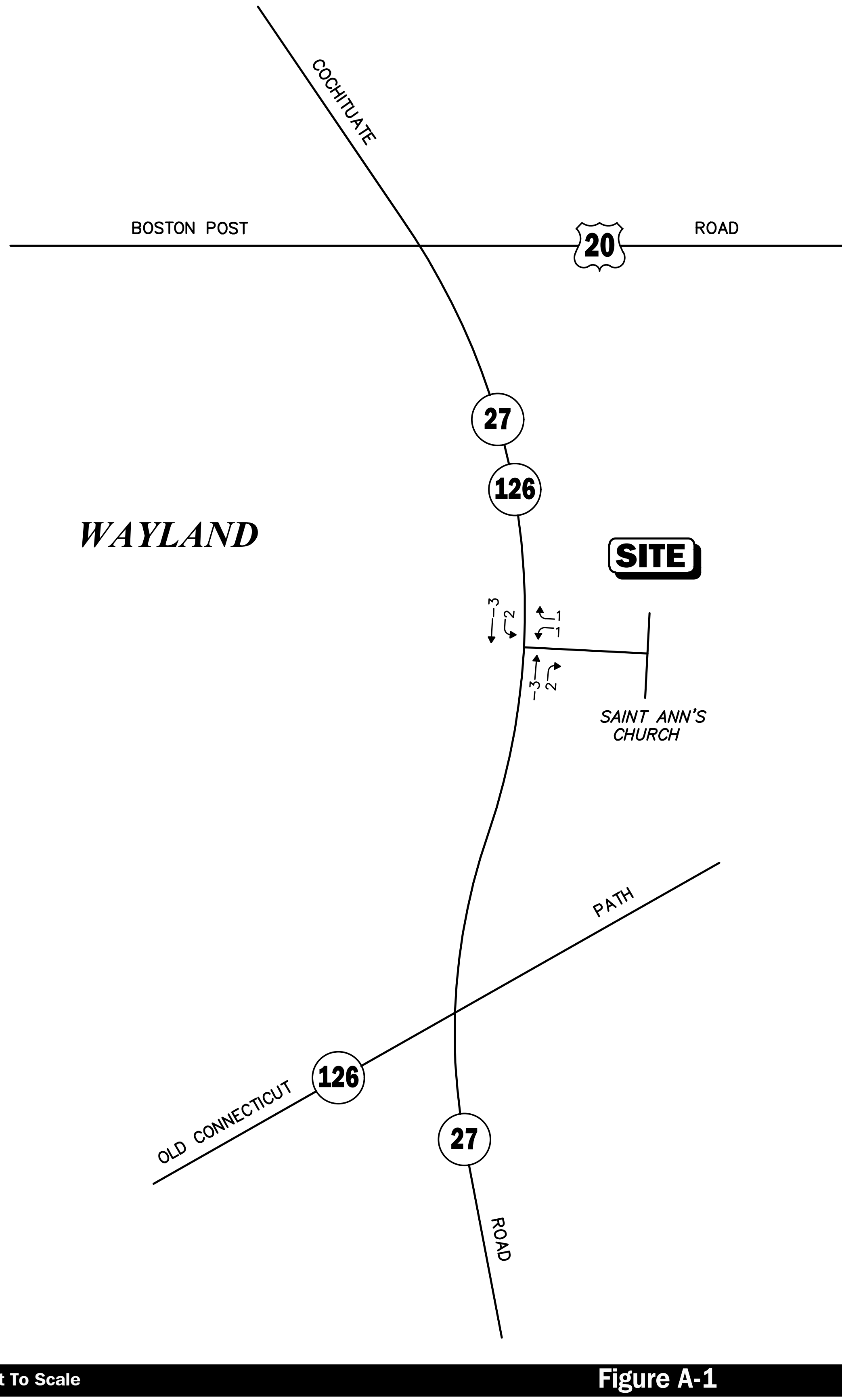
MassDOT

GENERAL BACKGROUND TRAFFIC GROWTH

General Background Traffic Growth - Daily Traffic Volumes

CITY/TOWN	ROUTE/STREET	LOCATION	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Annual Growth
Weston	Massturnpike	west of Winter Street									130,572	132,060	133,087	**0.96%**
														0.96%

BACKGROUND DEVELOPMENT NETWORKS



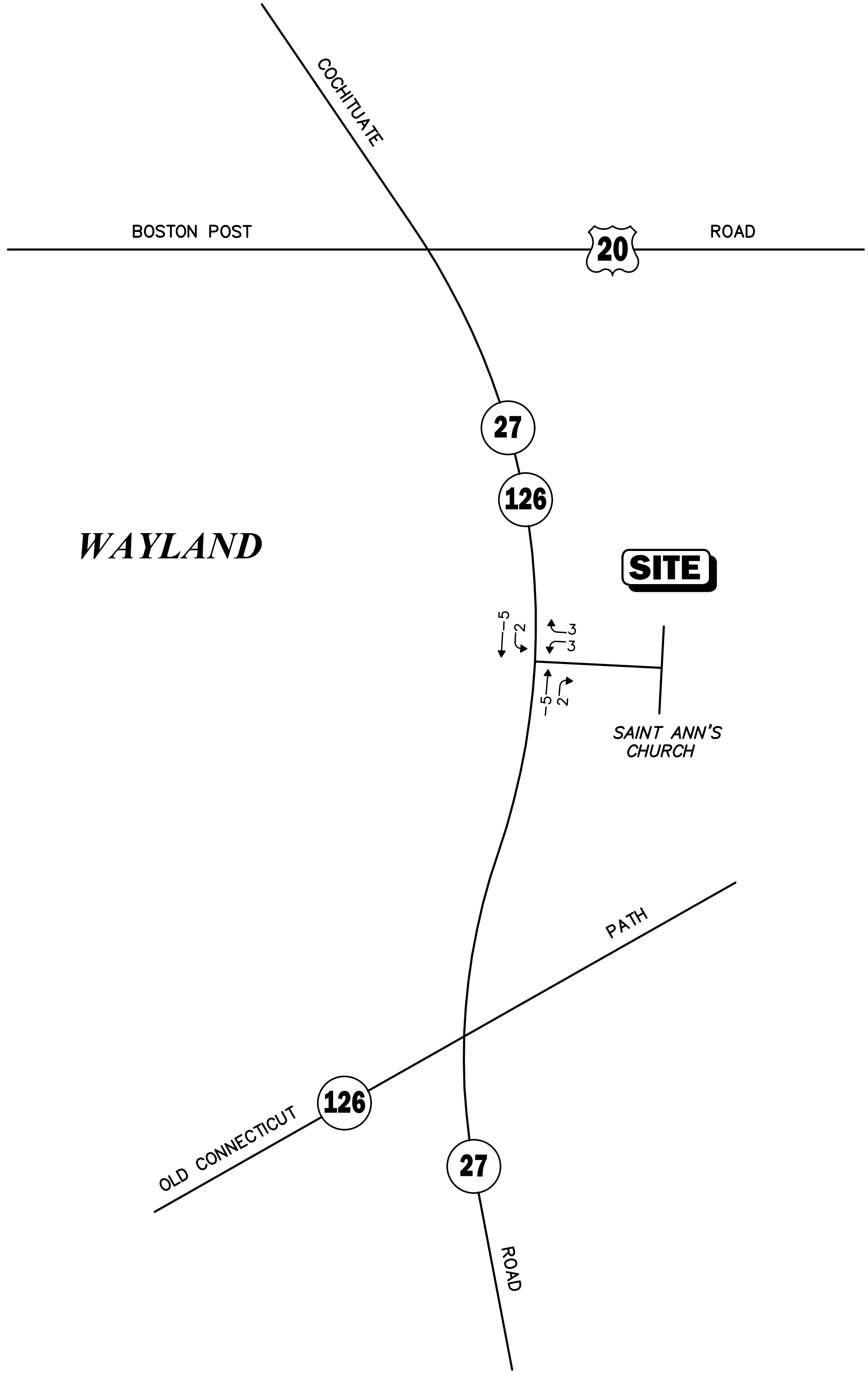
Not To Scale

Figure A-1

St. Ann's Church Trips
Weekday Morning
Peak-Hour Traffic Volumes

Vanasse & Associates inc

R:\9599\9599NT1.dwg, 4/10/2023 2:19:33 PM



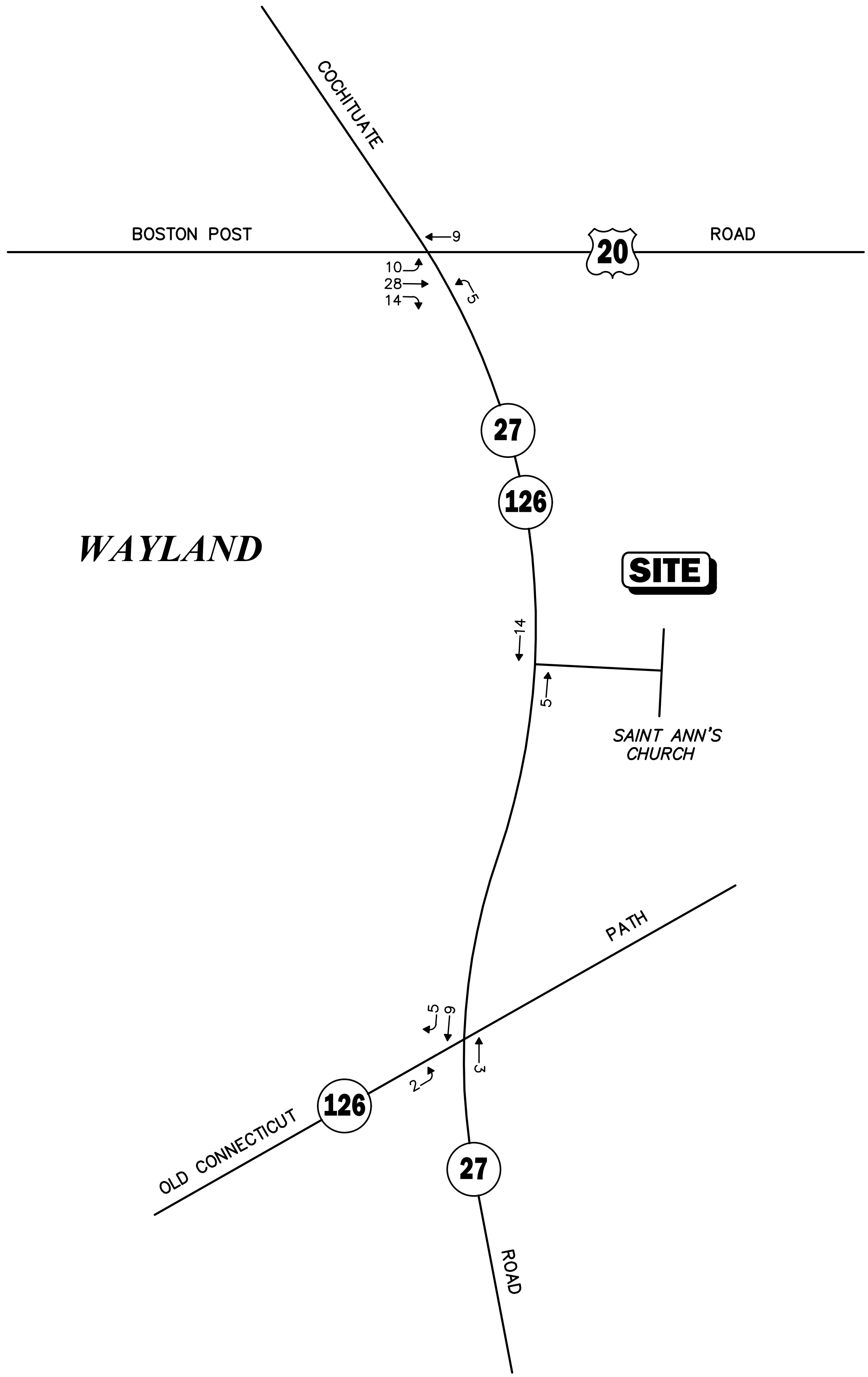
Not To Scale

Figure A-2

Vanasse & Associates inc

St. Ann's Church Trips
Weekday Evening
Peak-Hour Traffic Volumes

R:\9599\9599NT1.dwg, 4/10/2023 2:19:37 PM



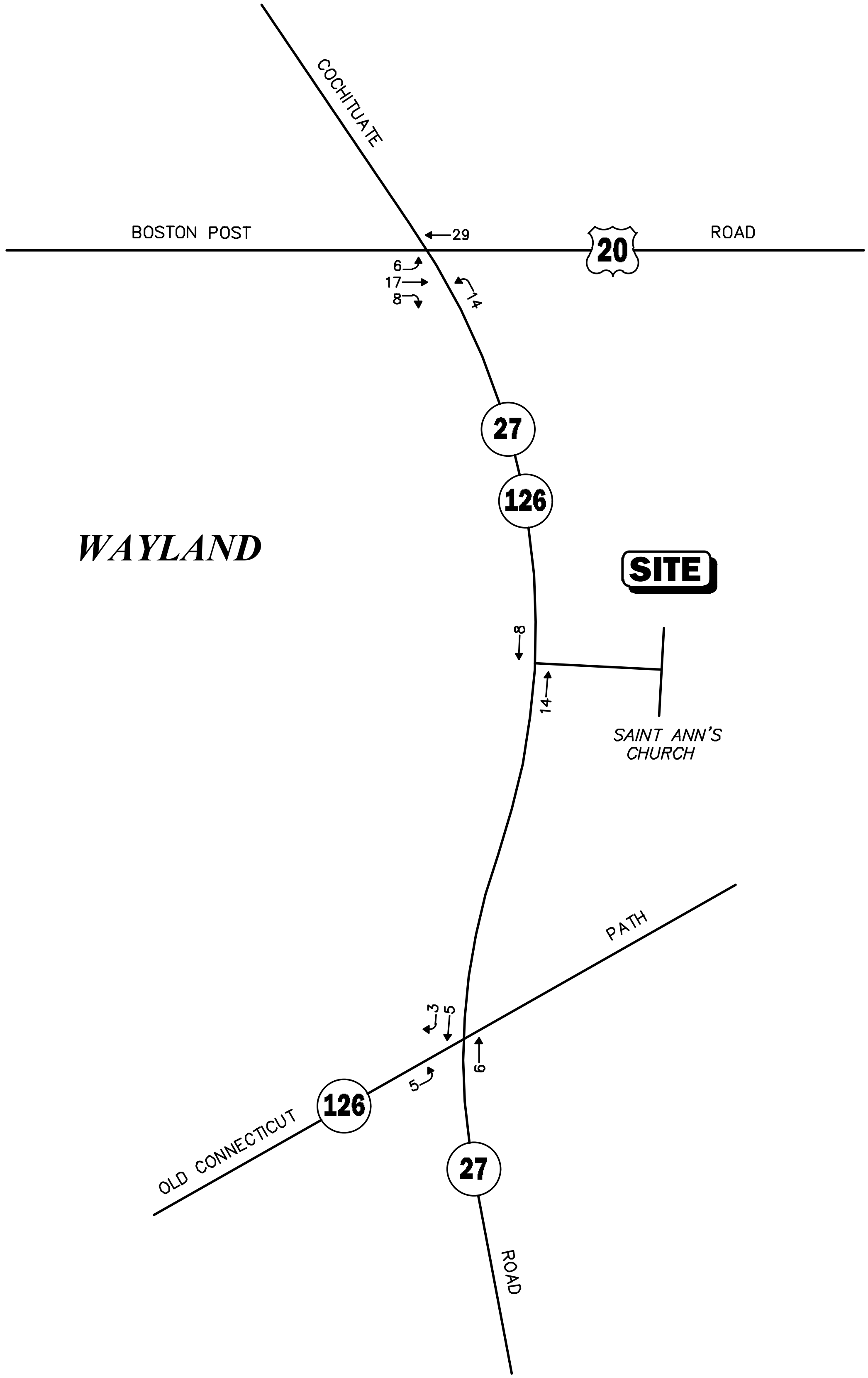
N

Not To Scale

Figure A-3

Proposed Multifamily Residential Development 297 Boston Post Road Weekday Morning Peak-Hour Traffic Volumes

Vanasse & Associates inc



Not To Scale

Figure A-4

Vanasse & Associates inc

Proposed Multifamily Residential Development 297 Boston Post Road Weekday Evening Peak-Hour Traffic Volumes

TRIP-GENERATION CALCUALTIONS

Graph Look Up

ITETripGen Web-based App

- Graph Look Up
- How to Use *ITETripGen*
- TGM Desk Reference
- TGM Appendices
- Support Documents
- Add Users
- Comments

Query | Filter

DATA SOURCE: Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE: 252

LAND USE GROUP: (200-299) Residential

LAND USE : 252 - Senior Adult Housing - Multifamily

LAND USE SUBCATEGORY: All Sites

SETTING/LOCATION: General Urban/Suburban

INDEPENDENT VARIABLE (IV): Dwelling Units

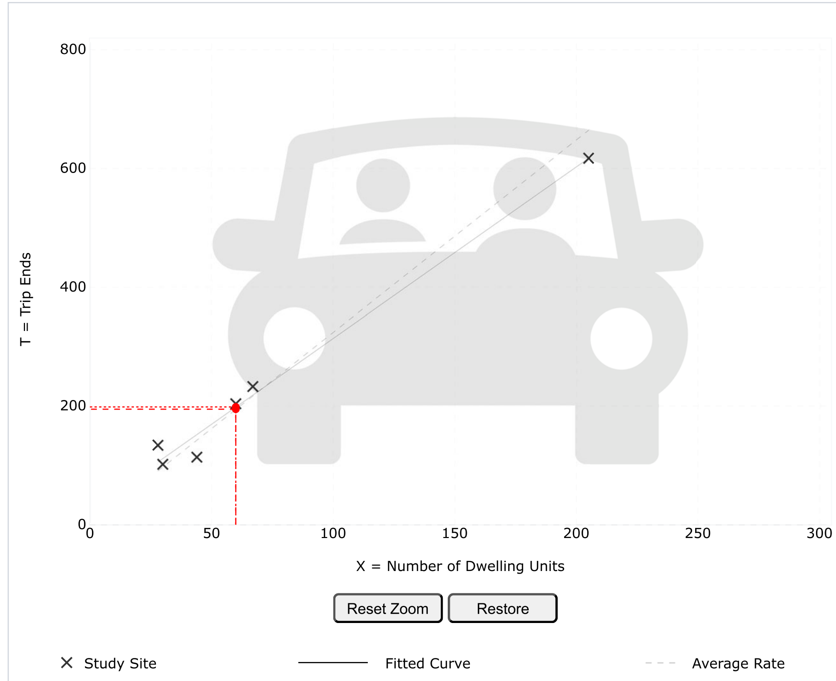
TIME PERIOD: Weekday

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 60

Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Senior Adult Housing - Multifamily (252) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
6

Avg. Num. of Dwelling Units:
72

Average Rate:
3.24

Range of Rates:
2.59 - 4.79

Standard Deviation:
0.53

Fitted Curve Equation:
T = 2.89(X) + 24.82

R^2:
0.99

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 194 (Total), 97 (Entry), 97 (Exit)
Fitted Curve: 198 (Total), 99 (Entry), 99 (Exit)

Add-ons to do more

Try OTISS Pro

Graph Look Up

ITETripGen Web-based App
Graph Look Up
How to Use ITETripGen
TGM Desk Reference
TGM Appendices
Support Documents
Add Users
Comments

Query | Filter

DATA SOURCE: Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE: 252

LAND USE GROUP: (200-299) Residential

LAND USE: 252 - Senior Adult Housing - Multifamily

LAND USE SUBCATEGORY: All Sites

SETTING/LOCATION: General Urban/Suburban

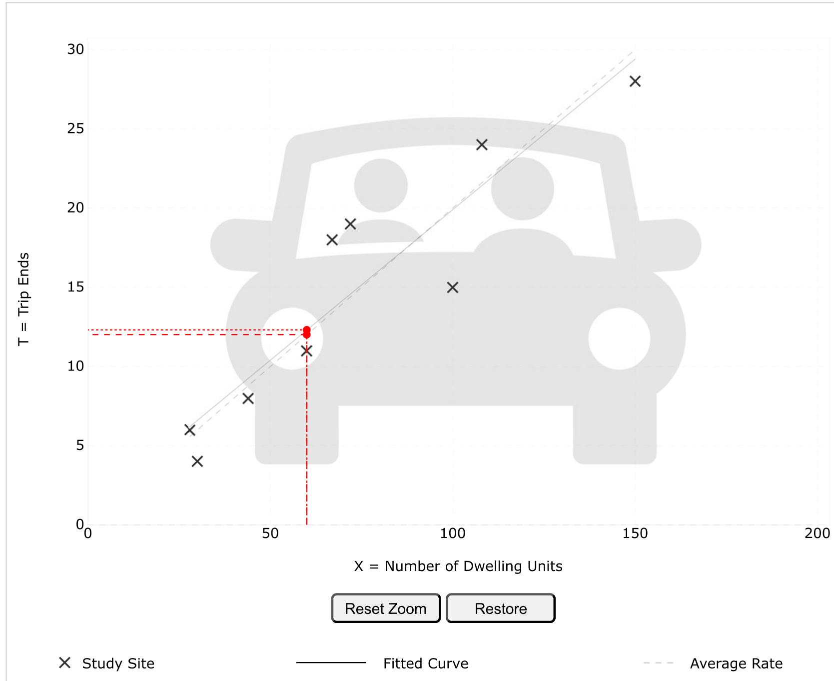
INDEPENDENT VARIABLE (IV): Dwelling Units

TIME PERIOD: Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 60 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Senior Adult Housing - Multifamily (252) Click for Description and Data Plots

Independent Variable:
Dwelling Units

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

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
9

Avg. Num. of Dwelling Units:
73

Average Rate:
0.20

Range of Rates:
0.13 - 0.27

Standard Deviation:
0.04

Fitted Curve Equation:
T = 0.19(X) + 0.90

R^2:
0.85

Directional Distribution:
34% entering, 66% exiting

Calculated Trip Ends:
Average Rate: 12 (Total), 4 (Entry), 8 (Exit)
Fitted Curve: 12 (Total), 4 (Entry), 8 (Exit)

Add-ons to do more
Try OTISS Pro

ITETripGen Web-based App

Help | Jeffrey Dirk | Sign out

Graph Look Up

ITETripGen Web-based App

- Graph Look Up
- How to Use *ITETripGen*
- TGM Desk Reference
- TGM Appendices
- Support Documents
- Add Users
- Comments

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
252

LAND USE GROUP:
(200-299) Residential

LAND USE :
252 - Senior Adult Housing - Multifamily

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

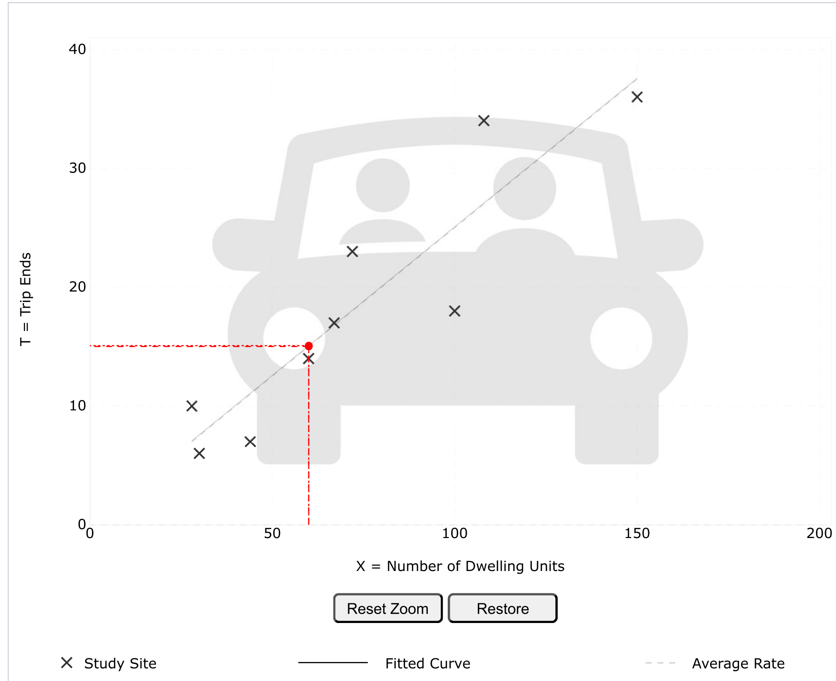
INDEPENDENT VARIABLE (IV):
Dwelling Units

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
60 | Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Senior Adult Housing - Multifamily (252) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
9

Avg. Num. of Dwelling Units:
73

Average Rate:
0.25

Range of Rates:
0.16 - 0.36

Standard Deviation:
0.06

Fitted Curve Equation:
T = 0.25(X) + 0.07

R^2:
0.84

Directional Distribution:
56% entering, 44% exiting

Calculated Trip Ends:
Average Rate: 15 (Total), 8 (Entry), 7 (Exit)
Fitted Curve: 15 (Total), 8 (Entry), 7 (Exit)

Add-ons to do more

Try OTISS Pro

TRIP DISTRIBUTION

Proposed Age-Restricted Multifamily Residential Development
Wayland, Massachusetts

Residence	Workplace	Number	Cochituate Road (North)		Route 20 (East)		Route 20 (West)		Cochituate Road (South)		Old Connecticut Path (East)		Old Connecticut Path (West)	
Wayland town	Wayland town	1,368	50%	684	10%	137	30%	410	10%	137		0		0
Wayland town	Boston city	816		0	50%	408		0		0	50%	408		0
Wayland town	Waltham city	396		0	50%	198		0		0	50%	198		0
Wayland town	Cambridge city	389		0	50%	195		0		0	50%	195		0
Wayland town	Natick town	389		0		0		0	60%	233		0	40%	156
Wayland town	Framingham town	337		0		0		0	40%	135		0	60%	202
Wayland town	Newton city	210		0	50%	105		0		0	50%	105		0
Wayland town	Wellesley town	196		0		0		0	100%	196		0		0
Wayland town	Marlborough city	183		0		0	60%	110		0		0	40%	73
Wayland town	Sudbury town	179	25%	45		0	75%	134		0		0		0
Wayland town	Watertown Town city	171		0	50%	86		0		0	50%	86		0
Wayland town	Lexington town	139		0	50%	70		0		0	50%	70		0
Wayland town	Worcester city	112		0		0		0	75%	84		0	25%	28
Wayland town	Weston town	101		0	50%	51		0		0	50%	51		0
Wayland town	Concord town	95	100%	95		0		0		0		0		0
Wayland town	Burlington town	83	20%	17	40%	33		0		0	40%	33		0
Wayland town	Malden city	67		0	50%	34		0		0	50%	34		0
Wayland town	Needham town	63		0		0		0	100%	63		0		0
Wayland town	Brookline town	61		0	50%	31		0		0	50%	31		0
Wayland town	Westborough town	59		0		0		0	40%	24		0	60%	35
Wayland town	Belmont town	52	20%	10	40%	21		0		0	40%	21		0
Wayland town	Billerica town	51	100%	51		0		0		0		0		0
Wayland town	Woburn city	45	20%	9	40%	18		0		0	40%	18		0
Wayland town	Andover town	39	20%	8	40%	16		0		0	40%	16		0
Wayland town	Merrimack town	39	100%	39		0		0		0		0		0
Wayland town	Bedford town	35		0	50%	18		0		0	50%	18		0
		5,675		958		1,417		654		872		1,280		494
				16.9%		25.0%		11.5%		15.4%		22.6%		8.7%
		SAY		**17%**		**25%**		**11%**		**15%**		**23%**		**9%**

CAPACITY ANALYSIS WORKSHEETS

Route 20 at Cochituate Road
Cochituate Road at Old Connecticut Path
Cochituate Road at the Saint Ann Northern Driveway

Route 20 at Cochituate Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	558	107	49	289	201	118	505	24	299	499	1
Future Volume (vph)	175	558	107	49	289	201	118	505	24	299	499	1
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976			0.938			0.993				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	3334	0	1574	3147	0	1646	1773	0	1668	1801	0
Flt Permitted	0.174			0.229			0.186			0.163		
Satd. Flow (perm)	306	3334	0	380	3147	0	322	1773	0	286	1801	0
Satd. Flow (RTOR)		17			134			2				
Adj. Flow (vph)	184	587	113	56	332	231	130	555	26	308	514	1
Lane Group Flow (vph)	184	700	0	56	563	0	130	581	0	308	515	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	22.5		11.0	22.5		11.0	22.5		11.0	22.5	
Total Split (s)	16.0	30.0		16.0	30.0		23.0	27.0		23.0	27.0	
Total Split (%)	13.3%	25.0%		13.3%	25.0%		19.2%	22.5%		19.2%	22.5%	
Maximum Green (s)	12.0	24.0		12.0	24.0		20.0	21.0		20.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0		0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.64	0.71		0.26	0.69		0.49	1.29		0.76	0.85	
Control Delay	33.0	35.8		23.7	30.9		24.0	179.9		34.4	46.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	33.0	35.8		23.7	30.9		24.0	179.9		34.4	46.6	
Queue Length 50th (ft)	68	184		19	116		38	~430		106	261	
Queue Length 95th (ft)	#197	#391		57	218		112	#891		#348	#718	
Internal Link Dist (ft)		226			321			1160			151	
Turn Bay Length (ft)	200			130			180					
Base Capacity (vph)	298	992		293	994		442	449		443	603	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.62	0.71		0.19	0.57		0.29	1.29		0.70	0.85	

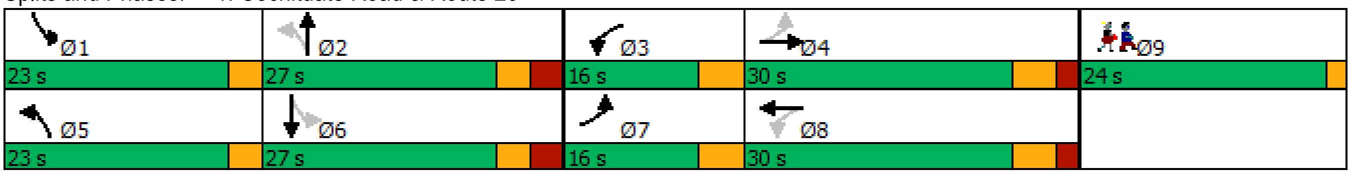
Intersection Summary
Cycle Length: 120

Lane Group	Ø9
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	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	22.0
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)	6.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 93.2
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Cochituate Road & Route 20



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	558	107	49	289	201	118	505	24	299	499	1
Future Volume (vph)	175	558	107	49	289	201	118	505	24	299	499	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	11	11	11	11	11	10	11	11
Total Lost time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.94		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	3333		1574	3149		1646	1774		1668	1800	
Flt Permitted	0.17	1.00		0.23	1.00		0.19	1.00		0.16	1.00	
Satd. Flow (perm)	306	3333		379	3149		322	1774		287	1800	
Peak-hour factor, PHF	0.95	0.95	0.95	0.87	0.87	0.87	0.91	0.91	0.91	0.97	0.97	0.97
Adj. Flow (vph)	184	587	113	56	332	231	130	555	26	308	514	1
RTOR Reduction (vph)	0	12	0	0	103	0	0	2	0	0	0	0
Lane Group Flow (vph)	184	688	0	56	460	0	130	579	0	308	515	0
Heavy Vehicles (%)	1%	2%	3%	7%	4%	4%	6%	3%	0%	1%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	35.6	25.3		26.2	19.9		31.6	21.5		42.3	29.2	
Effective Green, g (s)	35.6	27.3		26.2	21.9		31.6	23.5		42.3	31.2	
Actuated g/C Ratio	0.37	0.29		0.27	0.23		0.33	0.25		0.44	0.33	
Clearance Time (s)	4.0	6.0		4.0	6.0		3.0	6.0		3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	281	954		183	723		247	437		385	589	
v/s Ratio Prot	c0.08	c0.21		0.02	0.15		0.06	c0.33		c0.15	0.29	
v/s Ratio Perm	0.16			0.06			0.12			0.21		
v/c Ratio	0.65	0.72		0.31	0.64		0.53	1.33		0.80	0.87	
Uniform Delay, d1	22.5	30.6		26.4	33.1		24.3	35.9		21.9	30.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	2.7		1.0	1.8		2.0	161.9		11.3	13.6	
Delay (s)	27.9	33.3		27.3	34.9		26.3	197.8		33.2	43.8	
Level of Service	C	C		C	C		C	F		C	D	
Approach Delay (s)		32.2			34.3			166.5			39.8	
Approach LOS		C			C			F			D	

Intersection Summary			
HCM 2000 Control Delay	66.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	95.3	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	354	140	24	557	288	160	460	29	214	386	8
Future Volume (vph)	123	354	140	24	557	288	160	460	29	214	386	8
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958			0.949			0.991			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1685	3250	0	1685	3279	0	1694	1787	0	1636	1813	0
Flt Permitted	0.129			0.452			0.187			0.172		
Satd. Flow (perm)	229	3250	0	802	3279	0	333	1787	0	296	1813	0
Satd. Flow (RTOR)		44			70			2			1	
Adj. Flow (vph)	134	385	152	27	633	327	182	523	33	240	434	9
Lane Group Flow (vph)	134	537	0	27	960	0	182	556	0	240	443	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	22.5		11.0	22.5		11.0	22.5		11.0	22.5	
Total Split (s)	16.0	30.0		16.0	30.0		23.0	27.0		23.0	27.0	
Total Split (%)	13.3%	25.0%		13.3%	25.0%		19.2%	22.5%		19.2%	22.5%	
Maximum Green (s)	12.0	24.0		12.0	24.0		20.0	21.0		20.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0		0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.50	0.41		0.08	0.99		0.59	1.24		0.73	0.91	
Control Delay	25.6	23.3		20.0	58.5		26.6	160.2		34.0	59.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	25.6	23.3		20.0	58.5		26.6	160.2		34.0	59.1	
Queue Length 50th (ft)	43	90		8	264		61	~392		84	238	
Queue Length 95th (ft)	123	243		34	#580		148	#820		#221	#629	
Internal Link Dist (ft)		226			321			1160			151	
Turn Bay Length (ft)	200			130			180					
Base Capacity (vph)	290	1313		444	974		441	447		420	488	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.46	0.41		0.06	0.99		0.41	1.24		0.57	0.91	

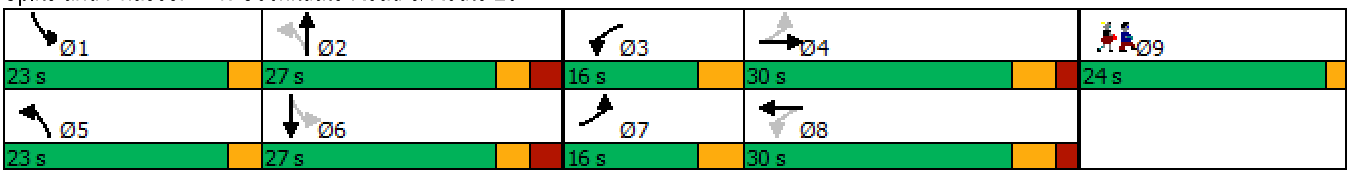
Intersection Summary
Cycle Length: 120

Lane Group	Ø9
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	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	22.0
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)	6.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 93.9
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Cochituate Road & Route 20



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	354	140	24	557	288	160	460	29	214	386	8
Future Volume (vph)	123	354	140	24	557	288	160	460	29	214	386	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	11	11	11	11	11	10	11	11
Total Lost time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1685	3248		1685	3279		1694	1787		1636	1813	
Flt Permitted	0.13	1.00		0.45	1.00		0.19	1.00		0.17	1.00	
Satd. Flow (perm)	229	3248		802	3279		333	1787		296	1813	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	134	385	152	27	633	327	182	523	33	240	434	9
RTOR Reduction (vph)	0	27	0	0	49	0	0	2	0	0	1	0
Lane Group Flow (vph)	134	510	0	27	911	0	182	554	0	240	442	0
Heavy Vehicles (%)	0%	4%	0%	0%	1%	1%	3%	2%	0%	3%	1%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.8	35.1		29.7	27.0		33.7	21.4		37.5	23.3	
Effective Green, g (s)	41.8	37.1		29.7	29.0		33.7	23.4		37.5	25.3	
Actuated g/C Ratio	0.43	0.38		0.30	0.30		0.34	0.24		0.38	0.26	
Clearance Time (s)	4.0	6.0		4.0	6.0		3.0	6.0		3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	258	1232		267	972		285	427		308	469	
v/s Ratio Prot	c0.06	0.16		0.00	c0.28		0.08	c0.31		c0.11	0.24	
v/s Ratio Perm	0.16			0.03			0.14			0.19		
v/c Ratio	0.52	0.41		0.10	0.94		0.64	1.30		0.78	0.94	
Uniform Delay, d1	21.4	22.3		24.1	33.5		25.3	37.2		24.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.2		0.2	15.7		4.6	150.7		11.8	27.6	
Delay (s)	23.2	22.6		24.3	49.2		29.9	187.9		35.8	63.2	
Level of Service	C	C		C	D		C	F		D	E	
Approach Delay (s)		22.7			48.6			148.9			53.5	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	68.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	97.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	626	129	52	319	216	131	541	26	320	535	1
Future Volume (vph)	198	626	129	52	319	216	131	541	26	320	535	1
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.974			0.940			0.993				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	3327	0	1574	3154	0	1646	1773	0	1668	1801	0
Flt Permitted	0.158			0.188			0.187			0.164		
Satd. Flow (perm)	277	3327	0	312	3154	0	324	1773	0	288	1801	0
Satd. Flow (RTOR)		18			125			2				
Adj. Flow (vph)	208	659	136	60	367	248	144	595	29	330	552	1
Lane Group Flow (vph)	208	795	0	60	615	0	144	624	0	330	553	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	22.5		11.0	22.5		11.0	22.5		11.0	22.5	
Total Split (s)	16.0	30.0		16.0	30.0		23.0	27.0		23.0	27.0	
Total Split (%)	13.3%	25.0%		13.3%	25.0%		19.2%	22.5%		19.2%	22.5%	
Maximum Green (s)	12.0	24.0		12.0	24.0		20.0	21.0		20.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0		0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.73	0.79		0.30	0.74		0.55	1.45		0.79	0.92	
Control Delay	39.3	39.1		24.7	34.2		26.0	246.7		36.6	55.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.3	39.1		24.7	34.2		26.0	246.7		36.6	55.5	
Queue Length 50th (ft)	79	222		21	139		44	~503		124	299	
Queue Length 95th (ft)	#257	#480		61	249		123	#967		#391	#798	
Internal Link Dist (ft)		226			321			542			151	
Turn Bay Length (ft)	200			130			180					
Base Capacity (vph)	284	1008		270	952		427	429		430	601	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.73	0.79		0.22	0.65		0.34	1.45		0.77	0.92	

Intersection Summary

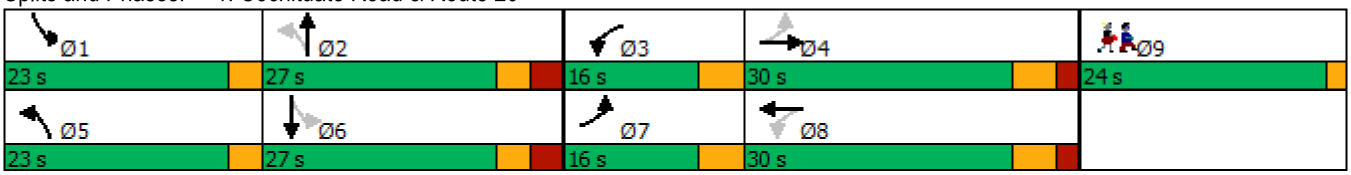
Cycle Length: 120

Lane Group	Ø9
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	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	22.0
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)	6.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 96.6
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Cochituate Road & Route 20



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	626	129	52	319	216	131	541	26	320	535	1
Future Volume (vph)	198	626	129	52	319	216	131	541	26	320	535	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	11	11	11	11	11	10	11	11
Total Lost time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.94		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	3328		1574	3152		1646	1773		1668	1800	
Flt Permitted	0.16	1.00		0.19	1.00		0.19	1.00		0.16	1.00	
Satd. Flow (perm)	278	3328		311	3152		324	1773		288	1800	
Peak-hour factor, PHF	0.95	0.95	0.95	0.87	0.87	0.87	0.91	0.91	0.91	0.97	0.97	0.97
Adj. Flow (vph)	208	659	136	60	367	248	144	595	29	330	552	1
RTOR Reduction (vph)	0	13	0	0	96	0	0	2	0	0	0	0
Lane Group Flow (vph)	208	782	0	60	519	0	144	622	0	330	553	0
Heavy Vehicles (%)	1%	2%	3%	7%	4%	4%	6%	3%	0%	1%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.5	26.9		27.9	21.3		32.1	21.4		44.0	30.3	
Effective Green, g (s)	37.5	28.9		27.9	23.3		32.1	23.4		44.0	32.3	
Actuated g/C Ratio	0.38	0.29		0.28	0.24		0.32	0.24		0.44	0.33	
Clearance Time (s)	4.0	6.0		4.0	6.0		3.0	6.0		3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	276	971		171	741		247	419		401	587	
v/s Ratio Prot	c0.09	c0.24		0.02	0.16		0.06	c0.35		c0.16	0.31	
v/s Ratio Perm	0.19			0.08			0.13			0.20		
v/c Ratio	0.75	0.81		0.35	0.70		0.58	1.49		0.82	0.94	
Uniform Delay, d1	23.7	32.4		27.3	34.7		26.3	37.8		23.8	32.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.1	4.9		1.2	3.0		3.5	231.0		12.8	23.6	
Delay (s)	34.8	37.4		28.5	37.7		29.8	268.8		36.6	56.1	
Level of Service	C	D		C	D		C	F		D	E	
Approach Delay (s)		36.8			36.9			224.0			48.8	
Approach LOS		D			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	83.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	99.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	397	158	26	626	309	186	494	31	230	414	9
Future Volume (vph)	138	397	158	26	626	309	186	494	31	230	414	9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.957			0.950			0.991			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1685	3247	0	1685	3282	0	1694	1787	0	1636	1813	0
Flt Permitted	0.132			0.381			0.188			0.172		
Satd. Flow (perm)	234	3247	0	676	3282	0	335	1787	0	296	1813	0
Satd. Flow (RTOR)		45			65			2			1	
Adj. Flow (vph)	150	432	172	30	711	351	211	561	35	258	465	10
Lane Group Flow (vph)	150	604	0	30	1062	0	211	596	0	258	475	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	22.5		11.0	22.5		11.0	22.5		11.0	22.5	
Total Split (s)	16.0	30.0		16.0	30.0		23.0	27.0		23.0	27.0	
Total Split (%)	13.3%	25.0%		13.3%	25.0%		19.2%	22.5%		19.2%	22.5%	
Maximum Green (s)	12.0	24.0		12.0	24.0		20.0	21.0		20.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0		0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.56	0.49		0.10	1.11		0.66	1.35		0.75	0.98	
Control Delay	28.0	26.3		20.4	95.5		29.3	205.0		35.5	73.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	28.0	26.3		20.4	95.5		29.3	205.0		35.5	73.8	
Queue Length 50th (ft)	50	133		9	~347		71	~449		91	266	
Queue Length 95th (ft)	#148	278		37	#672		171	#889		#263	#688	
Internal Link Dist (ft)		226			321			542			151	
Turn Bay Length (ft)	200			130			180					
Base Capacity (vph)	287	1227		403	958		438	440		417	484	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.52	0.49		0.07	1.11		0.48	1.35		0.62	0.98	

Intersection Summary

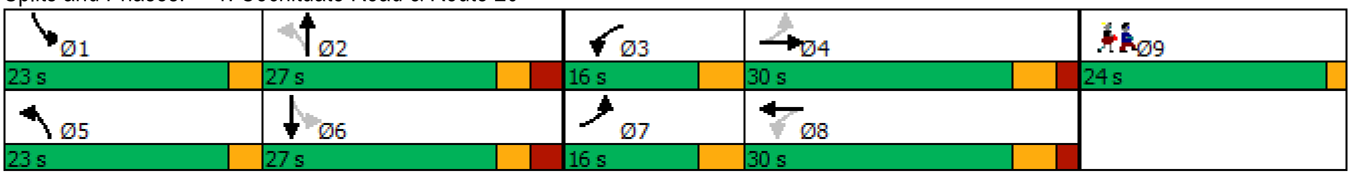
Cycle Length: 120

Lane Group	Ø9
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	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	22.0
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)	6.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 95.1
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Cochituate Road & Route 20



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	397	158	26	626	309	186	494	31	230	414	9
Future Volume (vph)	138	397	158	26	626	309	186	494	31	230	414	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	11	11	11	11	11	10	11	11
Total Lost time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1685	3248		1685	3284		1694	1787		1636	1813	
Flt Permitted	0.13	1.00		0.38	1.00		0.19	1.00		0.17	1.00	
Satd. Flow (perm)	235	3248		675	3284		335	1787		296	1813	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	150	432	172	30	711	351	211	561	35	258	465	10
RTOR Reduction (vph)	0	29	0	0	46	0	0	2	0	0	1	0
Lane Group Flow (vph)	150	575	0	30	1016	0	211	594	0	258	474	0
Heavy Vehicles (%)	0%	4%	0%	0%	1%	1%	3%	2%	0%	3%	1%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.2	33.1		30.3	26.2		34.6	21.3		38.6	23.3	
Effective Green, g (s)	41.2	35.1		30.3	28.2		34.6	23.3		38.6	25.3	
Actuated g/C Ratio	0.42	0.36		0.31	0.29		0.35	0.24		0.39	0.26	
Clearance Time (s)	4.0	6.0		4.0	6.0		3.0	6.0		3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	260	1159		250	942		301	423		324	466	
v/s Ratio Prot	c0.06	0.18		0.01	c0.31		0.09	c0.33		c0.12	0.26	
v/s Ratio Perm	0.18			0.03			0.15			0.19		
v/c Ratio	0.58	0.50		0.12	1.08		0.70	1.41		0.80	1.02	
Uniform Delay, d1	22.0	24.7		24.0	35.0		25.3	37.5		23.8	36.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	0.3		0.2	52.8		7.2	196.1		12.7	46.2	
Delay (s)	25.1	25.0		24.2	87.8		32.5	233.6		36.5	82.7	
Level of Service	C	C		C	F		C	F		D	F	
Approach Delay (s)		25.0			86.1			181.0			66.4	
Approach LOS		C			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	90.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	98.3	Sum of lost time (s)	17.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	626	129	53	319	216	132	542	28	320	536	1
Future Volume (vph)	198	626	129	53	319	216	132	542	28	320	536	1
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.974			0.940			0.993				
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	3327	0	1574	3154	0	1646	1773	0	1668	1801	0
Flt Permitted	0.159			0.189			0.188			0.165		
Satd. Flow (perm)	279	3327	0	313	3154	0	326	1773	0	290	1801	0
Satd. Flow (RTOR)		18			125			2				
Adj. Flow (vph)	208	659	136	61	367	248	145	596	31	330	553	1
Lane Group Flow (vph)	208	795	0	61	615	0	145	627	0	330	554	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	22.5		11.0	22.5		11.0	22.5		11.0	22.5	
Total Split (s)	16.0	30.0		16.0	30.0		23.0	27.0		23.0	27.0	
Total Split (%)	13.3%	25.0%		13.3%	25.0%		19.2%	22.5%		19.2%	22.5%	
Maximum Green (s)	12.0	24.0		12.0	24.0		20.0	21.0		20.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0		0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.73	0.79		0.30	0.74		0.55	1.46		0.78	0.92	
Control Delay	39.2	39.3		24.7	34.2		26.0	249.6		36.5	56.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.2	39.3		24.7	34.2		26.0	249.6		36.5	56.1	
Queue Length 50th (ft)	79	222		21	139		44	~507		123	301	
Queue Length 95th (ft)	#257	#482		61	249		123	#973		#390	#800	
Internal Link Dist (ft)		226			321			542			151	
Turn Bay Length (ft)	200			130			180					
Base Capacity (vph)	284	1006		270	952		428	429		430	600	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.73	0.79		0.23	0.65		0.34	1.46		0.77	0.92	

Intersection Summary

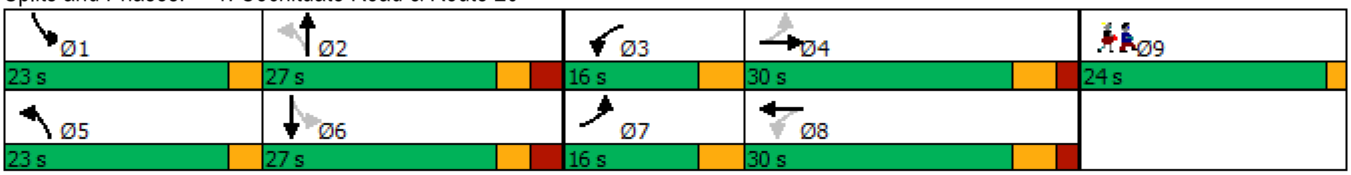
Cycle Length: 120

Lane Group	Ø9
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	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	22.0
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)	6.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 96.6
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Cochituate Road & Route 20



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	626	129	53	319	216	132	542	28	320	536	1
Future Volume (vph)	198	626	129	53	319	216	132	542	28	320	536	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	11	11	11	11	11	10	11	11
Total Lost time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.94		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1668	3328		1574	3152		1646	1772		1668	1800	
Flt Permitted	0.16	1.00		0.19	1.00		0.19	1.00		0.16	1.00	
Satd. Flow (perm)	279	3328		313	3152		325	1772		289	1800	
Peak-hour factor, PHF	0.95	0.95	0.95	0.87	0.87	0.87	0.91	0.91	0.91	0.97	0.97	0.97
Adj. Flow (vph)	208	659	136	61	367	248	145	596	31	330	553	1
RTOR Reduction (vph)	0	13	0	0	96	0	0	2	0	0	0	0
Lane Group Flow (vph)	208	782	0	61	519	0	145	625	0	330	554	0
Heavy Vehicles (%)	1%	2%	3%	7%	4%	4%	6%	3%	0%	1%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.4	26.8		27.8	21.2		32.0	21.3		43.9	30.2	
Effective Green, g (s)	37.4	28.8		27.8	23.2		32.0	23.3		43.9	32.2	
Actuated g/C Ratio	0.38	0.29		0.28	0.23		0.32	0.24		0.44	0.33	
Clearance Time (s)	4.0	6.0		4.0	6.0		3.0	6.0		3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	277	970		172	740		248	417		401	586	
v/s Ratio Prot	c0.09	c0.24		0.02	0.16		0.06	c0.35		c0.16	0.31	
v/s Ratio Perm	0.19			0.08			0.13			0.20		
v/c Ratio	0.75	0.81		0.35	0.70		0.58	1.50		0.82	0.95	
Uniform Delay, d1	23.7	32.4		27.3	34.6		26.3	37.8		23.7	32.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.9	5.0		1.3	3.0		3.5	237.2		12.8	24.2	
Delay (s)	34.6	37.4		28.5	37.7		29.8	275.0		36.5	56.7	
Level of Service	C	D		C	D		C	F		D	E	
Approach Delay (s)		36.8			36.8			228.9			49.1	
Approach LOS		D			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	84.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	397	159	28	626	309	187	494	33	230	415	9
Future Volume (vph)	138	397	159	28	626	309	187	494	33	230	415	9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.957			0.950			0.990			0.997	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1685	3247	0	1685	3282	0	1694	1785	0	1636	1813	0
Flt Permitted	0.132			0.378			0.188			0.172		
Satd. Flow (perm)	234	3247	0	670	3282	0	335	1785	0	296	1813	0
Satd. Flow (RTOR)		46			65			3			1	
Adj. Flow (vph)	150	432	173	32	711	351	213	561	38	258	466	10
Lane Group Flow (vph)	150	605	0	32	1062	0	213	599	0	258	476	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	22.5		11.0	22.5		11.0	22.5		11.0	22.5	
Total Split (s)	16.0	30.0		16.0	30.0		23.0	27.0		23.0	27.0	
Total Split (%)	13.3%	25.0%		13.3%	25.0%		19.2%	22.5%		19.2%	22.5%	
Maximum Green (s)	12.0	24.0		12.0	24.0		20.0	21.0		20.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	3.0		0.0	3.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0		0.0	-2.0		0.0	-2.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.56	0.49		0.10	1.11		0.66	1.36		0.75	0.99	
Control Delay	28.0	26.4		20.5	95.5		29.5	207.5		35.5	74.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	28.0	26.4		20.5	95.5		29.5	207.5		35.5	74.6	
Queue Length 50th (ft)	50	133		10	~347		72	~452		91	267	
Queue Length 95th (ft)	#149	279		38	#672		173	#894		#263	#691	
Internal Link Dist (ft)		226			321			542			151	
Turn Bay Length (ft)	200			130			180					
Base Capacity (vph)	287	1225		402	958		438	440		417	483	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.52	0.49		0.08	1.11		0.49	1.36		0.62	0.99	

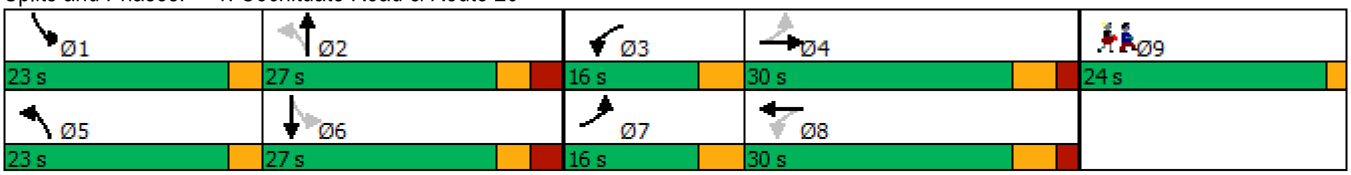
Intersection Summary
Cycle Length: 120

Lane Group	Ø9
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	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	20%
Maximum Green (s)	22.0
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)	6.0
Flash Dont Walk (s)	16.0
Pedestrian Calls (#/hr)	2
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 95.1
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Cochituate Road & Route 20



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	397	159	28	626	309	187	494	33	230	415	9
Future Volume (vph)	138	397	159	28	626	309	187	494	33	230	415	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	11	11	11	11	11	10	11	11
Total Lost time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1685	3247		1685	3284		1694	1786		1636	1813	
Flt Permitted	0.13	1.00		0.38	1.00		0.19	1.00		0.17	1.00	
Satd. Flow (perm)	235	3247		670	3284		335	1786		296	1813	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	150	432	173	32	711	351	212	561	38	258	466	10
RTOR Reduction (vph)	0	30	0	0	46	0	0	2	0	0	1	0
Lane Group Flow (vph)	150	575	0	32	1016	0	213	597	0	258	475	0
Heavy Vehicles (%)	0%	4%	0%	0%	1%	1%	3%	2%	0%	3%	1%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.2	33.0		30.4	26.2		34.6	21.3		38.6	23.3	
Effective Green, g (s)	41.2	35.0		30.4	28.2		34.6	23.3		38.6	25.3	
Actuated g/C Ratio	0.42	0.36		0.31	0.29		0.35	0.24		0.39	0.26	
Clearance Time (s)	4.0	6.0		4.0	6.0		3.0	6.0		3.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	260	1156		250	942		301	423		324	466	
v/s Ratio Prot	c0.06	0.18		0.01	c0.31		0.10	c0.33		c0.12	0.26	
v/s Ratio Perm	0.18			0.03			0.15			0.19		
v/c Ratio	0.58	0.50		0.13	1.08		0.71	1.41		0.80	1.02	
Uniform Delay, d1	22.0	24.8		23.9	35.0		25.3	37.5		23.8	36.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	0.3		0.2	52.8		7.4	198.4		12.7	46.8	
Delay (s)	25.1	25.1		24.2	87.8		32.7	235.9		36.5	83.3	
Level of Service	C	C		C	F		C	F		D	F	
Approach Delay (s)		25.1			85.9			182.6			66.8	
Approach LOS		C			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	91.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	98.3	Sum of lost time (s)	17.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Cochituate Road at Old Connecticut Path

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	305	25	59	156	33	24	483	99	10	448	192
Future Volume (vph)	197	305	25	59	156	33	24	483	99	10	448	192
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.982			0.978			0.960	
Flt Protected	0.950				0.988			0.998			0.999	
Satd. Flow (prot)	1652	1749	0	0	1809	0	0	1826	0	0	1888	0
Flt Permitted	0.358				0.799			0.953			0.989	
Satd. Flow (perm)	622	1749	0	0	1463	0	0	1744	0	0	1869	0
Satd. Flow (RTOR)												
Adj. Flow (vph)	259	401	33	77	203	43	29	575	118	11	487	209
Lane Group Flow (vph)	259	434	0	0	323	0	0	722	0	0	707	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	12.0	38.0		26.0	26.0		38.0	38.0		38.0	38.0	
Total Split (%)	10.0%	31.7%		21.7%	21.7%		31.7%	31.7%		31.7%	31.7%	
Maximum Green (s)	9.0	31.0		19.0	19.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	0.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-3.0			-3.0			-3.0			-3.0	
Total Lost Time (s)	3.0	4.0			4.0			3.0			3.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.69	0.60			0.82			0.97			0.89	
Control Delay	32.2	27.1			50.2			53.2			39.5	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	32.2	27.1			50.2			53.2			39.5	
Queue Length 50th (ft)	75	144			138			300			277	
Queue Length 95th (ft)	#253	360			#385			#896			#934	
Internal Link Dist (ft)		221			221			178			1160	
Turn Bay Length (ft)	50											
Base Capacity (vph)	378	725			392			744			797	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.69	0.60			0.82			0.97			0.89	

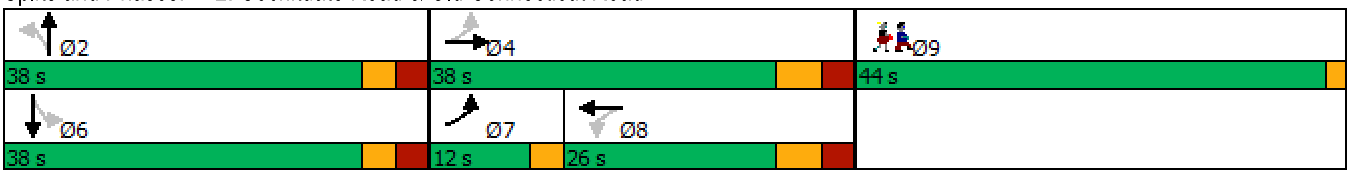
Intersection Summary
Cycle Length: 120

Lane Group	Ø9
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	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	44.0
Total Split (s)	44.0
Total Split (%)	37%
Maximum Green (s)	42.0
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)	35.0
Pedestrian Calls (#/hr)	1
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 84.8
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Cochituate Road & Old Connecticut Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	305	25	59	156	33	24	483	99	10	448	192
Future Volume (vph)	197	305	25	59	156	33	24	483	99	10	448	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	13	13	13	14	14	14
Total Lost time (s)	3.0	4.0			4.0			3.0			3.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.99			0.98			0.98			0.96	
Flt Protected	0.95	1.00			0.99			1.00			1.00	
Satd. Flow (prot)	1652	1748			1810			1826			1889	
Flt Permitted	0.36	1.00			0.80			0.95			0.99	
Satd. Flow (perm)	623	1748			1464			1743			1869	
Peak-hour factor, PHF	0.76	0.76	0.76	0.77	0.77	0.77	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	259	401	33	77	203	43	29	575	118	11	487	209
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	259	434	0	0	323	0	0	722	0	0	707	0
Heavy Vehicles (%)	2%	0%	4%	0%	3%	0%	0%	6%	1%	0%	3%	3%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.1	32.1			19.8			33.1			33.1	
Effective Green, g (s)	32.1	35.1			22.8			36.1			36.1	
Actuated g/C Ratio	0.37	0.41			0.26			0.42			0.42	
Clearance Time (s)	3.0	7.0			7.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	343	712			387			730			783	
v/s Ratio Prot	c0.08	0.25										
v/s Ratio Perm	0.20				c0.22			c0.41			0.38	
v/c Ratio	0.76	0.61			0.83			0.99			0.90	
Uniform Delay, d1	22.6	20.1			29.9			24.8			23.4	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	9.1	1.5			14.3			30.2			13.7	
Delay (s)	31.7	21.6			44.2			55.0			37.0	
Level of Service	C	C			D			E			D	
Approach Delay (s)		25.4			44.2			55.0			37.0	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	151	11	35	400	25	12	509	36	14	299	219
Future Volume (vph)	148	151	11	35	400	25	12	509	36	14	299	219
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.993			0.991			0.944	
Flt Protected	0.950				0.996			0.999			0.999	
Satd. Flow (prot)	1668	1756	0	0	1879	0	0	1926	0	0	1911	0
Flt Permitted	0.175				0.960			0.986			0.981	
Satd. Flow (perm)	307	1756	0	0	1811	0	0	1901	0	0	1877	0
Satd. Flow (RTOR)												
Adj. Flow (vph)	172	176	13	41	465	29	12	519	37	15	318	233
Lane Group Flow (vph)	172	189	0	0	535	0	0	568	0	0	566	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	12.0	38.0		26.0	26.0		38.0	38.0		38.0	38.0	
Total Split (%)	10.0%	31.7%		21.7%	21.7%		31.7%	31.7%		31.7%	31.7%	
Maximum Green (s)	9.0	31.0		19.0	19.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	0.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-3.0			-3.0			-3.0			-3.0	
Total Lost Time (s)	3.0	4.0			4.0			3.0			3.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.61	0.26			1.10			0.70			0.71	
Control Delay	31.5	21.2			103.2			28.7			29.0	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	31.5	21.2			103.2			28.7			29.0	
Queue Length 50th (ft)	47	53			~261			197			197	
Queue Length 95th (ft)	#192	176			#762			#690			#690	
Internal Link Dist (ft)		221			221			178			1160	
Turn Bay Length (ft)	50											
Base Capacity (vph)	280	727			486			811			801	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.61	0.26			1.10			0.70			0.71	

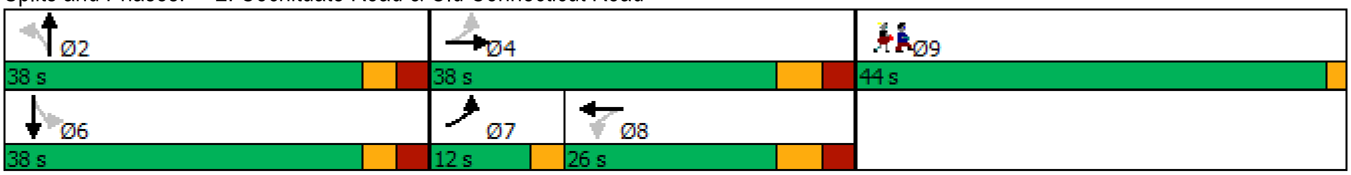
Intersection Summary
Cycle Length: 120

Lane Group	Ø9
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	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	44.0
Total Split (s)	44.0
Total Split (%)	37%
Maximum Green (s)	42.0
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)	35.0
Pedestrian Calls (#/hr)	1
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 84.8
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Cochituate Road & Old Connecticut Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	151	11	35	400	25	12	509	36	14	299	219
Future Volume (vph)	148	151	11	35	400	25	12	509	36	14	299	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	13	13	13	14	14	14
Total Lost time (s)	3.0	4.0			4.0			3.0			3.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.99			0.99			0.99			0.94	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1668	1755			1879			1926			1912	
Flt Permitted	0.18	1.00			0.96			0.99			0.98	
Satd. Flow (perm)	308	1755			1811			1902			1878	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.98	0.98	0.98	0.94	0.94	0.94
Adj. Flow (vph)	172	176	13	41	465	29	12	519	37	15	318	233
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	172	189	0	0	535	0	0	568	0	0	566	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.1	32.1			19.8			33.1			33.1	
Effective Green, g (s)	32.1	35.1			22.8			36.1			36.1	
Actuated g/C Ratio	0.37	0.41			0.26			0.42			0.42	
Clearance Time (s)	3.0	7.0			7.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	261	715			479			797			787	
v/s Ratio Prot	c0.07	0.11										
v/s Ratio Perm	0.17				c0.30			0.30			c0.30	
v/c Ratio	0.66	0.26			1.12			0.71			0.72	
Uniform Delay, d1	21.2	16.9			31.6			20.7			20.8	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	5.9	0.2			77.1			3.0			3.2	
Delay (s)	27.1	17.1			108.8			23.7			24.0	
Level of Service	C	B			F			C			C	
Approach Delay (s)		21.9			108.8			23.7			24.0	
Approach LOS		C			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	45.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	327	27	64	167	35	26	521	106	10	490	211
Future Volume (vph)	213	327	27	64	167	35	26	521	106	10	490	211
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.982			0.978			0.960	
Flt Protected	0.950				0.988			0.998			0.999	
Satd. Flow (prot)	1652	1747	0	0	1809	0	0	1826	0	0	1888	0
Flt Permitted	0.342				0.777			0.940			0.989	
Satd. Flow (perm)	595	1747	0	0	1423	0	0	1720	0	0	1869	0
Satd. Flow (RTOR)												
Adj. Flow (vph)	280	430	36	83	217	45	31	620	126	11	533	229
Lane Group Flow (vph)	280	466	0	0	345	0	0	777	0	0	773	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	12.0	38.0		26.0	26.0		38.0	38.0		38.0	38.0	
Total Split (%)	10.0%	31.7%		21.7%	21.7%		31.7%	31.7%		31.7%	31.7%	
Maximum Green (s)	9.0	31.0		19.0	19.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	0.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-3.0			-3.0			-3.0			-3.0	
Total Lost Time (s)	3.0	4.0			4.0			3.0			3.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.76	0.64			0.91			1.06			0.97	
Control Delay	36.4	28.3			60.8			76.4			51.9	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	36.4	28.3			60.8			76.4			51.9	
Queue Length 50th (ft)	82	159			152			345			321	
Queue Length 95th (ft)	#297	#399			#425			#988			#1047	
Internal Link Dist (ft)		221			221			178			538	
Turn Bay Length (ft)	50											
Base Capacity (vph)	370	724			381			734			797	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.76	0.64			0.91			1.06			0.97	

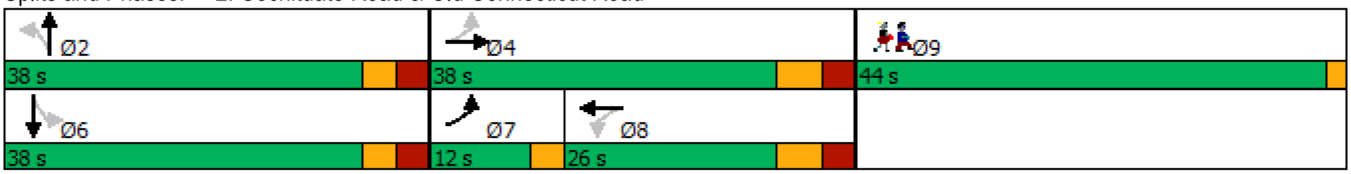
Intersection Summary
Cycle Length: 120

Lane Group	Ø9
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	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	44.0
Total Split (s)	44.0
Total Split (%)	37%
Maximum Green (s)	42.0
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)	35.0
Pedestrian Calls (#/hr)	1
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 84.8
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Cochituate Road & Old Connecticut Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	327	27	64	167	35	26	521	106	10	490	211
Future Volume (vph)	213	327	27	64	167	35	26	521	106	10	490	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	13	13	13	14	14	14
Total Lost time (s)	3.0	4.0			4.0			3.0			3.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.99			0.98			0.98			0.96	
Flt Protected	0.95	1.00			0.99			1.00			1.00	
Satd. Flow (prot)	1652	1747			1810			1826			1888	
Flt Permitted	0.34	1.00			0.78			0.94			0.99	
Satd. Flow (perm)	595	1747			1423			1720			1869	
Peak-hour factor, PHF	0.76	0.76	0.76	0.77	0.77	0.77	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	280	430	36	83	217	45	31	620	126	11	533	229
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	280	466	0	0	345	0	0	777	0	0	773	0
Heavy Vehicles (%)	2%	0%	4%	0%	3%	0%	0%	6%	1%	0%	3%	3%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.1	32.1			19.8			33.1			33.1	
Effective Green, g (s)	32.1	35.1			22.8			36.1			36.1	
Actuated g/C Ratio	0.37	0.41			0.26			0.42			0.42	
Clearance Time (s)	3.0	7.0			7.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	336	712			376			721			783	
v/s Ratio Prot	c0.09	0.27										
v/s Ratio Perm	0.22				c0.24			c0.45			0.41	
v/c Ratio	0.83	0.65			0.92			1.08			0.99	
Uniform Delay, d1	24.1	20.6			30.7			25.0			24.8	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	16.1	2.2			26.6			56.4			28.7	
Delay (s)	40.2	22.8			57.3			81.4			53.5	
Level of Service	D	C			E			F			D	
Approach Delay (s)		29.3			57.3			81.4			53.5	
Approach LOS		C			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	55.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	161	11	38	428	27	13	555	39	15	325	238
Future Volume (vph)	164	161	11	38	428	27	13	555	39	15	325	238
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.993			0.991			0.944	
Flt Protected	0.950				0.996			0.999			0.999	
Satd. Flow (prot)	1668	1756	0	0	1879	0	0	1926	0	0	1911	0
Flt Permitted	0.175				0.958			0.985			0.981	
Satd. Flow (perm)	307	1756	0	0	1807	0	0	1899	0	0	1877	0
Satd. Flow (RTOR)												
Adj. Flow (vph)	191	187	13	44	498	31	13	566	40	16	346	253
Lane Group Flow (vph)	191	200	0	0	573	0	0	619	0	0	615	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	12.0	38.0		26.0	26.0		38.0	38.0		38.0	38.0	
Total Split (%)	10.0%	31.7%		21.7%	21.7%		31.7%	31.7%		31.7%	31.7%	
Maximum Green (s)	9.0	31.0		19.0	19.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	0.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-3.0			-3.0			-3.0			-3.0	
Total Lost Time (s)	3.0	4.0			4.0			3.0			3.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.68	0.28			1.18			0.76			0.77	
Control Delay	34.8	21.4			132.0			31.1			31.4	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	34.8	21.4			132.0			31.1			31.4	
Queue Length 50th (ft)	53	56			~312			223			222	
Queue Length 95th (ft)	#228	186			#827			#777			#774	
Internal Link Dist (ft)		221			221			178			538	
Turn Bay Length (ft)	50											
Base Capacity (vph)	280	727			485			810			801	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.68	0.28			1.18			0.76			0.77	

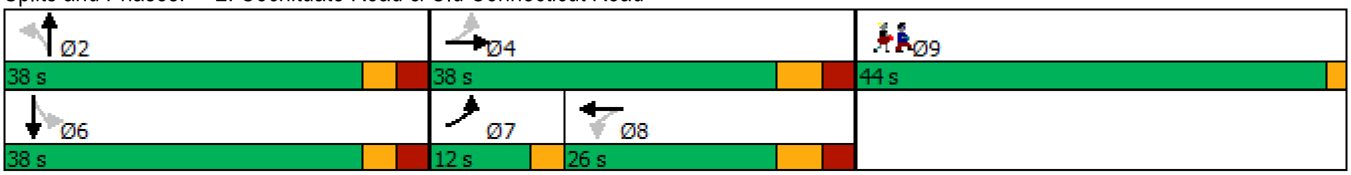
Intersection Summary
Cycle Length: 120

Lane Group	Ø9
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	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	44.0
Total Split (s)	44.0
Total Split (%)	37%
Maximum Green (s)	42.0
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)	35.0
Pedestrian Calls (#/hr)	1
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 84.8
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Cochituate Road & Old Connecticut Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	161	11	38	428	27	13	555	39	15	325	238
Future Volume (vph)	164	161	11	38	428	27	13	555	39	15	325	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	13	13	13	14	14	14
Total Lost time (s)	3.0	4.0			4.0			3.0			3.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.99			0.99			0.99			0.94	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1668	1756			1879			1927			1912	
Flt Permitted	0.18	1.00			0.96			0.98			0.98	
Satd. Flow (perm)	308	1756			1808			1899			1878	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.98	0.98	0.98	0.94	0.94	0.94
Adj. Flow (vph)	191	187	13	44	498	31	13	566	40	16	346	253
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	191	200	0	0	573	0	0	619	0	0	615	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.1	32.1			19.8			33.1			33.1	
Effective Green, g (s)	32.1	35.1			22.8			36.1			36.1	
Actuated g/C Ratio	0.37	0.41			0.26			0.42			0.42	
Clearance Time (s)	3.0	7.0			7.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	261	715			478			796			787	
v/s Ratio Prot	c0.08	0.11										
v/s Ratio Perm	0.19				c0.32			0.33			c0.33	
v/c Ratio	0.73	0.28			1.20			0.78			0.78	
Uniform Delay, d1	21.4	17.0			31.6			21.5			21.6	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	10.1	0.2			108.2			4.8			5.1	
Delay (s)	31.5	17.3			139.9			26.4			26.7	
Level of Service	C	B			F			C			C	
Approach Delay (s)		24.2			139.9			26.4			26.7	
Approach LOS		C			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	55.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	327	27	64	167	36	26	522	106	12	491	212
Future Volume (vph)	213	327	27	64	167	36	26	522	106	12	491	212
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.982			0.978			0.960	
Flt Protected	0.950				0.988			0.998			0.999	
Satd. Flow (prot)	1652	1747	0	0	1809	0	0	1826	0	0	1888	0
Flt Permitted	0.340				0.778			0.939			0.986	
Satd. Flow (perm)	591	1747	0	0	1425	0	0	1718	0	0	1863	0
Satd. Flow (RTOR)												
Adj. Flow (vph)	280	430	36	83	217	47	31	621	126	13	534	230
Lane Group Flow (vph)	280	466	0	0	347	0	0	778	0	0	777	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	12.0	38.0		26.0	26.0		38.0	38.0		38.0	38.0	
Total Split (%)	10.0%	31.7%		21.7%	21.7%		31.7%	31.7%		31.7%	31.7%	
Maximum Green (s)	9.0	31.0		19.0	19.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	0.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-3.0			-3.0			-3.0			-3.0	
Total Lost Time (s)	3.0	4.0			4.0			3.0			3.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.76	0.64			0.91			1.06			0.98	
Control Delay	36.7	28.3			61.2			77.2			53.8	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	36.7	28.3			61.2			77.2			53.8	
Queue Length 50th (ft)	82	159			153			346			325	
Queue Length 95th (ft)	#298	#399			#429			#989			#1053	
Internal Link Dist (ft)		221			221			178			538	
Turn Bay Length (ft)	50											
Base Capacity (vph)	368	724			382			733			794	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.76	0.64			0.91			1.06			0.98	

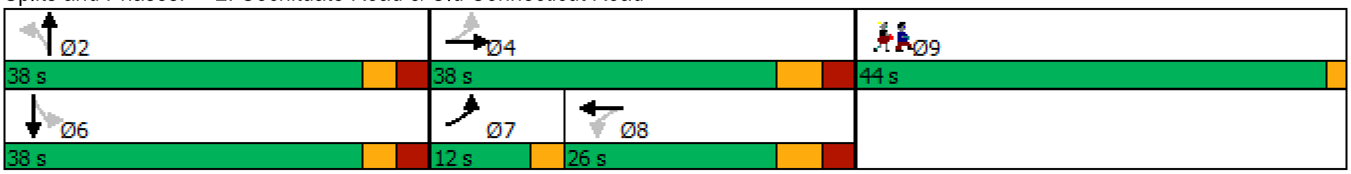
Intersection Summary
Cycle Length: 120

Lane Group	Ø9
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	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	44.0
Total Split (s)	44.0
Total Split (%)	37%
Maximum Green (s)	42.0
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)	35.0
Pedestrian Calls (#/hr)	1
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 84.8
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Cochituate Road & Old Connecticut Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	327	27	64	167	36	26	522	106	12	491	212
Future Volume (vph)	213	327	27	64	167	36	26	522	106	12	491	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	13	13	13	14	14	14
Total Lost time (s)	3.0	4.0			4.0			3.0			3.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.99			0.98			0.98			0.96	
Flt Protected	0.95	1.00			0.99			1.00			1.00	
Satd. Flow (prot)	1652	1747			1809			1826			1888	
Flt Permitted	0.34	1.00			0.78			0.94			0.99	
Satd. Flow (perm)	591	1747			1424			1719			1864	
Peak-hour factor, PHF	0.76	0.76	0.76	0.77	0.77	0.77	0.84	0.84	0.84	0.92	0.92	0.92
Adj. Flow (vph)	280	430	36	83	217	47	31	621	126	13	534	230
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	280	466	0	0	347	0	0	778	0	0	777	0
Heavy Vehicles (%)	2%	0%	4%	0%	3%	0%	0%	6%	1%	0%	3%	3%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.1	32.1			19.8			33.1			33.1	
Effective Green, g (s)	32.1	35.1			22.8			36.1			36.1	
Actuated g/C Ratio	0.37	0.41			0.26			0.42			0.42	
Clearance Time (s)	3.0	7.0			7.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	334	712			377			720			781	
v/s Ratio Prot	c0.09	0.27										
v/s Ratio Perm	0.22				c0.24			c0.45			0.42	
v/c Ratio	0.84	0.65			0.92			1.08			0.99	
Uniform Delay, d1	24.1	20.6			30.8			25.0			24.9	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	16.6	2.2			27.3			57.4			30.7	
Delay (s)	40.7	22.8			58.1			82.4			55.6	
Level of Service	D	C			E			F			E	
Approach Delay (s)		29.5			58.1			82.4			55.6	
Approach LOS		C			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	56.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	162	11	38	428	29	13	556	39	16	326	239
Future Volume (vph)	164	162	11	38	428	29	13	556	39	16	326	239
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.992			0.991			0.945	
Flt Protected	0.950				0.996			0.999			0.999	
Satd. Flow (prot)	1668	1756	0	0	1877	0	0	1926	0	0	1913	0
Flt Permitted	0.175				0.958			0.985			0.980	
Satd. Flow (perm)	307	1756	0	0	1806	0	0	1899	0	0	1877	0
Satd. Flow (RTOR)												
Adj. Flow (vph)	191	188	13	44	498	34	13	567	40	17	347	254
Lane Group Flow (vph)	191	201	0	0	576	0	0	620	0	0	618	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	12.0	38.0		26.0	26.0		38.0	38.0		38.0	38.0	
Total Split (%)	10.0%	31.7%		21.7%	21.7%		31.7%	31.7%		31.7%	31.7%	
Maximum Green (s)	9.0	31.0		19.0	19.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	0.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	-3.0			-3.0			-3.0			-3.0	
Total Lost Time (s)	3.0	4.0			4.0			3.0			3.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio	0.68	0.28			1.19			0.77			0.77	
Control Delay	34.8	21.4			135.1			31.2			31.6	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	34.8	21.4			135.1			31.2			31.6	
Queue Length 50th (ft)	53	57			~315			224			224	
Queue Length 95th (ft)	#228	188			#831			#779			#781	
Internal Link Dist (ft)		221			221			178			538	
Turn Bay Length (ft)	50											
Base Capacity (vph)	280	727			484			810			801	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.68	0.28			1.19			0.77			0.77	

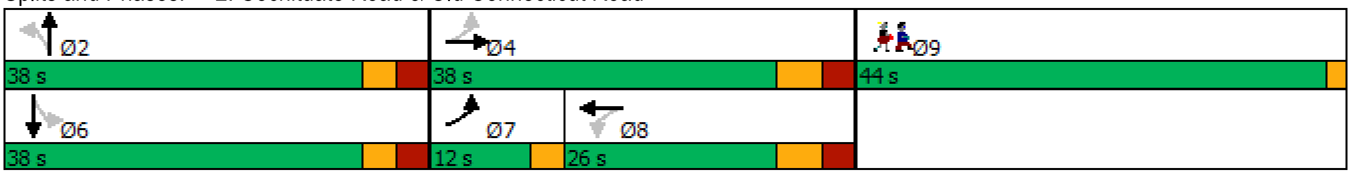
Intersection Summary
Cycle Length: 120

Lane Group	Ø9
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	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	44.0
Total Split (s)	44.0
Total Split (%)	37%
Maximum Green (s)	42.0
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)	35.0
Pedestrian Calls (#/hr)	1
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Actuated Cycle Length: 84.8
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Cochituate Road & Old Connecticut Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	162	11	38	428	29	13	556	39	16	326	239
Future Volume (vph)	164	162	11	38	428	29	13	556	39	16	326	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	13	13	13	14	14	14
Total Lost time (s)	3.0	4.0			4.0			3.0			3.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.99			0.99			0.99			0.94	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1668	1756			1878			1927			1912	
Flt Permitted	0.18	1.00			0.96			0.98			0.98	
Satd. Flow (perm)	308	1756			1807			1899			1876	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.98	0.98	0.98	0.94	0.94	0.94
Adj. Flow (vph)	191	188	13	44	498	34	13	567	40	17	347	254
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	191	201	0	0	576	0	0	620	0	0	618	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.1	32.1			19.8			33.1			33.1	
Effective Green, g (s)	32.1	35.1			22.8			36.1			36.1	
Actuated g/C Ratio	0.37	0.41			0.26			0.42			0.42	
Clearance Time (s)	3.0	7.0			7.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	261	715			478			796			786	
v/s Ratio Prot	c0.08	0.11										
v/s Ratio Perm	0.19				c0.32			0.33			c0.33	
v/c Ratio	0.73	0.28			1.21			0.78			0.79	
Uniform Delay, d1	21.4	17.1			31.6			21.6			21.7	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	10.1	0.2			110.7			4.8			5.2	
Delay (s)	31.5	17.3			142.4			26.4			26.9	
Level of Service	C	B			F			C			C	
Approach Delay (s)		24.2			142.4			26.4			26.9	
Approach LOS		C			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	56.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	86.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Cochituate Road at the Saint Ann Northern Driveway

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	767	2	2	708
Future Vol, veh/h	1	1	767	2	2	708
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	81	92	92	92
Heavy Vehicles, %	2	2	5	2	2	3
Mvmt Flow	1	1	947	2	2	770

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1722	948	0	0	949	0
Stage 1	948	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	98	316	-	-	724	-
Stage 1	377	-	-	-	-	-
Stage 2	455	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	98	316	-	-	724	-
Mov Cap-2 Maneuver	98	-	-	-	-	-
Stage 1	377	-	-	-	-	-
Stage 2	453	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	29.4	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	150	724	-
HCM Lane V/C Ratio	-	-	0.014	0.003	-
HCM Control Delay (s)	-	-	29.4	10	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	3	741	2	2	574
Future Vol, veh/h	3	3	741	2	2	574
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	95	92	92	94
Heavy Vehicles, %	2	2	1	2	2	0
Mvmt Flow	3	3	780	2	2	611

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1396	781	0	0	782	0
Stage 1	781	-	-	-	-	-
Stage 2	615	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	156	395	-	-	836	-
Stage 1	451	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	155	395	-	-	836	-
Mov Cap-2 Maneuver	155	-	-	-	-	-
Stage 1	451	-	-	-	-	-
Stage 2	537	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	223	836	-
HCM Lane V/C Ratio	-	-	0.029	0.003	-
HCM Control Delay (s)	-	-	21.6	9.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection						
Int Delay, s/veh	0.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	767	4	4	708
Future Vol, veh/h	5	5	767	4	4	708
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	81	92	92	92
Heavy Vehicles, %	2	2	5	2	2	3
Mvmt Flow	5	5	947	4	4	770

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1727	949	0	0	951	0
Stage 1	949	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	97	316	-	-	722	-
Stage 1	376	-	-	-	-	-
Stage 2	453	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	96	316	-	-	722	-
Mov Cap-2 Maneuver	96	-	-	-	-	-
Stage 1	376	-	-	-	-	-
Stage 2	448	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.4	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	147	722	-
HCM Lane V/C Ratio	-	-	0.074	0.006	-
HCM Control Delay (s)	-	-	31.4	10	0
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	741	4	4	574
Future Vol, veh/h	5	5	741	4	4	574
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	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	95	92	92	94
Heavy Vehicles, %	2	2	1	2	2	0
Mvmt Flow	5	5	780	4	4	611

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1401	782	0	0	784	0
Stage 1	782	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	154	394	-	-	834	-
Stage 1	451	-	-	-	-	-
Stage 2	537	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	153	394	-	-	834	-
Mov Cap-2 Maneuver	153	-	-	-	-	-
Stage 1	451	-	-	-	-	-
Stage 2	533	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.2	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	220	834	-
HCM Lane V/C Ratio	-	-	0.049	0.005	-
HCM Control Delay (s)	-	-	22.2	9.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

K. Support Letters

TOWN OF WAYLAND

41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778

SELECT BOARD

CAROL B. MARTIN
ADAM GARRETT GUTBEZAHL
THOMAS J. FAY
CHERRY C. KARLSON
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MICHAEL F. MCCALL
TOWN MANAGER
TEL. (508) 358-3620
www.wayland.ma.us

March 21, 2023

Rebecca Frawley Wachtel, Director
Low Income Housing Tax Credit
Department of Housing and Community Development
100 Cambridge Street, 3rd Floor
Boston, MA 02114

Re: St. Ann Senior Village Project

Dear Director Frawley Wachtel:

The Wayland Select Board enthusiastically supports the Planning Office of Urban Affairs' (POUA's) request for a Project Eligibility Letter so it can proceed with an application to the Wayland Zoning Board Appeals for a Comprehensive Permit.

Wayland considers itself fortunate to have such a well-respected and experienced developer as POUA proposing a project that exudes social justice. The proposal to construct 60 housing units that are 100% affordable to individuals 62+ years of age earning between 30% and 60% of area median income is in keeping with the Town's recently adopted Housing Production Plan. The units meet a significant need in the Wayland community and our region and the seniors who move in are often leaving existing housing opportunity for families to move into our community and the region.

On February 15, 2023 the Select Board held a public forum to introduce the community to and begin discussion of the project. Overall, the community comments were very favorable. When you listen to the public comments (beginning at 57:45) you will also hear from direct abutters that POUA has met several (4) times to seek and incorporate their input on the project design. The following is a link to the recording of the forum:

https://wayland.vod.castus.tv/vod/?video=5974fb57-daec-4474-ba71-6968572fb7c1

Wayland encourages DHCD to act quickly and favorably on the issuance of the Project Eligibility Letter. Please reach out to me should you have any questions.

Sincerely,

Cherry C Karlson

Cherry Karlson
Wayland Select Board Chair
On Behalf of the Select Board

Cc: Catherine Racer, DHCD
Alana Murphy, DHCD
Franklin Miller, DHCD
Wayland Select Board
William Grogan, POUA

TOWN OF WAYLAND
41 COCHITUATE ROAD
WAYLAND, MASSACHUSETTS 01778
PLANNING BOARD

Robert Hummel, Town Planner
(508) 358-3778
rhummel@wayland.ma.us

Anette Lewis, Chair
Jennifer Steel, Vice Chair
Daniel Hill
Larry Kiernan
Ira Montague
Prashant Shukla, Associate Member

February 28, 2023

Rebecca Frawley Wachtel, Director
Low Income Housing Tax Credit Program
DHCD
100 Cambridge Street, 3rd Floor
Boston, MA 02114

Re: Proposed St. Ann's Senior Village, 124 Cochituate Road, Wayland, MA

Dear Ms. Frawley Wachtel,

The Wayland Planning Board enthusiastically supports the Planning Office for Urban Affairs' (POUA) request for a Project Eligibility Letter to proceed with their proposed project of 60 one-bedroom affordable apartments at 124 Cochituate Road in Wayland. Wayland's recently approved Housing Production Plan specifically calls out the need for making affordable housing available to those with incomes below the statutory 80% area median income level. And, the project being proposed by POUA for individuals over the age of 62, with incomes between 30% and 60% of area median income is what Wayland has as one of its affordable housing goals.

We urge you to issue the Project Eligibility Letter by the earliest possible date so that POUA can submit an official Ch. 40B Zoning Board Application and town boards and the Applicant can work collaboratively to fill a real need in our community.

Very truly yours,

Anette Lewis

Anette Lewis, Chair
Wayland Planning Board

cc: Kate Racer, DHCD
William H. Grogan, POUA
Wayland Select Board

March 13, 2023

Rebecca Frawley Wachtel, Director
Low Income Housing Tax Credit Program
Department of Housing and Community Development
100 Cambridge Street, 3rd Floor
Boston, MA 02114
Rebecca.frawley@mass.gov

Dear Rebecca Frawley Wachtel:

The Wayland Housing Partnership was created by the Select Board to promote Wayland's affordable housing agenda. We advocate for affordable housing by Increasing public awareness, compiling data on affordable housing needs, and furthering the Town's affordable housing goals, in accordance with our Housing Production Plan.

The Housing Partnership has been a strong and steady advocate for developing affordable housing on the parcel of land at St. Ann's Church, which is owned by the Archdiocese of Boston. The idea for developing this parcel was first suggested several years ago by Father David O'Leary, the Parish's pastor. At that time, Fr. O'Leary was a member of the Housing Partnership, representing the Town's clergy association. The proposed development has the full support of the Parish Pastoral and Financial Councils.

For nearly one year, we have been discussing this project with the Planning Office for Urban Affairs of the Archdiocese of Boston, as well as with many other committees and boards in Town. We have been thrilled with the level of professionalism displayed by POUA. And, at the same time, the level of support from the various Town boards and committees has been exceptionally strong and enthusiastic.

The site will be ideal for a housing development; it is on a major road with sidewalks that lead to the center of Town, which is less than a mile away. As a Low-Income Housing Tax Credit project (Wayland's first), the proposed development will be 100% "affordable," providing housing for older adults, with incomes in the range of 30-60% of area median income. This is a much deeper affordability level than what we have been able to accomplish with other recent developments. We are also exploring the possibility of including a small number of units for developmentally or intellectually challenged younger adults. This need was specifically identified in our Housing Production Plan. While the size of the development has not yet been finalized, we anticipate that it will have between 45-65 units.

The unique topography of the site will likely allow the project to have only two stories along the front (facing route 27) and three stories in the rear. This new development will fit in well with neighboring structures and will be consistent with the overall streetscape.

This project will serve a concrete example of The Good Shepherd Parish's commitment and mission to advance social justice. In addition, we are confident that it will both be viewed as a model church-sponsored initiative, as well as an enormous asset to our community.

On January 24, 2023 the Housing Partnership enthusiastically voted to support this project, and we are looking forward to your granting POUA a Project Eligibility Letter as soon as feasible.

Thank you very much.

Mary Antes
Joanne Barnett
Kathleen Boundy
Rachel Bratt
Candace Hetzner
Jeff Johnson
Katherine Provost

WAYLAND HOUSING AUTHORITY
106 MAIN STREET
WAYLAND, MA 01778

V/TTY: (508) 655-6310
FAX: (508) 655-8566
WWW.WAYLAND.MA.US

BRIAN E. BOGGIA
EXECUTIVE DIRECTOR

February 24, 2023

Alana Murphy, Director of Policy
Massachusetts Department of Housing and Community Development
100 Cambridge Street
Boston, MA 02114

Dear Ms. Murphy:

The Wayland Housing Authority (the "WHA") Board of Commissioners ("Board") writes to express its strong support for issuance of a Project Eligibility Letter for the St. Ann's Senior Village project at 124 Cochituate Road, proposed by the Archdiocese of Boston Planning Office for Urban Affairs ("POUA").

As presented, the project would create 60 new affordable units in Wayland for extremely-low- to very-low-income individuals (30%-60% of Area Median Income) aged 62 and older. The Town's recent accomplishments in creating affordable housing, while hard-fought and significant, have not successfully served people of very-low- or extremely-low-income.

The WHA Board believes that St. Ann's Senior Village is an appropriate proposal for the Town and that the location is suitable to accommodate it. Although envisioned as a three-story building, the size of which is unusual for Wayland, it is proposed to be situated so that it appears to be a 2-story structure from the road. The placement on the site allows for ample parking while also shielding the parking area from the road.

The site is on a well-travelled road that runs north-south to connect the Route 20 Town Center commercial areas and municipal buildings to the Cochituate commercial area along Route 30. While there are no grocery, retail stores, or restaurants within an easy walking distance, there are grocery stores, pharmacies, restaurants, retail establishments, and medical and other services within a short drive, approximately 3 miles. There are also trails and areas for walking nearby, a sidewalk/bike path on the other side of the road, and a golf course open to the public across the street.

The site is within 2 miles of the Wayland Public Safety Building, allowing for prompt response to emergencies. While there would potentially be a 60 or so cars adding to Wayland traffic load, the age restriction makes it less likely that these tenants would be traveling at rush hours.

Residents of St. Ann's Senior Village would also be proximate to a variety of houses of worship. The location is adjacent to the St. Ann's Catholic Church and within 2.5 miles of other faith communities, including but not limited to Catholic, Trinitarian, Lutheran, Unitarian Universalist, and Methodist congregations, an Islamic mosque, and two Jewish synagogues.

In short, although the location does not allow for walking access to any stores or services, there are several retail stores, restaurants, faith communities, and the public library within a short drive.

Wayland's 2022 Housing Production Plan ("HPP") identified areas of need and strategies for creating affordable housing units. The HPP noted that about 90 percent of housing units are single-family structures and over 90 percent of Wayland households own their homes. Until very recently, the WHA has been the largest landlord in town with 136 HUD-subsidized public housing rental units. Apart from the WHA and the newly-built Alta Oxbow development, there are only scattered rental opportunities in Wayland. Rents for those that are "affordable" are out-of-reach for households earning 30%, 50%, or even 60% of AMI. Wayland has an identified need for truly affordable rental housing.

In addition, the HPP encouraged development through "friendly" 40B comprehensive permits, recommending cooperative relationships between the Town and property developers. The relevant local government entities in Wayland (including but not limited to the Wayland Municipal Affordable Housing Trust Fund, Housing Partnership, and Select Board) have indicated their support for the project.

The WHA Board holds out hope that the POUA will be able to include shared living space for individuals living with intellectual or developmental disabilities, either within the 60-unit building or in another building on the property. We understand that there are challenges in developing and maintaining such living spaces and that a service provider has not yet been identified. Nonetheless, this is an area of need for our community and we feel the need to advocate at every opportunity.

We are confident in the POUA's ability to create and sustain housing that meets some of Wayland's pressing affordable housing needs in a manner that is sensitive to community concerns. We encourage your issuance of a Project Eligibility Letter.

Very truly yours,

Susan Weinstein, Chair
Wayland Housing Authority Board of Commissioners
sweinstein@wayland.ma.us

L. Certified Abutter Lists

Town of Wayland

41 COCHITUATE ROAD
WAYLAND MASSACHUSETTS 01778
www.wayland.ma.us / assessors@wayland.ma.us / 508-358-3788

OFFICE STAFF
Tamara Keith, Assistant Assessor
Rob Leroux, MAA, Director of Assessing

OFFICE OF THE ASSESSOR
REQUEST FOR CERTIFIED LIST OF ABUTTERS

PLEASE NOTE
PER MGL CHAPTER 66 SECTION 10,
THE ASSESSOR'S OFFICE HAS 10 BUSINESS DAYS TO CERTIFY AN ABUTTER'S LIST.
PLEASE PLAN ACCORDINGLY.

Date of Request: May 3, 2023

Address To Be Certified: 124 Cochituate Road   Parcel ID (Map / Lot): 34 / 5

Owner's Name (Print): Roman Catholic Archbishop of Boston

Owner's Mailing Address: 66 Brooks Drive, Braintree, MA 02184

Applicant's Name: Planning Office for Urban Affairs, Inc.

Applicant's Telephone: 617-350-8885   Email: whg@poua.org

Applicant's Mailing Address: 84 State Street, Boston, MA ~~02129~~

Applicant's Signature:

Reason for List (Check One)

☐ Liquor License   Immediate abutters and also 500 feet from all borders for churches/hospitals/public & private schools

☐ Conservation (100')   ☐ Health (______)   ☐ Planning (300')   ☒ Zoning (300')   ☐ Select Board (______)

☐ Conservation (1,000')   An Applicant proposing a linear-shaped project greater than 1,000 feet in length is required to provide notification only to abutters whose lot is within 1,000 feet from the project site.

** Please check with the individual Board/Commission for their guidelines regarding the number of feet required for notification. Each Board/Commission has its own regulations and requirements for their abutter's list. The list(s) of abutters must be provided by the person or company requesting certification. Currently, a fee does not exist for abutter's certification.

ASSESSORS' USE ONLY

The Board of Assessor's certifies that the names and addresses of the parties assessed as adjoining "Owners in Possession" (as opposed to Owners of record on January 1) to the requested parcel described on this form. "Owners in Possession" have be[illegible] deeds dated through 31MAR2023

Certified By: ______________   Date: 08MAY2023

CC:

☐ Liquor License   ☐ Conservation (1,000')

☐ Conservation (100')   ☐ Health (______)   ☐ Planning (300')   ☒ Zoning (300')   ☐ Select Board (______)

Wayland, MA

1 inch = 556 Feet

May 8, 2023

0 556 1113 1670

www.cai-tech.com

Data shown on this map is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this map.

300 foot Abutters List Report

Wayland, MA

May 08, 2023

Subject Property:

Parcel Number:	34-005	Mailing Address:	GOOD SHEPHERD PARISH
CAMA Number:	34-005		99 MAIN ST
Property Address:	124 COCHITUATE RD		WAYLAND, MA 01778

Abutters:

Parcel Number:	29-005	Mailing Address:	MARSHALL ROBERT TRUSTEE
CAMA Number:	29-005		MUNSEY FAMILY TRUST
Property Address:	103 COCHITUATE RD		69 WINN ST
			BURLINGTON, MA 01803
Parcel Number:	33-001G	Mailing Address:	MES-WAYLAND ASSISTED LIVING LLC
CAMA Number:	33-001G		850 PROVIDENCE HWY
Property Address:	137 COCHITUATE RD		DEDHAM, MA 02060
Parcel Number:	33-001H	Mailing Address:	TOWN OF WAYLAND
CAMA Number:	33-001H		41 COCHITUATE ROAD
Property Address:	137A COCHITUATE RD		WAYLAND, MA 01778
Parcel Number:	33-001L	Mailing Address:	GITTO CHRISTA U
CAMA Number:	33-001L		KEIL HANS CONRADT
Property Address:	139 COCHITUATE RD		139 COCHITUATE RD
			WAYLAND, MA 01778
Parcel Number:	33-004B	Mailing Address:	TOWN OF WAYLAND
CAMA Number:	33-004B		HIGHWAY DEPT
Property Address:	172 OLD CONNECTICUT PATH		MAIN STREET
			WAYLAND, MA 01778
Parcel Number:	33-005	Mailing Address:	GARDNER ROBERT K
CAMA Number:	33-005		GARDNER AUDRA J
Property Address:	163 COCHITUATE RD		163 COCHITUATE RD
			WAYLAND, MA 01778
Parcel Number:	33-006	Mailing Address:	GUPTA RAJIV
CAMA Number:	33-006		GUPTA MARIA G
Property Address:	1 GREEN WAY		1 GREEN WAY
			WAYLAND, MA 01778
Parcel Number:	33-007	Mailing Address:	FRANK DAVID E
CAMA Number:	33-007		PIZZI MARISSA L
Property Address:	3 GREEN WAY		3 GREEN WAY
			WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	SALERNO CHARLES M
CAMA Number:	33-023A		SALERNO CARL R
Property Address:	6 GREEN WAY #101		6 GREEN WAY, UNIT 101
			WAYLAND, MA 01778

Parcel Number:	33-CM1	Mailing Address:	RACHEL E GUTIERREZ
CAMA Number:	33-023B		VALDIVA RICHARD G
Property Address:	6 GREEN WAY #102		6 GREEN WAY, UNIT 102
			WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	ROTHSCHILD WILLIAM
CAMA Number:	33-023C		6 GREEN WAY, UNIT 103
Property Address:	6 GREEN WAY #103		WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	DEVOE CHARLOTTE
CAMA Number:	33-023D		6 GREEN WAY, UNIT 104
Property Address:	6 GREEN WAY #104		WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	NORRIS MELVIN
CAMA Number:	33-023E		MELNOR REALTY TRUST
Property Address:	6 GREEN WAY #105		6 GREEN WAY, UNIT 105
			WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	CRIBBEN THOMAS
CAMA Number:	33-023F		6 GREEN WAY, UNIT 106
Property Address:	6 GREEN WAY #106		WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	HECKSCHER KATHERINE
CAMA Number:	33-023G		6 GREEN WAY, UNIT 107
Property Address:	6 GREEN WAY #107		WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	POND KEVIN R
CAMA Number:	33-023H		POND JANET A
Property Address:	6 GREEN WAY #108		6 GREEN WAY, UNIT 108
			WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	HALLORAN DONNA
CAMA Number:	33-023I		6 GREEN WAY, UNIT 201
Property Address:	6 GREEN WAY #201		WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	BADER FRANK
CAMA Number:	33-023J		BADER NANCY
Property Address:	6 GREEN WAY #202		6 GREEN WAY, UNIT 202
			WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	HUA QINGXIN
CAMA Number:	33-023K		JIA WENHUA
Property Address:	6 GREEN WAY #203		6 GREEN WAY, UNIT 203
			WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	HOAGLUND ROBERT I
CAMA Number:	33-023L		HOAGLUND PAULINE A
Property Address:	6 GREEN WAY #204		6 GREEN WAY, UNIT 204
			WAYLAND, MA 01778

300 foot Abutters List Report

Wayland, MA

May 08, 2023

Parcel Number:	33-CM1	Mailing Address:	WASSERMAN MARION
CAMA Number:	33-023M		WASSERMAN ELIZABETH
Property Address:	6 GREEN WAY #205		WASSERMAN JANE 6 GREEN WAY, UNIT 205 WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	RICHARD I HOYER FAMILY TRUST
CAMA Number:	33-023N		6 GREEN WAY, UNIT 206
Property Address:	6 GREEN WAY #206		WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	ANTES MARY M
CAMA Number:	33-023O		11 OLD FARM CIRCLE
Property Address:	6 GREEN WAY #207		WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	ALLEN SUZI TRUSTEE
CAMA Number:	33-023P		GREEN WAY NOMINEE TRUST
Property Address:	6 GREEN WAY #208		6 GREEN WAY, UNIT 208 WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	TUNIK GALIA
CAMA Number:	33-023Q		6 GREEN WAY, UNIT 301
Property Address:	6 GREEN WAY #301		WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	MARKS WESLEY
CAMA Number:	33-023R		MARKS SHIRLEY
Property Address:	6 GREEN WAY #302		6 GREEN WAY, UNIT 302 WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	KONG SON CHIU
CAMA Number:	33-023S		6 GREEN WAY, UNIT 303
Property Address:	6 GREEN WAY #303		WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	MAKARIOUS SHADIA
CAMA Number:	33-023T		6 GREEN WAY, UNIT 304
Property Address:	6 GREEN WAY #304		WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	LADD PAUL F
CAMA Number:	33-023U		LADD JACQUELINE
Property Address:	6 GREEN WAY #305		6 GREEN WAY, UNIT 305 WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	BROWN LOUISE R
CAMA Number:	33-023V		6 GREEN WAY, UNIT 306
Property Address:	6 GREEN WAY #306		WAYLAND, MA 01778
Parcel Number:	33-CM1	Mailing Address:	SUESS JENNIE-RAY M
CAMA Number:	33-023W		SARAH OLSON LIBERMAN
Property Address:	6 GREEN WAY #307		17 HOPESTILL BROWN RD SUDBURY, MA 01776
Parcel Number:	33-CM1	Mailing Address:	GREGORIAN JOHN B
CAMA Number:	33-023X		GREGORIAN JUDITH T
Property Address:	6 GREEN WAY #308		6 GREEN WAY, UNIT 308 WAYLAND, MA 01778

300 foot Abutters List Report

Wayland, MA
May 08, 2023

Parcel Number:	34-004	Mailing Address:	SAINT ANN'S CHURCH
CAMA Number:	34-004		PARSONAGE
Property Address:	124 COCHITUATE RD		124 COCHITUATE RD
			WAYLAND, MA 01778
Parcel Number:	34-042	Mailing Address:	QIAN CHANGGENG
CAMA Number:	34-042		ZUO ZHENGFA
Property Address:	163 OLD CONNECTICUT PATH		163 OLD CONNECTICUT
			PATH WAYLAND, MA 01778
Parcel Number:	34-043	Mailing Address:	GITTEN MICHAEL S
CAMA Number:	34-043		LEWIS CYNTHIA A
Property Address:	171 OLD CONNECTICUT PATH		171 OLD CONNECTICUT
			PATH WAYLAND, MA 01778

ALLEN SUZI
GREEN WAY NOMINEE TRUST
6 GREEN WAY, UNIT 208
WAYLAND, MA 01778

ANTES MARY M
11 OLD FARM CIRCLE
WAYLAND, MA 01778

BADER FRANK
BADER NANCY
6 GREEN WAY, UNIT 202
WAYLAND, MA 01778

BROWN LOUISE R
LOUISE R BROWN REVOCABLE
6 GREEN WAY, UNIT 306
WAYLAND, MA 01778

CRIBBEN THOMAS
6 GREEN WAY, UNIT 106
WAYLAND, MA 01778

DEVOE CHARLOTTE
6 GREEN WAY, UNIT 104
WAYLAND, MA 01778

FRANK DAVID E
PIZZI MARISSA L
3 GREEN WAY
WAYLAND, MA 01778

GARDNER ROBERT K
GARDNER AUDRA J
163 COCHITUATE RD
WAYLAND, MA 01778

GITTEN MICHAEL S
LEWIS CYNTHIA A
171 OLD CONNECTICUT PATH
WAYLAND, MA 01778

GITTO CHRISTA U
KEIL HANS CONRADT
139 COCHITUATE RD
WAYLAND, MA 01778

GREGORIAN JOHN B
GREGORIAN JUDITH T
6 GREEN WAY, UNIT 308
WAYLAND, MA 01778

GUPTA RAJIV
GUPTA MARIA G
1 GREEN WAY
WAYLAND, MA 01778

HALLORAN DONNA
6 GREEN WAY, UNIT 201
WAYLAND, MA 01778

HOAGLUND ROBERT I
HOAGLUND PAULINE A
6 GREEN WAY, UNIT 204
WAYLAND, MA 01778

HECKSCHER KATHERINE D
6 GREEN WAY, UNIT 107
WAYLAND, MA 01778

HUA QINGXIN
JIA WENHUA
6 GREEN WAY, UNIT 203
WAYLAND, MA 01778

KONG SON CHIU
LING CHUN FU CHIU
6 GREEN WAY, UNIT 303
WAYLAND, MA 01778

LADD PAUL F
LADD JACQUELINE
6 GREEN WAY, UNIT 305
WAYLAND, MA 01778

MAKARIOUS SHADIA
6 GREEN WAY, UNIT 304
WAYLAND, MA 01778

MARKS WESLEY
MARKS SHIRLEY
6 GREEN WAY, UNIT 302
WAYLAND, MA 01778

MARSHALL ROBERT
MUNSEY FAMILY TRUST
69 WINN ST
BURLINGTON, MA 01803

MES-WAYLAND ASSIST. LIVING
850 PROVIDENCE HWY
DEDHAM, MA 02060

NORRIS MELVIN
MELNOR REALTY TRUST
6 GREEN WAY, UNIT 105
WAYLAND, MA 01778

POND KEVIN R
POND JANET
6 GREEN WAY, UNIT 108
WAYLAND, MA 01778

QIAN CHANGGENG
ZUO ZHENGFA
163 OLD CONNECTICUT PATH
WAYLAND, MA 01778

GUTIERREZ RACHEL E
VALDIVA RICHARD G
6 GREEN WAY, UNIT 102
WAYLAND, MA 01778

RICHARD I HOYER
6 GREEN WAY, UNIT 206
WAYLAND, MA 01778

ROTHSCHILD WILLIAM
6 GREEN WAY, UNIT 103
WAYLAND, MA 01778

SAINT ANN'S CHURCH
PARSONAGE
124 COCHITUATE RD
WAYLAND, MA 01778

SALERNO CHARLES M
SALERNO CARL R
6 GREEN WAY, UNIT 101
WAYLAND, MA 01778

SUESS JENNIE-RAY M
SARAH OLSON LIBERMAN
17 HOPESTILL BROWN RD
SUDBURY, MA 01776

TOWN OF WAYLAND
HIGHWAY DEPT
MAIN STREET
WAYLAND, MA 01778

TOWN OF WAYLAND
41 COCHITUATE ROAD
WAYLAND, MA 01778

TUNIK GALIA
6 GREEN WAY, UNIT 301
WAYLAND, MA 01778

WASSERMAN MARION
WASSERMAN JANE
WASSERMAN ELIZABETH
6 GREEN WAY, UNIT 205
WAYLAND, MA 01778

Town of Wayland

41 COCHITUATE ROAD
WAYLAND MASSACHUSETTS 01778
www.wayland.ma.us / assessors@wayland.ma.us / 508-358-3788

OFFICE STAFF
Tamara Keith, Assistant Assessor
Rob Leroux, MAA, Director of Assessing

OFFICE OF THE ASSESSOR
REQUEST FOR CERTIFIED LIST OF ABUTTERS

PLEASE NOTE
PER MGL CHAPTER 66 SECTION 10,
THE ASSESSOR'S OFFICE HAS 10 BUSINESS DAYS TO CERTIFY AN ABUTTER'S LIST.
PLEASE PLAN ACCORDINGLY.

Date of Request: May 3, 2023

Address To Be Certified: 124 Cochituate Road   Parcel ID (Map / Lot): 34 / 4

Owner's Name (Print): Roman Catholic Archbishop of Boston

Owner's Mailing Address: 66 Brooks Drive, Braintree, MA 02184

Applicant's Name: Planning Office for Urban Affairs, Inc.

Applicant's Telephone: 617-350-8885   Email: whg@poua.org

Applicant's Mailing Address: 84 State Street, Boston, MA 02129

Applicant's Signature:

Reason for List (Check One)

☐ Liquor License   Immediate abutters and also 500 feet from all borders for churches/hospitals/public & private schools

☐ Conservation (100')   ☐ Health (______)   ☐ Planning (300')   ☒ Zoning (300')   ☐ Select Board (______)

☐ Conservation (1,000')   An Applicant proposing a linear-shaped project greater than 1,000 feet in length is required to provide notification only to abutters whose lot is within 1,000 feet from the project site.

** Please check with the individual Board/Commission for their guidelines regarding the number of feet required for notification. Each Board/Commission has its own regulations and requirements for their abutter's list. The list(s) of abutters must be provided by the person or company requesting certification. Currently, a fee does not exist for abutter's certification.

ASSESSORS' USE ONLY

The Board of Assessor's certifies that the names and addresses of the parties assessed as adjoining "Owners in Possession" (as opposed to Owners of record on January 1) to the requested parcel described on this form. "Owners in Possession" have been identified by deeds dated through 03MAR2023

Certified By: ______________   Date: 08MAY2023

CC:

☐ Liquor License   ☐ Conservation (1,000')

☐ Conservation (100')   ☐ Health (______)   ☐ Planning (300')   ☒ Zoning (300')   ☐ Select Board (______)

Wayland, MA

1 inch = 556 Feet

May 8, 2023

0 556 1113 1670

CAI Technologies

www.cai-tech.com

Data shown on this map is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this map.

300 foot Abutters List Report

Wayland, MA
May 08, 2023

Subject Property:

Parcel Number:	34-004	Mailing Address:	SAINT ANN'S CHURCH PARSONAGE
CAMA Number:	34-004		124 COCHITUATE RD
Property Address:	124 COCHITUATE RD		WAYLAND, MA 01778

Abutters:

Parcel Number:	29-005	Mailing Address:	MARSHALL ROBERT TRUSTEE
CAMA Number:	29-005		MUNSEY FAMILY TRUST
Property Address:	103 COCHITUATE RD		69 WINN ST
			BURLINGTON, MA 01803
Parcel Number:	33-005	Mailing Address:	GARDNER ROBERT K
CAMA Number:	33-005		GARDNER AUDRA J
Property Address:	163 COCHITUATE RD		163 COCHITUATE RD
			WAYLAND, MA 01778
Parcel Number:	33-006	Mailing Address:	GUPTA RAJIV
CAMA Number:	33-006		GUPTA MARIA G
Property Address:	1 GREEN WAY		1 GREEN WAY
			WAYLAND, MA 01778
Parcel Number:	33-007	Mailing Address:	FRANK DAVID E
CAMA Number:	33-007		PIZZI MARISSA L
Property Address:	3 GREEN WAY		3 GREEN WAY
			WAYLAND, MA 01778
Parcel Number:	34-002	Mailing Address:	NOWLAND QUENTIN & JAYME
CAMA Number:	34-002		LYNCH MICHAEL W & KELLEIGH M
Property Address:	4 WINDY HILL LN		4 WINDY HILL LN
			WAYLAND, MA 01778
Parcel Number:	34-002A	Mailing Address:	SHAMOIAN DAVID V
CAMA Number:	34-002A		SHAMOIAN ANDREA S
Property Address:	2 WINDY HILL LN		2 WINDY HILL LN
			WAYLAND, MA 01778
Parcel Number:	34-002B	Mailing Address:	SUDBURY VALLEY TRUSTEES, INC.
CAMA Number:	34-002B		18 WOLBACH RD
Property Address:	7 WINDY HILL LN		SUDBURY, MA 01776
Parcel Number:	34-002C	Mailing Address:	SUDBURY VALLEY TRUSTEES INC
CAMA Number:	34-002C		18 WOLBACH RD
Property Address:	7A WINDY HILL LN		SUDBURY, MA 01776
Parcel Number:	34-003	Mailing Address:	RUTLEDGE JOHN L
CAMA Number:	34-003		RUTLEDGE BARBARA C
Property Address:	1 WINDY HILL LN		1 WINDY HILL LN
			WAYLAND, MA 01778
Parcel Number:	34-003A	Mailing Address:	MEADOR C LAWRENCE
CAMA Number:	34-003A		MEADOR DIANE
Property Address:	3 WINDY HILL LN		3 WINDY HILL LANE
			WAYLAND, MA 01778

300 foot Abutters List Report

Wayland, MA

May 08, 2023

Parcel Number:	34-005	Mailing Address:	GOOD SHEPHERD PARISH
CAMA Number:	34-005		99 MAIN ST
Property Address:	124 COCHITUATE RD		WAYLAND, MA 01778
Parcel Number:	34-006	Mailing Address:	NANFELDT ELIZABETH A
CAMA Number:	34-006		140 OLD CONNECTICUT PATH
Property Address:	140 OLD CONNECTICUT PATH		WAYLAND, MA 01778
Parcel Number:	34-006A	Mailing Address:	XIANMING ZHOU
CAMA Number:	34-006A		YIFAN ZHANG
Property Address:	134 OLD CONNECTICUT PATH		134 OLD CONNECTICUT
			PATH WAYLAND, MA 01778
Parcel Number:	34-028	Mailing Address:	SUDBURY VALLEY TRUSTEES INC
CAMA Number:	34-028		18 WOLBACH RD
Property Address:	143 OLD CONNECTICUT PATH		SUDBURY, MA 01776
Parcel Number:	34-029	Mailing Address:	TAUNTON-RIGBY JASON
CAMA Number:	34-029		TAUNTON-RIGBY KATHLEEN
Property Address:	147 OLD CONNECTICUT PATH		147 OLD CONNECTICUT
			PATH WAYLAND, MA 01778
Parcel Number:	34-030	Mailing Address:	DOWD JOHN G
CAMA Number:	34-030		WHITE JULIA F
Property Address:	153 OLD CONNECTICUT PATH		153 OLD CONNECTICUT PATH
			WAYLAND, MA 01778
Parcel Number:	34-041A	Mailing Address:	YARBROUGH CHASE GARRETT
CAMA Number:	34-041A		YARBROUGH AMANDA
Property Address:	7 SHAW DR		7 SHAW DR
			WAYLAND, MA 01778
Parcel Number:	34-042	Mailing Address:	QIAN CHANGGENG
CAMA Number:	34-042		ZUO ZHENGFA
Property Address:	163 OLD CONNECTICUT PATH		163 OLD CONNECTICUT
			PATH WAYLAND, MA 01778

DOWD JOHN G
WHITE JULIA F
153 OLD CONNECTICUT PATH
WAYLAND, MA 01778

FRANK DAVID E
PIZZI MARISSA L
3 GREEN WAY
WAYLAND, MA 01778

GARDNER ROBERT K
GARDNER AUDRA J
163 COCHITUATE RD
WAYLAND, MA 01778

GOOD SHEPHERD PARISH
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RUTLEDGE JOHN L
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1 WINDY HILL LN
WAYLAND, MA 01778

SHAMOIAN DAVID V
SHAMOIAN ANDREA S
2 WINDY HILL LN
WAYLAND, MA 01778

SUDBURY VALLEY TRUSTEES
18 WOLBACH RD
SUDBURY, MA 01776

TAUNTON-RIGBY JASON
TAUNTON-RIGBY KATHLEEN T
147 OLD CONNECTICUT PATH
WAYLAND, MA 01778

XIANMING ZHOU
YIFAN ZHANG
134 OLD CONNECTICUT PATH
WAYLAND, MA 01778

YARBROUGH CHASE GARRETT
YARBROUGH AMANDA
7 SHAW DR
WAYLAND, MA 01778

M. Site Photographs

Google street view, northbound on Cochituate Road.

Google street view, southbound on Cochituate Road.

Existing two-story rectory.

South view of existing two-story rectory.

Wooded area at the northern edge of the site.

St. Ann's Church.

Wooded area at the eastern edge of the site.

South facing view of St. Ann's Church.

View from south
border of the site.

Wooded area east of
the church.