

Red Robin Pastures

Dover, MA

Comprehensive Permit Application



Submitted To: The Dover Zoning Board of Appeals

December 2020

RED ROBIN PASTURES

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Red Robin Pastures

Dover, Massachusetts

Comprehensive Permit Application
Under M.G.L. Chapter 40B, Sections 20-23

Submitted by:

Red Robin Pastures, LLC

December, 2020

Town of Dover Massachusetts
ZONING BOARD OF APPEALS

Premises affected: A 87,120 Square Foot parcel of land, at 61-63 County Road (Route 109)

**APPLICATION FOR A COMPREHENSIVE PERMIT
UNDER GENERAL LAW CHAPTER 40B, SECTIONS 20-23**

Red Robin Pastures, LLC (hereinafter the "Applicant") hereby applies to the Board of Appeals of the Town of Dover, Massachusetts, pursuant to General Laws, Chapter 40B, Section 20 through 23, as amended, for the issuance of a Comprehensive Permit authorizing the applicant to construct 39 apartment style rental units on land located at 61-63 County Road in Dover, Massachusetts. The applicant and the development are more particularly described in the exhibits here to annexed and submitted simultaneously here with, all of which are incorporated herein by reference and constitute the documents required to be submitted under the regulations for filing a 40B application by the Massachusetts Department of Housing and Community Development (760 CMR 56.00).

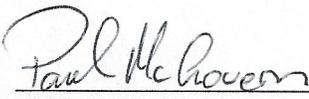
REQUEST FOR FINDINGS OF FACT

The applicant requests that the Board of Appeals make the following findings of fact in connection with the action of the Board on this application:

1. Red Robin Pastures LLC, a limited dividend organization within the meaning of General Laws, Chapter 40B and 760 CMR 56.02, and is eligible to receive a subsidy under a state or federal affordable housing program after a Comprehensive Permit has been granted.
2. The applicant has shown evidence of its site control to qualify it as a recipient of a Comprehensive Permit for this site.
3. Masshousing, as the Program Administrator of the New England Fund Program (NEF), will be the subsidizing agency within the meaning of the regulations of 40B (760 CMR 56.00) and within the meaning of the procedural regulations of the Housing Appeals Committee (760 CMR:30.01(C)).
4. The number of low or moderate income housing units in the Town of Dover constitutes 0.92% percent of their housing inventory, as reported by the Department of Housing & Community Development as of December 15, 2020.
5. The development as proposed in the application is consistent with local needs within the meaning of General Laws, Chapter 40B, Section 20.

The applicant respectfully requests the Board of Appeals after complying with the procedural requirements as provided by law, to issue to the applicant a Comprehensive Permit for the development.

Red Robin Pastures, LLC

By: 
Paul McGovern
Principal

PROJECT DATA SUMMARY

1. Applicant

Red Robin Pastures, LLC (the "Applicant") has been organized under the General Laws of the State of Massachusetts and is qualified to undertake the planning and development of the mixed income development in Dover, MA. The Applicant proposes to develop 39 apartment style rental units on a limited dividend basis as required under all laws and regulations of the Commonwealth of Massachusetts. The project manager of Red Robin Pastures, LLC, Paul McGovern, has experience with the construction and management of several multi-family housing developments. The Applicant respectfully requests that all notices from the Board in connection with this Application be sent to SEB LLC/Geoff Engler, 257 Hillside Avenue, Needham MA 02494.

2. Description of the Development

The proposed community consists of 39 apartment units: 9 One Bedroom, 24 Two Bedroom and 6 Three Bedroom units spread across three levels of residential living space. There is also a basement which will include additional resident storage and back-of-the-house functions including indoor trash storage. The three main levels and basement are all accessible by elevator. The 1BR and 2BR units on the top level have a ½ story loft accessible from an interior circular stairway. There is a 2-story 465 square foot conservatory on the entry level First Floor, a 200 square foot resident common area on the Second Floor and a 535 square foot meeting room on the Third Floor.

The exterior of the building has been designed to feature finishes commonly found in the local residential buildings including, clapboards, shingles, paneling and 8" cornerboards. Roof rakes are projected away from their gables and fascia/ subfascia board detailing has been included. Other architectural features included to create a "Dover-like" residential feel include a two-piece watertable trim transition located at the foundation; windows located in the shingled & 4-1/2" to the weather clapboard areas have a three-piece surround with an applied sill piece; and the gable roof styled building is finished with architectural roof shingles. The typical 8 pitch roofline is punctuated with 4-1/2 pitch shed roofs and small gabled 12 pitched roofs. Some of the gable roofs are clipped with a hip detail to lower the roofline. The public view of this U-shaped building is from County street only. It appears to be two separate 3-1/2 story multi-gabled buildings 56' wide and 57'-6" wide 45' apart from each other. The massing of the building is stepped with the end gables. The 8 pitch roof slopes down to 5' high kneewalls also designed to help lower the massing. The wall sections shift from each other to break the wall planes into smaller sections. The small gables and roofed 2-story boxed window units help to reduce the massing and add dimension to the facades. The First Floor of this 50' high building is 4' below the street level, making the lower eave of the 8 pitch roof 24' above the street

Each unit is designed with the living room window view visible upon entry. All units will have stacked washer/ dryers and individually metered heating and air conditioning. The 1BR units will have 1 bathroom, the 2BR and 3BR units will have 2 bathrooms.

The location of the proposed development is contextual and in an ideal location for Dover, which is almost exclusively large lot single family homes. More specifically, the project site is located on the edge of Dover adjacent to a 32 foot wide, east-west two lane suburban route, on the west-bound side. County Street (Route 109) connects interstates 95 and 495. This 2 acre site is located in a 1 acre single family zone. The site combines two 1-acre lots that currently have single family homes.

This project site is located between a cluster 40B project featuring a small cluster of family homes on a common hammerhead driveway and a 46 unit townhouse development with 12 separate buildings to the west. There is a single family lot to the east.

3. Qualification as a 40B Development

The development qualifies as assisted “low or moderate income housing” within the meaning of Massachusetts General Laws Chapter 40B, section 20 and will provide 10 units (25.6%) which will serve households earning at or below 80% of area median income and thus will meet the definition of low and moderate income under the statute. The Applicant will develop this project pursuant to the guidelines of the Masshousing, as the Program Administrator of the New England Fund Program (NEF) under which a project eligibility letter has been granted on September 22nd, 2020. Preliminary architectural drawings and engineering plans are attached hereto in reduced form and under separate cover as full size drawings.

4. Local Need

According to figures compiled by the Massachusetts Department of Communities and Development (DHCD) as of December 15th 2020, Dover’s subsidized housing inventory represented 0.92% of its total housing stock, which is below the threshold requirements established under Chapter 40B of M.G.L.

5. Exceptions and Approvals Requested

Certain elements of the proposed development do not comply with the current underlying zoning. Consequently, an exception of use is required to enable multi-family residential at the proposed density to be constructed. Other exceptions to the Town of Dover’s Zoning Bylaws and other local land use regulations are specifically detailed in this application. If any specific exceptions have not been listed in this application, the applicant, upon notification of such an oversight, shall promptly amend the list of exceptions included herein.

CONCLUSION

For all of the foregoing reasons, and for the additional reasons the Applicant will present at the scheduled public hearing on this Application, the Applicant respectfully requests the Board, after complying with the procedural requirements as provided by law, issue to the Applicant a Comprehensive Permit for the Development.

APPLICANT STATUS

The applicant, Red Robin Pastures, LLC is a Massachusetts limited liability company which is a Limited Dividend Organization within the meaning of 760 CMR 56.02 and an eligible applicant under 760 CMR 56.04. Pursuant to Masshousing, as the subsidizing agency, the applicant intends to enter into a Regulatory Agreement providing for (i) affordability of the proposed affordable units and (ii) limitation on the applicant's return on investment substantially in form included herein.



Massachusetts Housing Finance Agency
One Beacon Street, Boston, MA 02108

TEL: 617.854.1000
FAX: 617.854.1091 | www.masshousing.com
Videophone: 857.366.4157 or Relay: 711

September 22, 2020

Paul McGovern, Principal
Red Robin Pastures, LLC
1218 Great Plain Avenue
Needham, MA 02492

**Re: Red Robin Pastures
Project Eligibility/Site Approval
MassHousing ID No. 1081**

Dear Mr. McGovern:

This letter is in response to your application for a determination of Project Eligibility (“Site Approval”) pursuant to Massachusetts General Laws Chapter 40B (“Chapter 40B”), 760 CMR 56.00 (the “Regulations”) and the Comprehensive Permit Guidelines issued by the Department of Housing and Community Development (“DHCD”) (the “Guidelines” and, collectively with Chapter 40B and the Regulations, the “Comprehensive Permit Rules”), under the New England Fund (“NEF”) Program (the “Program”) of the Federal Home Loan Bank of Boston (“FHLBank Boston”).

Red Robin Pastures, LLC (the “Applicant”) has applied to MassHousing pursuant to Chapter 40B. You have proposed to build thirty-nine (39) units of rental housing (the “Project”) on approximately 2 acres of land located at 61 & 63 County Road (the “Site”) in Dover (the “Municipality”).

In accordance with the Comprehensive Permit Rules, this letter is intended to be a written determination of Project Eligibility by MassHousing acting as Subsidizing Agency under the Guidelines, including Part V thereof, “Housing Programs In Which Funding Is Provided by Other Than A State Agency.”

MassHousing has performed an on-site inspection of the Site, which local boards and officials were invited to attend, and has reviewed the pertinent information for the Project submitted by the Applicant, the Municipality and others in accordance with the Comprehensive Permit Rules.

Municipal Comments

Pursuant to the Comprehensive Permit Rules, the Municipality was initially given a thirty (30) day period in which to review the Site Approval application and submit comments to MassHousing. At the request of Walter Avallone, Building Inspector, this period was extended to a total of sixty (60) days. The Dover Board of Selectmen submitted a letter regarding the Project dated July 20, 2020 summarizing comments from Municipal departments, boards and committees, and identifying specific concerns with the proposed Project. Municipal concerns are outlined as follows:

- The Municipality expressed concern with various aspects of the site plan. Of significant concern was the height of the building and lack of guest parking. They also noted that the project design featured density levels significantly higher than those found at other properties located nearby.
- The Municipality emphasized that part of the Site sits in proximity to sensitive wetlands, and as such, any development of this Site must be designed to protect the surrounding wetlands and ensure that the species of animals and plants found in the area are protected. The Selectmen's letter also underscored the point that the development's stormwater collection and treatment system must prevent erosion and contamination of the area both during and after construction.
- The Municipality expressed concerns about the sufficiency and safety of the existing water supply and encouraged the Applicant to explore other public water supply options.
- The Municipality expressed concern about the size and location of the proposed sewage processing system.
- The Municipality emphasized that the Project must be designed so as to ensure the maximum level of emergency access and fire protection.
- The Municipality expressed concern that additional traffic generated by the Project would result in increased congestion on area roadways and pose heightened risks to drivers and pedestrians. They request that the Applicant provide a traffic study to allow them to fully assess potential traffic and public safety impacts.

MassHousing Determination and Recommendation

MassHousing staff has determined that the Project appears generally eligible under the requirements of the Program, subject to final review of eligibility and to Final Approval.¹ As a result of our review, we have made the findings as required pursuant to 760 CMR 56.04(1) and (4). Each such finding, with supporting reasoning, is set forth in further detail on Attachment 1 hereto. It is important to note that Comprehensive Permit Rules limit MassHousing to these specific findings in order to determine Project Eligibility. If, as here, MassHousing issues a determination of Project Eligibility, the Applicant may apply to the Zoning Board of Appeals ("ZBA") for a comprehensive permit. At that time local boards, officials and members of the public are provided the opportunity to further review the Project to ensure compliance with applicable state and local standards and regulations.

Based on MassHousing's site and design review, and in light of feedback received from the Municipality, the following issues should be addressed in the application to the ZBA, and the Applicant should be prepared to explore them more fully during the public hearing process:

- Development of this Site will require compliance with all state and federal environmental laws, regulations and standards applicable to existing conditions and to the proposed use related to

¹ MassHousing has relied on the Applicant to provide truthful and complete information with respect to this approval. If at any point prior to the issuance of a comprehensive permit MassHousing determines that the Applicant has failed to disclose any information pertinent to the findings set forth in 760 CMR 56.04 or information requested in the Certification and Acknowledgment of the Application, MassHousing retains the right to rescind this Site Approval letter.

building construction, stormwater management, wastewater collection and treatment, and hazardous waste safety. The Applicant should expect that the Municipality will require evidence of such compliance prior to the issuance of a building permit for the Project.

- The Applicant should be prepared to provide detailed information relative to proposed water use and potential impacts on existing capacity.
- The Applicant should be prepared to respond to Municipal concerns relative to potential off-site traffic impacts on area roadways and intersections and to respond to reasonable requests for mitigation.
- The Applicant must comply with Title V regulations regarding the design and construction of individual wells, septic systems and wastewater treatment plants. The Applicant should provide evidence of such compliance prior to the issuance of a building permit for the Project.
- The Applicant should continue to engage with the Municipality in a good-faith discussion regarding design review matters and other Site-related concerns raised by local boards and officials.
- The Applicant should continue to engage with the Municipality to ensure adequate access is provided for emergency vehicles and responders.
- A landscape plan should be provided to address Municipal concerns, including a detailed planting plan as well as paving, lighting, and signage details and the location of outdoor resident and guest parking.

MassHousing has also reviewed the application for compliance within the requirements of 760 CMR 56.04(2) relative to Application requirements and has determined that the material provided by the Applicant is sufficient to show compliance.

This Site Approval is expressly limited to the development of no more than thirty-nine (39) rental units under the terms of the Program, of which not less than ten (10) of such units shall be restricted as affordable for low- or moderate-income persons or families as required under the terms of the Guidelines. It is not a commitment or guarantee of financing and does not constitute a site plan or building design approval. Should you consider, prior to obtaining a Comprehensive Permit, the use of any other housing subsidy program, the construction of additional units or a reduction in the size of the Site, you may be required to submit a new Site Approval application for review by MassHousing. Should you consider a change in tenure type or a change in building type or height, you may be required to submit a new Site Approval application for review by MassHousing.

For guidance on the Comprehensive Permit review process, you are advised to consult the Guidelines. Further, we urge you to review carefully with legal counsel the M.G.L. c.40B Comprehensive Permit Regulations at 760 CMR 56.00.

This approval will be effective for a period of two (2) years from the date of this letter. Should the Applicant not apply for a Comprehensive Permit within this period this letter shall be expired and no longer in effect unless MassHousing extends the effective period of this letter in writing. In addition, the Applicant is required to notify MassHousing at the following times throughout this two-year period:

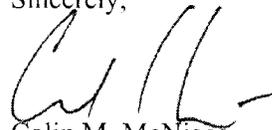
(1) when the Applicant applies to the local ZBA for a Comprehensive Permit, (2) when the ZBA issues a decision and (3) if applicable, when any appeals are filed.

Should a Comprehensive Permit be issued, please note that prior to (i) commencement of construction of the Project or (ii) issuance of a building permit, the Applicant is required to submit to MassHousing a request for Final Approval of the Project (as it may have been amended) in accordance with the Comprehensive Permit Rules (see especially 760 CMR 56.04(07) and the Guidelines including, without limitation, Part III thereof concerning Affirmative Fair Housing Marketing and Resident Selection). Final Approval will not be issued unless MassHousing is able to make the same findings at the time of issuing Final Approval as required at Site Approval.

Please note that MassHousing may not issue Final Approval if the Comprehensive Permit contains any conditions that are inconsistent with the regulatory requirements of the New England Fund Program of the FHLBB, for which MassHousing serves as Subsidizing Agency, as reflected in the applicable regulatory documents. In the interest of providing for an efficient review process and in order to avoid the potential lapse of certain appeal rights, the Applicant may wish to submit a “final draft” of the Comprehensive Permit to MassHousing for review. Applicants who avail themselves of this opportunity may avoid significant procedural delays that can result from the need to seek modification of the Comprehensive Permit after its initial issuance.

If you have any questions concerning this letter, please contact Michael Busby at (617) 854-1219.

Sincerely,



Colin M. McNiece
General Counsel

cc: Jennifer Maddox, Undersecretary, DHCD
The Honorable Michael C. Rush
The Honorable Denise C. Garlick
Robert Springett, Chair, Board of Selectmen
R. Alan Fryer, Chair, Zoning Board of Appeals

Attachment 1.

760 CMR 56.04 Project Eligibility: Other Responsibilities of Subsidizing Agency Section (4) Findings and Determinations

Red Robin Pastures, Dover, MH #1081

After the close of a 30-day review period, MassHousing hereby makes the following findings, based upon its review of the application, and taking into account information received during the site visit and from written comments:

(a) that the proposed Project appears generally eligible under the requirements of the housing subsidy program, subject to final approval under 760 CMR 56.04(7);

The Project is eligible under the NEF housing subsidy program and at least 25% of the units will be available to households earning at or below 80% of the Area Median Income, adjusted for household size, as published by the U.S. Department of Housing and Urban Development (“HUD”). The most recent HUD income limits indicate that 80% of the current median income for a four-person household in Dover is \$96,250.

Proposed gross rent levels of \$1,552 for a one-bedroom affordable unit, \$1,803 for a two-bedroom affordable unit and \$2,083 for a three-bedroom affordable unit, less utility allowances of \$121, \$204, and \$236 for the one, two and three-bedroom units, respectively, are below the 2020 maximum allowable rents for the Boston-Cambridge-Quincy HMFA under the NEF Program.

A letter of interest for project financing was provided by Charles River Bank, a member bank of the Federal Home Loan Bank of Boston.

(b) that the site of the proposed Project is generally appropriate for residential development, taking into consideration information provided by the Municipality or other parties regarding municipal actions previously taken to meet affordable housing needs, such as inclusionary zoning, multifamily districts adopted under c.40A, and overlay districts adopted under c.40R, (such finding, with supporting reasoning, to be set forth in reasonable detail);

Based on MassHousing staff’s site inspection, internal discussions, and a thorough review of the application, MassHousing finds that the Site is suitable for residential use and development and that such use would be compatible with surrounding uses. The Town of Dover does not have a DHCD-approved Housing Production Plan. According to DHCD’s Chapter 40B Subsidized Housing Inventory (SHI), updated through July 23, 2020, Dover has 18 Subsidized Housing Inventory (SHI) units (0.92% of its housing inventory), which is 177 units short of the statutory minima of 10%.

(c) that the conceptual project design is generally appropriate for the site on which it is located, taking into consideration factors that may include proposed use, conceptual site plan and building massing, topography, environmental resources, and integration into existing development patterns (such finding, with supporting reasoning, to be set forth in reasonable detail);

Relationship to Adjacent Building Typology (Including building massing, site arrangement, and architectural details):

The proposal consists of thirty-nine (39) rental units in a garden-style, 3 ½ story, multi-gabled U-shaped building. The Site is located between an existing 40B development featuring a small cluster of family homes and a townhouse development to the west. There is a single family lot to the east. The surrounding neighborhood is generally residential in character and is predominantly made up of large single-family homes. The exterior of the proposed building has been designed to feature finishes commonly found in local residential buildings, including clapboards, shingles, paneling and 8-inch corner boards. The wall sections shift from each other to help break the wall planes into smaller sections. The proposed small gables and roofed 2-story boxed window units help to reduce the massing and add dimensions to the façade.

Relationship to adjacent streets/Integration into existing development patterns

The Site is located on County Street (Route 109) between Tisdale Drive and Walpole Street. The existing neighborhood consists of a mixture of housing types and configurations with varied roof elevations but are primarily large lot single family homes. The proposed Project is located adjacent to a 40B project featuring four small single-family homes and nearby a townhouse development. The relationship of the proposed Site access and egress to County Road does not present any discernable public safety impacts. There appear to be adequate lines of sight for vehicles entering and exiting the proposed Site. The proximity to existing multifamily uses on adjacent parcels underlies the appropriateness of the proposed Project within the existing context.

Density

The Applicant proposes to build 39 rental units on approximately 2 acres, all of which are buildable. The resulting density is 19.5 units per buildable acre, which is acceptable given the proposed housing type.

Conceptual Site Plan

The proposed U-shaped garden-style building consists of thirty-nine (39) rental units including 9 one-bedroom units, 24 two-bedroom units and 6 three-bedroom units equally dispersed across three levels of residential living space. There is a basement which will provide additional resident storage space and indoor trash storage. The three main residential living levels and basement are all accessible by elevator. The Applicant proposes a two-story 465 square foot conservatory on the entry level first floor, a 200 square foot common area on the second floor and a 535 square foot meeting room on the third floor. A single point of access to the Site is proposed on County Street. The Applicant proposes 70 parking spaces at the rear of the Site and an on-site common septic system.

Environmental Resources

The property does not contain any area of critical concern or areas of estimated or priority habitat of rare species, wildlife or vernal pools.

Topography

The majority of the Site is generally level and at grade. The topography is not an impediment to the proposed development.

(d) that the proposed Project appears financially feasible within the housing market in which it will be situated (based on comparable rentals or sales figures);

The Applicant proposes 39 rental apartments to be financed under the NEF Program. There will be 29 market-rate units with proposed average rent levels of \$2,240 for the one-bedroom units; \$3,240 for the two-bedroom units; and \$3,667 for the three-bedroom units. MassHousing's Appraisal and Marketing team performed a Competitive Market Analysis and found that proposed market rents for each unit type fall within the range of adjusted comparable market rents.

(e) that an initial pro forma has been reviewed, including a land valuation determination consistent with the Department's Guidelines, and the Project appears financially feasible and consistent with the Department's Guidelines for Cost Examination and Limitations on Profits and Distributions (if applicable) on the basis of estimated development costs;

MassHousing has commissioned an "As-Is" appraisal performed by BJ Cockrell Real Estate Appraisal Company, which indicates a land valuation of \$1,020,000. Based on a proposed investment of \$5,463,270 in private equity, the application pro-forma appears to be financially feasible and within the limitations on profits and distributions.

(f) that the Applicant is a public agency, a non-profit organization, or a Limited Dividend Organization, and it meets the general eligibility standards of the housing program; and

MassHousing finds that the Applicant must be organized as a Limited Dividend Organization. MassHousing sees no reason this requirement could not be met given information reviewed to date. The Applicant meets the general eligibility standards of the NEF housing subsidy program and has executed an Acknowledgment of Obligations to restrict their profits in accordance with the applicable limited dividend provisions.

(g) that the Applicant controls the site, based on evidence that the Applicant or a related entity owns the site, or holds an option or contract to acquire such interest in the site, or has such other interest in the site as is deemed by the Subsidizing Agency to be sufficient to control the site.

The Applicant controls the Site through a Deed from Stephen Nobile, Trustee of Nobile Trust of 2002 to Red Robin Pastures, LLC, dated November 26, 2019.

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT CH40B SUBSIDIZED HOUSING INVENTORY

Dover

DHCD ID #	Project Name	Address	Type	Total SHI Units	Affordability Expires	Built w/ Comp. Permit?	Subsidizing Agency
868	County Court	Tisdale Drive	Ownership	17	Perp	Yes	DHCD
4260	DDS Group Homes	Confidential	Rental	0	N/A	No	DDS
9247	Dover Village	67 County St	Ownership	1	Perp	YES	MassHousing
Dover Totals				18	Census 2010 Year Round Housing Units		1,950
					Percent Subsidized		0.92%

Development Team

Applicant/Developer

Paul McGovern
Red Robin Pastures, LLC.
1218 Great Plain Avenue
Needham, MA 02492
Phone: (617) 602-8153
Email: paul@pgcminc.com

Architect

Henry Bobek
Signature Designs
73 Bishop Road
Sharon, MA 02067
Phone: 781-806-0063
Email: bobekh@aol.com

40B & Development Consultant

Geoff Engler
SEB, LLC
257 Hillside Avenue,
Needham, MA. 02494
Phone: (617) 782 2300 x 202
Email: gengler@s-e-b.com

Landscape Architect

Green Bean Designs
Lar Greene
12 Osborn Street
Salem, MA. 01970
Phone: (617) 388 7835
Email: greenebeandesign@gmail.com

Surveyor

Cheney Engineering Co. Inc.
Ardi Rrapi
53 Mellen Street
Needham, MA. 02494
Phone: (781) 444 2188
Email: ardi.rrapi@cheney-eng.com

Traffic Consultant

Jeff Dirk Vanasse & Associates,
Vanasse & Associates, Inc
35 New England Business Center Dr.
Andover, MA 01810
Phone: 978-269-6830
Email: jdirk@rdva.com
www.rdva.com

Civil Engineer

Ron Tiberi, PE.
9 Mass Ave
Natick, MA 01760
Phone: 617-232-0001
Email: rtib@comcast.com

Geo-Technical Consultant

Geotechnical Consultants, Inc.
201 Boston Post Road West
Marlborough, MA. 01752
Phone: (508) 229-0900

QUITCLAIM DEED

I, **STEPHEN NOBILE, TRUSTEE OF NOBILE REALTY TRUST OF 2002**, under a Declaration of Trust dated August 9, 2002, recorded with the Norfolk County Registry of Deeds in Book 17014, Page 437, as amended by First Amendment recorded with the Norfolk County Registry of Deeds in Book 32488, Page 505, of Dover, Norfolk County, Massachusetts,

for consideration paid and in full consideration of: Nine Hundred Eighty-Nine Thousand and 00/100 Dollars (\$989,000.00),

grant to: Red Robin Pastures, LLC, a Massachusetts limited liability company with an address of 1218 Great Plain Avenue, Needham, MA 02492,

with *QUITCLAIM COVENANTS*,

PARCEL 1 [61 COUNTY STREET]

A certain parcel of land on County Street in Dover, Norfolk County, Massachusetts, with the buildings thereon, being shown as Lot A on a plan entitled, "Plan of Land in Dover, Mass.," drawn by Cheney Engineering Co., Inc., Needham, Mass., dated August 6, 1971, and filed with the Norfolk County Registry of Deeds as Plan No. 732 in Plan Book 229.

Lot A contains 43,560 square feet of land, according to said plan.

PARCEL 2 [63 COUNTY STREET]

A certain parcel of land on County Street in Dover, Norfolk County, Massachusetts, with the buildings thereon, being shown as Lot B on a plan entitled, "Plan of Land in Dover, Mass.," drawn by Cheney Engineering Co., Inc., Needham, Mass., dated August 6, 1971, and filed with the Norfolk County Registry of Deeds as Plan No. 732 in Plan Book 229.

Lot B contains 43,560 square feet of land, according to said plan.

The Grantor hereby releases and waives any and all rights of homestead in said property to which he may be entitled to under the laws of the Commonwealth of Massachusetts and certifies that at the time of recording this Deed, no beneficiary or any other person is entitled to any homestead rights in said property.

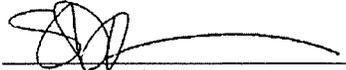
Meaning to convey the same premises conveyed to Julia M. Nobile, Trustee of Nobile Realty Trust of 2002 from Julia M. Nobile, by deeds dated August 9, 2002, recorded with the Norfolk County Registry of Deeds in Book 17014, Page 453 and in Book 17014, Page 454.

PROPERTY ADDRESSES: 61 and 63 County Street, Dover, MA 02030

MASSACHUSETTS STATE EXCISE TAX
Norfolk Registry of Deeds
Date: 12-10-2019 @ 03:22pm
Ctl#: 1145 Doc#: 115959
Fee: \$4,509.84 Cons: \$989,000.00

WILLIAM P. O'DONNELL, REGISTER
NORFOLK COUNTY REGISTRY OF DEEDS
RECEIVED & RECORDED ELECTRONICALLY

Witness my hand and seal this 26th day of November, 2019.

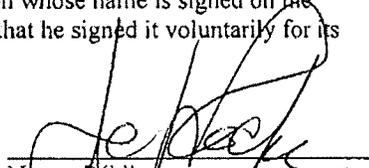

Stephen Nobile, Trustee

COMMONWEALTH OF MASSACHUSETTS

Norfolk County

November 26, 2019

On this 26th day of November, 2019, before me, the undersigned notary public, personally appeared **Stephen Nobile, Trustee**, as aforesaid, proved to me through satisfactory evidence of identification, being a valid driver's license, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose.


Notary Public:
My Commission Expires:



JOHN J. ROCHE
NOTARY PUBLIC
COMMONWEALTH OF MASSACHUSETTS
MY COMMISSION EXPIRES MAY 7, 2021

REGULATORY AND USE AGREEMENT

[Rental]

***For Comprehensive Permit Projects in Which Funding is Provided
By Other Than a State Agency***

This Regulatory and Use Agreement (this "Agreement") is made this ___ day of _____, 20___, by and between the Massachusetts Housing Finance Agency acting as Subsidizing Agency (the "Subsidizing Agency"), as defined under the provisions of 760 CMR 56.02, on behalf of the Department of Housing and Community Development ("DHCD"), and _____, a Massachusetts _____ having a mailing address at _____, and its successors and assigns (the "Developer").

RECITALS

WHEREAS, the Developer intends to construct a housing development known as _____ at a ___-acre site located at _____ in the [City/Town] of _____, Massachusetts (the "Municipality"), more particularly described in Exhibit A attached hereto and made a part hereof (the "Development"); and

WHEREAS, DHCD has promulgated Regulations at 760 CMR 56.00 (as may be amended from time to time, the "Regulations") relating to the issuance of comprehensive permits under Chapter 40B, Sections 20-23, of the Massachusetts General Laws (as may be amended from time to time, the "Act") and pursuant thereto has issued its Comprehensive Permit Guidelines (as may be amended from time to time, the "Guidelines" and, collectively with the Regulations and the Act, the "Comprehensive Permit Rules");

WHEREAS, the Development is being financed with a loan of approximately \$_____ by _____, a Federal Home Loan Bank of Boston ("FHLBB") member bank (the "NEF Lender"), a non-governmental entity for which the Massachusetts Housing Finance Agency acts as Subsidizing Agency pursuant to the Comprehensive Permit Rules; and

WHEREAS, the Massachusetts Housing Finance Agency will serve as Subsidizing Agency on behalf of DHCD pursuant to the Comprehensive Permit Rules and in accordance with the terms and provisions hereof; and

WHEREAS, the Developer has received a comprehensive permit (the "Comprehensive Permit") from the Zoning Board of Appeals of the Municipality in accordance with the Act, which permit is [recorded/filed] at the _____ County [Registry of Deeds/Registry District of the Land Court] ("Registry") [in Book _____, Page ___/ as Document No. _____], as amended by [amendments recorded in Book _____, Page ___/ as Document No. _____,

and in Book _____, Page ___/ as Document No. _____, and by] the terms of this Agreement; and

WHEREAS, pursuant to the Comprehensive Permit and the requirements of the Comprehensive Permit Rules, the Development is to consist of a total of ____ rental units, of which a minimum of 25 percent (___ units) (the "Affordable Units") will be rented to Low or Moderate Income Persons and Families (as defined herein) at rentals specified in this Agreement and will be subject to this Agreement; and

WHEREAS, the parties intend that this Agreement shall serve as a "Use Restriction" as defined in and required by Section 56.05(13) of the Regulations; and

WHEREAS, the parties recognize that Affirmative Fair Marketing (as defined herein) is an important precondition for rental of Affordable Units and that local preference is only applicable at initial rent-up and cannot be granted in a manner which results in a violation of applicable fair housing laws, regulations and subsidy programs; and.

WHEREAS, the parties recognize that the Municipality has an interest in preserving affordability of the Affordable Units and may offer valuable services in administration, monitoring and enforcement.

NOW, THEREFORE, in consideration of the agreements hereinafter set forth, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Subsidizing Agency and the Developer hereby agree as follows:

DEFINITIONS

1. In addition to terms defined elsewhere in this Agreement, the following terms as used in this Agreement shall have the meanings set forth below:

Act shall have the meaning given such term in the Recitals hereof.

Affirmative Fair Housing Marketing Plan shall mean the Affirmative Fair Housing Marketing Plan prepared by the Developer in accordance with the Guidelines and approved by the Subsidizing Agency, with such changes thereto that may be approved by the Subsidizing Agency, as further set forth in Section 3.

Affordable Units shall have the meaning set forth in the Recitals above.

Allowable Development Costs shall have the meaning given such term in Section 20 hereof.

Annual Income shall be determined in the manner set forth in 24 C.F.R. 5.609 (or any successor regulations).

Area shall mean the _____ Metropolitan Statistical Area (MSA) [or HUD Metro FMR Area (HMFA)] as designated by the Department of Housing and Urban Development

(“HUD”).

Area Median Income (“AMI”) shall mean the median gross income for the Area, as determined from time to time by HUD. For purposes of determining whether Adjusted Family Income qualifies a tenant for treatment as a Low or Moderate Income Tenant, the Area Median Income shall be adjusted for family size.

Audited Annual Limited Dividend Financial Report shall mean an annual report to be submitted by the Developer on a form prescribed by the Subsidizing Agency, pursuant to Section 12(e) hereof.

Comprehensive Permit shall have the meaning given such term in the Recitals hereof.

Comprehensive Permit Rules shall have the meaning given such term in the Recitals hereof.

Construction Lender shall mean the lender(s) making the Construction Loan, and its successors and assigns.

Construction Loan shall mean the loan to the Developer for the construction of the Development.

Construction Mortgage shall mean the mortgage from the Developer securing the Construction Loan.

Cost Certification shall have the meaning given such term in Section 20 hereof.

Cost Method shall have the meaning given such term in Section 7(d) hereof.

Developer Parties shall have the meaning given such term in Section 7(a) hereof.

Developer’s Equity shall be determined in the manner set forth in Section 7(d) hereof.

Development shall have the meaning given such term in the Recitals hereof.

Development Revenues: All rental income, receipts and other revenue derived from the operation of the Development other than revenues derived from any sales, financing, or other capital transaction, and not including any amounts payable in respect of capital contributions paid by any members or partners of the Developer or any loan proceeds payable to the Developer.

Distribution Payments shall have the meaning given such term in Section 7(a) hereof.

Event of Default shall mean a default in the observance of any covenant under this Agreement or the Mortgage existing after the expiration of any applicable notice and cure periods.

Excess Development Revenues shall have the meaning given such term in Section 12(e) hereof

Excess Equity: Surplus Cash in excess of the permitted Limited Dividend Distribution, as calculated in accordance with the Audited Annual Limited Dividend Financial Report described in Section 12 hereof.

Excess Equity Account: An interest-bearing account maintained by the Lender (or if the Loan is paid off, with the Subsidizing Agency) for the benefit of the Development during the Term hereof containing Development Revenues which exceed the Limited Dividend Distribution in a given year or years.

Family shall have the same meaning as set forth in 24 C.F.R. §5.403 (or any successor regulations).

Fiscal Year: The fiscal year of the Developer ending [_____].

Guidelines shall have the meaning given such term in the Recitals hereof.

Housing Subsidy Program shall mean any other state or federal housing subsidy program providing rental or other subsidy to the Development.

HUD shall mean the United States Department of Housing and Urban Development.

Lender shall mean the Construction Lender and/or the Permanent Lender.

Limited Dividend Distribution: The aggregate annual distributions permitted to be made to the Developer from Development Revenues as calculated pursuant to the Audited Annual Limited Dividend Financial Report.

Limited Dividend Term shall have the meaning set forth in Section 22(b) hereof.

Loan shall mean the Construction Loan and/or the Permanent Loan.

Low or Moderate Income Persons or Families shall mean persons or Families whose Annual Incomes do not exceed eighty percent (80%) of the Median Income for the Area, and shall also mean persons or Families meeting such lower income requirements as may be required under the Comprehensive Permit or any applicable Housing Subsidy Program.

Low or Moderate Income Tenants shall mean Low or Moderate Income Persons or Families who occupy the Affordable Units.

Mortgage shall mean the Construction Mortgage and/or the Permanent Mortgage.

Permanent Lender shall mean the lender(s) making the Permanent Loan to the Developer, and its successors and assigns.

Permanent Loan shall mean the Permanent Loan made or committed to be made by the Permanent Lender to the Developer after completion of construction of the Development, which

will replace the Construction Loan, or any subsequent refinancing thereof in compliance with any specific terms of the Comprehensive Permit or any Housing Subsidy Program applicable to the Development.

Permanent Mortgage shall mean the mortgage from the Developer to the Permanent Lender securing the Permanent Loan, or any replacement thereof.

Regulations shall have the meaning given such term in the Recitals hereof.

Related Person: shall mean a person whose relationship to such other person is such that (i) the relationship between such persons would result in a disallowance of losses under Section 267 or 707(b) of the Internal Revenue Code, or (ii) such persons are members of the same controlled group of corporations (as defined in Section 1563(a) of the Internal Revenue Code, except that “more than 50 percent” shall be substituted for “at least 80 percent” each place it appears therein).

Resident Selection Plan shall mean the Resident Selection Plan, prepared by the Developer in accordance with the Guidelines and approved by the Subsidizing Agency, with such changes thereto which may be approved by the Subsidizing Agency.

Substantial Completion shall have the meaning given such term in Section 19 hereof.

Surety shall have the meaning given such term in Section 21 hereof.

Surplus Cash shall have the meaning given such term in Section 7(c) hereof.

Term shall have the meaning set forth in Section 22 hereof.

Total Development Costs (“TDC”) shall have the meaning set forth in Section 7(h) hereof.

Value Method shall have the meaning given such term in Section 7(d) hereof.

CONSTRUCTION OBLIGATIONS

2. (a) The Developer agrees to construct the Development in accordance with plans and specifications approved by the Subsidizing Agency and the Municipality (the “Plans and Specifications”), which are consistent with the minimum design and construction standards of the Subsidizing Agency applicable to comprehensive permit projects in accordance with the Comprehensive Permit Guidelines, and in accordance with all on-site and off-site construction, design and land use conditions of the Comprehensive Permit, and in accordance with the information describing the Development presented by the Developer to the Subsidizing Agency in its application for Final Approval. The Development must fully comply with the State Building Code and with all applicable state and federal building, environmental, health, safety and other laws, rules, and regulations, including without limitation all applicable federal and

state laws, rules and regulations relating to the operation of adaptable and accessible housing for the handicapped. Except to the extent that the Development is exempted from such compliance by the Comprehensive Permit, the Development must also comply with all applicable local codes, ordinances and by-laws.

(b) The Subsidizing Agency shall monitor compliance with the construction obligations set forth in this section in such manner as the Subsidizing Agency may deem reasonably necessary. In furtherance thereof, the Developer shall provide to the Subsidizing Agency, prior to commencement of construction, a certification from the Construction Lender concerning construction monitoring in a form acceptable to the Subsidizing Agency. If the information provided to the Subsidizing Agency is not acceptable to the Subsidizing Agency, or if at any time after acceptance the NEF Lender's construction monitor fails to provide adequate construction oversight in accordance with the requirements of the NEF Lender's certification, the Subsidizing Agency may require that the Developer fund the cost of a construction monitor retained by the Subsidizing Agency.

USE RESTRICTION/RENTALS AND RENTS

3. (a) The Developer shall rent the Affordable Units during the Term hereof to Low or Moderate Income Persons or Families upon the terms and conditions set forth in the Comprehensive Permit and this Agreement. In fulfilling the foregoing requirement, the Developer will accept referrals of tenants from the Housing Authority in the Municipality, and will not unreasonably refuse occupancy to any prospective tenants so referred who otherwise meet the requirements of the Resident Selection Plan. The foregoing provisions shall not relieve the Developer of any obligations it may have under the provisions of other documents and instruments it has entered with respect to any applicable Housing Subsidy Program; provided, however, the Subsidizing Agency shall have no obligation hereunder, expressed or implied, to monitor or enforce the applicable requirements of any such Housing Subsidy Programs.

(b) The annual rental expense for each Affordable Unit (equal to the gross rent plus allowances for all tenant-paid utilities, including but not limited to tenant-paid heat, hot water and electricity) shall not exceed thirty percent (30%) of eighty percent (80%) of AMI (or such other higher percentage of AMI established by DHCD for Comprehensive Permit Projects In Which Funding Is Provided By Other Than a State Agency), adjusted for household size, assuming that an Affordable Unit which does not have a separate bedroom is occupied by one individual, and that a unit which has one or more separate bedrooms is occupied by 1.5 individuals for each separate bedroom. If rentals of the Affordable Units are subsidized under any Housing Subsidy Program, then the rent applicable to the Affordable Units may be limited to that permitted by such Housing Subsidy Program, provided that the tenant's share of rent does not exceed the maximum annual rental expense as provided in this Agreement.

(c) For purposes of satisfying the requirement that the Affordable Units shall be occupied by Low or Moderate Income Tenants hereunder, no Low or Moderate Income Tenant shall be denied continued occupancy because, after admission, the Low Moderate Income Tenant's Annual Income exceeds eighty percent (80%) of Area Median Income. No Low or

Moderate Income Tenant shall continue to be counted as a Low or Moderate Income Tenant as of any date upon which such tenant's Annual Income exceeds one hundred forty percent (140%) of the level at which a tenant may be qualified as a Low or Moderate Income Tenant provided, however, that the Developer shall not be in default regarding the requirements of this Agreement to maintain occupancy of the Affordable Units by Low or Moderate Income Tenants if the Developer rents the next available unit to Low or Moderate Income Tenants as needed to achieve compliance with such requirements (thereupon, as rented to a Low or Moderate Income Tenant, such unit or units shall be deemed an Affordable Unit hereunder).

(d) If, after initial occupancy, the income of a tenant in an Affordable Unit increases, and as a result of such increase, exceeds one hundred forty percent (140%) of the maximum income permitted hereunder for such a tenant, at the expiration of the applicable lease term, the rent restrictions shall no longer apply to such tenant. In the event that a Low or Moderate-Income Tenant's Annual Income increases and, as a result of such increase, exceeds one hundred forty percent (140%) of Area Median Income, the Developer may charge the formerly Low or Moderate-Income Tenant a market rate for the dwelling unit.

(e) Rentals for the Affordable Units shall be initially established as shown on the Rental Schedule attached as Appendix A hereto, subject to change from time to time (if necessary to reflect any changes in AMI) in accordance with the terms and provisions of this Agreement and any applicable Housing Subsidy Program. The Developer shall annually submit to the Subsidizing Agency a proposed schedule of monthly rents and utility allowances for all Affordable Units in the Development. It is understood that the Subsidizing Agency shall review such schedule with respect to the maximum rents for all the Affordable Units based on the size and required extent of affordability of each Affordable Unit, and shall not take into account the actual incomes of individual tenants in any given Affordable Unit. Rents for the Affordable Units shall not be increased above such maximum monthly rents without the Subsidizing Agency's prior approval of either (i) a specific request by the Developer for a rent increase; or (ii) the next annual schedule of rents and allowances as set forth in the preceding sentence. Notwithstanding the foregoing, rent increases shall be subject to the provisions of outstanding leases and shall not be implemented without at least 30 days' prior written notice by the Developer to all affected tenants.

(f) The Developer shall obtain income certifications satisfactory in form and manner to the Subsidizing Agency at least annually for all Low or Moderate-Income Tenants. Said income certifications shall be kept by the management agent for the Development and made available to the Subsidizing Agency upon request.

(g) Prior to initial lease-up, the Developer shall submit an Affirmative Fair Housing Marketing and Resident Selection Plan (also known as an "AFHMP") for the Subsidizing Agency's approval. At a minimum the AFHMP shall meet the requirements of the Guidelines, as the same may be amended from time to time. The AFHMP, upon approval by the Subsidizing Agency, shall become a part of this Agreement and shall have the same force and effect as if set out in full in this Agreement.

(h) The AFHMP shall designate entities to implement the plan that are qualified to perform their duties. The Subsidizing Agency may require that another entity be found if the Subsidizing Agency finds that the entity designated by the Developer is not qualified. Moreover, the Subsidizing Agency may require the removal of an entity responsible for a duty under the AFHMP if that entity does not meet its obligations under the AFHMP.

(i) The restrictions contained herein are intended to be construed as an affordable housing restriction as defined in Section 31 of Chapter 184 of Massachusetts General Laws which has the benefit of Section 32 of said Chapter 184, such that the restrictions contained herein shall not be limited in duration by any rule or operation of law but rather shall run for the Term hereof. In addition, this Agreement is intended to be superior to the lien of any mortgage on the Development and survive any foreclosure or exercise of any remedies thereunder and the Developer agrees to obtain any prior lienholder consent with respect thereto as the Subsidizing Agency shall require.

TENANT SELECTION AND OCCUPANCY

4. The Developer shall use its good faith efforts during the Term of this Agreement to maintain all the Affordable Units within the Development at full occupancy as set forth in Section 2 hereof. In marketing and renting the Affordable Units, the Developer shall comply with the Resident Selection Plan and AFHMP which are incorporated herein by reference with the same force and effect as if set out in this Agreement.

5. Occupancy agreements for Affordable Units shall meet the requirements of the Comprehensive Permit Rules, this Agreement, and any applicable Housing Subsidy Program, and shall contain clauses, among others, wherein each resident of such Affordable Unit:

(a) certifies the accuracy of the statements made in the application and income survey;

(b) agrees that the family income, family composition and other eligibility requirements, shall be deemed substantial and material obligations of his or her occupancy; that he or she will comply promptly with all requests for information with respect thereto from the Developer or the Subsidizing Agency; and that his or her failure or refusal to comply with a request for information with respect thereto shall be deemed a violation of a substantial obligation of his or her occupancy; and

(c) agrees that at such time as the Developer or the Subsidizing Agency may direct, he or she will furnish to the Developer certification of then current family income, with such documentation as the Subsidizing Agency shall reasonably require; and agrees to such charges as the Subsidizing Agency has previously approved for any facilities and/or services which may be furnished by the Developer or others to such resident upon his or her request, in addition to the facilities included in the rentals, as amended from time to time pursuant to Section 3 above.

EXPIRATION OF RESTRICTIONS - TENANT PROTECTIONS

6. (a) If, upon the expiration of the Term hereof, the affordability requirements under the Comprehensive Permit shall expire, the Developer shall deliver a written notice to all Low or Moderate or Income Tenants of such expiration (the "Expiration Notice") at the same time that it shall provide such notice to the Subsidizing Agency. The Expiration Notice shall inform all Low or Moderate or Income Tenants of the tenant protections described in this Section 6.

(b) For a period of one year after the date of expiration ("Year 1") (the date of expiration is hereinafter referred to as the "Expiration Date"), the Developer may not increase the rentals payable by any Low or Moderate-Income Tenant on the Expiration Date (a "Protected Low or Moderate-Income Tenant"), except for rental increases which would have been permitted by the terms and provisions of the applicable Housing Subsidy Program if such Expiration Date had not occurred.

(c) For a period of two years after Year 1 ("CPI Index Period"), the rentals for units occupied by Protected Low or Moderate Income Tenants may not be increased more than once annually by the greater of: (i) the consumer price index (applicable to the area in which the Development is located) times the rental rate in effect as of the Expiration Date; or (ii) such higher amount as the Subsidizing Agency shall approve. In no event may the Developer increase rentals for such Affordable Units in excess of any limitations contained in a Housing Subsidy Program which remains in effect after the Expiration Date.

(d) For three (3) years after the CPI Index Period (the "Transition Period"), the Developer shall provide Relocation Assistance, as defined herein, for any Protected Low or Moderate-Income Tenant who voluntarily terminates his or her lease during the Transition Period as a result of rental increases. For the purposes hereof, the term "Relocation Assistance" shall mean reasonable assistance in locating a comparable affordable unit, including the payment of any broker's fees and the payment of reasonable moving expenses within a thirty (30) mile radius of the Development.

(e) Upon expiration, the Developer agrees to continue to use the form of occupancy agreement for all Protected Low or Moderate-Income Tenants until the expiration of the periods described in (b) and (c), above. Thereafter, the Developer may require that all Protected Low or Moderate-Income Tenants enter into the lease form used for tenants in the market-rental units or a lease substantially in the form published by the National Apartment Association, provided that any new occupancy agreement shall provide the Protected Low or Moderate-Income Tenants with the benefits of subsection (d), above.

(f) The provisions of this Section 6 shall survive the termination of any other provisions of this Agreement as a result of expiration until the expiration of the periods described in subsections (b), (c), and (d), above.

(g) Protected Low or Moderate-Income Tenants shall have a right to enforce the protections provided them in this Section 6.

LIMITED DIVIDENDS; USE OF DEVELOPMENT REVENUES

7. (a) The Developer covenants and agrees that no Distribution Payments may be made to the Developer other than Limited Dividend Distributions. Repayment of developer's fee loaned is treated as a Limited Dividend Distribution and is subject to the limitations set forth herein. Limited Dividend Distributions may be made: (i) on a quarterly basis within the Developer's Fiscal Year; (ii) only once all currently payable amounts as identified in subsection (i) below are evidenced by a certificate provided by an independent accountant certifying that no such obligations are more than thirty (30) days past due and that there are no outstanding material extraordinary obligations incurred outside the ordinary course of business, even if thirty (30) or less days past due; and (iii) only after (x) submission by the Developer of the Audited Annual Limited Dividend Financial Report pursuant to Paragraph 12(b) below and (y) acceptance by the Subsidizing Agency of said report. Except with the prior written authorization of the Subsidizing Agency, Limited Dividend Distributions cannot be derived or made from borrowed funds or from the sale of capital assets.

For the purposes hereof, the term "Distribution Payments" shall mean all amounts paid from Development Revenues (herein called "Development Revenues") which are paid to any partner, manager, member or any other Related Person of the Developer (collectively, the "Developer Parties") as profit, income, or fees or other expenses which are unrelated to the operation of the Development or which are in excess of fees and expenses which would be incurred from persons providing similar services who are not Developer Parties and who provide such services on an arms-length basis.

(b) No Limited Dividend Distributions may be made when: (i) a default or an Event of Default has occurred and is continuing under this Agreement; (ii) there has been failure to comply with the Subsidizing Agency's notice of any reasonable requirement for adequate (as determined by the Subsidizing Agency using its reasonable discretion) maintenance of the Development in order to continue to provide decent, good quality and safe affordable housing; or (iii) prior to the expiration of the Term hereof, there is outstanding against all or any part of the Development any lien or security interest other than a lien securing the Loan or a lien expressly permitted by the Subsidizing Agency or Lender.

(c) Subject to the provisions set forth above, Limited Dividend Distributions may only be made to the Developer from Surplus Cash, provided that no Limited Dividend Distribution for any Fiscal Year may exceed ten percent (10%) of Developer's Equity.

"Surplus Cash", which is a balance sheet calculation, represents the long-term accumulation of working capital from the Development's revenues that is available at the end of any quarter in a given Fiscal Year to make: (i) Limited Dividend Distributions; (ii) deposits into the Excess Equity Account; and (iii), if necessary, a distribution to the Municipality for the purpose of developing and/or preserving Affordable Housing. The calculation of Surplus Cash is more fully detailed in Part A of the current "M.G.L. Ch. 40B RENTAL DEVELOPMENTS / Instructions for Use of Calculation Tool for Computation of Excess Equity and Limited Dividend Distributions" (as it exists as the date hereof) available from the Subsidizing Agency

and which currently is the form to be used in the preparation of the Audited Annual Limited Dividend Financial Report.

(d) For the purposes hereof the initial amount of "Developer's Equity" shall be \$_____, subject to adjustment as provided herein. The initial amount of "Developer's Equity" is established at the time of Final Approval based on the Developer's projection pursuant to the Cost Method as defined below. This initial amount shall be adjusted and verified at the time of Cost Certification with respect to the construction of the Development in accordance with the "Inter-Agency 40B Rental Cost Certification Guidance for Owners, Certified Public Accountants and Municipalities" (as it may be amended, revised or replaced) as the greater of the amounts determined by (a) the "Cost Method" or (b) the "Value Method." For purposes hereof the term "Cost Method" is defined as (i) actual cash contributed by the Developer to the Development, including tax credit equity (if applicable) plus (ii) the deferred portion of the maximum allowable developer fee determined in accordance with DHCD policy, provided that any payment of such deferred fee from project cash flow is treated as a Distribution Payment in accordance with Section 7 hereof, plus (iii) the appraised "as-is" market value of the land that exceeds the actual purchase price paid by the Developer for said land, if any, or less (iv) the actual purchase price paid by the Developer for said land that exceeds the appraised "as is" market value of the land, if any. —For purposes hereof the term "Value Method" is defined as (i) the as-complete and stabilized appraised market value of the Development, as determined by an independent appraisal commissioned by the Subsidizing Agency in accordance with this Section 7(d), less (ii) the sum of secured debt on the Development plus public equity, whether structured as a grant or loan, as determined by the Subsidizing Agency.

Thereafter, Developer's Equity may be adjusted not more than once in any five year period with the first five - year period commencing with the first Fiscal Year of the Development. Any adjustments shall be made only upon the written request of the Developer. Unless the Developer is otherwise directed by the Subsidizing Agency, the initial appraised market value and any adjustment thereto shall be based upon an appraisal commissioned by (and naming as a client) the Subsidizing Agency and prepared by an independent and qualified appraiser prequalified by, and randomly assigned to the Development by, the Subsidizing Agency. The appraiser shall submit a Self-Contained Appraisal Report to the Subsidizing Agency in accordance with the Uniform Standards of Professional Appraisal Practice (USPAP). The costs of such appraisal shall be borne by the Developer. Such appraisal shall use assumptions subject to the reasonable approval of the Subsidizing Agency.

Upon completion of an appraisal as provided above, the Developer's Equity shall be adjusted to equal the appraised value of the Development as determined by the appraisal less the unpaid principal amount of the sum of secured debt on the Development plus public equity, whether structured as a grant or loan determined as of the date of the appraisal. Such new Developer's Equity shall be the Developer's Equity the date of such appraisal.

(e) In the event that the amount available for Limited Dividend Distributions in a given Fiscal Year exceeds the Limited Dividend Distribution permitted for such Fiscal Year pursuant to Section 7(c) above, such excess shall be deposited and administered in accordance with Section 7(f) below. Amounts deposited into the Excess Equity Account may, subject to

subsections (a) through (c) above, and pursuant to the Subsidizing Agency's Limited Dividend Policy, be distributed by the Lender (or the Subsidizing Agency, as applicable) to the Developer in amounts equal to the difference between the amount by which Limited Dividend Distributions actually made in any prior Fiscal Year were less than the amount permitted to be distributed under Section 7(c) hereof for such Fiscal Year. In the event that Surplus Cash is insufficient to allow the Developer to take its Limited Dividend Distribution as permitted herein and there are funds in the Excess Equity Account, Lender (or the Subsidizing Agency, as applicable) may distribute to the Developer an amount equal to the unpaid portion of the permitted Limited Dividend Distribution for such Fiscal Year, provided that, in no event shall the amount so distributed exceed the amount available in the Excess Equity Account.

Notwithstanding the foregoing, in the event that the amount available for Limited Dividend Distributions in a given Fiscal Year exceeds the Limited Dividend Distribution permitted for such Fiscal Year pursuant to Section 7(c) above, the amount of any such excess may be applied to pay, with simple interest, the amount by which Limited Dividend Distributions made in any of the preceding Fiscal Years were less than the amount permitted to be paid under Section 7(c) hereof for such Fiscal Years, subject to the provisions of subsections (a) through (c) above.

(f) Any amounts available for a Limited Dividend Distribution which may not be distributed in any year pursuant to the provisions of Section 7(c) above ("Excess Equity"), shall be deposited in the Excess Equity Account with the Lender (or if the Loan is paid off, with the Subsidizing Agency). No distributions may be made to the Developer from the Excess Equity Account except those permitted pursuant to Section 7(e) and (f) hereof. Upon the occurrence of an Event of Default under this Agreement or the Mortgage, the Lender (or the Subsidizing Agency, as applicable) may apply any amounts in the Excess Equity Account to the payment of all or any portion of the debt secured by the Mortgage.

Upon the Developer's written request, amounts may also be withdrawn from the Excess Equity Account by the Lender (or the Subsidizing Agency, as applicable) during the Term hereof and applied for any purpose described in Section 7(i) hereof or for any purpose (i) that provides a direct and material benefit to Low or Moderate Income Tenants; (ii) that reduces rent charged to Low or Moderate Income Tenants; (iii) that extends the affordability of the Development; or (iv) that provides relocation and transitional assistance to Low or Moderate Income Tenants as described in Section 6 hereof.

To the extent that the Term of this Agreement extends beyond satisfaction in full of the debt secured by the Mortgage, the Subsidizing Agency may, in its sole discretion, during the remaining Term, make amounts available from the Excess Equity Account to: (a) pay all or a portion of the annual monitoring fee that remains outstanding thirty (30) days after its due date, and/or (b) provide relocation and transitional assistance to tenants of Affordable Units.

Upon the Developer's written request, amounts may also be withdrawn from the Excess Equity Account during the Term hereof and applied for the following purposes: (i) payment of or adequate reserve for all sums due or currently required to be paid under the terms of the Mortgage; (ii) payment of or adequate reserve for all reasonable and necessary operating

expenses of the Development as reasonably determined by the Developer; (iii) deposit of all amounts as may be deposited in a reserve fund for capital replacements reasonably determined by the Developer to be sufficient to meet anticipated capital needs of the Development which may be held by Lender or a lending institution reasonably acceptable to the Subsidizing Agency and which reserves shall be used for capital expenditures for the Development reasonably determined to be necessary by the Developer; (iv) payments of operating expense loans made by the partners, managers or members of the Developer for Development expenses, provided that the Developer shall have obtained prior written approval for such loans from the applicable Lender (or, if there is no mortgage, or after discharge of the Mortgage, from the Subsidizing Agency) and shall have supplied the applicable Lender (or the Subsidizing Agency) with such evidence as the applicable Lender (or the Subsidizing Agency, as applicable) may reasonably request as to the application of the proceeds of such operating expense loans to the Development; or (v) for any other purposes, subject to a determination by the Lender (or, if there is no Mortgage, or the Mortgage is discharged during the Term of this Agreement, the reasonable determination by the Subsidizing Agency) that the expenditure is necessary to address the Development's physical or financial needs and that no other Development reserve funds are available to address such needs. Notwithstanding the foregoing, payment of the items set forth in clauses (i), (ii) and (iv) above by the Developer shall be subject to the prior written approval of the Subsidizing Agency, which approval shall not be unreasonably withheld or delayed; it being agreed by the Subsidizing Agency that if the Developer can demonstrate that its proposed operating expenditures and reserves are substantially consistent with those made for comparable developments within the Commonwealth of Massachusetts, the Subsidizing Agency shall approve such request. Further, in no event shall such review or approval be required by the Subsidizing Agency to the extent any such capital expenditures or reserves are mandated by Lender.

In any event, cash available for distribution in any year in excess of 20% of Developer's Equity, subject to payment of a Limited Dividend Distribution pursuant to Section 7(c) hereof, shall be distributed to the Municipality within fifteen (15) business days of notice and demand given by the Subsidizing Agency as provided herein, or as otherwise directed by DHCD. Upon the expiration of the Limited Dividend Term (as defined in Section 22(b) hereof), any balance remaining in the Excess Equity Account shall (i) be contributed by the Developer to the replacement reserve held for the Development, if such contribution is deemed by the Subsidizing Agency (in its reasonable discretion) to be necessary, (ii) be distributed to the Subsidizing Agency for the purpose of developing and/or preserving affordable housing, or (iii) be distributed as otherwise directed by DHCD.

(g) All funds in the Excess Equity Account shall be considered additional security for the performance of obligations of the Developer under the Mortgage and this Agreement and the Developer hereby pledges and grants to the Lender (or the Subsidizing Agency, as applicable) a continuing security interest in said funds. Furthermore, the Developer recognizes and agrees that (i) possession of said funds by the Lender (or the Subsidizing Agency, as applicable) constitutes a bona fide pledge of said funds to the Lender (or the Subsidizing Agency, as applicable) for security purposes, (ii) to the extent required by applicable law, this Agreement, in combination, as necessary, with other documents referred to herein, constitutes a valid and binding security agreement, and (iii) the validity and effectiveness of said pledge will not be compromised if said

funds are held in a bank or other financial institution. The Developer further acknowledges and agrees that, notwithstanding any nomenclature or title given to the Excess Equity Account by the bank or other financial institution at which the Excess Equity Account is held, or the fact that the Developer's tax identification number is used with respect to the Excess Equity Account, the Lender (or the Subsidizing Agency, as applicable), and not the Developer, shall be the customer of the bank or other financial institution holding the Excess Equity Account; such bank or other financial institution shall comply with instructions originated by the Lender (or the Subsidizing Agency, as applicable) directing the disposition of funds in the Excess Equity Account, without further consent of the Developer; and the Lender (or the Subsidizing Agency, as applicable), and not the Developer, shall have the exclusive right to withdraw funds from the Excess Equity Account.

(h) Payment of fees and profits from capital sources for the initial development of the Development to the Developer and/or the Developer's related party consultants, partners and legal or beneficial owners of the Development shall, be limited to no more than ten percent (10%) of Total Development Costs, net of (i) such fees and profits, and (ii) any working capital or reserves intended for operation of the Development and approved by the Subsidizing Agency. Such limited payment of fees and profits shall not include fees or profits paid to any other party, whether or not related to the Developer, to the extent the same are arm's length and commercially reasonable in light of the size and complexity of the Development. The Developer shall comply with the requirements of Section 20 below regarding Cost Certification. In accordance with the requirements of 760 CMR 56.04(8)(e), in the event that the Subsidizing Agency determines, following examination of the Cost Certification submitted by the Developer pursuant to Section 20 below, that amounts were paid or distributed by the Developer in excess of the above limitations (the "Excess Distributions"), the Developer shall pay over in full such Excess Distributions to the Municipality within fifteen (15) business days of notice and demand given by the Subsidizing Agency as provided herein.

For the purposes hereof, the term "Total Development Costs" shall mean the total of all costs associated with acquisition, construction (including construction contingency), and general development (such as architectural, engineering, legal, and financing fees, insurance, real estate taxes and loan interest) for the Development. Total Development Costs include (i) developer overhead and developer fees, and (ii) any capitalized reserves intended for operation of the Development and approved by the Subsidizing Agency as being specifically excluded from the calculation of fees and profits payable from capital sources for the initial development of the Development.

(i) The Developer shall apply Development Revenues in the following order of priority: (x) payment of or adequate reserve for all sums due or currently required to be paid under the terms of the Loan; and (y) payment of or adequate reserve for all reasonable and necessary expenses of the Development as identified below. With respect to the application of Development Revenues as described above, the Developer agrees as follows:

(i) Payment for services, supplies, or materials shall not exceed the amount ordinarily and reasonably paid for such services, supplies, or materials in the area where the services are rendered or the supplies or materials furnished;

(ii) Reasonable and necessary expenses which may be payable pursuant to subsection (i), above, shall be directly related to the operation, maintenance or management of the Development; and

(iii) Without the Subsidizing Agency's prior written consent, the Developer may not assign, transfer, create a security interest in, dispose of, or encumber any Development Revenues except in connection with the Construction Loan, the Permanent Loan and any refinancing thereof and as expressly permitted herein.

(j) Notwithstanding anything to the contrary contained in this Agreement, a distribution resulting from the proceeds of a sale or refinancing of the Development shall not be regulated by this Agreement. A sale or refinancing shall not result in a new evaluation of Developer's Equity.

MANAGEMENT OF THE DEVELOPMENT

8. The Developer shall maintain the Development in good physical condition in accordance with the Subsidizing Agency's requirements and standards and the requirements and standards of the Mortgage and any applicable Housing Subsidy Program. The Developer shall provide for the management of the Development in a manner that is consistent with accepted practices and industry standards for the management of multi-family market rate rental housing. Notwithstanding the foregoing, the Subsidizing Agency shall have no obligation hereunder, expressed or implied, to monitor or enforce any such standards or requirements and, further, the Subsidizing Agency has not reviewed nor approved the Plans and Specifications for compliance with federal, state or local codes or other laws.

CHANGE IN COMPOSITION OF DEVELOPER ENTITY; RESTRICTIONS ON TRANSFERS

9. Prior to Substantial Completion, the following actions, without limitation, shall be subject to the Subsidizing Agency's prior written approval (which approval shall not be unreasonably withheld, conditioned or delayed):

(a) any change, substitution or withdrawal of any general partner, manager, or agent of the Developer; or

(b) the conveyance, assignment, transfer, or relinquishment of a majority of the Beneficial Interests (herein defined) in Developer (except for such a conveyance, assignment, transfer or relinquishment among holders of Beneficial Interests as of the date of this Agreement).

For purposes hereof, the term "Beneficial Interest" shall mean: (i) with respect to a partnership, any limited partnership interests or other rights to receive income, losses, or a return on equity contributions made to such partnership; (ii) with respect to a limited liability company,

any interests as a member of such company or other rights to receive income, losses, or a return on equity contributions made to such company; or (iii) with respect to a company or corporation, any interests as an officer, board member or stockholder of such company or corporation to receive income, losses, or a return on equity contributions made to such company or corporation;

(c) the sale, conveyance, transfer, ground lease, or exchange of the Developer's interest in the Development or any part of the Development.

Prior to any transfer of ownership of the Development or any portion thereof or a Beneficial Interest therein, the Developer agrees to secure from the transferee a written agreement stating that the transferee will assume in full the Developer's obligations and duties under this Agreement.

10. After Substantial Completion, Developer shall provide the Subsidizing Agency with thirty (30) days' prior written notice, of any sale, conveyance, transfer, ground lease or exchange of the Developer's interest in the Development or any part of the Development, but no consent shall be required. As in Section 9 above, prior to any transfer of ownership of the Development or any portion thereof or interest therein, the Developer agrees to secure from the transferee a written agreement stating that the transferee will assume in full the Developer's obligations and duties under this Agreement.

BOOKS AND RECORDS

11. All records, accounts, books, tenant lists, applications, waiting lists, documents, and contracts relating to the Developer's compliance with the requirements of this Agreement shall at all times be kept separate and identifiable from any other business of the Developer which is unrelated to the Development, and shall be maintained, as required by applicable regulations and/or guidelines issued by DHCD and/or the Subsidizing Agency from time to time, in a reasonable condition for proper audit and subject to examination during business hours by representatives of the Subsidizing Agency or DHCD. Failure to keep such books and accounts and/or make them available to the Subsidizing Agency or DHCD will be an Event of Default hereunder.

ANNUAL FINANCIAL REPORT

12. (a) Within ninety (90) days following the end of each Fiscal Year of the Development, the Developer shall furnish the Subsidizing Agency with a complete annual financial report for the Development based upon an examination of the books and records of the Developer containing a detailed, itemized statement of all income and expenditures, prepared and certified by a certified public accountant in accordance with the reasonable requirements of the Subsidizing Agency which include: (i) financial statements submitted in a format acceptable to the Subsidizing Agency; (ii) the financial report on an accrual basis and in conformity with

generally accepted accounting principles applied on a consistent basis; and (iii) amounts available for distribution under Section 7 above. A duly authorized agent of the Developer must approve such submission in writing. The provisions of this paragraph may be waived or modified by the Subsidizing Agency.

(b) In addition to the financial information required to be furnished by the Developer to the Subsidizing Agency pursuant to Section 12(a) above, the Developer shall furnish to the Subsidizing Agency, within ninety (90) days of the end of its Fiscal Year, an Audited Annual Limited Dividend Financial Report (including a certificate from the independent certified public accountant (the “CPA”) who prepared the Developer’s audited financial statements) in the form then required by the Subsidizing Agency. The Subsidizing Agency’s agreement to waive or modify the requirement of an Audited Annual Limited Dividend Financial Report for a given Fiscal Year shall not be deemed to constitute a waiver or modification of the requirement of an Audited Annual Limited Dividend Financial Report for any subsequent Fiscal Year. Should the Developer fail in any given year to comply with its obligations under this subparagraph, the Developer acknowledges and agrees that such failure constitutes a knowing waiver and relinquishment of any Limited Dividend Distributions to which it might otherwise be entitled for such Fiscal Year pursuant to Sections 7(c) and/or 7(e) above.

(c) Such Audited Annual Limited Dividend Financial Report shall be accompanied by a Certificate of Developer (in the form as then reasonably required by the Subsidizing Agency) certifying to the Developer’s best knowledge and belief, under the pains and penalties of perjury, as to matters such as, without limitation, the fact that (i) the Developer has made available all necessary financial records and related data to the CPA who prepared the Audited Annual Limited Dividend Financial Report, (ii) there are no material transactions related to the Development that have not been properly recorded in the accounting records underlying the Audited Annual Limited Dividend Financial Report, (iii) the Developer has no knowledge of any fraud or suspected fraud affecting the entity involving management, subcontractors, employees who have significant roles in internal control, or others where the fraud could have a material effect on the Audited Annual Limited Dividend Financial Report and has no knowledge of any allegations of fraud or suspected fraud affecting the Developer or the Development received in communications from employees, former employees, subcontractors, regulators, or others, and (iv) the Developer has reviewed the information presented in the Audited Annual Limited Dividend Financial Report and believes that such determination is an appropriate representation of the Development.

(d) The Subsidizing Agency shall have sixty (60) days after the delivery of the Audited Annual Limited Dividend Financial Report to accept it, to make its objections in writing to the Developer and the Developer’s CPA, or to request from the Developer and/or CPA additional information regarding it. If the Subsidizing Agency does not object to the Audited Annual Limited Dividend Financial Report or request additional information with respect to it, the Audited Annual Limited Dividend Financial Report shall have been deemed accepted by the Subsidizing Agency. If the Subsidizing Agency shall request additional information, then the Developer shall provide the Subsidizing Agency with such additional information as promptly as possible and the Subsidizing Agency shall have an additional thirty (30) days thereafter to review such information and either accept or raise objections to such Audited Annual Limited Dividend Financial Report. If no such objections are made within such thirty day (30) period, the Audited

Annual Limited Dividend Financial Report shall be deemed accepted by the Subsidizing Agency.

To the extent that the Subsidizing Agency shall raise any objections to such Audited Annual Limited Dividend Financial Report as provided above, then the Developer and the Subsidizing Agency shall consult in good faith and seek to resolve such objections within an additional thirty (30) day period. If any objections are not resolved during such period, then the Subsidizing Agency may enforce the provisions under this Section 12 by the exercise of any remedies it may have under this Agreement.

(e) If upon the acceptance of an Audited Annual Limited Dividend Financial Report as provided above, such Audited Annual Limited Dividend Financial Report shall show that the aggregate Distribution Payments to the Developer during the applicable Fiscal Year exceed the allowable Limited Dividend Distribution for the Developer, then upon thirty (30) days written notice from the Subsidizing Agency, the Developer shall cause such excess to be deposited in the Excess Equity Account from sources other than Development Revenues to the extent not otherwise required by the Lender to remain with the Development.

If such Audited Annual Limited Dividend Financial Report as accepted shall show that there are Development Revenues which are in excess of the allowable Limited Dividend Distribution which the Developer has not distributed (“Excess Development Revenues”), such amounts shall be applied as provided in Section 7(e) above within thirty (30) days after the acceptance of the Audited Annual Limited Dividend Financial Report as set forth in subsection (d) above.

FINANCIAL STATEMENTS AND OCCUPANCY REPORTS

13. At the request of the Subsidizing Agency, the Developer shall furnish financial statements and occupancy reports and shall give specific answers to questions upon which information is reasonably desired from time to time relative to the ownership and operation of the Development. The Developer covenants and agrees to secure and maintain on file for inspection and copying by the Subsidizing Agency such information, reports and certifications as the Subsidizing Agency may reasonably require in writing in order to insure that the restrictions contained herein are being complied with. The Developer further covenants and agrees to submit to the Subsidizing Agency annually, or more frequently if required in writing by the Subsidizing Agency, reports detailing such facts as the Subsidizing Agency reasonably determines are sufficient to establish compliance with the restrictions contained hereunder, copies of leases for all Affordable Units, and a certification by the Developer that, to the best of its knowledge, the restrictions contained herein are being complied with. The Developer further covenants and agrees promptly to notify the Subsidizing Agency if the Developer discovers noncompliance with any restrictions hereunder.

NO CHANGE OF DEVELOPMENT'S USE

14. Except to the extent permitted by the Comprehensive Permit, as it may be amended pursuant to the Comprehensive Permit Rules, the Developer shall not change the type or number of Affordable Units without prior written approval of the Subsidizing Agency and an amendment to this Agreement. Except to the extent permitted by applicable zoning requirements then in effect, the Developer shall not permit the use of the dwelling accommodations of the Development for any purpose except residences and any other use permitted by the Comprehensive Permit.

NO DISCRIMINATION

15. (a) There shall be no discrimination upon the basis of race, color, disability, religion, sex, familial status, sexual orientation, national origin, genetic information, ancestry, children, marital status, public assistance reciprocity or any other basis prohibited by law in the lease, use, or occupancy of the Development (provided that if the Development qualifies as elderly housing under applicable state and federal law, occupancy may be restricted to the elderly in accordance with said laws) or in connection with the employment or application for employment of persons for the construction, operation and management of the Development.

(b) There shall be full compliance with the provisions of all state or local laws prohibiting discrimination in housing on the basis of race, color, disability, religion, sex, familial status, sexual orientation, national origin, genetic information, ancestry, children, marital status, public assistance reciprocity or any other basis prohibited by law, and providing for nondiscrimination and equal opportunity in housing, including without limitation in the implementation of any local preference established under the Comprehensive Permit. Failure or refusal to comply with any such provisions shall be a proper basis for the Subsidizing Agency to take any corrective action it may deem necessary including, without limitation, referral to DHCD for enforcement.

DEFAULTS; REMEDIES

16. (a) If any default, violation, or breach of any provision of this Agreement is not cured to the satisfaction of the Subsidizing Agency within thirty (30) days after the giving of notice to the Developer as provided herein, then at the Subsidizing Agency's option, and without further notice, the Subsidizing Agency may either terminate this Agreement, or the Subsidizing Agency may apply to any state or federal court for specific performance of this Agreement, or the Subsidizing Agency may exercise any other remedy at law or in equity or take any other action as may be necessary or desirable to correct noncompliance with this Agreement. No party other than the Subsidizing Agency or its designee shall have the right to enforce the Developer's compliance with the requirements of this Agreement. The thirty (30) day cure period set forth in this paragraph shall be extended for such period of time as may be necessary to cure a default so long as the Developer is diligently prosecuting such a cure.

(b) If the Subsidizing Agency elects to terminate this Agreement as the result of an uncured breach, violation, or default hereof, then whether the Affordable Units continue to be included in the Subsidized Housing Inventory maintained by DHCD for purposes of the Act shall from the date of such termination be determined solely by DHCD rules and regulations then in effect.

(c) In the event the Subsidizing Agency or its designee brings an action to enforce this Agreement, unless the Developer prevails in such action the Developer shall pay all fees and expenses (including legal fees) of the Subsidizing Agency and/or its designee. In such event, the Subsidizing Agency and/or its designee shall be entitled to seek recovery of its respective fees and expenses incurred in enforcing this Agreement against the Developer and to assert a lien on the Development, junior to the lien securing the Loan, to secure payment by the Developer of such fees and expenses. The Subsidizing Agency and its designee may perfect a lien on the Development by recording/filing in the Registry one or more certificates setting forth the amount of the costs and expenses due and owing.

(d) The Developer hereby grants to the Subsidizing Agency or its designee the right to enter upon the Development for the purpose of enforcing the terms of this Agreement, or of taking all actions with respect to the Development which the Subsidizing Agency may determine to be necessary or appropriate to prevent, remedy or abate any violation of this Agreement.

MONITORING AGENT; FEES; SUCCESSOR SUBSIDIZING AGENCY

17. The Subsidizing Agency intends to monitor the Developer's compliance with the requirements of this Agreement. The Developer hereby agrees to pay the Subsidizing Agency fees as partial compensation for its services hereunder, as set forth on Appendix B hereto, initially in the amounts and on the dates therein provided, and hereby grants to the Subsidizing Agency a security interest in Development Revenues as security for the payment of such fees subject to the lien of the Mortgage and this Agreement shall constitute a security agreement with respect thereto.

18. The Subsidizing Agency shall have the right to engage a third party (the "Monitoring Agent") to monitor compliance with all or a portion of the ongoing requirements of this Agreement. The Subsidizing Agency shall notify the Developer and the Municipality in the event the Subsidizing Agency engages a Monitoring Agent, and in such event (i) as partial compensation for providing these services, the Developer hereby agrees to pay to the Monitoring Agent an annual monitoring fee in an amount reasonably determined by the Subsidizing Agency, payable within thirty (30) days of the end of each Fiscal Year of the Developer during the Term of this Agreement, but not in excess of the amounts as shown on Appendix B hereto and any fees payable under Section 17 hereof shall be net of such fees payable to a Monitoring Agent; and (ii) the Developer hereby agrees that the Monitoring Agent shall have the same rights, and be owed the same duties, as the Subsidizing Agency under this Agreement, and shall act on behalf of the Subsidizing Agency hereunder, to the extent that the Subsidizing Agency delegates its rights and duties by written agreement with the Monitoring Agent. The Monitoring Agent shall apply and adhere to the applicable standards, guidance and policies of DHCD relating to the administrative responsibilities of subsidizing agencies where available, and otherwise shall apply and adhere to the standards and practices of the Subsidizing Agency where applicable.

CONSTRUCTION AND FINAL COST CERTIFICATION

19. The Developer shall provide to the Subsidizing Agency evidence that the final plans and specifications for the Development comply with the requirements of the Comprehensive Permit and that the Development was built substantially in accordance with such plans and specifications. Upon Substantial Completion, the Developer shall provide the Subsidizing Agency with a certificate of the architect for the Development in the form of a “Certificate of Substantial Completion” (AIA Form G704) or such other form of completion certificate acceptable to the Subsidizing Agency.

As used herein, the term “Substantial Completion” shall mean the time when the construction of the Development is sufficiently complete so that all of the units may be occupied and amenities may be used for their intended purpose, except for designated punch list items and seasonal work which does not interfere with the residential use of the Development.

20. Within ninety (90) days after Substantial Completion, the Developer shall provide the Subsidizing Agency with its Cost Certification for the Development. The Subsidizing Agency may allow additional time for submission of the Cost Certification if significant issues are determined to exist which prevent the timely submission of the Cost Certification, and may in certain circumstances (such as a halt in construction for a significant period of time) require submission of an interim Cost Certification within ninety (90) days of written notice to the Developer.

For the purposes hereof the term “Cost Certification” shall mean the Developer’s documentation which will enable determination by the Subsidizing Agency of the aggregate amount of all Allowable Development Costs as a result of its review and approval of: (i) an itemized statement of Total Development Costs together with a statement of gross income from the Development received by the Developer to date, all in the format provided in the Subsidizing Agency’s Cost Examination Program, which Cost Certification must be examined (the “Cost Examination”) in accordance with the attestation standards of the American Institute of Certified Public Accountants (AICPA) by an independent certified public accountant (CPA) and (ii) an owner’s certificate, executed by the Developer under pains and penalties of perjury, which identifies the amount of the Construction Contract, the amount of any approved Change Orders, including a listing of such Change Orders, and any amounts due to subcontractors and/or suppliers. “Allowable Development Costs” shall mean any hard costs or soft costs paid or incurred with respect to Development as determined by and in accordance with the Guidelines.

21. In order to ensure that the Developer shall complete the Cost Certification as and when required by Section 20 hereof and, if applicable, pay any Excess Distributions to the Municipality, the Developer has provided the Subsidizing Agency with adequate financial surety (the “Surety”) provided through a letter of credit, bond or cash payment in the amounts and in accordance with the Comprehensive Permit Rules and in a form approved by the Subsidizing Agency. If the Subsidizing Agency shall determine that the Developer has failed in its obligation to provide Cost Certification as and when described above or to pay over to the Municipality any Excess Distributions, the Subsidizing Agency may draw on such Surety in order to pay the costs of completing Cost Certification and/or paying such Excess Distribution amounts due plus reasonable attorneys fees and collections costs.

TERM

22. (a) This Agreement shall bind, and the benefits shall inure to, respectively, the Developer and its successors and assigns, and the Subsidizing Agency and its successors and assigns, until the date which is thirty (30) years from the date hereof (the “Term”). Upon expiration of the Term, this Agreement and the rights and obligations of the Subsidizing Agency hereunder shall automatically terminate without the need of either party executing any additional document. The rights and obligations of the Developer and of the Subsidizing Agency under this Agreement shall continue for the Term, regardless of whether the loan from the NEF Lender is still outstanding. Prior to the expiration of the Term, the Developer shall enter into a use agreement with the Municipality, or as otherwise required by the Comprehensive Permit Rules, ensuring that the Development will comply with the continued affordability requirements applicable to the Development.

(b) Notwithstanding subsection (a) above, the provisions of Section 7 herein shall bind, and the benefits shall inure to, respectively, Developer and its successors and assigns, and the Subsidizing Agency and its successors and assigns, and the Municipality and its successors and assigns, until the date which is the later of (i) the expiration of the term of the Loan or (ii) fifteen (15) years from the date of Substantial Completion (the “Limited Dividend Term”).

INDEMNIFICATION/LIMITATION ON LIABILITY

23. The Developer, for itself and its successors and assigns, agrees to indemnify and hold harmless the Subsidizing Agency and any Monitoring Agent against all damages, costs and liabilities, including reasonable attorney’s fees, asserted against the Subsidizing Agency or the Monitoring Agent by reason of its relationship to the Development under this Agreement and not involving the Subsidizing Agency or the Monitoring Agent acting in bad faith or with gross negligence.

24. The Subsidizing Agency shall not be held liable for any action taken or omitted under this Agreement so long as it shall have acted in good faith and without gross negligence.

25. Notwithstanding anything in this Agreement to the contrary, no affiliate and no partner, manager, or member of the Developer or affiliate and no officer, director, shareholder, trustee, member, manager, agent, or employee of the Developer or affiliate or of any partner, manager, or member thereof shall have any personal liability for the payment of any sum of money that is, or may become, payable by the Developer under or pursuant to this Agreement or for the performance of any obligation by the Developer arising pursuant to this Agreement, and the Subsidizing Agency shall look only to the Developer’s interest in the Development for such payment or performance.

Nothing herein shall preclude the Subsidizing Agency from asserting such claims as it may have at law or in equity against the Developer for any loss or damage the Subsidizing Agency actually suffers as a result of any of the following:

- (i) a willful breach of the provisions limiting payments or distributions to partners, members, managers, or affiliates as set forth in this Agreement; or
- (ii) intentional fraud committed Developer; or
- (iii) a willful breach of a Developer warranty contained in this Agreement or a false representation of a material fact which was known to be false when made; or
- (iv) a false representation knowingly made that the individual signing this Agreement on behalf of the Developer has legal capacity and is authorized to sign this Agreement on behalf of the entity on whose behalf such individual has signed.

Nothing contained in the provisions of this Section 25 or elsewhere shall limit: (i) the right of the Subsidizing Agency to obtain injunctive relief or to pursue equitable remedies under this Agreement, excluding only any injunctive relief ordering payment of obligations by any person or entity for which personal liability does not otherwise exist; or (ii) the liability of any attorney, law firm, architect, accountant or other professional who or which renders or provides any written opinion or certificate to the Subsidizing Agency in connection with the Development even though such person or entity may be an agent or employee of the Developer or of any partner, manager, or member thereof.

CASUALTY

26. Subject to the rights of the Lender, the Developer agrees that if the Development, or any part thereof, shall be damaged or destroyed or shall be condemned or acquired for public use, the Developer shall have the right, but not the obligation, to repair and restore the Development to substantially the same condition as existed prior to the event causing such damage or destruction, or to relieve the condemnation, and thereafter to operate the Development in accordance with the terms of this Agreement. Notwithstanding the foregoing, in the event of a casualty in which some but not all of the buildings in the Development are destroyed, if such destroyed buildings are not restored by the Developer then the Developer shall be required to maintain the same percentage of Affordable Units of the total number of units in the Development.

DEVELOPER'S REPRESENTATIONS, COVENANTS AND WARRANTIES

27. The Developer hereby represents, covenants and warrants as follows:

(a) The Developer (i) is a _____ duly organized under, and is qualified to transact business under, the laws of the Commonwealth of Massachusetts, (ii) has the power and authority to own its properties and assets and to carry on its business as now being conducted, and (iii) has the full legal right, power and authority to execute and deliver this Agreement.

(b) The execution and performance of this Agreement by the Developer (i) will not violate or, as applicable, has not violated any provision of law, rule or regulation, or any order of any court or other agency or governmental body, and (ii) will not violate or, as applicable, has

not violated any provision of any indenture, agreement, mortgage, mortgage note, or other instrument to which the Developer is a party or by which it or the Development is bound, and (iii) will not result in the creation or imposition of any prohibited encumbrance of any nature.

(c) The Developer will, at the time of execution and delivery of this Agreement, have good and marketable title to the premises constituting the Development free and clear of any lien or encumbrance (subject to encumbrances created pursuant to this Agreement, and any other documents executed in connection with the loan from the NEF Lender, or other encumbrances permitted by the Subsidizing Agency).

(d) There is no action, suit or proceeding at law or in equity or by or before any governmental instrumentality or other agency now pending, or, to the knowledge of the Developer, threatened against or affecting it, or any of its properties or rights, which, if adversely determined, would materially impair its right to carry on business substantially as now conducted (and as now contemplated by this Agreement) or would materially adversely affect its financial condition.

MISCELLANEOUS CONTRACT PROVISIONS

28. This Agreement may not be modified or amended except with the written consent of the Subsidizing Agency or its successors and assigns and Developer or its successors and assigns.

29. The Developer warrants that it has not, and will not, execute any other agreement with provisions contradictory to, or in opposition to, the provisions hereof, and that, in any event, the requirements of this Agreement are paramount and controlling as to the rights and obligations set forth and supersede any other requirements in conflict therewith.

30. The invalidity of any clause, part or provision of this Agreement shall not affect the validity of the remaining portions thereof.

31. Any titles or captions contained in this Agreement are for reference only and shall not be deemed a part of this Agreement or play any role in the construction or interpretation hereof.

32. Words of the masculine gender shall be deemed and construed to include correlative words of the feminine and neuter genders. Unless the context shall otherwise indicate, words importing the singular number shall include the plural number and vice versa, and words importing persons shall include corporations and associations, including public bodies, as well as natural persons.

33. The terms and conditions of this Agreement have been freely accepted by the parties. The provisions and restrictions contained herein exist to further the mutual purposes and goals of DHCD, the Subsidizing Agency, the Municipality and the Developer set forth herein to create and preserve access to land and to decent and affordable rental housing opportunities for eligible families who are often denied such opportunities for lack of financial resources.

NOTICES

34. Any notice or other communication in connection with this Agreement shall be in writing and (i) deposited in the United States mail, postage prepaid, by registered or certified mail, or (ii) hand delivered by any commercially recognized courier service or overnight delivery service, such as Federal Express, or (iii) sent by facsimile transmission if a fax number is designated below, addressed as follows:

If to the Developer:

[Redacted address for Developer]

with copies by regular mail or such hand delivery
[or facsimile transmission] to:

[Redacted address for Developer]

If to the Subsidizing Agency:

Massachusetts Housing Finance Agency
One Beacon Street
Boston, MA 02108
Attention: Director of Comprehensive Permit Programs
Fax: 617-854-1029

Any such addressee may change its address for such notices to any other address in the United States as such addressee shall have specified by written notice given as set forth above.

A notice shall be deemed to have been given, delivered and received upon the earliest of: (i) if sent by certified or registered mail, on the date of actual receipt (or tender of delivery and refusal thereof) as evidenced by the return receipt; or (ii) if hand delivered by such courier or overnight delivery service, when so delivered or tendered for delivery during customary business hours on a business day at the specified address; or (iii) if facsimile transmission is a permitted means of giving notice, upon receipt as evidenced by confirmation. Notice shall not be deemed to be defective with respect to the recipient thereof for failure of receipt by any other party.

RECORDING

35. Upon execution, the Developer shall immediately cause this Agreement and any amendments hereto to be recorded or filed with the Registry, and the Developer shall pay all fees and charges incurred in connection therewith. Upon recording or filing, as applicable, the Developer shall immediately transmit to the Subsidizing Agency and the Monitoring Agent, if any, evidence of such recording or filing including the date and instrument, book and page or registration number of the Agreement.

GOVERNING LAW

36. This Agreement shall be governed by the laws of the Commonwealth of Massachusetts. Any amendments to this Agreement must be in writing and executed by all of the parties hereto. The invalidity of any clause, part, or provision of this Agreement shall not affect the validity of the remaining portions hereof.

CONFLICT; PRIORITY OF AGREEMENT

37. In the event of any conflict or inconsistency (including without limitation more restrictive terms) between the terms of the Comprehensive Permit, any other document relating to the Development and the terms of this Agreement, the terms of this Agreement shall control.

This Agreement is senior to the Mortgage and to any other mortgage encumbering the Development. Furthermore, the Developer understands and agrees that, in the event of foreclosure of the Mortgage and the exercise by the Lender of the power of sale therein, the Development will be sold subject to the restrictions imposed hereby. The Developer acknowledges that any discharge or termination of this Agreement shall not affect the validity or enforceability of the Comprehensive Permit or the obligations of the Developer to comply with the provisions thereof.

[Remainder of page intentionally left blank.]

IN WITNESS WHEREOF, the parties have caused these presents to be signed and sealed by their respective, duly authorized representatives, as of the day and year first written above.

DEVELOPER:

By: _____
Name:
Title:

**MASSACHUSETTS HOUSING
FINANCE AGENCY, as Subsidizing
Agency as aforesaid**

By: _____
Gregory P. Watson, AICP, Manager,
Comprehensive Permit Programs

Attachments:

Acknowledgment of Zoning Board of Appeals

Exhibit A – Legal Description

Appendix A – Rent Schedule

Appendix B – Subsidizing Agency Fees

COMMONWEALTH OF MASSACHUSETTS

County of _____, ss.

On this __ day of _____, 2017, before me, the undersigned notary public, _____ personally appeared, proved to me through satisfactory evidence of identification, which was: [] at least one current document issued by a federal or state government agency bearing the photographic image of the signatory’s face and signature, [] the oath or affirmation of a credible witness unaffected by the document or transaction who is personally known to me and who personally knows the signatory, or [] identification of the signatory based on my personal knowledge of the identity of the signatory, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that [he][she] signed it voluntarily for its stated purpose, as [[general] partner for _____, a partnership // _____ for _____, a corporation // [manager/managing member] for _____, a limited liability company // _____ for _____, a _____]. *[enter appropriate information depending on entity structure]*

Notary Public
My Commission Expires:

COMMONWEALTH OF MASSACHUSETTS

County of Suffolk, ss.

On this __ day of _____, 2017, before me, the undersigned notary public, _____ personally appeared, proved to me through satisfactory evidence of identification, which was: [] at least one current document issued by a federal or state government agency bearing the photographic image of the signatory’s face and signature, [] the oath or affirmation of a credible witness unaffected by the document or transaction who is personally known to me and who personally knows the signatory, or [] identification of the signatory based on my personal knowledge of the identity of the signatory, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that [he][she] signed it voluntarily for its stated purpose, as _____ of the Massachusetts Housing Finance Agency, a body politic and corporate organized and operated under the provisions of Chapter 708 of the Acts of 1966 of the Commonwealth of Massachusetts, as amended.

Notary Public
My Commission Expires:

EXHIBIT A
LEGAL DESCRIPTION

APPENDIX A
RENT SCHEDULE (INITIAL)
 [Sample/Model]

Low-Income / Rental Assisted At or Below ____ % of AMI Rental Assisted <i>[Delete Columns if N/A]</i>	Low/Moderate-Income ¹ Rent Set at 30% of 80% AMI Qualify with Incomes at or Below 80% of AMI	Market Rate Unrestricted
--	---	---------------------------------

Number of Bedrooms	<u>1 BR</u>	<u>2 BR</u>	<u>3 BR</u>	<u>1 BR</u>	<u>2 BR</u>	<u>3 BR</u>	<u>1 BR</u>	<u>2 BR</u>	<u>3 BR</u>
Number of Units	#	#	#	#	#	#	#	#	#
Net SF/Unit	---	-,---	-,---	---	-,---	-,---	---	-,---	-,---
Elev. (E) / Non-Elev. (N)	E or N	E or N	E or N	E or N	E or N	E or N	E or N	E or N	E or N
Applicable Base/Gross Rent:	\$-,---	\$-,---	\$-,---	\$-,---	\$-,---	\$-,---	\$-,---	\$-,---	\$-,---
Per: <u>[Identify²]</u> MSA or HMFA									
Utility Allowance**	\$---	\$---	\$---	\$---	\$---	\$---	N/A	N/A	N/A
Tenant Rent*	30% of adjusted gross income			\$-,---	\$-,---	\$-,---	\$-,---	\$-,---	\$-,---

* **Tenant Rents** are net of utility allowances. The total of tenant rent and utility allowance may not exceed the Applicable Base/Gross Rent.

****Utility Allowances** are based on the attached schedule or matrix prepared by the [Town Name] Housing Authority and dated _____, as the same may be amended from time to time. The dollar amount listed assumes the following utilities are to be paid by the tenant: *[list all that apply or "All utilities included in rent."]*
 [Oil, Gas or Electric] Heat for the [e.g. "Low-Rise – Garden"] Housing Type;
 [Oil, Gas or Electric] Water Heating; [Gas or Electric] Cooking Fuel; and Electricity

The following utilities are to be paid by the owner/landlord and included in the rent: *[list all that apply or "none"]*
 [Oil, Gas or Electric] Heat for the [e.g. "Low-Rise – Garden"] Housing Type;
 [Oil, Gas or Electric] Water Heating; [Gas or Electric] Cooking Fuel; and Electricity

[If alternative method for calculation of utility allowances is employed, describe here in detail.]

¹ Maximum NEF Ch. 40B affordable unit Rent Limits are calculated based on 30% of the 80% of the Area Median Income (AMI) Limit as derived from income limits published annually by HUD. Changes to the published income limits will result in changes to the rent limits. - Unless subsidized under another housing subsidy program, the 80% of AMI Limit also is the standard used to qualify for occupancy at NEF Ch. 40B affordable housing developments.

² Identify subject income limit area, i.e. Metropolitan Statistical Area (MSA) or HUD Metro FMR Areas (HMFA) – See "Area" definition.

APPENDIX B

FEE PAYABLE TO SUBSIDIZING AGENCY

- **Masshousing NEF Rental Regulatory Agreement Affordability and Limited Dividend Monitoring Fees**
 - Initial Fee Due upon Execution of the Regulatory Agreement by MassHousing
 - \$7,500
 - Annual Fee Payable at the time of Initial Occupancy and Annually thereafter
 - \$200 per affordable unit per year

ACKNOWLEDGEMENT OF ZONING BOARD OF APPEALS

The undersigned duly authorized Chairman and members of the _____ Zoning Board of Appeals hereby acknowledges that, after due consideration of the Developer’s request, pursuant to the requirements of 760 CMR 56.05(11), the Board hereby agrees that the foregoing Regulatory Agreement satisfies the requirements of the Comprehensive Permit as defined therein. Without limiting the generality of the foregoing, the units in the Development required to be affordable under the Comprehensive Permit shall be affordable if such units are rented in accordance with Section 3, 4 and 5 of the foregoing Regulatory Agreement; any local preference set forth in the Comprehensive Permit shall be implemented only at initial rent-up and only to the extent in compliance with applicable state and federal fair housing rules; and compliance with the limited dividend requirement shall be determined solely by the Subsidizing Agency under the Regulatory Agreement using the standards of the Subsidizing Agency applicable to comprehensive permit projects in accordance with the Comprehensive Permit Rules. In addition, the conflict provision of the Regulatory Agreement shall control over any conflict provision of the Comprehensive Permit.

Name:
Chairman, _____ Zoning Board of Appeals

Name:

Name:

Name:

Name:

COMMONWEALTH OF MASSACHUSETTS

County of _____, ss.

On this __ day of _____, 2017, before me, the undersigned notary public, _____ personally appeared, proved to me through satisfactory evidence of identification, which was: [] at least one current document issued by a federal or state government agency bearing the photographic image of the signatory's face and signature, [] the oath or affirmation of a credible witness unaffected by the document or transaction who is personally known to me and who personally knows the signatory, or [] identification of the signatory based on my personal knowledge of the identity of the signatory, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that [he][she] signed it voluntarily for its stated purpose, as _____, for the Town of _____.

Notary Public
My Commission Expires:

Transportation Impact Assessment

Proposed Multifamily Residential Development
63 County Street (Route 109)
Dover, Massachusetts

Prepared for:

Red Robin Pastures, LLC
Needham, Massachusetts

December 2020

Prepared by:

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

35 New England Business Center Drive
Suite 140
Andover, MA 01810

Dear Reviewer:

This letter shall certify that this *Transportation Impact Assessment* has been prepared under my direct supervision and responsible charge. I am a Registered Professional Engineer (P.E.) in the Commonwealth of Massachusetts (Massachusetts P.E. No. 38871, Civil) and hold Certification as a Professional Traffic Operations Engineer (PTOE) from the Transportation Professional Certification Board, Inc. (TPCB), an independent affiliate of the Institute of Transportation Engineers (ITE) (PTOE Certificate No. 993). I am also a Fellow of the Institute of Transportation Engineers (FITE).

Sincerely,

VANASSE & ASSOCIATES, INC.



Jeffrey S. Dirk, P.E., PTOE, FITE
Managing Partner

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1	Study Area Intersection Description
2	2020 Existing Traffic Volumes
3	Vehicle Travel Speed Measurements
4	Motor Vehicle Crash Data Summary
5	Trip-Generation Summary
6	Traffic Volume Comparison
7	Peak-Hour Traffic-Volume Increases
8	Level-of-Service Criteria for Unsignalized Intersections
9	Unsignalized Intersection Level-of-Service and Vehicle Queue Summary
10	Sight Distance Measurements

EXECUTIVE SUMMARY

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 a 39-unit multifamily residential community to be located at 63 County Street (Route 109) in Dover, Massachusetts (hereafter referred to as the Project). This assessment was prepared in consultation with the Massachusetts Department of Transportation (MassDOT) and the Towns of Dover, Medfield, Walpole, Westwood, and 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.

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 212 vehicle trips on an average weekday (two-way, 24-hour volume), with 14 vehicle trips expected during the weekday morning peak-hour and 18 vehicle trips expected during the weekday evening peak-hour;
2. The Project will not have a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), with Project-related impacts generally defined as an increase in average motorist delay of less than 1.0 seconds with no material increase in vehicle queuing predicted;
3. All movements at the Project site driveway intersection with Route 109 were shown to operate at a level-of-service (LOS) C or better during both the weekday morning and evening peak hours, where an LOS of "D" or better is defined as "acceptable" traffic operations, with negligible vehicle queuing predicted;
4. Independent of the Project, all movements from Walpole Street at the Route 109/Walpole Street intersection were shown to operate at or over capacity (defined as LOS "E" or "F", respectively) during the peak hours, with Project-related impacts at this intersection predicted to be minor with no resulting increase in vehicle queuing;

¹*Trip Generation*, 10th Edition; Institute of Transportation Engineers; Washington, DC; 2017.

5. No apparent safety deficiencies were noted with respect to the motor vehicle crash history at the study area intersections, with all of the intersections found to have motor vehicle crash rates below the MassDOT average crash rates for similar intersections; and
6. Lines of sight at the Project site driveway intersection with Route 109 were found to exceed the recommended minimum distances for safe and efficient operation 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 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 at off-site locations evaluated in conjunction with this study. 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.

Project Access

Access to the Project site will be provided by way of a new driveway that will intersect the north side of Route 109 approximately 450 feet east of Tisdale Drive. The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation, many of which are reflected on the Site Plans:

- The Project site driveway and internal circulating roadways should be a minimum of 22-feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.
- Where perpendicular parking is proposed, the drive aisle behind the parking should be a minimum of 23-feet in width in order to accommodate 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)*.²
- Americans with Disabilities Act (ADA) compliant wheelchair ramps should be provided at all pedestrian crossings internal to the Project site where pedestrian crossings are present.
- 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.

²*Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.

- Snow windrows within sight triangle areas of the Project site driveway should be promptly removed where such accumulations would impede sight lines.

Off-Site

Route 109 at Walpole Street

Independent of the Project, all movements from Walpole Street during both the weekday morning and evening peak hours at the Route 109/Walpole Street intersection are currently operating at or over capacity (i.e., LOS “E” or “F”, respectively) under 2020 Existing conditions. Absent improvement, motorist delays are expected to further increase in the future, again, independent of the Project.

An initial review of the four-hour traffic signal warrant (Warrant 2) presented in the MUTCD indicates that the installation of a traffic control signal in order to improve operating conditions at the intersection may be warranted under 2028 No-Build conditions. To the extent so desired by the Town, the Project proponent will undertake a formal Traffic Signal Warrants Analysis (TSWA) for the intersection in accordance with the methodology outlined in the MUTCD, including performing a continuous 12-hour (7:00 AM to 7:00 PM) manual turning movement count, and will summarize the results of the analysis in a technical memorandum that will be provided to the Town. The technical memorandum will also include a review of alternative traffic control measures for the intersection.

Transportation Demand Management

Regularly scheduled public transportation services are not currently provided in the vicinity of the Project site or within the study area. The MetroWest Regional Transit Authority (MWRTA) provides on-demand, curb-to-curb transportation services for eligible disabled residents of the Town of Dover in compliance with the Americans with Disabilities Act (ADA). In addition, the Town of Dover Council on Aging (COA) provides rides to local destinations and to Boston through a private partner (JFK Transportation Service). The service operates on weekdays between the hours of 7:00 AM and 5:00 PM.

In an effort to encourage the use of alternative modes of transportation to single-occupant vehicles, the following Transportation Demand Management (TDM) measures will be implemented as a part of the Project:

- A transportation coordinator will be designated for the Project to coordinate the elements of the TDM program;
- Information regarding public transportation services, maps, schedules and fare information will be posted in a central location and/or otherwise made available to residents;
- A “welcome packet” will be provided to residents detailing available public transportation services, bicycle and walking alternatives, and commuter options available;
- Pedestrian accommodations will be incorporated into the Project site;
- A mail drop will be provided within the building; and
- Bicycle parking will be provided within the Project site.

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.

INTRODUCTION

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 a multifamily residential community to be located at 63 County Street (Route 109) in Dover, 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 Route 109, and at the following specific intersections: Route 109 at Walpole Street and Route 109 at Draper Road.

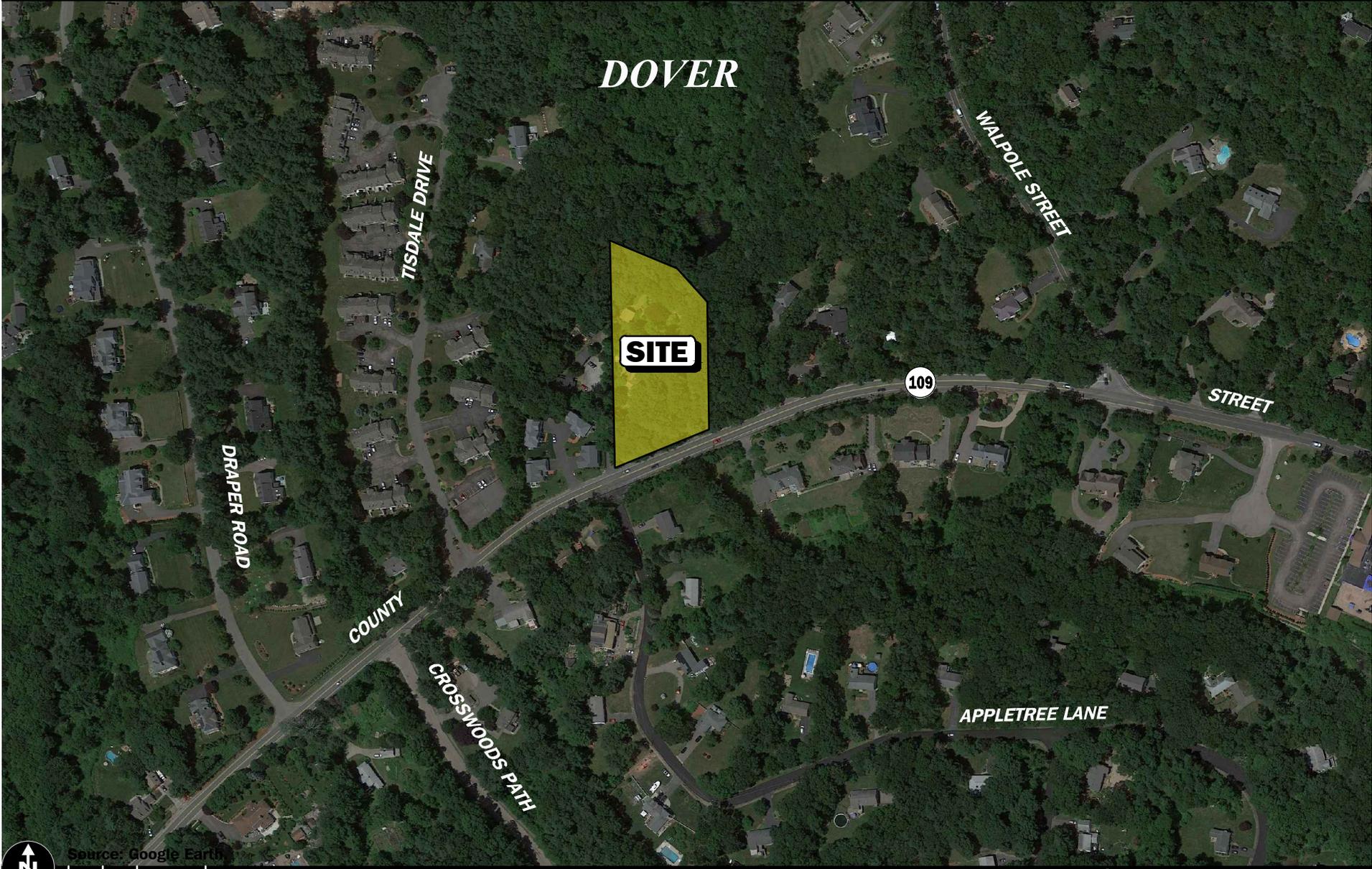
PROJECT DESCRIPTION

The Project will entail the construction of a 39-unit multifamily residential community to be located at 63 County Street (Route 109) in Dover, Massachusetts. The Project site encompasses approximately 2± acres of land that is bounded by residential properties to the north, east, and west, and by Route 109 to the south. Figure 1 depicts the Project site location in relation to the existing roadway network. At present, the Project site is occupied by two (2) single-family homes and associated appurtenances that will be removed to accommodate the Project.

Access to the Project site will be provided by way of a new driveway that will intersect the north side of Route 109 approximately 450 feet east of Tisdale Drive. Off-street parking will be provided for 70 vehicles, which is within the requirements of Chapter 239, *Multifamily Zoning*; Section 4, *Additional Standards*, of the Zoning Bylaw of the Town of Dover.³

³ A minimum of one and one-half (1.5) parking spaces per dwelling unit is required.

DOVER



Source: Google Earth
0 150 300 Scale in Feet

Figure 1
Site Location Map



STUDY METHODOLOGY

This study was prepared in consultation with the Massachusetts Department of Transportation (MassDOT) and the Towns of Dover, Medfield, Walpole and Westwood; 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 2028 horizon was selected for analyses consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. The traffic analysis conducted in stage two identifies existing or projected future roadway capacity, traffic safety, and site access issues.

The third stage of the study presents and evaluates measures to address traffic and safety issues, if any, identified in stage two of the study.

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions within the study area was conducted in October and November 2020. The field investigation consisted of an inventory of existing roadway geometrics; pedestrian and bicycle facilities; public transportation services; traffic volumes; and operating characteristics; as well as posted speed limits and land use information within the study area. The study area that was assessed for the Project consisted of Route 109 and the following specific intersections: Route 109 at Walpole Street and Route 109 at Draper Road.

The following describes the study area roadway and intersections.

Roadway

Route 109

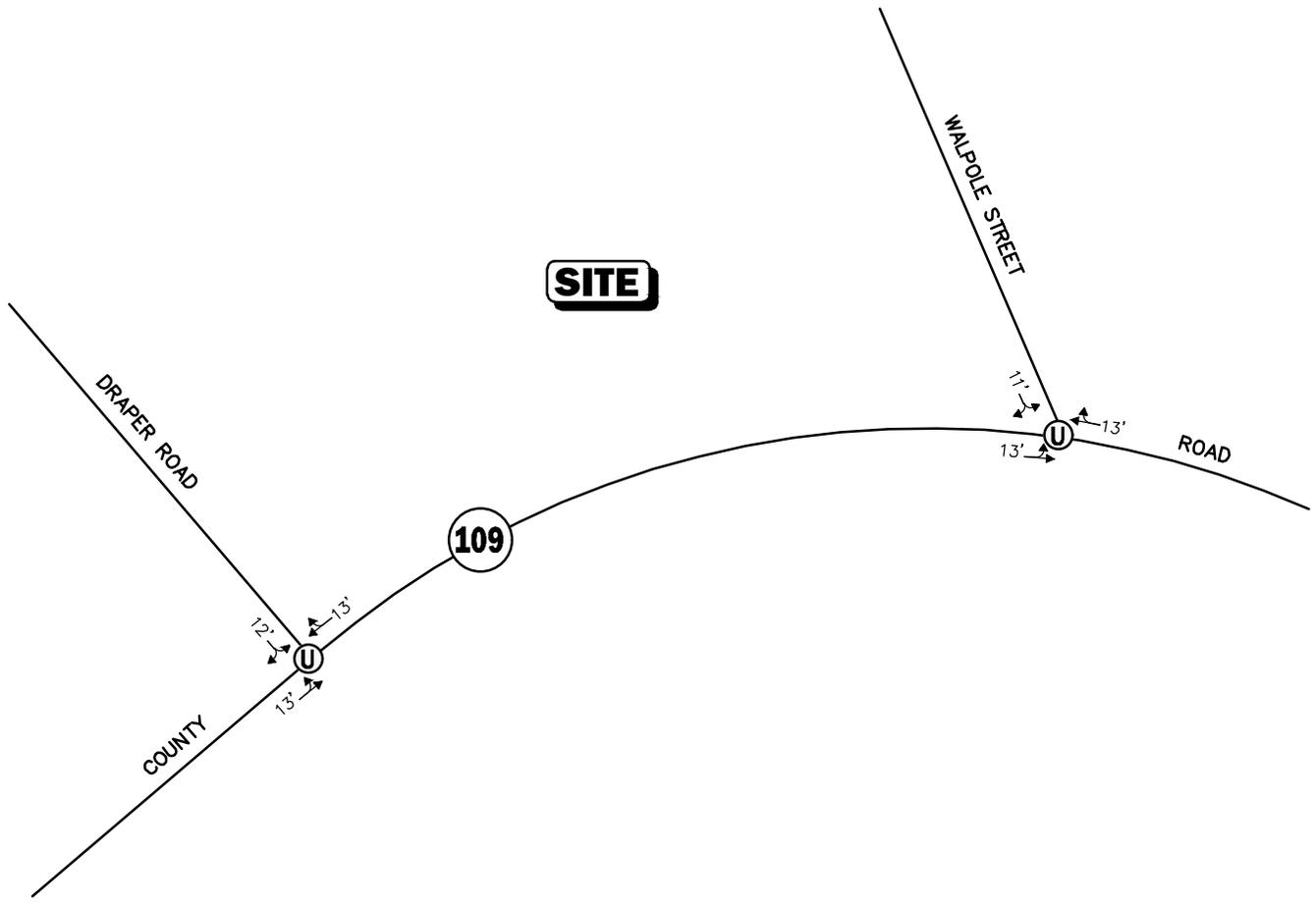
- Two-lane urban principal arterial roadway under Town jurisdiction
- Traverses study area in a general east-west direction
- Provides two 13-foot wide travel lanes that are separated by a double-yellow centerline with 2 to 4-foot wide marked shoulders provided
- The posted speed limit is 40 miles per hour (mph) within the study area
- Sidewalks and illumination are not provided within the study area
- Land use within the study area consists of the Project site, residential properties 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 November 2020.

Legend:

- ⓪ Unsignalized Intersection
- xx' ↔ Lane Use and Travel Lane Width



Not To Scale



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

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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. 109/ Walpole St.	S	1 general purpose travel lane on all approaches	Yes; 1- to 4-feet on Rte. 109; 1- to 2-feet on Walpole St.	No	Yes, shared travelled-way on Rte. 109 ^b
Rte. 109/ Draper Rd.	S	1 general purpose travel lane on all approaches	Yes; 2-feet on Rte. 109	No	Yes, shared travelled-way on Rte. 109

^aS = STOP-sign control.

^bCombined shoulder and travel lane width equal to or exceed 14 feet.

TRAFFIC VOLUMES

In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts, manual turning movement counts (TMCs) and vehicle classification counts were completed in October 2020. The ATR counts were conducted on October 21st through October 22nd, 2020 (Wednesday through Thursday, inclusive) on Route 109 in the vicinity of the Project site 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 manual TMCs performed at the study intersections on October 21, 2020 (Wednesday). 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.

Traffic-Volume Adjustments

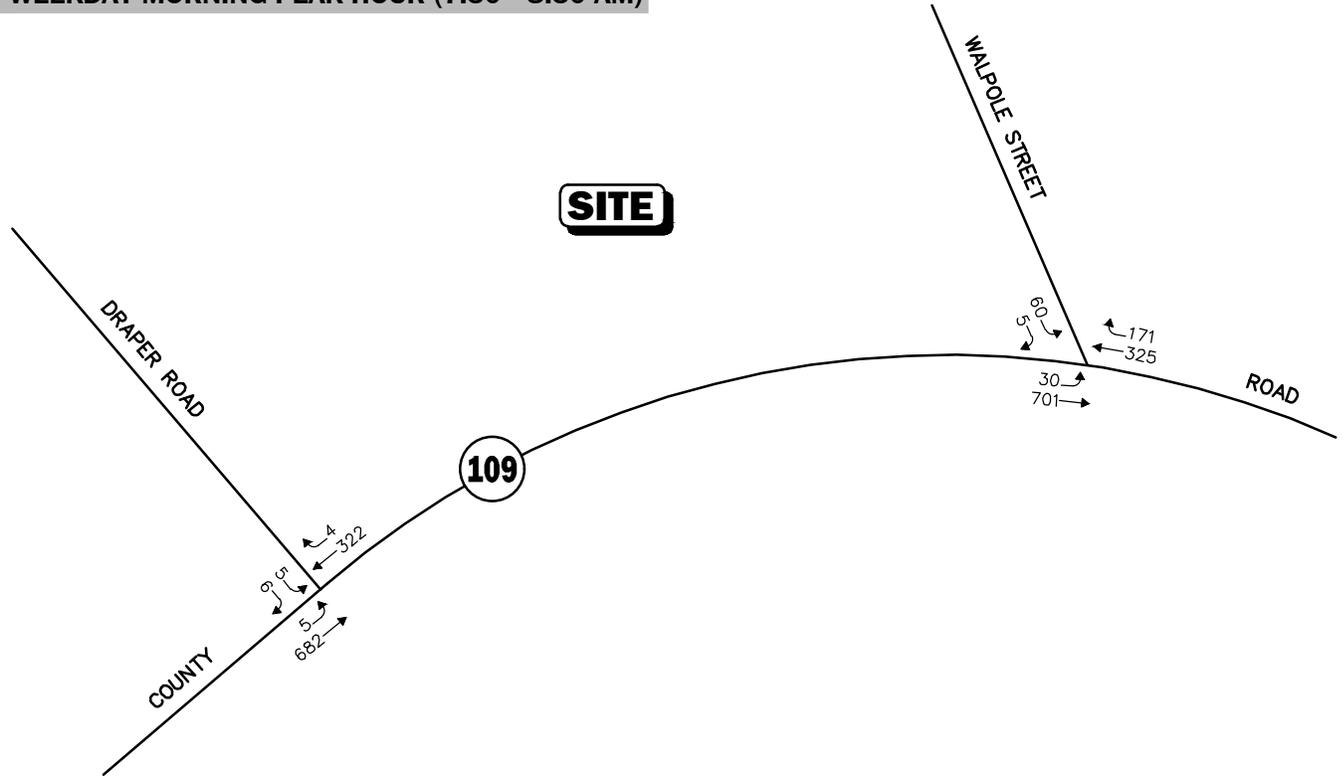
In order to evaluate the potential for seasonal fluctuation of traffic volumes within the study area, traffic volume data from MassDOT Continuous Count Station No. 6242 located on Interstate 95 in Walpole were reviewed.⁴ Based on a review of this data, it was determined that traffic volumes for the month of October are approximately 0.7 percent below average-month conditions. As such, the October traffic volumes were adjusted upward by 0.7 percent in order to be representative of average-month conditions.

In order to account for the impact on traffic volumes and trip patterns resulting from the “safer-at-home” order and the phased “Reopening Massachusetts” plan that was issued by the Governor on May 18, 2020, in response to the COVID-19 pandemic, the October 2020 traffic volumes that were collected as a part of this assessment were adjusted upward by an additional 16 percent based on a comparison of October 2019 and October 2020 traffic volume data obtained from MassDOT Continuous Count Station No. 6242.

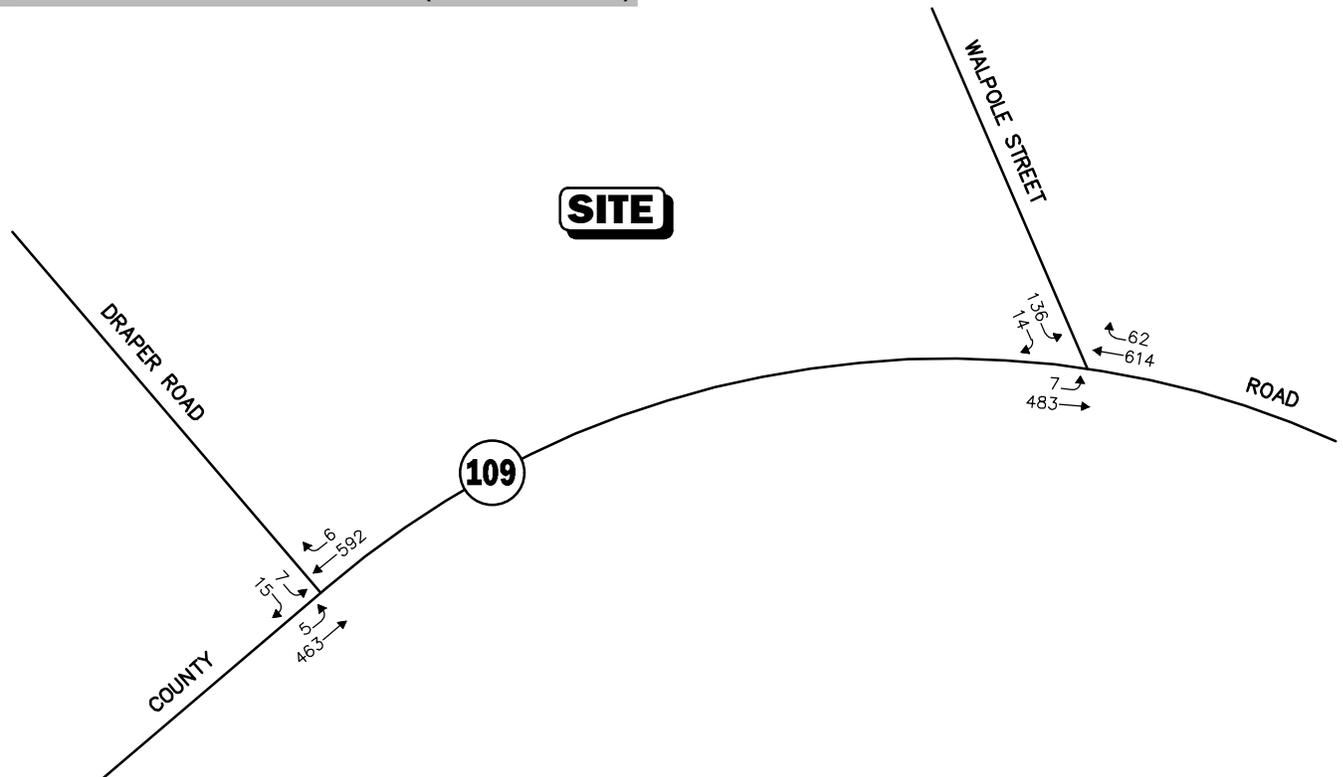
The 2020 Existing traffic volumes are summarized in Table 2, with the weekday morning and evening peak-hour traffic volumes graphically depicted on Figure 3. Note that the peak-hour traffic volumes presented in Table 2 were obtained from Figure 3.

⁴MassDOT Traffic Volumes for the Commonwealth of Massachusetts; 2020.

WEEKDAY MORNING PEAK HOUR (7:30 - 8:30 AM)



WEEKDAY EVENING PEAK HOUR (4:15 - 5:15 PM)



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

Figure 3
2020 Existing
Peak Hour Traffic Volumes



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Table 2
2020 EXISTING TRAFFIC VOLUMES

Location/Peak Hour	AWT ^a	VPH ^b	K Factor ^c	Directional Distribution ^d
<i>Route 109, west of Walpole Street</i>	12,150	--	--	--
Weekday Morning (7:30 – 8:30 AM)	--	1,061	8.7	68.9% EB
Weekday Evening (4:30 – 5:30 PM)	--	1,118	9.2	56.2% WB

^aAverage weekday traffic in vehicles per day.

^bVehicles per hour.

^cPercent of daily traffic occurring during the peak hour.

^dPercent traveling in peak direction.

NB = northbound, WB = westbound

As can be seen in Table 2, Route 109 in the vicinity of the Project site was found to accommodate approximately 12,150 vehicles on an average weekday (two-way, 24-hour volume), with approximately 1,061 vehicles per hour (vph) during the weekday morning peak-hour and 1,118 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 November 2020. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study roadways and at the study area intersections. As detailed on Figure 2, sidewalks and formal bicycle facilities are not provided within the study area; however Route 109 was found to provide sufficient width to accommodate bicycle travel in a shared traveled-way condition (i.e., bicyclists and motor vehicles sharing the traveled-way).⁵

PUBLIC TRANSPORTATION

Regularly scheduled public transportation services are not currently provided in the vicinity of the Project site or within the study area. The MetroWest Regional Transit Authority (MWRTA) provides on-demand, curb-to-curb transportation services for eligible disabled residents of the Town of Dover in compliance with the Americans with Disabilities Act (ADA). In addition, the Town of Dover Council on Aging (COA) provides rides to local destinations and to Boston through a private partner (JFK Transportation Service). The service operates on weekdays between the hours of 7:00 AM and 5:00 PM.

SPOT SPEED MEASUREMENTS

Vehicle travel speed measurements were performed on Route 109 in the vicinity of the Project site in conjunction with the ATR counts. Table 3 summarizes the vehicle travel speed measurements.

⁵A minimum combined travel lane and paved shoulder width of 14-feet is required to support bicycle travel in a shared traveled-way condition.

Table 3
VEHICLE TRAVEL SPEED MEASUREMENTS

	Route 109	
	Eastbound	Westbound
Mean Travel Speed (mph)	34	38
85 th Percentile Speed (mph)	38	43
Posted Speed Limit (mph)	40	40

mph = miles per hour.

As can be seen in Table 3, the mean vehicle travel speed along Route 109 in the vicinity of the Project site was found to be 34 mph in the eastbound direction and 38 mph westbound. 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 38 mph in the eastbound direction and 43 mph westbound, which is generally consistent with the posted speed limit in the vicinity of the Project site (40 mph). 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 (2013 through 2017, inclusive) in order 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 presented in Table 4.

As can be seen in Table 4, the study area intersections experienced an average of approximately one (1) reported motor vehicle crash per year over the five-year review period and were found to have a motor vehicle crash rate below the MassDOT statewide and District average crash rates for an unsignalized intersection for the MassDOT Highway Division District in which the intersections are located (District 6). The majority of the reported crashes occurred on a weekday, during daylight, under clear conditions, and resulted in property damage only.

A review of the MassDOT statewide High Crash Location List indicated that there are no locations within the study area or along Route 109 within the Town of Dover that are included on MassDOT's Highway Safety Improvement Program (HSIP) listing as a high crash location. In addition, no fatal motor vehicle crashes were reported to have occurred at the study area intersections over the five-year review period.

Based on a review of the MassDOT motor vehicle crash data, no discernable safety deficiencies were apparent in the vicinity of the Project site.

The detailed MassDOT Crash Rate Worksheets are provided in the Appendix.

Table 4
MOTOR VEHICLE CRASH DATA SUMMARY^a

	Rte. 109/ Walpole St.	Rte. 109/ Draper Rd.
Traffic Control Type: ^b	U	U
<i>Year:</i>		
2013	0	0
2014	1	1
2015	2	0
2016	1	2
<u>2017</u>	<u>0</u>	<u>0</u>
Total	4	3
Average	0.80	0.60
Rate ^c	0.15	0.14
MassDOT Crash Rate: ^d	0.57/0.52	0.57/0.52
Significant? ^e	No	No
<i>Type:</i>		
Angle	0	0
Rear-End	0	3
Head-On	0	0
Sideswipe	1	0
Fixed Object	2	0
Pedestrian/Bicycle	0	0
<u>Unknown/Other</u>	<u>1</u>	<u>0</u>
Total	4	3
<i>Conditions:</i>		
Clear	2	2
Cloudy	1	1
Rain	1	0
<u>Snow/Ice</u>	<u>0</u>	<u>0</u>
Total	4	3
<i>Lighting:</i>		
Daylight	2	2
Dawn/Dusk	1	0
Dark (Road Lit)	1	1
<u>Dark (Road Unlit)</u>	<u>0</u>	<u>0</u>
Total	4	3
<i>Day of Week:</i>		
Monday through Friday	2	3
Saturday	2	0
<u>Sunday</u>	<u>0</u>	<u>0</u>
Total	4	3
<i>Severity:</i>		
Property Damage Only	3	3
Personal Injury	1	0
<u>Fatality</u>	<u>0</u>	<u>0</u>
Total	4	3

^aSource: MassDOT Safety Management/Traffic Operations Unit records, 2013 through 2017.

^bTraffic Control Type: U = unsignalized.

^cCrash rate per million vehicles entering the intersection.

^dStatewide/District crash rate.

^eThe 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 6).

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2028, which reflects an eight-year planning horizon and is consistent with MassDOT's *Transportation Impact Assessment (TIA) Guidelines*. Independent of the Project, traffic volumes on the roadway network in the year 2028 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2028 No-Build traffic volumes reflect 2028 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 Towns of Dover, Medfield, Walpole, and Westwood were consulted in order to determine if there were any projects planned within the study area that would have an impact on future traffic volumes at the study intersections. Based on those consultations, no 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

General Background Traffic Growth

Traffic-volume data compiled by MassDOT from permanent count stations situated in the local area were reviewed in order to determine general traffic growth trends. This data indicates that traffic volumes have fluctuated over the past several years, with the average growth rate found to be approximately 0.8 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 Towns of Dover, Medfield, Walpole, Westwood and MassDOT were contacted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2028 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 2028 No-Build condition peak-hour traffic-volumes were developed by applying the 1.0 percent per year compounded annual background traffic growth rate to the 2020 Existing peak-hour traffic volumes. The resulting 2028 No-Build weekday morning and evening peak-hour traffic volumes are shown on Figure 4.

PROJECT-GENERATED TRAFFIC

Design year (2028 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 39-unit, multifamily residential community. In order to develop the traffic characteristics of the Project, trip-generation statistics published by the ITE⁶ for a similar land use as that proposed were used. ITE Land Use Code 221, *Multifamily Housing (Mid-Rise)*, was used to develop the traffic characteristics of the Project, the results of which are summarized in Table 5.

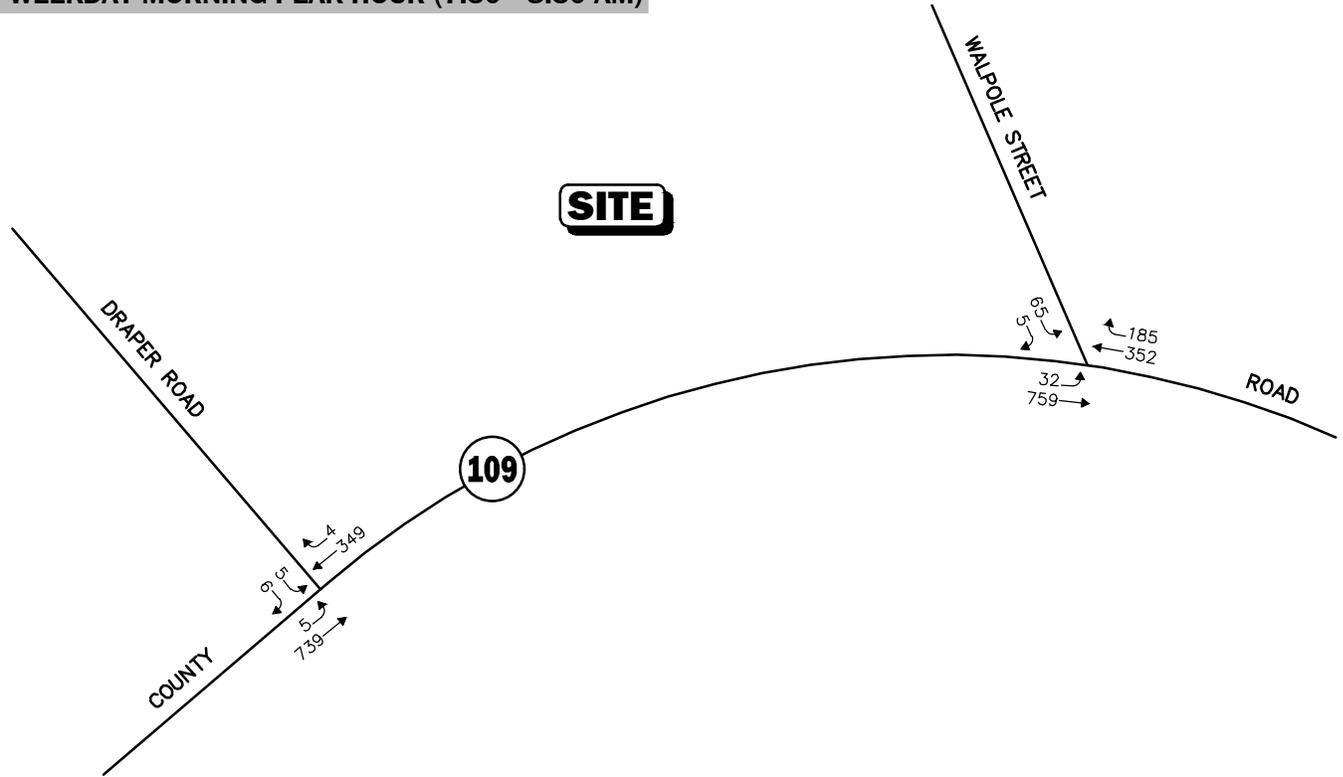
Table 5
TRIP GENERATION SUMMARY

Time Period	Vehicle Trips ^a		
	Entering	Exiting	Total
<i>Average Weekday:</i>	106	106	212
<i>Weekday Morning Peak-Hour:</i>	4	10	14
<i>Weekday Evening Peak-Hour:</i>	11	7	18

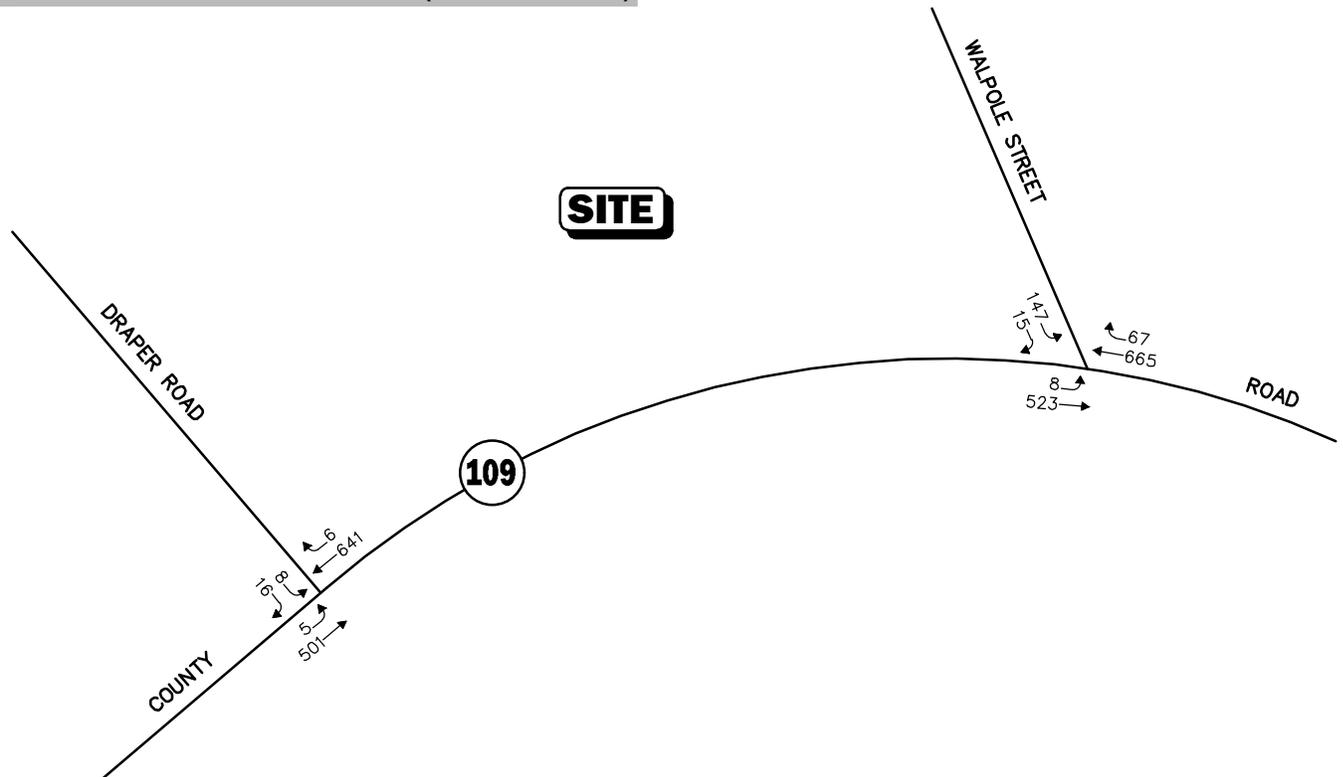
^aBased on ITE LUC 221, *Multifamily Housing (Mid-Rise)*.

⁶Ibid 1.

WEEKDAY MORNING PEAK HOUR (7:30 - 8:30 AM)



WEEKDAY EVENING PEAK HOUR (4:15 - 5:15 PM)



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

Figure 4

2028 No-Build
Peak Hour Traffic Volumes



Project-Generated Traffic Volume Summary

As can be seen in Table 5, the Project is expected to generate approximately 212 vehicle trips on an average weekday (two-way, 24-hour volume, or 106 vehicles entering and 106 exiting), with 14 vehicle trips (4 vehicles entering and 10 exiting) expected during the weekday morning peak-hour and 18 vehicle trips (11 vehicles entering and 7 exiting) expected during the weekday evening peak-hour.

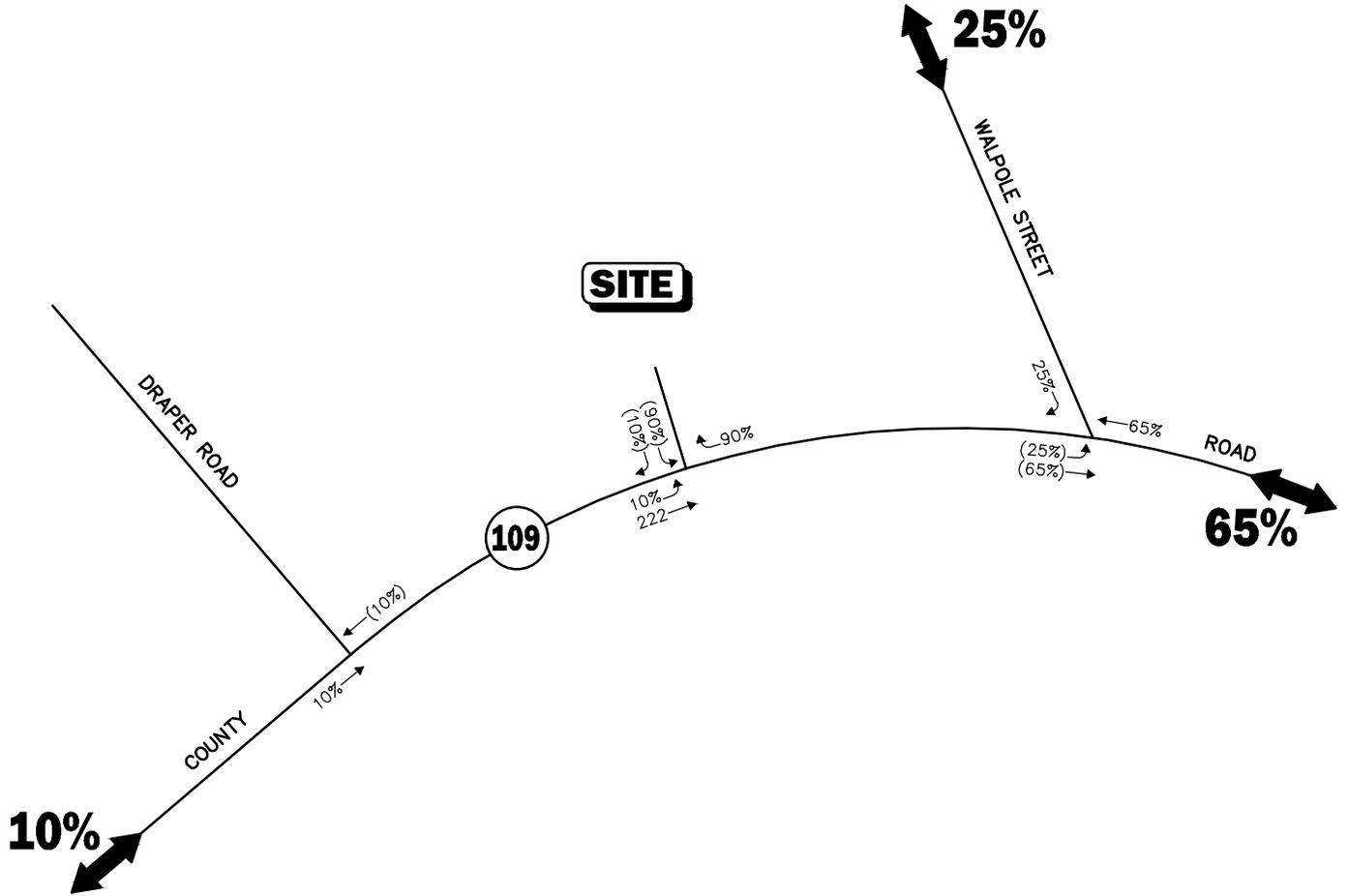
TRIP DISTRIBUTION AND ASSIGNMENT

The directional distribution of generated trips to and from the Project site was determined based on a review of Journey-to-Work data obtained from the U.S. Census for persons residing in the Town of Dover and then refined based on existing traffic patterns within the study area. This methodology is consistent with the residential nature of the Project. The general trip distribution for the Project is graphically depicted on Figure 5. The additional traffic expected to be generated by the Project was assigned on the study area roadway network as shown on Figure 6 for the weekday morning and evening peak hours, respectively.

FUTURE TRAFFIC VOLUMES - BUILD CONDITION

The 2028 Build condition traffic volumes consist of the 2028 No-Build traffic volumes with the additional traffic expected to be generated by the Project added to them. The 2028 Build weekday morning and evening peak-hour traffic-volumes are graphically depicted on Figure 7.

A summary of peak-hour projected traffic-volume changes outside of the study area that is the subject of this assessment is shown in Table 6. These changes are a result of the construction of the Project.



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

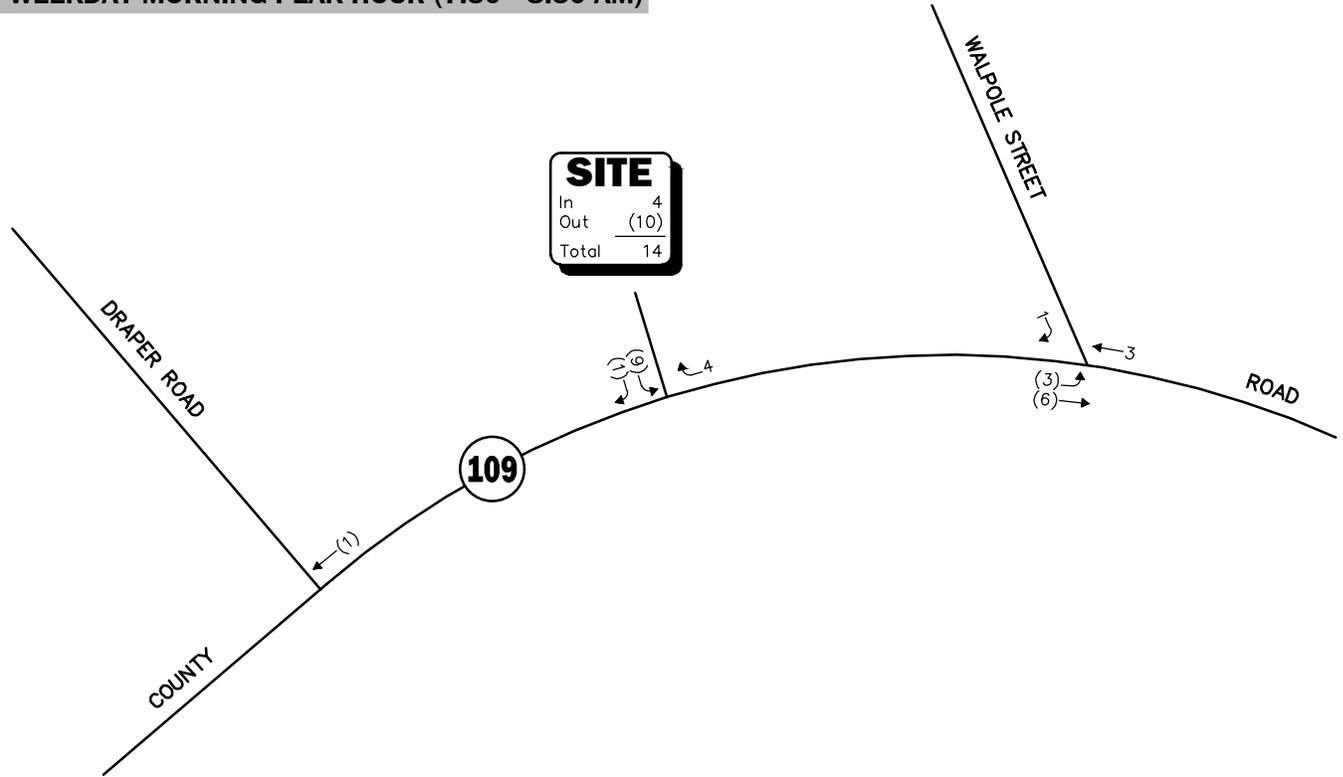
Not To Scale

Figure 5

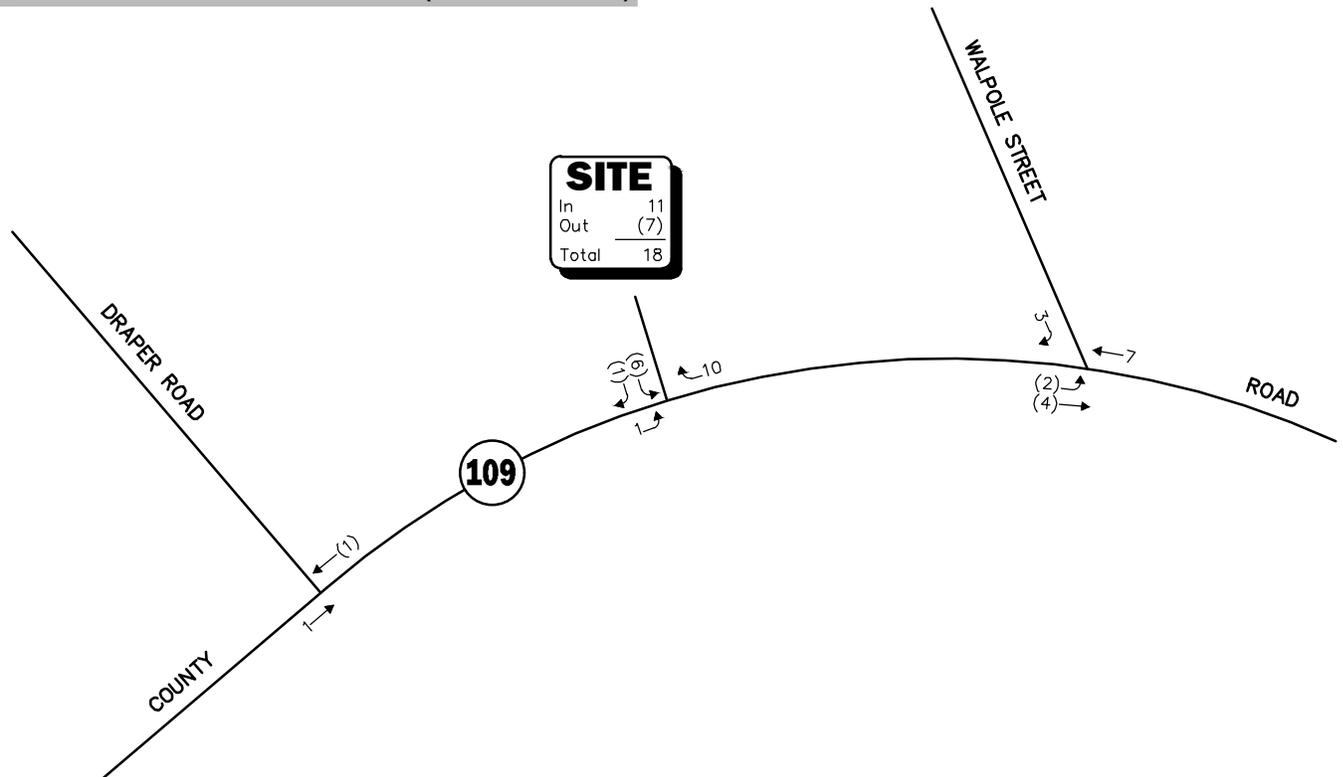


Trip Distribution Map

WEEKDAY MORNING PEAK HOUR (7:30 - 8:30 AM)



WEEKDAY EVENING PEAK HOUR (4:15 - 5:15 PM)

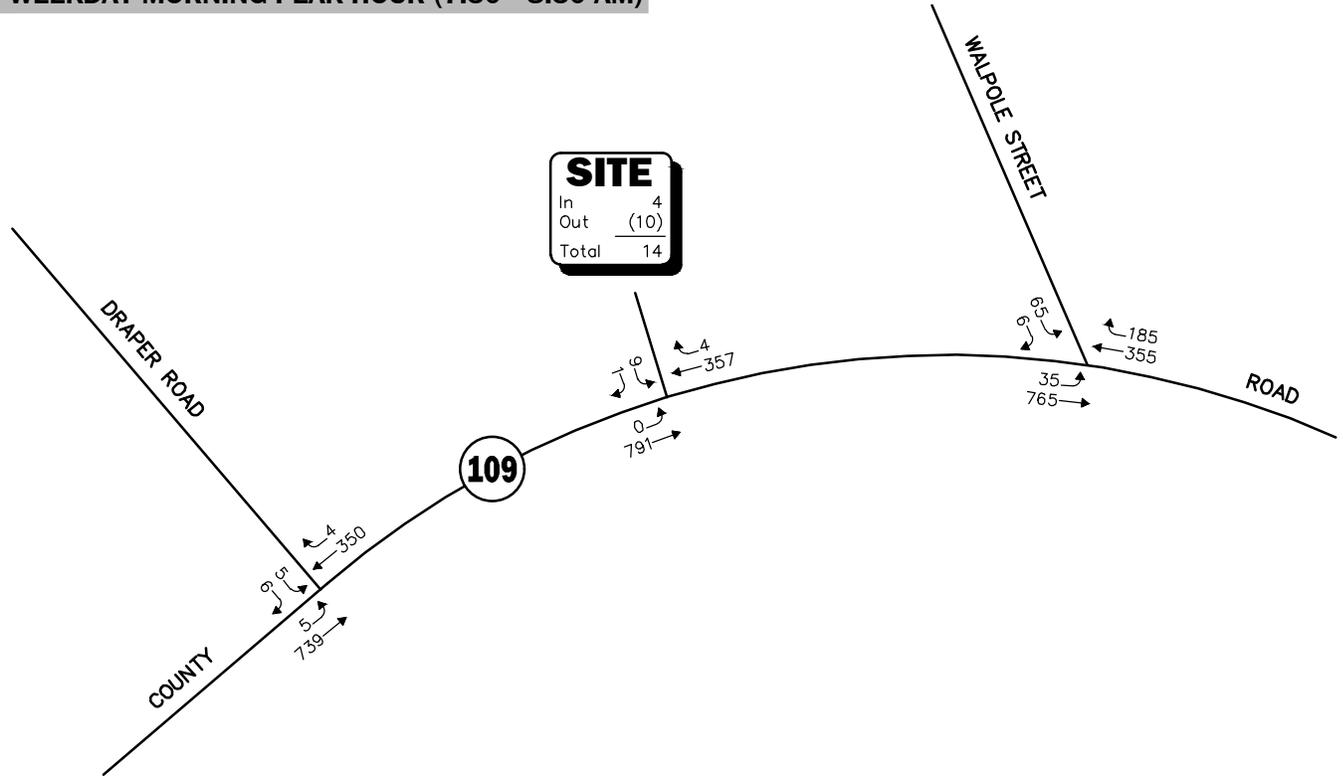


Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

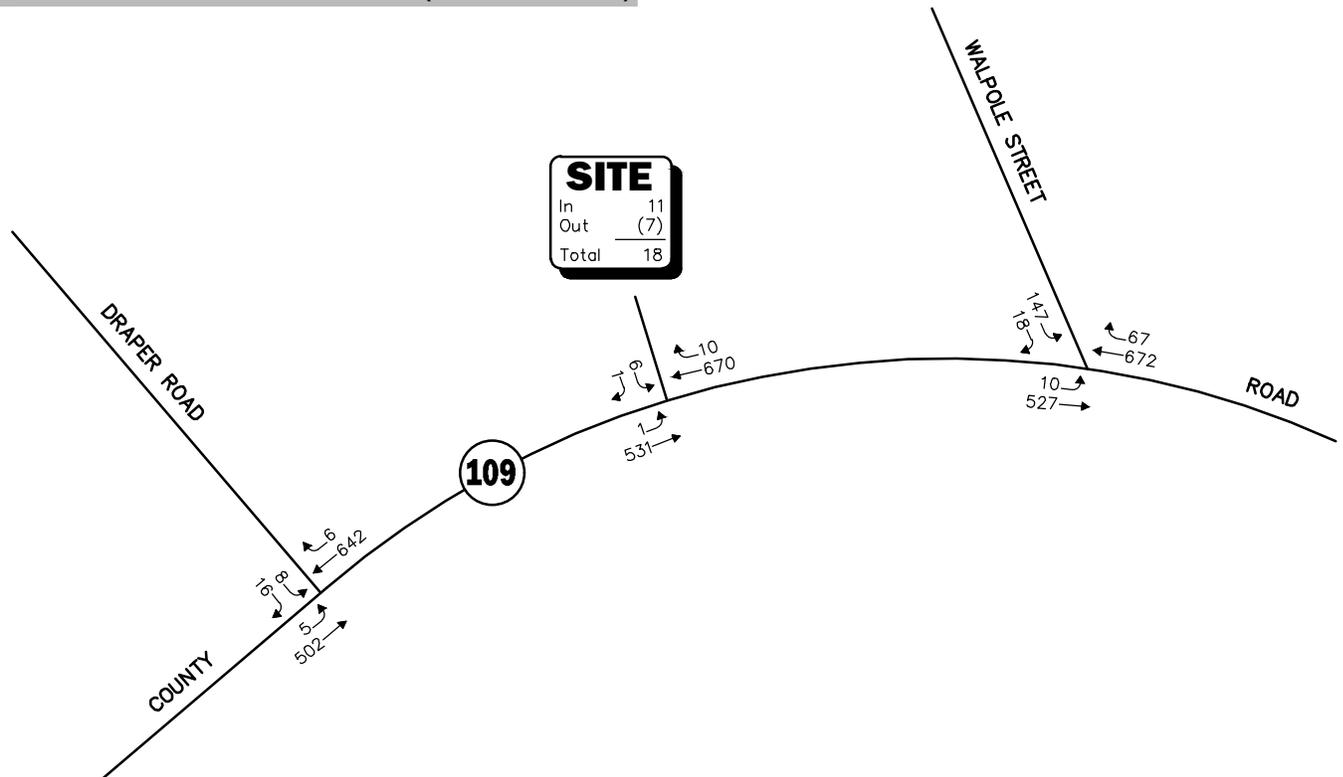
Not To Scale

Figure 6

WEEKDAY MORNING PEAK HOUR (7:30 - 8:30 AM)



WEEKDAY EVENING PEAK HOUR (4:15 - 5:15 PM)



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

Not To Scale

Figure 7



2028 Build
 Peak Hour Traffic Volumes

Table 6
PEAK-HOUR TRAFFIC-VOLUME INCREASES

Location/Peak Hour	2020 Existing	2028 No-Build	2028 Build	Traffic Volume Increase Over No-Build	Percent Increase Over No-Build
<i>Route 109, east of Walpole Street:</i>					
Weekday Morning	1,257	1,361	1,370	9	0.7
Weekday Evening	1,295	1,402	1,413	11	0.8
<i>Route 109, west of Draper Road:</i>					
Weekday Morning	1,015	1,099	1,100	1	0.1
Weekday Evening	1,075	1,163	1,165	2	0.2
<i>Walpole Street, north of Route 109:</i>					
Weekday Morning	266	287	291	4	1.4
Weekday Evening	219	237	242	5	2.1
<i>Draper Road, north of Route 109:</i>					
Weekday Morning	20	20	20	0	0.0
Weekday Evening	33	35	35	0	0.0

As shown in Table 6, Project-related traffic-volume increases outside of the study area relative to 2028 No-Build conditions are anticipated to range from 0.0 to 2.1 percent during the peak periods, with vehicle increases shown to range from 0 to 11 vehicles. ***When distributed over the peak-hour, the predicted traffic volume increases would not result in a significant impact (increase) on motorist delays or vehicle queuing outside of the immediate study area that is the subject of this assessment.***

TRAFFIC OPERATIONS ANALYSIS

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

METHODOLOGY

Levels of Service

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.⁷ The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

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

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

⁷The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010.

Unsignalized Intersections

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

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

The levels of service of unsignalized intersections are determined by application of a procedure described in the 2010 *Highway Capacity Manual*.⁸ Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the 2010 *Highway Capacity Manual*. Table 7 summarizes the relationship between level of service and average control delay for two-way stop controlled and all-way stop controlled intersections.

**Table 7
LEVEL-OF-SERVICE CRITERIA FOR
UNSIGNALIZED INTERSECTIONS^a**

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

^aSource: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010; page 19-2.

⁸*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010.

Vehicle Queue Analysis

Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the Synchro® intersection capacity analysis software which is based upon the methodology and procedures presented in the 2010 *Highway Capacity Manual*. The Synchro® vehicle queue analysis methodology is a simulation based model which reports the number of vehicles that experience a delay of six seconds or more at an intersection. For signalized intersections, Synchro® reports both the average (50th percentile) the 95th percentile vehicle queue. For unsignalized intersections, Synchro® reports the 95th percentile vehicle queue. Vehicle queue lengths are a function of the capacity of the movement under study and the volume of traffic being processed by the intersection during the analysis period. The 95th percentile vehicle queue is the vehicle queue length that will be exceeded only 5 percent of the time, or approximately three minutes out of sixty minutes during the peak one hour of the day (during the remaining fifty-seven minutes, the vehicle queue length will be less than the 95th percentile queue length).

ANALYSIS RESULTS

Level-of-service and vehicle queue analyses were conducted for 2020 Existing, 2028 No-Build and 2028 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized in Table 8, with the detailed analysis results presented in the Appendix.

The following is a summary of the level-of-service and vehicle queue analyses for the intersections within the study area. For context, we note that an LOS of "D" or better is generally defined as "acceptable" operating conditions.

As can be seen in Table 8, the addition of Project-related traffic to the study area intersections is not predicted to result in a change in LOS or an increase in vehicle queuing for any movement over No-Build conditions. Project-related impacts at the study area intersections were identified as follows:

Route 109 at Walpole Street – No-change in LOS or vehicle queuing is predicted to occur for any movement over No-Build conditions. Independent of the Project, all movements from Walpole Street are currently operating at or over capacity (defined as LOS "E" or "F", respectively) during both peak hours.

Route 109 at Draper Road – No-change in LOS or vehicle queuing is predicted to occur for any movement over No-Build conditions, with all movements shown to continue to operate at LOS C or better with vehicle queues of up to one (1) vehicle.

Route 109 at the Project Site Driveway – All movements exiting the Project site driveway to Route 109 were shown to operate at LOS C during both the weekday morning and evening peak hours with negligible vehicle queuing predicted. All movements along Route 109 approaching the Project site driveway were shown to operate at LOS A during both peak hours, also with negligible vehicle queuing.

Table 8
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

Unsignalized Intersection/ Peak Hour/Movement	2020 Existing				2027 No-Build				2027 Build			
	Demand ^a	Delay ^b	LOS ^c	Queue ^d 95 th	Demand	Delay	LOS	Queue 95 th	Demand	Delay	LOS	Queue 95 th
Route 109 at Walpole Street												
<i>Weekday Morning:</i>												
Route 109 EB LT/TH	731	0.4	A	0	791	0.4	A	0	800	0.4	A	0
Route 109 WB TH/RT	496	0.0	A	0	537	0.0	A	0	540	0.0	A	0
Walpole Street SB LT/RT	65	48.2	E	3	70	>50.0	F	4	71	>50.0	F	4
<i>Weekday Evening:</i>												
Route 109 EB LT/TH	490	0.1	A	0	531	0.1	A	0	537	0.2	A	0
Route 109 WB TH/RT	676	0.0	A	0	732	0.0	A	0	739	0.0	A	0
Walpole Street SB LT/RT	150	>50.0	F	7	162	>50.0	F	10	165	>50.0	F	10
Route 109 at Draper Road												
<i>Weekday Morning:</i>												
Route 109 EB LT/TH	687	0.1	A	0	744	0.1	A	0	744	0.1	A	0
Route 109 WB TH/RT	326	0.0	A	0	353	0.0	A	0	354	0.0	A	0
Draper Road SB LT/RT	11	16.4	C	0	11	17.8	C	0	11	17.8	C	0
<i>Weekday Evening:</i>												
Route 109 EB LT/TH	468	0.1	A	0	506	0.1	A	0	507	0.1	A	0
Route 109 WB TH/RT	598	0.0	A	0	647	0.0	A	0	648	0.0	A	0
Draper Road SB LT/RT	22	17.7	C	1	24	19.7	C	1	24	19.7	C	1
Route 109 at the Project Site Driveway												
<i>Weekday Morning:</i>												
Route 109 EB LT/TH	--	--	--	--	--	--	--	--	791	0.0	A	0
Route 109 WB TH/RT	--	--	--	--	--	--	--	--	361	0.0	A	0
Project Site Driveway SB LT/RT	--	--	--	--	--	--	--	--	10	23.4	C	0
<i>Weekday Evening:</i>												
Route 109 EB LT/TH	--	--	--	--	--	--	--	--	532	0.0	A	0
Route 109 WB TH/RT	--	--	--	--	--	--	--	--	680	0.0	A	0
Project Site Driveway SB LT/RT	--	--	--	--	--	--	--	--	7	24.6	C	0

^aDemand in vehicles per hour.

^bAverage control delay per vehicle (in seconds).

^cLevel-of-Service.

^dQueue length in vehicles.

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

SIGHT DISTANCE EVALUATION

Sight distance measurements were performed at the Project site driveway intersection with Route 109 in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)⁹ 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 on-coming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. In accordance with AASHTO standards, if the measured ISD is at least equal to the required SSD value for the appropriate design speed, the intersection can operate in a safe manner. Table 9 presents the measured SSD and ISD at the subject intersections.

Table 10
SIGHT DISTANCE MEASUREMENTS^a

Intersection/Sight Distance Measurement	Feet		
	Required Minimum (SSD)	Desirable (ISD) ^b	Measured
<i>Route 109 at the Project Roadway</i>			
<i>Stopping Sight Distance:</i>			
Route 109 approaching from the east	360	--	600+
Route 109 approaching from the west	360	--	458
 <i>Intersection Sight Distance:</i>			
Looking to the east from the Project Roadway	360	500	600+
Looking to the west from the Project Roadway	360	430	528

^aRecommended 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 an approach speed of 45 mph along Route 109.

^bValues 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.

⁹*A Policy on Geometric Design of Highway and Streets*, 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.

As can be seen in Table 10, the available lines of sight at the Project site driveway intersection were found to exceed the recommended minimum sight distance to function in a safe (SSD) and efficient (ISD) manner based on a 45 mph approach speed along Route 109, which is 2 to 7 mph above the measured 85th percentile travel speed along Route 109 (38/43 mph) and 5 mph above the posted speed limit in this area (40 mph).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

VAI has conducted a TIA in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a 39-unit multifamily residential community to be located at 63 County Street (Route 109) in Dover, 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,¹⁰ the Project is expected to generate approximately 212 vehicle trips on an average weekday (two-way, 24-hour volume), with 14 vehicle trips expected during the weekday morning peak-hour and 18 vehicle trips expected during the weekday evening peak-hour;
2. The Project will not have a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), with Project-related impacts generally defined as an increase in average motorist delay of less than 1.0 seconds with no material increase in vehicle queuing predicted;
3. All movements at the Project site driveway intersection with Route 109 were shown to operate at LOS C or better during both the weekday morning and evening peak hours, where an LOS of “D” or better is defined as “acceptable” traffic operations, with negligible vehicle queuing predicted;
4. Independent of the Project, all movements from Walpole Street at the Route 109/Walpole Street intersection were shown to operate at or over capacity (defined as LOS “E” of “F”, respectively) during the peak hours, with Project-related impacts at this intersection predicted to be minor with no resulting increase in vehicle queuing;

¹⁰Ibid 1.

5. No apparent safety deficiencies were noted with respect to the motor vehicle crash history at the study area intersections, with all of the intersections found to have motor vehicle crash rates below the MassDOT average crash rates for similar intersections; and
6. Lines of sight at the Project site driveway intersection with Route 109 were found to exceed the recommended minimum distances for safe and efficient operation 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 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 at off-site locations evaluated in conjunction with this study. 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.

Project Access

Access to the Project site will be provided by way of a new driveway that will intersect the north side of Route 109 approximately 450 feet east of Tisdale Drive. The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation, many of which are reflected on the Site Plans:

- The Project site driveway and internal circulating roadways should be a minimum of 22-feet in width and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.
- Where perpendicular parking is proposed, the drive aisle behind the parking should be a minimum of 23-feet in width in order to accommodate 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).¹¹
- Americans with Disabilities Act (ADA) compliant wheelchair ramps should be provided at all pedestrian crossings internal to the Project site where pedestrian crossings are present.
- 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.

¹¹Ibid 2.

- Snow windrows within sight triangle areas of the Project site driveway should be promptly removed where such accumulations would impede sight lines.

Off-Site

Route 109 at Walpole Street

Independent of the Project, all movements from Walpole Street during both the weekday morning and evening peak hours at the Route 109/Walpole Street intersection are currently operating at or over capacity (i.e., LOS “E” or “F”, respectively) under 2020 Existing conditions. Absent improvement, motorist delays are expected to further increase in the future, again, independent of the Project.

An initial review of the four-hour traffic signal warrant (Warrant 2) presented in the MUTCD indicates that the installation of a traffic control signal in order to improve operating conditions at the intersection may be warranted under 2028 No-Build conditions. To the extent so desired by the Town, the Project proponent will undertake a formal Traffic Signal Warrants Analysis (TSWA) for the intersection in accordance with the methodology outlined in the MUTCD, including performing a continuous 12-hour (7:00 AM to 7:00 PM) manual turning movement count, and will summarize the results of the analysis in a technical memorandum that will be provided to the Town. The technical memorandum will also include a review of alternative traffic control measures for the intersection.

Transportation Demand Management

Regularly scheduled public transportation services are not currently provided in the vicinity of the Project site or within the study area. The MWRTA provides on-demand, curb-to-curb transportation services for eligible disabled residents of the Town of Dover in compliance with the ADA. In addition, the Town of Dover COA provides rides to local destinations and to Boston through a private partner (JFK Transportation Service). The service operates on weekdays between the hours of 7:00 AM and 5:00 PM.

In an effort to encourage the use of alternative modes of transportation to single-occupant vehicles, the following Transportation Demand Management (TDM) measures will be implemented as a part of the Project:

- A transportation coordinator will be designated for the Project to coordinate the elements of the TDM program;
- Information regarding public transportation services, maps, schedules and fare information will be posted in a central location and/or otherwise made available to residents;
- A “welcome packet” will be provided to residents detailing available public transportation services, bicycle and walking alternatives, and commuter options available;
- Pedestrian accommodations will be incorporated into the Project site;
- A mail drop will be provided within the building; and
- Bicycle parking will be provided within the Project site.

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.

APPENDIX

PROJECT SITE PLAN

AUTOMATIC TRAFFIC RECORDER COUNT DATA

MANUAL TURNING MOVEMENT COUNT DATA

SEASONAL ADJUSTMENT DATA

COVID-19 ADJUSTMENT DATA

VEHICLE TRAVEL SPEED DATA

MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING

GENERAL BACKGROUND TRAFFIC GROWTH

TRIP-GENERATION CALCULATIONS

JOURNEY TO WORK TRIP DISTRIBUTION

CAPACITY ANALYSIS WORKSHEETS

PROJECT SITE PLAN

PL.BK.229 PL.NO.732



LEGEND	
	PROP LINE
	STONE WALL
	EROSION CONTROL
	WATER SERVICE
	SOIL TESTING LOCATION
	EXISTING CONTOUR
	PROPOSED GRADING
	PROPOSED SPOT ELEV.
	EXISTING TREE

INSIDE OF WALL TO HAVE A 5' IMPERVIOUS BARRIER SHEET FROM ELEVATION 291.5 TO ELEV 286.5 (MILLER ENVIRONMENTAL CORP. OR APPROVED EQUAL)

INSIDE OF WALL TO HAVE A 10' IMPERVIOUS BARRIER SHEET FROM ELEVATION 291.5 TO ELEV 281.5 (MILLER ENVIRONMENTAL CORP. OR APPROVED EQUAL)

gwt=285.0
+2.0
287.00 = bot sys
+4.25' high sys
291.25 = top sys
WALL=4' WIDE

1372 AFC R-TANK HD SIZE 2 CHAMBERS (SIZE 2 = 33.9" CHAMBER HEIGHT) 6" STONE BELOW, 24" STONE ALL AROUND AND 12" STONE COVER BOTTOM STONE = 287.0 BOTTOM CHAMBER = 287.50 TOP CHAMBER = 290.33 TOP STONE = 291.33



PROPOSED CONDITIONS
PLAN
63 COUNTY STREET
IN
DOVER, MASSACHUSETTS

AUTOMATIC TRAFFIC RECORDER COUNT DATA

Accurate Counts
978-664-2565

Location : Route 109
Location : East of Appletree Lane
City/State: Dover, MA

8745VL01

Start Time	10/21/202 Wed	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		2	80			10	62				
12:15		4	88			8	79				
12:30		3	100			5	76				
12:45		1	73	10	341	7	79	30	296	40	637
01:00		2	82			1	64				
01:15		1	92			3	67				
01:30		1	101			3	71				
01:45		1	88	5	363	0	81	7	283	12	646
02:00		0	80			1	85				
02:15		2	93			1	68				
02:30		5	90			1	82				
02:45		1	82	8	345	2	74	5	309	13	654
03:00		1	96			2	97				
03:15		3	89			0	88				
03:30		3	102			6	93				
03:45		2	88	9	375	3	74	11	352	20	727
04:00		9	100			2	75				
04:15		13	113			3	88				
04:30		11	95			6	100				
04:45		17	104	50	412	12	109	23	372	73	784
05:00		30	106			4	102				
05:15		48	103			13	96				
05:30		43	89			10	89				
05:45		74	118	195	416	11	57	38	344	233	760
06:00		89	86			16	71				
06:15		104	86			24	70				
06:30		96	74			42	85				
06:45		127	48	416	294	45	74	127	300	543	594
07:00		116	57			39	64				
07:15		133	54			49	55				
07:30		146	38			67	36				
07:45		183	38	578	187	64	50	219	205	797	392
08:00		162	42			55	43				
08:15		136	32			85	38				
08:30		131	28			72	42				
08:45		122	18	551	120	56	26	268	149	819	269
09:00		98	23			62	26				
09:15		87	18			60	30				
09:30		110	22			69	25				
09:45		98	20	393	83	72	13	263	94	656	177
10:00		76	12			65	11				
10:15		104	12			53	20				
10:30		76	4			62	17				
10:45		98	10	354	38	51	10	231	58	585	96
11:00		79	5			55	19				
11:15		66	7			56	6				
11:30		82	5			66	12				
11:45		76	6	303	23	73	11	250	48	553	71
Total		2872	2997			1472	2810			4344	5807
Percent		48.9%	51.1%			34.4%	65.6%			42.8%	57.2%

Accurate Counts
978-664-2565

Location : Route 109
Location : East of Appletree Lane
City/State: Dover, MA

8745VL01

Start Time	10/22/2022 Thu	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		2	90			7	73				
12:15		3	101			10	82				
12:30		2	80			6	63				
12:45		3	108	10	379	4	50	27	268	37	647
01:00		0	86			3	93				
01:15		1	76			1	74				
01:30		1	88			3	63				
01:45		2	89	4	339	1	62	8	292	12	631
02:00		2	97			2	72				
02:15		4	112			1	75				
02:30		3	76			0	102				
02:45		4	108	13	393	1	80	4	329	17	722
03:00		3	89			2	93				
03:15		1	113			2	64				
03:30		2	109			0	70				
03:45		4	94	10	405	2	73	6	300	16	705
04:00		7	100			2	92				
04:15		11	103			4	63				
04:30		14	126			6	99				
04:45		21	119	53	448	6	88	18	342	71	790
05:00		34	123			10	94				
05:15		48	102			5	96				
05:30		48	116			7	88				
05:45		81	97	211	438	13	85	35	363	246	801
06:00		84	94			16	97				
06:15		94	96			34	72				
06:30		94	54			47	83				
06:45		148	76	420	320	46	66	143	318	563	638
07:00		167	76			38	62				
07:15		129	34			57	50				
07:30		135	49			30	56				
07:45		161	44	592	203	4	50	129	218	721	421
08:00		161	43			46	54				
08:15		150	47			66	50				
08:30		124	25			94	47				
08:45		126	26	561	141	70	50	276	201	837	342
09:00		109	18			58	22				
09:15		112	16			56	27				
09:30		102	18			77	28				
09:45		114	16	437	68	78	22	269	99	706	167
10:00		77	16			66	24				
10:15		90	8			63	15				
10:30		109	18			73	16				
10:45		104	16	380	58	56	9	258	64	638	122
11:00		86	16			67	20				
11:15		114	14			63	21				
11:30		88	10			68	9				
11:45		106	8	394	48	72	16	270	66	664	114
Total		3085	3240			1443	2860			4528	6100
Percent		48.8%	51.2%			33.5%	66.5%			42.6%	57.4%
Grand Total		5957	6237			2915	5670			8872	11907
Percent		48.9%	51.1%			34.0%	66.0%			42.7%	57.3%

ADT ADT 10,390 AADT 10,390

Location : Route 109
Location : East of Appletree Lane
City/State: Dover, MA

8745VL01

Start Time	10/19/2020		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	*	*	10	30	10	27	*	*	*	*	*	*	10	28
01:00	*	*	*	*	5	7	4	8	*	*	*	*	*	*	4	8
02:00	*	*	*	*	8	5	13	4	*	*	*	*	*	*	10	4
03:00	*	*	*	*	9	11	10	6	*	*	*	*	*	*	10	8
04:00	*	*	*	*	50	23	53	18	*	*	*	*	*	*	52	20
05:00	*	*	*	*	195	38	211	35	*	*	*	*	*	*	203	36
06:00	*	*	*	*	416	127	420	143	*	*	*	*	*	*	418	135
07:00	*	*	*	*	578	219	592	129	*	*	*	*	*	*	585	174
08:00	*	*	*	*	551	268	561	276	*	*	*	*	*	*	556	272
09:00	*	*	*	*	393	263	437	269	*	*	*	*	*	*	415	266
10:00	*	*	*	*	354	231	380	258	*	*	*	*	*	*	367	244
11:00	*	*	*	*	303	250	394	270	*	*	*	*	*	*	348	260
12:00 PM	*	*	*	*	341	296	379	268	*	*	*	*	*	*	360	282
01:00	*	*	*	*	363	283	339	292	*	*	*	*	*	*	351	288
02:00	*	*	*	*	345	309	393	329	*	*	*	*	*	*	369	319
03:00	*	*	*	*	375	352	405	300	*	*	*	*	*	*	390	326
04:00	*	*	*	*	412	372	448	342	*	*	*	*	*	*	430	357
05:00	*	*	*	*	416	344	438	363	*	*	*	*	*	*	427	354
06:00	*	*	*	*	294	300	320	318	*	*	*	*	*	*	307	309
07:00	*	*	*	*	187	205	203	218	*	*	*	*	*	*	195	212
08:00	*	*	*	*	120	149	141	201	*	*	*	*	*	*	130	175
09:00	*	*	*	*	83	94	68	99	*	*	*	*	*	*	76	96
10:00	*	*	*	*	38	58	58	64	*	*	*	*	*	*	48	61
11:00	*	*	*	*	23	48	48	66	*	*	*	*	*	*	36	57
Lane Day	0	0	0	0	5869	4282	6325	4303	0	0	0	0	0	0	6097	4291
AM Peak	-	-	-	-	07:00	08:00	07:00	08:00	-	-	-	-	-	-	07:00	08:00
Vol.	-	-	-	-	578	268	592	276	-	-	-	-	-	-	585	272
PM Peak	-	-	-	-	17:00	16:00	16:00	17:00	-	-	-	-	-	-	16:00	16:00
Vol.	-	-	-	-	416	372	448	363	-	-	-	-	-	-	430	357

Comb. Total	0	0	10151	10628	0	0	0	10388
ADT	ADT 10,390	AADT 10,390						

MANUAL TURNING MOVEMENT COUNT DATA

Accurate Counts
978-664-2565

N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy

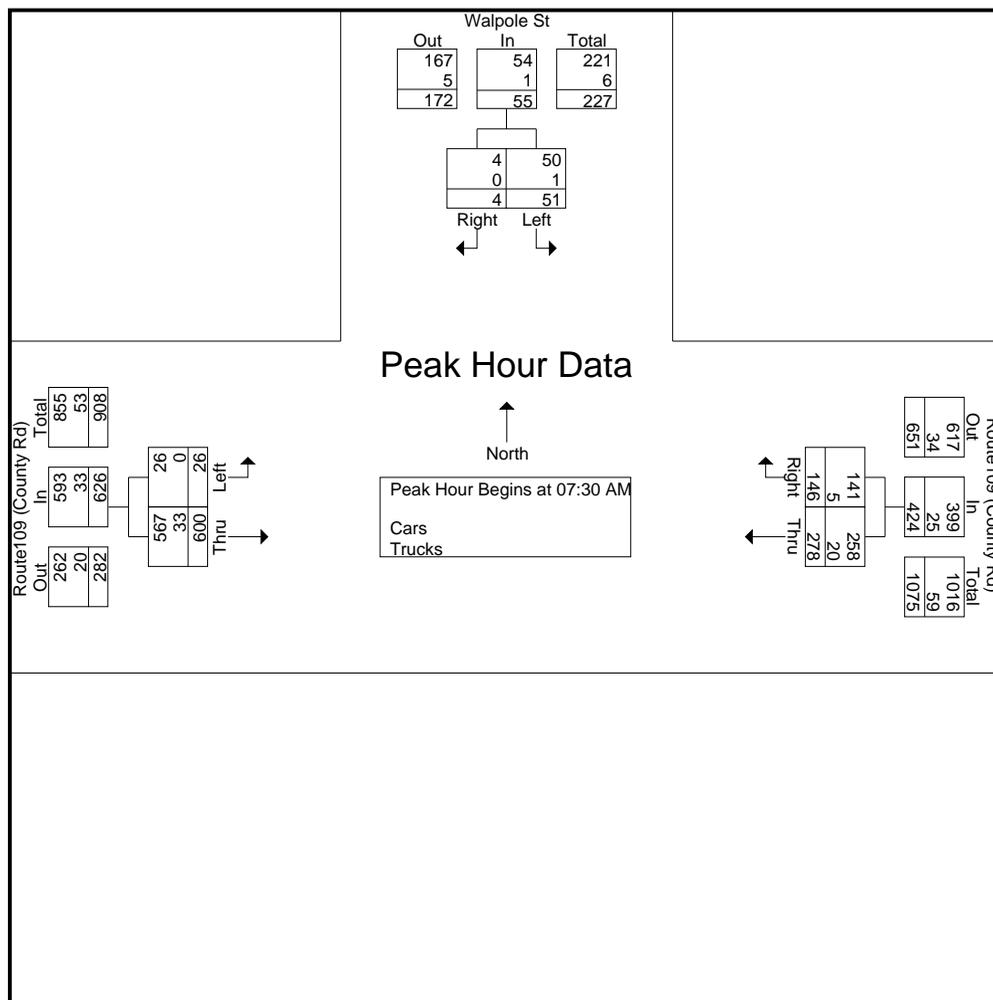
File Name : 87450001
Site Code : 87450001
Start Date : 10/21/2020
Page No : 1

Groups Printed- Cars - Trucks

Start Time	Walpole St From North		Route109 (County Rd) From East		Route109 (County Rd) From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	8	0	41	30	5	109	193
07:15 AM	12	0	51	34	5	130	232
07:30 AM	8	2	68	52	12	133	275
07:45 AM	12	0	68	44	9	167	300
Total	40	2	228	160	31	539	1000
08:00 AM	18	2	55	29	3	162	269
08:15 AM	13	0	87	21	2	138	261
08:30 AM	11	0	74	28	3	120	236
08:45 AM	13	3	58	17	2	122	215
Total	55	5	274	95	10	542	981
Grand Total	95	7	502	255	41	1081	1981
Apprch %	93.1	6.9	66.3	33.7	3.7	96.3	
Total %	4.8	0.4	25.3	12.9	2.1	54.6	
Cars	93	6	469	246	41	1028	1883
% Cars	97.9	85.7	93.4	96.5	100	95.1	95.1
Trucks	2	1	33	9	0	53	98
% Trucks	2.1	14.3	6.6	3.5	0	4.9	4.9

Start Time	Walpole St From North			Route109 (County Rd) From East			Route109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	8	2	10	68	52	120	12	133	145	275
07:45 AM	12	0	12	68	44	112	9	167	176	300
08:00 AM	18	2	20	55	29	84	3	162	165	269
08:15 AM	13	0	13	87	21	108	2	138	140	261
Total Volume	51	4	55	278	146	424	26	600	626	1105
% App. Total	92.7	7.3		65.6	34.4		4.2	95.8		
PHF	.708	.500	.688	.799	.702	.883	.542	.898	.889	.921
Cars	50	4	54	258	141	399	26	567	593	1046
% Cars	98.0	100	98.2	92.8	96.6	94.1	100	94.5	94.7	94.7
Trucks	1	0	1	20	5	25	0	33	33	59
% Trucks	2.0	0	1.8	7.2	3.4	5.9	0	5.5	5.3	5.3

N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



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

Peak Hour for Each Approach Begins at:

	08:00 AM			07:30 AM			07:30 AM		
+0 mins.	18	2	20	68	52	120	12	133	145
+15 mins.	13	0	13	68	44	112	9	167	176
+30 mins.	11	0	11	55	29	84	3	162	165
+45 mins.	13	3	16	87	21	108	2	138	140
Total Volume	55	5	60	278	146	424	26	600	626
% App. Total	91.7	8.3		65.6	34.4		4.2	95.8	
PHF	.764	.417	.750	.799	.702	.883	.542	.898	.889
Cars	55	4	59	258	141	399	26	567	593
% Cars	100	80	98.3	92.8	96.6	94.1	100	94.5	94.7
Trucks	0	1	1	20	5	25	0	33	33
% Trucks	0	20	1.7	7.2	3.4	5.9	0	5.5	5.3

Accurate Counts

978-664-2565

N/S Street : Walpole Street
 E/W Street : Route 109 (County Road)
 City/State : Dover, MA
 Weather : Cloudy

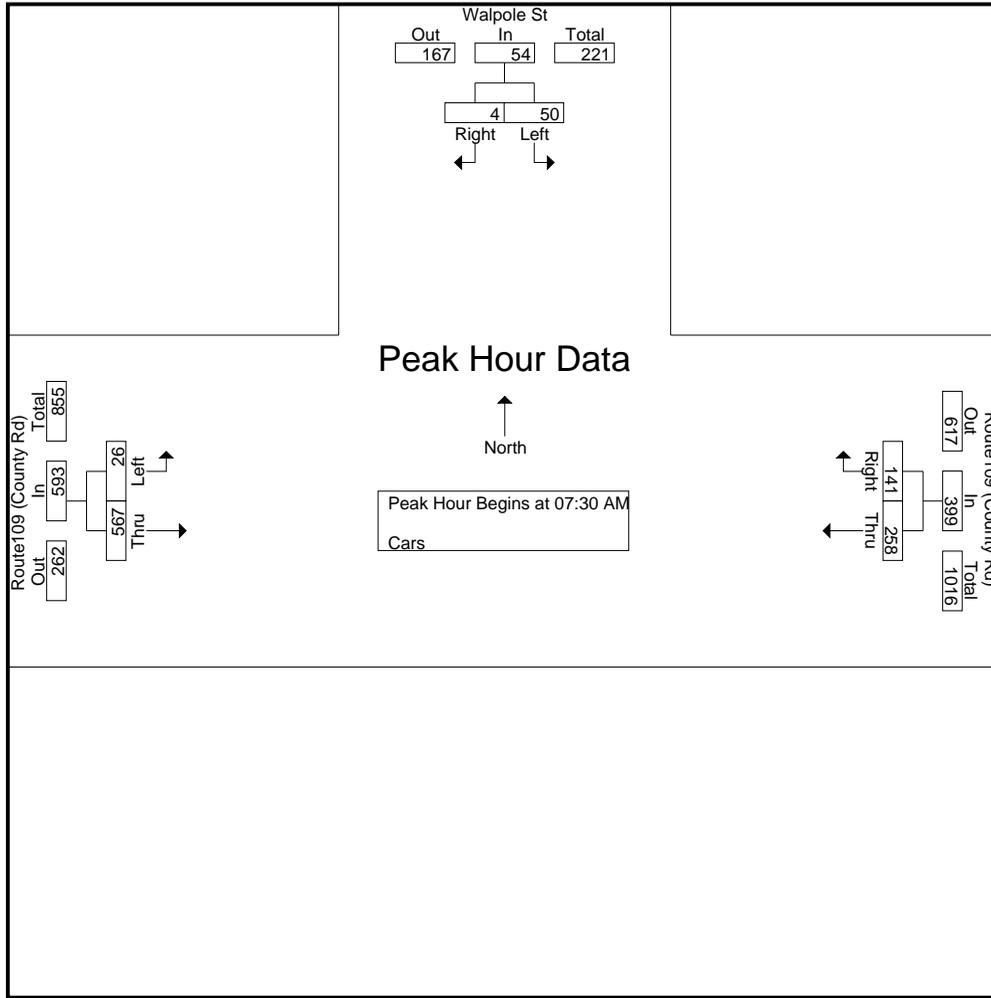
File Name : 87450001
 Site Code : 87450001
 Start Date : 10/21/2020
 Page No : 4

Groups Printed- Cars

Start Time	Walpole St From North		Route109 (County Rd) From East		Route109 (County Rd) From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	8	0	41	27	5	105	186
07:15 AM	11	0	47	33	5	124	220
07:30 AM	7	2	63	50	12	123	257
07:45 AM	12	0	64	43	9	160	288
Total	38	2	215	153	31	512	951
08:00 AM	18	2	47	29	3	154	253
08:15 AM	13	0	84	19	2	130	248
08:30 AM	11	0	71	28	3	116	229
08:45 AM	13	2	52	17	2	116	202
Total	55	4	254	93	10	516	932
Grand Total	93	6	469	246	41	1028	1883
Apprch %	93.9	6.1	65.6	34.4	3.8	96.2	
Total %	4.9	0.3	24.9	13.1	2.2	54.6	

Start Time	Walpole St From North			Route109 (County Rd) From East			Route109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	7	2	9	63	50	113	12	123	135	257
07:45 AM	12	0	12	64	43	107	9	160	169	288
08:00 AM	18	2	20	47	29	76	3	154	157	253
08:15 AM	13	0	13	84	19	103	2	130	132	248
Total Volume	50	4	54	258	141	399	26	567	593	1046
% App. Total	92.6	7.4		64.7	35.3		4.4	95.6		
PHF	.694	.500	.675	.768	.705	.883	.542	.886	.877	.908

N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



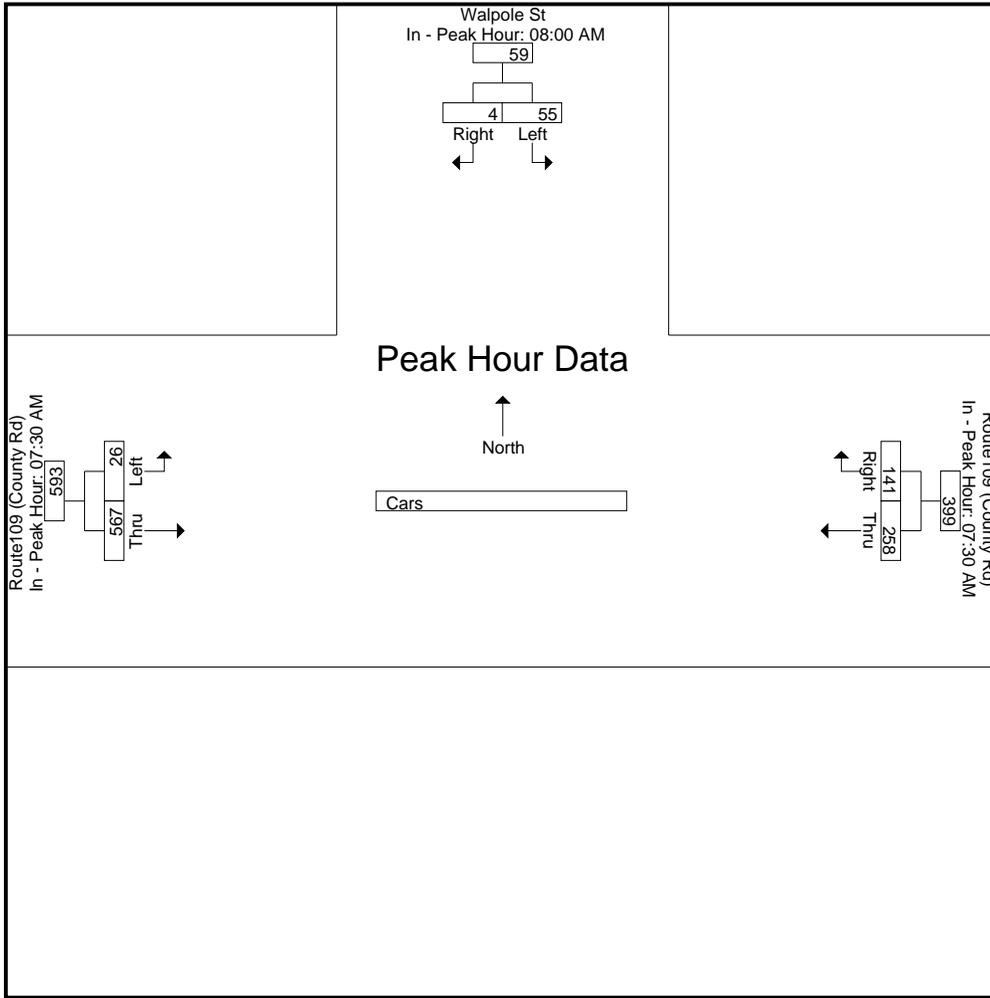
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM			07:30 AM			07:30 AM		
+0 mins.	18	2	20	63	50	113	12	123	135
+15 mins.	13	0	13	64	43	107	9	160	169
+30 mins.	11	0	11	47	29	76	3	154	157
+45 mins.	13	2	15	84	19	103	2	130	132
Total Volume	55	4	59	258	141	399	26	567	593
% App. Total	93.2	6.8		64.7	35.3		4.4	95.6	
PHF	.764	.500	.738	.768	.705	.883	.542	.886	.877

Accurate Counts
978-664-2565

File Name : 87450001
Site Code : 87450001
Start Date : 10/21/2020
Page No : 6

N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



Accurate Counts

978-664-2565

N/S Street : Walpole Street
 E/W Street : Route 109 (County Road)
 City/State : Dover, MA
 Weather : Cloudy

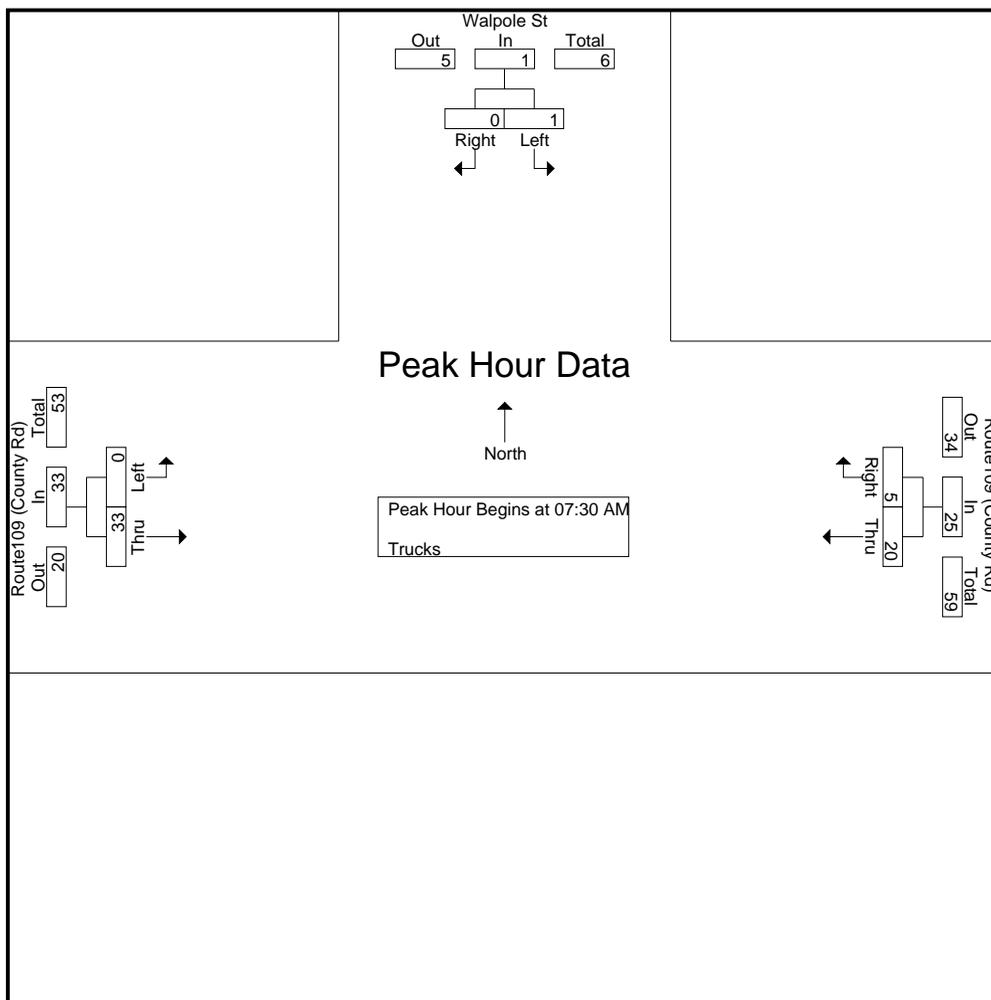
File Name : 87450001
 Site Code : 87450001
 Start Date : 10/21/2020
 Page No : 7

Groups Printed- Trucks

Start Time	Walpole St From North		Route109 (County Rd) From East		Route109 (County Rd) From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	0	0	0	3	0	4	7
07:15 AM	1	0	4	1	0	6	12
07:30 AM	1	0	5	2	0	10	18
07:45 AM	0	0	4	1	0	7	12
Total	2	0	13	7	0	27	49
08:00 AM	0	0	8	0	0	8	16
08:15 AM	0	0	3	2	0	8	13
08:30 AM	0	0	3	0	0	4	7
08:45 AM	0	1	6	0	0	6	13
Total	0	1	20	2	0	26	49
Grand Total	2	1	33	9	0	53	98
Apprch %	66.7	33.3	78.6	21.4	0	100	
Total %	2	1	33.7	9.2	0	54.1	

Start Time	Walpole St From North			Route109 (County Rd) From East			Route109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	1	0	1	5	2	7	0	10	10	18
07:45 AM	0	0	0	4	1	5	0	7	7	12
08:00 AM	0	0	0	8	0	8	0	8	8	16
08:15 AM	0	0	0	3	2	5	0	8	8	13
Total Volume	1	0	1	20	5	25	0	33	33	59
% App. Total	100	0		80	20		0	100		
PHF	.250	.000	.250	.625	.625	.781	.000	.825	.825	.819

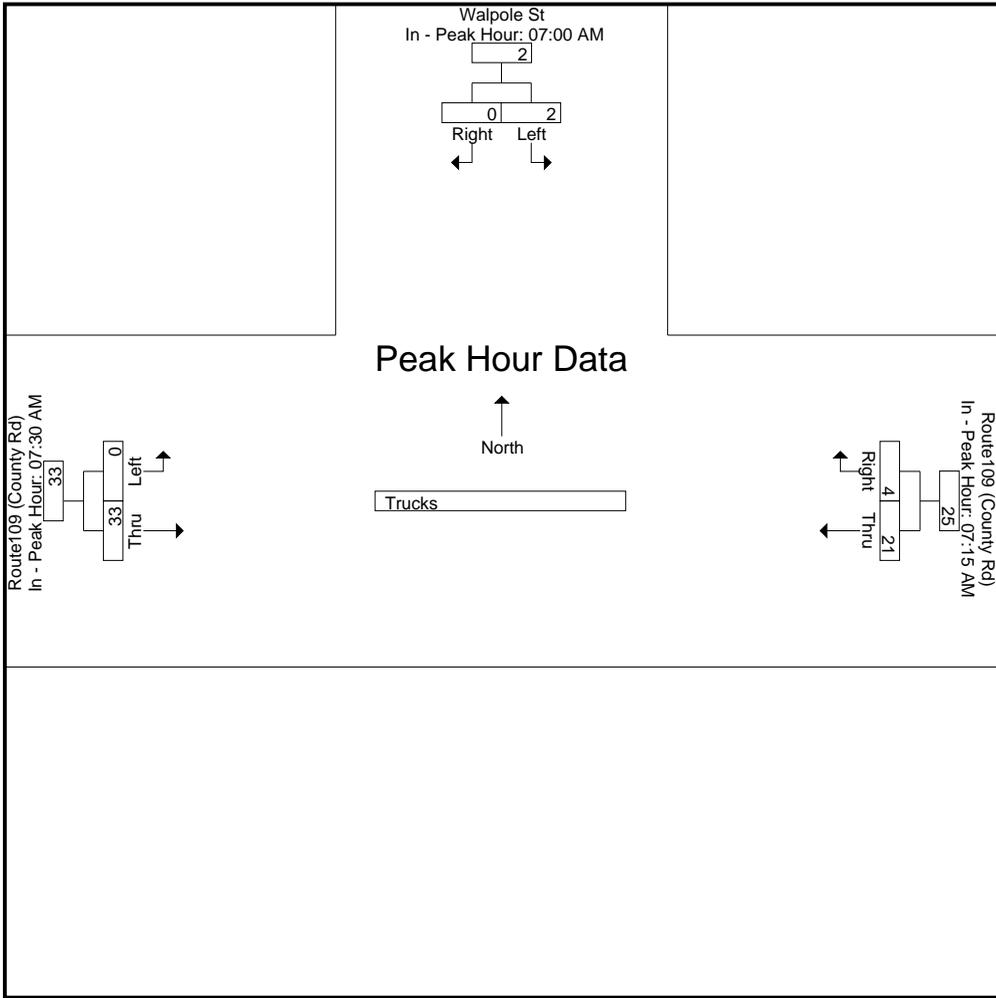
N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



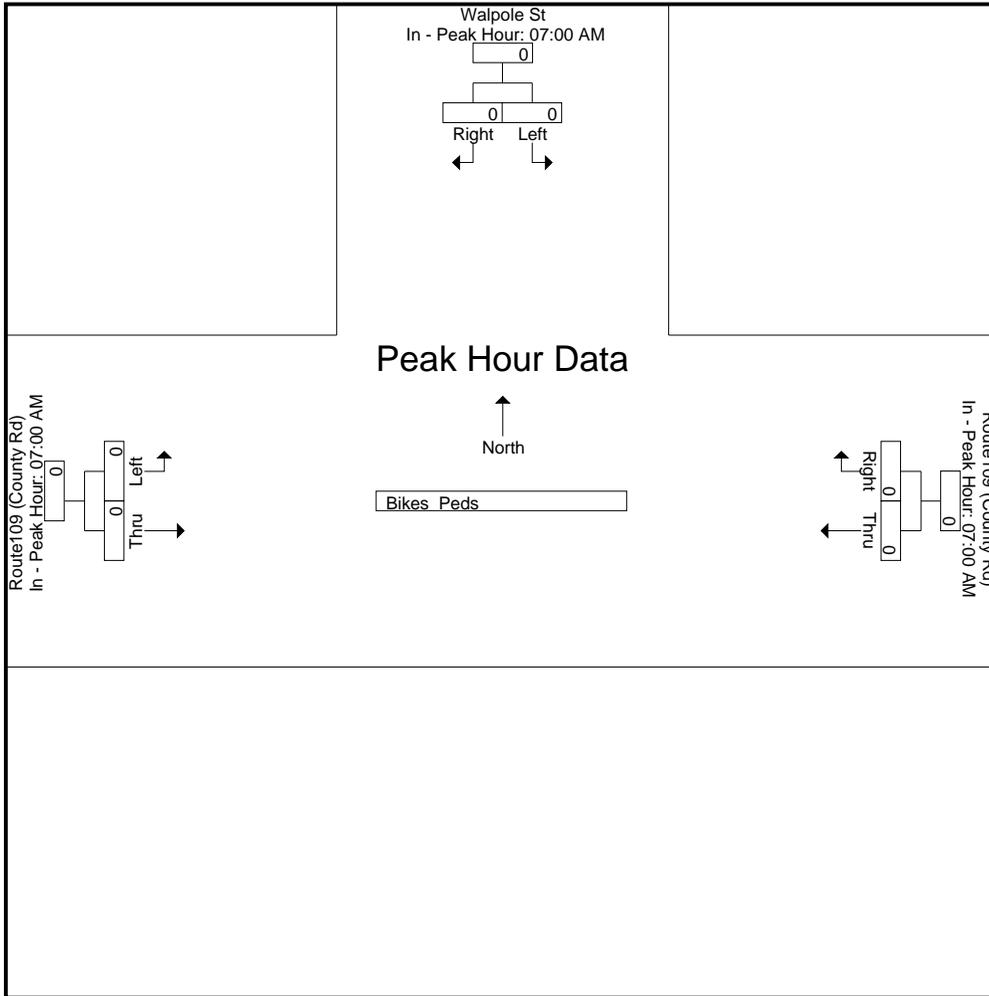
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:15 AM			07:30 AM		
+0 mins.	0	0	0	4	1	5	0	10	10
+15 mins.	1	0	1	5	2	7	0	7	7
+30 mins.	1	0	1	4	1	5	0	8	8
+45 mins.	0	0	0	8	0	8	0	8	8
Total Volume	2	0	2	21	4	25	0	33	33
% App. Total	100	0		84	16		0	100	
PHF	.500	.000	.500	.656	.500	.781	.000	.825	.825

N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



Accurate Counts

978-664-2565

N/S Street : Walpole Street
 E/W Street : Route 109 (County Road)
 City/State : Dover, MA
 Weather : Cloudy

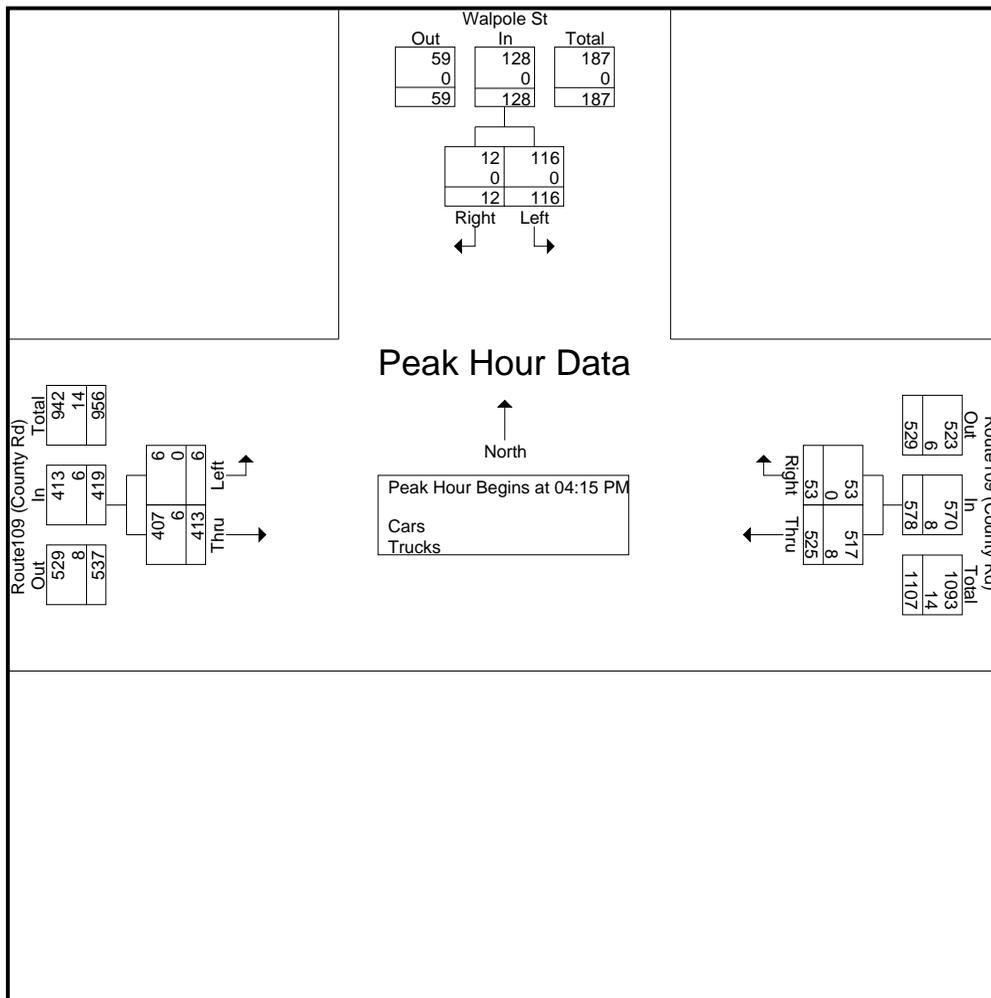
File Name : 87450001
 Site Code : 87450001
 Start Date : 10/21/2020
 Page No : 1

Groups Printed- Cars - Trucks

Start Time	Walpole St From North		Route109 (County Rd) From East		Route109 (County Rd) From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
04:00 PM	26	2	100	7	2	99	236
04:15 PM	33	4	118	15	1	110	281
04:30 PM	26	1	124	12	3	92	258
04:45 PM	31	4	151	13	1	104	304
Total	116	11	493	47	7	405	1079
05:00 PM	26	3	132	13	1	107	282
05:15 PM	26	0	133	10	1	97	267
05:30 PM	23	5	112	7	0	92	239
05:45 PM	36	2	76	15	5	112	246
Total	111	10	453	45	7	408	1034
Grand Total	227	21	946	92	14	813	2113
Apprch %	91.5	8.5	91.1	8.9	1.7	98.3	
Total %	10.7	1	44.8	4.4	0.7	38.5	
Cars	227	21	932	92	14	802	2088
% Cars	100	100	98.5	100	100	98.6	98.8
Trucks	0	0	14	0	0	11	25
% Trucks	0	0	1.5	0	0	1.4	1.2

Start Time	Walpole St From North			Route109 (County Rd) From East			Route109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	33	4	37	118	15	133	1	110	111	281
04:30 PM	26	1	27	124	12	136	3	92	95	258
04:45 PM	31	4	35	151	13	164	1	104	105	304
05:00 PM	26	3	29	132	13	145	1	107	108	282
Total Volume	116	12	128	525	53	578	6	413	419	1125
% App. Total	90.6	9.4		90.8	9.2		1.4	98.6		
PHF	.879	.750	.865	.869	.883	.881	.500	.939	.944	.925
Cars	116	12	128	517	53	570	6	407	413	1111
% Cars	100	100	100	98.5	100	98.6	100	98.5	98.6	98.8
Trucks	0	0	0	8	0	8	0	6	6	14
% Trucks	0	0	0	1.5	0	1.4	0	1.5	1.4	1.2

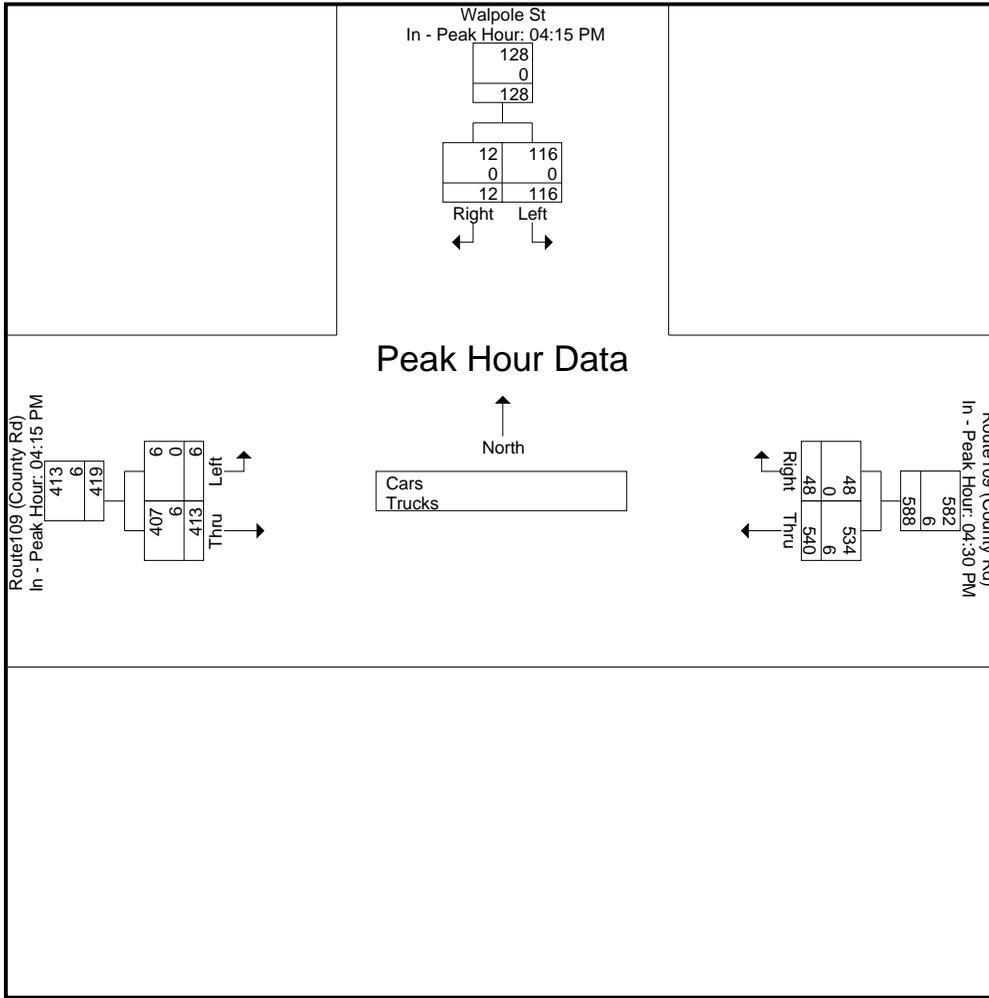
N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



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			04:30 PM			04:15 PM		
+0 mins.	33	4	37	124	12	136	1	110	111
+15 mins.	26	1	27	151	13	164	3	92	95
+30 mins.	31	4	35	132	13	145	1	104	105
+45 mins.	26	3	29	133	10	143	1	107	108
Total Volume	116	12	128	540	48	588	6	413	419
% App. Total	90.6	9.4		91.8	8.2		1.4	98.6	
PHF	.879	.750	.865	.894	.923	.896	.500	.939	.944
Cars	116	12	128	534	48	582	6	407	413
% Cars	100	100	100	98.9	100	99	100	98.5	98.6
Trucks	0	0	0	6	0	6	0	6	6
% Trucks	0	0	0	1.1	0	1	0	1.5	1.4

N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



Accurate Counts
978-664-2565

N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy

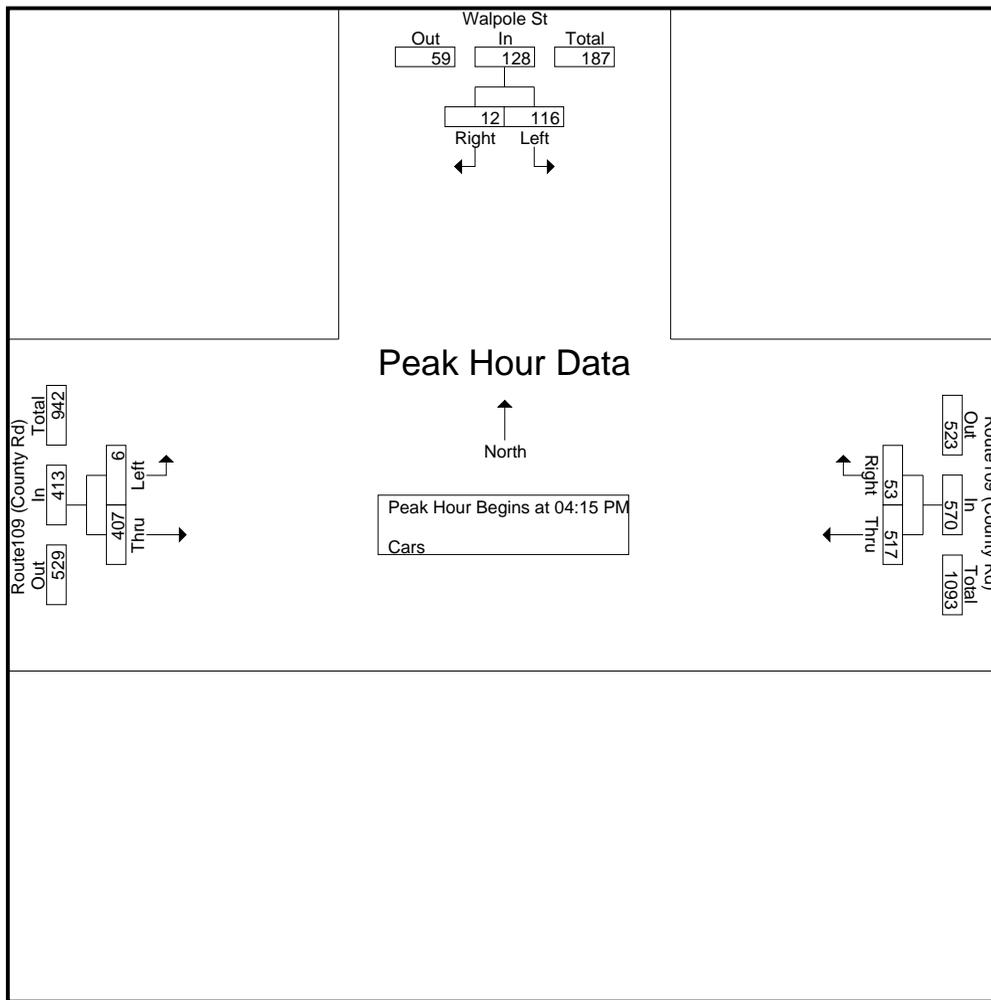
File Name : 87450001
Site Code : 87450001
Start Date : 10/21/2020
Page No : 4

Groups Printed- Cars

Start Time	Walpole St From North		Route109 (County Rd) From East		Route109 (County Rd) From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
04:00 PM	26	2	97	7	2	98	232
04:15 PM	33	4	116	15	1	108	277
04:30 PM	26	1	123	12	3	92	257
04:45 PM	31	4	146	13	1	102	297
Total	116	11	482	47	7	400	1063
05:00 PM	26	3	132	13	1	105	280
05:15 PM	26	0	133	10	1	96	266
05:30 PM	23	5	111	7	0	90	236
05:45 PM	36	2	74	15	5	111	243
Total	111	10	450	45	7	402	1025
Grand Total	227	21	932	92	14	802	2088
Apprch %	91.5	8.5	91	9	1.7	98.3	
Total %	10.9	1	44.6	4.4	0.7	38.4	

Start Time	Walpole St From North			Route109 (County Rd) From East			Route109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	33	4	37	116	15	131	1	108	109	277
04:30 PM	26	1	27	123	12	135	3	92	95	257
04:45 PM	31	4	35	146	13	159	1	102	103	297
05:00 PM	26	3	29	132	13	145	1	105	106	280
Total Volume	116	12	128	517	53	570	6	407	413	1111
% App. Total	90.6	9.4		90.7	9.3		1.5	98.5		
PHF	.879	.750	.865	.885	.883	.896	.500	.942	.947	.935

N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



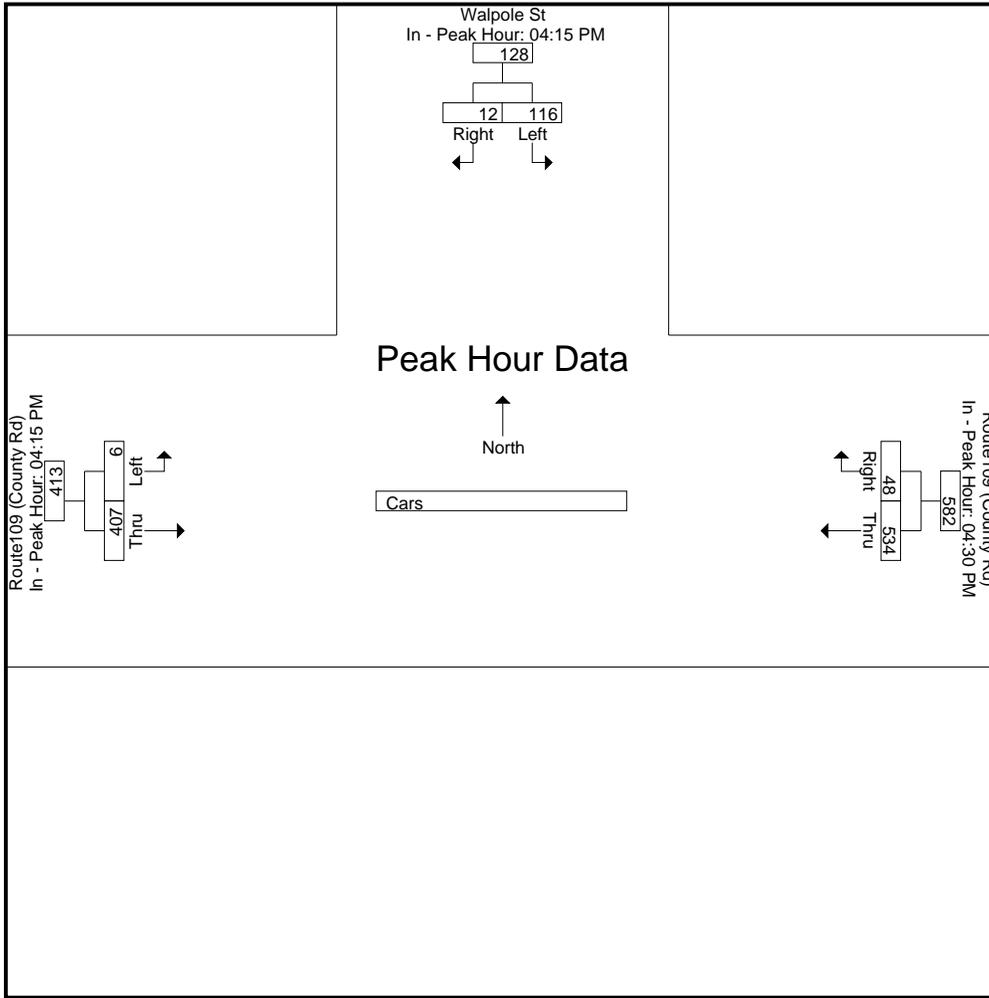
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:30 PM			04:15 PM		
+0 mins.	33	4	37	123	12	135	1	108	109
+15 mins.	26	1	27	146	13	159	3	92	95
+30 mins.	31	4	35	132	13	145	1	102	103
+45 mins.	26	3	29	133	10	143	1	105	106
Total Volume	116	12	128	534	48	582	6	407	413
% App. Total	90.6	9.4		91.8	8.2		1.5	98.5	
PHF	.879	.750	.865	.914	.923	.915	.500	.942	.947

Accurate Counts
978-664-2565

File Name : 87450001
 Site Code : 87450001
 Start Date : 10/21/2020
 Page No : 6

N/S Street : Walpole Street
 E/W Street : Route 109 (County Road)
 City/State : Dover, MA
 Weather : Cloudy



Accurate Counts
978-664-2565

N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy

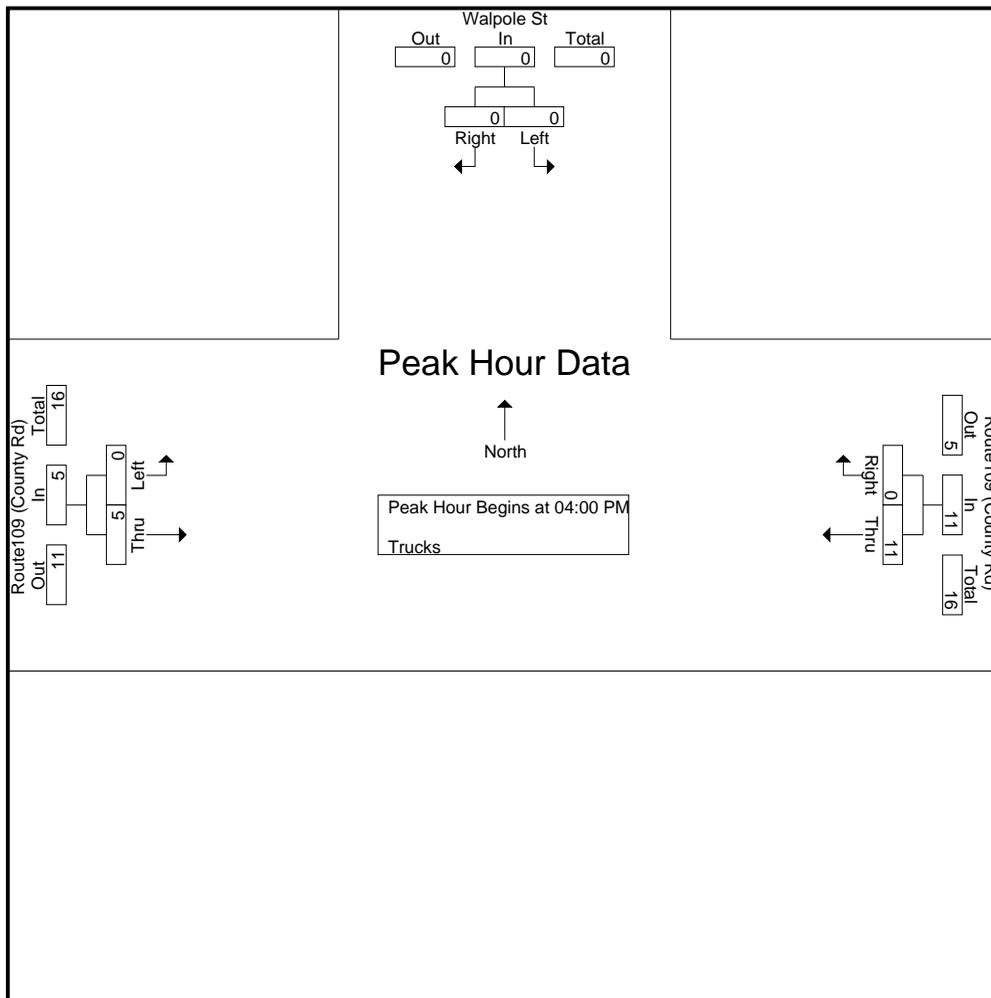
File Name : 87450001
Site Code : 87450001
Start Date : 10/21/2020
Page No : 7

Groups Printed- Trucks

Start Time	Walpole St From North		Route109 (County Rd) From East		Route109 (County Rd) From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
04:00 PM	0	0	3	0	0	1	4
04:15 PM	0	0	2	0	0	2	4
04:30 PM	0	0	1	0	0	0	1
04:45 PM	0	0	5	0	0	2	7
Total	0	0	11	0	0	5	16
05:00 PM	0	0	0	0	0	2	2
05:15 PM	0	0	0	0	0	1	1
05:30 PM	0	0	1	0	0	2	3
05:45 PM	0	0	2	0	0	1	3
Total	0	0	3	0	0	6	9
Grand Total	0	0	14	0	0	11	25
Apprch %	0	0	100	0	0	100	
Total %	0	0	56	0	0	44	

Start Time	Walpole St From North			Route109 (County Rd) From East			Route109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. 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	3	0	3	0	1	1	4
04:15 PM	0	0	0	2	0	2	0	2	2	4
04:30 PM	0	0	0	1	0	1	0	0	0	1
04:45 PM	0	0	0	5	0	5	0	2	2	7
Total Volume	0	0	0	11	0	11	0	5	5	16
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.550	.000	.550	.000	.625	.625	.571

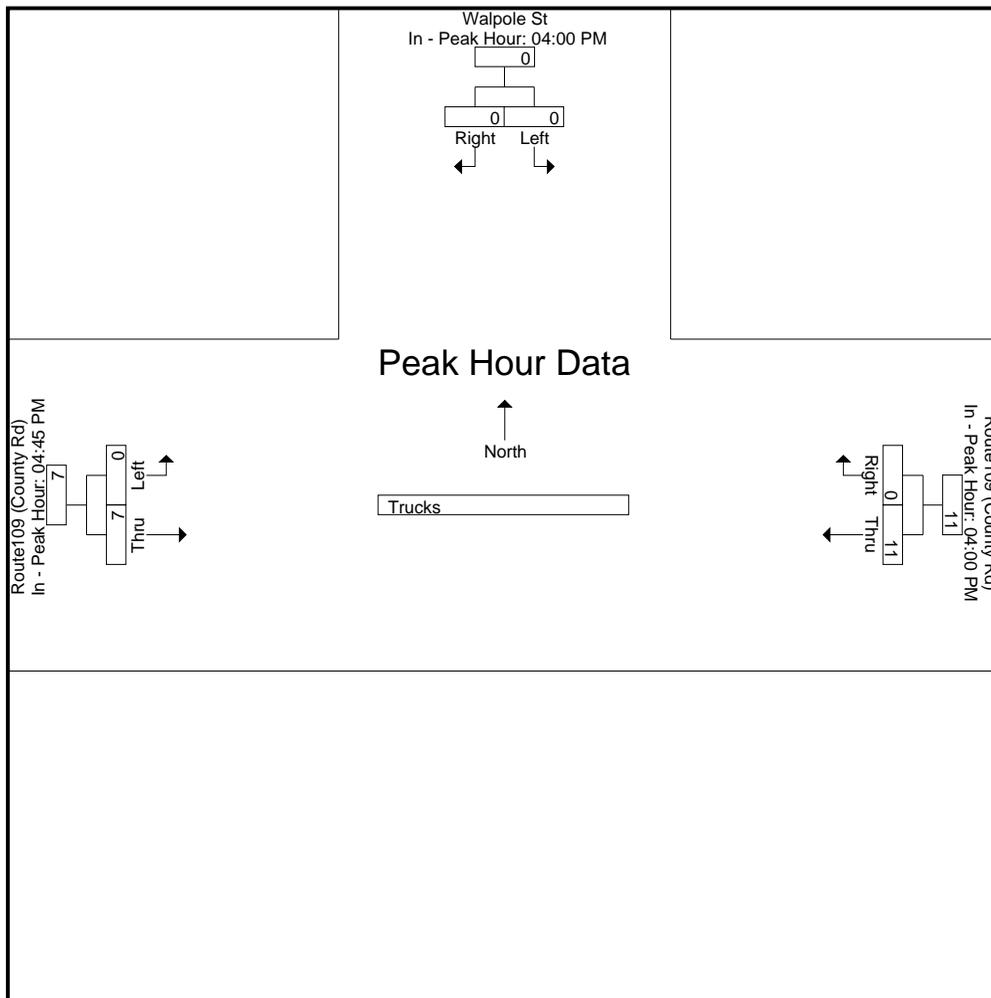
N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



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			04:45 PM		
+0 mins.	0	0	0	3	0	3	0	2	2
+15 mins.	0	0	0	2	0	2	0	2	2
+30 mins.	0	0	0	1	0	1	0	1	1
+45 mins.	0	0	0	5	0	5	0	2	2
Total Volume	0	0	0	11	0	11	0	7	7
% App. Total	0	0	0	100	0	100	0	100	100
PHF	.000	.000	.000	.550	.000	.550	.000	.875	.875

N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



Accurate Counts
978-664-2565

N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy

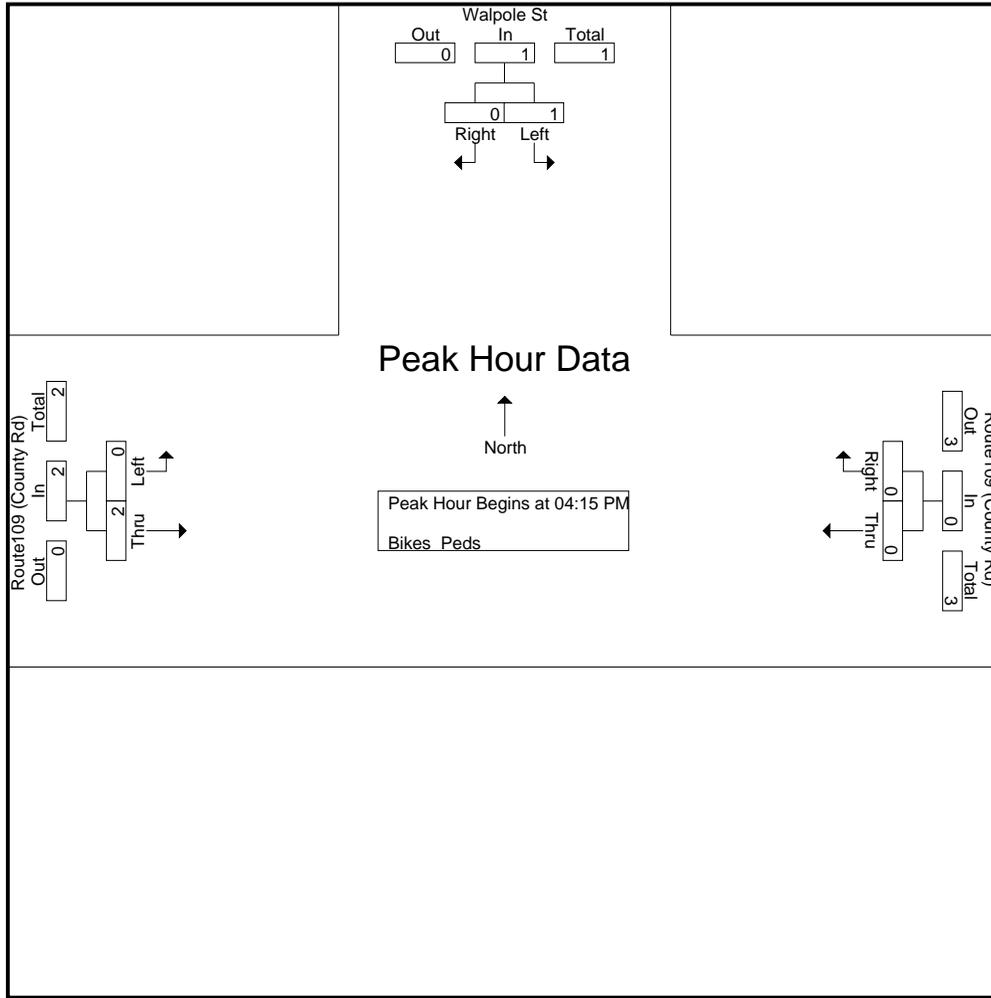
File Name : 87450001
Site Code : 87450001
Start Date : 10/21/2020
Page No : 10

Groups Printed- Bikes Peds

Start Time	Walpole St From North			Route109 (County Rd) From East			Route109 (County Rd) From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds			
04:00 PM	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
04:30 PM	0	0	0	0	0	0	0	1	0	0	1	1
04:45 PM	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	0	2	0	0	2	2
05:00 PM	1	0	0	0	0	0	0	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	1	0	0	0	0	0	1	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	0	0	0	0	0	2	2
Grand Total	1	0	0	0	1	0	0	2	0	0	4	4
Apprch %	100	0		0	100		0	100				
Total %	25	0		0	25		0	50			100	

Start Time	Walpole St From North			Route109 (County Rd) From East			Route109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	1	1	1
04:45 PM	0	0	0	0	0	0	0	1	1	1
05:00 PM	1	0	1	0	0	0	0	0	0	1
Total Volume	1	0	1	0	0	0	0	2	2	3
% App. Total	100	0		0	0		0	100		
PHF	.250	.000	.250	.000	.000	.000	.000	.500	.500	.750

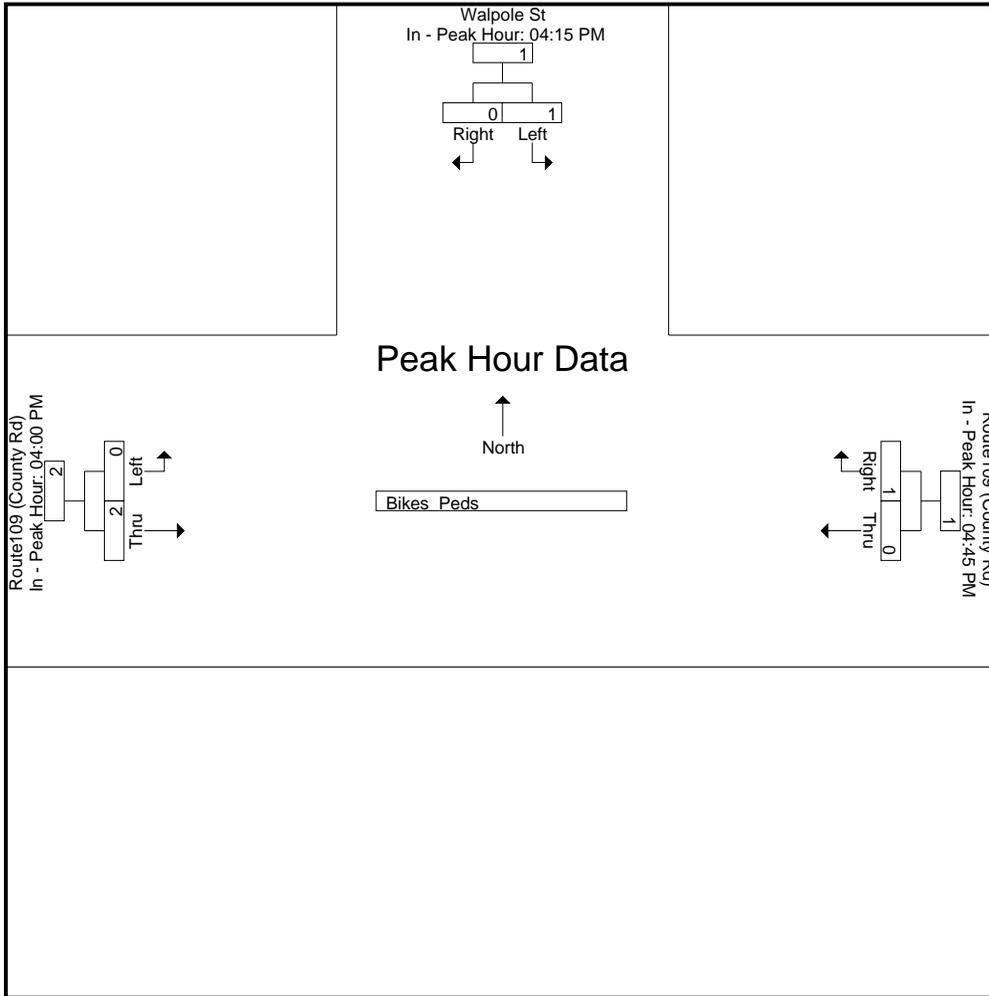
N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



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			04:45 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	1	1
+45 mins.	1	0	1	0	1	1	0	1	1
Total Volume	1	0	1	0	1	1	0	2	2
% App. Total	100	0		0	100		0	100	
PHF	.250	.000	.250	.000	.250	.250	.000	.500	.500

N/S Street : Walpole Street
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



Accurate Counts

978-664-2565

N/S Street : Draper Road
 E/W Street : Route 10- (County Road)
 City/State : Dover, MA
 Weather : Cloudy

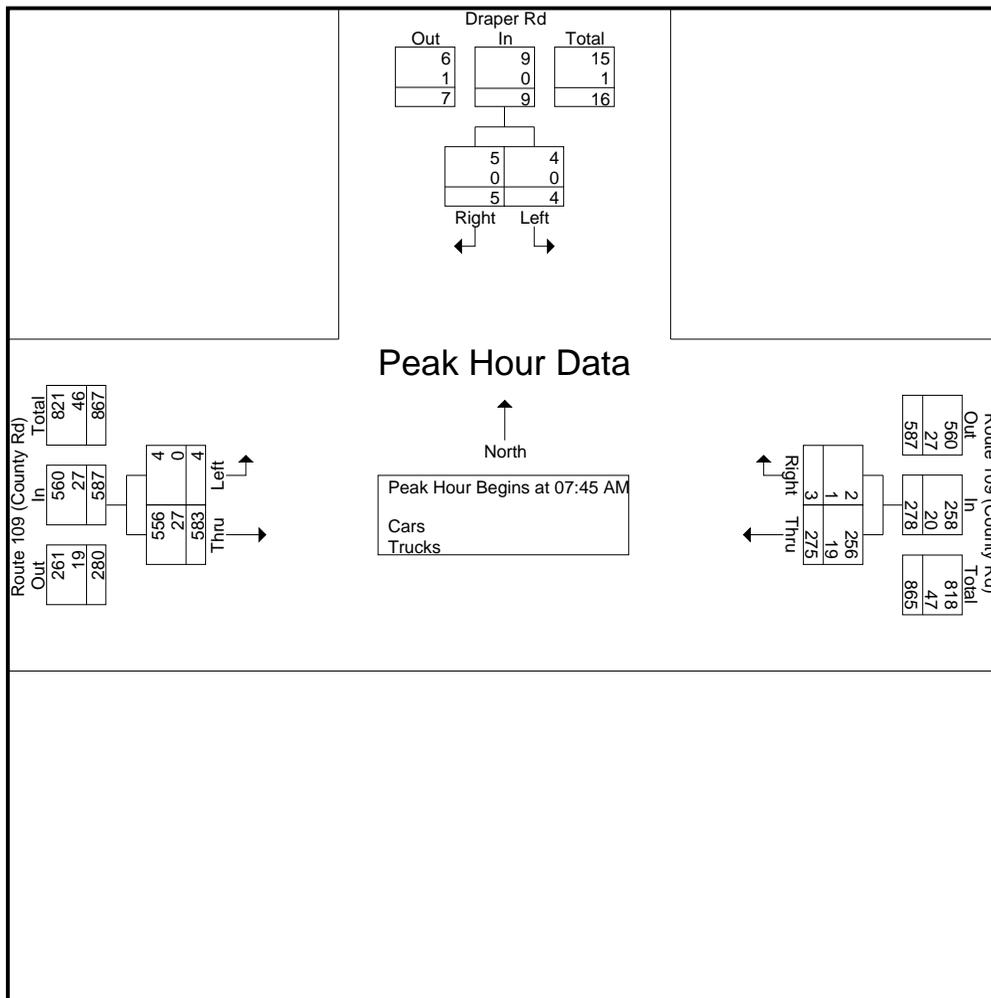
File Name : 87450002
 Site Code : 87450002
 Start Date : 10/21/2020
 Page No : 1

Groups Printed- Cars - Trucks

Start Time	Draper Rd From North		Route 109 (County Rd) From East		Route 109 (County Rd) From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	1	0	39	0	0	107	147
07:15 AM	0	0	52	1	1	123	177
07:30 AM	2	0	63	0	0	128	193
07:45 AM	1	0	66	0	2	173	242
Total	4	0	220	1	3	531	759
08:00 AM	2	1	56	2	1	157	219
08:15 AM	0	2	82	0	1	125	210
08:30 AM	1	2	71	1	0	128	203
08:45 AM	2	0	60	0	2	105	169
Total	5	5	269	3	4	515	801
Grand Total	9	5	489	4	7	1046	1560
Apprch %	64.3	35.7	99.2	0.8	0.7	99.3	
Total %	0.6	0.3	31.3	0.3	0.4	67.1	
Cars	9	5	456	3	7	992	1472
% Cars	100	100	93.3	75	100	94.8	94.4
Trucks	0	0	33	1	0	54	88
% Trucks	0	0	6.7	25	0	5.2	5.6

Start Time	Draper Rd From North			Route 109 (County Rd) From East			Route 109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	1	0	1	66	0	66	2	173	175	242
08:00 AM	2	1	3	56	2	58	1	157	158	219
08:15 AM	0	2	2	82	0	82	1	125	126	210
08:30 AM	1	2	3	71	1	72	0	128	128	203
Total Volume	4	5	9	275	3	278	4	583	587	874
% App. Total	44.4	55.6		98.9	1.1		0.7	99.3		
PHF	.500	.625	.750	.838	.375	.848	.500	.842	.839	.903
Cars	4	5	9	256	2	258	4	556	560	827
% Cars	100	100	100	93.1	66.7	92.8	100	95.4	95.4	94.6
Trucks	0	0	0	19	1	20	0	27	27	47
% Trucks	0	0	0	6.9	33.3	7.2	0	4.6	4.6	5.4

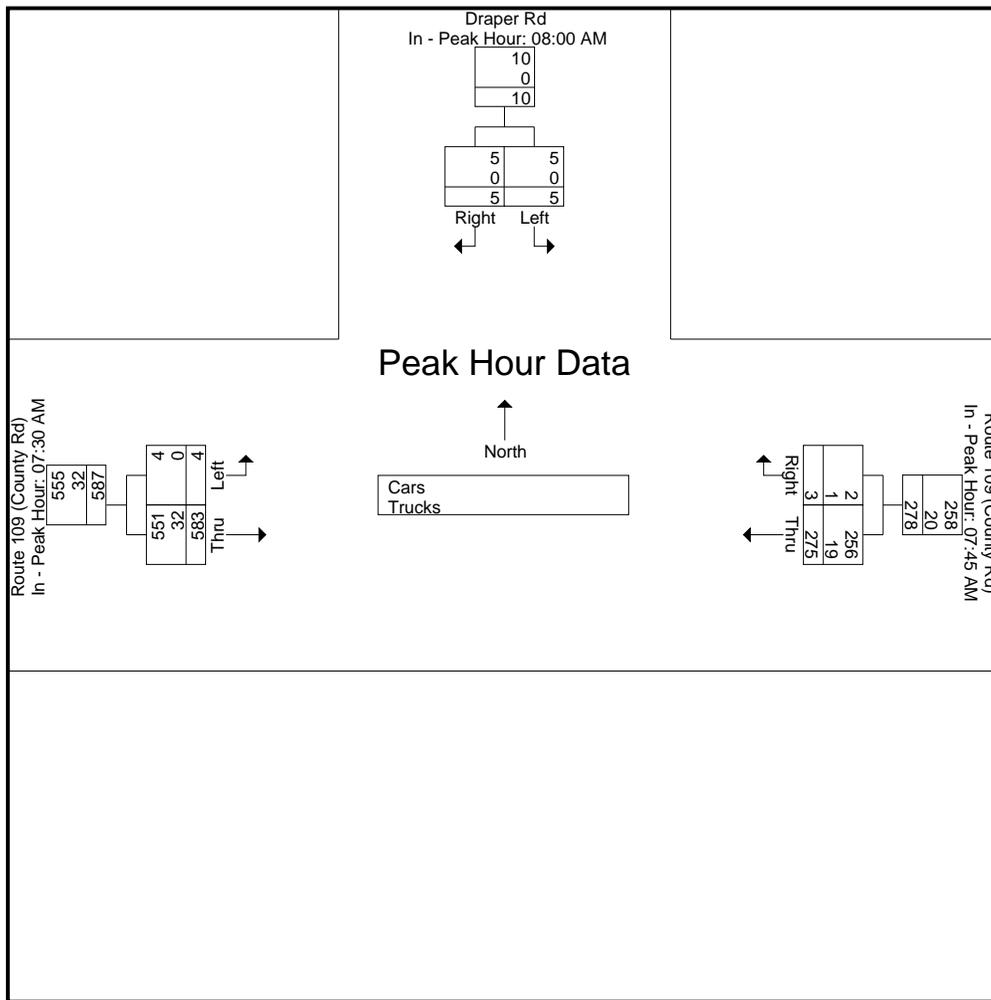
N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM			07:45 AM			07:30 AM		
+0 mins.	2	1	3	66	0	66	0	128	128
+15 mins.	0	2	2	56	2	58	2	173	175
+30 mins.	1	2	3	82	0	82	1	157	158
+45 mins.	2	0	2	71	1	72	1	125	126
Total Volume	5	5	10	275	3	278	4	583	587
% App. Total	50	50		98.9	1.1		0.7	99.3	
PHF	.625	.625	.833	.838	.375	.848	.500	.842	.839
Cars	5	5	10	256	2	258	4	551	555
% Cars	100	100	100	93.1	66.7	92.8	100	94.5	94.5
Trucks	0	0	0	19	1	20	0	32	32
% Trucks	0	0	0	6.9	33.3	7.2	0	5.5	5.5

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



Accurate Counts

978-664-2565

N/S Street : Draper Road
 E/W Street : Route 10- (County Road)
 City/State : Dover, MA
 Weather : Cloudy

File Name : 87450002
 Site Code : 87450002
 Start Date : 10/21/2020
 Page No : 4

Groups Printed- Cars

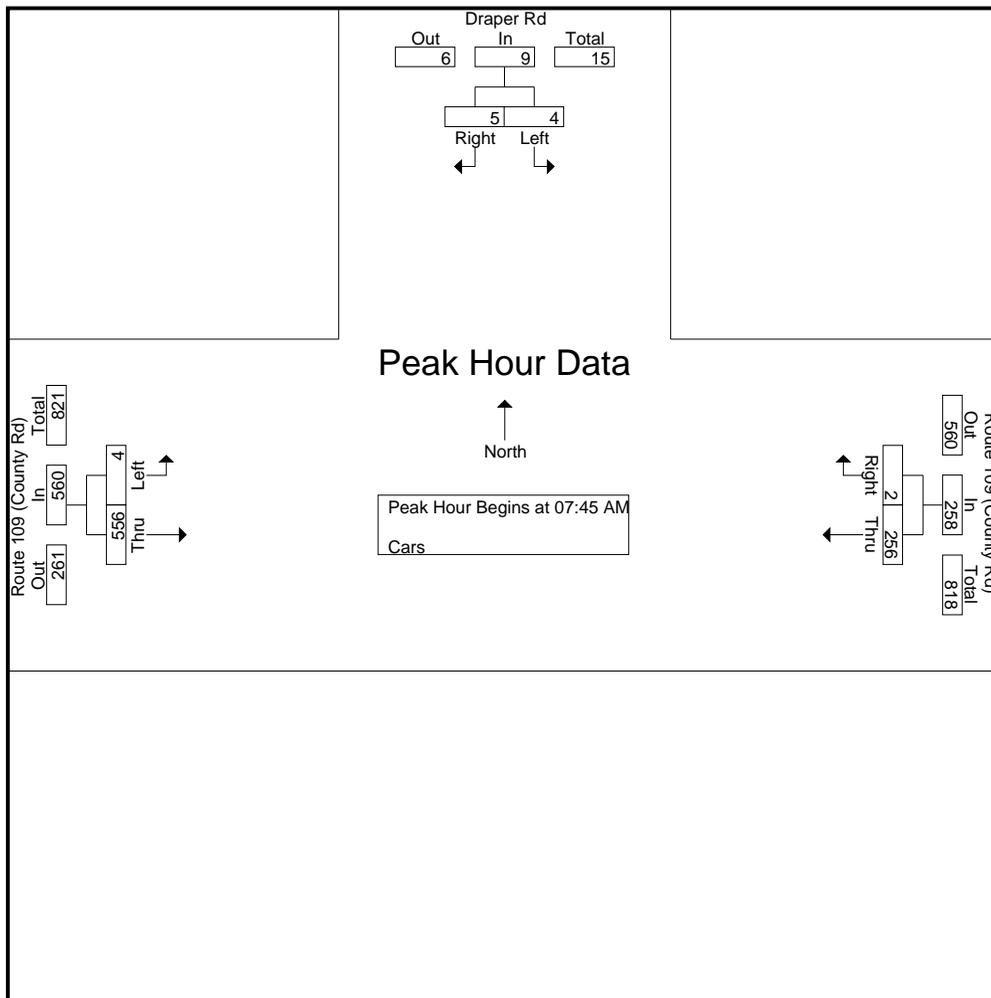
Start Time	Draper Rd From North		Route 109 (County Rd) From East		Route 109 (County Rd) From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	1	0	38	0	0	104	143
07:15 AM	0	0	49	1	1	117	168
07:30 AM	2	0	59	0	0	117	178
07:45 AM	1	0	62	0	2	168	233
Total	4	0	208	1	3	506	722
08:00 AM	2	1	48	1	1	147	200
08:15 AM	0	2	79	0	1	119	201
08:30 AM	1	2	67	1	0	122	193
08:45 AM	2	0	54	0	2	98	156
Total	5	5	248	2	4	486	750
Grand Total	9	5	456	3	7	992	1472
Apprch %	64.3	35.7	99.3	0.7	0.7	99.3	
Total %	0.6	0.3	31	0.2	0.5	67.4	

Start Time	Draper Rd From North			Route 109 (County Rd) From East			Route 109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	1	0	1	62	0	62	2	168	170	233
08:00 AM	2	1	3	48	1	49	1	147	148	200
08:15 AM	0	2	2	79	0	79	1	119	120	201
08:30 AM	1	2	3	67	1	68	0	122	122	193
Total Volume	4	5	9	256	2	258	4	556	560	827
% App. Total	44.4	55.6		99.2	0.8		0.7	99.3		
PHF	.500	.625	.750	.810	.500	.816	.500	.827	.824	.887

Accurate Counts
978-664-2565

File Name : 87450002
Site Code : 87450002
Start Date : 10/21/2020
Page No : 5

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



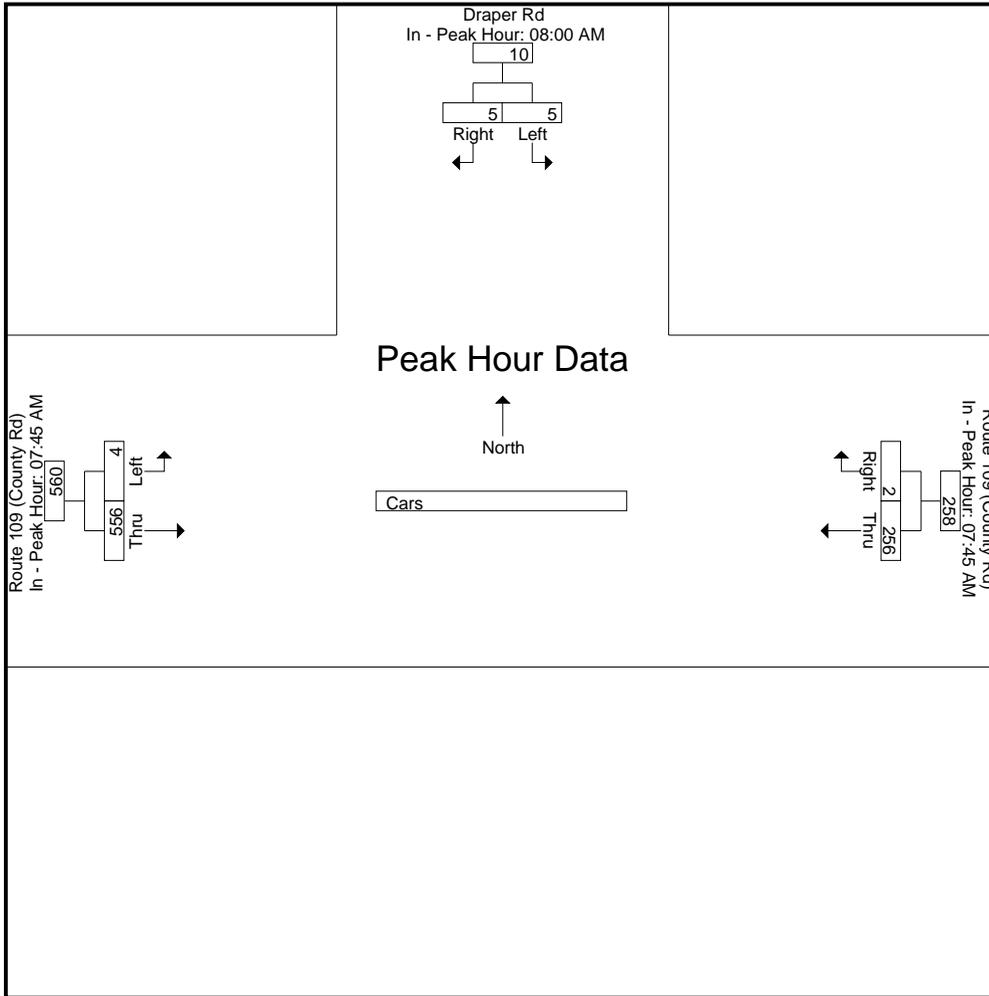
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM			07:45 AM			07:45 AM		
+0 mins.	2	1	3	62	0	62	2	168	170
+15 mins.	0	2	2	48	1	49	1	147	148
+30 mins.	1	2	3	79	0	79	1	119	120
+45 mins.	2	0	2	67	1	68	0	122	122
Total Volume	5	5	10	256	2	258	4	556	560
% App. Total	50	50		99.2	0.8		0.7	99.3	
PHF	.625	.625	.833	.810	.500	.816	.500	.827	.824

Accurate Counts
978-664-2565

File Name : 87450002
Site Code : 87450002
Start Date : 10/21/2020
Page No : 6

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



Accurate Counts

978-664-2565

N/S Street : Draper Road
 E/W Street : Route 10- (County Road)
 City/State : Dover, MA
 Weather : Cloudy

File Name : 87450002
 Site Code : 87450002
 Start Date : 10/21/2020
 Page No : 7

Groups Printed- Trucks

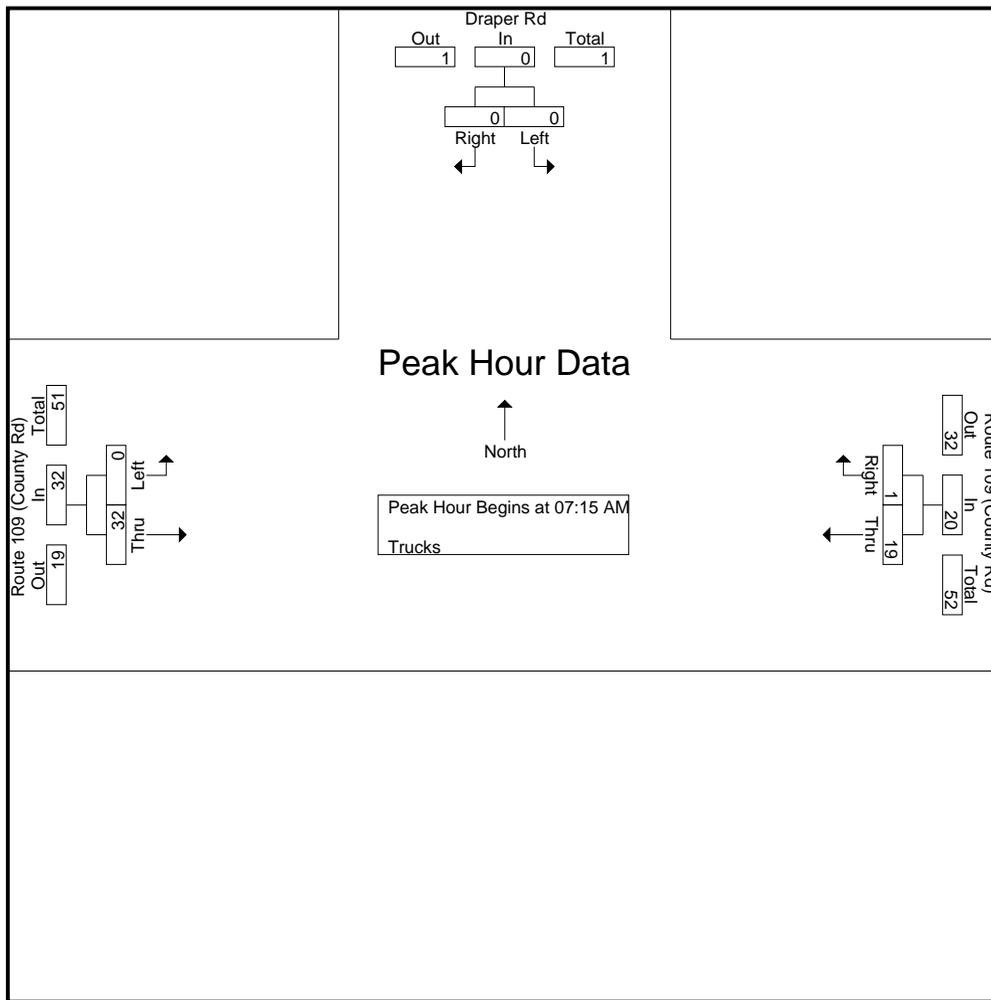
Start Time	Draper Rd From North		Route 109 (County Rd) From East		Route 109 (County Rd) From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
07:00 AM	0	0	1	0	0	3	4
07:15 AM	0	0	3	0	0	6	9
07:30 AM	0	0	4	0	0	11	15
07:45 AM	0	0	4	0	0	5	9
Total	0	0	12	0	0	25	37
08:00 AM	0	0	8	1	0	10	19
08:15 AM	0	0	3	0	0	6	9
08:30 AM	0	0	4	0	0	6	10
08:45 AM	0	0	6	0	0	7	13
Total	0	0	21	1	0	29	51
Grand Total	0	0	33	1	0	54	88
Apprch %	0	0	97.1	2.9	0	100	
Total %	0	0	37.5	1.1	0	61.4	

Start Time	Draper Rd From North			Route 109 (County Rd) From East			Route 109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	3	0	3	0	6	6	9
07:30 AM	0	0	0	4	0	4	0	11	11	15
07:45 AM	0	0	0	4	0	4	0	5	5	9
08:00 AM	0	0	0	8	1	9	0	10	10	19
Total Volume	0	0	0	19	1	20	0	32	32	52
% App. Total	0	0		95	5		0	100		
PHF	.000	.000	.000	.594	.250	.556	.000	.727	.727	.684

Accurate Counts
978-664-2565

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy

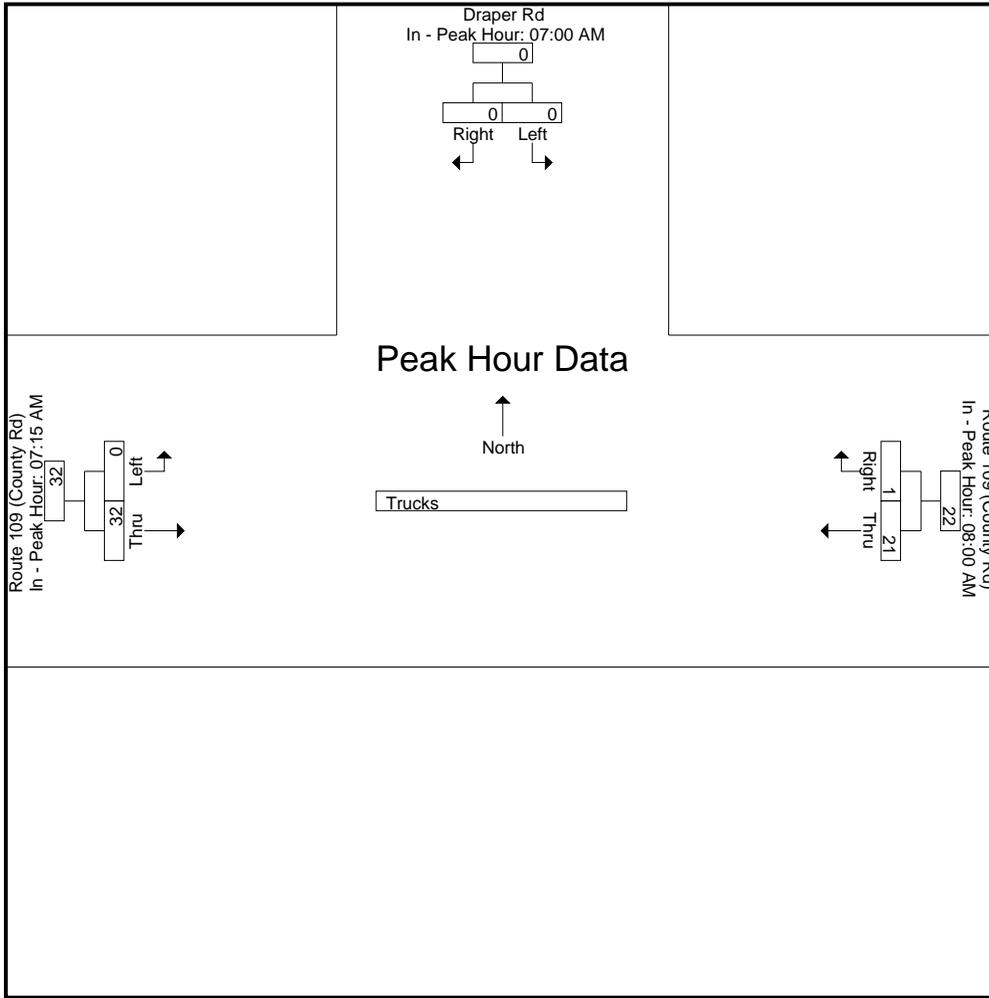
File Name : 87450002
Site Code : 87450002
Start Date : 10/21/2020
Page No : 8



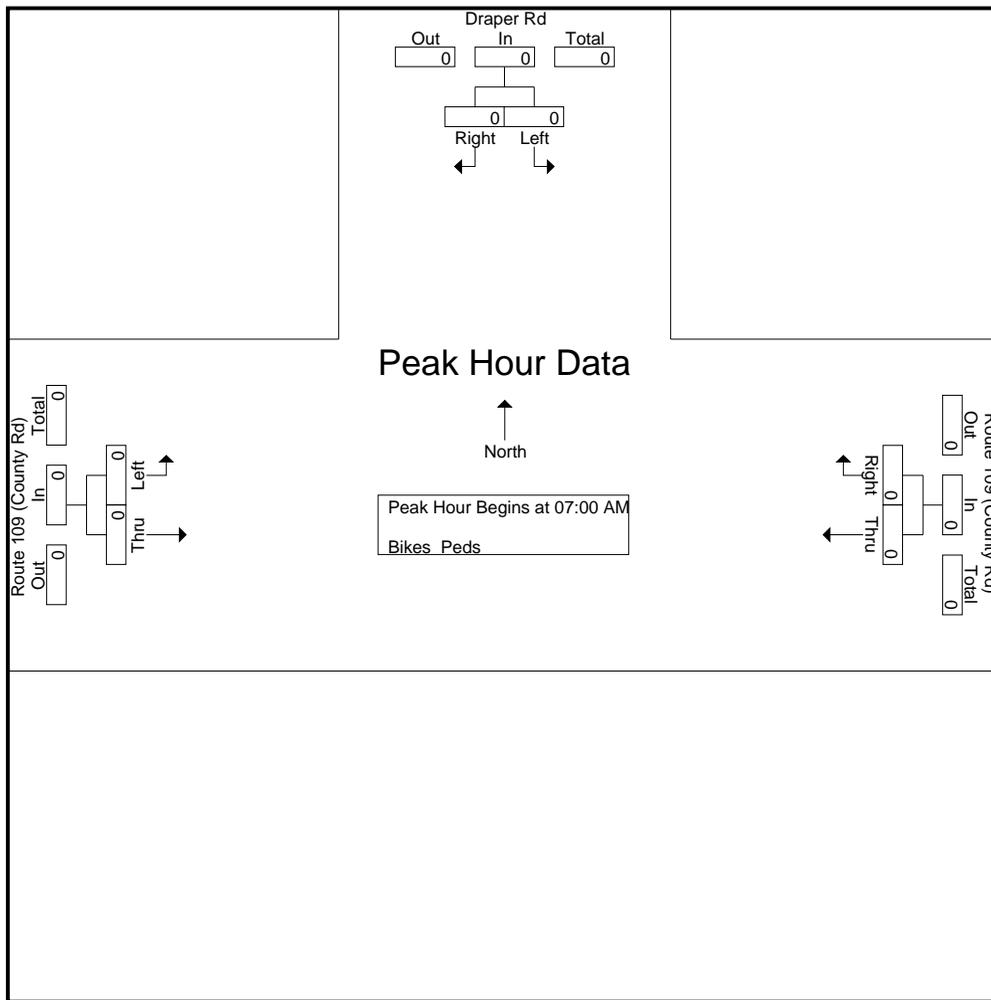
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			08:00 AM			07:15 AM		
+0 mins.	0	0	0	8	1	9	0	6	6
+15 mins.	0	0	0	3	0	3	0	11	11
+30 mins.	0	0	0	4	0	4	0	5	5
+45 mins.	0	0	0	6	0	6	0	10	10
Total Volume	0	0	0	21	1	22	0	32	32
% App. Total	0	0	0	95.5	4.5		0	100	
PHF	.000	.000	.000	.656	.250	.611	.000	.727	.727

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



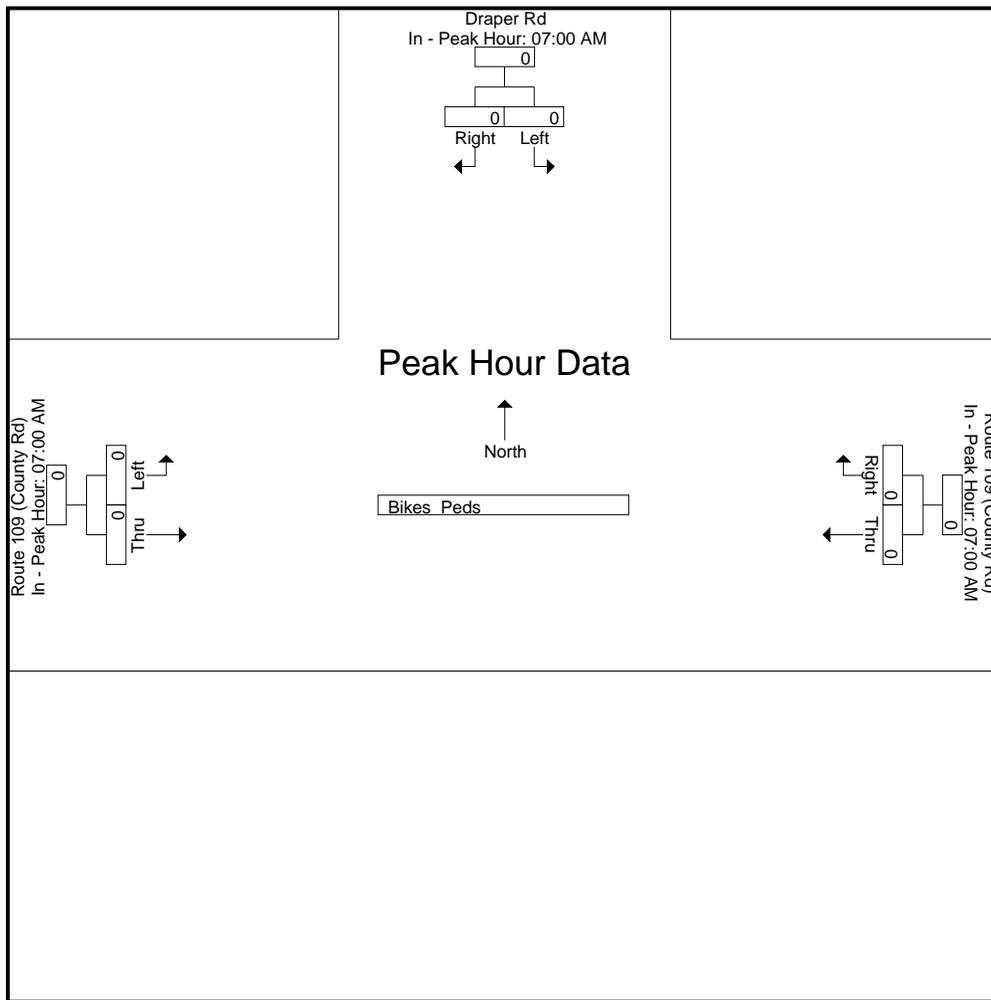
N/S Street : Draper Road
E/W Street : Route 109 (County Road)
City/State : Dover, MA
Weather : Cloudy



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		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



Accurate Counts
978-664-2565

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy

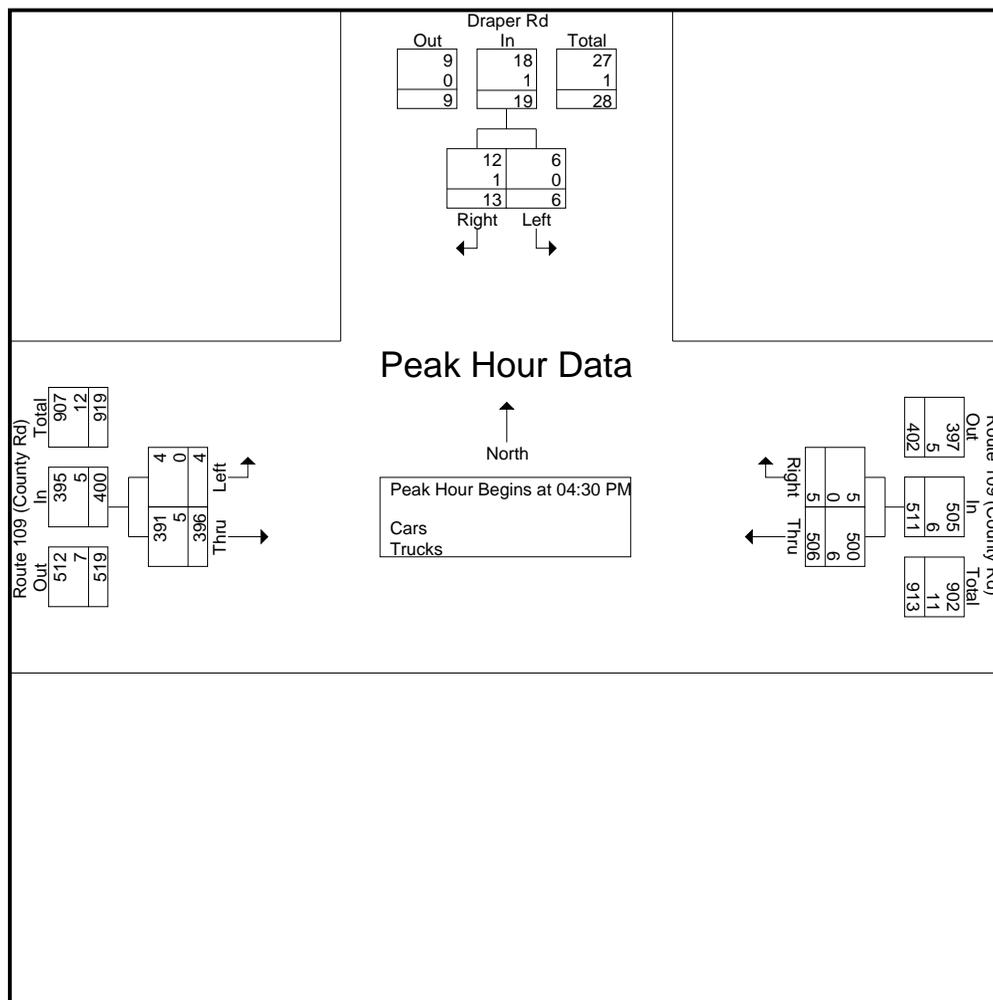
File Name : 87450002
Site Code : 87450002
Start Date : 10/21/2020
Page No : 1

Groups Printed- Cars - Trucks

Start Time	Draper Rd From North		Route 109 (County Rd) From East		Route 109 (County Rd) From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
04:00 PM	0	3	105	0	1	95	204
04:15 PM	0	2	112	1	0	112	227
04:30 PM	1	3	118	1	2	89	214
04:45 PM	1	2	136	1	2	102	244
Total	2	10	471	3	5	398	889
05:00 PM	1	5	121	2	0	105	234
05:15 PM	3	3	131	1	0	100	238
05:30 PM	0	3	109	2	1	87	202
05:45 PM	1	6	69	2	0	107	185
Total	5	17	430	7	1	399	859
Grand Total	7	27	901	10	6	797	1748
Apprch %	20.6	79.4	98.9	1.1	0.7	99.3	
Total %	0.4	1.5	51.5	0.6	0.3	45.6	
Cars	7	26	887	10	6	787	1723
% Cars	100	96.3	98.4	100	100	98.7	98.6
Trucks	0	1	14	0	0	10	25
% Trucks	0	3.7	1.6	0	0	1.3	1.4

Start Time	Draper Rd From North			Route 109 (County Rd) From East			Route 109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	1	3	4	118	1	119	2	89	91	214
04:45 PM	1	2	3	136	1	137	2	102	104	244
05:00 PM	1	5	6	121	2	123	0	105	105	234
05:15 PM	3	3	6	131	1	132	0	100	100	238
Total Volume	6	13	19	506	5	511	4	396	400	930
% App. Total	31.6	68.4		99	1		1	99		
PHF	.500	.650	.792	.930	.625	.932	.500	.943	.952	.953
Cars	6	12	18	500	5	505	4	391	395	918
% Cars	100	92.3	94.7	98.8	100	98.8	100	98.7	98.8	98.7
Trucks	0	1	1	6	0	6	0	5	5	12
% Trucks	0	7.7	5.3	1.2	0	1.2	0	1.3	1.3	1.3

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy

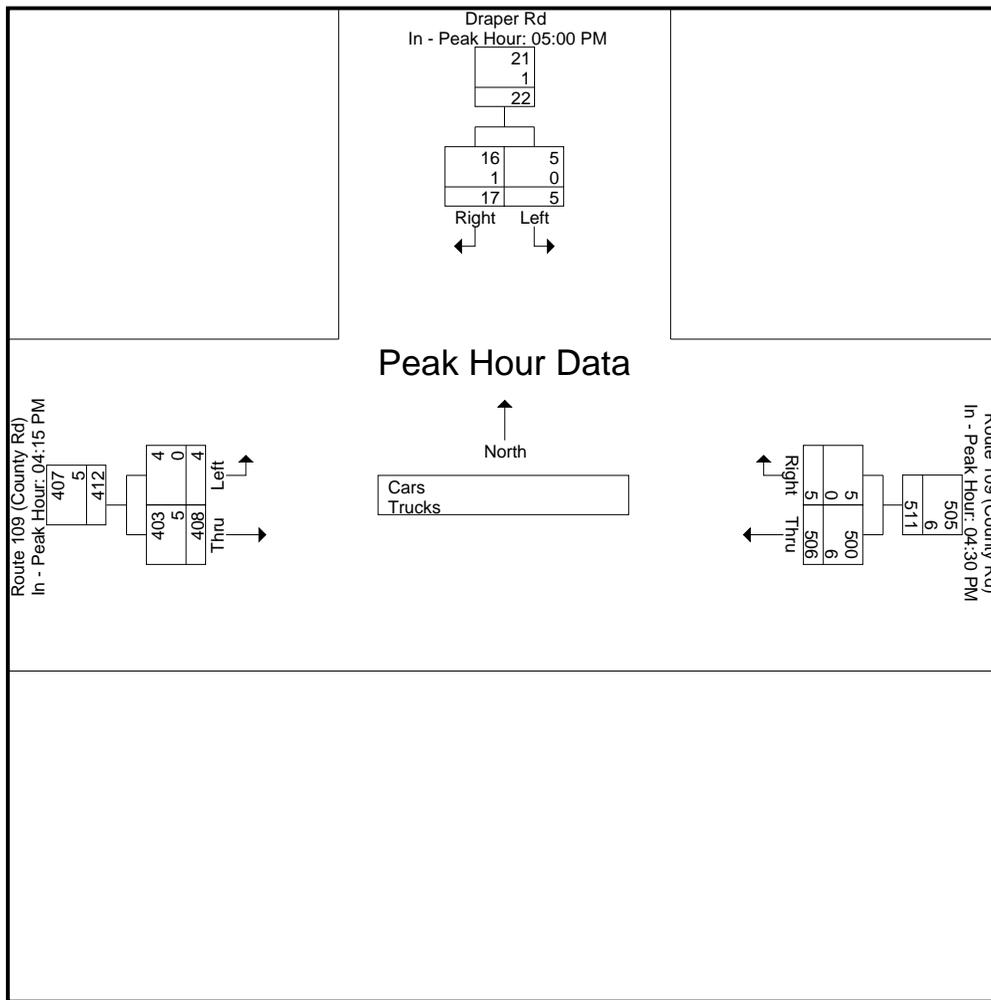


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			04:30 PM			04:15 PM		
+0 mins.	1	5	6	118	1	119	0	112	112
+15 mins.	3	3	6	136	1	137	2	89	91
+30 mins.	0	3	3	121	2	123	2	102	104
+45 mins.	1	6	7	131	1	132	0	105	105
Total Volume	5	17	22	506	5	511	4	408	412
% App. Total	22.7	77.3		99	1	99	1	99	
PHF	.417	.708	.786	.930	.625	.932	.500	.911	.920
Cars	5	16	21	500	5	505	4	403	407
% Cars	100	94.1	95.5	98.8	100	98.8	100	98.8	98.8
Trucks	0	1	1	6	0	6	0	5	5
% Trucks	0	5.9	4.5	1.2	0	1.2	0	1.2	1.2

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



Accurate Counts

978-664-2565

N/S Street : Draper Road
 E/W Street : Route 10- (County Road)
 City/State : Dover, MA
 Weather : Cloudy

File Name : 87450002
 Site Code : 87450002
 Start Date : 10/21/2020
 Page No : 4

Groups Printed- Cars

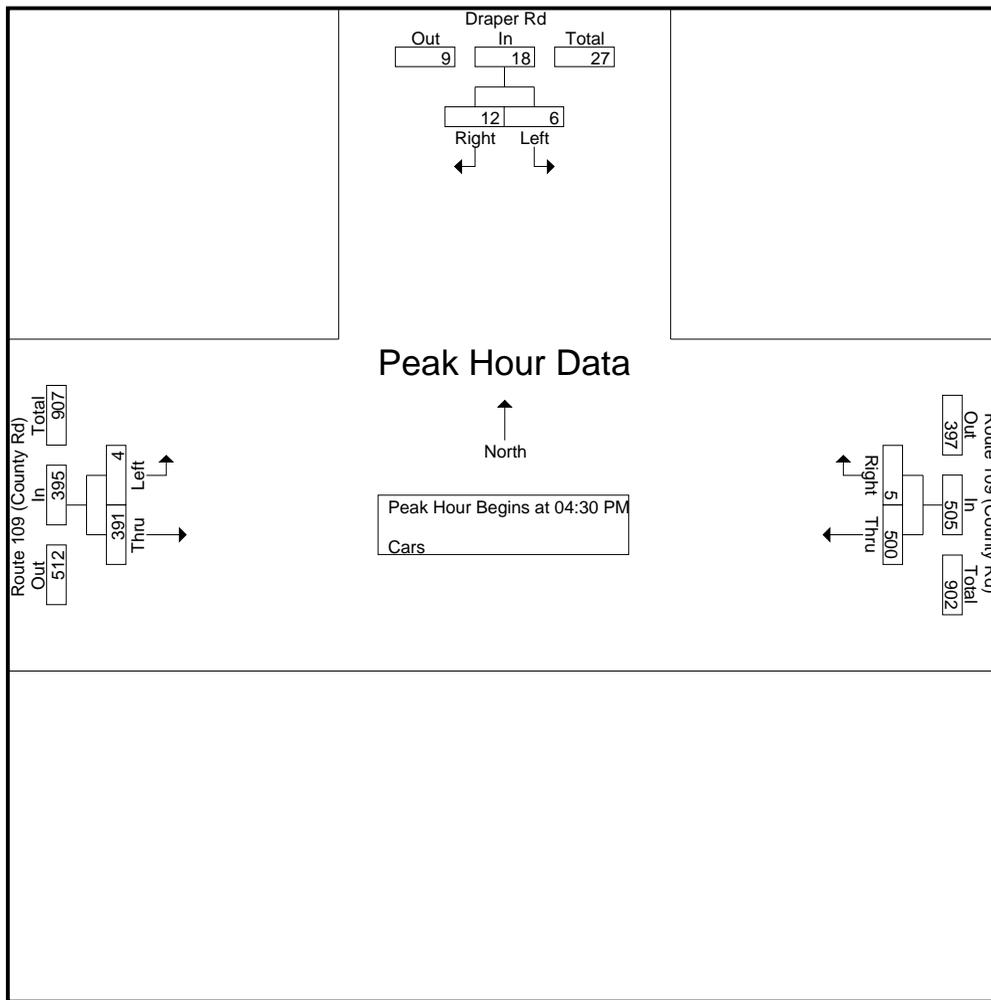
Start Time	Draper Rd From North		Route 109 (County Rd) From East		Route 109 (County Rd) From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
04:00 PM	0	3	102	0	1	94	200
04:15 PM	0	2	110	1	0	111	224
04:30 PM	1	3	116	1	2	89	212
04:45 PM	1	2	132	1	2	100	238
Total	2	10	460	3	5	394	874
05:00 PM	1	4	121	2	0	103	231
05:15 PM	3	3	131	1	0	99	237
05:30 PM	0	3	108	2	1	86	200
05:45 PM	1	6	67	2	0	105	181
Total	5	16	427	7	1	393	849
Grand Total	7	26	887	10	6	787	1723
Apprch %	21.2	78.8	98.9	1.1	0.8	99.2	
Total %	0.4	1.5	51.5	0.6	0.3	45.7	

Start Time	Draper Rd From North			Route 109 (County Rd) From East			Route 109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	1	3	4	116	1	117	2	89	91	212
04:45 PM	1	2	3	132	1	133	2	100	102	238
05:00 PM	1	4	5	121	2	123	0	103	103	231
05:15 PM	3	3	6	131	1	132	0	99	99	237
Total Volume	6	12	18	500	5	505	4	391	395	918
% App. Total	33.3	66.7		99	1		1	99		
PHF	.500	.750	.750	.947	.625	.949	.500	.949	.959	.964

Accurate Counts
978-664-2565

File Name : 87450002
Site Code : 87450002
Start Date : 10/21/2020
Page No : 5

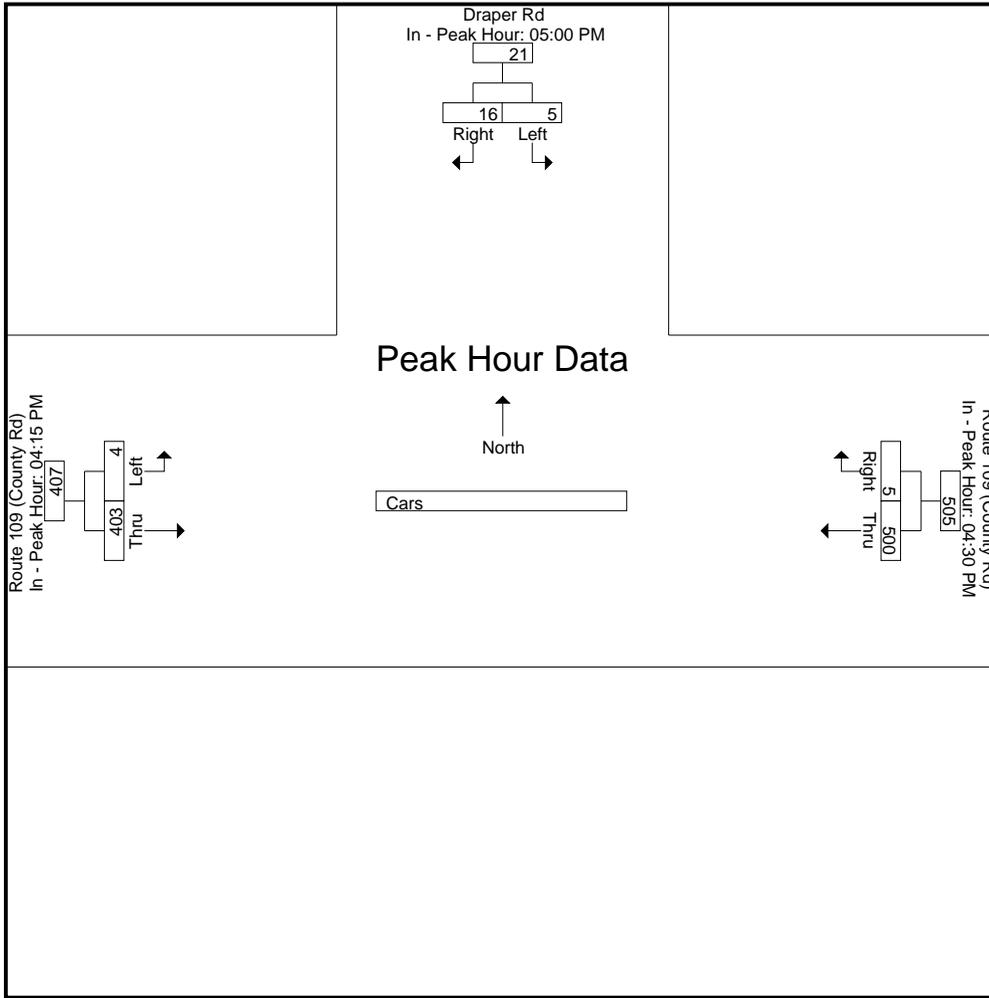
N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			04:30 PM			04:15 PM		
+0 mins.	1	4	5	116	1	117	0	111	111
+15 mins.	3	3	6	132	1	133	2	89	91
+30 mins.	0	3	3	121	2	123	2	100	102
+45 mins.	1	6	7	131	1	132	0	103	103
Total Volume	5	16	21	500	5	505	4	403	407
% App. Total	23.8	76.2		99	1	99	1	99	
PHF	.417	.667	.750	.947	.625	.949	.500	.908	.917

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



Accurate Counts
978-664-2565

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy

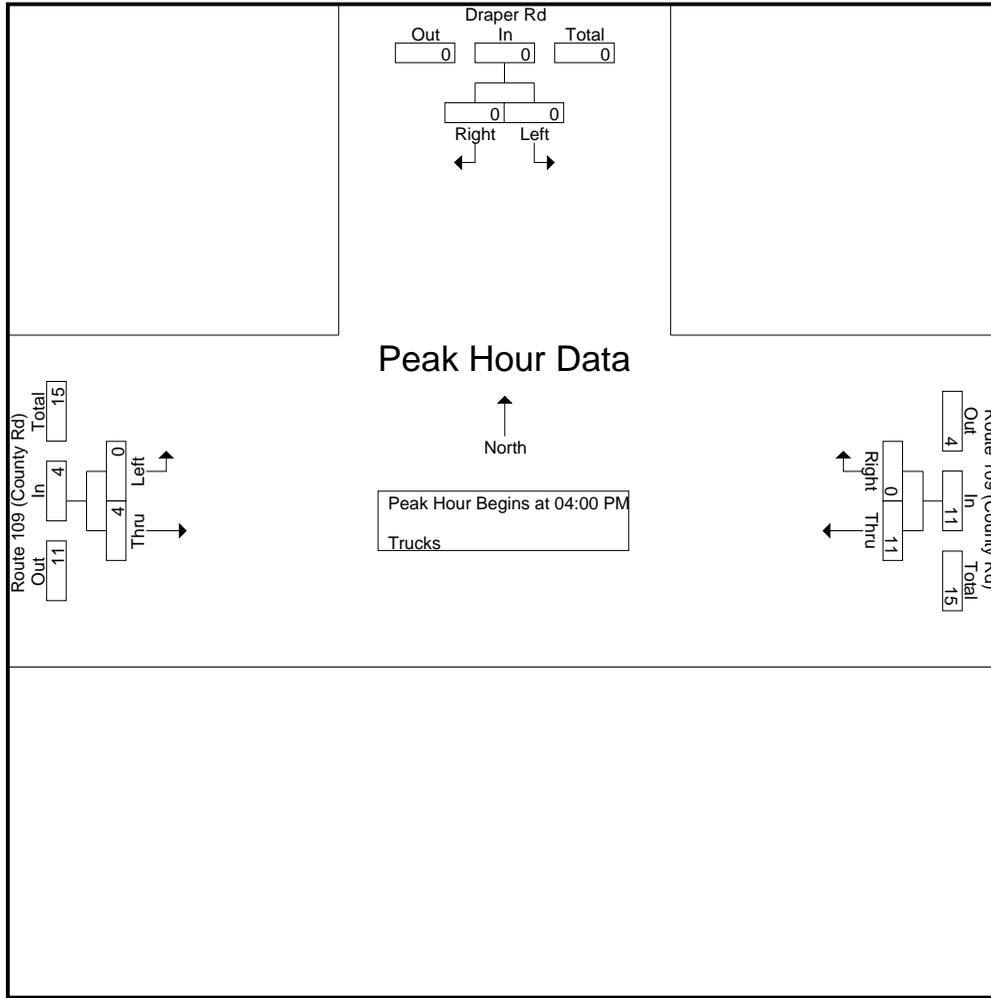
File Name : 87450002
Site Code : 87450002
Start Date : 10/21/2020
Page No : 7

Groups Printed- Trucks

Start Time	Draper Rd From North		Route 109 (County Rd) From East		Route 109 (County Rd) From West		Int. Total
	Left	Right	Thru	Right	Left	Thru	
04:00 PM	0	0	3	0	0	1	4
04:15 PM	0	0	2	0	0	1	3
04:30 PM	0	0	2	0	0	0	2
04:45 PM	0	0	4	0	0	2	6
Total	0	0	11	0	0	4	15
05:00 PM	0	1	0	0	0	2	3
05:15 PM	0	0	0	0	0	1	1
05:30 PM	0	0	1	0	0	1	2
05:45 PM	0	0	2	0	0	2	4
Total	0	1	3	0	0	6	10
Grand Total	0	1	14	0	0	10	25
Apprch %	0	100	100	0	0	100	
Total %	0	4	56	0	0	40	

Start Time	Draper Rd From North			Route 109 (County Rd) From East			Route 109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. 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	3	0	3	0	1	1	4
04:15 PM	0	0	0	2	0	2	0	1	1	3
04:30 PM	0	0	0	2	0	2	0	0	0	2
04:45 PM	0	0	0	4	0	4	0	2	2	6
Total Volume	0	0	0	11	0	11	0	4	4	15
% App. Total	0	0		100	0		0	100		
PHF	.000	.000	.000	.688	.000	.688	.000	.500	.500	.625

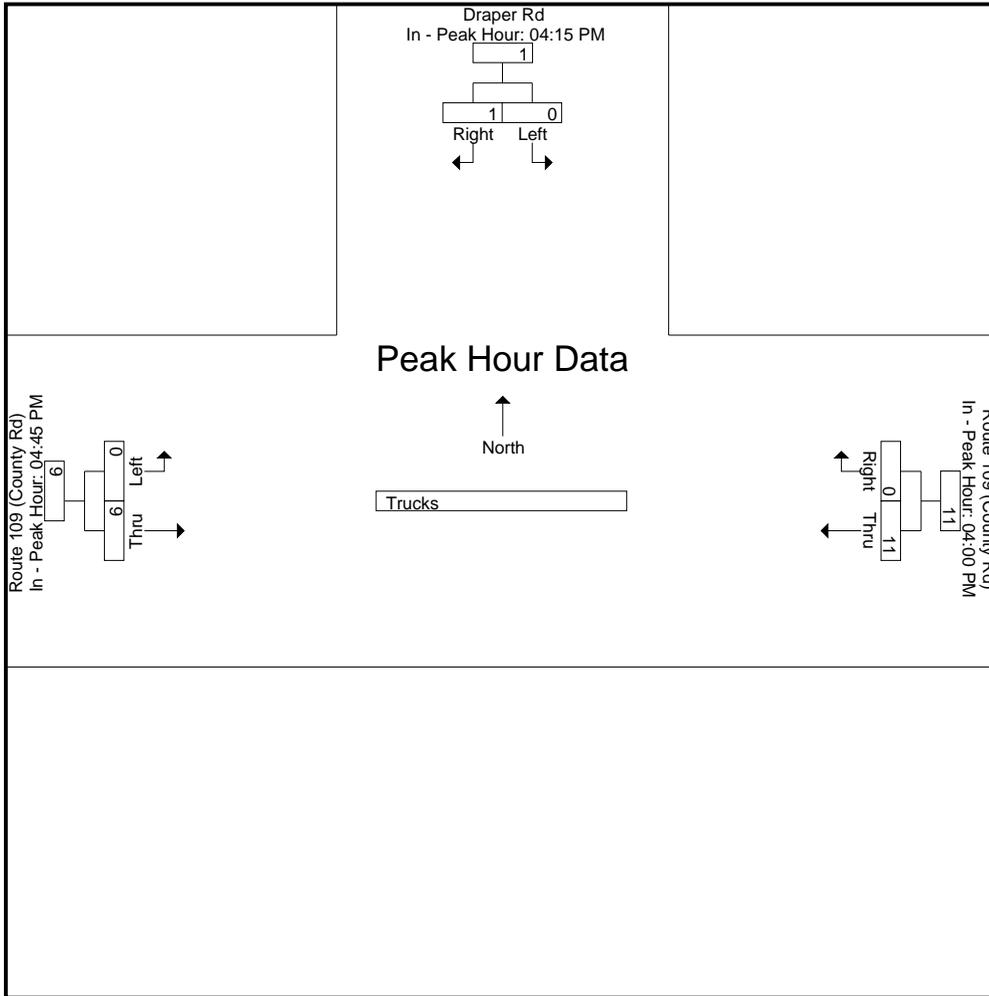
N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



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			04:00 PM			04:45 PM		
+0 mins.	0	0	0	3	0	3	0	2	2
+15 mins.	0	0	0	2	0	2	0	2	2
+30 mins.	0	0	0	2	0	2	0	1	1
+45 mins.	0	1	1	4	0	4	0	1	1
Total Volume	0	1	1	11	0	11	0	6	6
% App. Total	0	100		100	0		0	100	
PHF	.000	.250	.250	.688	.000	.688	.000	.750	.750

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



Accurate Counts
978-664-2565

File Name : 87450002
Site Code : 87450002
Start Date : 10/21/2020
Page No : 10

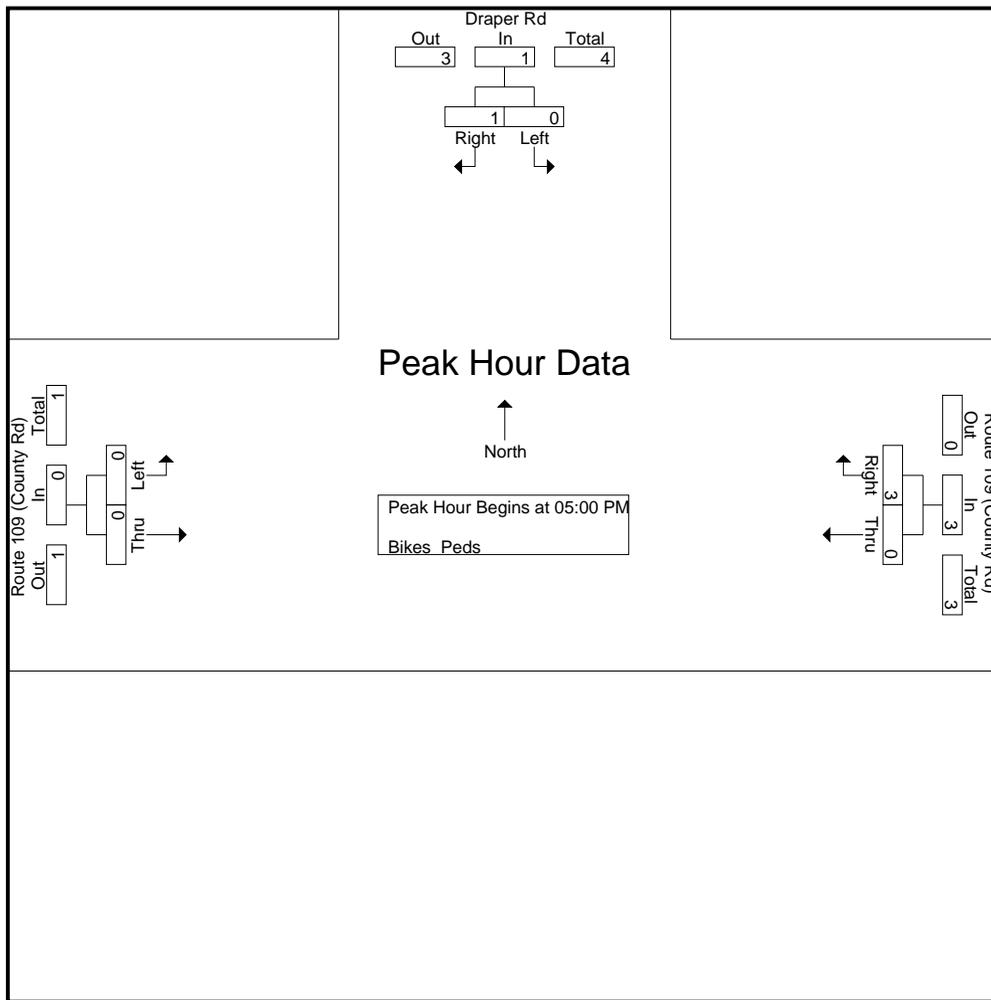
N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy

Groups Printed- Bikes Peds

Start Time	Draper Rd From North			Route 109 (County Rd) From East			Route 109 (County Rd) From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds			
04:00 PM	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
04:30 PM	0	0	0	0	0	0	0	1	0	0	1	1
04:45 PM	1	0	0	0	0	0	0	0	0	0	1	1
Total	1	0	0	0	0	0	0	1	0	0	2	2
05:00 PM	0	0	0	0	0	2	0	0	0	2	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	2	0	0	0	3	3	2	5
05:45 PM	0	1	1	0	1	0	0	0	0	1	2	3
Total	0	1	1	0	3	2	0	0	3	6	4	10
Grand Total	1	1	1	0	3	2	0	1	3	6	6	12
Apprch %	50	50		0	100		0	100				
Total %	16.7	16.7		0	50		0	16.7		50	50	

Start Time	Draper Rd From North			Route 109 (County Rd) From East			Route 109 (County Rd) From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	2	2	0	0	0	2
05:45 PM	0	1	1	0	1	1	0	0	0	2
Total Volume	0	1	1	0	3	3	0	0	0	4
% App. Total	0	100		0	100		0	0		
PHF	.000	.250	.250	.000	.375	.375	.000	.000	.000	.500

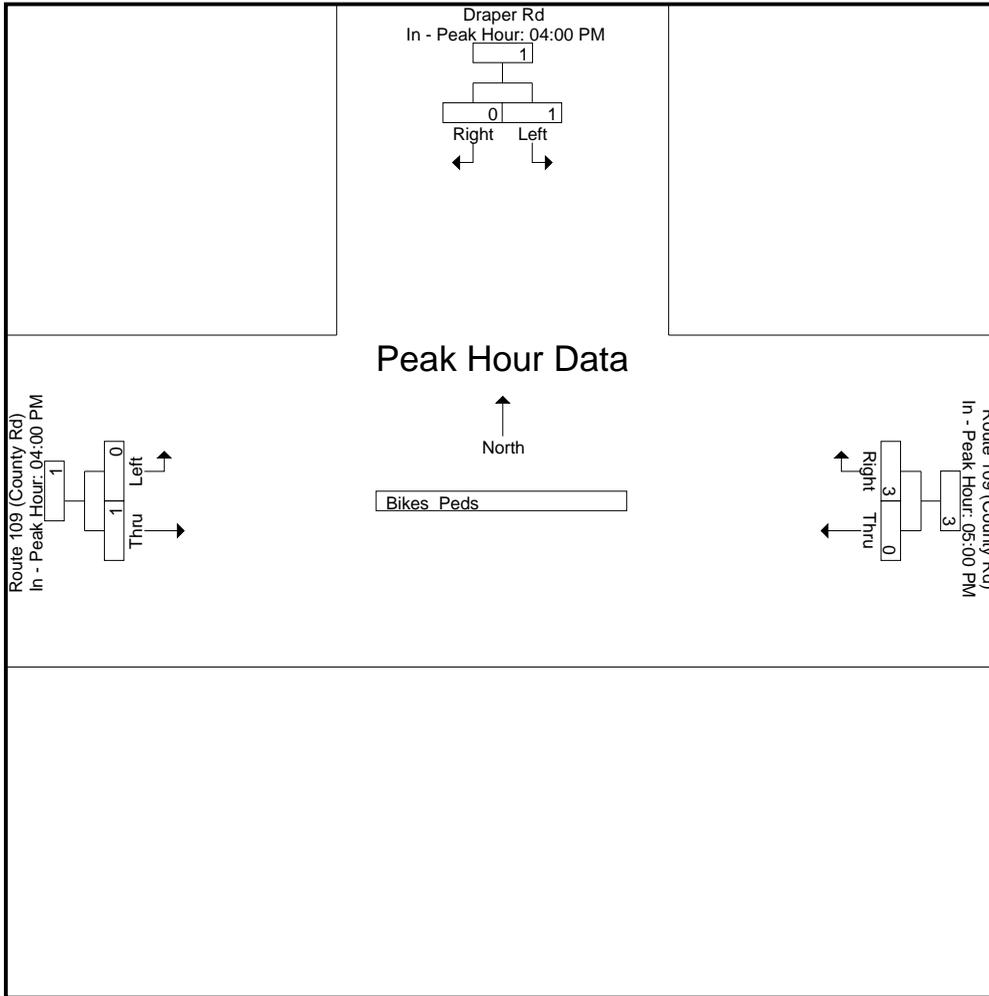
N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



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			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	2	2	0	1	1
+45 mins.	1	0	1	0	1	1	0	0	0
Total Volume	1	0	1	0	3	3	0	1	1
% App. Total	100	0		0	100		0	100	
PHF	.250	.000	.250	.000	.375	.375	.000	.250	.250

N/S Street : Draper Road
E/W Street : Route 10- (County Road)
City/State : Dover, MA
Weather : Cloudy



SEASONAL ADJUSTMENT DATA

Massachusetts Highway Department

6242: Monthly Hourly Volume for October 2019

Location ID:	6242																							Seasonal Factor Group:	U1-Boston			
County:	Norfolk																							Daily Factor Group:				
Functionl Class	1																							Axle Factor Group:	U1-Boston			
Location:	INTERSTATE 95																							Growth Factor Group:				
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status		
1	832	593	473	701	2145	5728	6311	5467	5335	5527	5515	5487	5993	6330	8011	7868	8477	9335	7203	5298	3744	2948	2204	1641	113166	Accepted		
2	828	529	486	700	2170	5662	6923	5650	6711	6030	5617	5930	5834	6410	7588	7230	7887	7693	6668	5461	3714	2859	2349	1593	112522	Accepted		
3	921	610	495	740	2109	5662	6784	6022	6255	6036	5594	5819	6116	6774	7441	7428	8188	8283	7134	5764	4248	3403	2484	1887	116197	Accepted		
4	1080	732	561	769	2070	5215	6175	6973	6415	5951	6100	6272	6636	7146	8306	8372	8117	8139	7403	5527	4451	3816	3250	2852	122328	Accepted		
5	1705	1161	812	784	1048	1892	3012	4216	5406	6605	7368	7457	8059	7980	7890	8016	7978	7685	6729	5817	5031	4622	3794	3157	118224	Accepted		
6	1981	1340	994	698	669	1029	1693	2650	3772	5091	6756	7477	8865	7610	6892	6951	7191	7315	6356	5087	3996	2901	2076	1519	100909	Accepted		
7	973	626	474	697	2158	5447	6714	6288	6522	6058	5554	5481	5638	6295	7246	7819	7728	8273	6825	4937	4644	2567	2013	1436	112413	Accepted		
8	950	609	493	694	2158	5492	6591	5903	5152	5320	5430	5521	5897	6562	7588	7808	8034	8498	7396	5452	3844	2842	2111	1709	112054	Accepted		
9	1134	624	468	733	2140	5466	6747	6187	6701	6127	5571	5671	5848	6352	7322	7531	7288	7234	6359	5383	3954	2970	2201	1795	111806	Accepted		
10	1205	658	523	728	2068	5286	6681	6233	6451	5898	5536	5798	6120	6879	8250	8319	8441	8165	7060	5992	4191	3101	3368	5151	122102	Accepted		
11	4320	2242	810	819	2043	4905	6626	6799	6566	6052	5846	6427	6536	6750	7720	7512	7483	7616	6953	5785	4392	3494	3143	2607	123446	Accepted		
12	1759	1117	908	747	974	1846	2704	4116	5130	6444	6602	7576	7854	7738	7892	7893	8034	7273	6591	5408	4649	4359	4076	3047	114737	Accepted		
13	2049	1275	1051	805	708	1100	1775	2664	3746	5366	6937	7686	7472	7382	7248	7379	7384	7433	6532	5583	5046	3784	2902	2160	105467	Accepted		
14	1172	785	743	657	1314	3212	4441	5004	5437	5583	6562	6900	7151	8132	8240	7758	8586	7506	6997	5910	4688	3126	2338	1544	113786	Accepted		
15	917	541	486	718	2222	5567	6950	5937	6350	6187	5902	5904	6127	6467	7459	7814	8204	7907	7235	5571	4066	3069	2198	1684	115482	Accepted		
16	927	595	501	700	2156	5450	6723	6109	6085	6144	5810	5806	5989	6525	7555	7978	8291	8361	6585	5425	3877	2826	2205	1475	114098	Accepted		
17	884	584	496	744	2003	5373	6444	6585	6333	6022	5662	5843	6065	6555	7712	7977	8407	8152	7149	5344	4178	3317	2607	2025	116461	Accepted		
18	1156	739	651	815	2092	5317	6767	6907	6043	5969	6180	6698	6889	7160	7918	7568	7252	7968	6952	5920	4374	3724	3255	2672	120986	Accepted		
19	1750	1110	947	782	1017	2097	3095	4563	6198	6713	7120	7552	8468	7874	8223	8210	8267	7999	7393	5967	5302	4732	4181	3186	122746	Accepted		
20	1971	1263	1102	774	723	1058	1792	2834	4040	5534	6773	7737	7773	7583	7702	7908	8094	7725	6664	5631	4457	3194	2232	1705	106269	Accepted		
21	937	630	495	744	2142	5531	6765	6869	6333	6089	5470	5441	5958	6312	7358	7744	7694	8023	6853	5219	3544	2557	2002	1563	112273	Accepted		
22	938	605	485	771	2162	5500	6656	6346	6897	5939	5660	5810	5868	6266	7777	7958	8525	8310	7048	4990	3715	3131	2349	1697	115403	Accepted		
23	980	592	438	663	2021	5384	6222	6462	5977	6163	5661	5929	6052	6499	7497	7778	7978	7778	7006	5637	4137	3132	2389	1652	114027	Accepted		
24	958	673	508	719	2161	5570	6789	6923	6801	5866	5883	5967	6235	6860	7606	7985	8115	8518	7330	5714	4538	3198	2763	2128	119808	Accepted		
25	1357	788	642	785	2088	5348	6789	6926	6821	6030	6005	6330	6975	7434	8125	8743	8537	8272	7089	5849	4377	3747	3530	2878	125465	Accepted		
26	1773	1116	978	803	1095	1997	2987	4259	5500	6487	7335	8246	8278	8053	9506	9216	8592	8036	7324	5937	5183	4786	4587	3425	125499	Accepted		
27	2238	1395	1205	891	660	1016	1784	2592	3605	4971	6562	7853	7807	7409	7382	6884	6248	5834	5976	6351	6009	3983	2434	1510	102599	Accepted		
28	910	571	546	775	2218	5470	6539	6272	5974	6075	5555	5699	5743	6312	7103	7655	7885	7464	7005	4988	3481	2141	1799	1821	110001	Accepted		
29	907	610	508	676	2129	5098	6213	5511	4878	5594	5641	5508	6012	6270	7345	7593	8101	7911	7303	5417	3793	2994	2387	1685	110084	Accepted		
30	910	628	500	725	2223	5600	6423	5639	4678	4448	5139	5672	5843	6426	7416	7857	7412	7357	6853	5418	3883	3176	2515	1895	108636	Accepted		
31	991	680	517	726	2088	5343	6548	6676	6535	5523	5357	5474	5726	6325	7029	7559	7692	7155	5686	3825	3244	2706	2078	1575	107058	Accepted		
																										October Average	114389	
																											2019 AADT	115198
																											Seasonal Adjustment	1.007

COVID-19 ADJUSTMENT DATA

2019 Average Count Data – Station 6242

October ADT: **114,389**

2020 Average Count Data – Station 6242

October ADT: **98,528**

COVID Adjustment

$$\frac{114,389}{98,528} = 1.161$$

Massachusetts Highway Department

6242: Monthly Hourly Volume for October 2019

Location ID:	6242																							Seasonal Factor Group:	U1-Boston			
County:	Norfolk																							Daily Factor Group:				
Functionl Class	1																							Axle Factor Group:	U1-Boston			
Location:	INTERSTATE 95																							Growth Factor Group:				
	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status		
1	832	593	473	701	2145	5728	6311	5467	5335	5527	5515	5487	5993	6330	8011	7868	8477	9335	7203	5298	3744	2948	2204	1641	113166	Accepted		
2	828	529	486	700	2170	5662	6923	5650	6711	6030	5617	5930	5834	6410	7588	7230	7887	7693	6668	5461	3714	2859	2349	1593	112522	Accepted		
3	921	610	495	740	2109	5662	6784	6022	6255	6036	5594	5819	6116	6774	7441	7428	8188	8283	7134	5764	4248	3403	2484	1887	116197	Accepted		
4	1080	732	561	769	2070	5215	6175	6973	6415	5951	6100	6272	6636	7146	8306	8372	8117	8139	7403	5527	4451	3816	3250	2852	122328	Accepted		
5	1705	1161	812	784	1048	1892	3012	4216	5406	6605	7368	7457	8059	7980	7890	8016	7978	7685	6729	5817	5031	4622	3794	3157	118224	Accepted		
6	1981	1340	994	698	669	1029	1693	2650	3772	5091	6756	7477	8865	7610	6892	6951	7191	7315	6356	5087	3996	2901	2076	1519	100909	Accepted		
7	973	626	474	697	2158	5447	6714	6288	6522	6058	5554	5481	5638	6295	7246	7819	7728	8273	6825	4937	4644	2567	2013	1436	112413	Accepted		
8	950	609	493	694	2158	5492	6591	5903	5152	5320	5430	5521	5897	6562	7588	7808	8034	8498	7396	5452	3844	2842	2111	1709	112054	Accepted		
9	1134	624	468	733	2140	5466	6747	6187	6701	6127	5571	5671	5848	6352	7322	7531	7288	7234	6359	5383	3954	2970	2201	1795	111806	Accepted		
10	1205	658	523	728	2068	5286	6681	6233	6451	5898	5536	5798	6120	6879	8250	8319	8441	8165	7060	5992	4191	3101	3368	5151	122102	Accepted		
11	4320	2242	810	819	2043	4905	6626	6799	6566	6052	5846	6427	6536	6750	7720	7512	7483	7616	6953	5785	4392	3494	3143	2607	123446	Accepted		
12	1759	1117	908	747	974	1846	2704	4116	5130	6444	6602	7576	7854	7738	7892	7893	8034	7273	6591	5408	4649	4359	4076	3047	114737	Accepted		
13	2049	1275	1051	805	708	1100	1775	2664	3746	5366	6937	7686	7472	7382	7248	7379	7384	7433	6532	5583	5046	3784	2902	2160	105467	Accepted		
14	1172	785	743	657	1314	3212	4441	5004	5437	5583	6562	6900	7151	8132	8240	7758	8586	7506	6997	5910	4688	3126	2338	1544	113786	Accepted		
15	917	541	486	718	2222	5567	6950	5937	6350	6187	5902	5904	6127	6467	7459	7814	8204	7907	7235	5571	4066	3069	2198	1684	115482	Accepted		
16	927	595	501	700	2156	5450	6723	6109	6085	6144	5810	5806	5989	6525	7555	7978	8291	8361	6585	5425	3877	2826	2205	1475	114098	Accepted		
17	884	584	496	744	2003	5373	6444	6585	6333	6022	5662	5843	6065	6555	7712	7977	8407	8152	7149	5344	4178	3317	2607	2025	116461	Accepted		
18	1156	739	651	815	2092	5317	6767	6907	6043	5969	6180	6698	6889	7160	7918	7568	7252	7968	6952	5920	4374	3724	3255	2672	120986	Accepted		
19	1750	1110	947	782	1017	2097	3095	4563	6198	6713	7120	7552	8468	7874	8223	8210	8267	7999	7393	5967	5302	4732	4181	3186	122746	Accepted		
20	1971	1263	1102	774	723	1058	1792	2834	4040	5534	6773	7737	7773	7583	7702	7908	8094	7725	6664	5631	4457	3194	2232	1705	106269	Accepted		
21	937	630	495	744	2142	5531	6765	6869	6333	6089	5470	5441	5958	6312	7358	7744	7694	8023	6853	5219	3544	2557	2002	1563	112273	Accepted		
22	938	605	485	771	2162	5500	6656	6346	6897	5939	5660	5810	5868	6266	7777	7958	8525	8310	7048	4990	3715	3131	2349	1697	115403	Accepted		
23	980	592	438	663	2021	5384	6222	6462	5977	6163	5661	5929	6052	6499	7497	7778	7978	7778	7006	5637	4137	3132	2389	1652	114027	Accepted		
24	958	673	508	719	2161	5570	6789	6923	6801	5866	5883	5967	6235	6860	7606	7985	8115	8518	7330	5714	4538	3198	2763	2128	119808	Accepted		
25	1357	788	642	785	2088	5348	6789	6926	6821	6030	6005	6330	6975	7434	8125	8743	8537	8272	7089	5849	4377	3747	3530	2878	125465	Accepted		
26	1773	1116	978	803	1095	1997	2987	4259	5500	6487	7335	8246	8278	8053	9506	9216	8592	8036	7324	5937	5183	4786	4587	3425	125499	Accepted		
27	2238	1395	1205	891	660	1016	1784	2592	3605	4971	6562	7853	7807	7409	7382	6884	6248	5834	5976	6351	6009	3983	2434	1510	102599	Accepted		
28	910	571	546	775	2218	5470	6539	6272	5974	6075	5555	5699	5743	6312	7103	7655	7885	7464	7005	4988	3481	2141	1799	1821	110001	Accepted		
29	907	610	508	676	2129	5098	6213	5511	4878	5594	5641	5508	6012	6270	7345	7593	8101	7911	7303	5417	3793	2994	2387	1685	110084	Accepted		
30	910	628	500	725	2223	5600	6423	5639	4678	4448	5139	5672	5843	6426	7416	7857	7412	7357	6853	5418	3883	3176	2515	1895	108636	Accepted		
31	991	680	517	726	2088	5343	6548	6676	6535	5523	5357	5474	5726	6325	7029	7559	7692	7155	5686	3825	3244	2706	2078	1575	107058	Accepted		
																										October Average	114389	
																											2019 AADT	115198
																											Seasonal Adjustment	1.007

Massachusetts Highway Department

6242: Monthly Hourly Volume for October 2020

Location ID: 6242
County: Norfolk
Functional Class: 1
Location: INTERSTATE 95

Seasonal Factor Group: U1-Boston
Daily Factor Group:
Axle Factor Group: U1-Boston
Growth Factor Group:

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status
1	767	510	480	660	1479	4459	5892	6809	6115	5294	5145	5219	5523	5917	7084	7303	7193	7407	5897	4197	3187	2443	1811	1444	102235	Accepted
2	775	513	416	588	1528	4230	5662	6453	5798	5197	5163	5523	5928	6358	7403	7476	7467	7487	6086	4631	3510	2703	2342	1747	104984	Accepted
3	1154	634	577	514	806	1555	2541	3403	4411	5028	6031	6681	6749	5988	5641	6860	6711	6385	5866	4803	3850	3166	2816	2046	94216	Accepted
4	1226	785	595	440	502	797	1414	1894	2688	3913	5224	6146	6391	6862	6443	6313	6169	5943	5275	4684	3710	2535	1714	1163	82826	Accepted
5	680	447	353	526	1478	4237	4657	6282	6077	4937	4716	4709	4987	5216	6453	6880	6897	6660	5383	3641	2589	1921	1506	1130	92362	Accepted
6	674	386	403	556	1495	4424	6023	6541	5415	5569	4808	4947	5220	5483	6841	7172	7175	7340	5552	3808	2703	2098	1484	1233	97350	Accepted
7	715	373	404	521	1500	4335	5472	6875	6103	5302	5001	5092	5317	5589	7023	7163	7281	7047	4876	3926	2787	2103	1656	1259	97720	Accepted
8	697	419	395	566	1554	4426	5797	6727	6183	5483	5098	5334	5501	5859	7115	7611	7517	7574	6027	4336	3142	2563	1888	1474	103286	Accepted
9	858	503	441	556	1570	4228	5670	6394	6218	5438	5868	5938	6261	6880	7597	8031	7896	7941	6944	5324	3698	2829	2500	1788	111371	Accepted
10	1196	678	585	494	719	1388	2370	3145	4188	5717	6578	6987	7318	7293	7077	7004	6867	6434	5859	5127	4074	3138	2676	2016	98928	Accepted
11																										
12																										
13																										
14																										
15																										
16																										
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27																										
28																										
29																										
30																										
31																										

October Average 98528

VEHICLE TRAVEL SPEED DATA

Accurate Counts
978-664-2565

Location : Route 109
Location : East of Appletree Lane
City/State: Dover, MA

8745SP01

EB

Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total
10/21/20	0	1	0	1	2	3	2	1	0	0	0	0	0	0	10
01:00	0	0	0	0	2	2	0	0	0	1	0	0	0	0	5
02:00	0	0	0	0	1	2	2	3	0	0	0	0	0	0	8
03:00	0	0	0	0	3	3	2	1	0	0	0	0	0	0	9
04:00	0	0	0	1	9	19	18	3	0	0	0	0	0	0	50
05:00	0	0	2	7	45	107	31	3	0	0	0	0	0	0	195
06:00	0	0	6	47	187	148	27	1	0	0	0	0	0	0	416
07:00	0	0	7	100	248	195	26	2	0	0	0	0	0	0	578
08:00	0	0	21	83	252	176	19	0	0	0	0	0	0	0	551
09:00	7	2	11	74	168	116	15	0	0	0	0	0	0	0	393
10:00	2	0	13	66	170	81	22	0	0	0	0	0	0	0	354
11:00	0	0	9	39	132	94	26	3	0	0	0	0	0	0	303
12 PM	0	1	3	54	154	105	21	3	0	0	0	0	0	0	341
13:00	0	0	8	57	151	115	30	2	0	0	0	0	0	0	363
14:00	0	0	8	32	164	118	20	3	0	0	0	0	0	0	345
15:00	0	1	8	37	167	124	37	1	0	0	0	0	0	0	375
16:00	1	1	1	60	157	166	25	1	0	0	0	0	0	0	412
17:00	0	0	9	42	164	178	22	1	0	0	0	0	0	0	416
18:00	3	2	16	46	111	103	13	0	0	0	0	0	0	0	294
19:00	3	2	5	24	70	77	5	1	0	0	0	0	0	0	187
20:00	0	0	1	10	46	56	5	2	0	0	0	0	0	0	120
21:00	0	0	0	13	39	26	4	1	0	0	0	0	0	0	83
22:00	0	0	0	2	12	21	2	0	1	0	0	0	0	0	38
23:00	0	0	2	3	9	6	3	0	0	0	0	0	0	0	23
Total	16	10	130	798	2463	2041	377	32	1	1	0	0	0	0	5869

Daily

- 15th Percentile : 29 MPH
- 50th Percentile : 34 MPH
- 85th Percentile : 38 MPH
- 95th Percentile : 41 MPH

Mean Speed(Average) : 34 MPH

10 MPH Pace Speed : 31-40 MPH

- Number in Pace : 4504
- Percent in Pace : 76.7%
- Number of Vehicles > 35 MPH : 2452
- Percent of Vehicles > 35 MPH : 41.8%

Accurate Counts
978-664-2565

Location : Route 109
Location : East of Appletree Lane
City/State: Dover, MA

8745SP01

EB

Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total
10/22/20	0	0	1	1	3	3	2	0	0	0	0	0	0	0	10
01:00	0	0	0	0	1	1	1	0	1	0	0	0	0	0	4
02:00	0	0	0	0	5	5	1	2	0	0	0	0	0	0	13
03:00	0	0	1	0	1	4	4	0	0	0	0	0	0	0	10
04:00	0	0	0	1	15	20	14	2	1	0	0	0	0	0	53
05:00	0	0	4	6	39	121	37	3	1	0	0	0	0	0	211
06:00	0	0	8	57	173	152	27	3	0	0	0	0	0	0	420
07:00	61	14	52	138	178	124	25	0	0	0	0	0	0	0	592
08:00	3	1	35	86	238	177	21	0	0	0	0	0	0	0	561
09:00	0	0	8	76	187	139	27	0	0	0	0	0	0	0	437
10:00	0	2	20	44	150	137	24	2	1	0	0	0	0	0	380
11:00	0	0	10	80	175	112	17	0	0	0	0	0	0	0	394
12 PM	0	0	7	64	167	125	15	1	0	0	0	0	0	0	379
13:00	0	1	3	43	136	136	18	1	1	0	0	0	0	0	339
14:00	0	1	11	41	151	149	37	3	0	0	0	0	0	0	393
15:00	1	0	8	54	161	153	27	1	0	0	0	0	0	0	405
16:00	0	0	3	53	206	164	21	1	0	0	0	0	0	0	448
17:00	0	0	4	43	193	174	23	1	0	0	0	0	0	0	438
18:00	0	0	0	51	147	102	17	3	0	0	0	0	0	0	320
19:00	0	0	2	19	94	74	14	0	0	0	0	0	0	0	203
20:00	0	1	4	10	56	55	14	1	0	0	0	0	0	0	141
21:00	0	0	0	5	25	32	6	0	0	0	0	0	0	0	68
22:00	0	0	0	7	17	21	9	4	0	0	0	0	0	0	58
23:00	1	0	1	5	14	20	6	1	0	0	0	0	0	0	48
Total	66	20	182	884	2532	2200	407	29	5	0	0	0	0	0	6325

Daily
 15th Percentile : 28 MPH
 50th Percentile : 33 MPH
 85th Percentile : 38 MPH
 95th Percentile : 41 MPH
 Mean Speed(Average) : 34 MPH
 10 MPH Pace Speed : 31-40 MPH
 Number in Pace : 4732
 Percent in Pace : 74.8%
 Number of Vehicles > 35 MPH : 2641
 Percent of Vehicles > 35 MPH : 41.8%

Grand Total	82	30	312	1682	4995	4241	784	61	6	1	0	0	0	0	12194
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Overall
 15th Percentile : 29 MPH
 50th Percentile : 33 MPH
 85th Percentile : 38 MPH
 95th Percentile : 41 MPH
 Mean Speed(Average) : 34 MPH
 10 MPH Pace Speed : 31-40 MPH
 Number in Pace : 9236
 Percent in Pace : 75.7%
 Number of Vehicles > 35 MPH : 5093
 Percent of Vehicles > 35 MPH : 41.8%

Accurate Counts
978-664-2565

Location : Route 109
Location : East of Appletree Lane
City/State: Dover, MA

8745SP01

WB

Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total
10/21/20	0	0	0	0	3	18	4	5	0	0	0	0	0	0	30
01:00	0	0	0	1	0	1	5	0	0	0	0	0	0	0	7
02:00	0	0	0	0	0	2	1	2	0	0	0	0	0	0	5
03:00	0	0	0	2	1	3	4	1	0	0	0	0	0	0	11
04:00	0	0	0	0	0	6	7	7	3	0	0	0	0	0	23
05:00	0	0	0	0	4	16	10	6	1	1	0	0	0	0	38
06:00	0	0	1	6	21	59	29	10	1	0	0	0	0	0	127
07:00	0	0	0	3	44	117	51	3	0	0	1	0	0	0	219
08:00	0	1	1	14	45	123	74	8	1	0	0	0	1	0	268
09:00	0	2	9	7	57	122	58	7	0	1	0	0	0	0	263
10:00	1	0	8	16	58	88	53	6	0	0	0	1	0	0	231
11:00	0	0	1	4	27	130	74	10	3	0	0	0	1	0	250
12 PM	0	0	0	12	41	137	95	9	2	0	0	0	0	0	296
13:00	0	0	4	7	40	127	89	15	1	0	0	0	0	0	283
14:00	0	0	4	20	46	136	90	11	1	0	0	0	0	1	309
15:00	0	2	7	15	37	161	110	18	2	0	0	0	0	0	352
16:00	0	5	1	29	54	167	110	5	1	0	0	0	0	0	372
17:00	0	3	7	23	65	167	73	6	0	0	0	0	0	0	344
18:00	0	1	5	10	61	132	84	6	1	0	0	0	0	0	300
19:00	0	0	2	4	19	104	66	10	0	0	0	0	0	0	205
20:00	0	0	1	5	11	80	43	8	1	0	0	0	0	0	149
21:00	0	0	2	3	6	41	36	5	1	0	0	0	0	0	94
22:00	0	0	0	1	4	21	23	6	2	1	0	0	0	0	58
23:00	0	0	0	0	4	18	19	7	0	0	0	0	0	0	48
Total	1	14	53	182	648	1976	1208	171	21	3	1	1	2	1	4282

Daily
 15th Percentile : 33 MPH
 50th Percentile : 38 MPH
 85th Percentile : 43 MPH
 95th Percentile : 44 MPH
 Mean Speed(Average) : 38 MPH
 10 MPH Pace Speed : 36-45 MPH
 Number in Pace : 3184
 Percent in Pace : 74.4%
 Number of Vehicles > 35 MPH : 3384
 Percent of Vehicles > 35 MPH : 79.0%

Location : Route 109
Location : East of Appletree Lane
City/State: Dover, MA

8745SP01

WB

Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total
10/22/20	0	0	0	1	5	14	4	3	0	0	0	0	0	0	27
01:00	0	0	0	0	1	1	2	3	1	0	0	0	0	0	8
02:00	0	0	0	0	1	1	2	0	0	0	0	0	0	0	4
03:00	0	0	0	0	2	2	0	1	0	0	1	0	0	0	6
04:00	0	0	0	2	2	4	6	3	1	0	0	0	0	0	18
05:00	0	0	2	1	3	8	12	7	1	1	0	0	0	0	35
06:00	0	0	1	10	23	59	39	11	0	0	0	0	0	0	143
07:00	0	1	0	6	33	64	19	4	0	0	0	2	0	0	129
08:00	0	0	4	16	44	133	71	8	0	0	0	0	0	0	276
09:00	0	0	8	18	41	133	66	3	0	0	0	0	0	0	269
10:00	0	0	7	19	50	120	56	6	0	0	0	0	0	0	258
11:00	0	1	5	5	46	132	75	4	0	0	2	0	0	0	270
12 PM	0	0	1	8	37	139	75	6	0	0	0	0	1	1	268
13:00	0	0	1	4	39	143	91	14	0	0	0	0	0	0	292
14:00	0	2	10	21	63	145	82	6	0	0	0	0	0	0	329
15:00	0	1	5	17	35	136	94	11	0	0	0	0	1	0	300
16:00	0	2	9	19	40	159	105	8	0	0	0	0	0	0	342
17:00	1	1	7	13	49	161	119	12	0	0	0	0	0	0	363
18:00	0	4	5	27	49	167	60	6	0	0	0	0	0	0	318
19:00	0	0	2	7	16	110	72	9	1	1	0	0	0	0	218
20:00	0	0	9	10	15	78	72	15	2	0	0	0	0	0	201
21:00	0	0	2	2	6	43	32	12	1	0	1	0	0	0	99
22:00	0	0	0	0	5	25	22	10	2	0	0	0	0	0	64
23:00	0	0	1	4	5	22	23	7	2	2	0	0	0	0	66
Total	1	12	79	210	610	1999	1199	169	11	4	4	2	2	1	4303

Daily
 15th Percentile : 32 MPH
 50th Percentile : 38 MPH
 85th Percentile : 43 MPH
 95th Percentile : 44 MPH

 Mean Speed(Average) : 38 MPH
 10 MPH Pace Speed : 36-45 MPH
 Number in Pace : 3198
 Percent in Pace : 74.3%
 Number of Vehicles > 35 MPH : 3391
 Percent of Vehicles > 35 MPH : 78.8%

Grand Total	2	26	132	392	1258	3975	2407	340	32	7	5	3	4	2	8585
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Overall
 15th Percentile : 32 MPH
 50th Percentile : 38 MPH
 85th Percentile : 43 MPH
 95th Percentile : 44 MPH

 Mean Speed(Average) : 38 MPH
 10 MPH Pace Speed : 36-45 MPH
 Number in Pace : 6382
 Percent in Pace : 74.3%
 Number of Vehicles > 35 MPH : 6775
 Percent of Vehicles > 35 MPH : 78.9%

Accurate Counts
978-664-2565

Location : Route 109
Location : East of Appletree Lane
City/State: Dover, MA

8745SP01

EB, WB

Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total
10/21/20	0	1	0	1	5	21	6	6	0	0	0	0	0	0	40
01:00	0	0	0	1	2	3	5	0	0	1	0	0	0	0	12
02:00	0	0	0	0	1	4	3	5	0	0	0	0	0	0	13
03:00	0	0	0	2	4	6	6	2	0	0	0	0	0	0	20
04:00	0	0	0	1	9	25	25	10	3	0	0	0	0	0	73
05:00	0	0	2	7	49	123	41	9	1	1	0	0	0	0	233
06:00	0	0	7	53	208	207	56	11	1	0	0	0	0	0	543
07:00	0	0	7	103	292	312	77	5	0	0	1	0	0	0	797
08:00	0	1	22	97	297	299	93	8	1	0	0	0	1	0	819
09:00	7	4	20	81	225	238	73	7	0	1	0	0	0	0	656
10:00	3	0	21	82	228	169	75	6	0	0	0	1	0	0	585
11:00	0	0	10	43	159	224	100	13	3	0	0	0	1	0	553
12 PM	0	1	3	66	195	242	116	12	2	0	0	0	0	0	637
13:00	0	0	12	64	191	242	119	17	1	0	0	0	0	0	646
14:00	0	0	12	52	210	254	110	14	1	0	0	0	0	1	654
15:00	0	3	15	52	204	285	147	19	2	0	0	0	0	0	727
16:00	1	6	2	89	211	333	135	6	1	0	0	0	0	0	784
17:00	0	3	16	65	229	345	95	7	0	0	0	0	0	0	760
18:00	3	3	21	56	172	235	97	6	1	0	0	0	0	0	594
19:00	3	2	7	28	89	181	71	11	0	0	0	0	0	0	392
20:00	0	0	2	15	57	136	48	10	1	0	0	0	0	0	269
21:00	0	0	2	16	45	67	40	6	1	0	0	0	0	0	177
22:00	0	0	0	3	16	42	25	6	3	1	0	0	0	0	96
23:00	0	0	2	3	13	24	22	7	0	0	0	0	0	0	71
Total	17	24	183	980	3111	4017	1585	203	22	4	1	1	2	1	10151

Daily

- 15th Percentile : 30 MPH
- 50th Percentile : 35 MPH
- 85th Percentile : 40 MPH
- 95th Percentile : 44 MPH

Mean Speed(Average) : 36 MPH

10 MPH Pace Speed : 31-40 MPH

- Number in Pace : 7128
- Percent in Pace : 70.2%
- Number of Vehicles > 35 MPH : 5836
- Percent of Vehicles > 35 MPH : 57.5%

Accurate Counts
978-664-2565

Location : Route 109
Location : East of Appletree Lane
City/State: Dover, MA

8745SP01

EB, WB

Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total
10/22/20	0	0	1	2	8	17	6	3	0	0	0	0	0	0	37
01:00	0	0	0	0	2	2	3	3	2	0	0	0	0	0	12
02:00	0	0	0	0	6	6	3	2	0	0	0	0	0	0	17
03:00	0	0	1	0	3	6	4	1	0	0	1	0	0	0	16
04:00	0	0	0	3	17	24	20	5	2	0	0	0	0	0	71
05:00	0	0	6	7	42	129	49	10	2	1	0	0	0	0	246
06:00	0	0	9	67	196	211	66	14	0	0	0	0	0	0	563
07:00	61	15	52	144	211	188	44	4	0	0	0	2	0	0	721
08:00	3	1	39	102	282	310	92	8	0	0	0	0	0	0	837
09:00	0	0	16	94	228	272	93	3	0	0	0	0	0	0	706
10:00	0	2	27	63	200	257	80	8	1	0	0	0	0	0	638
11:00	0	1	15	85	221	244	92	4	0	0	2	0	0	0	664
12 PM	0	0	8	72	204	264	90	7	0	0	0	0	1	1	647
13:00	0	1	4	47	175	279	109	15	1	0	0	0	0	0	631
14:00	0	3	21	62	214	294	119	9	0	0	0	0	0	0	722
15:00	1	1	13	71	196	289	121	12	0	0	0	0	1	0	705
16:00	0	2	12	72	246	323	126	9	0	0	0	0	0	0	790
17:00	1	1	11	56	242	335	142	13	0	0	0	0	0	0	801
18:00	0	4	5	78	196	269	77	9	0	0	0	0	0	0	638
19:00	0	0	4	26	110	184	86	9	1	1	0	0	0	0	421
20:00	0	1	13	20	71	133	86	16	2	0	0	0	0	0	342
21:00	0	0	2	7	31	75	38	12	1	0	1	0	0	0	167
22:00	0	0	0	7	22	46	31	14	2	0	0	0	0	0	122
23:00	1	0	2	9	19	42	29	8	2	2	0	0	0	0	114
Total	67	32	261	1094	3142	4199	1606	198	16	4	4	2	2	1	10628

Daily
 15th Percentile : 30 MPH
 50th Percentile : 35 MPH
 85th Percentile : 40 MPH
 95th Percentile : 44 MPH

 Mean Speed(Average) : 36 MPH
 10 MPH Pace Speed : 31-40 MPH
 Number in Pace : 7341
 Percent in Pace : 69.1%
 Number of Vehicles > 35 MPH : 6032
 Percent of Vehicles > 35 MPH : 56.8%

Grand Total	84	56	444	2074	6253	8216	3191	401	38	8	5	3	4	2	20779
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Overall
 15th Percentile : 30 MPH
 50th Percentile : 35 MPH
 85th Percentile : 40 MPH
 95th Percentile : 44 MPH

 Mean Speed(Average) : 36 MPH
 10 MPH Pace Speed : 31-40 MPH
 Number in Pace : 14469
 Percent in Pace : 69.6%
 Number of Vehicles > 35 MPH : 11868
 Percent of Vehicles > 35 MPH : 57.1%

MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Dover COUNT DATE : Oct-20

DISTRICT : 6 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Route 109

MINOR STREET(S) : Walpole Street

**INTERSECTION
 DIAGRAM**
 (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	EB	WB			
PEAK HOURLY VOLUMES (PM) :	150	490	676			1,316

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

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

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

Comments : Below Statewide and District Crash Rates
 Project Title & Date: Proposed Residential Development

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Dover COUNT DATE : Oct-20

DISTRICT : 6 UNSIGNALIZED : SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Route 109

MINOR STREET(S) : Draper Road

**INTERSECTION
 DIAGRAM
 (Label Approaches)**



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	EB	WB			
PEAK HOURLY VOLUMES (PM) :	22	468	598			1,088

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

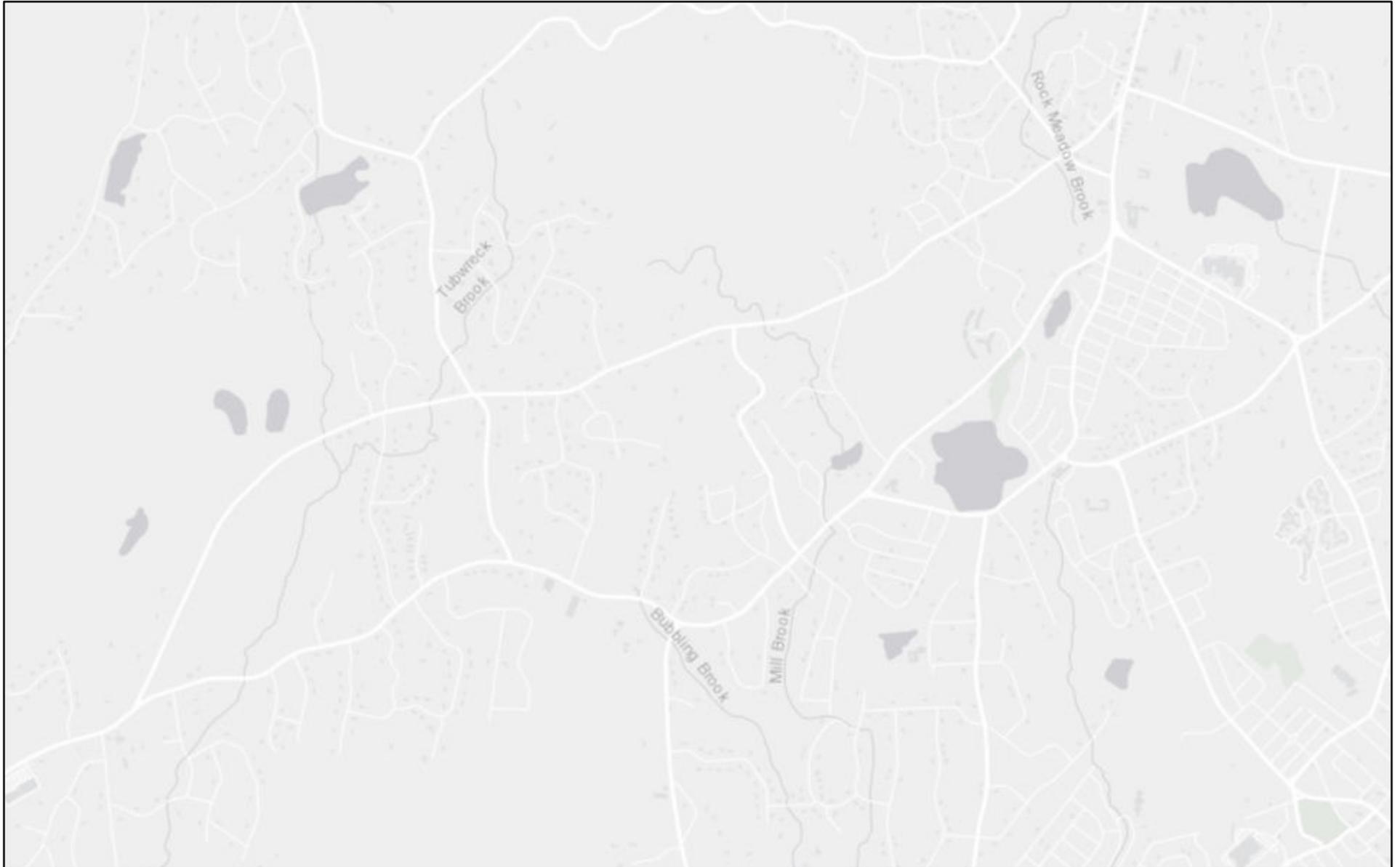
TOTAL # OF CRASHES : # OF YEARS : AVERAGE # OF CRASHES PER YEAR (A) :

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

Comments : Below Statewide and District Crash Rates

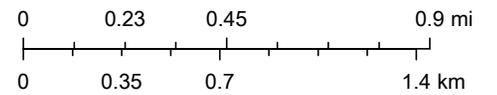
Project Title & Date: Proposed Residential Development

GeoDOT Map



12/7/2020, 4:03:29 PM

1:36,112



Esri, HERE

MassDOT
Esri, HERE | Esri, HERE |

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 Rate
Westwood	Brook Streert	at Walpole Town Line	2,000	1,995	2,061	2,046	2,040	2,103	2,151	2,284	2,323	2,156	2,147	1.11%
Westwood	North Street	at Walpole Town Line	8,300	8,250	8,476	8,114	8,151	8,404	8,018	8,515	8,660	8,821	8,786	0.64%
Westwood	Harrow Road	at Norwood Town Line	794	766	794	789	785	809	828	879	808	810	807	0.52%
														0.76%

TRIP-GENERATION CALCULATIONS

Multifamily Housing (Mid-Rise) (221)

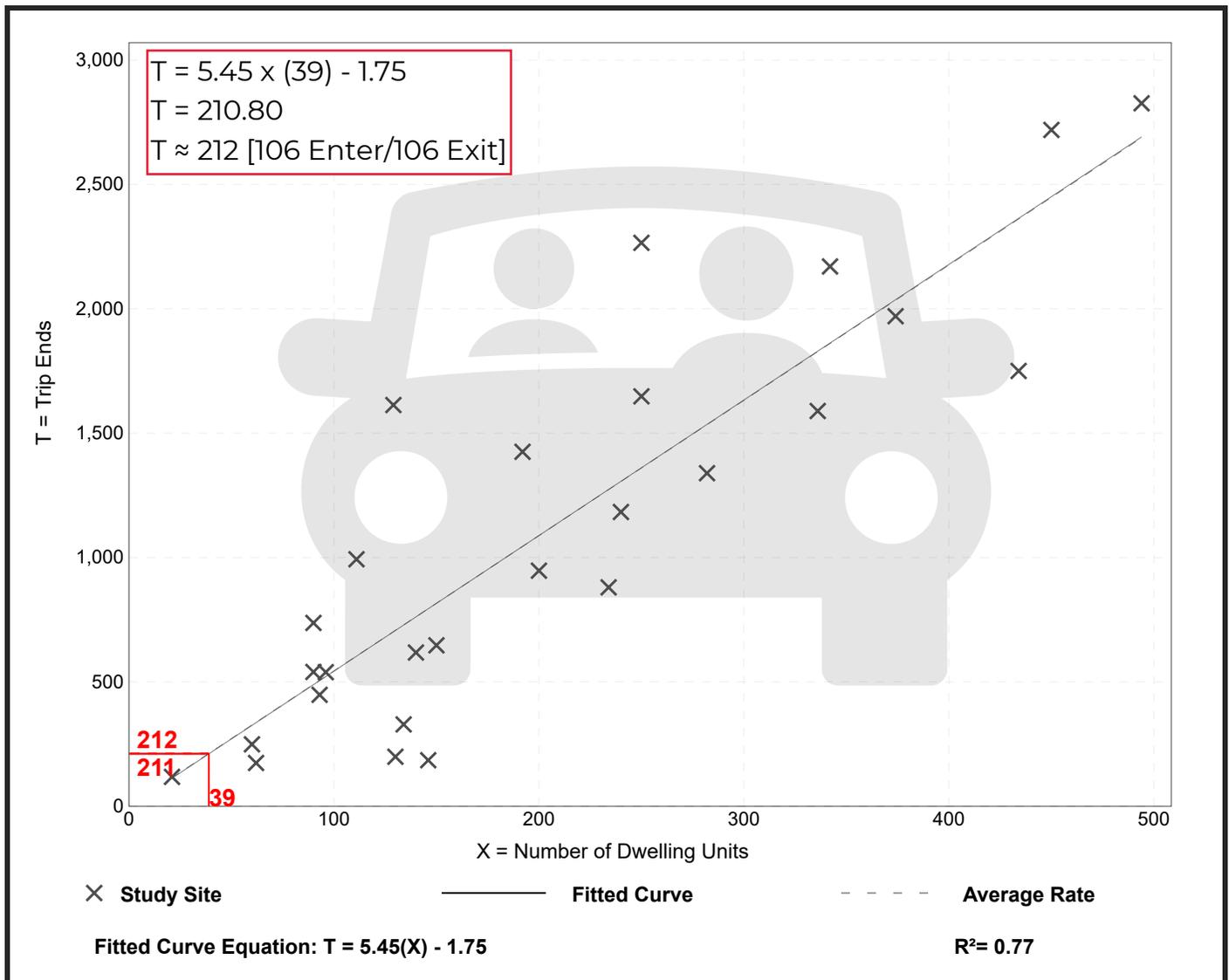
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 27
Avg. Num. of Dwelling Units: 205
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
5.44	1.27 - 12.50	2.03

Data Plot and Equation



Multifamily Housing (Mid-Rise) (221)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

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

Setting/Location: General Urban/Suburban

Number of Studies: 53

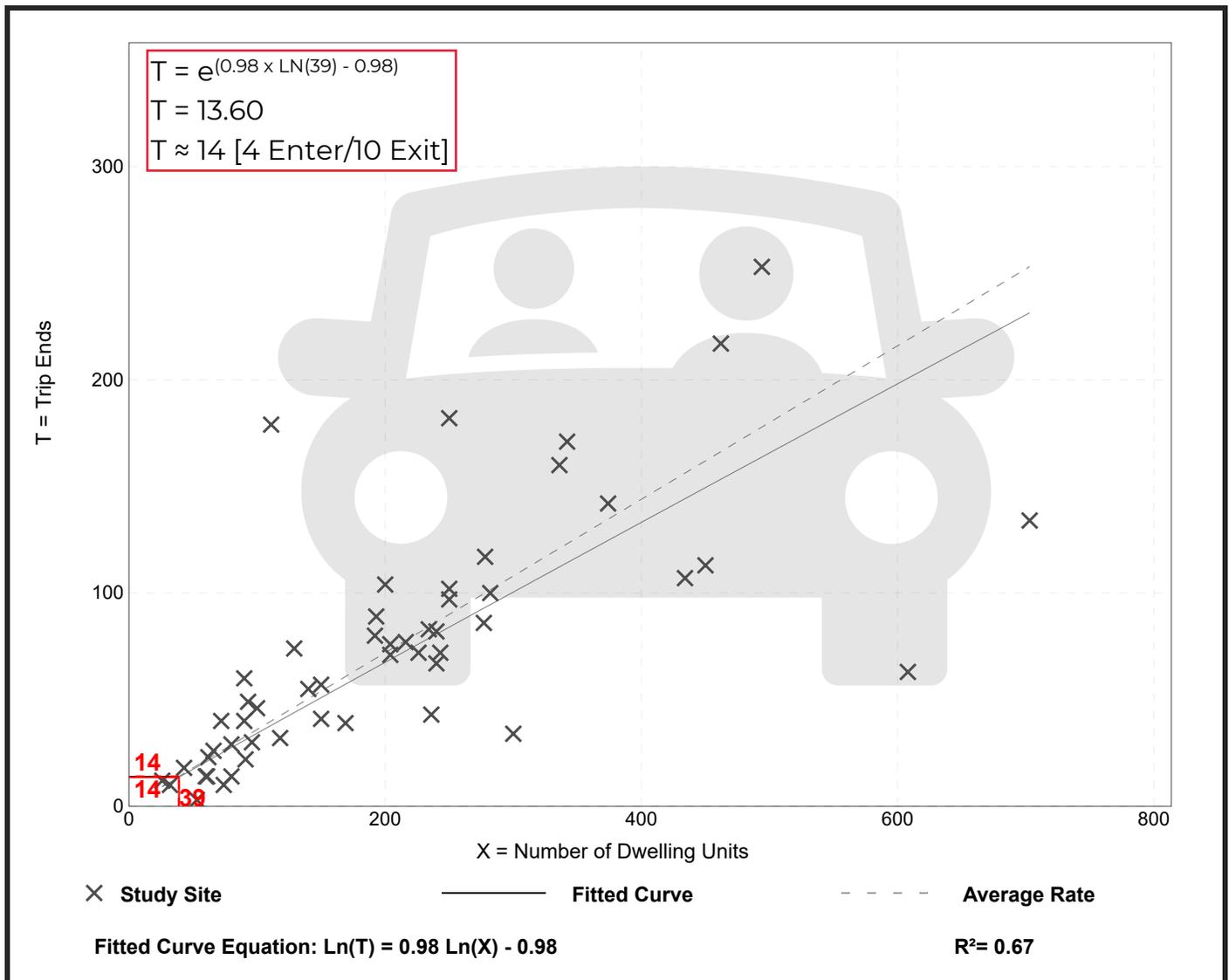
Avg. Num. of Dwelling Units: 207

Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.36	0.06 - 1.61	0.19

Data Plot and Equation



Multifamily Housing (Mid-Rise) (221)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 60

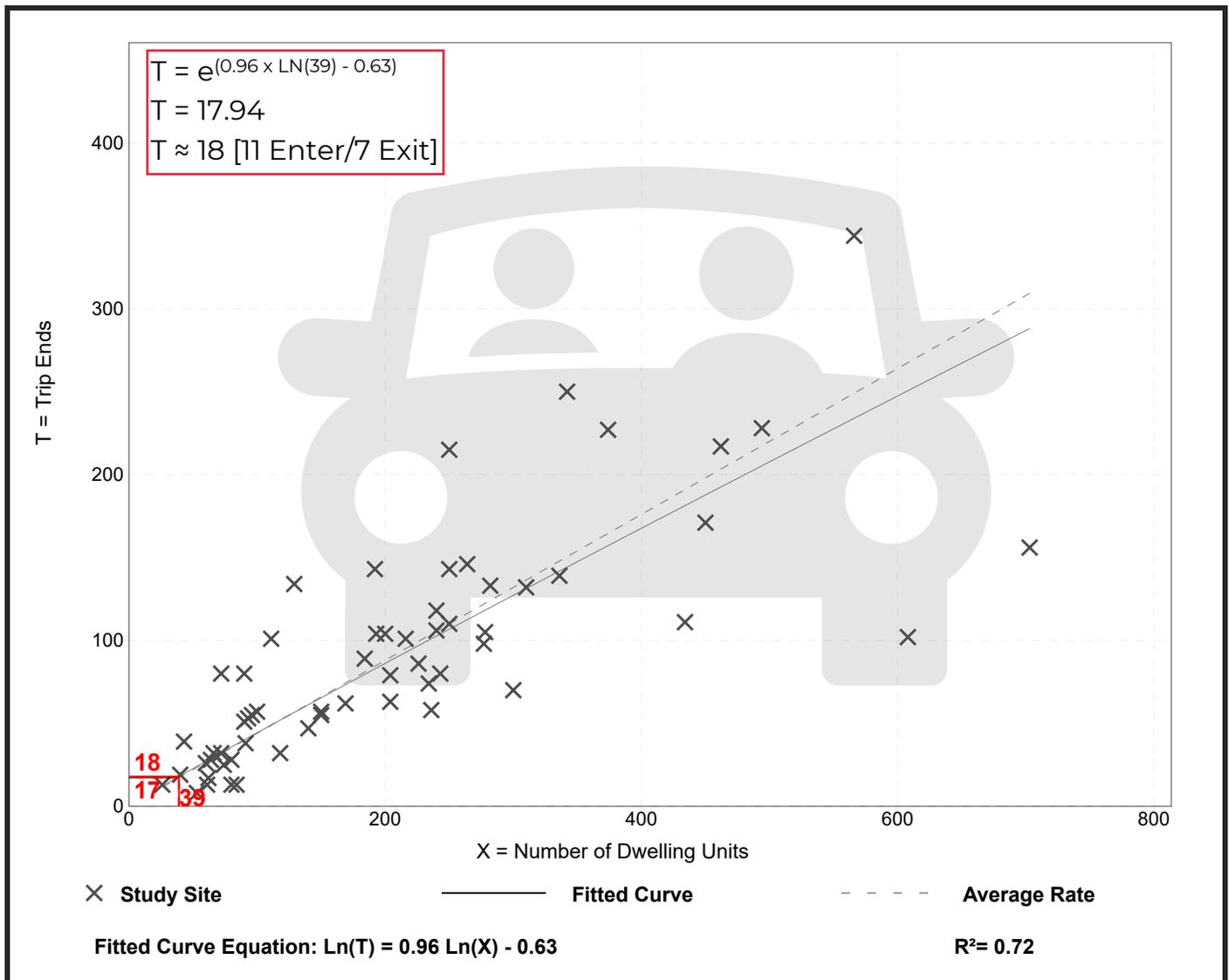
Avg. Num. of Dwelling Units: 208

Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.44	0.15 - 1.11	0.19

Data Plot and Equation



JOURNEY TO WORK TRIP DISTRIBUTION

Proposed Residential Development
Dover, MA

Residence	Workplace	Number	Route 109 (East)	Route 109 (West)	Walpole Street (North)	Draper Road (North)			
Dover town	Boston city	630	100%	630	0	0			
Dover town	Dover town	342		0	0	100%	342	0	
Dover town	Wellesley town	197	50%	99	0	50%	99	0	
Dover town	Needham town	122	50%	61	0	50%	61	0	
Dover town	Newton city	99	75%	74	0	25%	25	0	
Dover town	Framingham town	91		0	75%	68	25%	23	0
Dover town	Dedham town	86	100%	86	0	0	0	0	
Dover town	Waltham city	81	100%	81	0	0	0	0	
Dover town	Brookline town	69	100%	69	0	0	0	0	
Dover town	Norwood town	63	100%	63	0	0	0	0	
Dover town	Cambridge city	60	100%	60	0	0	0	0	
Dover town	Lexington town	57	75%	43	0	25%	14	0	
Dover town	Watertown Town city	46	75%	35	0	25%	12	0	
Dover town	Westwood town	45	75%	34	0	25%	11	0	
Dover town	Natick town	40		0	75%	30	25%	10	0
Dover town	Braintree Town city	31	100%	31	0	0	0	0	
Dover town	Medfield town	31		0	100%	31	0	0	0
Dover town	Worcester city	28		0	100%	28	0	0	0
Dover town	Marlborough city	27		0	100%	27	0	0	0
Dover town	Mansfield town	22	100%	22	0	0	0	0	0
Dover town	Stoughton town	20	100%	20	0	0	0	0	0
Dover town	Burlington town	18	75%	14	0	25%	5	0	0
Dover town	Weymouth Town city	14	100%	14	0	0	0	0	0
		2,219		1,434	184	601		0	
				64.6%	8.3%	27.1%		0.0%	
		<u>SAY</u>		<u>65%</u>	<u>10%</u>	<u>25%</u>		<u>0%</u>	

CAPACITY ANALYSIS WORKSHEETS

Route 109 at Walpole Street

Route 109 at Draper Road

Route 109 at the Project Site Driveway

Route 109 Walpole Street

2020 Existing Weekday Morning Peak Hour
1: Route 109 & Walpole Street

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	30	701	325	171	60	5
Future Vol, veh/h	30	701	325	171	60	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	88	88	69	69
Heavy Vehicles, %	0	6	7	3	2	0
Mvmt Flow	34	788	369	194	87	7

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	563	0	-	0	1322 466
Stage 1	-	-	-	-	466 -
Stage 2	-	-	-	-	856 -
Critical Hdwy	4.1	-	-	-	6.42 6.2
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.2	-	-	-	3.518 3.3
Pot Cap-1 Maneuver	1019	-	-	-	173 601
Stage 1	-	-	-	-	632 -
Stage 2	-	-	-	-	416 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1019	-	-	-	163 601
Mov Cap-2 Maneuver	-	-	-	-	163 -
Stage 1	-	-	-	-	595 -
Stage 2	-	-	-	-	416 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	48.2
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1019	-	-	-	173
HCM Lane V/C Ratio	0.033	-	-	-	0.545
HCM Control Delay (s)	8.7	0	-	-	48.2
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	-	2.8

2020 Existing Weekday Evening Peak Hour
1: Route 109 & Walpole Street

Intersection						
Int Delay, s/veh	10.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	7	483	614	62	136	14
Future Vol, veh/h	7	483	614	62	136	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	88	88	86	86
Heavy Vehicles, %	0	1	2	0	0	0
Mvmt Flow	7	514	698	70	158	16

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	768	0	-	0	1261 733
Stage 1	-	-	-	-	733 -
Stage 2	-	-	-	-	528 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	855	-	-	-	190 424
Stage 1	-	-	-	-	479 -
Stage 2	-	-	-	-	596 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	855	-	-	-	188 424
Mov Cap-2 Maneuver	-	-	-	-	188 -
Stage 1	-	-	-	-	474 -
Stage 2	-	-	-	-	596 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	85.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	855	-	-	-	198
HCM Lane V/C Ratio	0.009	-	-	-	0.881
HCM Control Delay (s)	9.2	0	-	-	85.4
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	6.7

2028 No Build Weekday Morning Peak Hour
 1: Route 109 & Walpole Street

Intersection						
Int Delay, s/veh	4.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	32	759	352	185	65	5
Future Vol, veh/h	32	759	352	185	65	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	88	88	69	69
Heavy Vehicles, %	0	6	7	3	2	0
Mvmt Flow	36	853	400	210	94	7

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	610	0	-	0	1430 505
Stage 1	-	-	-	-	505 -
Stage 2	-	-	-	-	925 -
Critical Hdwy	4.1	-	-	-	6.42 6.2
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.2	-	-	-	3.518 3.3
Pot Cap-1 Maneuver	979	-	-	-	148 571
Stage 1	-	-	-	-	606 -
Stage 2	-	-	-	-	386 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	979	-	-	-	138 571
Mov Cap-2 Maneuver	-	-	-	-	138 -
Stage 1	-	-	-	-	564 -
Stage 2	-	-	-	-	386 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	72.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	979	-	-	-	146
HCM Lane V/C Ratio	0.037	-	-	-	0.695
HCM Control Delay (s)	8.8	0	-	-	72.5
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	4

2028 No Build Weekday Evening Peak Hour
1: Route 109 & Walpole Street

Intersection						
Int Delay, s/veh	18.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	8	523	665	67	147	15
Future Vol, veh/h	8	523	665	67	147	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	88	88	86	86
Heavy Vehicles, %	0	1	2	0	0	0
Mvmt Flow	9	556	756	76	171	17

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	832	0	-	0	1368 794
Stage 1	-	-	-	-	794 -
Stage 2	-	-	-	-	574 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	809	-	-	-	~ 163 391
Stage 1	-	-	-	-	449 -
Stage 2	-	-	-	-	567 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	809	-	-	-	~ 160 391
Mov Cap-2 Maneuver	-	-	-	-	~ 160 -
Stage 1	-	-	-	-	442 -
Stage 2	-	-	-	-	567 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	158.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	809	-	-	-	169
HCM Lane V/C Ratio	0.011	-	-	-	1.115
HCM Control Delay (s)	9.5	0	-	-	158.6
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	9.7

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

2028 Build Weekday Morning Peak Hour
1: Route 109 & Walpole Street

Intersection						
Int Delay, s/veh	5.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	35	765	355	185	65	6
Future Vol, veh/h	35	765	355	185	65	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	88	88	69	69
Heavy Vehicles, %	0	6	7	3	2	0
Mvmt Flow	39	860	403	210	94	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	613	0	-	0	1446 508
Stage 1	-	-	-	-	508 -
Stage 2	-	-	-	-	938 -
Critical Hdwy	4.1	-	-	-	6.42 6.2
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.2	-	-	-	3.518 3.3
Pot Cap-1 Maneuver	976	-	-	-	145 569
Stage 1	-	-	-	-	604 -
Stage 2	-	-	-	-	381 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	976	-	-	-	134 569
Mov Cap-2 Maneuver	-	-	-	-	134 -
Stage 1	-	-	-	-	558 -
Stage 2	-	-	-	-	381 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	77.2
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	976	-	-	-	143
HCM Lane V/C Ratio	0.04	-	-	-	0.72
HCM Control Delay (s)	8.8	0	-	-	77.2
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	4.2

2028 Build Weekday Evening Peak Hour
1: Route 109 & Walpole Street

Intersection						
Int Delay, s/veh	20.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	10	527	672	67	147	18
Future Vol, veh/h	10	527	672	67	147	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	88	88	86	86
Heavy Vehicles, %	0	1	2	0	0	0
Mvmt Flow	11	561	764	76	171	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	840	0	-	0	1385 802
Stage 1	-	-	-	-	802 -
Stage 2	-	-	-	-	583 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	804	-	-	-	~ 160 387
Stage 1	-	-	-	-	445 -
Stage 2	-	-	-	-	562 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	804	-	-	-	~ 157 387
Mov Cap-2 Maneuver	-	-	-	-	~ 157 -
Stage 1	-	-	-	-	436 -
Stage 2	-	-	-	-	562 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	168.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	804	-	-	-	168
HCM Lane V/C Ratio	0.013	-	-	-	1.142
HCM Control Delay (s)	9.5	0	-	-	168.1
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	10.1

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

Route 109 at Draper Road

2020 Existing Weekday Morning Peak Hour
2: Route 109 & Draper Road

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	5	682	322	4	5	6
Future Vol, veh/h	5	682	322	4	5	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	75	75
Heavy Vehicles, %	0	5	7	33	0	0
Mvmt Flow	6	802	379	5	7	8

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	384	0	-	0	1196 382
Stage 1	-	-	-	-	382 -
Stage 2	-	-	-	-	814 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1186	-	-	-	208 670
Stage 1	-	-	-	-	694 -
Stage 2	-	-	-	-	439 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1186	-	-	-	206 670
Mov Cap-2 Maneuver	-	-	-	-	206 -
Stage 1	-	-	-	-	688 -
Stage 2	-	-	-	-	439 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1186	-	-	-	331
HCM Lane V/C Ratio	0.005	-	-	-	0.044
HCM Control Delay (s)	8.1	0	-	-	16.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

2020 Existing Weekday Evening Peak Hour
2: Route 109 & Draper Road

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	5	463	592	6	7	15
Future Vol, veh/h	5	463	592	6	7	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	83	83	79	79
Heavy Vehicles, %	0	1	1	0	0	8
Mvmt Flow	5	487	713	7	9	19

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	720	0	-	0	1214 717
Stage 1	-	-	-	-	717 -
Stage 2	-	-	-	-	497 -
Critical Hdwy	4.1	-	-	-	6.4 6.28
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.372
Pot Cap-1 Maneuver	891	-	-	-	202 420
Stage 1	-	-	-	-	487 -
Stage 2	-	-	-	-	615 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	891	-	-	-	200 420
Mov Cap-2 Maneuver	-	-	-	-	200 -
Stage 1	-	-	-	-	483 -
Stage 2	-	-	-	-	615 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	17.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	891	-	-	-	311
HCM Lane V/C Ratio	0.006	-	-	-	0.09
HCM Control Delay (s)	9.1	0	-	-	17.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3

2028 No Build Weekday Morning Peak Hour
2: Route 109 & Draper Road

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	5	739	349	4	5	6
Future Vol, veh/h	5	739	349	4	5	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	75	75
Heavy Vehicles, %	0	5	7	33	0	0
Mvmt Flow	6	869	411	5	7	8

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	416	0	-	0	1295 414
Stage 1	-	-	-	-	414 -
Stage 2	-	-	-	-	881 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1154	-	-	-	181 643
Stage 1	-	-	-	-	671 -
Stage 2	-	-	-	-	408 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1154	-	-	-	179 643
Mov Cap-2 Maneuver	-	-	-	-	179 -
Stage 1	-	-	-	-	664 -
Stage 2	-	-	-	-	408 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	17.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1154	-	-	-	295
HCM Lane V/C Ratio	0.005	-	-	-	0.05
HCM Control Delay (s)	8.1	0	-	-	17.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

2028 No Build Weekday Evening Peak Hour
2: Route 109 & Draper Road

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	5	501	641	6	8	16
Future Vol, veh/h	5	501	641	6	8	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	83	83	79	79
Heavy Vehicles, %	0	1	1	0	0	8
Mvmt Flow	5	527	772	7	10	20

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	779	0	0	1313	776
Stage 1	-	-	-	776	-
Stage 2	-	-	-	537	-
Critical Hdwy	4.1	-	-	6.4	6.28
Critical Hdwy Stg 1	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	3.5	3.372
Pot Cap-1 Maneuver	847	-	-	176	388
Stage 1	-	-	-	457	-
Stage 2	-	-	-	590	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	847	-	-	175	388
Mov Cap-2 Maneuver	-	-	-	175	-
Stage 1	-	-	-	453	-
Stage 2	-	-	-	590	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	19.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	847	-	-	-	276
HCM Lane V/C Ratio	0.006	-	-	-	0.11
HCM Control Delay (s)	9.3	0	-	-	19.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.4

2028 Build Weekday Morning Peak Hour
2: Route 109 & Draper Road

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	5	739	350	4	5	6
Future Vol, veh/h	5	739	350	4	5	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	75	75
Heavy Vehicles, %	0	5	7	33	0	0
Mvmt Flow	6	869	412	5	7	8

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	417	0	-	0	1296 415
Stage 1	-	-	-	-	415 -
Stage 2	-	-	-	-	881 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1153	-	-	-	181 642
Stage 1	-	-	-	-	671 -
Stage 2	-	-	-	-	408 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1153	-	-	-	179 642
Mov Cap-2 Maneuver	-	-	-	-	179 -
Stage 1	-	-	-	-	664 -
Stage 2	-	-	-	-	408 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	17.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1153	-	-	-	295
HCM Lane V/C Ratio	0.005	-	-	-	0.05
HCM Control Delay (s)	8.1	0	-	-	17.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

2028 Build Weekday Evening Peak Hour
2: Route 109 & Draper Road

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	5	502	642	6	8	16
Future Vol, veh/h	5	502	642	6	8	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	83	83	79	79
Heavy Vehicles, %	0	1	1	0	0	8
Mvmt Flow	5	528	773	7	10	20

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	780	0	-	0	1315 777
Stage 1	-	-	-	-	777 -
Stage 2	-	-	-	-	538 -
Critical Hdwy	4.1	-	-	-	6.4 6.28
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.372
Pot Cap-1 Maneuver	846	-	-	-	176 387
Stage 1	-	-	-	-	457 -
Stage 2	-	-	-	-	589 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	846	-	-	-	175 387
Mov Cap-2 Maneuver	-	-	-	-	175 -
Stage 1	-	-	-	-	453 -
Stage 2	-	-	-	-	589 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	19.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	846	-	-	-	276
HCM Lane V/C Ratio	0.006	-	-	-	0.11
HCM Control Delay (s)	9.3	0	-	-	19.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.4

Route 109 at the Project Site Driveway

2028 Build Weekday Morning Peak Hour
 3: Route 109 & Site Driveway

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	0	791	357	4	9	1
Future Vol, veh/h	0	791	357	4	9	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	860	388	4	10	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	392	0	-	0	1250 390
Stage 1	-	-	-	-	390 -
Stage 2	-	-	-	-	860 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1167	-	-	-	191 658
Stage 1	-	-	-	-	684 -
Stage 2	-	-	-	-	414 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1167	-	-	-	191 658
Mov Cap-2 Maneuver	-	-	-	-	191 -
Stage 1	-	-	-	-	684 -
Stage 2	-	-	-	-	414 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	23.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1167	-	-	-	206
HCM Lane V/C Ratio	-	-	-	-	0.053
HCM Control Delay (s)	0	-	-	-	23.4
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

2028 Build Weekday Evening Peak Hour
3: Route 109 & Site Driveway

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	1	531	670	10	6	1
Future Vol, veh/h	1	531	670	10	6	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	577	728	11	7	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	739	0	-	0	1313 734
Stage 1	-	-	-	-	734 -
Stage 2	-	-	-	-	579 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	867	-	-	-	175 420
Stage 1	-	-	-	-	475 -
Stage 2	-	-	-	-	560 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	867	-	-	-	175 420
Mov Cap-2 Maneuver	-	-	-	-	175 -
Stage 1	-	-	-	-	474 -
Stage 2	-	-	-	-	560 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	24.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	867	-	-	-	191
HCM Lane V/C Ratio	0.001	-	-	-	0.04
HCM Control Delay (s)	9.2	0	-	-	24.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

RED ROBIN PASTURES

DOVER, MASSACHUSETTS

CONSULTANTS LEGEND



OWNER/ DEVELOPER:

RED ROBIN PASTURES, LLC.
128 GREAT PLAIN AVE.
NEEDHAM, MA 02492
Phone: 617 602-8153
Attention: PAUL McGOVERN
paul@pgcmlnc.com

DEVELOPMENT CONSULTANTS:

SEB, LLC / Strategic Land Ventures, LLC
251 HILLSIDE AVENUE
NEEDHAM, MA 02494
Phone: 617 782-2300 x202
Attention: GEOFF ENGLER
gerglers@s-b.com

CIVIL ENGINEER:

RONALD TIBIERI, PE
9 MASSACHUSETTS AVENUE
NATICK, MA 01760
Phone: 617 592-6122

ARCHITECT:

SIGNATURE DESIGNS-ARCHITECTURE
13 BISHOP ROAD
SHARON, MA 02061
Phone: 781 806-0063
Attention: Henry Bobek, RA
bobek@aol.com

STRUCTURAL ENGINEERING:

THE DEMPSEY GROUP
P.O. BOX 921
HARWICH, MA 02661
Phone: 508 326-5498
Attention: Richard Dempsey, PE
tdgstructural@comcast.net

M/E/P & FIRE PROTECTION ENGINEER:

WOZNY / BABAR & ASSOC., INC.
1076 WASHINGTON STREET
HANOVER, MA 02860
Phone: 781 826-4144
Attention: ZBIGNIEW WOZNY, PE
zwozny@wbengineers.com

SURVEYOR:

CHENEY ENGINEERING CO., INC.
153 MELLE STREET
NEEDHAM, MA 02494
Phone: 781 444-2188
Attention: Ardi Rrapi
ardi.rrapi@chene-engine.com

GEOTECHNICAL CONSULTANTS:

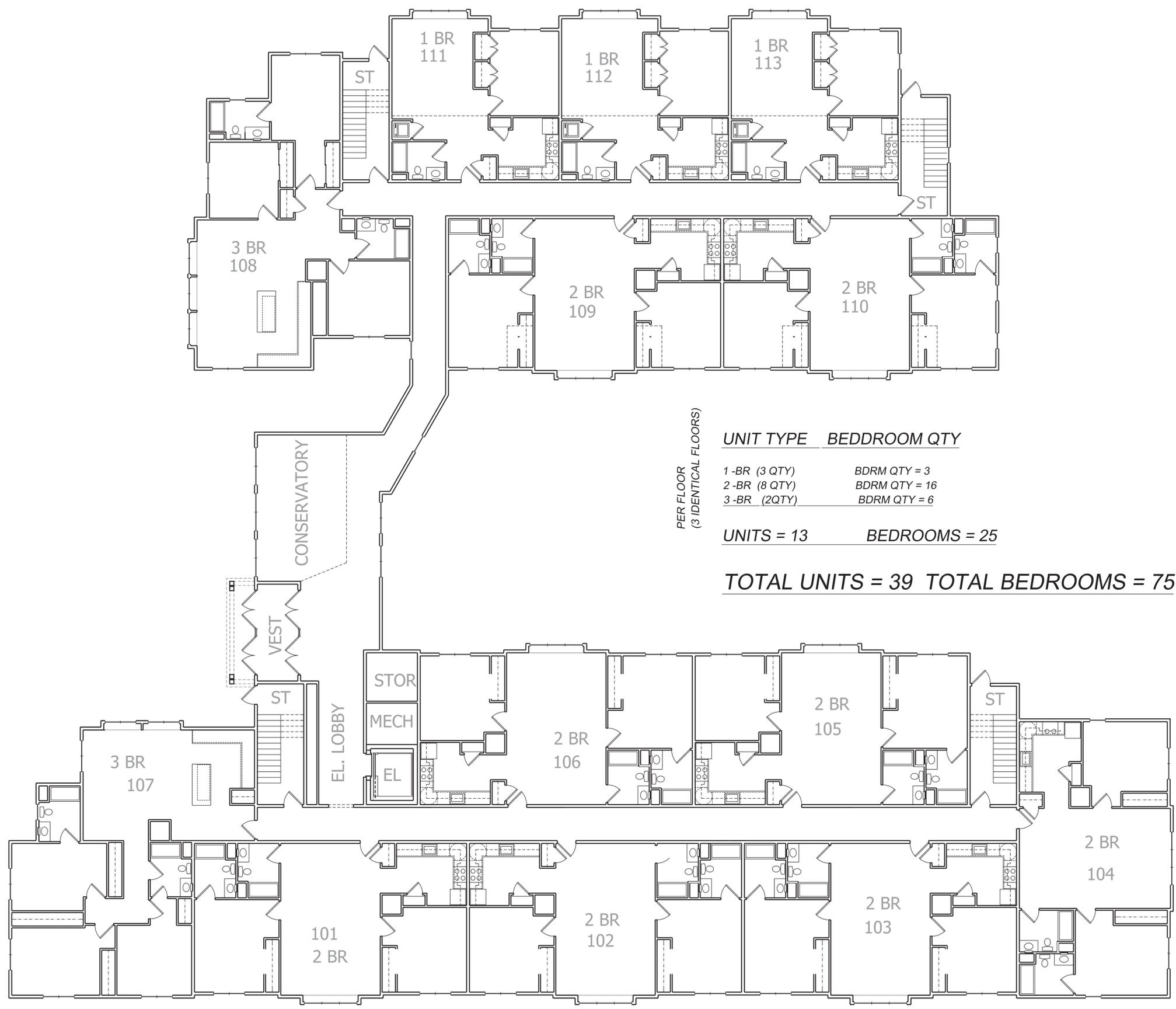
GEOTECHNICAL CONSULTANTS, INC.
201 BOSTON POST ROAD WEST
MARLBOROUGH, MA 01752
Phone: 508 229-0900
info@geotechnical.us

TRANSPORTATION CONSULTANT:

VANASSE & ASSOCIATES INC.
35 NEW ENGLAND BUSINESS CENTER DR
SUITE 140
ANDOVER, MA 01810
Phone: 978 263-6830
Attention: Jeffrey S. Dirk PE FTOE FITE

LANDSCAPE & LIGHTING CONSULTANT:

GREEN BEAN DESIGN, INC.
SALEM MA



PER FLOOR
(3 IDENTICAL FLOORS)

UNIT TYPE	BEDROOM QTY
1 -BR (3 QTY)	BDRM QTY = 3
2 -BR (8 QTY)	BDRM QTY = 16
3 -BR (2QTY)	BDRM QTY = 6

UNITS = 13 BEDROOMS = 25

TOTAL UNITS = 39 TOTAL BEDROOMS = 75

FIRST FLOOR PLAN
SCALE: 1/8"=1'-0"

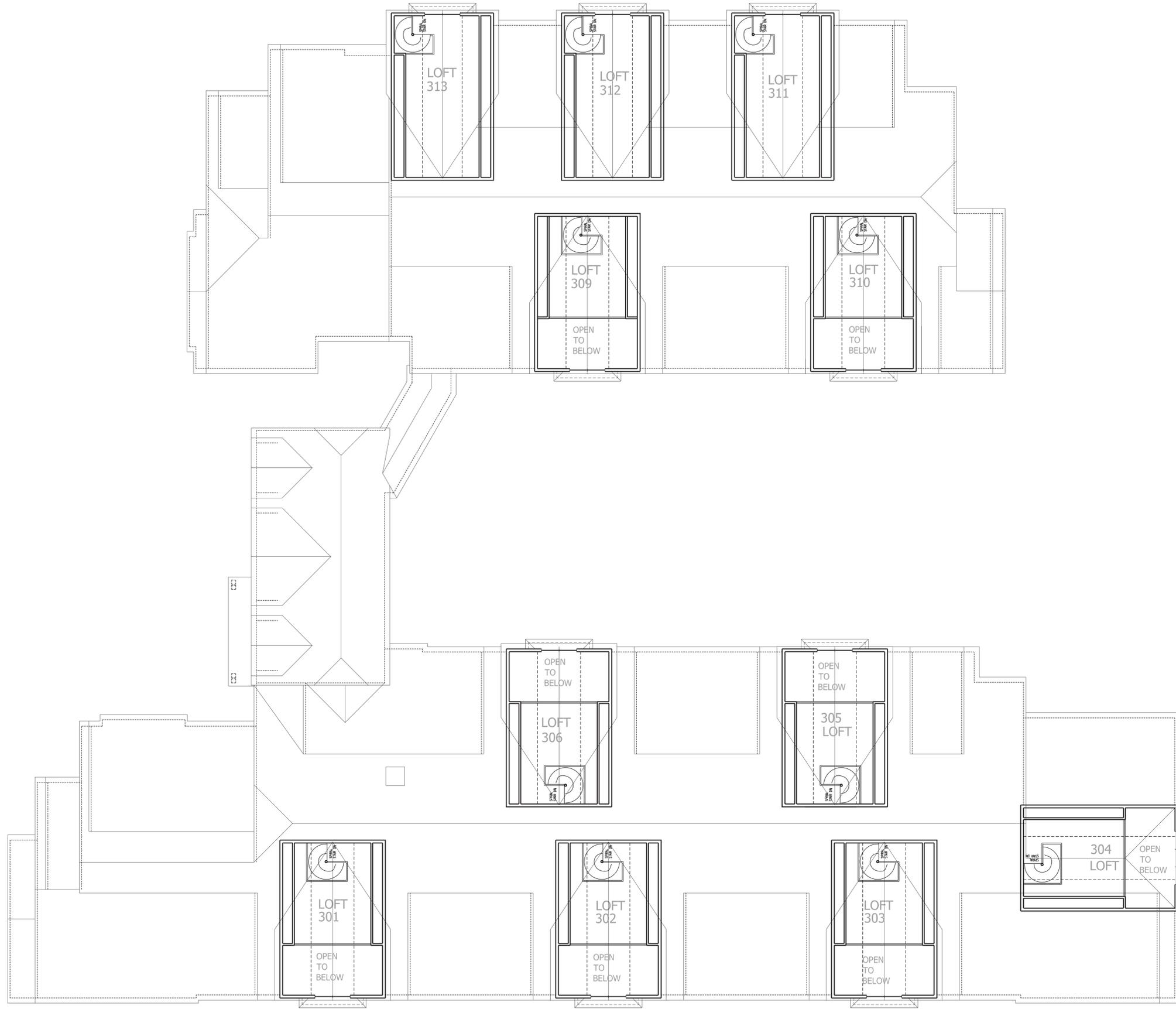
Rev. #	Date

Use and Interpretation of this Drawing (C1's) the CONTRACTOR represents that he has visited the site, familiarized himself with the local conditions, verified field dimensions and correlated his observations with the requirements of the CD's. Plans, annotations, shall not accept, settled, L1166006, project, address, 1. The contractor shall be responsible for all construction details and shall coordinate with the architect and engineer for all construction details. 2. The contractor shall be responsible for all construction details and shall coordinate with the architect and engineer for all construction details. 3. SP-A is providing Design/Detailing & Limited Site Verification services. SP-A is not responsible for site violations or verifying. A project is built in accordance with CD's. It is the responsibility of the contractor, architect, engineer, and manufacturer to ensure that all construction is in accordance with industry standards.

Drawing Description
**FIRST FLOOR PLAN
RED ROBIN PASTURES
DOVER, MA**

Designed & Drafting services performed by:
**Signature Designs
ARCHITECTURE**
73 Bishop Road, Sharon, MA 02067 781 806-0065

Sheet No.
A1
OF 6



LOFT LEVEL & ROOF PLAN
SCALE: 1/8"=1'-0"

Rev. #	Date

Designer/Drafter
HB
Scale
AS NOTED
Date
04/27/20

Use and Interpretation of this Drawing
1. By use of these Construction Drawings (CD's) the CONTRACTOR represents that he has visited the site, familiarized himself with the local conditions, verified field dimensions and correlated his observations with the requirements of the CD's. Any omissions shall not be accepted. Lilliboss, project address, 73 Bishop Road, Sharon, MA 02007. The drawings are prepared by Signature Designs Architecture, Inc. (SD-A) and are not to be used for any other project. Changes to the CD's must be made by SD-A. CD-200
2. SD-A is providing Design/Detailing & Limited Site Verification services. SD-A is not responsible for site violations or verifying. A project is built in accordance with CD's. It is the responsibility of the contractor to verify the accuracy of the CD's and to provide the necessary equipment, materials, and labor in accordance with industry standards.

Drawing Description
LOFT LEVEL & ROOF PLAN
RED ROBIN PASTURES
DOVER, MA

Design & Drafting services performed by:
Signature Designs
ARCHITECTURE
73 Bishop Road, Sharon, MA 02007 781 806-0165

Sheet No.
A4
OF 6



COUNTY STREET ELEVATION
SCALE: 1/8"=1'-0"



ENTRY ELEVATION
SCALE: 1/8"=1'-0"

Rev. #	Date

Use and Interpretation of this Drawing
 1. By use of these Construction Drawings (CD's) the CONTRACTOR represents that he has visited the site, familiarized himself with the local conditions, verified field dimensions and correlated his observations with the requirements of the CD's. Plan annotations shall not accept, edited, illustrated, printed, address, or instruments of service, in this project. Specifications shall be those of the CD's. CD's are the property of Signature Architecture (SA-A) and shall not be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of SA-A.
 2. SA-A is providing Design/Developing & Limited Site Verification services. SA-A is not responsible for site violations or verifying. Approval is built in accordance with CD's. It is property constructed, workmanship practices, use & furnishing of equipment & materials in accordance with industry standards.

Drawing Description
ENTRY & STREET ELEVATIONS
RED ROBIN PASTURES
DOVER, MA

Design & Drafting services performed by:
Signature Architecture
ARCHITECTURE
 73 Bishop Road, Sharon, MA 02007 781 806-0065



WEST ELEVATION
SCALE: 1/8"=1'-0"



EAST ELEVATION
SCALE: 1/8"=1'-0"

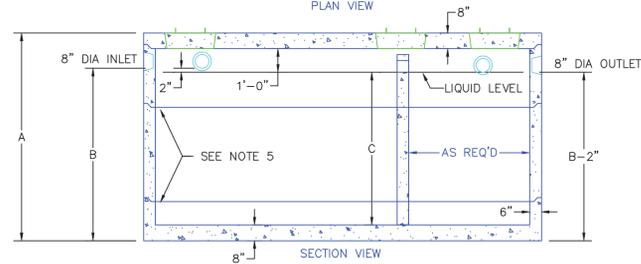
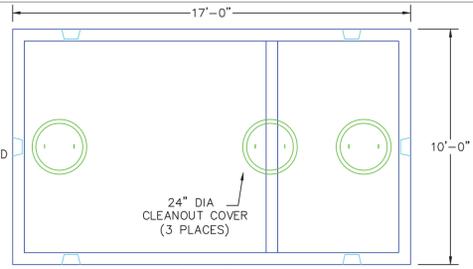
Rev. #	Date

Use and Interpretation of this Drawing
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Drawing Description
EAST & WEST ELEVATIONS
RED ROBIN PASTURES
DOVER, MA

Design & Drafting services performed by:
Signature Designs
ARCHITECTURE
 73 Bishop Road, Sharon, MA 02067 781 806-0065

- NOTES:
1. CONCRETE, 5,000 PSI MINIMUM AFTER 28 DAYS.
 2. DESIGN CONFORMS WITH 310 CMR 15.00, DEP TITLE 5 REGS. FOR SEPTIC TANKS.
 3. ALL REINFORCEMENT PER ASTM C1227.
 4. DESIGNED FOR AASHTO HS-20 LOADING, COVER 1-5 FEET.
 5. TONGUE AND GROOVE JOINT SEALED WITH BUTYL RESIN. INLET HEIGHT MAY INCREASE SLIGHTLY DUE TO THE BUTYL RESIN USED.
 6. TEES AND BAFFLES SOLD SEPARATELY.
 7. SPANNERS USED IN CENTER SECTIONS FOR TANKS GREATER THAN 7000 GALLONS.

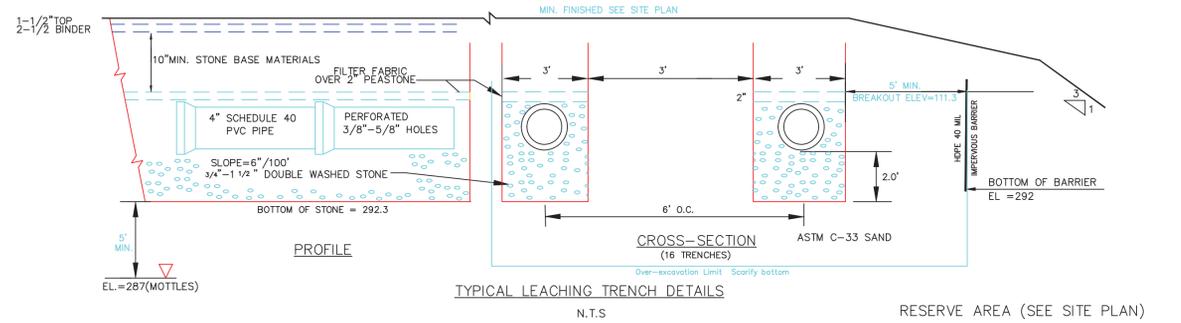


GALLONS	A (HEIGHT)	B (INLET)	C (LIQUID)	TOTAL WEIGHT	RISER 1 SIZE	RISER 2 SIZE	RISER 3 SIZE
4,000	76"	58"	48"	55,366	48"	0	0
5,000	88"	70"	60"	59,812	30"	30"	0
5,500	92"	74"	64"	61,296	30"	34"	0
6,000	96"	78"	68"	62,780	34"	34"	0
6,500	100"	82"	72"	64,258	30"	42"	0
7,000	106"	88"	78"	66,482	30"	48"	0
7,500	112"	94"	84"	68,704	42"	42"	0
8,000	118"	100"	90"	70,928	42"	48"	0
8,500	124"	106"	96"	73,152	48"	48"	0
9,000	130"	112"	102"	75,374	30"	30"	42"
9,500	136"	118"	108"	77,598	30"	30"	48"
10,000	140"	122"	112"	79,082	30"	34"	48"
10,500	146"	128"	118"	81,304	34"	42"	42"
11,000	152"	134"	124"	83,528	34"	42"	48"
11,500	158"	140"	130"	85,752	34"	48"	48"
12,000	162"	144"	134"	87,232	38"	48"	48"

ITEM	SIZE	WEIGHT
8" TOP		16,312#
21" BOTTOM		20,517#
30" RISER		11,116#
34" RISER		12,600#
38" RISER		14,080#
42" RISER		15,562#
48" RISER		17,786#

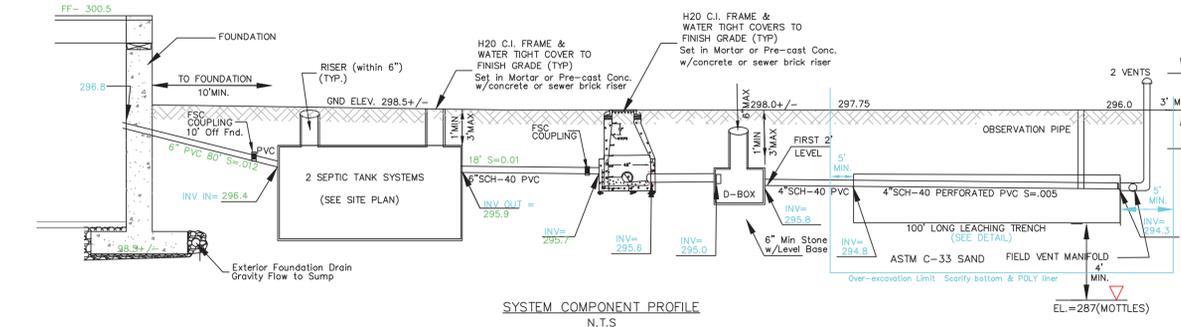
ALL RISERS HAVE SPANS

TANK DETAILS
N.T.S.

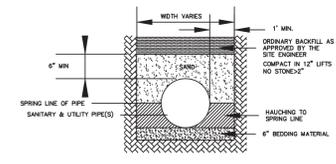


TYPICAL LEACHING TRENCH DETAILS
N.T.S.

RESERVE AREA (SEE SITE PLAN)

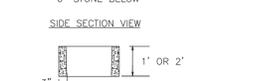
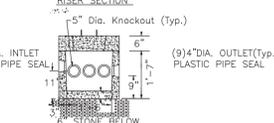
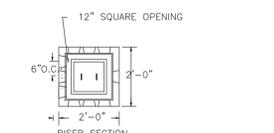


SYSTEM COMPONENT PROFILE
N.T.S.

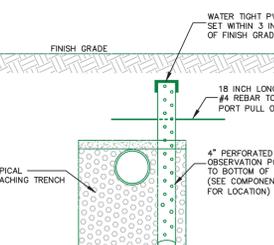


NOTES:
 1. AREAS OF GROUNDWATER MOVEMENT AND FINE IN-SITU SOILS. THE BEDDING MATERIAL IS TO BE CHECKED WITH FINE AGGREGATE TESTING THE APPROVAL OF THE SITE ENGINEER TO PERMIT MIXTURE OF FINES FROM THE IN-SITU SOILS.
 2. PRIOR TO PIPE INSTALLATION, CAREFULLY BRING THE 6" OF BEDDING MATERIAL (AS PER PIPE MANUFACTURER'S AND UTILITY COMPANY'S RECOMMENDATIONS) TO GRADE ALONG THE ENTIRE LENGTH OF PIPE TO BE INSTALLED. PLACE AND COMPACT BEDDING MATERIAL AS PER PIPE MANUFACTURER'S AND UTILITY COMPANY'S RECOMMENDATION. IF TRENCH BOTTOM CONDITIONS SO WARRANT, MORE THAN 6" OF BEDDING MAY BE REQUIRED.
 3. HAUNCHING: CAREFULLY WORK BY HAND FROM EDGE OF THE TRENCH UP AND UNDER THE PIPE SUPPORT THE HAUNCHES. CONTINUE FILLING BY HAND TO THE SPRING LINE OF THE PIPE.
 4. METAL BACKFILL: CONTINUE WITH PLACEMENT AND COMPACTION OF BEDDING MATERIAL TO A DEPTH OF AT LEAST 6" ABOVE TOP OF PIPE.

PIPE BEDDING DETAIL
N.T.S.



9-OUTLET DISTRIBUTION BOX
N.T.S.



TYPICAL INSPECTION PORT DETAIL
N.T.S.

- NOTES:
1. Concrete : 5,000 P.S.I Minimum Strength @ 28 Days
 2. Steel Reinforcing- ASTM A-615, Grade 60.
 3. Cover to Steel-1" Minimum
 4. Tongue and groove joint sealed with butyl resin.
 5. Grout & Seal round all knockouts
 6. Provide Bit. Sealant on interior
 7. Shea -B9DBH H2O or Equivalent

ZABEL FILTER - A-100

Not To Scale

SOIL EVALUATORS CERTIFICATIONS ON FILE W/BOH
 ① REMOVE TO UNTIL C2 LAYER IS EXPOSED OR ALL UNSUITABLE MATERIAL IS REMOVED AND REPLACE WITH TITLE V SAND (ASTM C-33 EQUIV.) 5- FEET ALL AROUND TRENCHES

DATE	REVISION

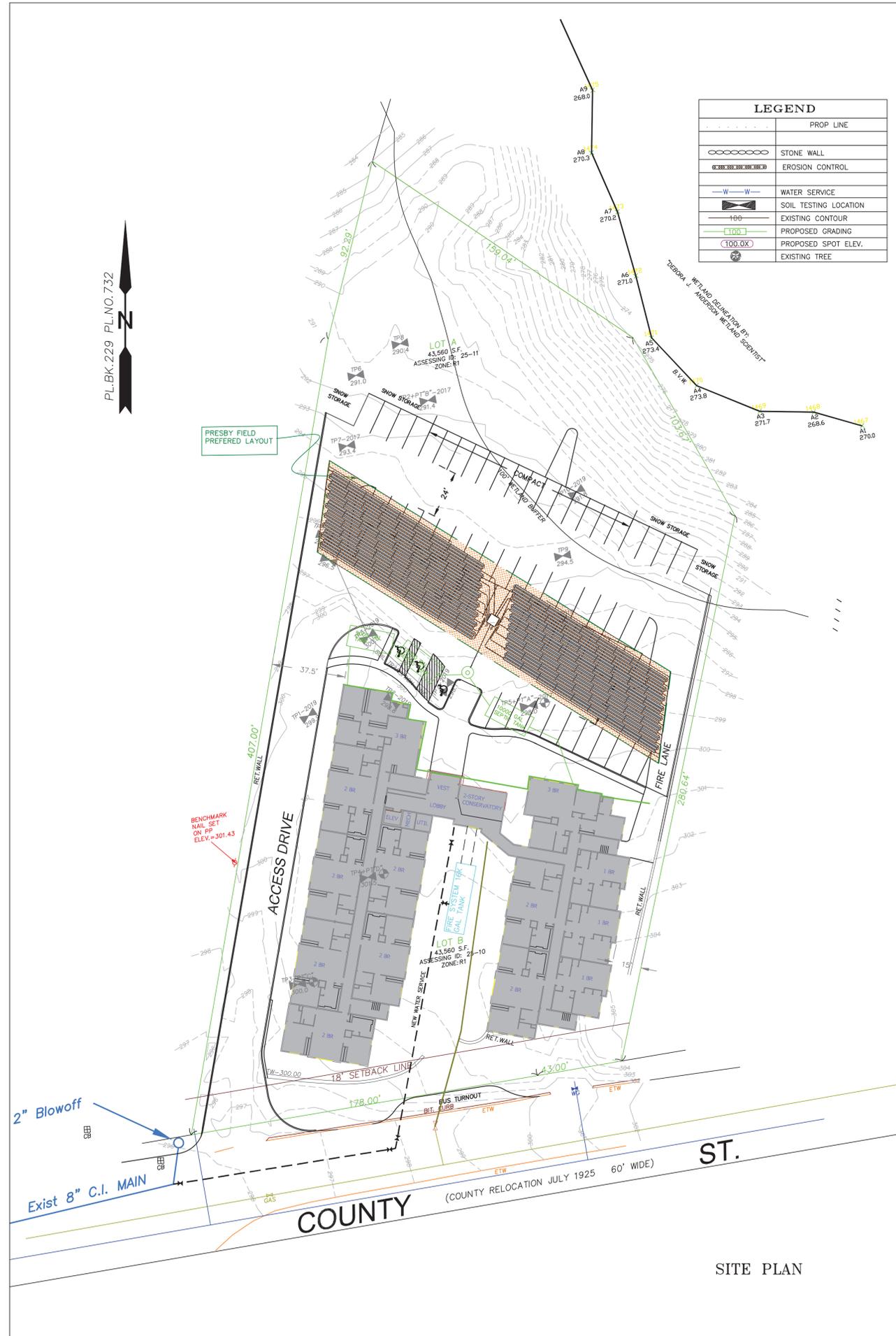
DATE	REVISION

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RED ROBIN PASTURES
DOVER MASS
STANDARD TITLE V DETAIL SHEET

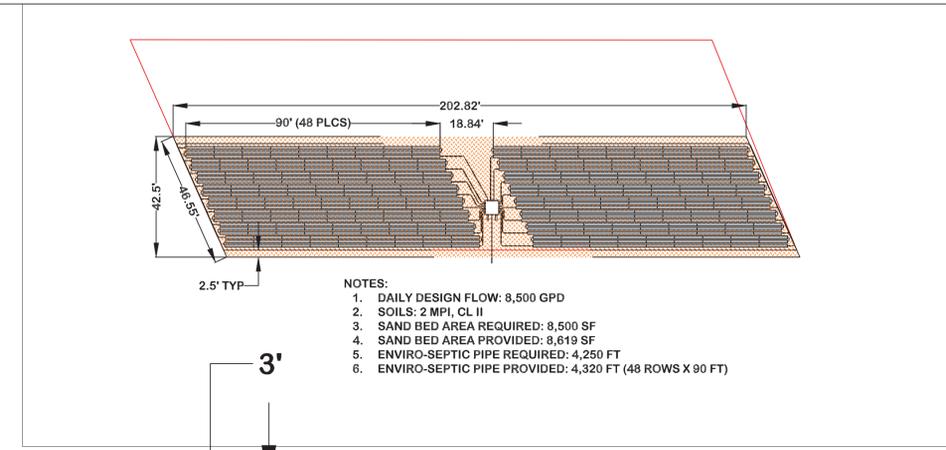
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73 Bishop Road, Sharon, MA 02067 781 806-0063

Sheet No.
C4
22



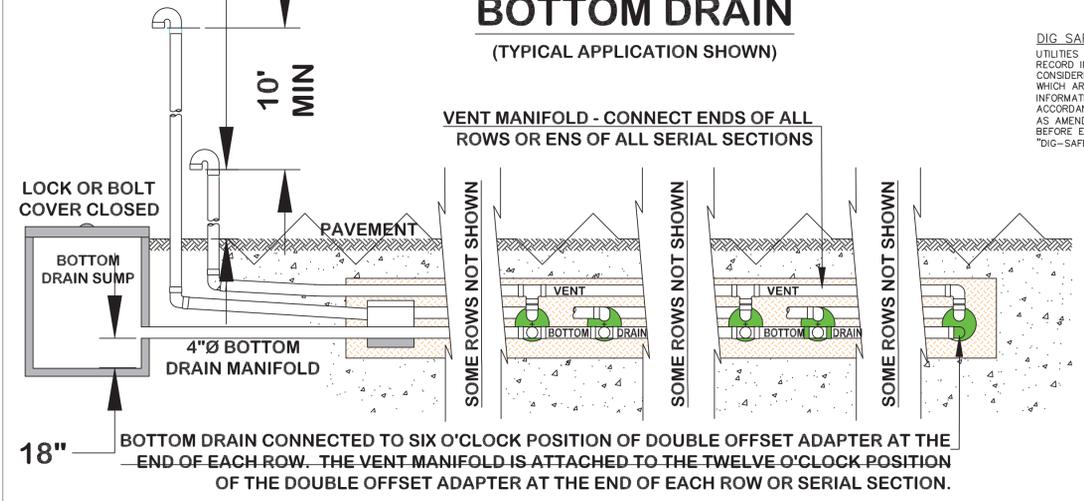
LEGEND	
---	PROP LINE
▬▬▬▬▬	STONE WALL
▬▬▬▬▬▬▬▬	EROSION CONTROL
W-W	WATER SERVICE
⊗	SOIL TESTING LOCATION
100	EXISTING CONTOUR
100.0X	PROPOSED GRADING
100.0X	PROPOSED SPOT ELEV.
⊗	EXISTING TREE

SITE PLAN



- NOTES:
- DAILY DESIGN FLOW: 8,500 GPD
 - SOILS: 2 MPI, CL II
 - SAND BED AREA REQUIRED: 8,500 SF
 - SAND BED AREA PROVIDED: 8,619 SF
 - ENVIRO-SEPTIC PIPE REQUIRED: 4,250 FT
 - ENVIRO-SEPTIC PIPE PROVIDED: 4,320 FT (48 ROWS X 90 FT)

BOTTOM DRAIN
(TYPICAL APPLICATION SHOWN)



18" BOTTOM DRAIN CONNECTED TO SIX O'CLOCK POSITION OF DOUBLE OFFSET ADAPTER AT THE END OF EACH ROW. THE VENT MANIFOLD IS ATTACHED TO THE TWELVE O'CLOCK POSITION OF THE DOUBLE OFFSET ADAPTER AT THE END OF EACH ROW OR SERIAL SECTION.

NOTES & SPECIFICATIONS

- All work shall be in accordance with NPDES permit and Spill Prevention Plans
- Pipe and fittings shall be Schedule 40 PVC (polyvinyl chloride) manufactured in accordance with the latest requirements of ASTM D3034. Joints shall be solvent welded type (tight joints). Pipe to be laid on firm compacted base.
- Perforated pipe, when required, shall be schedule 40 PVC (ASTM D1785) for entire length of system. All joints shall be tight joint. Orifice dia. = 3/8" to 5/8".
- Washed stone and other soil materials shall be in accordance with ASTM Standard
- Fill Material shall be clean granular material with a percolation rate of 2 min./inch or less, be free of deleterious material, and properly compacted to minimize settlement, or allowed to settle for twelve months.
- No changes shall be made in this plan without the authorization of the engineer, the Board of Health & Town Engineer.
- Contractor must notify dig safe & the local water department prior to beginning excavation work.
- Construction access is limited to the existing driveway. Prior approval and permitting from the Town of Dover Highway Department will be required for any area of disturbance within the right of way to obtain access or install any proposed system.
- Notify Town of Dover Board of Health 3 days prior to start of construction.
- Vehicle traffic over, parking of vehicles on, stacking of materials over, or storage of equipment on system shall not be allowed at any time.
- De-watering is required if fill is to be placed below ground water.
- There are no industrial category or prohibited wastewaters are used currently at this site.
- Fill shall not be placed during rain or snow storms.
- 48 Hour notice for field inspection, call Town Engineer for schedule
- Design Engineer to certify system installed & operating
- Weekly or as needed inspections required
- Decommission when practical

DIG SAFE NOTE:

UTILITIES ARE PLOTTED FROM FIELD LOCATION AND ANY RECORD INFORMATION AVAILABLE, AND SHOULD BE CONSIDERED APPROXIMATE. OTHER UTILITIES MAY EXIST WHICH ARE NOT EVIDENT OR FOR WHICH RECORD INFORMATION WAS NOT AVAILABLE. CONTRACTORS (IN ACCORDANCE WITH MASS.G.L. CHAPTER 82 SECTION 40 AS AMENDED) MUST CONTACT ALL UTILITY COMPANIES BEFORE EXCAVATING AND DRILLING. ALSO, CALL "DIG-SAFE" AT 1(888)344-7233 [(888)DIG-SAFE].



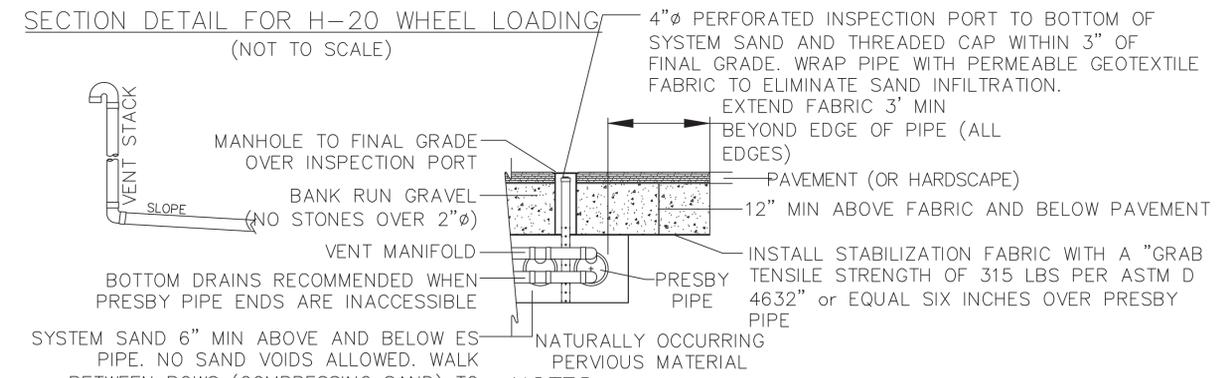
LEACHING FACILITY DESIGN CRITERIA

TYPE OF BUILDINGS	MULTI FAMILY DWELLING
# OF BEDROOMS	75
MIN. DAILY FLOW	8250 GPD
PERC. DESIGN RATE	< 2 MIN./INCH
SOIL CLASS	II
EFFLUENT LOADING RATE (GPD/SF)	= 0.74

CALCULATION:
 REQUIRED AREA = 8250 GPD / 0.74 GPD/SF = 11,148 SF
 Stone Trench Req'd = 11148 SF / 7 SF/LF = 1592 LF
 Stone Trenches = 16x100LF / 7 SF/LF = 11200 SF Provided

DISPOSAL DEED RESTRICTION REQUIRED
 NO NITROGEN LOADING RESTRICTION REQUIRED

SECTION DETAIL FOR H-20 WHEEL LOADING
(NOT TO SCALE)



SYSTEM SAND 6" MIN ABOVE AND BELOW ES PIPE. NO SAND VOIDS ALLOWED. WALK BETWEEN ROWS (COMPRESSING SAND) TO ENSURE SAND FILLS ALL VOIDS AROUND PRESBY PIPES.

- NOTES:
- THE ONLY SOIL COMPACTION THAT SHOULD TAKE PLACE IS AT THE POINT OF PREPARATION FOR PAVEMENT.
 - NOT ALL ROWS SHOWN.

DATE	REVISION

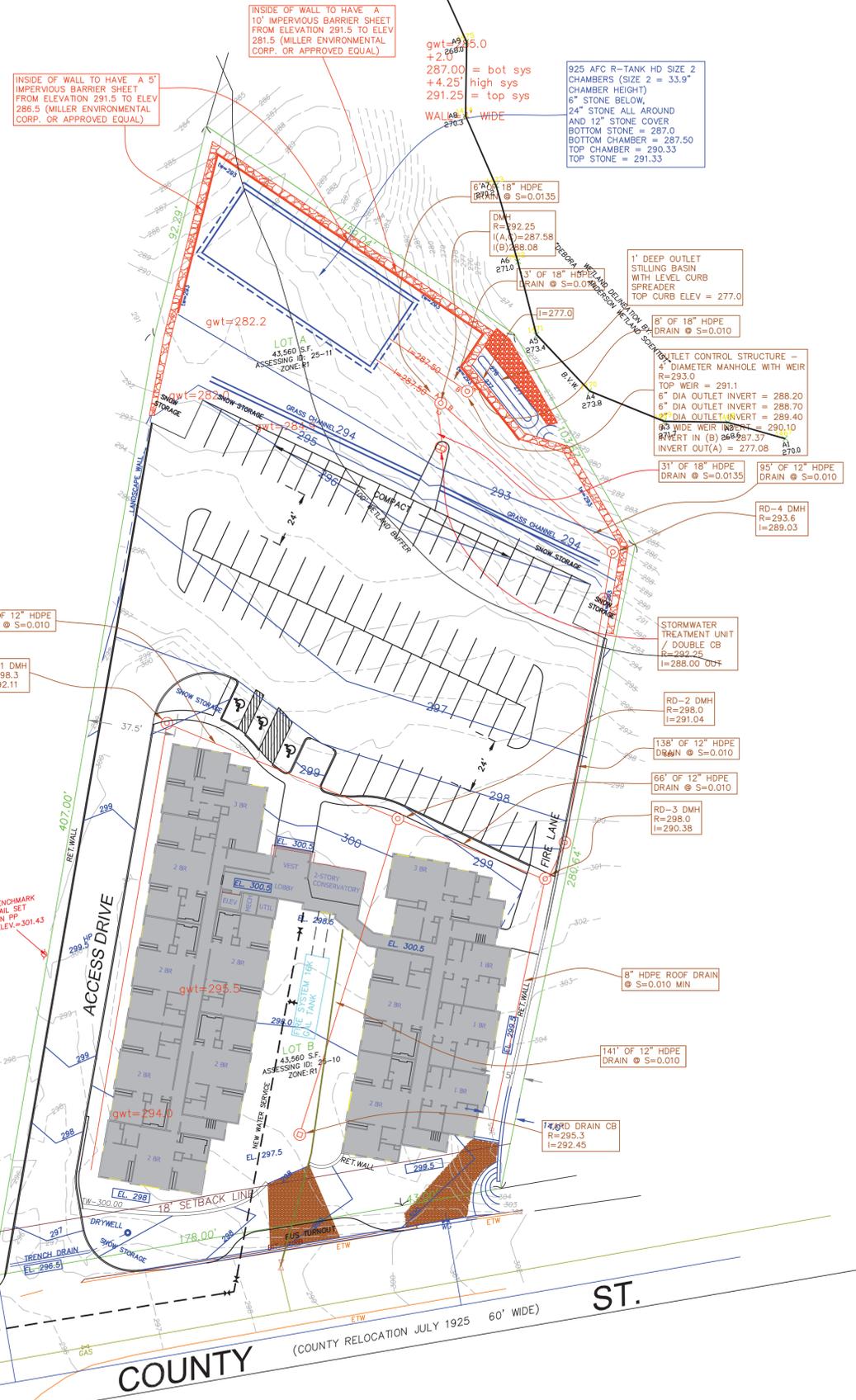
DATE	REVISION

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RED ROBIN PASTURES
 DOVER MASS
 PRESBY SANITARY SYSTEM & DETAILS

Signature Designs
 ARCHITECTURE
 73 Bishop Road, Sharon, MA 02067 781 806-0063

PLBK.229 PLNO.732



INSIDE OF WALL TO HAVE A 5' IMPERVIOUS BARRIER SHEET FROM ELEVATION 291.5 TO ELEV 286.5 (MILLER ENVIRONMENTAL CORP. OR APPROVED EQUAL)

INSIDE OF WALL TO HAVE A 10' IMPERVIOUS BARRIER SHEET FROM ELEVATION 291.5 TO ELEV 281.5 (MILLER ENVIRONMENTAL CORP. OR APPROVED EQUAL)

gwt=285.0
+2.0
287.00 = bot sys
+4.25' high sys
291.25 = top sys
WALL 18" WIDE

925 AFC R-TANK HD SIZE 2 CHAMBERS (SIZE 2 = 33.9' CHAMBER HEIGHT) 6" STONE BELOW, 24" STONE ALL AROUND AND 12" STONE COVER BOTTOM STONE = 287.0 BOTTOM CHAMBER = 287.50 TOP CHAMBER = 290.33 TOP STONE = 291.33

6" DIA 18" HDPE DRAIN @ S=0.0135

DMH R=292.25 (A)=287.59 (B)=288.08

3' OF 18" HDPE DRAIN @ S=0.010

I=277.0

1' DEEP OUTLET STILLING BASIN WITH LEVEL CURB SPREADER TOP CURB ELEV = 277.0

8" OF 18" HDPE DRAIN @ S=0.010

INLET CONTROL STRUCTURE - 4" DIAMETER MANHOLE WITH WEIR R=293.0 TOP WEIR = 291.1 6" DIA OUTLET INVERT = 288.20 6" DIA OUTLET INVERT = 288.70 6" DIA OUTLET INVERT = 289.40 8" WIDE WEIR INVERT = 290.10 INVERT IN (B) = 287.37 INVERT OUT (A) = 277.08

31" OF 18" HDPE DRAIN @ S=0.0135

95" OF 12" HDPE DRAIN @ S=0.010

RD-4 DMH R=293.6 I=289.03

STORMWATER TREATMENT UNIT / DOUBLE CB R=292.25 I=288.00

RD-2 DMH R=298.0 I=291.04

138' OF 12" HDPE DRAIN @ S=0.010

66' OF 12" HDPE DRAIN @ S=0.010

RD-3 DMH R=298.0 I=290.38

8" HDPE ROOF DRAIN @ S=0.010 MIN

141' OF 12" HDPE DRAIN @ S=0.010

14" RD DRAIN CB R=295.3 I=292.45

107' OF 12" HDPE DRAIN @ S=0.010

RD-1 DMH R=298.3 I=292.11

BENCHMARK WALL SET ON PP ELEV=301.43

Exist 2" Blowoff
Exist 8" C.I. MAIN

COUNTY ST. (COUNTY RELOCATION JULY 1925 60' WIDE)

LEGEND	
	PROP LINE
	STONE WALL
	EROSION CONTROL
	WATER SERVICE
	SOIL TESTING LOCATION
	EXISTING CONTOUR
	PROPOSED GRADING
	PROPOSED SPOT ELEV.
	EXISTING TREE

NOTES & SPECIFICATIONS

- All work shall be in conformance with NPDES permit and Spill Prevention Plans
- Pipe and fittings shall be Schedule 40 PVC (polyvinyl chloride) manufactured in accordance with the latest requirements of ASTM D3034. Joints shall be solvent welded type (tight joints). Pipe to be laid on firm compacted base.
- Perforated pipe, when required, shall be schedule 40 PVC (ASTM D1785) for entire length of system. All joints shall be tight joint. Orifice dia=3/8" to 5/8".
- Washed stone and other soil materials shall be in conformance with ASTM Standard
- Fill Material shall be clean granular material with a percolation rate of 2 min./inch or less, be free of deleterious material, and properly compacted to minimize settlement, or allowed to settle for twelve months.
- No changes shall be made in this plan without the authorization of the engineer, the Board of Health & Town Engineer.
- Contractor must notify dig safe & the local water department prior to beginning excavation work.
- Construction access is limited to the existing driveway. Prior approval and permitting from the Town of Dover Highway Department will be required for any area of disturbance within the right of way to obtain access or install any proposed system.
- Notify Town of Dover Board of Health 3 days prior to start of construction.
- Vehicle traffic over, parking of vehicles on, stockpiling of materials over, or storage of equipment on system shall not be allowed at any time.
- Dewatering is required if fill is to be placed below ground water.
- There are no industrial category or prohibited wastewaters are used currently at this site.
- Fill shall not be placed during rain or snow storms.
- 48 Hour notice for field inspection, call Town Engineer for schedule
- Design Engineer to certify system installed & operating
- Weekly or as needed inspections required
- Decommission when practical

DATE	REVISION

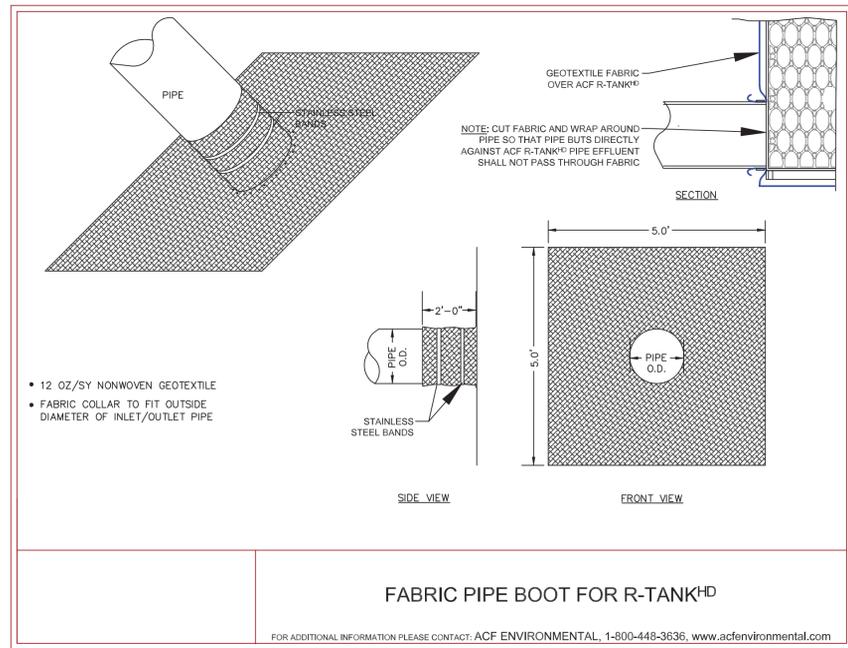
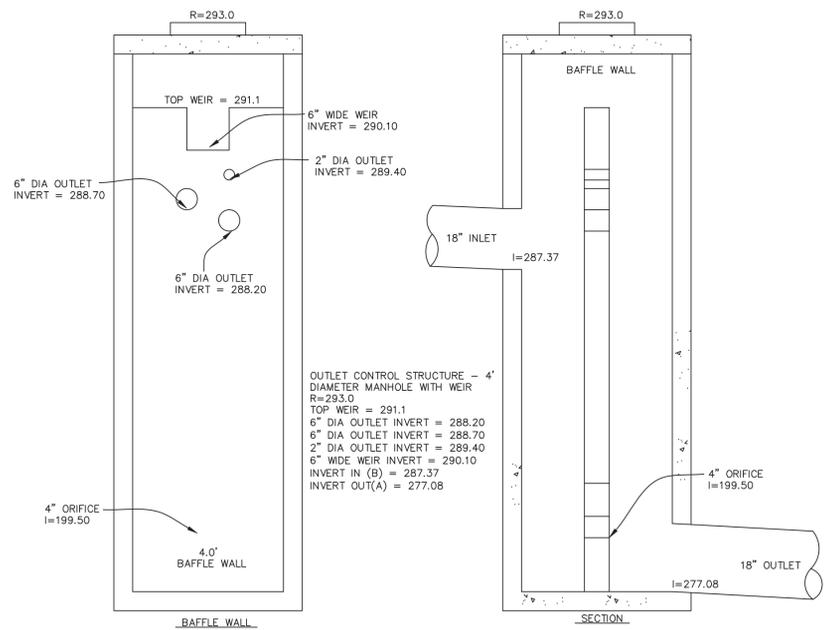
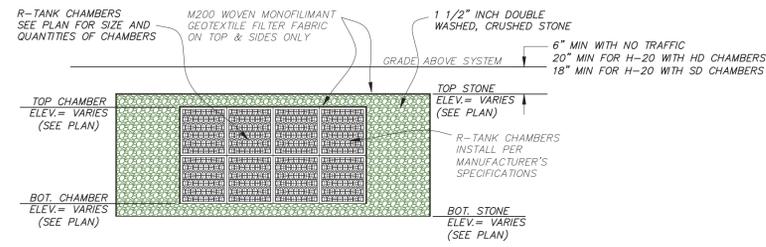
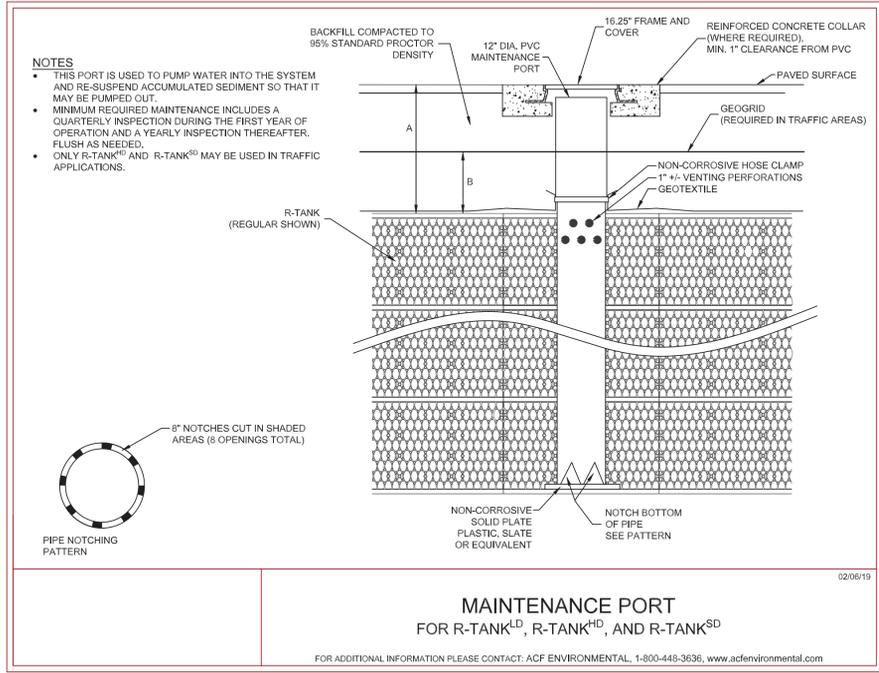
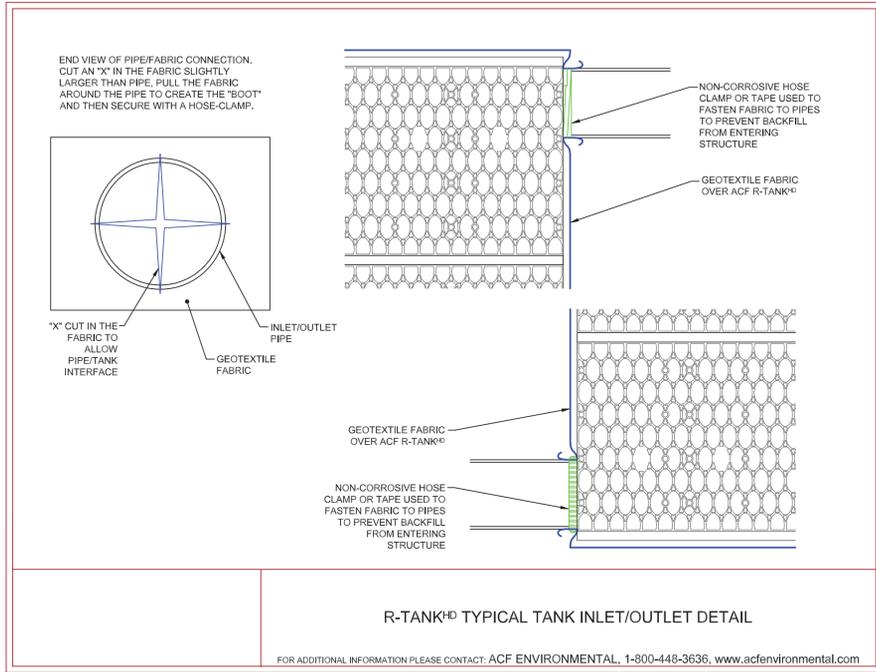
DATE	REVISION

1. By use of these Construction Drawings (CD's), the CONTRACTOR represents that he has visited the site, furnished himself with the local conditions, verified field dimensions and completed his observations with the requirements of the CD's. Data, location, title, and project address. All block, project address. 2. As instruments of service, all Drawings, Specifications and copies thereof furnished by Signature Design-Architecture (SD-A) are the property of SD-A. They are to be used only for this Project and are not to be used on any other Project. Changes to the CD's may only be made by SD-A. © 2020 Signature Design-Architecture. All rights reserved. SD-A shall not be held responsible for any errors or omissions in these drawings or specifications. All work shall be in accordance with CD's. All work shall be constructed in accordance with industry standards.

RED ROBIN PASTURES
DOVER MASS
DRAINAGE & GRADING PLAN

Signature Designs
ARCHITECTURE
73 Bishop Road, Sharon, MA 02067 781-806-0063

Sheet No.
C6
22



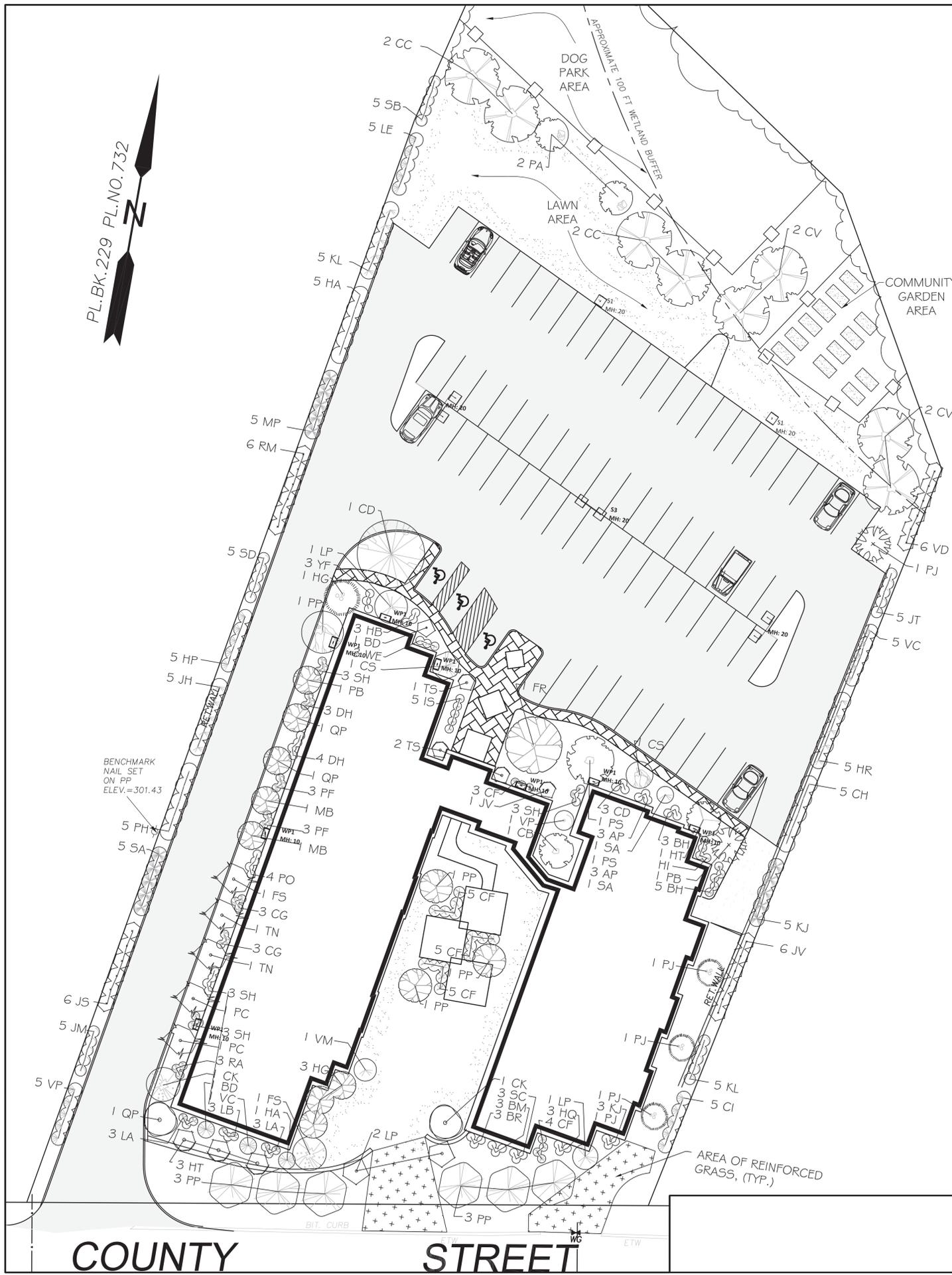
DATE 4	
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REVIEW 4	
REVIEW 3	
REVIEW 2	
REVIEW 1	

1. By use of these Construction Drawings (CD's) the CONTRACTOR represents that he has visited the site, familiarized himself with the local conditions, verified field dimensions and complied his observations with the requirements of the CD's. His signature shall not accept, edit, libel, block, project address. They are to be used only for this Project and are not to be used on any other Project. Changes to the CD's may only be made by SD-A. © 2020 Signature Designs Architecture. All rights reserved. No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of Signature Designs Architecture. This document is the property of Signature Designs Architecture and is to be used only for the project and site identified herein. It is not to be used for any other project without the prior written permission of Signature Designs Architecture. The CONTRACTOR shall be responsible for obtaining all necessary permits, licenses, and approvals for the project and shall be responsible for the safety of the project and the safety of the public. The CONTRACTOR shall be responsible for the safety of the project and the safety of the public. The CONTRACTOR shall be responsible for the safety of the project and the safety of the public.

**RED ROBIN PASTURES
DOVER MASS
DETAIL SHEET**

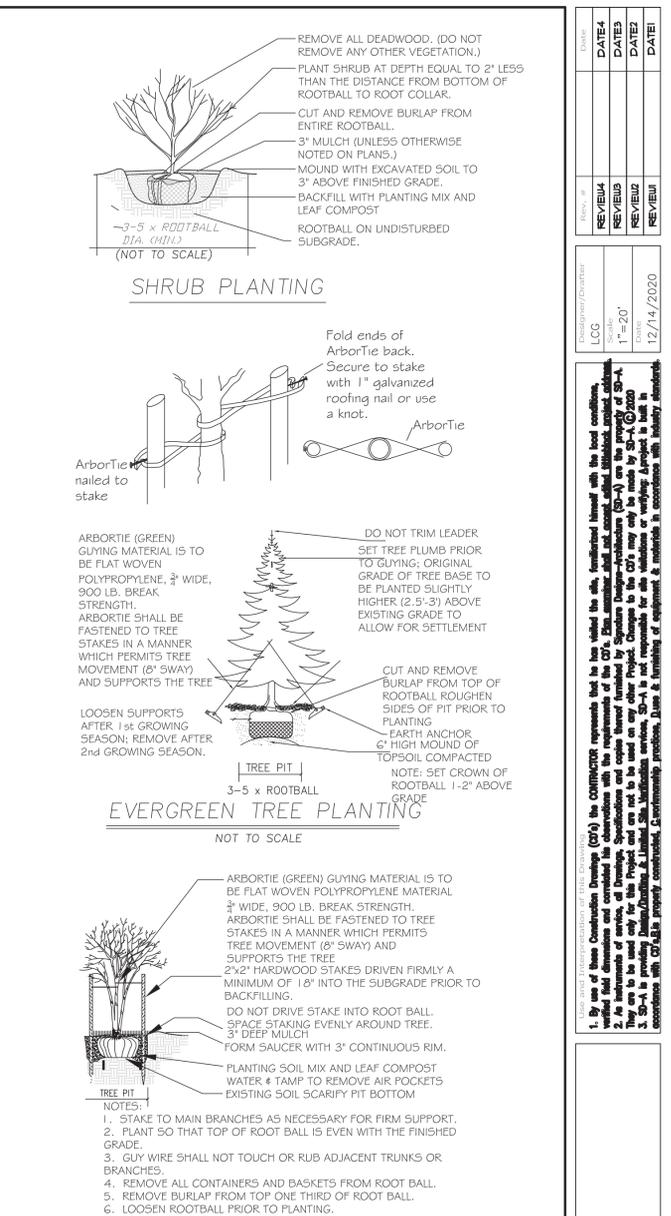
Signature Designs
ARCHITECTURE



Qty./Key	Common Name	Botanical Name	Size	Remarks
TREES				
1	CB Pyramidal European Hornbeam	<i>Carpinus betulus 'Fastigiata'</i>	3" Cal.	B&B
4	CC Eastern Redbud	<i>Cercis canadensis</i>	3" Cal.	B&B
1	CD Turkish Filbert	<i>Corylus corulna</i>	3" Cal.	B&B
2	CK Chinese Dogwood	<i>Cornus kousa chinensis</i>	3" Cal.	B&B
2	CS 'Santoni' Dogwood	<i>Cornus kousa 'Santoni'</i>	3" Cal.	B&B
4	CV Winter King Hawthorn	<i>Crataegus viridis 'Winter King'</i>	3" Cal.	B&B
1	FR Rivers Purple Beech	<i>Fagus sylvatica 'Riversii'</i>	3" Cal.	B&B
2	FS 'Red Obelisk' Beech	<i>Fagus sylvatica 'Red Obelisk'</i>	3" Cal.	B&B
4	HG 'Gracilis' Hinoki Cypress	<i>Cham. obtusa 'Gracilis'</i>	7" Ht.	B&B
4	HT 'Tardiva' Hydrangea	<i>Hydrangea paniculata 'Tardiva' treeform</i>	#15Pot	Container Grown
2	MB 'Butterfly' Magnolia	<i>Magnolia acuminata x den. Butterfly</i>	3" Cal.	B&B
2	PA Norway Spruce	<i>Picea abies</i>	8" Ht.	B&B
2	PB 'Hoopsi' Blue Spruce	<i>Picea pungens 'Hoopsi'</i>	12" Ht.	B&B
2	PC 'Krauter Vesuvius' Plum	<i>Prunus cerasifera 'Krauter vesuvius'</i>	3" Cal.	B&B
4	PJ White Spruce	<i>Picea glauca</i>	8" Ht.	B&B
9	PP Persian Parrotia	<i>Parrotia persica</i>	3" Cal.	B&B
1	PR 'Redspire' Pear	<i>Pyrus calleryana 'Redspire'</i>	3" Cal.	B&B
1	PS Upright White Pine	<i>Pinus strobus 'Fastigiata'</i>	8" Ht.	B&B
3	OP 'Green Pillar' Oak	<i>Quercus palustris 'Green Pillar'</i>	3" Cal.	B&B
2	TN 'Green Green' Arborvitae	<i>Thuja occidentalis 'Nigra'</i>	8" Ht.	B&B
3	TS 'Degroots Spire' Arborvitae	<i>Thuja occidentalis 'Degroots spire'</i>	8" Ht.	B&B
SHRUBS				
3	AP 'Pink Discovery' Azalea	<i>Azalea sp. 'Pink Discovery' 'evergreen'</i>	#7 Pot	Container Grown
2	BD 'Pink Delight' Butterfly Bush	<i>Buddleia davidii 'Pink Delight'</i>	24" Ht.	B&B
3	BH 'Graham Brandy' Boxwood	<i>Buxus sempervirens 'Graham Brandy'</i>	3" Ht.	B&B
3	BM 'Wintergreen' Boxwood	<i>Buxus microphylla 'Wintergreen'</i>	#3 Pot	Container Grown
3	BR 'Bonica' Rose	<i>Rosa sp. 'Bonica'</i>	#3 Pot	Container Grown
6	CC 'Grand Bleu' Bluebeard	<i>Caryopteris x clandonensis 'Grand Bleu'</i>	#3 Pot	Container Grown
5	CH 'Golden Mops' Hinoki Cypress	<i>Chamaecyparis obtusa 'Golden Mops'</i>	#3 Pot	Container Grown
5	CI 'Insanti' Dogwood	<i>Cornus sericea 'Insanti'</i>	#7 Pot	Container Grown
7	DL 'Carol Mackie' Daphne	<i>Daphne burkwoodii 'Carol Mackie'</i>	24" Ht.	B&B
6	HA 'Abetwo' Hydrangea	<i>Hydrangea arborescens 'Abetwo'</i>	24" Ht.	B&B
5	HP Golden Cup St. John's Wort	<i>Hypericum Hidcote</i>	#3 Pot	Container Grown
3	HQ 'Pee Wee' Hydrangea	<i>Hydrangea quercifolia 'Pee Wee'</i>	#3 Pot	Container Grown
5	HR 'Blue chiffon' Hibiscus	<i>Hibiscus syriacus 'Rose Satin'</i>	5" Ht.	Container Grown
5	IS 'Sky Pencil' Holly	<i>Ilex crenata 'Sky Pencil'</i>	#15 Pot	Container Grown
5	JH 'Hollywood' Juniper	<i>Juniperus chinensis 'Hollywood'</i>	48" Ht.	B&B
5	JM 'Mountbatten' Juniper	<i>Juniperus chinensis 'Mountbatten'</i>	48" Ht.	B&B
6	JS 'Steads' Holly	<i>Ilex crenata 'Steads'</i>	#15Pot	Container Grown
5	JT 'Emerald Sentinel' Juniper	<i>Juniperus virginiana 'Emerald Sentinel'</i>	6" Ht.	Container Grown
7	JV 'Taylor' Red Cedar	<i>Juniperus virginiana 'Taylor'</i>	60" Ht.	B&B
8	KJ 'Golden Guinea' Kerria	<i>Kerria japonica 'Golden Guinea'</i>	24" Ht.	B&B
10	KL 'Peppermint' Mtn. Laurel	<i>Kalmia latifolia 'Peppermint'</i>	48" Ht.	B&B
10	LE 'Coast' Leucothoe	<i>Leucothoe axillaris</i>	#3 Pot	Container Grown
4	LP California Privet	<i>Ligustrum ovalifolium</i>	4" Ht.	B&B
5	MP Northern Bayberry	<i>Myrica pensylvanica</i>	#7 Pot	Container Grown
6	PF 'Happy Face' Potentilla	<i>Potentilla fruticosa 'Happy Face'</i>	#3 Pot	Container Grown
5	PH 'Mindia' Purple Ninebark	<i>Physocarpus opulifolius 'Coppertina'</i>	#5 Pot	Container Grown
4	PO 'Dakota Sunrise' Potentilla	<i>Potentilla fruticosa 'Dakota Sunrise'</i>	#3 Pot	Container Grown
3	RA 'Gro-Low' Sumac	<i>Rhus aromatica 'Gro-Low'</i>	#3 Pot	Container Grown
6	RM 'Blushing Knock out' Rose	<i>Rosa sp. 'Blushing Knock Out'</i>	#3 Pot	Container Grown
5	SA 'Flamingo' Japanese Willow	<i>Salix integra 'Flamingo'</i>	#3 Pot	Container Grown
5	SB 'Shirobi' Spirea	<i>Spirea japonica 'Shirobi'</i>	#3 Pot	Container Grown
5	SD 'Double Play Blue Kazoo' Spirea	<i>Spirea media 'Blue Kazoo'</i>	#3 Pot	Container Grown
6	VC 'Summer Snowflake' Viburnum	<i>Viburnum plicatum 'Summer Snowflake'</i>	24" Ht.	B&B
6	VD Highbush Blueberry	<i>Vaccinium corymbosum</i>	24" Ht.	B&B
1	VM 'Blue Muffin' Viburnum	<i>Viburnum dentatum 'Blue Muffin'</i>	24" Ht.	B&B
6	VP 'Popcorn' Viburnum	<i>Viburnum plicatum 'Popcorn'</i>	48" Ht.	B&B
3	WE 'Tuxedo' Weigela	<i>Weigela florida 'Tuxedo'</i>	24" Ht.	B&B
3	YF 'Bright Edge' Yucca	<i>Yucca filamentosa 'Bright Edge'</i>	24" Ht.	B&B
PERENNIALS				
5	BH 'Beni Kaze' Hakone Grass	<i>Hakonechloa macra 'Beni Kaze'</i>	#3 Pot	Container Grown
3	CD 'Darlensis' Heather	<i>Calluna vulgaris 'Darlensis'</i>	#3 Pot	Container Grown
22	CF 'Foerster's' Feather Reed Grass	<i>Calagragrostis x acuti. Karl Foerster</i>	#3 Pot	Container Grown
3	HB 'Big Daddy' Hosta	<i>Hosta sp. 'Big Daddy'</i>	#3 Pot	Container Grown
1/2	HI 'Baltic' English Ivy	<i>Hedera helix 'Baltica'</i>	Flat	Container Grown
6	LA English Lavender	<i>Lavandula angustifolia</i>	#2 Pot	Container Grown
3	LB 'Becky' Shasta Daisy	<i>Leucanthemum x superbum 'Becky'</i>	#2 Pot	Container Grown
12	SH 'Hamel' Fountain Grass	<i>Pennisetum alopecuroides 'Hamel'</i>	#1 Pot	Container Grown

LANDSCAPING NOTES

- NOTIFY DIG-SAFE AT 1-888-DIG-SAFE AND LOCAL AUTHORITIES PRIOR TO ANY TYPE OF SITE PREPARATION OR CONSTRUCTION.
- THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIAL AND MULCH IN SUFFICIENT QUANTITIES TO COMPLETE PLANTING AS SHOWN ON THE DRAWINGS.
- DRAWING QUANTITIES TAKE PRECEDENCE OVER PLANT LIST QUANTITIES.
- ALL PLANT MATERIAL SHALL CONFORM TO THE GUIDELINES SET FORTH BY THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION.
- ALL TREES AND SHRUBS SHALL BE PLANTED WITH THE "BEST FACE" SHOWING. ALL PLANTS SHALL BE BALLED AND BURLAPPED OR CONTAINER GROWN, UNLESS OTHERWISE APPROVED BY THE LANDSCAPE ARCHITECT.
- ALL CONTAINER GROWN STOCK SHALL BE HEALTHY, VIGOROUS, WELL ROOTED AND ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE GROWING. THEY SHALL HAVE TOPS OF GOOD QUALITY, NO APPARENT INJURY AND BE IN A HEALTHY GROWING CONDITION. A CONTAINER GROWN PLANT SHALL HAVE A WELL ESTABLISHED ROOT SYSTEM REACHING THE SIDES OF THE CONTAINER TO MAINTAIN A FIRM BALL.
- THE QUALITY OF ALL TREES & SHRUBS IS TO BE NORMAL FOR THE SPECIES. ALL PLANTS ARE TO HAVE DEVELOPED ROOT SYSTEMS, TO BE FREE OF INSECTS AND DISEASES AS WELL AS MECHANICAL INJURIES, AND IN ALL RESPECTS BE SUITABLE FOR PLANTINGS.
- ALL CONIFERS SHALL HAVE DORMANT BUDS AND SECONDARY NEEDLES.
- WHERE SPECIFIED, CALIPER SIZE IS TO BE THE OVERRIDING FACTOR IN TREE SELECTION. CALIPER SIZE SHALL BE MEASURED 12" ABOVE THE ROOTBALL.
- PLANT SUBSTITUTIONS ARE NOT ALLOWED UNLESS APPROVED BY THE PROJECT LANDSCAPE ARCHITECT.
- ALL DISTURBED AREAS NOT SHOWN OTHERWISE SHALL BE LOAMED AND SEEDED AND BLENDED INTO EXISTING GRADE AND CONDITIONS.
- PRIOR TO INSTALLING ANY PLANT MATERIAL, THE CONTRACTOR SHALL SUBMIT A LOAM SOIL SAMPLE FOR A ROUTINE, ORGANIC, SALTS, AND NITRATE SOIL TEST. UPON THE RESULTS OF THIS TEST, THE SITE CONTRACTOR SHALL AMEND THE LOAM AS RECOMMENDED. SEND THE SOIL SAMPLE TO THE UNIVERSITY OF MASSACHUSETTS SOIL AND PLANT TISSUE TESTING LABORATORY, WEST EXPERIMENT STATION, 682 NORTH PLEASANT ST., UNIVERSITY OF MASSACHUSETTS, AMHERST, MA 01003.
- LAWN SEED MIX SHALL BE THE PREVIOUS YEARS CROP: 35% JEFFERSON KENTUCKY BLUEGRASS, 35% CARMEN CHEWING FESCUE AND 30% STALLION PERENNIAL RYEGRASS, OR APPROVED EQUAL. PLANT AT A RATE OF 1 LB. PER 150 SQUARE FEET.
- SLOPE SEED MIX SHALL BE THE PREVIOUS YEARS CROP. PLANT AT A RATE OF 1 LB. PER 150. SQUARE FEET. SEED MIX SHALL BE STALLION PERENNIAL RYE 10%, CREEPING RED FESCUE 50%, ANNUAL RYE GRASS 15%, JEFFERSON KENTUCKY BLUE GRASS 10%, RED TOP CLOVER 5%, AND LADINO CLOVER 5%, OR APPROVED EQUAL. PLANT AT A RATE OF 1 LB. PER 150SF.
- LAWN SEED AREAS SHALL BE NOT BE DEEMED ACCEPTABLE UNTIL IN EXCESS OF 90% OF EACH AREA, INDEPENDENTLY, IS GERMINATED, GROWING AND DISPLAYING HEALTHY, UNIFORM GROWTH AND HAS BEEN CUT TWICE. THE SITE CONTRACTOR IS RESPONSIBLE FOR APPLYING AT A MINIMUM 1" OF WATER A WEEK UNTIL THE SEEDED AREAS HAVE BEEN ACCEPTED. THE WATERING SHALL OCCUR IN SMALL DOSES. THE SITE CONTRACTOR IS RESPONSIBLE FOR REMOVING ANY WEEDS (GRAB GRASS) WITHIN THE SEEDED AREAS UNTIL THE SEEDED AREAS HAVE BEEN ACCEPTED.
- THE HYDRO SEED SLURRY SHALL BE A WOOD BASED BONDED FIBER MATRIX. THE APPLICATION RATE SHALL BE 2,500-3,000LB. PER ACRE SPRAYED IN AT LEAST TWO DIRECTIONS. DO NOT APPLY HYDRO SEED SLURRY IF RAIN IS EXPECTED WITHIN 12 HOURS, AND WHEN TEMPERATURES ARE BELOW 50 DEGREES.
- PRIOR TO PLANTING, THE LANDSCAPER SHALL REVIEW AND COORDINATE WITH THE SITE UTILITY PLAN AND GRADING PLAN.
- THE ROOTS OF NEWLY PLANTED TREES AND SHRUBS MUST BE KEPT STEADILY MOIST, AS THE DEVELOPING ROOTS ESTABLISH IN THE NEW SOIL. AT PLANTING, WATER THOROUGHLY TO SOAK THE ROOTS AND TO SETTLE THE NEW SOIL AROUND THE ROOT BALL THE AMOUNT OF SUPPLEMENTAL WATER NEEDED EACH WEEK DURING THE FIRST GROWING SEASON AFTER PLANTING DEPENDS ON RECENT RAINFALL, TEMPERATURE, AND WIND. IF LESS THAN ONE-INCH OF RAIN HAS FALLEN OVER THE PAST FIVE TO SEVEN DAYS, THE NEW PLANTINGS MUST BE WATERED. LAWNS, TREES, AND SHRUBS WATERING SHALL OCCUR AT A MINIMUM OF TWO (2) TIMES A DAY FOR THE FIRST TWO (2) MONTHS; ONCE IN THE EARLY MORNING AND THEN THE OTHER IN THE LATE AFTERNOON. IN GENERAL TEN GALLONS OF WATER APPLIED TWICE A WEEK WILL WET A 20'-24" ROOT BALL AND PROVIDE THE EQUIVALENT OF ONE INCH OF RAIN FALL. NEW LAWNS SHALL BE WATERED SO THAT IT RECEIVES AT A MINIMUM ONE INCH (1") OF WATER EVERY WEEK.
- WITHIN THE LANDSCAPE BEDS ADJACENT TO THE BUILDING FOUNDATIONS, NO (HEMLOCK, PINE, SPRUCE, OR CEDAR) MULCH OR OTHER COMBUSTIBLE LANDSCAPE MATERIALS SHALL BE INSTALLED WITHIN 18" OF THE FOUNDATION.
- ALL LANDSCAPE BEDS SHALL RECEIVE THREE-INCHES OF BARK MULCH.
- LANDSCAPE AREAS SHALL BE DEEP TILLED TO A DEPTH OF TWELVE INCHES TO FACILITATE DEEP WATER PENETRATION.
- ALL TREE AND VEGETATION REMOVAL SHALL BE IN COORDINATION WITH THE PROJECT LANDSCAPE ARCHITECT.



DATE: 12/14/2020

REVISIONS:

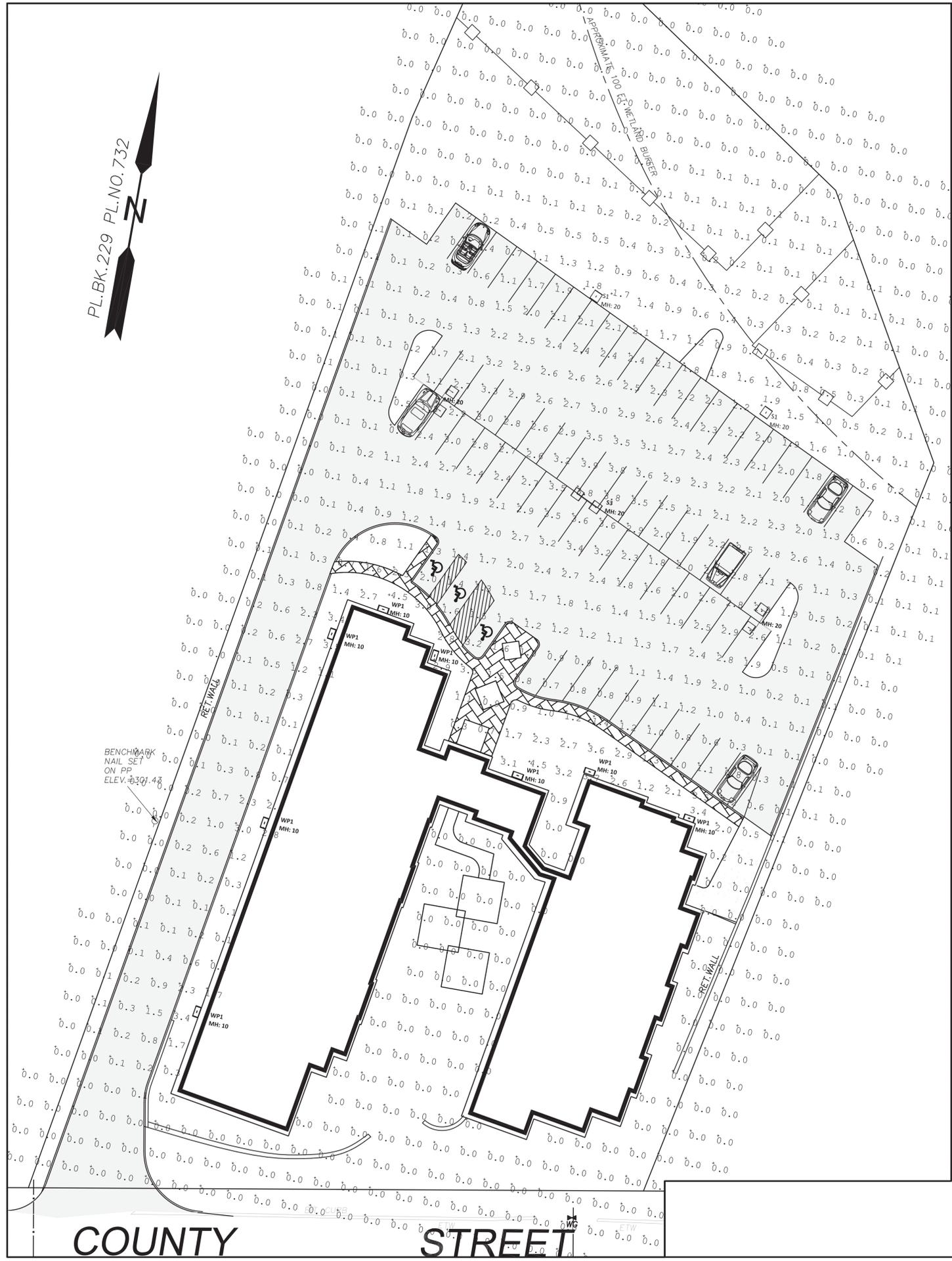
NO.	DATE	DESCRIPTION
1	12/14/2020	ISSUED FOR PERMITS

PROJECT: LANDSCAPE PLAN DWGDISC-L2 DWGDISC-L3

Signature of Architect: ARCHITECTURE

73 Bishop Road, Sharon, MA 02067 781.804.0065

Sheet No. L1 of 22



WALL MOUNTED FIXTURE



PARKING LOT FIXTURE

Calculation Summary

Label	Units	Avg	Max	Min	Avg/Min	Max/Min
LOT_Planar	Fc	0.62	4.5	0.0	N.A.	N.A.

Luminaire Schedule

Symbol	Label	Lumens/Lamp	Lum. Lumens	Lum. Watts	LLF	Description
	S1	N.A.	7088	52	0.900	LUMARK: PRV-C15-D-UNV-T4-BZ
	WP1	N.A.	2561	20.7	0.900	LUMARK: AXCS2A
	S2	N.A.	6437	52	0.900	LUMARK: PRV-C15-D-UNV-T4-BZ-HSS
	S3	N.A.	6551	52	0.900	LUMARK: PRV-C15-D-UNV-T2-BZ-HSS

COUNTY

STREET

DATE	REVISION
DATE4	REVIEW4
DATE3	REVIEW3
DATE2	REVIEW2
DATE1	REVIEW1

PROJECT/OWNER	LOG
DATE	SCALE
12/14/2020	1"=20'

1. By use of these Construction Drawings (CDs) the CONTRACTOR represents that he has visited the site, furnished himself with the local conditions, verified field dimensions and correlated the observations with the requirements of the CD's. Etc. and shall not accept liability for any errors or omissions. 2. No implementation of work, all drawings, specifications and contract documents shall be subject to the approval of the CONTRACTOR. 3. The CONTRACTOR shall be responsible for the installation of the equipment and materials in accordance with industry standards.

LIGHTING PLAN
DWGDISC-L2
DWGDISC-L3

Signature Design ARCHITECTURE
73 Bishop Road, Sharon, MA 02067 781.866.6065

Sheet No. L2 of 22

WAIVER REVIEW

Below is a summary of the requested waivers. Please note in some instances, we do not believe a waiver is necessary based on a review of local bylaws, but we have chosen to include a comment for the benefit of the ZBA.

GENERAL BY-LAWS

Chapter 185 ZONING BY-LAW

- Table of Conventional Dimensional Requirements, as shown below:

Zoning District: **RI**

	<u>Required RI</u>	<u>Proposed (total)</u>	<u>Waiver</u>
Use Regulations	Single Family	Multifamily	Required
Minimum Lot Size	43560 sf	87120 sf	None Required
Minimum Frontage	150'	221'	None required
Front Setback	40'	18'	Required
Lot line Setback	30'	14' to closest building	Required
Rear Setback	30'	175'+	None Required
Building Height	35' or 2.5 stories	50' 3.5 stories.	Required
Perfect Square	150x150		None Required
Bldg. Lot Coverage	20%	19%	None Required
Parking	1.5 spaces/unit	1.8 spaces/unit	None Required

Chapter 217 Sanitary Bylaws

Section 217-3(6 a&b)- Sewage Disposal Systems 100' Setback requirement from Designated wetland areas

Section 217-3(7)- Prohibition of soil absorption system under parking area

Chapter 263 Rules and Regulations for the Dover Wetlands Protection Bylaw

Section 263-5-I - Vernal Pools. Any work within 100 feet of a Vernal Pool must not impair its capacity to function as a Vernal Pool.

Section 263-5-J-2 Setbacks – No disturbance & No Structure

June 1, 2020

Mass Housing
Michael Busby
1 Beacon Street
Boston, MA 02108

This correspondence is in relation to reviewing an application for site plan approval submitted by Red Robin Pastures, LLC. These comments reflect Town Inspectional Staff review regarding Town Code and Regulations and best management practices for site development.

The following is a composite of those comments after having ample time to review the plans submitted. Attached are additional comments from the Boards and Commissions of the Town of Dover.

DRAINAGE

- a. There are a number of questions regarding retaining walls for the grading of the site and it appears that some walls could be 5' to 10' in height but does not address fall resistance on the site as well as being too close to the property lines.
- b. Wall construction and stability due to hydraulic loading and engineering required.
- c. Soil evaluations for potential erosion along the walls.
- d. Discharges of storm water overflows that may be directed onto adjacent property.
- e. Drive way paved areas with catch basins to keep runoff from draining onto Rt. 109.
- f. Retention basin on a steep slope requiring retaining wall having to be engineered and designed.

WATER SUPPLY

- a. Site does not address the use of on-site well(s) or connection to Walpole town water system or Colonial Water system. Walpole refused to supply water to the 40B project that consisted of 4 single family houses that is the immediate neighbor to the west. Colonial Water more than likely does not have the capacity to provide domestic water that would include a supply for the building sprinkler system. (Walpole is the neighboring town to Dover at this site and route 109 forms the town line for a distance along the road)

SEWAGE DISPOSAL

- a. Test results to support a design have not been submitted to Board of Health at this time.
- b. Proposal is for 75 bedrooms and will result in a leaching field below the parking area.
- c. Concerns of the design below paved areas in the event of repairs or failure in the future.

CONSERVATION

- a. There are wetlands on the site and a significant portion of the site development within the jurisdictional boundary (100 feet) of conservation protection.
- b. The Conservation Commission holds the Brook Run Conservation Restriction on Schaffner Lane properties that protect a portion of this wetlands which feeds into Tubwreck Brook a perennial stream. The Town and State EEOC have seen the value in protecting this resource.
- c. Conservation Commission has received no information or inquiries regarding this proposed site plan or an evaluation from a wet lands engineer for type of resource to be protected.

PARKING

- a. Dover requires 2 spaces per residence which total 78 spaces required and plan shows 63 spaces including 3 handicapped spaces. The travel way widths are questionable for width for back around but plan for review provided did not indicate a dimensional scale.
- b. No provisions are shown for guest parking, delivery service or the like facilities.
- c. No areas are shown for dumpsters or service way to the dumpster for trash pick-up.
- d. Safe school bus stop area is not depicted on the plans.

SNOW REMOVAL

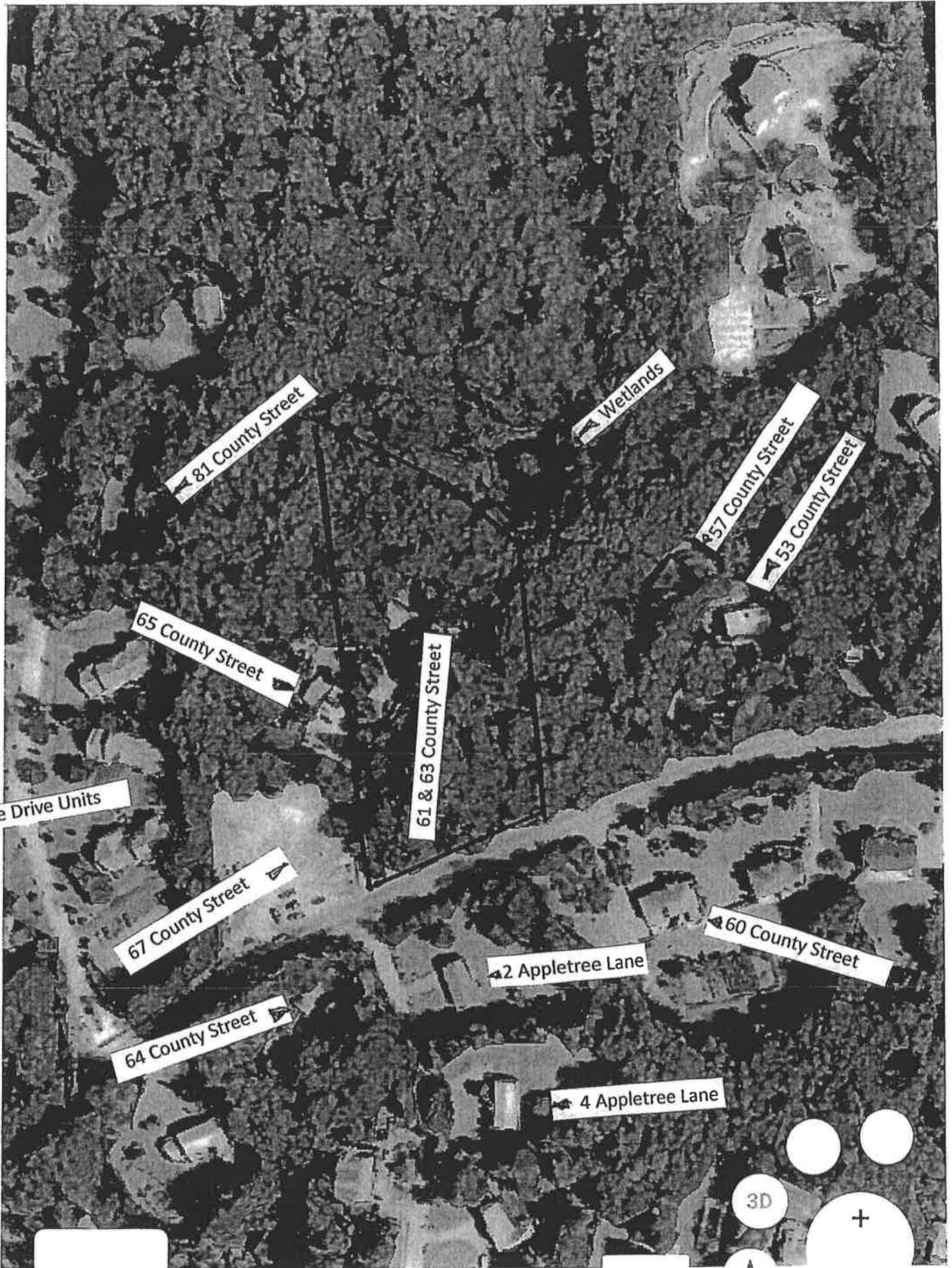
- a. Snow removal will prove difficult with retaining walls along both sides of the parking area and driveway within 5 feet of the property lines and may not be pushed onto adjacent properties.
- b. Snow cannot be piled upon storm water basin to the rear of the site as it may interfere with function.

FIRE SAFETY

- a. The area of the building to the east provides no access, either formal or conditional for emergency fire apparatus equipment.
- b. The question of availability of water regarding the sprinkler system.

SITE DEVELOPMENT

- a. Site development appears to be dense given the size of two single acre lots combined to accommodate 39 apartments of one, two, and three-bedroom units in 3 ½ story buildings.
- b. The site, according to plot plan, is being developed to accommodate the buildings rather than fitting the buildings to complement existing topography and nature of the parcels.
- c. The site would require the stripping of all vegetation right to the property lines and construction taking place right to the property bounds.
- d. The building size and density does not reflect the character of the neighborhood and would be 15 feet above the existing current zoning threshold of 35 feet.
- e. In relation to the surrounding residential homes the buildings will tower above these residences by 15 to 25 feet.
- f. Photos are provided of the neighboring residential homes in the immediate vicinity but are representative of the entire area and not just the adjacent properties. They are cataloged and identified on an aerial photo.

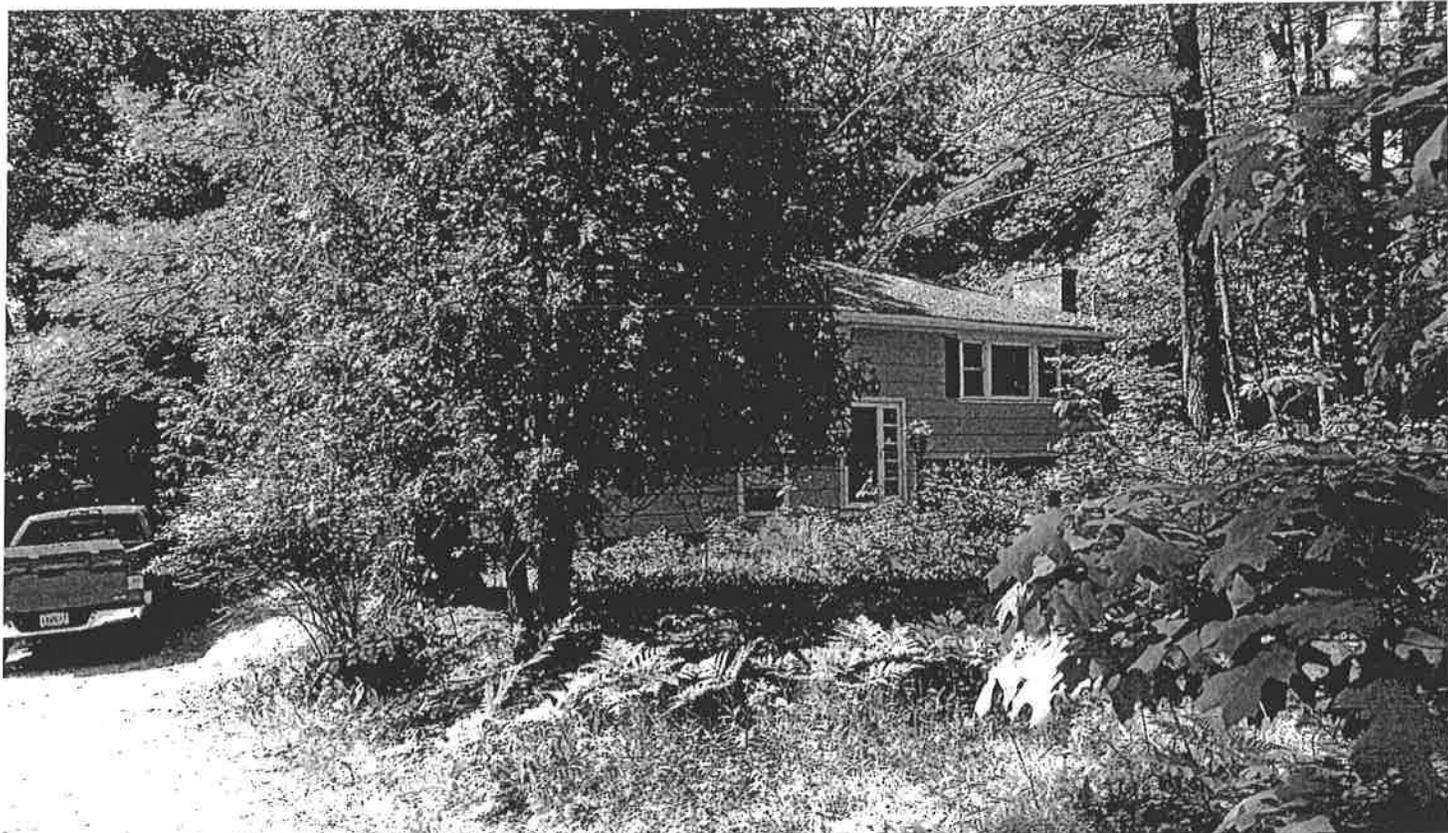




4 APPLE TREE LANE



2 APPLETREE LANE



64 COUNTY STREET



TISDALE DRIVE



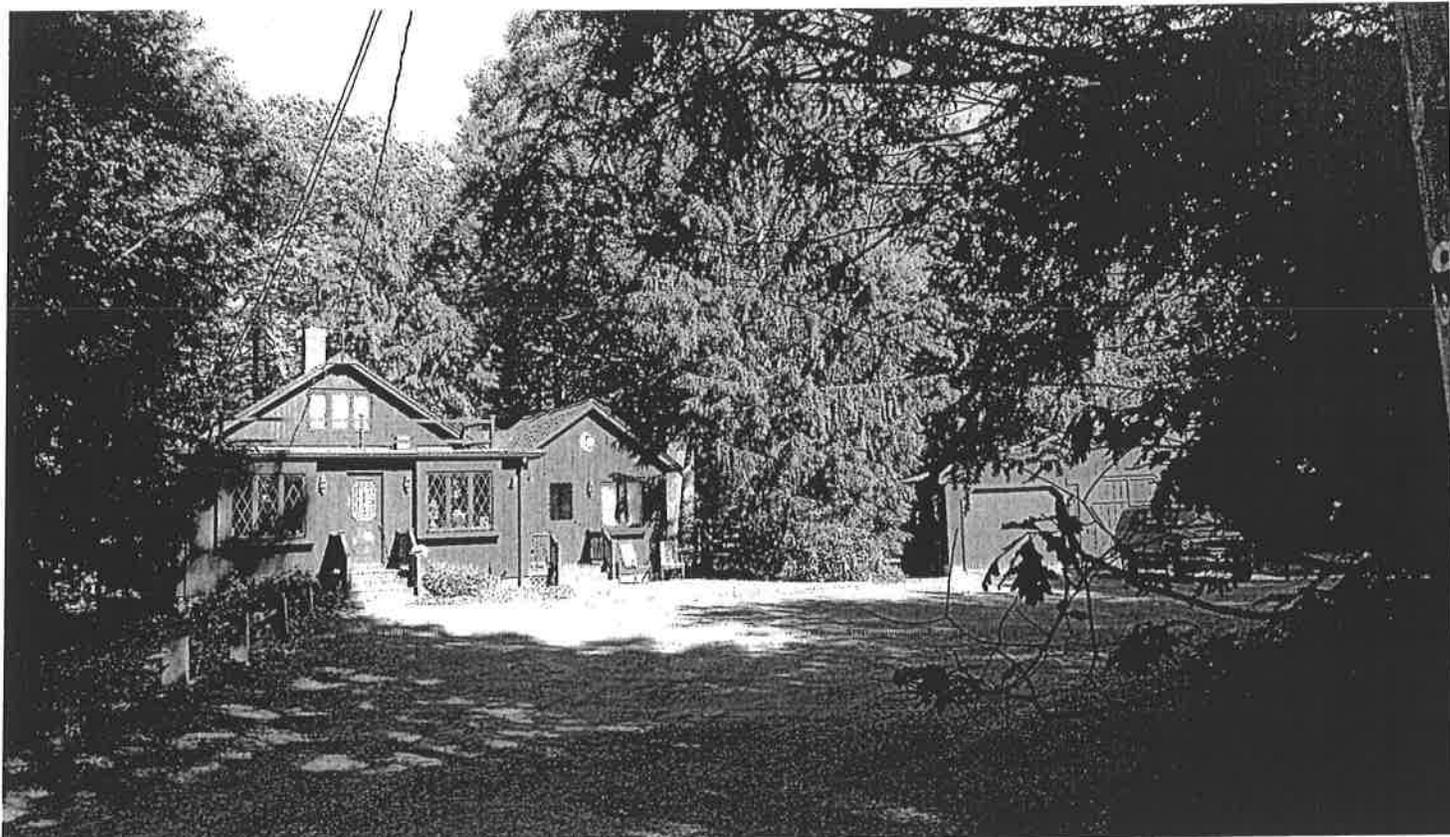
81 COUNTY STREET



67 COUNTY STREET



67 COUNTY STREET



65 COUNTY STREET



57 COUNTY STREET



53 COUNTY STREET



63 COUNTY STREET



61 COUNTY STREET