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AGREEMENT FOR PURCHASE AND SALE OF PROPERTY

This AGREEMENT FOR PURCHASE AND SALE OF PROPERTY (this "**Agreement**") is made and entered into as of this 11th day of December, 2020, by and between BOLTON OFFICE PARK LLC, a Massachusetts limited liability company ("**Seller**"), and WP EAST ACQUISITIONS, L.L.C., a Georgia limited liability company ("**Buyer**").

W I T N E S S E T H T H A T :

WHEREAS, Buyer wishes to purchase, and Seller wishes to sell, the Property (as hereinafter defined), upon the terms and conditions hereinafter set forth.

NOW, THEREFORE, in consideration of [redacted] the mutual covenants and agreements contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto do hereby agree as follows:

1. Definitions and Exhibits.

1.1 Definitions. For purposes of this Agreement, each of the following terms, when used herein with an initial capital letter, shall have the meaning ascribed to it as follows:

"**Broker**" shall mean O'Brien Commercial Properties, Inc.

"**Building Permit**" shall mean a building permit for the vertical construction of the Project.

"**Business Day**" shall mean a day other than a Saturday, Sunday or legal or bank holiday in either the State where the Land is located or of the Federal Government.

"**Closing**" shall mean the closing and consummation of the purchase and sale of the Property pursuant hereto.

"**Closing Date**" shall mean the date on which the Closing occurs as provided in Section 9.1 hereof.

"**Contract Date**" shall mean the date upon which this Agreement shall be deemed effective, which shall be the date first above written.

"**Demolition Costs**" shall mean any and all hard and soft costs and expenses associated with the Demolition Work, including the planning, performance and completion thereof.

"**Demolition Holdback**" shall have the meaning set forth in Section 6.5 hereof.

"**Demolition Holdback Agreement**" shall have the meaning set forth in Section 6.5 hereof.

"**Demolition Improvements**" shall mean that portion of the Parent Parcel Improvements which are to be demolished pursuant to the Demolition Plans.

"**Demolition Work**" shall mean all demolition, off-haul and other work to be performed by Seller pursuant to the Demolition Plans immediately upon Closing.

"**Demolition Work Completion**" shall mean the lien-free completion of the Demolition Work in accordance with the Demolition Plans, Demolition Work Permits and all other applicable legal requirements, as confirmed by Seller's delivery to Buyer of: (i) a certificate of completion from Seller's contractor for the Demolition Work, on form reasonably acceptable to Buyer, confirming completion of the Demolition Work in accordance with the Demolition Plans and all applicable legal requirements; and (ii) copies of appropriate lien waivers and full payment affidavits from the contractor and any other applicable materialmen, subcontractors and suppliers capable of recording a lien on the Property under Massachusetts law for the Demolition Work with respect to the performance of the Demolition Work.

"**Demolition Work Completion Deadline**" shall mean the date which is 60 days after Closing.

"**Demolition Work Permits**" shall have the meaning set forth in Section 6.5 hereof.

"**Demolition Plans**" shall have the meaning set forth in Section 6.5 hereof.

"**Development Approvals**" shall mean all federal, state, county, and municipal government permits, approvals, and modifications that are necessary for the Intended Use which are reasonably acceptable to Buyer in its reasonable discretion and do not impose upon Buyer or the Land any conditions to or limitations on the acquisition, development or use of the Land which are unacceptable to Buyer in its reasonable discretion. For the purposes hereof, Buyer will be deemed to be acting reasonably in rejecting any Development Approval(s) if one or more of the key assumptions set forth on EXHIBIT I are not met, it being acknowledged that such assumptions are not a comprehensive listing of all facts, conditions or circumstances that would render a Development Approval not reasonably acceptable to Buyer for the purposes of the foregoing

sentence or this Agreement; *provided, however*, it is expressly understood that Buyer shall not be deemed to be acting reasonably in rejecting any condition(s) or requirement(s) imposed on or associated with the Development Approvals listed on EXHIBIT I as being expressly excluded from the key assumptions. The Development Approvals shall include, but not be limited to, (i) any rezoning or zoning modifications required to allow for the Intended Use, (ii) any subdivision, re-subdivision, lot consolidation or parcel maps, plats or plans or other similar legal subdivisions, re-subdivisions, partitions, consolidations or recombinations of the Real Property, portions thereof or larger parcels which include the Real Property which may be required in connection with the Intended Use (other than the Subdivision Approvals, which Seller will pursue pursuant to the terms of this Agreement), (iii) site plan approvals, (iv) confirmation of availability of all necessary utilities (including easements necessary for delivery of services to the Property) required for the Intended Use, including necessary easements from the Town of Bolton and/or, if applicable, any adjacent landowners to support the installation of a well system and wastewater treatment plant to service the Project (the "**Wastewater Treatment Plant**"); (v) all approvals and permits (or modifications thereto) by or from the municipal governing body or other agencies or boards of the Intended Use (including, but not limited to, land disturbance and erosion control permits), including a Comprehensive Permit (40b); and (vi) all necessary development-related easements (e.g. access, crane swing or encroachment easements) over the Seller's Remainder Parcel as Buyer shall reasonably require for the development of the Project and which do not otherwise unreasonably interfere with the Seller's use of the Seller's Remainder Parcel; *provided, however*, that the Building Permit(s) shall be expressly excluded from the definition of "Development Approvals" for all purposes hereunder. A Development Approval shall not be considered to have been received by Buyer for purposes of this Agreement until the expiration of applicable statutory periods of appeal of the issuance of the Development Approval without an appeal being filed or, if the Development Approval has been issued by the duly authorized governmental body or agency but the issuance of the Development Approval has been appealed, when an appeal of a Development Approval has been resolved in Buyer's favor such that the Development Approval is issued either by court decision that cannot be further appealed or by settlement. Buyer shall have the right to appeal and/or contest any decision regarding the Development Approvals with applicable governing authorities.

"**Earnest Money**" shall have that meaning set forth in Section 3.1 hereof.

"**Entitlements Date**" shall have the meaning set forth in Section 7.4 hereof.

"**Entitlements Deposit**" shall have the meaning set forth in Section 3.1 hereof.

"**Entitled Units**" shall mean the number of residential units that the Buyer is permitted to construct within the Project pursuant to the Development Approvals.

"**Environmental Reports**" shall mean all existing environmental site assessments, remediation reports, tank removal reports and other reports (including, but not limited to, any soils and groundwater assessments and reports) for the Property.

"**Escrow Agent**" shall mean First American Title Insurance Company acting as Escrow Agent pursuant to the terms and conditions of the Escrow Agreement and Section 3 hereof.

"**Escrow Agreement**" shall mean that certain Escrow Agreement of even date herewith among Seller, Buyer and Escrow Agent referred to in Section 3 hereof and attached hereto as EXHIBIT D and by this reference made a part hereof.

"**General Assignment**" shall mean an Assignment of Service Contracts, Warranties and Other Intangible Property in the form attached hereto as EXHIBIT E.

"**Hazardous Substances**" shall mean any and all hazardous, extremely hazardous, or toxic substances or wastes or constituents as those terms are defined by any applicable Hazardous Substance Law (including, without limitation, CERCLA and RCRA) and petroleum, petroleum products, asbestos or any asbestos-containing materials, the group of organic compounds known as polychlorinated biphenyls (PCBs), flammables, explosives, radioactive materials, and chemicals known to cause cancer or reproductive toxicity.

"**Hazardous Substance Law**" shall mean any and all federal, state, or local laws, rules, regulations, ordinances, agency or judicial orders and decrees, and agency agreements now and hereafter enacted or promulgated or otherwise in effect, relating to the protection of the environment from Hazardous Substances, including, without limitation, the Resource Conservation and Recovery Act of 1976 ("**RCRA**"), 42 U.S.C. §§6901 et seq., the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("**CERCLA**"), 42 U.S.C. §§9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 ("SARA"), the Hazardous Materials Transportation Act, 49 U.S.C. §6901, et seq., the Federal Water Pollution Control Act, 33 U.S.C. §§1251 et seq., the Clean Air Act, 42 U.S.C. §§7401 et seq., the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq., and the Safe Drinking Water Act, 42 U.S.C. §§300f et seq., and all amendments, regulations, orders and decrees promulgated thereunder or pursuant thereto.

"**Improvements**" shall collectively mean any buildings, structures and improvements located on the Land, including without limitation the Demolition Improvements.

"**Inspection Date**" shall mean the Inspection Date set forth in Section 7.3 hereof.

"**Intangible Personal Property**" shall collectively mean, to the extent assignable, all intangible personal property and in Seller's possession, if any, owned by Seller and related exclusively to the Real Property, including, without limitation: (i) any trade names associated with the Real Property; (ii) any plans and specifications and other architectural and engineering drawings for the Improvements or any other improvements contemplated in connection with the development or potential development of the Property; (iii) any warranties; (iv) any Service Contracts and other contract rights related to the Property (but only to the extent Seller's obligations thereunder are expressly assumed by Buyer pursuant to the General Assignment); and (v) any governmental permits, approvals and licenses (including any pending applications), including without limitation, the Development Approvals.

"**Intended Use**" (also sometimes referred to herein as the "**Project**") shall mean a multi-family or mixed-use development project containing at least [redacted] multi-family residential units (or such lesser number as Buyer shall approve in its sole discretion), together with certain amenities, common areas and other ancillary improvements for such development.

"**Land**" shall mean that certain real property located in Worcester County, Massachusetts that is generally depicted as "Parcel 2" in EXHIBIT A attached hereto and made a part hereof, as will be confirmed by the Final Survey and the Subdivision.

"**Material Condemnation**" shall mean a condemnation or threatened condemnation pursuant to which (i) any portion of the Property with a value equal to or greater than [redacted] is taken or threatened in writing to be taken; (ii) materially interferes with or increases the cost of the development, use or operation of the Real Property for its Intended Use; (iii) results or would result in the Property being in violation of any applicable law, ordinance or regulation; (iv) results or would result in access to the Property being materially impaired, as reasonably determined by Buyer; or (v) otherwise has or would have a material, adverse effect on the Intended Use, which may include, without limitation, a condemnation or threatened condemnation which materially, adversely affects or would materially, adversely affect Buyer's ability to construct and/or develop the Project for its Intended Use.

"**OFAC**" shall mean the Office of Foreign Assets Control, Department of the Treasury.

"**Parent Parcel**" shall mean the property described on EXHIBIT A-1 attached hereto and made a part hereof.

"**Parent Parcel Improvements**" shall mean all buildings, structures and improvements located on the Parent Parcel.

"**Permitted Title Exceptions**" shall mean those matters affecting title to the Land identified on EXHIBIT B attached hereto and by this reference made a part hereof.

"**Person**" shall mean any individual, sole proprietorship, partnership, joint venture, trust, unincorporated organization, association, corporation, institution, entity, party or government (whether national, Federal, state, county, city, municipal or otherwise, including, without limitation, any instrumentality, division, agency, body or department thereof).

"**Property**" shall collectively mean:

(i) the Real Property; and

(ii) all of Seller's right, title and interest in and to the Intangible Personal Property.

There is no tangible personal property included in the sale and therefore the definition of "Property" specifically excludes any tangible personal property unless expressly identified herein to the contrary. Seller shall remove any and all tangible personal property from the Real Property prior to Closing.

"**Proration Date**" shall mean the effective date of the prorations provided in Section 4.2 hereof, which is 11:59 p.m. on the eve of the Closing Date.

"**Purchase Price**" shall mean the purchase price for the Property described in Section 4.1 hereof.

"**Real Property**" shall collectively mean the Land, together with:

(i) the Improvements;

(ii) all rights, benefits, privileges, easements, tenements, hereditaments, rights-of-way and other appurtenances thereon or in any way appertaining thereto, including all mineral rights, development rights, air and water rights; and

(iii) all strips and gores and any land lying in the bed of any street, road or alley, open or proposed, adjoining such Land.

"**Second Deposit**" shall have the meaning set forth in Section 3.1 hereof.

"**Service Contracts**" shall collectively mean all contracts pertaining to the operation of the Property, including all management, leasing, service and maintenance agreements, and equipment leases.

"**Subdivision**" shall mean the subdivision of the Land from the balance of the Parent Parcel (such balance, the "**Seller's Remainder Parcel**") pursuant to the Subdivision Plat so as to create, at a minimum, two legally distinct parcels of land (to wit, the Land and the Seller's Remainder Parcel shall be separated). Notwithstanding the foregoing, to the extent the Seller can legally divide the Land from the balance of the Seller's Remainder Parcel with an "Approval Not Required" Plan (an "**ANR Plan**"), all references to Subdivision, as provided for in this Contract, shall be deemed to include the division of the Land from the Seller's Remainder Parcel through the use of an ANR Plan.

"**Subdivision Approvals**" shall mean all jurisdictional approvals required to effectuate the Subdivision and record the Subdivision Plat in the applicable real estate records of Worcester County, Massachusetts.

"**Subdivision Plat**" shall mean the ANR Plan, plat, survey, lot plan or similar instrument to be recorded in order to effectuate the Subdivision.

"**Survey**" shall have that meaning set forth in in Section 6 hereof.

"**Taxes**" shall have the meaning set forth in Section 4.2 hereof.

"**Title Insurer**" shall mean First American Title Insurance Company, or any other national title insurance company reasonably acceptable to Buyer.

1.2 Exhibits; Schedules. All exhibits, schedules and other attachments hereto form an integral part of this Agreement, all of which are incorporated into this Agreement as fully as if the contents thereof were set out in full herein at each point of reference thereto.

2. Purchase and Sale. Subject to the provisions hereof, Seller agrees to sell, assign and convey the Property to Buyer, and Buyer agrees to purchase the Property from Seller.

3. Earnest Money.

3.1 Earnest Money. Within 3 Business Days after the Contract Date, Buyer shall deposit with Escrow Agent the sum of [redacted] (the "**First Deposit**") as earnest money hereunder. Provided this Agreement is then in full force and effect, Buyer shall deposit with Escrow Agent (i) the additional sum of [redacted] (the "**Second Deposit**") as additional earnest money hereunder on or before 1 Business Day after the Inspection Date and (ii) the additional sum of [redacted] on or before 1 Business Day after the Entitlements Date (the "**Entitlements Deposit**") (the First Deposit, the Second Deposit, and the Entitlements Deposit, if and when made, together with any interest or other income earned thereon, is collectively referred to as the "**Earnest Money**"). The Earnest Money shall be held, invested and disbursed pursuant to the respective terms and provisions hereof and of the Escrow Agreement.

3.2 Cooperation. Whenever the Earnest Money is by the terms hereof to be disbursed by Escrow Agent, Seller and Buyer agree promptly to execute and deliver such notices as necessary or, in the opinion of Escrow Agent, appropriate to authorize Escrow Agent to make such disbursement.

4. Purchase Price and Prorations.

4.1 Purchase Price.

a. Purchase Price. [redacted].

b. Payment Mechanics. The Purchase Price, as adjusted by the prorations provided in Section 4.2 hereof and as reduced by the Earnest Money (which, unless otherwise disbursed hereunder, shall be disbursed by Escrow Agent at the Closing to Seller as a portion of the Purchase Price) shall be paid by Buyer to Seller (via Escrow Agent or otherwise) at the Closing in United States dollars, by Federal Reserve System wire transfer or other immediately available funds acceptable to Seller.

4.2 Prorations.

a. Proration Items. The following items shall be prorated between Seller and Buyer as of the Proration Date, and prorations favoring Buyer, to the extent determinable as of the Proration Date, shall reduce the Purchase Price payable by Buyer at the Closing, and such prorations favoring Seller, to the extent determinable as of the Proration Date, shall increase the Purchase Price payable by Buyer at the Closing:

i. Taxes: The state, county, city or other ad valorem property taxes and assessments for the tax period in which the Closing occurs (the "**Taxes**").

1. Assumed Tax Amount: If the actual tax bills for the tax period of Closing have not been issued, then such proration shall be based on such taxes for the prior tax period.

2. True Up Upon Receipt of Tax Bill. After the tax bills for the tax period of Closing are received by either Buyer or Seller, Buyer and Seller shall adjust such proration, and any amount then owing shall be paid within 20 days of demand by the party entitled thereto.

3. Not Separate Tax Parcel: If the Land is taxed as a portion of a larger parcel, the parties agree to pay their pro rata share of the Taxes covering

the tax period of Closing (and any previous periods) for the entire parcel, based on the square footage of the Land and Seller's Remainder Parcel (it being acknowledged that Buyer shall bear no responsibility for any Taxes assessed upon or attributable to the Parent Parcel Improvements, all of which shall be borne by Seller) (the foregoing allocation of payment responsibility being referred to as each party's "**Pro Rata Share**") to taxing authorities at the Closing, or, if the tax bill is not available, pay into escrow the estimated amount of said bill for payment by the Escrow Agent directly to the taxing authorities when the tax bill becomes available and shall execute and deliver such documentation before and after Closing as may be necessary to cause the Land to be assessed as a separate parcel.

4. Rollback Taxes Ascertainable by Closing. If the Land has been designated or valued as agricultural, open space or other special category such that its sale or change of use would trigger the imposition of any "rollback", "agricultural rollback", "catch up" or similar taxes, including penalties and interest thereon (collectively, the "**Rollback Taxes**"), or if any Rollback Taxes are imposed on the Land by the Closing Date in connection with the Intended Use or the conveyance of the Property, Seller shall be responsible for paying any such Rollback Taxes in full at the Closing.

5. Rollback Taxes Not Ascertainable by Closing. If Rollback Taxes are not ascertainable at Closing, Seller shall escrow the amount thereof as estimated by Seller's tax consultant with Escrow Agent pursuant to an escrow agreement to be executed at Closing between Buyer, Seller and Escrow Agent which shall require Escrow Agent to apply the escrowed funds toward payment of such Rollback Taxes as soon as same have been determined and are due and payable, and shall obligate Seller to pay any deficiency between the actual amount of the Rollback Taxes and the amount of the escrowed funds.

ii. Assessment Liens:

1. Seller Responsibility. Assessment liens which have been certified as of the Contract Date, pending liens where the improvements have been substantially completed, and special assessments or other similar governmental assessments or charges on the Property (collectively, "**Special Assessments**") that have been billed and are pending prior to the Contract Date, shall be satisfied by Seller, in full, at Closing.

2. Allocation of Responsibility. Assessment liens which are certified between the Contract Date and the Closing Date, pending liens where the improvements have been substantially completed which arise after the Contract Date, and Special Assessments that are billed and are pending after the Contract Date and relate to periods prior to Closing (collectively,

"**Pre-Closing Assessments**"), shall be apportioned between the parties based on their Pro Rata Share and satisfied at the Closing, provided that Buyer shall be solely responsible for any Pre-Closing Assessments resulting from Buyer's pursuit and/or receipt of the Development Approvals. Any costs and expenses relating to Pre-Closing Assessments for which the Buyer is responsible hereunder ("**Buyer Pre-Closing Assessments**") shall be applicable to the Aggregate Cost Increase Cap as set forth in Section 7.4(b) and on EXHIBIT I hereto.

iii. Utility and Sewer Charges: Seller will take all commercially reasonable action necessary to ensure that the utilities servicing the Property as of Closing ("**Pre-Closing Utilities**") are closed out by Closing, and there will accordingly be no proration with respect to utilities. All utility security deposits, if any, will be retained by Seller. In any event, (A) Seller will insure that all such utilities are closed out and all applicable lines cut and capped as part of the Demolition Work, if applicable; and (B) Buyer shall not be responsible for any utility charges associated with any Pre-Closing Utilities, all of which shall be borne by Seller.

iv. Service Contracts: Charges or payments due under any Service Contracts which are assumed by Buyer pursuant to the terms hereof.

b. Proration Errors. If the parties make any errors or omissions in the closing prorations or if they subsequently determine any dollar amount prorated to be incorrect, each agrees, upon notice from the other no later than 6 months after the Closing, to make any adjustment necessary to correct the error, including payment of any amount to the other then determined to be owing.

c. Payment of Prorations. Buyer and Seller shall promptly pay to the other party any amount due to the other party as a result of any proration required under this Section 4.2.

d. Interest. Any amounts due hereunder not paid within 20 days after demand by the payee shall bear interest at a rate equal to 15% per annum until such time as all such amounts are paid in full.

e. Survival. The terms and provisions of this Section 4.2 shall survive the delivery of the Deed.

5. Title.

5.1 Fee Simple Conveyance at Closing. Seller shall convey good, marketable and insurable fee simple title to the Land to Buyer free and clear of all liens and encumbrances, subject only to the Permitted Title Exceptions and any other matters of title to which Buyer shall expressly consent in writing pursuant hereto.

5.2 Review of Title Commitment. Buyer shall have until the Inspection Date by which to examine title to the Property, to obtain a title insurance commitment (the "**Title Commitment**"), and to give written notice to Seller of any objections.

a. Failure of Buyer to Object. If Buyer fails to give any notice to Seller by such date, Buyer shall be deemed to have waived such right to object to any title exceptions or defects disclosed in the Title Commitment (except for any Monetary Liens, which must be removed by Seller in accordance with Section 5.5) and the same shall constitute Permitted Title Exceptions.

b. Buyer Provides Objections. If Buyer timely notifies Seller of Buyer's objection(s) to any title exceptions or defects, Seller may, by delivering written notice thereof to Buyer within 7 days of receipt of such objection(s), elect (x) not to take any action to cure such objection(s), or (y) to cure or satisfy such objection(s) (and, to the extent Seller fails to provide a response to Buyer's objection(s) within such 7 day period, Seller shall be deemed to have elected not to cure such Buyer's objection(s)).

i. Seller Fails to Cure Objection. If Seller elects (A) not to cure such objections (except that Seller must cure Monetary Liens as required by Section 5.5), or (B) to cure such objections and such objections are not reasonably cured or satisfied within 60 days after such election to cure is made, then Buyer may, within 7 days after the election is made in clause (A) or within 7 days after the end of such 60 day cure period in clause (B), as applicable, elect, by written notice to Seller, either:

1. Terminate: to terminate this Agreement, in which case the Earnest Money, less $100 to be paid to Seller, shall be returned to Buyer by Escrow Agent, and the parties shall have no further rights or obligations hereunder, except for those which expressly survive any such termination, or

2. Waive: to waive its objections hereunder and proceed with the transaction pursuant to the remaining terms and conditions of this Agreement, in which event the matter objected to shall constitute a Permitted Title Exception.

If Buyer fails to give Seller notice of its election by such time, it shall be deemed to have elected the option contained in Section 5.2(b)(i)(2). For avoidance of doubt, if Seller elects to cure only some of such objections, then (i) Buyer shall have the rights set forth in Section 5.2(b)(i) above as if Seller elected not to cure any of Buyer's objections, and (ii) Seller is obligated to cure any such objections in the manner set forth in this Section 5.2 (and otherwise subject to any applicable rights of Buyer set forth herein with respect thereto).

ii. Seller Cures Objection. If Seller reasonably cures or satisfies all such objection(s) within 60 days after its election to do the same, then this Agreement shall continue in full force and effect.

iii. Waiver. Buyer shall have the right at any time to waive any objections that it may have made and, thereby, to preserve this Agreement in full force and effect.

5.3 Further Encumbrances. Seller agrees not to further alter or encumber in any way Seller's title to the Property after the Contract Date without Buyer's prior written consent, except as expressly permitted hereunder (e.g. the recordation of the Subdivision Plat). Notwithstanding the foregoing, to the extent, in connection with the Subdivision, Seller requires one or more easements on, under or over the Property in order to access and otherwise continue to use Seller's Remainder Parcel, Buyer shall not unreasonably withhold Buyer's consent to any such easements, so long as the same does not materially interfere with Buyer's Intended Use. As of the Contract Date, Seller anticipates that the only easements it will need are as outlined in EXHIBIT A. Seller shall prepare drafts of any easement documentation contemplated hereunder for Buyer's review and approval, which approval shall not be unreasonably withheld, conditioned or delayed.

5.4 Changes In Title. Except as provided in Section 5.3 above, Buyer shall have the right to object to any new title exception or defect disclosed in any update to the Title Commitment, and if (i) Seller elects to cure such objection and Seller cannot cure or satisfy any such objection (or any objection which Seller has previously undertaken to cure or satisfy) within 60 days after such election, or (ii) Seller does not notify Buyer that it will cure such objection within 5 days after receipt of notice thereof, Buyer may exercise the option set forth in clause 5.2(b)(i)(1) or 5.2(b)(i)(2) above. The foregoing election is not intended to be in derogation of, but shall be in addition to, Buyer's remedies for Seller's default hereunder, and does not negate, modify or amend the representations, warranties and covenants of Seller contained herein.

5.5 Monetary Liens. Seller shall remove any monetary liens caused, assumed or created by, through or under Seller and affecting the Land (collectively, "**Monetary Liens**") at or before the Closing, including, without limitation, any such liens created by, through or under any tenants of the Property. To the extent that any Monetary Liens have not been removed at or prior to the Closing, Buyer may (without any obligation to do so) cause any such Monetary Liens to be removed at the Closing and apply the cost thereof (including, but not limited to, any out-of-pocket costs incurred in connection with such removal) against the Purchase Price.

5.6 Time Periods. The Closing Date shall be automatically extended to allow all time periods in this Section 5 to run fully.

6. Surveying; Subdivision; Demolition Work.

6.1 Survey. Prior to the Inspection Date, Buyer shall obtain, at its sole cost and expense, and deliver to Seller an ALTA/NSPS Land Title Survey of the Property (the "**Survey**"). The Survey shall be certified to Buyer, Seller, Title Company, and any other party(ies) designated by Buyer. The description of the Property as shown on the Survey shall be consistent with the depiction of the Property as shown on EXHIBIT A attached hereto. The Survey, including the legal description of the Land as shown on the Survey, shall be subject to Buyer's and Seller's prior written approval, not to be unreasonably withheld, conditioned or delayed. Once approved, the Survey shall be deemed the "**Final Survey**" for the purposes hereof (subject to Section 6.6 below), and will form the basis of the Subdivision Plat and Seller's pursuit of the Subdivision.

6.2 Buyer Objections. Any matters shown on any Survey and objected to by Buyer by the Inspection Date shall be additional title objections, as to which the obligations and rights of Buyer and Seller shall be the same as provided in Section 5 above. Furthermore, Buyer shall have the right to object to any new matters disclosed on updates to the Survey in the manner set forth in Section 5.4 above.

6.3 Subdivision. Once the Final Survey is approved pursuant to Section 6.1 above, Seller will, at its sole cost and expense, cause to be prepared the Subdivision Plat, which shall be subject to Buyer's approval, not to be unreasonably withheld, conditioned or delayed so long as it is consistent with the Final Survey. Buyer shall have 5 Business Days following receipt of the Subdivision Plat from Seller to notify Seller of any objections to the Subdivision Plat. To the extent Buyer fails to timely notify Seller of any such objection, such Subdivision Plat shall be deemed approved by Buyer. Once the Subdivision Plat is approved by Buyer, Seller will thereafter diligently pursue the Subdivisions Approvals, and Buyer will reasonably cooperate with Seller in such pursuit efforts, at no cost or expense to Buyer. In the event that, despite such pursuit efforts, Seller is unable to obtain the Subdivision Approvals prior to the date which is [redacted] days after the Inspection Date (the "**Subdivision Deadline**"), Buyer shall have the right to terminate this Agreement by notice thereof to Seller, in which case the Earnest Money, less $100 to be paid to Seller, shall be returned to Buyer by Escrow Agent, and the parties shall have no further rights or obligations hereunder, except for those which expressly survive any such termination.

6.4 Legal Description. The deed to be delivered by Seller to Buyer at the Closing shall contain the legal description of the Land as shown on the Subdivision Plat, or will cross reference the Land as shown on the Subdivision Plat.

6.5 Demolition Work.

a. Approval of Demolition Plans. The parties acknowledge that, in order for Buyer to develop the Project for its Intended Use, the portion of the Parent Parcel Improvements depicted on the plan attached hereto as EXHIBIT J will need to be demolished. Accordingly, on or before the date which is [redacted] days prior to the Entitlements Date, Seller shall, at its sole cost and expense, prepare or cause the preparation of and submit to Buyer plans for the demolition of that portion of the Parent Parcel Improvements located on the Land and depicted on EXHIBIT J, as well as all off-haul and other work related thereto (the "**Demolition Plans**"). The Demolition Plans shall be subject to Buyer's approval, not to be unreasonably withheld, conditioned or delayed.

b. Pricing and Permitting of Demolition Work. No later than the 45th day after the Contract Date, Seller shall deliver to Buyer a preliminary estimate of Demolition Costs based on its preliminary plans and pricing for the Demolition Work (the "**Preliminary Demolition Cost Estimate**"). Additionally, once the Demolition Plans are approved by the Seller and Buyer, Seller will solicit bids from one or more contractors reasonably approved by Buyer for the Demolition Work, and a final budget itemizing all Demolition Costs shall be furnished to Buyer at or prior to Closing (the "**Final Demolition Cost Budget**"). Seller shall, at its sole cost and expense and prior to Closing, obtain any and all governmental permits and approvals required in order to allow Seller to commence performance of the Demolition Work immediately upon Closing (collectively, "**Demolition Work Permits**").

c. Performance and Completion of Demolition Work; Security for Performance. From and after Closing, Seller shall, at its sole cost and expense, perform the Demolition Work in accordance with the Demolition Plans and the Demolition Work Permits and shall cause Demolition Work Completion to occur prior to the Demolition Work Completion Deadline. As security for Seller's obligation to complete the Demolition Work as aforesaid, an amount equal to 115% of the greater of (i) the Preliminary Demolition Cost Estimate and (ii) the Demolition Costs set forth in the Final Demolition Cost Budget will be held back from the Purchase Price at Closing (the "**Demolition Holdback**"), and the parties will enter into a holdback escrow agreement with the Escrow Agent whereby, among other terms and conditions: (i) the Demolition Holdback will be held in escrow by the Escrow Agent pending Demolition Work Completion; and (ii) in the event Seller fails to achieve Demolition Work Completion by the Demolition Work Completion Deadline, Buyer will have the right to assume control of the Demolition Work (and take assignment of all contracts respecting such work) and draw on the Demolition Holdback in order to pay for the costs associated with completing the Demolition Work (the "**Demolition Holdback Agreement**"). Seller and Buyer agree to negotiate in good faith the terms of the Demolition Holdback Agreement during the Inspection Period, and upon finalization of same, the parties will enter into an amendment to this Agreement attaching the final form of Demolition Holdback Agreement.

This Section 6.5 shall survive the Closing hereunder except to the extent superseded by the Demolition Holdback Agreement.

6.6 Property Line Adjustment. Notwithstanding anything to the contrary contained herein, if at any time during the pendency of this Agreement, Buyer confirms, whether by issuance of the Development Approvals or otherwise, [redacted]:

a. Notice to Seller. Buyer will provide Seller with notice of Buyer's Low Unit Count Confirmation promptly upon its confirmation of same (the "**Buyer's LUC Notice**");

b. Seller Election. Within 20 Business Days after receipt of the Buyer's LUC Notice, Seller may provide notice to Buyer ("**Seller's Property Line Adjustment Notice**") that Seller elects to adjust the proposed boundary line for the Land (as reflected on EXHIBIT A and memorialized in the Final Survey and proposed Subdivision Plat, as applicable) so that both office building pods currently comprising the Parent Parcel Improvements would not be part of the Property conveyed to Buyer at Closing (i.e. both buildings would remain as part of the Seller's Remainder Parcel at Closing), which would in turn avoid the need for Seller to perform the Demolition Work pursuant to the terms of Section 6.5 above (the "**Property Line Adjustment**"). The Seller's Property Line Adjustment Notice will include a proposed revised Final Survey and Subdivision Plat reflecting the Property Line Adjustment. In the event Seller fails to timely provide Seller's Property Line Adjustment Notice together with the supporting documentation required hereunder, there will be no Property Line Adjustment and this Section 6.6 shall be null and void and of no further force and effect.

c. Buyer Approval Rights. In the event Seller timely provides the Seller's Property Line Adjustment Notice, Buyer will have the right to review, approve and propose reasonable commentary to the proposed Property Line Adjustment and the Seller's proposed modifications to the Final Survey and Subdivision Plat, and Seller and Buyer agree to act reasonably and in good faith in order to agree upon a Property Line Adjustment acceptable to both parties; *provided, however*, in no event shall Buyer be obligated to accept any proposed Property Line Adjustment under this Section 6.6 if, in Buyer's reasonable judgment, (i) the Property Line Adjustment would adversely impact the Development Approvals or Buyer's pursuit thereof (if not yet issued), (ii) the Property Line Adjustment would materially decrease the likelihood of Seller obtaining all requisite Subdivision Approvals and effectuating the Subdivision prior to Closing, or (iii) the Property Line Adjustment would otherwise materially, adversely affect the development of the Project for its Intended Use, including the timing, scope or cost thereof (the foregoing clauses (i), (ii) and (iii) are each referred to herein as a "**Property Line Adjustment MAE**"). If, despite the parties' efforts, they are unable to agree

upon the Property Line Adjustment and attendant revisions to the Final Survey and Subdivision Plat, or in the event Buyer rejects the Property Line Adjustment based on a Property Line Adjustment MAE, there will be no Property Line Adjustment and this Section 6.6 shall be null and void and of no further force and effect; provided that, Seller may elect, by providing written notice to Buyer within 10 days of Seller's receipt of Buyer's rejection of the Property Line Adjustment, to terminate this Agreement, in which event, the Earnest Money, less $100 to be paid to Seller, shall be returned to Buyer by Escrow Agent, and the parties shall have no further rights or obligations hereunder, except for those which expressly survive any such termination.

d. Confirmation of Property Line Adjustment. If the parties are able to agree upon the Property Line Adjustment and attendant revisions to the Final Survey and Subdivision Plat, then the definitions of "Final Survey", "Subdivision" and "Subdivision Plat" for all purposes under this Agreement shall be deemed modified to account for the Property Line Adjustment, Seller will not be required to perform the Demolition Work from and after Closing, and the provisions of Section 6.5 hereof shall therefore be null and void and of no further force and effect. Seller will, at its sole cost and expense, make any adjustments required to the Subdivision Plat and obtain all Subdivision Approvals required in connection with the Property Line Adjustment as soon as practicable after the parties approval of same, and in any event, prior to Closing.

6.7 Wastewater Treatment Plant. Buyer acknowledges that Seller desires to tie in and utilize the Wastewater Treatment Plant in order to service the improvements located on Seller's Remainder Parcel (the "**Seller WWTP Tie-In**"). Accordingly, Buyer and Seller will work in good faith to come to one or more agreements by which (i) Buyer will design and construct the Wastewater Treatment Plant in contemplation of the Seller WWTP Tie-In, (ii) Seller will share in the costs of such design and construction, and in the ongoing maintenance and repair of the Wastewater Treatment Plant, pursuant to a cost-sharing allocation mutually agreeable to the parties, and (iii) Buyer will grant the Seller, as owner of the Seller's Remainder Parcel, the right to tie-in and utilize the Wastewater Treatment Plant upon completion thereof, including the grant of any necessary easements in connection therewith (collectively, the "**WWTP Tie-In and Cost-Sharing Agreement**"). Notwithstanding the foregoing, the parties finalization, execution and delivery of the WWTP Tie-In and Cost-Sharing Agreement shall in no event be a condition to Closing hereunder, and if the parties are unable, despite their good faith efforts, to come to an agreement regarding same prior to Closing (or such earlier deadline as Buyer shall reasonably determine based on the status of its design of the Wastewater Treatment Plant and the status and impact of the Seller WWTP Tie-In on the Development Approvals), Buyer shall have no obligation to provide for the Seller WWTP Tie-In and the owner of Seller's Remainder Parcel will have not have any rights in and to the Wastewater Treatment Plant.

7. Buyer's Inspection.

7.1 Physical Inspection.

a. Inspection Right. Buyer and its agents, employees, representatives and independent contractors may enter upon the Property for the purpose of making such surveys, soil tests, borings, percolation tests, inspections, examinations, and studies (collectively, "**Inspections**") as are reasonably necessary to evaluate and study the Property as contemplated herein. In no event shall Buyer be permitted to conduct invasive testing of the Property, including, without limitation, conducting a Phase II environmental test, without Seller's prior written consent, which consent may be granted or withheld in Seller's sole and absolute discretion; *provided, however*, that Buyer may conduct a customary geotechnical test to the Property without Seller's approval and Buyer may conduct a Phase II environmental study if its Phase I report recommends that additional testing be performed and so long as Seller is given an opportunity to review and approve the scope of such Phase II testing, which approval shall not be unreasonably withheld, conditioned or delayed. Seller agrees that Buyer shall have until the Closing Date in which to conduct all such Inspections, but that Buyer's right to terminate this Agreement based thereon shall be limited as provided in Section 7.3, Section 7.4 and Section 7.6 below.

b. Inspection Indemnity. Buyer shall (i) be responsible for restoring the Property to substantially the same condition as existed prior to such Inspections and (ii) indemnify, defend and hold Seller harmless from any and all claims, liabilities, costs or expenses ("**Claims**") arising out of such Inspections of and entries onto the Property, including, but not limited to, liability for personal injury (including death) and property damage to the extent caused by Buyer, its agents, employees and consultants.

c. Carveout to Inspection Indemnity. Notwithstanding the foregoing, in no event shall Buyer be liable to restore the Property, or be obligated to indemnify Seller under Section 7.1(b) for (i) the mere discovery of pre-existing conditions at the Property or (ii) any claims, liabilities, costs or expenses arising out of the gross negligence or willful misconduct of Seller or any agents, employees, consultants or contractors thereof.

d. Insurance Requirements. Prior to entry onto the Property, Buyer shall provide, or cause its consultants to provide, Seller with a certificate of insurance evidencing that Buyer or its applicable consultants performing the Inspections maintain a commercial general liability policy that names Seller as an additional insured, in an amount of not less than $2,000,000 per occurrence and in the aggregate and from insurers licensed in the Commonwealth of Massachusetts with a rating of not less than "A-/VIII" as published in the most current available "Best's Insurance Reports". Required commercial

general liability limits can be satisfied with a combination of primary and excess/umbrella liability policies.

7.2 Document Inspection. Seller covenants that on or before the date that is five (5) Business Days after the Contract Date, Seller will deliver to Buyer true, correct and complete copies of each of the documents or materials listed on EXHIBIT C attached hereto to the extent in Seller's possession or reasonable control. The delivery of any such documents or materials shall be without warranty or representation of any kind.

7.3 Inspection Period.

a. Inspection Date; Termination Right. Notwithstanding Buyer's right of inspection contained in Section 7.1, Buyer shall have until 5:00 p.m. Bolton, Massachusetts time, on the 75th day after the Contract Date (the "**Inspection Date**") to investigate the Property and all matters relevant to its acquisition, ownership and development thereof; including, without limitation, the right to have made, at Buyer's expense, subject to Section 7.1(a) above, any studies or inspections of the Property that Buyer may deem necessary or appropriate, and to terminate this Agreement, by written notice to Seller, to be received on or before the Inspection Date, if Buyer is not, for any reason or for no reason, satisfied with the Property in its sole and absolute discretion, in which case the Earnest Money, less $100 to be paid to Seller, shall be returned to Buyer by Escrow Agent, and the parties shall have no further rights or obligations hereunder, except for those which expressly survive any such termination. Notwithstanding the foregoing, in the event a COVID-19 Delay (as defined below) delays Buyer's ability to appropriately investigate the Property for the Intended Use and/or inquire or communicate with or receive responses from applicable governing authorities regarding the Property or the Development Approvals, Buyer shall have the right, upon notice to Seller prior to the then-current Inspection Date, to extend the Inspection Date by 30 days.

b. Seller Cooperation. Seller agrees to cooperate reasonably with any such investigations, inspections or studies made by or at Buyer's direction at no cost or expense to Seller.

c. Failure to Exercise Termination Right. If, on or before the Inspection Date, Buyer does not exercise its termination right pursuant to this Section 7.3, then this Agreement shall remain in full force and effect in accordance with its terms.

d. Second Deposit. If Buyer waives its right to terminate this Agreement pursuant to this Section 7.3, Buyer shall deposit the Second Deposit with Escrow Agent in accordance with Section 3.1.

7.4 Development Approvals Contingency.

a. Entitlements Date. Buyer will have until the [redacted] after the Inspection Date (the "**Entitlements Date**") in order to obtain the Development Approvals or otherwise waive such contingency as set forth in Section 7.4(b) below. If Buyer obtains the Development Approvals prior to such deadline, the "**Entitlements Date**" for the purposes hereof shall be deemed accelerated to the date upon which Buyer obtains such approvals. EXHIBIT I attached hereto contains the list of Development Approvals which Buyer anticipates will be needed for the Project; *provided, however*, that Buyer may, upon written notice to Seller on or before the Inspection Date (a "**DA Update Notice**"), update the list of Development Approvals based on Buyer's due diligence and as Buyer deems necessary for the Project, and EXHIBIT I will be deemed updated accordingly upon Buyer's provision of any such DA Update Notice. Buyer hereby acknowledges that Buyer shall be solely responsible for obtaining any and all Development Approvals to enable Buyer to develop the Project, and Buyer agrees to use diligent efforts to obtain such approvals during the pendency of this Agreement. However, Seller, at no cost and expense to Seller, shall cooperate with Buyer and join with Buyer in the signing of any documents necessary to obtain such approvals.

b. Termination Right. Notwithstanding anything contained in this Agreement, if at any time on or prior to the Entitlements Date, (i) the Development Approvals and/or any condition, restriction or contribution required by applicable governing authorities prevents or unreasonably restricts Buyer's intended development of the Property for its Intended Use, including, but not limited to, (A) any condition or restriction that inhibits Buyer from constructing the Project for its Intended Use, including any imposition of berms, buffers and/or setbacks that adversely affect the minimum unit count or parking requirements of the Project, or (B) any conditions, restrictions or contributions (which shall be deemed to include any Buyer Pre-Closing Assessments) that collectively increase the cost of the Project by more than [redacted]; or (ii) Buyer, in its reasonable judgment, believes that it will not be able to obtain the Development Approvals on or before the Entitlements Date, then Buyer shall have the right, by providing notice to Seller no later than the Entitlements Date, to (1) terminate this Agreement, in which event the Earnest Money, less $100 to be paid to Seller, shall be returned to Buyer, and the parties hereto shall have no further rights or obligations hereunder, except for those which expressly survive such termination; or (2) proceed to Closing without regard to the failure of such condition. If Buyer does not timely deliver the notice referenced in option (1), it shall be deemed to have elected option (2). In the event Buyer elects or is deemed to have elected to proceed to Closing beyond the Entitlements Date pursuant to the terms hereof, it shall deposit the Entitlements Deposit with Escrow Agent in accordance with Section 3.1 hereof.

c. Extension of Entitlements Date. Notwithstanding anything to the contrary contained herein, Buyer shall have [redacted] options to extend the Entitlements Date for successive periods of [redacted] days each (each an "**Option**"), by delivering written

notice of the election to exercise the applicable Option to Seller on or before the then-current Entitlements Date.

7.5 Conditions Precedent. In addition to other conditions set forth in this Agreement, Buyer's obligation to purchase the Property shall be subject to and contingent upon the following conditions precedent, any or all of which Buyer may waive by written notice only:

a. Adverse Conditions. There shall be no material adverse change in the physical condition of or affecting the Property not caused by Buyer between the time of Buyer's inspection of the Property prior to the Inspection Date and the Closing Date, including, but not limited to, environmental contamination;

b. Title Insurance. The willingness of Title Insurer to issue, on the Closing Date, upon the sole condition of the payment of an amount no greater than its regularly scheduled premium, its standard extended ALTA form owner's policy of title insurance, insuring in the amount of the Purchase Price that title to the Property is vested of record in Buyer on the Closing Date, subject only to the Permitted Title Exceptions;

c. Representations and Warranties. Seller's representations and warranties contained herein shall be true and correct in all material respects as of the Contract Date and the Closing Date; *provided, however*, that if Seller's representations in Section 8.1(h) or 8.1(o) are not true and correct as of Closing due to facts or circumstances beyond the Seller's control arising between the Contract Date and the Closing Date (and not otherwise due to Seller's breach hereunder), Buyer will not be entitled to claim a failed condition if such representations are not true and correct as of Closing,. For purposes herein, subject to the foregoing proviso, a representation shall be false if the factual matter that is the subject of the representation is false notwithstanding any lack of knowledge or notice to the party making the representation.

d. Compliance with Agreement. Seller must have materially performed all obligations and complied with all covenants required in this Agreement to be performed or complied with by it prior to or at Closing.

e. Development Approvals. Buyer shall have obtained any and all Development Approvals, unless Buyer is deemed to have elected option 2 pursuant to the provisions of Section 7.4(b).

f. Subdivision. Seller shall have obtained all requisite Subdivision Approvals and recorded the Subdivision Plat (as approved by Buyer) in order to effectuate the Subdivision.

7.6 Failure of Conditions Precedent. If any of the conditions precedent set forth in Section 7.5 are not satisfied or waived in writing by Buyer by 12:00p.m. Eastern time on

the Closing Date, Buyer may, but shall not be obligated to, elect, at its option, by notice to Seller, either to: (a) terminate this Agreement, in which event the Earnest Money, less $100 to be paid to Seller, shall be returned to Buyer, and the parties hereto shall have no further rights or obligations hereunder, except for those which expressly survive such termination; or (b) close without regard to the failure of such condition. The foregoing election is not intended to be in derogation of, but shall be in addition to, Buyer's remedies for Seller's default hereunder, and does not negate, modify or amend the representations, warranties or post-closing covenants of Seller contained herein, which representations, warranties and post-closing covenants shall survive the Closing as herein provided.

8. Representations and Warranties.

8.1 Representations and Warranties. Seller hereby represents and warrants to Buyer as follows:

a. No Litigation. Seller has no actual knowledge of, and has not received any written notice of, any actual, pending or threatened violation, action or proceeding by any organization, person, individual or governmental agency against Seller with respect to the Property or against the Property (or any portion thereof), and, to the Seller's actual knowledge, there is no current threat of any litigation or other legal action being filed against Seller or the Property which would affect the Property or Seller's ability to perform its obligations hereunder.

b. Authority.

i. Organization. Seller is a limited liability company validly existing and in good standing under the laws of the Commonwealth of Massachusetts, and qualified to do business in the State in which the Property is located.

ii. Authorization: Seller has obtained all requisite authorizations and consents to enter into this Agreement with Buyer and to consummate the transactions contemplated hereby and the execution, delivery and performance of this Agreement and the other agreements and instruments referred to herein and the consummation of the transactions contemplated hereby by Seller will not violate, nor constitute a default under, Seller's operating agreement or any order or ruling of any governmental authority or court or any document, instrument or agreement by which Seller or the Property may be bound.

iii. Legally Binding: This Agreement is the valid and legally binding obligation of Seller, enforceable against Seller in accordance with its terms.

iv. Legal Power: The entities and individuals executing this Agreement and the other documents and instruments referenced herein or otherwise executed and delivered in connection herewith on behalf of Seller have the legal power, right and authority to bind Seller under the terms and conditions stated herein.

d. Undisclosed Agreements and Liabilities. Other than as expressly set forth in this Agreement, the Title Commitment or otherwise disclosed in writing to Buyer pursuant to this Agreement, to Seller's actual knowledge, there are no undisclosed liabilities or agreements affecting the Property or Seller, in its capacity as owner of the Property.

f. No Rights to Purchase. Except as disclosed in the Title Commitment, no Person, other than Buyer, has any right, agreement, commitment, option, right of first refusal or any other agreement, whether oral or written, with respect to the purchase, assignment or transfer of all or any portion of the Property.

g. Environmental Matters. Seller has received no written or oral notice or other communication of pending or threatened claims, actions, suits, proceedings or investigations against Seller, the Property or any occupant of the Property related to alleged or actual violations of Hazardous Substance Laws.

h. No Condemnation. To Seller's actual knowledge, there is no pending or threatened condemnation, expropriation, eminent domain, change in grade of public street or similar proceeding affecting all or any portion of the Property; Seller has received no written or oral notice of the same; and Seller has no actual knowledge that any such proceeding is contemplated.

i. Covenants, Conditions, Restrictions or Easements. There is no default or breach by Seller nor, to the actual knowledge of Seller, any other party thereto, under any covenants, conditions, restrictions or easements which may affect the Property or any portion or portions thereof which are to be performed or complied with by the owner of the Property, and, to Seller's actual knowledge, no condition or circumstance exists which, with the giving of notice or the passage of time, or both, would constitute a default or breach by Seller nor any other party thereto, under any such covenants, conditions, restrictions, rights-of-way or easements.

j. No Bankruptcy. Neither Seller, nor its general partner[s] (if Seller is a partnership), is party to any voluntary or involuntary proceedings in bankruptcy, reorganization or similar proceedings under the Federal bankruptcy laws or under any state laws relating to the protection of debtors, or subject to any general assignment for the benefit of the creditors, and, to the Seller's actual knowledge, no such action has been threatened.

k. No Leases. There are no tenants of the Property and no person or entity now has (other than Seller), or at the time of Closing will have, any possessory interest in the Property, under a lease or otherwise.

l. Non-Foreign Status; Withholding. Seller is not a "foreign person" as that term is defined in the Internal Revenue Code of 1986, as amended and the Regulations promulgated pursuant thereto. Seller's sale of the Property is not subject to any

Federal, state or local withholding obligation of Buyer under the tax laws applicable to Seller or the Property.

m. Service Contracts. Other than as set forth on EXHIBIT F, there are no Service Contracts affecting the Property. All Service Contracts at the Property are, or by Closing will be, terminable upon thirty (30) or fewer days prior written notice to the service providers under the Service Contracts.

n. OFAC. Neither Seller nor, to Seller's actual knowledge, any individual having a beneficial interest in Seller is a Person described by Section 1 of the Executive Order (No. 13224) Blocking Property and Prohibiting Transactions with Persons Who Commit, Threaten to Commit, or Support Terrorism, 66 Fed. Reg. 49079 (September 25, 2001), and does not engage in any dealings or transactions, and is not otherwise associated with any such Persons.

o. Special Assessments. Seller has not received written notice of any pending or planned Special Assessments imposed or to be imposed on the Property.

8.2 Seller's Actual Knowledge. As used in this Section 8, the phrase "to Seller's actual knowledge," "Seller has no actual knowledge" or phrases of similar import shall mean the actual, not constructive or imputed, knowledge of either of Jeffrey C. O'Neill or Donald O'Neill, without any obligation on the part of either of them to make any independent investigation of the matters being represented and warranted, or to make any inquiry of any other persons, or to search or examine any files, records, books, correspondence and the like. Neither of Jeffrey C. O'Neill nor Donald O'Neill shall be personally liable for any of the obligations of Seller under this Agreement. To the extent Buyer discovers prior to the Closing any inaccuracy in a representation and warranty of Seller in this Agreement that would give Buyer a right to terminate this Agreement and the Closing occurs notwithstanding the Buyer's discovery of such inaccuracy, such representation and warranty shall be deemed modified to reflect the inaccuracy discovered by Buyer.

8.3 Survival. The foregoing representations are true, correct and complete, and the foregoing warranties are in full force and effect and binding on Seller, as of the date hereof, and shall be true and correct and in full force and effect, as the case may be, and deemed to have been reaffirmed and restated by Seller as of the date and time of the Closing, shall survive the Closing for a period of 6 months and shall not be deemed merged into any instrument of conveyance delivered at the Closing, and shall inure to the benefit of and be enforceable by Buyer, its successors and assigns.

8.4 Limitation on Seller's Liability. Notwithstanding anything herein or in any other document executed in connection with this Agreement or the transaction contemplated hereby, Seller shall have no liability to Buyer for a breach of any representation or warranty hereunder or under the documents executed at Closing listed in Sections 9.2(a) through 9.2(f) unless the valid claims for all such breaches collectively aggregate more than $25,000, in which event the full amount of such valid claims shall be actionable, up to a maximum of $1,250,000.

9. Closing.

9.1 Time and Place.

a. **Closing Date**. Provided that all of the conditions set forth in this Agreement are theretofore fully satisfied or performed, the Closing shall be conducted by escrow through the Title Insurer on the earlier of: (i) the date that is [redacted] days after the earlier to occur of: (A) the Entitlements Date and (B) Buyer's receipt of all Development Approvals (the earlier to occur of the foregoing, the "**Outside Closing Date**"), or (ii) any date prior to the Outside Closing Date chosen by Buyer and set forth in a written notice from Buyer to Seller at least 7 days prior thereto (as applicable, the "**Closing Date**"), unless the Closing Date is postponed pursuant to the express terms of this Agreement or as otherwise agreed by Seller and Buyer in writing.

b. **Closing Extensions**. Notwithstanding the foregoing, Buyer shall have the right to extend the Outside Closing Date for up to [redacted] periods of [redacted] days each (each, a "**Closing Extension**"), by delivering the following on or before the then-current Closing Date: (i) notice to Seller of the Closing Extension; and (ii) an additional deposit to Seller in the amount of [redacted] (each, an "**Extension Deposit**"). Each Extension Deposit shall be deemed non-refundable, except in the case of Seller's default. Notwithstanding the foregoing, provided Buyer fulfills Buyer's obligations under this Agreement and the transaction contemplated hereby is consummated, each Extension Deposit paid to Seller shall be credited to the Purchase Price.

9.2 Closing Deliverables. For and in consideration of, and as a condition precedent to Buyer's delivery to Seller of the Purchase Price, Seller shall obtain and deliver to Buyer at the Closing the following documents (all of which shall be duly executed, acknowledged, and witnessed, as applicable), which documents in subsections below Buyer agrees to execute where applicable:

a. Deed: a quitclaim deed (the "**Deed**") conveying to Buyer all of Seller's right, title and interest in and to the Property, subject only to the Permitted Title Exceptions and such other matters as are permitted by Section 5 hereof;

b. General Assignment. The General Assignment;

c. Non-Foreign Certificate: a Certificate and Affidavit of Non-Foreign Status, in the form attached as EXHIBIT G hereto and by this reference made a part hereof;

d. Affidavit of Title: an affidavit of title in the form required by the Title Insurer in order to issue its extended coverage owner's policy of title insurance without exception for mechanic's, materialmen's or other statutory liens, unrecorded easements or other rights of parties in possession;

e. Authority: such evidence as Title Insurer shall reasonably require as to the authority of the parties acting on behalf of Seller to enter into this Agreement and to discharge the obligations of Seller pursuant hereto;

f. Reaffirmation of Representations and Warranties: a certificate of Seller, dated as of the Closing Date, reaffirming that all representations and warranties of Seller under this Agreement are materially true, correct and complete as of the Closing Date and that there has occurred no material default or breach, nor any event which, with the giving of notice or the passage of time, or both, would constitute a material default or breach by Seller under this Agreement;

g. Subdivision Plat: if not previously recorded, the Subdivision Plat.

h. Demolition Holdback Agreement: the Demolition Holdback Agreement, if applicable pursuant to the terms hereof.

i. Closing Statement: a closing statement setting forth the prorations, credits, debits, and disbursements to be made at the Closing in accordance with this Agreement; and

j. Further Documentation: such further instructions, documents and information as Buyer or Title Insurer may reasonably request as customarily necessary to consummate the purchase and sale contemplated by this Agreement.

9.3 Costs. At the Closing:

a. Transfer Taxes: Seller shall pay any and all transfer taxes incident to the conveyance of title to the Property to Buyer;

b. Recording Costs: Seller shall pay the cost of recording the Deed and Subdivision Plat;

c. Title Exam and Premium: Buyer shall pay the costs of examination of title to the Property and owner's title insurance therefor;

d. Financing Costs: Buyer shall pay any mortgage recording or intangibles tax and all other taxes, costs, fees or expenses relating to Buyer's financing of the Property;

e. Survey: Buyer shall pay the cost of the Survey;

f. Subdivision: Seller shall pay the costs associated with the Subdivision Plat and/or Subdivision Approvals as set forth herein.

g. Escrow/Closing Fees: Any escrow/closing fees charged by the Title Insurer shall be shared equally by Seller and Buyer; and

h. Other Costs: Seller and Buyer shall pay their own respective costs incurred with respect to the consummation of the purchase and sale of the Property as contemplated herein, including, without limitation, attorneys' fees.

10. Default and Remedies.

10.1 Buyer's Default. If the Closing does not occur as a result of a default by Buyer under the terms of this Agreement, the Earnest Money shall be paid to Seller, and Seller shall be entitled, as its sole and exclusive remedy hereunder, to retain the Earnest Money as full liquidated damages for such default of Buyer, whereupon this Agreement shall terminate and the parties shall have no further rights or obligations hereunder, except for those which expressly survive any such termination. It is hereby agreed that Seller's damages in the event of a default by Buyer hereunder are uncertain and difficult to ascertain, and that the Earnest Money constitutes a reasonable liquidation of such damages and is intended not as a penalty, but as full liquidated damages. Seller hereby waives and covenants not to bring any action or suit, whether legal or equitable, against Buyer for damages or other redress in the event of Buyer's default hereunder.

10.2 Seller's Default. In the event of a default by Seller under the terms of this Agreement which is first discovered by Buyer prior to the Closing and is not cured by Seller within 10 days after receipt of notice of such default from Buyer (except for Seller's failure to deliver the Deed and otherwise close on the Closing Date, for which there will be no notice and cure period afforded Seller), Buyer's remedies hereunder shall be either to: a) terminate this Agreement and receive a refund of the Earnest Money and any Extension Deposit paid to Seller, and Buyer shall have the right to recover from Seller all out-of-pocket fees, costs and expenses incurred by Buyer in connection with this Agreement and the transactions contemplated by this Agreement in an amount not to exceed [redacted] (which shall be in addition to, and not inclusive of, the Earnest Money and any Extension Deposit paid to Seller); or (b) seek specific performance of Seller's obligations under this Agreement. Additionally, notwithstanding anything in this Agreement to the contrary, in the event of a Material Seller Default, Buyer shall be entitled to pursue an action for actual damages against Seller, up to a maximum of [redacted] (which shall be in addition to, and not inclusive of, the Earnest Money and any Extension Deposit paid to Seller). For the purposes hereof, a "**Material Seller Default**" shall mean any default by Seller hereunder that is characterized by the following and is not cured within the 10-day period noted above: (i) Seller selling or conveying the Property to another party in violation of this Agreement in a manner that renders specific performance unavailable; (ii) Seller intentionally or willfully encumbering the Property in violation of this Agreement in a manner that has or would have a material, adverse effect on the developability of the Property (including the proposed timing, scope or cost thereof) for Buyer's Intended Use (e.g. by entering into a long-term lease whose term extends beyond the Closing Date, subjecting the

Property to a mortgage that cannot be discharged by the payment of the Purchase Price, or subjecting the Property to an easement or other restriction or encumbrance that would have a material, adverse effect on the developability of the Property); (iii) intentionally omitted; (iv) Seller's failure to comply with the Seller's Cessation Covenant at Closing; or (v) a willful or intentional breach of any representation or warranty of Seller hereunder, the falsity of which has or would have a material, adverse effect on the developability of the Property (including the proposed timing, scope or cost thereof) for Buyer's Intended Use.

10.3 Seller's Misrepresentation or Breach of Warranty. In the event that Buyer first discovers after the Closing that any representation, warranty or covenant contained herein was untrue or breached, as the case may be, as of the Closing Date, or if Buyer chooses to enforce any surviving indemnification set forth herein, Buyer shall be entitled to all remedies provided for herein or otherwise available to Buyer at law or in equity, subject to the limitation set forth in Section 8.4 hereof.

11. Maintenance of Improvements and Operation of Property.

(a) Insurance. Seller agrees to keep its customary property insurance covering the Property in effect until the Closing (provided, however, that the terms of any such coverage maintained in blanket form may be modified as Seller deems necessary).

(b) Maintenance. Seller shall maintain all Improvements substantially in their present condition (ordinary wear and tear, casualty and condemnation excepted).

(c) Operation. Seller shall operate and manage the Property in a manner consistent with Seller's practices in effect prior to the Effective Date.

(d) Service Contracts.

(i) Notice of Assumption. No later than the Inspection Date, Buyer may advise Seller in writing which Service Contracts Buyer elects to assume, and Seller shall, at its sole cost and expense, terminate effective as of or prior to Closing all Service Contracts that Buyer does not so elect to assume.

(ii) Failure to Provide Notice. Buyer's failure to so advise Seller in writing shall be deemed to constitute Buyer's election to not assume any such Service Contracts.

(iii) Notices. Seller shall deliver at Closing notices of termination of all Service Contracts that are not so assumed and Seller shall be responsible for any charges applicable to periods commencing with the Closing.

(iv) Existing Management and Leasing Agreements. Seller shall terminate, effective as of or prior to Closing, all existing management and leasing agreements with respect to the Property.

(e) No New Encumbrances. From and after the Contract Date until the date and time of the Closing, except as expressly permitted hereunder, Seller shall not convey any portion of the Property or any rights therein, or enter into any conveyance, security document, easement or other agreement, or amend any existing agreement, granting to any Person (other than Buyer) any rights with respect to the Property or any part thereof or any interest whatsoever therein, without Buyer's prior written consent.

(f) Development Approvals and Building Permit Cooperation. Seller, at no cost and expense to Seller, shall cooperate with Buyer in good faith and join with Buyer in the signing of any documents necessary to obtain the Development Approvals.

(g) Cessation of Operations; Removal of Personal Property. If the Demolition Work is to be performed post-Closing on the terms hereof, Seller will cease all operations in the Demolition Improvements and remove all personal property and effects therefrom prior to Closing ("**Seller Cessation Covenant**").

12. Casualty/Condemnation.

12.1. Casualty. In the event that prior to the Closing there is any damage to the Property, or any part thereof, Buyer shall accept the Property in its then condition, and proceed with the transaction contemplated by this Agreement and Buyer shall be entitled to an assignment of all of Seller's rights to any insurance proceeds payable by reason of such damage or destruction; provided that, to the extent that as a result of such casualty, a material health or safety issue results such that the applicable governmental authority requires commencement of repair prior to Closing, Seller shall commence such repairs (and the amount of insurance proceeds payable to Buyer shall be reduced by Seller's costs of such repairs). Seller shall not compromise, settle or adjust any claims to such proceeds without Buyer's prior written consent.

12.2 Material Condemnation. In the event of a Material Condemnation, Buyer may, at its option to be exercised within 5 Business Days after receipt of notice of the occurrence of the damage or the actual or threatened commencement of condemnation proceedings, either terminate this Agreement or consummate the purchase for the full Purchase Price as required by the terms hereof.

(a) Buyer Elects to Terminate. If Buyer elects to terminate this Agreement by delivering written notice thereof to Seller, then this Agreement shall terminate, the Earnest Money, less $100 paid to Seller, shall be returned to Buyer and neither party shall have any further rights or obligations hereunder, except for those which expressly survive any such termination.

(b) Buyer Does Not Elect to Terminate. If Buyer elects to proceed with the purchase or fails to give Seller notice within such 5 Business Day period that Buyer elects to terminate this Agreement, or Buyer is not entitled to terminate this Agreement

because the condemnation or taking is not a Material Condemnation, then this Agreement shall remain in full force and effect.

12.3 Awards and Proceeds.

(a) Credit. Upon the Closing, if Buyer is not entitled to or elects not to terminate this Agreement pursuant to Section 12.1 and Section 12.2 above, there shall be a credit against the Purchase Price due hereunder equal to the amount of any insurance proceeds or condemnation awards collected by Seller as a result of any such damage or condemnation, plus the amount of any insurance deductible, less any reasonable sums expended by Seller toward the collection of such proceeds or awards or to restoration or repair of the Property (the nature of which restoration or repairs, but not the right of Seller to effect such restoration or repairs, shall be subject to the approval of Buyer, which approval shall not be unreasonably withheld, conditioned or delayed).

(b) Assignment. If the proceeds or awards have not been collected as of the Closing, then such proceeds or awards shall be assigned to Buyer, except to the extent needed to reimburse Seller for any reasonable sums expended to collect such proceeds or awards or to repair or restore the Property.

13. Assignment.

13.1 Assignment by Buyer. This Agreement is not assignable by Buyer without first obtaining the prior written approval of Seller (not to be unreasonably withheld, conditioned or delayed), except that Buyer may assign this Agreement without the prior written approval of Seller to (i) an Affiliate of Buyer; or (ii) any firm, partnership, corporation or other entity in which Buyer and/or one or more Affiliates of Buyer have a direct or indirect ownership interest. For the purposes of this paragraph, "Affiliate" means a person or entity who, directly or indirectly through one or more intermediaries, owns or controls, is owned or controlled by or is under common control or ownership with the person or entity in question. Buyer shall provide written notice to Seller of any proposed assignment as permitted hereunder no later than 5 days prior to the Closing Date, together with a copy of the relevant assignment documentation (provided that Seller acknowledges that such assignment may not be rendered effective until the Closing Date). Such assignment shall not relieve Buyer of any obligations or liability arising out of or related to this Agreement unless and until Closing occurs.

13.2 Assignment by Seller. From and after the Contract Date, Seller shall not, without the prior written consent of Buyer, which consent Buyer may withhold in its sole discretion, assign, transfer, convey, hypothecate or otherwise dispose of all or any part of its right, title and interest in the Property.

14. Buyer's Representation and Warranty. Buyer does hereby represent and warrant to Seller that (a) it is duly organized, validly existing and in good standing under the laws of the

State of its formation; (b) it has all requisite authorizations to enter into this Agreement with Seller and to consummate the transactions contemplated hereby; (c) the parties executing this Agreement on behalf of Buyer are duly authorized to so do; and (d) neither Buyer nor, to Buyer's actual knowledge, any individual having a beneficial interest in Buyer is a Person described by Section 1 of the Executive Order (No. 13224) Blocking Property and Prohibiting Transactions with Persons Who Commit, Threaten to Commit, or Support Terrorism, 66 Fed. Reg. 49079 (September 25, 2001), and does not engage in any dealings or transactions, and is not otherwise associated with any such Persons. It shall be a condition precedent to Seller's performance hereunder that the foregoing representations and warranties shall remain true and accurate in all material respects at the time of Closing.

15. Broker and Broker's Commission.

15.1 Commission. Seller shall pay to Broker a commission for this transaction pursuant to a separate commission agreement. Broker shall only be entitled to such commission if and when the transaction contemplated herein actually closes. Buyer shall have no responsibility for payment of any such commissions.

15.2 Indemnity. Buyer and Seller each warrant and represent to the other that, with the exception of Broker, such party has not and will not employ a real estate broker or agent in connection with the transaction contemplated hereby. Each party agrees to indemnify and hold the other harmless from any loss or cost suffered or incurred by it as a result of the other's representation herein being untrue. The provisions of this Section 15.2 shall survive the termination of this Agreement and the delivery of the Deed.

16. Notices.

16.1 Form of Notice. Wherever any notice or other communication is required or permitted hereunder, such notice or other communication shall be in writing and shall be delivered by (a) hand, (b) nationally-recognized overnight express delivery service, or (c) e-mail of a letter in "pdf" format (provided that if the receiving Party has not acknowledged receipt thereof within one (1) Business Day after such delivery (which acknowledgement may be given by such party or its counsel via a "read receipt" or response via electronic mail), then the delivering party shall send a copy of such notice via method (a) or (b) above) to the addresses set out below or at such other addresses as are specified by written notice delivered in accordance herewith:

SELLER:

c/o Condyne Capital Partners, LLC
100 Grandview Drive, Suite 312
Braintree, MA 02184
Attn: Jeffrey C. O'Neill
Telephone: 781-552-4202
E-mail: joneill@condyne.com

With a copy to:

Nutter, McClennen & Fish LLP
155 Seaport Boulevard
Boston, MA 02210-2604
Attn: Wendy M. Fiscus, Esq.
Telephone: 617-439-2858
E-mail: wfiscus@nutter.com

BUYER:

c/o Wood Partners
91 Hartwell Avenue
Lexington, Massachusetts 02421
Attention: Jim Lambert
Phone No.: (781) 541-5822
Email: Jim.Lambert@woodpartners.com

With copies to:

c/o Wood Partners
636 W. Yale Street
Orlando, Florida 32804
Attention: Sean Reynolds
Telephone: (407) 982-2517
E-mail: sean.reynolds@woodpartners.com

And

Alston & Bird LLP
One Atlantic Center
1201 W. Peachtree Street
Atlanta, Georgia 30309
Attention: Drew Allen
Telephone: (404) 881-4522
E-mail: drew.allen@alston.com

16.2 Notice Received. Any notice or other communication sent as hereinabove provided shall be deemed received: (a) on the date of delivery, if delivered by hand or overnight express delivery service; or (b) on the date of transmission, if

sent by electronic transfer device (provided that if the receiving Party did not acknowledge receipt thereof within one (1) Business Day after such delivery, then the delivering Party sent a copy of such notice via method (a) or (b) described in Section 16.1 above).

17. Governing Law. This Agreement shall be construed and interpreted under the laws of the State or Commonwealth in which the Land is located, without regard to any conflict of law principles that may call for the application of the laws of any other jurisdiction.

18. Construction. The parties agree that this Agreement is the result of negotiation by the parties, each of whom was represented by counsel, and thus, this Agreement shall not be construed against the maker thereof.

19. No Waiver. Neither the failure of either party to exercise any power given such party hereunder or to insist upon strict compliance by the other party with its obligations hereunder, nor any custom or practice of the parties at variance with the terms hereof shall constitute a waiver of either party's right to demand exact compliance with the terms hereof.

20. Entire Agreement. This Agreement and the documents incorporated herein by reference contain the entire agreement of the parties hereto with respect to the Property, and no representations, inducements, promises or agreements, oral or otherwise, between the parties not embodied herein or incorporated herein by reference shall be of any force or effect.

21. Binding Effect. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective heirs, executors, administrators, legal representatives, successors and assigns.

22. Amendments. No amendment to this Agreement shall be binding on any of the parties hereto unless such amendment is in writing and is executed by the party against whom enforcement of such amendment is sought.

23. Possession. Possession of the Property shall be granted by Seller to Buyer no later than the Closing Date, subject to the Permitted Title Exceptions and the right/obligation of Seller to complete the Demolition Work, if applicable.

24. Date For Performance. If the time period or date by which any right, option or election provided under this Agreement must be exercised, or by which any act required hereunder must be performed, or by which the Closing must be held, expires on any day other than a Business Day, then such time period shall be automatically extended through 5:00 p.m. Bolton, Massachusetts time on the next Business Day.

25. Recording. Seller and Buyer agree that, they will not record this Agreement. Notwithstanding the foregoing, simultaneously with the execution of this Agreement, Seller shall execute and deliver to Buyer a short form memorandum of this Agreement in the form attached hereto as Exhibit H (the "**Memorandum of Contract**"), which Buyer

may countersign and record at any time after the Seller has obtained the Subdivision Approval; *provided, however*, that if Seller has not obtained the Subdivision Approvals by the Subdivision Deadline and Buyer waives its right to terminate this Agreement in accordance with Section 6.3, Buyer may countersign and record the Memorandum of Contract on the entirety of the Parent Parcel, but agrees to file any amendments or modifications thereto once the Subdivision Approvals are obtained so as to contain the Memorandum of Contract to the Land only. In the event this Agreement is terminated by either party pursuant to the terms hereof following the recording of the Memorandum of Contract, Buyer agrees that Buyer shall cause a termination of the Memorandum of Contract to be recorded within 10 days of such termination. Buyer agrees to indemnify and hold Seller harmless for all loss, cost and/or damage, including reasonable attorney's fees, incurred by Seller as a result of Buyer's failure to timely record a termination of the Memorandum of Contract. The terms and provisions of this Section shall survive the termination of this Agreement.

26. Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original, but all of which, when taken together, shall constitute but one and the same instrument. This Agreement may be executed electronically (e.g., via DocuSign) and delivered by electronic mail transmission (via .pdf or similar format). An executed copy of this Agreement delivered by electronic mail transmission (via a .pdf or similar format) shall be deemed to be an original counterpart hereof for all purposes.

27. Severability. If any term or provision of this Agreement or the application thereof to any person or circumstance shall for any reason and to any extent be held to be invalid or unenforceable, then such term or provision shall be ignored, and to the maximum extent possible, this Agreement shall continue in full force and effect, but without giving effect to such term or provision.

28. Listings and Other Offers. During the pendency of this Agreement, Seller shall not list the Property with any broker (other than Broker pursuant to the current listing) or otherwise solicit or make or accept any offers to sell the Property, engage in any discussions or negotiations with any third party with respect to the sale or other disposition of the Property, or enter into any contracts or agreements (whether binding or not) regarding any disposition of the Property.

29. Survival. No representations, warranties, covenants or agreements of Seller or Buyer contained herein shall survive the Closing or the earlier termination of this Agreement, except as expressly provided in this Agreement.

30. COVID-19. Notwithstanding anything in this Agreement to the contrary, the deadlines specified this Agreement (including, without limitation, the Entitlements Date and the Closing Date) shall be extended (subject to the terms and conditions of this Section) as is reasonably necessary, in the event either party hereto is prevented from, or delayed in, performing any material obligation hereunder (including Buyer's obligation to use diligent efforts to obtain the Development Approvals) as a direct result of any event occurring beyond the reasonable control of such party related to the coronavirus disease

(COVID-19) ("**COVID-19**"), including, without limitation, an epidemic, a pandemic, the spread of COVID-19 or any related illness, any state of emergency, any governmental restrictions (including the suspension of postal or other services), and any delays in obtaining any necessary governmental approvals or permits beyond normal process times, regardless of whether the same was known by the party asserting such delay on or before the Contract Date (each a "**COVID-19 Delay**"). For purposes of clarity, COVID-19 Delays shall include delays caused by third parties (including, without limitation, Escrow Agent and government agencies), but do not include changes in economic or market conditions (including, without limitation, the unavailability of debt or equity). Without limiting the generality of the foregoing, the following circumstances shall constitute COVID-19 Delays: (i) the inability of Buyer, Escrow Agent, Buyer's lender(s) (if any), or Buyer's equity partner(s) (if any) to initiate or receive wire transfers, (ii) the closure of the clerk of county courts or other agencies necessary to record any closing documents (unless e-recording remains available), and (iii) the Title Insurer's unwillingness to issue a title insurance policy for the Property at the Closing that meets the requirements set forth in Section 7.5(b) (including, insuring over any "gap period") for any reason other than Buyer's failure to pay the title insurance premium.

In the event either party hereto asserts a COVID-19 Delay, such party shall provide written notice thereof (each a "**COVID-19 Notice**") to the other, which notice shall include a reasonable description and, if possible, estimated duration of the asserted COVID-19 Delay; provided, however, in no event shall a COVID-19 Delay operate to extend any deadline hereunder for more than 30 days in each individual instance.

Notwithstanding the foregoing, in no event shall a COVID-19 Delay operate to extend Seller's obligation to comply with the Seller's Cessation Covenant prior to the Closing Date.

[signatures on following page]

IN WITNESS WHEREOF, each of the parties hereto has caused this Agreement to be executed by its authorized signatory, effective as of Contract Date.

SELLER:

BOLTON OFFICE PARK LLC, a Massachusetts limited liability company

By: Condyne Investment Partners Bolton, LLC, a Massachusetts limited liability company, its manager

By: Bolton Investment Partners, LLC, a Massachusetts limited liability company, its sole member & sole manager

By: Condyne LLC, a Massachusetts limited liability company, its sole member

By: _____
Name:
Title: Manager

BUYER:

WP EAST ACQUISITIONS, L.L.C., a Georgia limited liability company

_____
Name:
Title:

IN WITNESS WHEREOF, each of the parties hereto has caused this Agreement to be executed by its authorized signatory, effective as of Contract Date.

SELLER:

BOLTON OFFICE PARK LLC, a Massachusetts limited liability company

By: Condyne Investment Partners Bolton, LLC, a Massachusetts limited liability company, its manager

By: Bolton Investment Partners, LLC, a Massachusetts limited liability company, its sole member & sole manager

By: Condyne LLC, a Massachusetts limited liability company, its sole member

By:_____
Name:
Title: Manager

BUYER:

WP EAST ACQUISITIONS, L.L.C., a Georgia limited liability company

Name: James Lambert
Title: Vice President

APPLICANT DETAILS & FINANCIAL INFORMATION

CERTIFIED ABUTTER'S LIST

Pd ck# 890
9/9/2021

TOWN OF BOLTON
ASSESSORS OFFICE
TOWN HALL
663 MAIN STREET
BOLTON, MASSACHUSETTS 01740
PHONE (978) 779-5556 FAX (978) 779-5461

Date of Application September 7, 2021

REQUEST FOR LIST OF ABUTTERS

Effective August 24, 2004, anyone requesting a list of abutters must give at least three (3) working days notice. This notice will allow the Assessors Office sufficient time necessary to prepare the list of Abutters.

Effective July 1, 2004, the fee schedule is $15 per certified abutters list.

**Please note that these fees apply to preparation of new list or verification or reverification of an existing list.*

Please indicate with a check

_____ **Immediate Abutters (Board of Selectmen)**

X **Board of Appeals, Planning Board, Site Plan review - within 300 feet**

_____ **Conservation Commission within 100 feet or distance = _____ feet**

_____ **Planning Board for sub division – 500 feet**

_____ **Abutter to Abutter within distance of_____ feet**

Map _____ **Parcel(s)** 004.C-0000-0024.0

Allen & Major Associates, Inc. (on behalf of Bolton Office Park LLC). — Applicant (please print)

580 Main Street — Location of Property

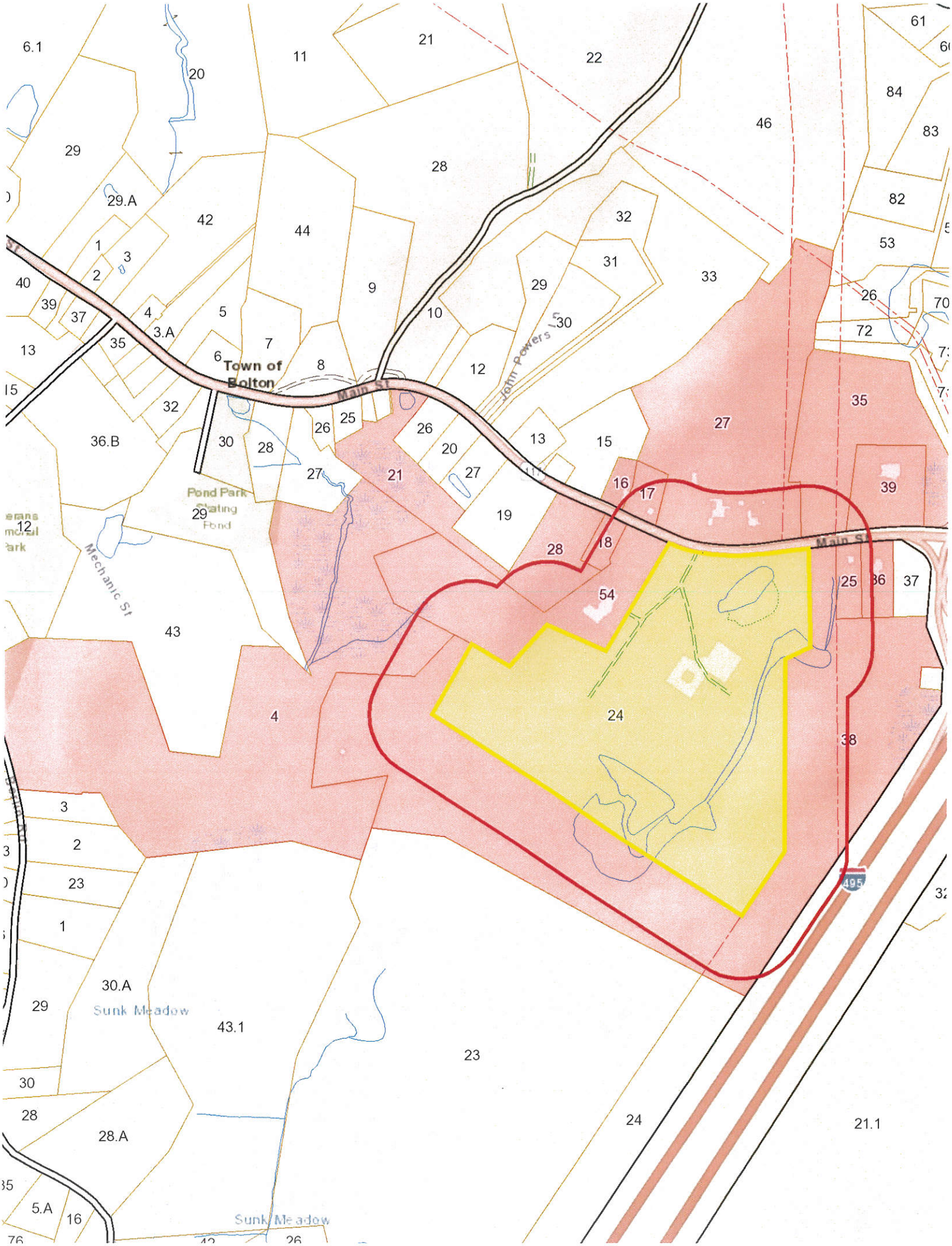
(for LANDOWNER)
Signature of Applicant

(A&M) 10 Main Street, Lakeville, MA — Mailing Address of Applicant

(508) 923-1010 — Telephone Number

(___)_____ — FAX Number

PLEASE NOTE: THIS ABUTTERS LIST IS VALID FOR SIX MONTHS


Town of Bolton
Main St
Main St
John Powers Ln
Pond Park
Skating Pond
Mechanic St
Sunk Meadow
Sunk Meadow
495

300 foot Abutters List Report

Bolton, MA
September 07, 2021

Subject Property:

Parcel Number:	004.C-0000-0024.0	Mailing Address:	BOLTON OFFICE PARK LLC 100 GRANDVIEW RD, STE 312 BRAINTREE, MA 02184
CAMA Number:	004.C-0000-0024.0		
Property Address:	580 MAIN ST		

Abutters:

Parcel Number:	002.0-0000-0016.0	Mailing Address:	HASTIE MARISA 607 MAIN ST BOLTON, MA 01740
CAMA Number:	002.0-0000-0016.0		
Property Address:	607 MAIN ST		
Parcel Number:	002.0-0000-0017.0	Mailing Address:	NICHOLS ROBERT A TR 601-603 MAIN ST REALTY TRUST 50 HOPKINTON RD WESTBORO, MA 01581-104
CAMA Number:	002.0-0000-0017.0		
Property Address:	601 MAIN ST		
Parcel Number:	002.0-0000-0018.0	Mailing Address:	BICKFORD KAREN & JOHN 10 WILDER RD BOLTON, MA 01740
CAMA Number:	002.0-0000-0018.0		
Property Address:	608 MAIN ST		
Parcel Number:	002.0-0000-0021.0	Mailing Address:	ROUFAIL NABIL, TR, HARES REALTY TR 7 DEER RUN CHARLTON, MA 01507
CAMA Number:	002.0-0000-0021.0		
Property Address:	0 MAIN ST		
Parcel Number:	002.0-0000-0028.0	Mailing Address:	ROUFAIL NABIL, TR, HARES REALTY TR 7 DEER RUN CHARLTON, MA 01507
CAMA Number:	002.0-0000-0028.0		
Property Address:	0 MAIN ST		
Parcel Number:	004.C-0000-0004.0	Mailing Address:	TOWN OF BOLTON DERBY PURCHASE & SAWYER 1967 663 MAIN ST BOLTON, MA 01740
CAMA Number:	004.C-0000-0004.0		
Property Address:	0 BERLIN RD		
Parcel Number:	004.C-0000-0025.0	Mailing Address:	WACHUSETT REALTY LLC 200 CHURCH ST CLINTON, MA 01510
CAMA Number:	004.C-0000-0025.0		
Property Address:	562 MAIN ST		
Parcel Number:	004.C-0000-0027.0	Mailing Address:	BOLTON PROPERTY MANAGEMENT LLC 579 MAIN ST BOLTON, MA 01740
CAMA Number:	004.C-0000-0027.0		
Property Address:	579 MAIN ST		
Parcel Number:	004.C-0000-0035.0	Mailing Address:	FREIDUS FREDERIC J TR 563 MAIN STREET RTY TR 138 WATTAQUADOCK HILL RD BOLTON, MA 01740
CAMA Number:	004.C-0000-0035.0		
Property Address:	0 MAIN ST		
Parcel Number:	004.C-0000-0036.0	Mailing Address:	CAVINESS ALAN R TR FIVE FIFTY SIX GREAT RD RTY TR 556 MAIN ST BOLTON, MA 01740
CAMA Number:	004.C-0000-0036.0		
Property Address:	556 MAIN ST		

300 foot Abutters List Report

Bolton, MA
September 07, 2021

Parcel Number:	004.C-0000-0038.0	Mailing Address:	TOWN OF BOLTON FLATLEY FIELD & CELLONE P O BOX 278 BOLTON, MA 01740
CAMA Number:	004.C-0000-0038.0		
Property Address:	0 MAIN ST		
Parcel Number:	004.C-0000-0039.0	Mailing Address:	SWAND LLC 563 MAIN ST BOLTON, MA 01740
CAMA Number:	004.C-0000-0039.0		
Property Address:	563 MAIN ST		
Parcel Number:	004.C-0000-0054.0	Mailing Address:	BOLTON SENIOR HOUSING CORP 663 MAIN ST BOLTON, MA 01740
CAMA Number:	004.C-0000-0054.0		
Property Address:	600 MAIN ST		

As set forth in the Assessor's records as of January 1, 2021.

Kelly Garlock
Assistant Assessor

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BICKFORD KAREN & JOHN
10 WILDER RD
BOLTON, MA 01740

BOLTON PROPERTY MANAGEMEN
579 MAIN ST
BOLTON, MA 01740

BOLTON SENIOR HOUSING COR
663 MAIN ST
BOLTON, MA 01740

CAVINESS ALAN R TR
FIVE FIFTY SIX GREAT RD R
556 MAIN ST
BOLTON, MA 01740

FREIDUS FREDERIC J TR
563 MAIN STREET RTY TR
138 WATTAQUADOCK HILL RD
BOLTON, MA 01740

HASTIE MARISA
607 MAIN ST
BOLTON, MA 01740

NICHOLS ROBERT A TR
601-603 MAIN ST REALTY TR
50 HOPKINTON RD
WESTBORO, MA 01581-104

ROUFAIL NABIL, TR, HARES
7 DEER RUN
CHARLTON, MA 01507

ROUFAIL NABIL, TR, HARES
7 DEER RUN
CHARLTON, MA 01507

SWAND LLC
563 MAIN ST
BOLTON, MA 01740

TOWN OF BOLTON
FLATLEY FIELD & CELLONE
P O BOX 278
BOLTON, MA 01740

TOWN OF BOLTON
DERBY PURCHASE & SAWYER 1
663 MAIN ST
BOLTON, MA 01740

WACHUSETT REALTY LLC
200 CHURCH ST
CLINTON, MA 01510

Pat: avery.com/patents

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BICKFORD KAREN & JOHN
10 WILDER RD
BOLTON, MA 01740

BOLTON PROPERTY MANAGEMEN
579 MAIN ST
BOLTON, MA 01740

BOLTON SENIOR HOUSING COR
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BOLTON, MA 01740

TOWN OF BOLTON
DERBY PURCHASE & SAWYER 1
663 MAIN ST
BOLTON, MA 01740

WACHUSETT REALTY LLC
200 CHURCH ST
CLINTON, MA 01510

APPENDIX B WETLAND REPORT

Feb 2, 2021

Allen and Major Assoc
10 Main St
Lakeville, MA 02347

Re: Wetland Border Report
Bolton, 580 Main St

Dear Allen and Major:

During the month of January 2021 during no snow and un-frozen ground conditions, the wetland resources were delineated on land located at the above referenced site. The wetland border was flagged using the criteria in the most recent edition of MA Wetland Protection Act (WPA) and Regulations 310 CMR 10.00 et al and the local Wetland Protection Bylaw. Hydric soil indicators, vegetation changes, hydrological indicators, and topography were all considered for delineation purposes.

The Mean Annual High Water (MAHW) of a perennial stream and Bordering Vegetated Wetland (BVW) was delineated on site. The BVW associated with the river was delineated with series GC1-108 (west side), GC200-264 (east side), and D1-25 (a regulated, vegetated storm-basin created prior to 1996 which appears to be constructed in a possible wetland area and currently hydrologically connected to the BVW areas on-site via culverts). These BVW resources consists of red maple, dogwood, loosestrife, spirea, buckthorn, alder, phragmites, wetland ferns and poison ivy. Department of Environmental Protection BVW field data forms were documented at wetland flag # GC22 and 70 (see attached forms).

Another area of BVW with an interior intermittent stream was flagged with series A1-45. This is a wet meadow and forested wetland located in the southwestern portion of the site. This wetland is vegetated with ferns, loosestrife, alder, red maple, sedges, rushes, poison ivy and spirea.

Two other wetland areas near the existing buildings were flagged with series C1-11 and B1-14. The wetland flagged with series "B" is located with maintained lawn and spills into an adjacent wet forested area. The part of this wetland located within lawn (which is vegetated with 100% wetland indicator species and has hydric soils) is part of a stormwater management system, which appears to be built within upland prior to 1996 (according to historical aerial photographs). This wetland "B" series is jurisdictional under the local bylaw however would only be jurisdictional under the MA Wetlands Protection

act if the corresponding stormwater culvert was hydrologically connected to the wetland system flagged with series "GC".

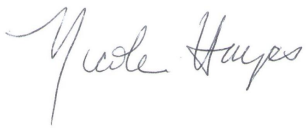
Wetland series "C" also appears to be part of a stormwater management system. Currently this wetland is not hydrologically connected to series "B" due to an upland divide. Since this area also has culverts associated with it, the hydrological connection of this wetland needs to be determined; to determine state jurisdiction. This wetland area "C" would also be under local jurisdiction according to the bylaw. Both of these wetland systems are vegetated with cattail, red maple, alder, loosestrife, sedges, rushes, spirea and wetland ferns.

The northern portion of MAHW of the river (which corresponds with the top of Bank) was flagged with series MAHW 1-13 (west side) and MAHW 100-119 (east side). This reach of the river is approximately 6-15 feet wide with 6-18-inch banks vegetated with maple, buckthorn and wetland ferns. Upland located upgradient of the MAHW line was vegetated in knotweed, oak, white pine, honeysuckle, and rose. The southern portion of the riverfront area was not delineated in the field since the river has over topped its clearly defined banks into the adjacent wetland due to beaver activity. The current extent of flooding within this area of the BVW is not consistent with the annual high water and therefore the centerline of the stream via the USGS/GIS should be used in this area of the site to determine the 200-ft riverfront area.

According to the Mass GIS data layers for NHESP, this site is not located within Estimated and/or Priority Habitat of Rare Wildlife and has no mapped vernal pools. The site is not located in an ACEC; however, a portion of the site is located within a jurisdictional FEMA Flood Zone so that the resource area Bordering Land Subject to Flooding (BLSF) is located from the wetland/bank line up to the 100-year FEMA flood elevation. The FEMA flood map for this area is located within map 25027C0486F and has the AE listed from elevation 336 to 359 (see attached map).

The local Wetland Protection Bylaw and the MA Wetlands Protection Act takes jurisdiction over BVW, BLSF and the 200-ft Riverfront Area resources. In addition, the local bylaw takes jurisdiction over isolated wetlands. The BVW and IVW resource areas have a state /local jurisdictional 100-foot Buffer Zone. Any work within the resource areas and/or 100-foot buffer zone requires a Request for Determination (RDA) or Notice of Intent (NOI) be filed with the Conservation Commission.

Goddard Consulting, LLC.



Nicole Hayes, PWS
Senior Wetland Scientist

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: **Allen and Major** Prepared by: **Goddard Consulting LLC** Project location: **580 Main St, bolton** DEP File #: _____

Check all that apply:
- [ ] Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- [x] Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- [ ] Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: **GC-22** Transect Number: **Upgradient** Date of Delineation: **7-Jan-21**

Sample Layer and Plant Species	Scientific name	% Cover	% Dominance	Dominant Plant (yes or no)	Wetland Indicator Category*
Tree Layer					
White Pine	*Pinus strobus*	20%	50.0%	Yes	FACU
Red oak	*Quercus rubra*	20%	50.0%	Yes	FACU
Sapling Layer					
Shrub Layer					
Honeysuckle	*Lonicera sp.*	36%	64.3%	Yes	FACU
Rambler rose	*Rosa multiflora*	20%	35.7%	Yes	FACU
Climbing Woody Vine					
American bittersweet	*Celastrus scandens*	10%	100.0%	Yes	FACU
Ground Cover					
Goldenrod	*Solidago sp.*	10%	100.0%	Yes	NI

Remarks: * An asterisk after common plant name indicates stunted growth; ** indicates extremely stunted growth

Morphological Adaptations: 0 **Description:**

* An asterisk after indicator status denotes wetlands plants: plants listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; or plants listed as FAC, FACW, or OBL.

Vegetation conclusion:

Number of dominant wetland indicator plants: 0 **Number of dominant non-wetland indicator plants: 6**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? no

If vegetation alone is presumes adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent.

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? ☑ yes ☐ no

title/date: **Soil Survey of Worcester County, Northeastern Part - 1985**

map number:

soil type mapped: **Udorthents**

hydric soil inclusions:

Are field observations consistent with soil survey? ☑ yes ☐ no

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottles Color or Texture
A	0-10"	10YR2/2	
B	10-20"	10YR5/4	

Remarks:

3. Other:

Conclusion: Is soil hydric? ☐ yes ☑ no

Other Indicators of Hydrology: (check all that apply and describe)

- ☐ Site inundated:
- ☐ Depth to free water in observation hole:
- ☐ Depth to soil saturation in observation hole:
- ☐ Water marks:
- ☐ Drift Lines:
- ☐ Sediment deposits:
- ☐ Drainage patterns in BVW:
- ☐ Oxidized rhizoshperes:
- ☐ Water-stained leaves:
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion for Upgradient of GC-22

	yes	no
Number of wetland indicator plants >= number of non-wetland plants		X
Wetland hydrology present:		
hydric soils present		X
other indicators of hydrology present		X
Sample location is in a BVW		X

Submit this form with the Request for Determination of Applicability or Notice of Intent

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: **Allen and Major** Prepared by: **Goddard Consulting LLC** Project location: **580 Main St, bolton** DEP File #: _____

Check all that apply:
- [ ] Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- [x] Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- [ ] Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: **GC-22** Transect Number: **Downgradient** Date of Delineation: **7-Jan-21**

Sample Layer and Plant Species	Scientific name	% Cover	% Dominance	Dominant Plant (yes or no)	Wetland Indicator Category*
Tree Layer					
Red maple	*Acer rubrum*	36%	100.0%	Yes	FAC*
Sapling Layer					
Speckled alder	*Alnus incana*	10%	50.0%	Yes	FACW*
Red Maple	*Acer rubrum*	10%	50.0%	Yes	FAC*
Shrub Layer					
Silky Dogwood	*Cornus amomum*	63%	75.9%	Yes	FACW*
European buckthorn	*Frangula alnus*	20%	24.1%	Yes	FAC*
Climbing Woody Vine					
Ground Cover					
Eastern poison ivy	*Toxicodendron radicans*	10%	33.3%	Yes	FAC*
Sensitive fern	*Onoclea sensibilis*	20%	66.7%	Yes	FACW*

Remarks: * An asterisk after common plant name indicates stunted growth; ** indicates extremely stunted growth

Morphological Adaptations: 0 **Description:**

* An asterisk after indicator status denotes wetlands plants: plants listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; or plants listed as FAC, FACW, or OBL.

Vegetation conclusion:

Number of dominant wetland indicator plants: 7 **Number of dominant non-wetland indicator plants: 0**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? yes

If vegetation alone is presumes adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent.

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? ☑ yes ☐ no

title/date: **Soil Survey of Worcester County, Northeastern Part - 1985**

map number:

soil type mapped: **Udorthents**

hydric soil inclusions: **None listed**

Are field observations consistent with soil survey? ☐ yes ☑ no

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottles Color or Texture
O	0-12"	10YR2/1	
C	12-20	10YR6/1	

Remarks:

3. Other:

Conclusion: Is soil hydric? ☑ yes ☐ no

Other Indicators of Hydrology: (check all that apply and describe)

- ☐ Site inundated:
- ☐ Depth to free water in observation hole:
- ☐ Depth to soil saturation in observation hole:
- ☐ Water marks:
- ☐ Drift Lines:
- ☐ Sediment deposits:
- ☑ Drainage patterns in BVW:
- ☑ Oxidized rhizoshperes:
- ☑ Water-stained leaves:
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion for Downgradient of GC-22

	yes	no
Number of wetland indicator plants >= number of non-wetland plants	X	
Wetland hydrology present:		
hydric soils present	X	
other indicators of hydrology present	X	
Sample location is in a BVW	X	

Submit this form with the Request for Determination of Applicability or Notice of Intent

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: **Allen and Major** Prepared by: **Goddard Consulting LLC** Project location: **580 Main St, bolton** DEP File #: _____

Check all that apply:
- [ ] Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- [x] Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- [ ] Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: **GC-70** Transect Number: **Upgradient** Date of Delineation: **7-Jan-21**

Sample Layer and Plant Species	Scientific name	% Cover	% Dominance	Dominant Plant (yes or no)	Wetland Indicator Category*
Tree Layer					
White Pine	*Pinus strobus*	10%	100.0%	Yes	FACU
Sapling Layer					
Crabapple	*Pyrus sp.*	10%	100.0%	Yes	UPL
Shrub Layer					
Honeysuckle	*Lonicera sp.*	36%	100.0%	Yes	FACU
Climbing Woody Vine					
American bittersweet	*Celastrus scandens*	3%	100.0%	Yes	FACU
Ground Cover					
Goldenrod	*Solidago sp.*	20%	100.0%	Yes	NI

Remarks: * An asterisk after common plant name indicates stunted growth; ** indicates extremely stunted growth

Morphological Adaptations: 0 **Description:**

* An asterisk after indicator status denotes wetlands plants: plants listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; or plants listed as FAC, FACW, or OBL.

Vegetation conclusion:

Number of dominant wetland indicator plants: 0 **Number of dominant non-wetland indicator plants: 5**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? no

If vegetation alone is presumes adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent.

DEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: **Allen and Major** Prepared by: **Goddard Consulting LLC** Project location: **580 Main St, bolton** DEP File #: _____

Check all that apply:
- [ ] Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- [x] Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- [ ] Method other than dominance test used (attach additional information)

Section I. Vegetation Observation Plot Number: **GC-70** Transect Number: **Downgradient** Date of Delineation: **7-Jan-21**

Sample Layer and Plant Species	Scientific name	% Cover	% Dominance	Dominant Plant (yes or no)	Wetland Indicator Category*
Tree Layer					
Willow	*Salix sp.*	20%	100.0%	Yes	FACW*
Sapling Layer					
Red Maple	*Acer rubrum*	10%	100.0%	Yes	FAC*
Shrub Layer					
European buckthorn	*Frangula alnus*	20%	100.0%	Yes	FAC*
Climbing Woody Vine					
Ground Cover					
Cattail	*Typha latifolia*	20%	26.3%	Yes	OBL*
Eastern poison ivy	*Toxicodendron radicans*	20%	26.3%	Yes	FAC*
Sensitive fern	*Onoclea sensibilis*	36%	47.4%	Yes	FACW*

Remarks: * An asterisk after common plant name indicates stunted growth; ** indicates extremely stunted growth

Morphological Adaptations: 0 **Description:**

* An asterisk after indicator status denotes wetlands plants: plants listed in the Wetlands Protection Act (MGL c.131, s.40); plants in the genus Sphagnum; or plants listed as FAC, FACW, or OBL.

Vegetation conclusion:

Number of dominant wetland indicator plants: 6 **Number of dominant non-wetland indicator plants: 0**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? yes

If vegetation alone is presumes adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent.

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? ☑ yes ☐ no

title/date: **Soil Survey of Worcester County, Northeastern Part - 1985**

map number:

soil type mapped: **Udorthents**

hydric soil inclusions:

Are field observations consistent with soil survey? ☑ yes ☐ no

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottles Color or Texture
A	0-8"	10YR2/2	
B	8-18"	10YR5/4	

Remarks:

3. Other:

Conclusion: Is soil hydric? ☐ yes ☑ no

Other Indicators of Hydrology: (check all that apply and describe)

- ☐ Site inundated:
- ☐ Depth to free water in observation hole:
- ☐ Depth to soil saturation in observation hole:
- ☐ Water marks:
- ☐ Drift Lines:
- ☐ Sediment deposits:
- ☐ Drainage patterns in BVW:
- ☐ Oxidized rhizoshperes:
- ☐ Water-stained leaves:
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion for Upgradient of GC-70

	yes	no
Number of wetland indicator plants >= number of non-wetland plants		**X**
Wetland hydrology present:		
hydric soils present		**X**
other indicators of hydrology present		**X**
Sample location is in a BVW		**X**

Submit this form with the Request for Determination of Applicability or Notice of Intent

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? ☑ yes ☐ no

title/date: **Soil Survey of Worcester County, Northeastern Part - 1985**

map number:

soil type mapped: **Udorthents**

hydric soil inclusions: **None listed**

Are field observations consistent with soil survey? ☐ yes ☑ no

Remarks:

2. Soil Description

Horizon	Depth (inches)	Matrix Color	Mottles Color or Texture
O	0-10"	10YR2/1	
C	10-19	10YR6/1	

Remarks:

3. Other:

Conclusion: Is soil hydric? ☑ yes ☐ no

Other Indicators of Hydrology: (check all that apply and describe)

- ☐ Site inundated:
- ☐ Depth to free water in observation hole:
- ☐ Depth to soil saturation in observation hole:
- ☐ Water marks:
- ☐ Drift Lines:
- ☐ Sediment deposits:
- ☑ Drainage patterns in BVW:
- ☑ Oxidized rhizoshperes:
- ☑ Water-stained leaves:
- ☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):
- ☐ Other:

Vegetation and Hydrology Conclusion for Downgradient of GC-70

	yes	no
Number of wetland indicator plants >= number of non-wetland plants	X	
Wetland hydrology present:		
hydric soils present	X	
other indicators of hydrology present	X	
Sample location is in a BVW	X	

Submit this form with the Request for Determination of Applicability or Notice of Intent

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Massachusetts State Plane Mainland Zone (FIPS zone 2001). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from digital orthophotography. Basemap files were provided in digital form by Massachusetts Geographic Information System (MassGIS). Ortho imagery was produced at a scale of 1:5000 and is dated April 2008. The projection used in the preparation of this map is Massachusetts State Plane Mainland (FIPSZONE2001). The horizontal datum is NAD 83, GRS1980 spheroid.

The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

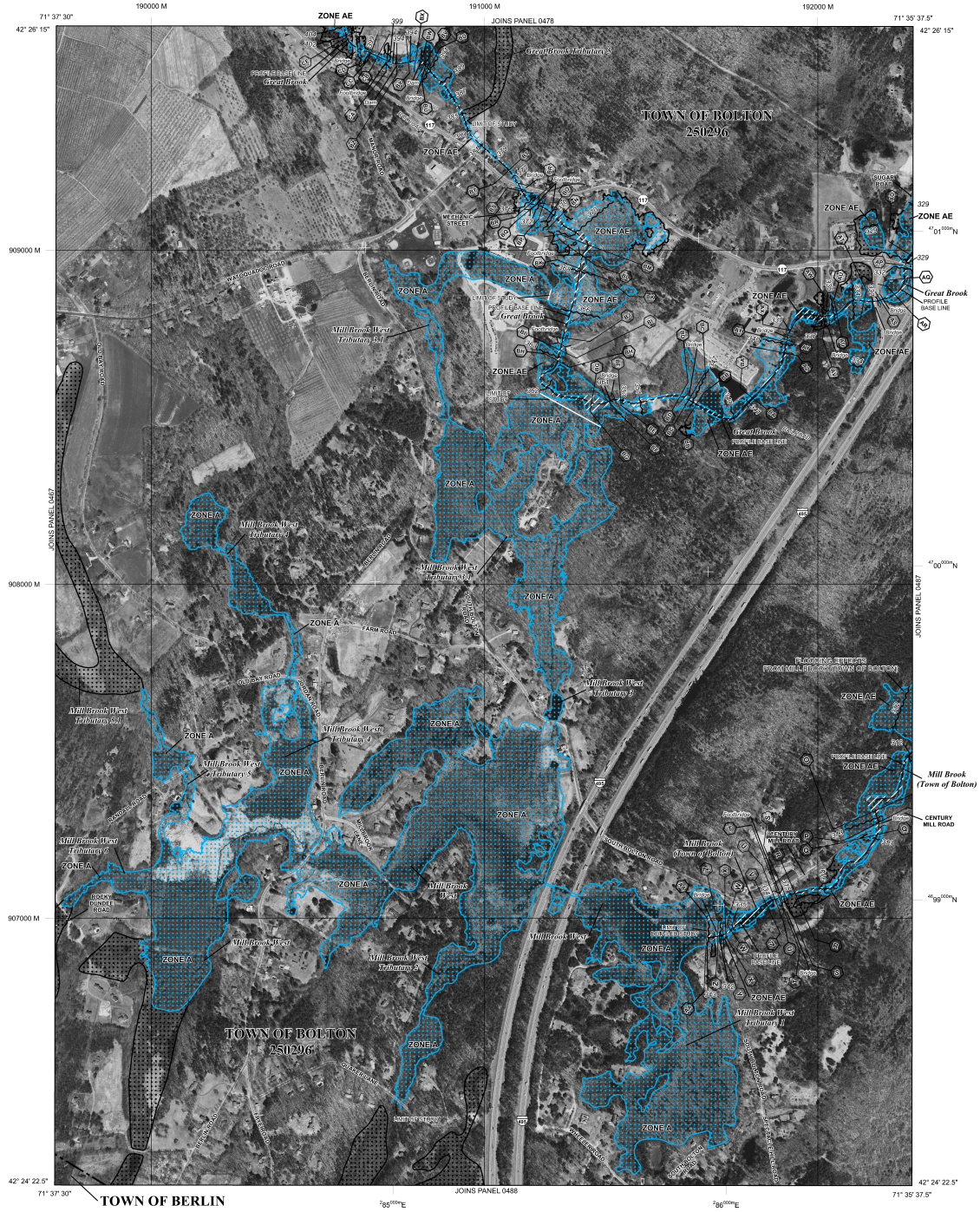
Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for multiple streams in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map,** how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities.

513*	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 - - - 23	Transect line
	Culvert
	Bridge
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
4989000 M	1000-meter grid values: Massachusetts State Plane Mainland Zone (FIPS Zone 2001), Lambert Conformal Conic projection
$^{49}89^{000m}$ N	1000-meter Universal Transverse Mercator grid ticks, Zone 19N
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
July 4, 2011

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
July 16, 2014 - to change Base Flood Elevations and Special Flood Hazard Areas, to change zone designations, to update corporate limits and to add roads and road names.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0486F

FIRM

FLOOD INSURANCE RATE MAP

WORCESTER COUNTY, MASSACHUSETTS (ALL JURISDICTIONS)

PANEL 486 OF 1075

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BERLIN, TOWN OF	250294	0486	F
BOLTON, TOWN OF	250296	0486	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
25027C0486F

MAP REVISED
JULY 16, 2014

Federal Emergency Management Agency

APPENDIX C WATER SUPPLY & WASTEWATER

Report

To: *Mr.* **David Moore, Wood Partners**

From: **Susan Hunnewell, PE**

David Formato, PE

CC:

Date: **October 1, 2021**

Re: ***580 Main Street, Bolton – Water Systems Summary***

In accordance with Task 1.2.7 of our Agreement, we have prepared this report to summarize the findings of the recent well explorations on site, provide updated water supply considerations, and to identify conceptual water system configuration and treatment requirements for the above referenced project. Overall this memo updates, as necessary, the information and recommendations detailed in our November 17, 2020 Water Supply Considerations Memorandum. Since that time, we have worked with Wood Partners and Allen & Major (A&M) to develop a conceptual plan that identifies the existing and proposed wells and associated Zone I and Interim Wellhead Protection Area (IWPA) requirements; conducted site visits to locate the new well in relation to various site features including proximity to bordering vegetated wetlands and other environmental resource areas; corresponded with the Bolton Board of Health, Nashoba Associated Boards of Health and MassDEP Drinking Water Program; and subcontracted with a Massachusetts Certified Well Driller for the installation of a new "test" well on site and collected and analyzed water quality samples from that new well. Our findings and recommendations with regard to the water systems anticipated for the project are identified herein:

Public Water Supply Considerations

As outlined in our November memorandum, the development of public groundwater sources in Massachusetts is governed by the Massachusetts Drinking Water Regulations (310 CMR 22.21) and the New Source Approval Process - a step-by-step exploratory procedure that culminates in MassDEP approval of a public water system (PWS). The process begins with the exploration of potential sources of groundwater, followed by Request for Site Exam/Pumping Test Proposal permitting (BRP WS 13), as well as Pump Testing and Source Final Report permitting (BRP WS 15), and concluding with approval of the Final Source and Public Water System. A primary consideration in the development of a new source is the ability to meet certain wellhead protection requirements associated with the Zone I and Interim Wellhead Protection Area (IWPA) or Zone II around the well.

- Zone I – The Zone I is defined as the protective radius required around a public water supply well. For wells with approved yields of less than 100,000 gpd the Zone I is proportional to the approved pumping rate of the well as determined by the following equation: Zone I radius in feet = (150 x $\log_{10}$ of pumping rate in gpd) – 350. Guidance on complying with Zone I ownership, control and protection requirements is included in 310 CMR 22.21 of the regulations and in Policy 94-03 of the Guidelines and Policies for Public Water Systems. In general, the regulations require that public water systems own or control the

Zone I around their wells and limit activities to those directly related to the provision of the water supply, or to activities that will have no significant adverse impact on drinking water quality. It should be noted that based on input received from MassDEP, water storage tanks are permissible in a Zone I.

- Interim Wellhead Protection Area (IWPA) – The IWPA or Zone II is considered to be the area which contributes water to a well under the most severe pumping and recharge conditions that can realistically be anticipated. For wells with approved pumping rates of less than 100,000 gpd, the IWPA radius is proportional to the approved pumping rate as determined by the following equation: IWPA radius (feet) = [(32 x pumping rate (gpm)) + 400]. When evaluating a proposed New Source (or expanded pumping rate of an existing source), MassDEP will consider land uses and zoning within the IWPA, as well as existing water withdrawals, existing and potential sources of contamination, and compliance with Nitrogen Loading Limitations (310 CMR 15.214). In general, the Nitrogen Loading Limitation requires that the IWPA around a source not intercept any large on-site septic systems or groundwater discharge system leaching fields permitted through the Groundwater Discharge Program (GWDP).

Existing Water Supply Sources

The Bolton Rt. 117 Office Park site is served by two existing public water supply sources (PWS #2034019 – 01G and 02G) as summarized below and on Table 1.

- Well 1 is located in the central portion of the site south of the existing parking lot area and approximately 110 feet west of an existing drainage/fire pond. Based on the original Pump Test Report as approved by MassDEP on July 15, 1985, this bedrock well is 175 feet deep and was pumped at a rate of 15 gpm (or 21,600 gpd). The MassDEP approvable yield for a bedrock well is 75% of the pump test rate or 16,200 gpd (11.25 gpm) and the associated Zone 1 and IWPA radii are 281 feet and 760 feet, respectively. The existing Zone I for this source is less than the approvable pumping rate, as it was reduced by MassDEP based on the actual water usage of the Office Park.

- Well 2 is located along the western edge of the wetland near the back property boundary. Based on the original Pump Test Report as approved by MassDEP, this bedrock well is 505 feet deep and was pumped at a rate of 8.5 gpm (or 12,240 gpd). The MassDEP approvable yield for this bedrock well is 75% of the pump test rate or 9,180 gpd (6.4 gpm) and the associated Zone 1 and IWPA radii are 244 feet and 604 feet, respectively. The existing Zone I for this source is also less than the approvable pumping rate because it too was reduced by MassDEP, based on the actual water usage of the Office Park.

Table 1
Existing Water Supply Summary
580 Main Street – Bolton, Massachusetts

Well No.	Approvable Yield (gpd)	Zone I (ft)	IWPA (ft)
1	16,200	281	760
2	9,180	244	604

In reviewing MassDEP correspondence pertaining to the existing sources, including the 2012 Sanitary Survey, it should be noted that both wells were identified as being in non-conformance with the MassDEP Zone I requirements due to the location of parking and roads within the Zone I. The Sanitary Survey also states that MassDEP may require compliance with the Zone I requirement in the event that plans are made to modify or expand the source(s) or replace them. Therefore, although the MassDEP may permit an increase in the approvable yield of the existing wells and/or development of additional well(s) on site, in either case it should be assumed that conformance with the Zone I regulations will be required.

It should also be noted that, although none of the MassDEP correspondence addresses the location of the fire pond within the Zone I of the existing Well 1, new regulations prohibit stormwater discharges to a Zone I unless they are essential to the operation of a public water supply. Field reconnaissance and review of the A&M surveyed existing conditions plan appears to confirm that there are no stormwater discharge points into the fire pond and that it is currently inundated with water due to beaver activity blocking off the outlet structures. Furthermore, MassDEP indicated that the fire pond is not prohibited within the Zone I provided that it not part of the stormwater system for the site. However, MassDEP also conveyed that new community wells located within 200 feet of a surface water feature are required to meet the exemption criteria for Groundwater Under the Direct Influence of Surface Water (GWUDI). The exemption criteria includes well construction features, as well as completion of microscopic particulate analyses (MPA) testing during New Source Approval permitting and in the Spring and Fall during the first year of operation.

Future Water Supply Considerations

New Water Sources

Based on the data reviewed, as well as our site visits, we have identified two locations for potential new well(s) on site. Location 1 is approximately 100 linear feet west of the existing Well 2 at the edge of the existing grassed access road to the Town of Bolton Horse Ring Field on the western side of the property. The location and capacity of a well in this area is dictated by the Zone I and IWPA requirements. The IWPA radius is limited to the distance from this well to the GWDP leaching field for the Florence Sawyer School, which is approximately 545 feet away, since the leaching field for the school must be maintained outside of the IWPA of a new source. In addition, the Zone I should remain within the property limits in order to avoid the need for an easement or other agreement with the Town of Bolton. Please note that use of the ball fields and community garden is not allowed within a Zone I, nor is the maintenance of an access way for public use to said property, so it should be confirmed with the existing Owner that the public use of the access road to the Horse Ring Field is not allowed by right or easement.

Location 2 is located approximately 70 linear feet east of the existing parking lot on the eastern side of the property. The location and capacity of a well in this area is also dictated by the Zone I and IWPA requirements. The development plan for the site will need to remove existing pavement within the Zone I radius and maintain and protect the area around the wellhead. Since the nearest existing potential source of contamination to the well within the IWPA is Interstate 495 located over 800 feet away, the limiting factor will likely be the distance from the new well to the planned GWDP leaching area for the developed site. In addition, since a well in this location would be located within 200 feet of a surface water feature it would be subject to MPA testing as part of the New Source Approval process as previously noted.

Future Water Demands

In order to properly evaluate the water supply capacity of the site and the need for a future water source or sources, the estimated future water demands of the site were evaluated. It is our understanding that the current conceptual plan for the site includes four new residential buildings with a total of 229 units (394 bedrooms), as well as an amenity building with a leasing office and one of the existing office buildings to remain. The projected Title 5 design flow based on this plan is 48,128 gpd as summarized in Table 2.

Table 2
Unit Count and Associated Title 5 Design Flow
580 Main Street – Bolton, Massachusetts

	Gross Floor Area (sf)	No. of Bedrooms	Title 5 Requirement	Title 5 Design Flow (gpd)
Residential Apartment Buildings	261,155	394	110 gallons/bedroom	43,340
Amenity Building	5,491	NA	75 gpd/1000 sf	100[1]
Office Building	62,500	NA	75 gpd/1000 sf	4,688
Total		**394**	**-**	**48,128**

1. As the amenity space is restricted to residents only, per MassDEP advisory opinions there will be no additional Title 5 flow associated with those areas. The additional Title 5 water demand shown is associated with the leasing office space, which is estimated to approximately 1,300 sf. of the Amenity Building and, therefore, 100 gpd.

It should be noted that MassDEP Guidelines for Public Water Systems states that sites seeking approval for less than 100,000 gpd shall use Title 5 design flow criteria in assessing minimum pumping test source approval rates, absent other appropriate design flow criteria. For this project, historical flow information is available for the existing office building, and for similar residential apartment building developments completed by your Firm in other Massachusetts communities. In the case of the existing office building, MassDEP reviewed existing water use records between 2007 and 2010 when reevaluating the Zone I and IWPA radii for the site and reported an average combined water use of 1,370 gpd and a maximum month demand of 3,523 gpd. Therefore, we would anticipate that MassDEP would accept a prorated domestic water use of 3,523 gpd or less for the remaining existing office building.

Furthermore, as you are aware, actual water demand data for the year 2020 for a similarly designed residential apartment building development in Framingham was provided to us by Wood Partners. Based

upon our review of that data, it appears that the average actual maximum day water use per bedroom are approximately 85% of the theoretical Title 5 design flow MassDEP typically employs (i.e., the data we analyzed revealed that the average actual peak day water used was 93 gpd/bedroom instead of the required 110 gpd/bedroom). It is important to note that over this small sample size, the water use fluctuated depending upon the occupancy rate of the units and the time of year. Furthermore, in our opinion, the actual amount of water used in 2020 was most likely higher than normal demands would be, as many of the residents of the units were required to conduct work and school from home due to the COVID-19 pandemic.

In discussing this further with MassDEP, they indicated that they would be open to considering the use of historical flow information for the residential buildings when developing the domestic water needs for the site and that a reduction in Title 5 design flows of 10% to 15% may be reasonable. To strengthen this proposal to MassDEP, additional efforts relative to obtaining and compiling pre-2020 water use data from other Wood Partners apartment developments over several years of occupancy would be critical to establishing the appropriate level of reduction that can reasonably be proposed.

Based on the above considerations and assumptions about water demand projections, we envision that domestic water use estimates for the site could be proposed to MassDEP as follows:

- Domestic Water Usage
    - Residential Buildings (Assuming 95 gpd/bedroom and 394 bedrooms) = 37,430 gpd
    - Amenity Building Leasing Office Only (Title 5 Design Flow) = 100 gpd (maximum)
    - Existing Office Building (Historical Flow Data) = 3,523 gpd (maximum)
    - Total Daily Water Use = 41,053 gpd

As noted previously, it is ultimately at MassDEP's discretion to decide which flow criteria is used when permitting public water supply sources and how much, if any, relieve might be granted from their standards. Therefore, additional historical flow data from similar developments over the past 3-5 years, (including maximum monthly water use), is recommended to support the domestic flow estimates provided above and to develop a compelling case for allowing historic water use data in these calculations. We envision that this information would be compiled and analyzed as part of preparing and filing the BRP WS 13 and 15 application for new source approvals and approval to site a public water supply.

Water Supply Capacity Evaluation

In order for the site to support a water demand of at least 41,328 gpd, additional sources of water would be required due to limitations on the amount of water withdrawal from the existing well(s) that is due to constraints related to their Zone Is and IWPAs. The recommended option based on the current site layout and targeted water supply yields is summarized in the table below:

Table 3
Recommended Water Supply Option
Eliminate Use of Existing Well 1 as a PWS and Develop Two New Sources
580 Main Street - Bolton, Massachusetts

Well No.	Approvable Yield (gallons per day)	Yield (gpm)	Zone I (feet)	IWPA (feet)
1 (Existing)	0 gpd			
2 (Existing)	9,150	6.35	244	603
1R (New Well in Eastern Portion of Site)	26,000	18	312	978
3 (New Well in Western Portion of Site)	7,700	5.35	233	571
TOTAL	**42,850**	**29.7**	**N/A**	**N/A**

Figure 1 shows the locations of the water supply sources and their respective Zone I and IWPA radii under this option. Under this scenario, existing Well 1 would be decommissioned as a public water supply and used to meet fire suppression needs of the site only and the estimated domestic water demands would be met via existing Well 2 and two new sources – Well 1R located in the eastern portion of the site and Well 3, located in the western portion of the site. This scenario, while it lessens the impact relative to development restriction, carries more risk because it requires two new wells and the new well located in the eastern portion of the site requires a higher yield than typical bedrock wells. However, it does appear that the new wells could be sited such that the IWPAs do not impact any existing or the site's proposed wastewater discharge, so additional treatment for nitrogen removal on the wastewater side would not be required. As noted previously, the new well located in the eastern portion of the site would be located within 200 feet of a surface water feature and as such would be subject to MPA testing as part of the New Source Approval process. However, in our experience bedrock wells constructed to the depths expected for this project and installed with a proper sanitary seal, are rarely impacted by surface water.

In order to confirm the potential yield of the new sources, general engineering practice recommends that a "test" well be drilled. Unfortunately, small diameter "test wells" are not generally viable for bedrock exploration and in the experience of the well drillers that we spoke to installation of any bedrock well should be completed in accordance with MassDEP well construction requirements and under the assumption that it will become the permanent source. Given the yields of the existing bedrock wells on this site, as well as the yields of bedrock wells in the region, we are confident that a new well (Well 3) could be drilled adjacent to existing Well 2 in the western portion of the site with a capacity of approximately 5 gpm without installing a new "test" well. However, given the high yield required from a new well (Well 1R) drilled in the eastern portion of the site, a Certified Well Driller was contracted to install a new bedrock well and provide an estimate of the available yield in this location.

New Bedrock Well (1R)

In December 2020, Wood Partners authorized Onsite to subcontract with a well driller to install a new bedrock well (1R) on the eastern portion of the site. The location of the well was sited by Onsite in conjunction with A&M, to allow for a Zone I radius around the well under the conceptual future site layout and a 25-foot offset from flagged bordering vegetated wetlands and the existing fire pond, in accordance with local regulations. A

Request for Determination of Applicability (RDA) for the well work was filed by A&M in January 2021; and on February 2, 2021, the Bolton Conservation Commission voted to issue a negative determination with the condition that erosion controls be setup around the drill site; that the slurry from drilling be contained within said barriers; and that the area be raked and allowed to naturalize back at completion of drilling.

Prior to proceeding with the installation of the well, Onsite consulted the Bolton Board of Health and Nashoba Associated Board of Health to determine if a Well Construction Permit was required for the well installation; and were advised that a local permit was not required as the intent was to permit the well (if successful) as a public water supply through the MassDEP New Source Approval program. Although local permitting requirements were waived, the BOH did request that they be included on future correspondence with the MassDEP and that the Well Completion Report and associated water quality data be forwarded for any test wells installed.

In accordance with the potential concerns raised in the November memorandum, Onsite also consulted with the MassDEP Drinking Water Program regarding the conceptual project. MassDEP advised that, while they had no overlying concerns with the proposed well locations, any new well installation is at risk and formal approval can only be provided with the submittal of a BRP WS 13 permit.

On February 11, 2021 Charlton Well, a Massachusetts Certified Well Driller, mobilized to the site and installed straw wattles along the limit of work in accordance with the RDA conditions. On February 17, Charlton Well commenced drilling and on February 26 drilling ceased. Bedrock was encountered at 28 feet below ground surface (bgs) and water-bearing zones in the bedrock were identified between 175 and 200 feet bgs and 285 feet and 295 feet bgs. The well was constructed to a depth of 506 feet bgs with 54 feet of 6.625-inch diameter, schedule 40 steel casing (extending approximately 24 feet into bedrock). A 12-inch bore hole around the casing allowed for the annular seal around the well (from 20 feet to 52 feet bgs) to be grouted in place using a mixture of Portland Type ½ neat cement and 2% bentonite weight. The estimated yield of the well as reported by Charlton Well is 20 gpm, which is slightly higher than the 18 gpm identified in Table 3 above, but lower than the 24 gpm rate required during pump testing to permit an approvable yield of 18 gpm. Based upon the well completion report prepared by Charlton Well, the well meets the material and construction standards for Well Construction, as required under Section 4.20.3 of the MassDEP Guidelines. The Well Completion Report is included in Attachment B.

Upon completion of the drilling and development operations by Charlton Well groundwater samples were collected by Onsite and delivered to Alpha Analytical, Westborough, MA, a State-certified laboratory, for analysis. The laboratory samples were collected in individually labeled laboratory-prepared containers using standard methods for sample collection and preservation. Analytical testing was performed in accordance with Section 4.3.1.1 - Groundwater Exploration of the MassDEP Guidelines, and included the following parameters: volatile organic compounds, nitrate, nitrite, perchlorate, bacteria, secondary contaminants and inorganic compounds.

An evaluation of the sampling results as compared to the appropriate primary and secondary drinking water standards, including the Massachusetts Maximum or Secondary Maximum Contaminant Levels (MMCLs/SMCLs) and Office of Research & Standards Guidelines (ORSG), was completed in order to identify if treatment of the source may be required. In general, MMCL are enforceable standards that represent the maximum permissible level of a contaminant that can be delivered to any user of a PWS; ORSG are guidelines for constituents for which no federal standards currently exist; and SMCL are guidance values, representing

levels of chemicals or parameters above which the aesthetic properties of the water can be affected or cosmetic affects may occur. The water quality results are summarized below and the laboratory data sheets are included in Attachment C.

- Bacteriological Contaminants – Samples were negative for both total coliform and Escherichia Coli bacteria. The absence of total coliform is an indicator that the well is unlikely to be under the influence of surface water. Additional bacteriological sampling, as well as MPA testing will be required during the New Source Approval permitting to confirm that the well is exempt from GWUDI requirements.
- Secondary Contaminants – All secondary contaminants were reported below the respective MMCL, SMCL or ORSG, apart from iron and manganese. Iron was reported at 0.811 mg/l in comparison to the SMCL of 0.3 mg/l, and manganese was detected at 0.155 mg/l above the SMCL of 0.05 mg/l, but below the health advisory level of 0.30 mg/l. In general, the concentrations of all secondary contaminants were within normal ranges expected for groundwater. The pH is neutral (7.9), and alkalinity (67.4 mg/l) and TDS (150 mg/l) normal. Turbidity (4.5 NTU) and color (8) levels were elevated, likely due to the presence of iron detected in the water. The hardness was reported at 116 mg/l and is considered moderately hard on the hardness scale. Hard water is an aesthetic concern but often leads to problems with water heaters, fixtures, appliances, etc. and as such treatment for hardness may be desirable.
- Inorganic Compounds, Lead, Nitrate, Nitrite and Perchlorate - Analysis of samples collected indicate that inorganic compounds, as well as lead, nitrite, nitrate, and perchlorate, were either non-detectable or detected below their respective MCLs. Parameters with detections included sodium with a concentration of 10 mg/l, below the guideline concentration of 20 mg/l; arsenic with a concentration of 0.0016 mg/l below the MCL of 0.01 mg/l; and barium with a concentration of 0.0104 mg/l below the MCL of 2 mg/l. Nitrate, nitrite and perchlorate were all non-detectable indicating that there are no initial concerns due to potential sources of contamination.
- Volatile Organic Compounds - Analyses showed non-detectable levels of all VOCs analyzed, again indicating no initial concerns due to potential sources of contamination.

As part of our efforts for this project, we also reviewed water quality data from the existing wells required to operate those public water supplies. The data that was reviewed revealed that the water produced from those wells has similar types and levels of contaminants as what was shown to be in the water from the new test well. This information confirms that a site wide water treatment system would be appropriate and will likely be required to remove iron, manganese and hardness. The recommended treatment plan is discussed later in this memorandum.

Future Water System Considerations

Domestic Water Storage

Separate water storage tanks are typically required for fire and domestic water supply for a project of this size, especially when treatment is required. For domestic water storage, MassDEP requires that community public water systems that rely on groundwater well(s) provide a redundant source of supply, or provide storage capacity equivalent to the demand of at least two average day demands. Therefore, although it appears that use of the existing Well 2, supplemented by two new wells, may meet the projected daily water demands of the site; redundant supply is not available. Therefore, a water storage tank capacity equal to two times the average day demand or approximately 80,000 gallons will be required.

Water storage tanks are available in a wide variety of materials and can be installed either above or below grade. Given concerns with regard to groundwater elevation and the presence of ledge, we assumed an 80,000 above grade tank for estimating purposes. The estimated dimension of the tank is 20-feet in diameter and 38-feet in height. These dimensions can vary, depending upon tank manufacturer, site needs and capacity and height limitations. Therefore, if for aesthetics purposes a lower profile tank is desired, the tank manufacturer can generally design the tank around those parameters; making the tank shorter and wider as required. On the conceptual layout, we have located the domestic water tank on the western portion of the site near existing Well 2 and the anticipated water pump station. As noted previously, water storage tanks are permissible in a Zone I. Based on costs provided by a manufacturer of above grade bolted steel tanks, we estimate a budgetary cost of $215,000 to furnish and install the 80,000 gallon domestic water tank (including foundation).

Fire Protection

In our experience, the fire protection needs of a site are met using a combination of water supply and water storage. The fire tank for a site is typically supplied by a dedicated well for fire storage or use of the permitted public water supply sources. In general, a well utilized for fire protection does not need to meet the stringent wellhead protection requirements of a public water supply source and would require permitting through the local board of health only. For the purpose of this evaluation, we've assumed that existing Well 1 will be abandoned as a public water supply source and instead used exclusively to feed the fire tank. The anticipated fire service and fire storage needs and assumptions for the site as provided by Wood Partners are as follows:

- Fire Service
    - Fire Protection flow remains as noted below at 1,500 gpm with the possibility of the Fire Department requesting a maximum of 2,000 gpm.
    - Fire flows per NFPA 1.
    - Assuming VA (IBC) construction which is V(111) based on NFPA.
    - Approximately 110,000 sq. ft. per building.
    - Buildings more than 50 feet apart.
    - The required flow is 6,000 gpm reduced by 75% or 1,500 gpm for using residential and quick response sprinklers.
    - Fire department has the authority to lower the flow to minimum 600 gpm, but also can request increasing the flow.

- Fire Storage
    - Storage sizing per NFPA 1.
    - 234 unit concept – 263,000 gallons. Assuming an above grade tank would be used, the estimated dimensions for 300,000 gallons of storage is 36-feet in diameter and 38-feet in height.
    - 272 unit concept – 413,000 gallons. Assuming an above grade tank the estimated dimensions of a 300,000 gallon tank is 36-feet in diameter and 38-feet in height. These dimensions may vary depending upon tank manufacturer.

As with the potable water storage tank, the fire tank dimensions may vary depending upon tank manufacturer and/or height limits and site constraints imposed on the project. On the conceptual layout, we have located a 300,000 gallon fire tank adjacent to the domestic water tank on the western portion of the site near existing Well 2 and the anticipated water pump station. As noted previously, water storage tanks are permissible in a

Zone I. Based on costs obtained from a manufacturer of above grade bolted steel tanks, we estimate a budgetary cost of $500,000 to furnish and install a 300,000 gallon fire tank, which appears to be adequate at the current design development program being considered.

Water Treatment

Based on the water quality sampling as summarized above, we recommend treatment for iron, manganese and hardness. In general, ion exchange (or water softening) is an appropriate treatment technology for these parameters given the low concentrations of iron and manganese present in the raw water. One potential concern with ion exchange is that the technology functions by exchanging sodium ions present in the brine for the iron, manganese and hardness ions in the water; and as a result may lead to elevated sodium levels in the finished water. If sodium levels are a concern, a switch to more expensive potassium chloride resin would be a solution that could be considered. Another concern with ion exchange is the disposal of the sodium laden backwash water. Due to these concerns the other viable treatment option to be considered is greensand filtration. The final selection of the treatment method is typically evaluated after completion of the extended duration pumping test so that the representative water quality is better understood. For either treatment process, disposal of backwash water will need to be considered. Typically the backwash water is discharged to a permitted Underground Injection Control (UIC) drywell located outside the Zone I's.

Potable Water System Description

The conceptual overall water system is envisioned to consist of three bedrock well sources (Existing Well 2 plus new Wells 3 and 4) each equipped with a submersible well pump. Due to the proposed increased in yield at Well 2 and the anticipated age of the equipment in this well, we have assumed that new submersible well pump and hydrofracking will likely be required as part of the New Source Approval process. Given the age of this well, it would be safe to assume that the existing pump and water bearing fractures have been fouled over time and therefore, hydrofracking would be a suitable course of action to restore the yield and a new pump system would be required to provide suitable volume and pressure at the anticipated increased yield.

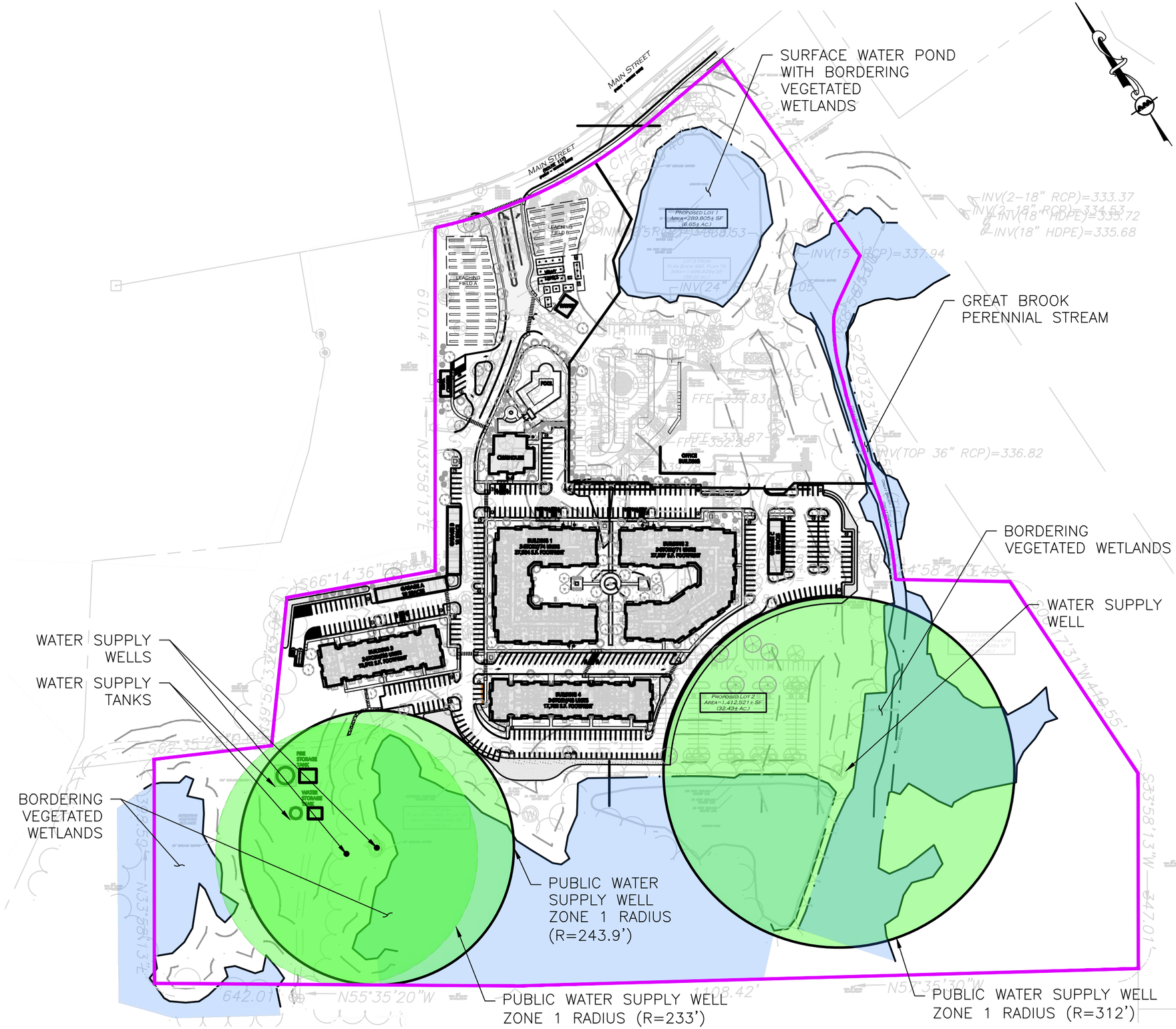
High density polyethylene piping will extend from the three wells to the proposed water treatment and pump control system station, located adjacent to Well 2 in the western portion of the site. From there, treated water would be discharged to the domestic water storage tank. As noted, treatment will occur within the water pump station prior to discharge to the water storage tank. From the water tank, water will be pumped via a constant pressure VFD controlled booster pump skid into the pressurized domestic water distribution and service system connected to the individual buildings in the development. An emergency generator and automatic transfer switch will be incorporated into the water system design to allow for operation of the water system in event of an emergency. Estimated costs associated with the various components of the water system are outlined below.

Fire Protection Water System Description

The conceptual fire protection water system is envisioned to consist of the existing Well 1, an above ground storage tank and a fire booster pump system that connects into the fire distribution network for the site. As previously noted, Well 1 could be repurposed as a dedicated fire system water supply source, which would not require public water supply permitting or treatment to meet potable water standards. As such, we anticipate that the discharge from Well 1 would be directed into the fire storage tank and from there water will be pumped via a constant pressure VFD controlled fire booster pump skid into the dedicated pressurized fire water distribution system connected to the individual buildings in the development.

Attachment A

Conceptual Plan – Figure 1



APPLICANT/OWNER:

WP EAST AQUISITIONS, LLC.
91 HARTWELL AVENUE, 3RD FLOOR
LEXINGTON, MA 02421

PROJECT:

ALTA NASHOBA VALLEY
580 MAIN STREET BOLTON, MA

PROJECT NO.	1670-15	**DATE:**	08-16-21
SCALE:	1" = 180'	**DWG. NAME:**	C-1670-15
DESIGNED BY:	PLC	**CHECKED BY:**	PLC

PREPARED BY:

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civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
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FAX: (508) 923-6309
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NH

DRAWING TITLE:

OVERALL LAYOUT PLAN

SHEET No.

FIG-A

Attachment B

Well Completion Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection
Well Completion Reports

Well Driller

Please specify work performed:
New Well

Please specify well type:
Public Water Supply

Number Of Wells:

Well Location

In public right-of-way:
○ Yes ○ No

Subdivision/Property/Description:
BOLTON OFFICE PARK LLC

Property Owner:
BOLTON OFFICE PARL LLC

Engineering Firm:
ON SITE

Address at well location:

Street Number:	Street Name:
580	MAIN ST
Building Lot#:	Assessor's Map #:
Assessor's Lot#:	ZIP Code: 01740

City/Town:
BOLTON

GPS

North:	West:
42.42777	71.59974

Mailing Address:
☐ click here if same as well location address

Street Number:	Street Name:
100	GRANDVIEW RD SUITE 312
City/Town: BRAINTREE	State: MASSACHUSETTS
ZIP Code: 02184	

Board of health permit obtained:
○ Yes ◉ Not Required

Permit Number:	Date Issued:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Well Driller Program
Well Completion Reports(General)

Well Driller - General Well Form

DRILLING METHOD

Overburden	Bedrock
Mud Rotary	Air Hammer

WELL LOG OVERBURDEN LITHOLOGY

From(ft)	To(ft)	Code	Color	Comment	Drop in drill stem	Extra fast or slow drill rate	Loss or addition of fluid
0	4	Organics	Black		○ YES ◉ NO	○ Fast ○ Slow	○ Loss ○ Addition
4	8	Clay	Yellowish Brown		○ YES ◉ NO	○ Fast ○ Slow	○ Loss ◉ Addition
8	20	Gravel	Dark Gray		○ YES ◉ NO	○ Fast ○ Slow	○ Loss ◉ Addition
20	28	Boulders	Light Gray		○ YES ◉ NO	○ Fast ◉ Slow	○ Loss ○ Addition

WELL LOG BEDROCK LITHOLOGY

From(ft)	To(ft)	Code	Comment	Drop in drill stem	Extra fast or slow drill rate	Loss or addition of fluid	Visible Rust Staining	Extra Large Chips
28	43	Gneiss		○ YES ◉ NO	○ Fast ○ Slow	○ Loss ○ Addition	☐ Yes	☐ Yes
43	44	Gneiss		○ YES ◉ NO	○ Fast ○ Slow	○ Loss ◉ Addition	☐ Yes	☐ Yes
44	144	Gneiss		○ YES ◉ NO	○ Fast ○ Slow	○ Loss ◉ Addition	☐ Yes	☐ Yes
144	244	Schist		○ YES ◉ NO	○ Fast ○ Slow	○ Loss ○ Addition	☐ Yes	☐ Yes
244	340	Gneiss		○ YES ◉ NO	○ Fast ○ Slow	○ Loss ◉ Addition	☐ Yes	☐ Yes
340	420	Gneiss		○ YES ◉ NO	○ Fast ○ Slow	○ Loss ○ Addition	☐ Yes	☐ Yes
420	435	Schist		◉ YES ○ NO	○ Fast ○ Slow	○ Loss ◉ Addition	☐ Yes	☑ Yes
435	506	Schist		○ YES ◉ NO	○ Fast ○ Slow	○ Loss ○ Addition	☐ Yes	☐ Yes

ADDITIONAL WELL INFORMATION

Developed	◉ Yes ○ No	Disinfected	◉ Yes ○ No
Total Well Depth	506	Depth to Bedrock	28
Surface Seal Type	None	Fracture Enhancement	○ Yes ◉ No

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Well Driller Program
Well Completion Reports(General)

CASING ☑ Is Casing above ground? From: 52 To: 2

From	To	Type	Thickness	Diameter	Driveshoe
2	52	Steel	Schedule 40	6.625	☑ Yes

SCREEN ☑ No Screen

From	To	Type	Slot Size	Diameter
		--- Choose Screen Type ---		

WATER-BEARING ZONES ☐ DRY WELL

From	To	Yield (gpm)
175	200	3
285	295	17

PERMANENT PUMP (IF AVAILABLE)

Pump Description: --- Choose Pump Description ---

Horsepower: --- Choose Horsepower ---

Pump Intake Depth (ft)

Nominal Pump Capacity (gpm)

ANNULAR SEAL / FILTER PACK

From	To	Material 1	Weight	Material 2	Weight	Water (gal)	Batches (count)	Method Of Placement
20	52	Cement/Bentonite Grout		Choose Material			25	Tremie

WELL TEST DATA

Date	Method	Yield (gpm)	Time Pumped (HH:MM)	Pumping Level (ft BGS)	Time To Recover (HH:MM)	Recovery (ft BGS)
02/26/2021	Air Blow With Drill Stem	20	03:00	500	01:45	10

WATER LEVEL

Date Measured	Static Depth BGS (ft)	Flowing Rate (gpm)
02/26/2021	0	1

COMMENTS

12" BORE HOLE FOR CASING.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Well Driller Program
Well Completion Reports(General)

WELL DRILLERS STATEMENT

This well was drilled or altered under my direct supervision, according to the applicable rules and regulations, and this report is complete and accurate to the best of my knowledge.

Driller	PETER J BELANGER	Registration #	883	Monitoring [M]	Supervising Driller Signature	BELANGER, PETER, J
Firm	CHARLTON WELL CO. INC.	Rig Permit #	0543		Date Job Complete	02/26/2021

NOTE: Well Completion Reports must be filed by the registered well driller within 30 days of well completion.

Attachment C

Water Quality

ANALYTICAL REPORT

Lab Number:	L2109646
Client:	Onsite Engineering 279 East Central Street #241 Franklin, MA 02038
ATTN:	Susan Hunnewell
Phone:	(508) 553-0616
Project Name:	580 MAIN ST
Project Number:	Not Specified
Report Date:	03/05/21

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2109646-01	TW-3	DW	BOLTON	02/26/21 14:15	02/26/21
L2109646-02	TRIP BLANK	DW	BOLTON	02/26/21 00:00	02/26/21

Project Name:	580 MAIN ST	**Lab Number:**	L2109646
Project Number:	Not Specified	**Report Date:**	03/05/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	580 MAIN ST	**Lab Number:**	L2109646
Project Number:	Not Specified	**Report Date:**	03/05/21

Case Narrative (continued)

Anions by Ion Chromatography

The WG1469105-3 MS recoveries, performed on L2109646-01, are outside the acceptance criteria for sulfate (89%) and chloride (69%); however, the associated LCS recoveries are within criteria. No further action was taken.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Caitlin Walukevich

Title: Technical Director/Representative

Date: 03/05/21

ORGANICS

VOLATILES

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

SAMPLE RESULTS

Lab ID: L2109646-01
Client ID: TW-3
Sample Location: BOLTON

Date Collected: 02/26/21 14:15
Date Received: 02/26/21
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 16,524.2
Analytical Date: 03/01/21 13:18
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	0.50	--	1
Chloromethane	ND		ug/l	0.50	--	1
Vinyl chloride	ND		ug/l	0.50	--	1
Bromomethane	ND		ug/l	0.50	--	1
Chloroethane	ND		ug/l	0.50	--	1
Trichlorofluoromethane	ND		ug/l	0.50	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
Methylene chloride	ND		ug/l	0.50	--	1
Methyl tert butyl ether	ND		ug/l	0.50	--	1
trans-1,2-Dichloroethene	ND		ug/l	0.50	--	1
1,1-Dichloroethane	ND		ug/l	0.50	--	1
2,2-Dichloropropane	ND		ug/l	0.50	--	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	--	1
Chloroform	ND		ug/l	0.50	--	1
Bromochloromethane	ND		ug/l	0.50	--	1
1,1,1-Trichloroethane	ND		ug/l	0.50	--	1
1,1-Dichloropropene	ND		ug/l	0.50	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Trichloroethene	ND		ug/l	0.50	--	1
1,2-Dichloropropane	ND		ug/l	0.50	--	1
Bromodichloromethane	ND		ug/l	0.50	--	1
Dibromomethane	ND		ug/l	0.50	--	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	--	1
Toluene	ND		ug/l	0.50	--	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	--	1
1,1,2-Trichloroethane	ND		ug/l	0.50	--	1

Project Name: 580 MAIN ST
Project Number: Not Specified
Lab Number: L2109646
Report Date: 03/05/21

SAMPLE RESULTS

Lab ID: L2109646-01
Client ID: TW-3
Sample Location: BOLTON
Date Collected: 02/26/21 14:15
Date Received: 02/26/21
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,3-Dichloropropane	ND		ug/l	0.50	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Dibromochloromethane	ND		ug/l	0.50	--	1
1,2-Dibromoethane	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Ethylbenzene	ND		ug/l	0.50	--	1
p/m-Xylene	ND		ug/l	0.50	--	1
o-Xylene	ND		ug/l	0.50	--	1
Styrene	ND		ug/l	0.50	--	1
Isopropylbenzene	ND		ug/l	0.50	--	1
Bromoform	ND		ug/l	0.50	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--	1
1,2,3-Trichloropropane	ND		ug/l	0.50	--	1
Xylenes, Total[1]	ND		ug/l	0.50	--	1
n-Propylbenzene	ND		ug/l	0.50	--	1
Bromobenzene	ND		ug/l	0.50	--	1
1,3,5-Trimethylbenzene	ND		ug/l	0.50	--	1
o-Chlorotoluene	ND		ug/l	0.50	--	1
p-Chlorotoluene	ND		ug/l	0.50	--	1
tert-Butylbenzene	ND		ug/l	0.50	--	1
1,2,4-Trimethylbenzene	ND		ug/l	0.50	--	1
sec-Butylbenzene	ND		ug/l	0.50	--	1
p-Isopropyltoluene	ND		ug/l	0.50	--	1
1,3-Dichlorobenzene	ND		ug/l	0.50	--	1
1,4-Dichlorobenzene	ND		ug/l	0.50	--	1
n-Butylbenzene	ND		ug/l	0.50	--	1
1,2-Dichlorobenzene	ND		ug/l	0.50	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	0.50	--	1
1,2,4-Trichlorobenzene	ND		ug/l	0.50	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	0.50	--	1
1,2,3-Trichlorobenzene	ND		ug/l	0.50	--	1

Project Name: 580 MAIN ST **Lab Number:** L2109646

Project Number: Not Specified **Report Date:** 03/05/21

SAMPLE RESULTS

Lab ID:	L2109646-01	Date Collected:	02/26/21 14:15
Client ID:	TW-3	Date Received:	02/26/21
Sample Location:	BOLTON	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichlorobenzene-d4	104		80-120
4-Bromofluorobenzene	99		80-120

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

SAMPLE RESULTS

Lab ID: L2109646-02
Client ID: TRIP BLANK
Sample Location: BOLTON

Date Collected: 02/26/21 00:00
Date Received: 02/26/21
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 16,524.2
Analytical Date: 03/01/21 12:49
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Dichlorodifluoromethane	ND		ug/l	0.50	--	1
Chloromethane	ND		ug/l	0.50	--	1
Vinyl chloride	ND		ug/l	0.50	--	1
Bromomethane	ND		ug/l	0.50	--	1
Chloroethane	ND		ug/l	0.50	--	1
Trichlorofluoromethane	ND		ug/l	0.50	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
Methylene chloride	ND		ug/l	0.50	--	1
Methyl tert butyl ether	ND		ug/l	0.50	--	1
trans-1,2-Dichloroethene	ND		ug/l	0.50	--	1
1,1-Dichloroethane	ND		ug/l	0.50	--	1
2,2-Dichloropropane	ND		ug/l	0.50	--	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	--	1
Chloroform	ND		ug/l	0.50	--	1
Bromochloromethane	ND		ug/l	0.50	--	1
1,1,1-Trichloroethane	ND		ug/l	0.50	--	1
1,1-Dichloropropene	ND		ug/l	0.50	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Trichloroethene	ND		ug/l	0.50	--	1
1,2-Dichloropropane	ND		ug/l	0.50	--	1
Bromodichloromethane	ND		ug/l	0.50	--	1
Dibromomethane	ND		ug/l	0.50	--	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	--	1
Toluene	ND		ug/l	0.50	--	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	--	1
1,1,2-Trichloroethane	ND		ug/l	0.50	--	1

Project Name: 580 MAIN ST
Project Number: Not Specified
Lab Number: L2109646
Report Date: 03/05/21

SAMPLE RESULTS

Lab ID: L2109646-02
Client ID: TRIP BLANK
Sample Location: BOLTON
Date Collected: 02/26/21 00:00
Date Received: 02/26/21
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,3-Dichloropropane	ND		ug/l	0.50	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Dibromochloromethane	ND		ug/l	0.50	--	1
1,2-Dibromoethane	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Ethylbenzene	ND		ug/l	0.50	--	1
p/m-Xylene	ND		ug/l	0.50	--	1
o-Xylene	ND		ug/l	0.50	--	1
Styrene	ND		ug/l	0.50	--	1
Isopropylbenzene	ND		ug/l	0.50	--	1
Bromoform	ND		ug/l	0.50	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--	1
1,2,3-Trichloropropane	ND		ug/l	0.50	--	1
Xylenes, Total[1]	ND		ug/l	0.50	--	1
n-Propylbenzene	ND		ug/l	0.50	--	1
Bromobenzene	ND		ug/l	0.50	--	1
1,3,5-Trimethylbenzene	ND		ug/l	0.50	--	1
o-Chlorotoluene	ND		ug/l	0.50	--	1
p-Chlorotoluene	ND		ug/l	0.50	--	1
tert-Butylbenzene	ND		ug/l	0.50	--	1
1,2,4-Trimethylbenzene	ND		ug/l	0.50	--	1
sec-Butylbenzene	ND		ug/l	0.50	--	1
p-Isopropyltoluene	ND		ug/l	0.50	--	1
1,3-Dichlorobenzene	ND		ug/l	0.50	--	1
1,4-Dichlorobenzene	ND		ug/l	0.50	--	1
n-Butylbenzene	ND		ug/l	0.50	--	1
1,2-Dichlorobenzene	ND		ug/l	0.50	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	0.50	--	1
1,2,4-Trichlorobenzene	ND		ug/l	0.50	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	0.50	--	1
1,2,3-Trichlorobenzene	ND		ug/l	0.50	--	1

Project Name: 580 MAIN ST **Lab Number:** L2109646

Project Number: Not Specified **Report Date:** 03/05/21

SAMPLE RESULTS

Lab ID:	L2109646-02	Date Collected:	02/26/21 00:00
Client ID:	TRIP BLANK	Date Received:	02/26/21
Sample Location:	BOLTON	Field Prep:	Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichlorobenzene-d4	103		80-120
4-Bromofluorobenzene	100		80-120

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Method Blank Analysis
Batch Quality Control

Analytical Method: 16,524.2
Analytical Date: 03/01/21 11:47
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1469593-4					
Dichlorodifluoromethane	ND		ug/l	0.50	--
Chloromethane	ND		ug/l	0.50	--
Vinyl chloride	ND		ug/l	0.50	--
Bromomethane	ND		ug/l	0.50	--
Chloroethane	ND		ug/l	0.50	--
Trichlorofluoromethane	ND		ug/l	0.50	--
1,1-Dichloroethene	ND		ug/l	0.50	--
Methylene chloride	ND		ug/l	0.50	--
Methyl tert butyl ether	ND		ug/l	0.50	--
trans-1,2-Dichloroethene	ND		ug/l	0.50	--
1,1-Dichloroethane	ND		ug/l	0.50	--
2,2-Dichloropropane	ND		ug/l	0.50	--
cis-1,2-Dichloroethene	ND		ug/l	0.50	--
Chloroform	ND		ug/l	0.50	--
Bromochloromethane	ND		ug/l	0.50	--
1,1,1-Trichloroethane	ND		ug/l	0.50	--
1,1-Dichloropropene	ND		ug/l	0.50	--
Carbon tetrachloride	ND		ug/l	0.50	--
1,2-Dichloroethane	ND		ug/l	0.50	--
Benzene	ND		ug/l	0.50	--
Trichloroethene	ND		ug/l	0.50	--
1,2-Dichloropropane	ND		ug/l	0.50	--
Bromodichloromethane	ND		ug/l	0.50	--
Dibromomethane	ND		ug/l	0.50	--
cis-1,3-Dichloropropene	ND		ug/l	0.50	--
Toluene	ND		ug/l	0.50	--
trans-1,3-Dichloropropene	ND		ug/l	0.50	--
1,1,2-Trichloroethane	ND		ug/l	0.50	--
1,3-Dichloropropane	ND		ug/l	0.50	--

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Method Blank Analysis
Batch Quality Control

Analytical Method: 16,524.2
Analytical Date: 03/01/21 11:47
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1469593-4					
Tetrachloroethene	ND		ug/l	0.50	--
Dibromochloromethane	ND		ug/l	0.50	--
1,2-Dibromoethane	ND		ug/l	0.50	--
Chlorobenzene	ND		ug/l	0.50	--
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--
Ethylbenzene	ND		ug/l	0.50	--
p/m-Xylene	ND		ug/l	0.50	--
o-Xylene	ND		ug/l	0.50	--
Styrene	ND		ug/l	0.50	--
Isopropylbenzene	ND		ug/l	0.50	--
Bromoform	ND		ug/l	0.50	--
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--
1,2,3-Trichloropropane	ND		ug/l	0.50	--
Xylenes, Total[1]	ND		ug/l	0.50	--
n-Propylbenzene	ND		ug/l	0.50	--
Bromobenzene	ND		ug/l	0.50	--
1,3,5-Trimethylbenzene	ND		ug/l	0.50	--
o-Chlorotoluene	ND		ug/l	0.50	--
p-Chlorotoluene	ND		ug/l	0.50	--
tert-Butylbenzene	ND		ug/l	0.50	--
1,2,4-Trimethylbenzene	ND		ug/l	0.50	--
sec-Butylbenzene	ND		ug/l	0.50	--
p-Isopropyltoluene	ND		ug/l	0.50	--
1,3-Dichlorobenzene	ND		ug/l	0.50	--
1,4-Dichlorobenzene	ND		ug/l	0.50	--
n-Butylbenzene	ND		ug/l	0.50	--
1,2-Dichlorobenzene	ND		ug/l	0.50	--
1,2-Dibromo-3-chloropropane	ND		ug/l	0.50	--
1,2,4-Trichlorobenzene	ND		ug/l	0.50	--

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Method Blank Analysis
Batch Quality Control

Analytical Method: 16,524.2
Analytical Date: 03/01/21 11:47
Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-02 Batch: WG1469593-4					
Hexachlorobutadiene	ND		ug/l	0.50	--
Naphthalene	ND		ug/l	0.50	--
1,2,3-Trichlorobenzene	ND		ug/l	0.50	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichlorobenzene-d4	104		80-120
4-Bromofluorobenzene	99		80-120

Lab Control Sample Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1469593-3								
Dichlorodifluoromethane	112		-		70-130	-		20
Chloromethane	102		-		70-130	-		20
Vinyl chloride	102		-		70-130	-		20
Bromomethane	105		-		70-130	-		20
Chloroethane	98		-		70-130	-		20
Trichlorofluoromethane	95		-		70-130	-		20
1,1-Dichloroethene	98		-		70-130	-		20
Methylene chloride	95		-		70-130	-		20
Methyl tert butyl ether	90		-		70-130	-		20
trans-1,2-Dichloroethene	100		-		70-130	-		20
1,1-Dichloroethane	100		-		70-130	-		20
2,2-Dichloropropane	98		-		70-130	-		20
cis-1,2-Dichloroethene	102		-		70-130	-		20
Chloroform	98		-		70-130	-		20
Bromochloromethane	95		-		70-130	-		20
1,1,1-Trichloroethane	98		-		70-130	-		20
1,1-Dichloropropene	95		-		70-130	-		20
Carbon tetrachloride	100		-		70-130	-		20
1,2-Dichloroethane	105		-		70-130	-		20
Benzene	98		-		70-130	-		20
Trichloroethene	108		-		70-130	-		20
1,2-Dichloropropane	102		-		70-130	-		20
Bromodichloromethane	102		-		70-130	-		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1469593-3								
Dibromomethane	108		-		70-130	-		20
cis-1,3-Dichloropropene	95		-		70-130	-		20
Toluene	100		-		70-130	-		20
trans-1,3-Dichloropropene	95		-		70-130	-		20
1,1,2-Trichloroethane	100		-		70-130	-		20
1,3-Dichloropropane	105		-		70-130	-		20
Tetrachloroethene	108		-		70-130	-		20
Dibromochloromethane	98		-		70-130	-		20
1,2-Dibromoethane	102		-		70-130	-		20
Chlorobenzene	90		-		70-130	-		20
1,1,1,2-Tetrachloroethane	85		-		70-130	-		20
Ethylbenzene	90		-		70-130	-		20
p/m-Xylene	91		-		70-130	-		20
o-Xylene	88		-		70-130	-		20
Styrene	85		-		70-130	-		20
Isopropylbenzene	90		-		70-130	-		20
Bromoform	80		-		70-130	-		20
1,1,2,2-Tetrachloroethane	90		-		70-130	-		20
1,2,3-Trichloropropane	88		-		70-130	-		20
n-Propylbenzene	90		-		70-130	-		20
Bromobenzene	92		-		70-130	-		20
1,3,5-Trimethylbenzene	88		-		70-130	-		20
o-Chlorotoluene	92		-		70-130	-		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 Batch: WG1469593-3								
p-Chlorotoluene	95		-		70-130	-		20
tert-Butylbenzene	88		-		70-130	-		20
1,2,4-Trimethylbenzene	90		-		70-130	-		20
sec-Butylbenzene	90		-		70-130	-		20
p-Isopropyltoluene	90		-		70-130	-		20
1,3-Dichlorobenzene	92		-		70-130	-		20
1,4-Dichlorobenzene	88		-		70-130	-		20
n-Butylbenzene	88		-		70-130	-		20
1,2-Dichlorobenzene	88		-		70-130	-		20
1,2-Dibromo-3-chloropropane	78		-		70-130	-		20
1,2,4-Trichlorobenzene	80		-		70-130	-		20
Hexachlorobutadiene	85		-		70-130	-		20
Naphthalene	80		-		70-130	-		20
1,2,3-Trichlorobenzene	85		-		70-130	-		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichlorobenzene-d4	101				80-120
4-Bromofluorobenzene	104				80-120

Matrix Spike Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1469593-6 QC Sample: L2109751-01 Client ID: MS Sample												
Dichlorodifluoromethane	ND	4	5.1	128		-	-		70-130	-		20
Chloromethane	ND	4	4.6	115		-	-		70-130	-		20
Vinyl chloride	ND	4	4.9	123		-	-		70-130	-		20
Bromomethane	ND	4	4.1	103		-	-		70-130	-		20
Chloroethane	ND	4	4.3	108		-	-		70-130	-		20
Trichlorofluoromethane	ND	4	4.2	105		-	-		70-130	-		20
1,1-Dichloroethene	ND	4	4.2	105		-	-		70-130	-		20
Methylene chloride	ND	4	4.0	100		-	-		70-130	-		20
Methyl tert butyl ether	ND	4	3.7	92		-	-		70-130	-		20
trans-1,2-Dichloroethene	ND	4	4.0	100		-	-		70-130	-		20
1,1-Dichloroethane	ND	4	4.1	103		-	-		70-130	-		20
2,2-Dichloropropane	ND	4	3.3	82		-	-		70-130	-		20
cis-1,2-Dichloroethene	ND	4	3.9	98		-	-		70-130	-		20
Chloroform	ND	4	4.0	100		-	-		70-130	-		20
Bromochloromethane	ND	4	3.8	95		-	-		70-130	-		20
1,1,1-Trichloroethane	ND	4	4.0	100		-	-		70-130	-		20
1,1-Dichloropropene	ND	4	4.1	103		-	-		70-130	-		20
Carbon tetrachloride	ND	4	4.2	105		-	-		70-130	-		20
1,2-Dichloroethane	ND	4	4.2	105		-	-		70-130	-		20
Benzene	ND	4	4.5	113		-	-		70-130	-		20
Trichloroethene	ND	4	4.5	113		-	-		70-130	-		20
1,2-Dichloropropane	ND	4	4.2	105		-	-		70-130	-		20
Bromodichloromethane	ND	4	4.1	103		-	-		70-130	-		20
Dibromomethane	ND	4	4.3	108		-	-		70-130	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1469593-6 QC Sample: L2109751-01 Client ID: MS Sample												
cis-1,3-Dichloropropene	ND	4	3.7	92		-	-		70-130	-		20
Toluene	ND	4	4.2	105		-	-		70-130	-		20
trans-1,3-Dichloropropene	ND	4	3.4	85		-	-		70-130	-		20
1,1,2-Trichloroethane	ND	4	4.3	108		-	-		70-130	-		20
1,3-Dichloropropane	ND	4	4.3	108		-	-		70-130	-		20
Tetrachloroethene	ND	4	4.6	115		-	-		70-130	-		20
Dibromochloromethane	ND	4	3.9	98		-	-		70-130	-		20
1,2-Dibromoethane	ND	4	4.1	103		-	-		70-130	-		20
Chlorobenzene	ND	4	3.8	95		-	-		70-130	-		20
1,1,1,2-Tetrachloroethane	ND	4	3.5	88		-	-		70-130	-		20
Ethylbenzene	ND	4	3.8	95		-	-		70-130	-		20
p/m-Xylene	ND	8	7.7	96		-	-		70-130	-		20
o-Xylene	ND	4	3.9	98		-	-		70-130	-		20
Styrene	ND	4	3.6	90		-	-		70-130	-		20
Isopropylbenzene	ND	4	3.9	98		-	-		70-130	-		20
Bromoform	ND	4	3.1	78		-	-		70-130	-		20
1,1,2,2-Tetrachloroethane	ND	4	3.6	90		-	-		70-130	-		20
1,2,3-Trichloropropane	ND	4	3.6	90		-	-		70-130	-		20
n-Propylbenzene	ND	4	4.0	100		-	-		70-130	-		20
Bromobenzene	ND	4	3.8	95		-	-		70-130	-		20
1,3,5-Trimethylbenzene	ND	4	4.0	100		-	-		70-130	-		20
o-Chlorotoluene	ND	4	4.0	100		-	-		70-130	-		20
p-Chlorotoluene	ND	4	4.0	100		-	-		70-130	-		20
tert-Butylbenzene	ND	4	3.8	95		-	-		70-130	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: 580 MAIN ST

Project Number: Not Specified

Lab Number: L2109646

Report Date: 03/05/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1469593-6 QC Sample: L2109751-01 Client ID: MS Sample												
1,2,4-Trimethylbenzene	ND	4	4.1	103		-	-		70-130	-		20
sec-Butylbenzene	ND	4	4.1	103		-	-		70-130	-		20
p-Isopropyltoluene	ND	4	3.9	98		-	-		70-130	-		20
1,3-Dichlorobenzene	ND	4	3.8	95		-	-		70-130	-		20
1,4-Dichlorobenzene	ND	4	3.7	92		-	-		70-130	-		20
n-Butylbenzene	ND	4	3.8	95		-	-		70-130	-		20
1,2-Dichlorobenzene	ND	4	3.6	90		-	-		70-130	-		20
1,2-Dibromo-3-chloropropane	ND	4	3.3	82		-	-		70-130	-		20
1,2,4-Trichlorobenzene	ND	4	3.4	85		-	-		70-130	-		20
Hexachlorobutadiene	ND	4	3.7	92		-	-		70-130	-		20
Naphthalene	0.69	4	4.1	85		-	-		70-130	-		20
1,2,3-Trichlorobenzene	ND	4	3.4	85		-	-		70-130	-		20

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
1,2-Dichlorobenzene-d4	102				80-120
4-Bromofluorobenzene	105				80-120

Lab Duplicate Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1469593-5 QC Sample: L2109242-01 Client ID: DUP Sample						
Dichlorodifluoromethane	ND	ND	ug/l	NC		20
Chloromethane	ND	ND	ug/l	NC		20
Vinyl chloride	ND	ND	ug/l	NC		20
Bromomethane	ND	ND	ug/l	NC		20
Chloroethane	ND	ND	ug/l	NC		20
Trichlorofluoromethane	ND	ND	ug/l	NC		20
1,1-Dichloroethene	ND	ND	ug/l	NC		20
Methylene chloride	ND	ND	ug/l	NC		20
Methyl tert butyl ether	ND	ND	ug/l	NC		20
trans-1,2-Dichloroethene	ND	ND	ug/l	NC		20
1,1-Dichloroethane	ND	ND	ug/l	NC		20
2,2-Dichloropropane	ND	ND	ug/l	NC		20
cis-1,2-Dichloroethene	ND	ND	ug/l	NC		20
Chloroform	4.4	4.2	ug/l	5		20
Bromochloromethane	ND	ND	ug/l	NC		20
1,1,1-Trichloroethane	ND	ND	ug/l	NC		20
1,1-Dichloropropene	ND	ND	ug/l	NC		20
Carbon tetrachloride	ND	ND	ug/l	NC		20
1,2-Dichloroethane	ND	ND	ug/l	NC		20
Benzene	ND	ND	ug/l	NC		20
Trichloroethene	ND	ND	ug/l	NC		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1469593-5 QC Sample: L2109242-01 Client ID: DUP Sample						
1,2-Dichloropropane	ND	ND	ug/l	NC		20
Bromodichloromethane	5.2	5.1	ug/l	2		20
Dibromomethane	ND	ND	ug/l	NC		20
cis-1,3-Dichloropropene	ND	ND	ug/l	NC		20
Toluene	ND	ND	ug/l	NC		20
trans-1,3-Dichloropropene	ND	ND	ug/l	NC		20
1,1,2-Trichloroethane	ND	ND	ug/l	NC		20
1,3-Dichloropropane	ND	ND	ug/l	NC		20
Tetrachloroethene	ND	ND	ug/l	NC		20
Dibromochloromethane	2.1	2.2	ug/l	5		20
1,2-Dibromoethane	ND	ND	ug/l	NC		20
Chlorobenzene	ND	ND	ug/l	NC		20
1,1,1,2-Tetrachloroethane	ND	ND	ug/l	NC		20
Ethylbenzene	ND	ND	ug/l	NC		20
p/m-Xylene	ND	ND	ug/l	NC		20
o-Xylene	ND	ND	ug/l	NC		20
Styrene	ND	ND	ug/l	NC		20
Isopropylbenzene	ND	ND	ug/l	NC		20
Bromoform	ND	ND	ug/l	NC		20
1,1,2,2-Tetrachloroethane	ND	ND	ug/l	NC		20
1,2,3-Trichloropropane	ND	ND	ug/l	NC		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1469593-5 QC Sample: L2109242-01 Client ID: DUP Sample						
Xylene (Total)[1]	ND	ND	ug/l	NC		20
n-Propylbenzene	ND	ND	ug/l	NC		20
Bromobenzene	ND	ND	ug/l	NC		20
Trihalomethanes, Total	12	12	ug/l	2		20
1,3,5-Trimethylbenzene	ND	ND	ug/l	NC		20
o-Chlorotoluene	ND	ND	ug/l	NC		20
p-Chlorotoluene	ND	ND	ug/l	NC		20
tert-Butylbenzene	ND	ND	ug/l	NC		20
1,2,4-Trimethylbenzene	ND	ND	ug/l	NC		20
sec-Butylbenzene	ND	ND	ug/l	NC		20
p-Isopropyltoluene	ND	ND	ug/l	NC		20
1,3-Dichlorobenzene	ND	ND	ug/l	NC		20
1,4-Dichlorobenzene	ND	ND	ug/l	NC		20
n-Butylbenzene	ND	ND	ug/l	NC		20
1,2-Dichlorobenzene	ND	ND	ug/l	NC		20
1,2-Dibromo-3-chloropropane	ND	ND	ug/l	NC		20
1,2,4-Trichlorobenzene	ND	ND	ug/l	NC		20
Hexachlorobutadiene	ND	ND	ug/l	NC		20
Naphthalene	ND	ND	ug/l	NC		20
1,2,3-Trichlorobenzene	ND	ND	ug/l	NC		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1469593-5 QC Sample: L2109242-01 Client ID: DUP Sample						

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichlorobenzene-d4	106		104		80-120
4-Bromofluorobenzene	100		99		80-120

METALS

Project Name: 580 MAIN ST
Project Number: Not Specified
Lab Number: L2109646
Report Date: 03/05/21

SAMPLE RESULTS

Lab ID: L2109646-01
Client ID: TW-3
Sample Location: BOLTON
Sample Depth:
Matrix: Dw

Date Collected: 02/26/21 14:15
Date Received: 02/26/21
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.300		mg/l	0.100	--	1	03/02/21 12:32	03/04/21 19:56	EPA 3005A	19,200.7	BV
Antimony, Total	ND		mg/l	0.0040	--	1	03/02/21 12:32	03/02/21 16:03	EPA 3005A	3,200.8	AM
Arsenic, Total	0.0016		mg/l	0.0010	--	1	03/02/21 12:32	03/02/21 16:03	EPA 3005A	3,200.8	AM
Barium, Total	0.0104		mg/l	0.0010	--	1	03/02/21 12:32	03/02/21 16:03	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.0010	--	1	03/02/21 12:32	03/02/21 16:03	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.0002	--	1	03/02/21 12:32	03/02/21 16:03	EPA 3005A	3,200.8	AM
Calcium, Total	35.1		mg/l	0.100	--	1	03/02/21 12:32	03/04/21 19:56	EPA 3005A	19,200.7	BV
Chromium, Total	ND		mg/l	0.0010	--	1	03/02/21 12:32	03/02/21 16:03	EPA 3005A	3,200.8	AM
Copper, Total	ND		mg/l	0.010	--	1	03/02/21 12:32	03/04/21 19:56	EPA 3005A	19,200.7	BV
Iron, Total	0.811		mg/l	0.050	--	1	03/02/21 12:32	03/04/21 19:56	EPA 3005A	19,200.7	BV
Magnesium, Total	7.00		mg/l	0.100	--	1	03/02/21 12:32	03/04/21 19:56	EPA 3005A	19,200.7	BV
Manganese, Total	0.155		mg/l	0.010	--	1	03/02/21 12:32	03/04/21 19:56	EPA 3005A	19,200.7	BV
Mercury, Total	ND		mg/l	0.0002	--	1	03/02/21 13:24	03/04/21 17:10	EPA 245.1	3,245.1	NB
Nickel, Total	ND		mg/l	0.0020	--	1	03/02/21 12:32	03/02/21 16:03	EPA 3005A	3,200.8	AM
Potassium, Total	3.02		mg/l	2.50	--	1	03/02/21 12:32	03/04/21 19:56	EPA 3005A	19,200.7	BV
Selenium, Total	ND		mg/l	0.0050	--	1	03/02/21 12:32	03/02/21 16:03	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.007	--	1	03/02/21 12:32	03/04/21 19:56	EPA 3005A	19,200.7	BV
Sodium, Total	10.0		mg/l	2.00	--	1	03/02/21 12:32	03/04/21 19:56	EPA 3005A	19,200.7	BV
Thallium, Total	ND		mg/l	0.0010	--	1	03/02/21 12:32	03/02/21 16:03	EPA 3005A	3,200.8	AM
Zinc, Total	ND		mg/l	0.050	--	1	03/02/21 12:32	03/04/21 19:56	EPA 3005A	19,200.7	BV
Total Hardness by SM 2340B - Mansfield Lab											
Hardness	116		mg/l	0.660	NA	1	03/02/21 12:32	03/04/21 19:56	EPA 3005A	19,200.7	BV

Project Name: 580 MAIN ST **Lab Number:** L2109646

Project Number: Not Specified **Report Date:** 03/05/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1469285-1										
Antimony, Total	ND		mg/l	0.0040	--	1	03/02/21 12:32	03/02/21 15:46	3,200.8	AM
Arsenic, Total	ND		mg/l	0.0010	--	1	03/02/21 12:32	03/02/21 15:46	3,200.8	AM
Barium, Total	ND		mg/l	0.0010	--	1	03/02/21 12:32	03/02/21 15:46	3,200.8	AM
Beryllium, Total	ND		mg/l	0.0010	--	1	03/02/21 12:32	03/02/21 15:46	3,200.8	AM
Cadmium, Total	ND		mg/l	0.0002	--	1	03/02/21 12:32	03/02/21 15:46	3,200.8	AM
Chromium, Total	ND		mg/l	0.0010	--	1	03/02/21 12:32	03/02/21 15:46	3,200.8	AM
Nickel, Total	ND		mg/l	0.0020	--	1	03/02/21 12:32	03/02/21 15:46	3,200.8	AM
Selenium, Total	ND		mg/l	0.0050	--	1	03/02/21 12:32	03/02/21 15:46	3,200.8	AM
Thallium, Total	ND		mg/l	0.0010	--	1	03/02/21 12:32	03/02/21 15:46	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1469286-1										
Aluminum, Total	ND		mg/l	0.100	--	1	03/02/21 12:32	03/04/21 19:47	19,200.7	BV
Calcium, Total	ND		mg/l	0.100	--	1	03/02/21 12:32	03/04/21 19:47	19,200.7	BV
Copper, Total	ND		mg/l	0.010	--	1	03/02/21 12:32	03/04/21 19:47	19,200.7	BV
Iron, Total	ND		mg/l	0.050	--	1	03/02/21 12:32	03/04/21 19:47	19,200.7	BV
Magnesium, Total	ND		mg/l	0.100	--	1	03/02/21 12:32	03/04/21 19:47	19,200.7	BV
Manganese, Total	ND		mg/l	0.010	--	1	03/02/21 12:32	03/04/21 19:47	19,200.7	BV
Potassium, Total	ND		mg/l	2.50	--	1	03/02/21 12:32	03/04/21 19:47	19,200.7	BV
Silver, Total	ND		mg/l	0.007	--	1	03/02/21 12:32	03/04/21 19:47	19,200.7	BV
Sodium, Total	ND		mg/l	2.00	--	1	03/02/21 12:32	03/04/21 19:47	19,200.7	BV
Zinc, Total	ND		mg/l	0.050	--	1	03/02/21 12:32	03/04/21 19:47	19,200.7	BV

Prep Information

Digestion Method: EPA 3005A

Project Name: 580 MAIN ST
Project Number: Not Specified
Lab Number: L2109646
Report Date: 03/05/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Hardness by SM 2340B - Mansfield Lab for sample(s): 01 Batch: WG1469286-1										
Hardness	ND		mg/l	0.660	NA	1	03/02/21 12:32	03/04/21 19:47	19,200.7	BV

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1469287-1										
Mercury, Total	ND		mg/l	0.0002	--	1	03/02/21 13:24	03/04/21 17:03	3,245.1	NB

Prep Information

Digestion Method: EPA 245.1

Lab Control Sample Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1469285-2								
Antimony, Total	90		-		85-115	-		
Arsenic, Total	95		-		85-115	-		
Barium, Total	94		-		85-115	-		
Beryllium, Total	95		-		85-115	-		
Cadmium, Total	103		-		85-115	-		
Chromium, Total	91		-		85-115	-		
Nickel, Total	88		-		85-115	-		
Selenium, Total	95		-		85-115	-		
Thallium, Total	93		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1469286-2								
Aluminum, Total	99		-		85-115	-		
Calcium, Total	104		-		85-115	-		
Copper, Total	105		-		85-115	-		
Iron, Total	102		-		85-115	-		
Magnesium, Total	104		-		85-115	-		
Manganese, Total	101		-		85-115	-		
Potassium, Total	106		-		85-115	-		
Silver, Total	106		-		85-115	-		
Sodium, Total	108		-		85-115	-		
Zinc, Total	111		-		85-115	-		

Lab Control Sample Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 Batch: WG1469286-2					
Hardness	104	-	85-115	-	
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1469287-2					
Mercury, Total	88	-	85-115	-	

Matrix Spike Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1469285-3 QC Sample: L2109646-01 Client ID: TW-3												
Antimony, Total	ND	0.5	0.4564	91		-	-		70-130	-		20
Arsenic, Total	0.0016	0.12	0.1178	97		-	-		70-130	-		20
Barium, Total	0.0104	2	1.919	95		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.0487	97		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.0526	103		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.1818	91		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4430	89		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1220	102		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1105	92		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1469286-3 QC Sample: L2109646-01 Client ID: TW-3												
Aluminum, Total	0.300	2	2.27	98		-	-		75-125	-		20
Calcium, Total	35.1	10	45.3	102		-	-		75-125	-		20
Copper, Total	ND	0.25	0.264	106		-	-		75-125	-		20
Iron, Total	0.811	1	1.80	99		-	-		75-125	-		20
Magnesium, Total	7.00	10	16.9	99		-	-		75-125	-		20
Manganese, Total	0.155	0.5	0.648	99		-	-		75-125	-		20
Potassium, Total	3.02	10	13.4	104		-	-		75-125	-		20
Silver, Total	ND	0.05	0.053	106		-	-		75-125	-		20
Sodium, Total	10.0	10	20.7	107		-	-		75-125	-		20
Zinc, Total	ND	0.5	0.559	112		-	-		75-125	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1469286-3 QC Sample: L2109646-01 Client ID: TW-3									
Hardness	116	66.2	183	101	-	-	75-125	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1469287-3 QC Sample: L2109646-01 Client ID: TW-3									
Mercury, Total	ND	0.005	0.0045	90	-	-	70-130	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: 580 MAIN ST

Project Number: Not Specified

Lab Number: L2109646

Report Date: 03/05/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1469285-4 QC Sample: L2109646-01 Client ID: TW-3						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	0.0016	0.0017	mg/l	2		20
Barium, Total	0.0104	0.0103	mg/l	1		20
Beryllium, Total	ND	ND	mg/l	NC		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	ND	mg/l	NC		20
Selenium, Total	ND	ND	mg/l	NC		20
Thallium, Total	ND	ND	mg/l	NC		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: 580 MAIN ST

Project Number: Not Specified

Lab Number: L2109646

Report Date: 03/05/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1469286-4 QC Sample: L2109646-01 Client ID: TW-3					
Aluminum, Total	0.300	0.299	mg/l	0	20
Calcium, Total	35.1	35.2	mg/l	0	20
Copper, Total	ND	ND	mg/l	NC	20
Iron, Total	0.811	0.823	mg/l	1	20
Magnesium, Total	7.00	7.02	mg/l	0	20
Manganese, Total	0.155	0.155	mg/l	0	20
Potassium, Total	3.02	2.96	mg/l	2	20
Silver, Total	ND	ND	mg/l	NC	20
Sodium, Total	10.0	10.1	mg/l	1	20
Zinc, Total	ND	ND	mg/l	NC	20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1469286-4 QC Sample: L2109646-01 Client ID: TW-3					
Hardness	116	117	mg/l	1	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1469287-4 QC Sample: L2109646-01 Client ID: TW-3					
Mercury, Total	ND	ND	mg/l	NC	20

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Serial Dilution Analysis
Batch Quality Control

Lab Number: L2109646
Report Date: 03/05/21

Parameter	Native Sample	Serial Dilution	Units	% D	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1469286-6 QC Sample: L2109646-01 Client ID: TW-3						
Calcium, Total	35.1	37.5	mg/l	7		20
Magnesium, Total	7.00	8.18	mg/l	17		20
Total Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1469286-6 QC Sample: L2109646-01 Client ID: TW-3						
Hardness	116	127	mg/l	9		20

INORGANICS
&
MISCELLANEOUS

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

SAMPLE RESULTS

Lab ID: L2109646-01
Client ID: TW-3
Sample Location: BOLTON

Date Collected: 02/26/21 14:15
Date Received: 02/26/21
Field Prep: Not Specified

Sample Depth:
Matrix: Dw

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Perchlorate by IC-MS-MS - Westborough Lab										
Perchlorate	ND		ug/l	0.050	--	1	-	03/02/21 14:15	71,332.0	AM
General Chemistry - Westborough Lab										
Turbidity	4.5		NTU	0.20	--	1	-	02/26/21 21:31	44,180.1	AS
Odor @ 60 C	NO ODOR		TON	1	--	1	-	02/26/21 16:57	121,2150B	AS
Color, Apparent	8.0		A.P.C.U.	5.0	--	1	-	02/26/21 20:37	121,2120B	AS
Alkalinity, Total	67.4		mg CaCO3/L	2.00	NA	1	-	03/01/21 14:45	121,2320B	JB
Solids, Total Dissolved	150		mg/l	10	--	1	-	03/02/21 07:25	121,2540C	DW
Cyanide, Total	ND		mg/l	0.005	--	1	03/01/21 10:35	03/01/21 15:35	121,4500CN-CE	CR
Fluoride	ND		mg/l	0.20	--	1	03/03/21 21:00	03/03/21 21:00	121,4500F-C	EN
pH (H)	7.9		SU	-	NA	1	-	02/26/21 21:43	121,4500H+-B	AS
Nitrogen, Nitrite	ND		mg/l	0.050	--	1	-	02/27/21 05:53	44,353.2	MR
Nitrogen, Nitrate	ND		mg/l	0.10	--	1	-	02/27/21 05:53	44,353.2	MR
Bacteria in Water - Westborough Lab										
Coliform, Total	Negative		col/100ml	-	NA	1	-	02/26/21 17:09	121,9223B	CC
Escherichia Coli	Negative		col/100ml	-	NA	1	-	02/26/21 17:09	121,9223B	CC
Anions by Ion Chromatography - Westborough Lab										
Chloride	35.2		mg/l	0.500	--	1	-	02/28/21 14:22	44,300.0	SH
Sulfate	18.1		mg/l	1.00	--	1	-	02/28/21 14:22	44,300.0	SH

Project Name: 580 MAIN ST **Lab Number:** L2109646

Project Number: Not Specified **Report Date:** 03/05/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1468783-1										
Odor	NO ODOR		TON	1	--	1	-	02/26/21 16:57	121,2150B	AS
Bacteria in Water - Westborough Lab for sample(s): 01 Batch: WG1468819-1										
Coliform, Total	Negative		col/100ml	-	NA	1	-	02/26/21 17:09	121,9223B	CC
Escherichia Coli	Negative		col/100ml	-	NA	1	-	02/26/21 17:09	121,9223B	CC
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1468843-1										
Turbidity	ND		NTU	0.20	--	1	-	02/26/21 21:31	44,180.1	AS
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1468889-1										
Nitrogen, Nitrate	ND		mg/l	0.10	--	1	-	02/27/21 05:29	44,353.2	MR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1468890-1										
Nitrogen, Nitrite	ND		mg/l	0.050	--	1	-	02/27/21 05:32	44,353.2	MR
Anions by Ion Chromatography - Westborough Lab for sample(s): 01 Batch: WG1469105-1										
Sulfate	ND		mg/l	1.00	--	1	-	02/28/21 12:10	44,300.0	SH
Anions by Ion Chromatography - Westborough Lab for sample(s): 01 Batch: WG1469105-1										
Chloride	ND		mg/l	0.500	--	1	-	02/28/21 12:10	44,300.0	SH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1469229-1										
Cyanide, Total	ND		mg/l	0.005	--	1	03/01/21 10:35	03/01/21 15:18	121,4500CN-CE	CR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1469349-1										
Alkalinity, Total	ND		mg CaCO3/L	2.00	NA	1	-	03/01/21 14:45	121,2320B	JB
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1469538-1										
Solids, Total Dissolved	ND		mg/l	10	--	1	-	03/02/21 07:25	121,2540C	DW
Perchlorate by IC-MS-MS - Westborough Lab for sample(s): 01 Batch: WG1469745-1										
Perchlorate	ND		ug/l	0.050	--	1	-	03/02/21 13:23	71,332.0	AM
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1470347-1										
Fluoride	ND		mg/l	0.20	--	1	03/03/21 21:00	03/03/21 21:00	121,4500F-C	EN

Lab Control Sample Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1468841-1								
pH	100		-		99-101	-		5
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1468843-2								
Turbidity	108		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1468889-2								
Nitrogen, Nitrate	98		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1468890-2								
Nitrogen, Nitrite	96		-		90-110	-		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 Batch: WG1469105-2								
Chloride	103		-		90-110	-		
Sulfate	103		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1469229-2								
Cyanide, Total	93		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1469349-2								
Alkalinity, Total	106		-		90-110	-		10

Lab Control Sample Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1469538-2					
Solids, Total Dissolved	89	-	80-120	-	
Perchlorate by IC-MS-MS - Westborough Lab Associated sample(s): 01 Batch: WG1469745-2					
Perchlorate	103	-	80-120	-	20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1470347-2					
Fluoride	93	-	78-115	-	

Matrix Spike Analysis
Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1468889-4 QC Sample: L2109646-01 Client ID: TW-3												
Nitrogen, Nitrate	ND	4	3.9	98		-	-		83-113	-		6
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1468890-4 QC Sample: L2109646-01 Client ID: TW-3												
Nitrogen, Nitrite	ND	4	3.7	92		-	-		80-120	-		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1469105-3 QC Sample: L2109646-01 Client ID: TW-3												
Chloride	35.2	4	38.0	**69**	Q	-	-		90-110	-		18
Sulfate	18.1	8	25.3	**89**	Q	-	-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1469229-4 QC Sample: L2109782-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.195	98		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1469349-4 QC Sample: L2109398-01 Client ID: MS Sample												
Alkalinity, Total	63.4	100	160	97		-	-		86-116	-		10
Perchlorate by IC-MS-MS - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1469745-3 WG1469745-4 QC Sample: L2109646-01 Client ID: TW-3												
Perchlorate	ND	0.05	0.062	86		0.064	92		80-120	5		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1470347-4 QC Sample: L2109646-01 Client ID: TW-3												
Fluoride	ND	2	1.9	96		-	-		69-124	-		13

Lab Duplicate Analysis

Batch Quality Control

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1468783-2 QC Sample: L2109646-01 Client ID: TW-3						
Odor	NO ODOR	NO ODOR	TON	NC		
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1468839-1 QC Sample: L2109646-01 Client ID: TW-3						
Color, Apparent	8.0	8.0	A.P.C.U.	0		
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1468841-2 QC Sample: L2109301-01 Client ID: DUP Sample						
pH	7.1	7.1	SU	0		5
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1468843-3 QC Sample: L2109646-01 Client ID: TW-3						
Turbidity	4.5	4.6	NTU	2		13
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1468889-3 QC Sample: L2109646-01 Client ID: TW-3						
Nitrogen, Nitrate	ND	ND	mg/l	NC		6
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1468890-3 QC Sample: L2109646-01 Client ID: TW-3						
Nitrogen, Nitrite	ND	ND	mg/l	NC		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1469105-4 QC Sample: L2109646-01 Client ID: TW-3						
Chloride	35.2	35.4	mg/l	1		18
Sulfate	18.1	18.2	mg/l	1		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1469229-3 QC Sample: L2109798-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30

Lab Duplicate Analysis

Batch Quality Control

Project Name: 580 MAIN ST

Project Number: Not Specified

Lab Number: L2109646

Report Date: 03/05/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1469349-3 QC Sample: L2109398-01 Client ID: DUP Sample					
Alkalinity, Total	63.4	62.5	mg CaCO3/L	1	10
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1469538-3 QC Sample: L2110038-01 Client ID: DUP Sample					
Solids, Total Dissolved	190	200	mg/l	5	10
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1470347-3 QC Sample: L2109646-01 Client ID: TW-3					
Fluoride	ND	ND	mg/l	NC	13

Project Name: 580 MAIN ST
Project Number: Not Specified

Lab Number: L2109646
Report Date: 03/05/21

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2109646-01A	Vial HCl preserved	A	NA		5.2	Y	Absent		524.2(14)
L2109646-01B	Vial HCl preserved	A	NA		5.2	Y	Absent		524.2(14)
L2109646-01C	Bacteria Cup Na2S2O3 preserved	A	NA		5.2	Y	Absent		T-COLI-C(1.25)
L2109646-01D	Bacteria Cup Na2S2O3 preserved	A	NA		5.2	Y	Absent		T-COLI-C(1.25)
L2109646-01E	Bacteria Cup unpreserved	A	NA		5.2	Y	Absent		PERC-332(28)
L2109646-01F	Plastic 250ml unpreserved	A	NA		5.2	Y	Absent		PERC-332(28)
L2109646-01G	Plastic 250ml unpreserved/No Headspace	A	NA		5.2	Y	Absent		ALK-T-2320(14)
L2109646-01H	Plastic 250ml NaOH preserved	A	>12	>12	5.2	Y	Absent		TCN-4500(14)
L2109646-01I	Plastic 250ml HNO3 preserved	A	<2	<2	5.2	Y	Absent		CD-2008T(180),AG-UI(180),NI-2008T(180),CA-UI(180),ZN-UI(180),BE-2008T(180),K-UI(180),MG-UI(180),FE-UI(180),HARDU(180),SE-2008T(180),HG-U(28),AS-2008T(180),AL-UI(180),MN-UI(180),BA-2008T(180),NA-UI(180),CU-UI(180),TL-2008T(180),CR-2008T(180),SB-2008T(180)
L2109646-01J	Plastic 950ml HNO3 preserved	A	<2	<2	5.2	Y	Absent		CD-2008T(180),AG-UI(180),NI-2008T(180),CA-UI(180),ZN-UI(180),BE-2008T(180),K-UI(180),MG-UI(180),FE-UI(180),HARDU(180),SE-2008T(180),HG-U(28),AS-2008T(180),AL-UI(180),MN-UI(180),BA-2008T(180),NA-UI(180),CU-UI(180),TL-2008T(180),CR-2008T(180),SB-2008T(180)
L2109646-01K	Plastic 950ml unpreserved	A	7	7	5.2	Y	Absent		F-4500(28),SO4-300(28),CL-300(28),NO2-353(2),TURB-180(2),NO3-353(2),PH-4500(.01),TDS-2540(7)
L2109646-01L	Amber 950ml unpreserved	A	7	7	5.2	Y	Absent		COLOR-A-2120(2),ODOR-2150(1)
L2109646-02A	Vial HCl preserved	A	NA		5.2	Y	Absent		524.2(14)
L2109646-02B	Vial HCl preserved	A	NA		5.2	Y	Absent		524.2(14)

*Values in parentheses indicate holding time in days

Project Name:	580 MAIN ST	**Lab Number:**	L2109646
Project Number:	Not Specified	**Report Date:**	03/05/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	580 MAIN ST	**Lab Number:**	L2109646
Project Number:	Not Specified	**Report Date:**	03/05/21

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Project Name: 580 MAIN ST **Lab Number:** L2109646

Project Number: Not Specified **Report Date:** 03/05/21

Data Qualifiers

the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

Project Name: 580 MAIN ST **Lab Number:** L2109646
Project Number: Not Specified **Report Date:** 03/05/21

REFERENCES

3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.

16 Methods for the Determination of Organic Compounds in Drinking Water - Supplement II. EPA/600/R-92/129, August 1992.

19 Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes. Appendix C, Part 136, 40 CFR (Code of Federal Regulations). July 1, 1999 edition.

44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.

71 Determination of Perchlorate in Drinking Water by Ion Chromatography with Suppressed Conductivity and Electrospray Ionization Mass Spectrometry. EPA Method 332.0, EPA/600/R-05/049. Revision 1.0, March 2005.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene
EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D/8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE ____ OF ____

ALPHA ANALYTICAL
8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220
320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Date Rec'd in Lab: 2/26/21

ALPHA Job #: L2109696

Project Information

Project Name: 580 MAIN ST
Project Location: BOLTON
Project #:
Project Manager: Susan Hunnewell
ALPHA Quote #:

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due:

Report Information - Data Deliverables

☐ ADEx ☐ EMAIL

Billing Information

☐ Same as Client info PO #:

Client Information

Client: Onsite Engineering
Address: 279 East Central St
PMB 241, Franklin MA
Phone: Cell (978) 660-2752
Email: shunnewell@onsite-eng.com

Regulatory Requirements & Project Information Requirements

☐ Yes ☒ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Additional Project Information:

Test well #3 - Potential future public water supply

ANALYSIS

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC: ☐ 8260 ☐ 624 ☒ 524.2	SVOC: ☐ ABN ☐ PAH	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13	EPH: ☐ Ranges & Targets ☐ Ranges Only	VPH: ☐ Ranges & Targets ☐ Ranges Only	☐ PCB ☐ PEST	TPH: ☐ Quant Only ☐ Fingerprint	Total Coliform	Inorganics (Drinking Water)	Sec. Contaminants (Drinking)	Perchlorate	Nitrite/Nitrate	SAMPLE INFO (Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do) Sample Comments	TOTAL # BOTTLES
09696-01	TW-3	2/26	2:15			X								X	X	X	X	X		
-02	TRIP BLANK																			

Container Type	
Preservative	

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Susan Hunnewell	2/26 @ 2:56	Cjelbeau ATL	2/26/21 1456

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

APPENDIX D
TRAFFIC IMPACT ASSESSMENT

Traffic Impact Assessment

TEC Project File No. T1120

580 Main Street

Bolton, Massachusetts

On Behalf of: **A Limited Dividend Affiliate of WP East Acquisitions, LLC**
91 Hartwell Avenue
Lexington, Massachusetts 02421

Prepared by: **TEC, Inc.**
146 Dascomb Road
Andover, Massachusetts 01810

I have reviewed this document as it relates to the proposed design and have determined the design to be safe for public health and welfare in conformity with accepted engineering standards.

Elizabeth Oltman, PE
Senior Project Engineer

September 30, 2021

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

I. INTRODUCTION

TEC, Inc. (TEC) has been retained by a Limited Dividend Affiliate of WP East Acquisitions, LLC (the "Applicant"), to prepare a Traffic Impact Assessment (TIA) associated with a proposed 229 multi-family unit development at 580 Main Street (Route 117) in Bolton, Massachusetts. The site is currently occupied by a 105,000 square foot (SF) office building, a portion of which will be demolished and approximately 50,000 SF of which will remain. Access/egress for the site will be provided via the existing Bolton Office Park Driveway onto Main Street (Route 117), which is under the jurisdiction of the Town of Bolton. The Bolton Office Park Driveway also provides access to the Bolton Country Manor, an age-restricted residential building.

TEC has evaluated the traffic operations for the site driveway and study area intersections under existing and future conditions. The future year planning horizon examines traffic operations under existing conditions (2021), as well as a 7-year design horizon (2028) for traffic volume projections, which includes an evaluation of the No Build conditions (without the proposed project) and Build conditions (with site traffic added). These conditions are compared to determine what, if any, additional off-site mitigation is necessary to provide reasonable traffic operations in the area after the project is complete.

II. EXISTING CONDITIONS

TRAFFIC STUDY AREA

A comprehensive field inventory of existing traffic conditions on the study area corridors and intersections was conducted during various site visits by TEC staff. The field investigations consisted of existing roadway geometrics, operating characteristics, and study area safety. The study area was selected to contain the major roadways providing local access/egress to/from the project site.

Study Area Intersections

The study area was selected to contain the major roadways providing local access/egress to/from the project site. The following intersections were therefore evaluated as part of the study area:

1. Bolton Office Park Driveway / Main Street (Route 117)
2. I-495 Southbound Ramps / Main Street (Route 117)
3. I-495 Northbound Ramps / Main Street (Route 117)

The study area intersections and project site are shown graphically in Figure 1.

GEOMETRY

TEC staff conducted a comprehensive field inventory of the existing traffic conditions within the study area in June 2021. The field investigation consisted of an inventory of existing roadway geometrics, operating characteristics, and safety characteristics. A description of the existing roadway and intersection inventory is provided below.

229 Multi-Family Units - Bolton, Massachusetts
Traffic Impact Assessment

Figure 1

Project Location Map & Study Area Intersections

TEC
The Engineering Corp

T:\T1120\CAD\Highway\Graphics\T1120_Bolton 229 Multi-Family Units Locus Map.dwg 6/22/2021 4:10:46 PM

Roadways

Main Street (Route 117)

Main Street (Route 117) is an east-west rural minor arterial roadway under the jurisdiction of the Town of Bolton. The roadway provides regional connection between area communities and I-495. Main Street (Route 117) generally provides one travel lane in each direction with exclusive left turn lanes at some intersecting streets. Main Street (Route 117) provides two travel lanes westbound and one travel lane eastbound in the vicinity of its interchange with I-495. Main Street (Route 117) provides a full interchange with I-495 east of the subject site. Directional flow along Main Street (Route 117) is separated by a marked centerline. The posted speed limit is 40 miles per hour (MPH). Sidewalks and bicycle lanes are not provided along either side of the roadway within the study area. Land uses along Main Street (Route 117) are primarily commercial and residential.

Intersections

Bolton Office Park Driveway / Main Street (Route 117)

The Bolton Office Park Driveway intersects Main Street (Route 117) to form a three-legged unsignalized intersection. The Bolton Office Park Driveway is under STOP-control while the Main Street (Route 117) westbound and eastbound approaches are free-flowing. Main Street (Route 117) eastbound approach consists of a single general-purpose lane and the westbound approach consists of an exclusive left turn lane and a through lane. Directional flow along Main Street (Route 117) is separated by a marked centerline. The Bolton Office Park Driveway northbound approach consists of single wide general-purpose lane with directional flow separated by a raised landscaped median island. Sidewalks are provided on the south side of Main Street (Route 117) extending to the west of the Bolton Office Park Driveway. There are no striped crosswalks across the Bolton Office Park Driveway or Main Street (Route 117). No bicycle accommodations are provided at the intersection.

I-495 Southbound Ramps / Sugar Road / Main Street (Route 117)

I-495 Southbound Ramps intersect Main Street (Route 117) opposite Sugar Road to form a four-legged, fully-actuated, signalized intersection. The Main Street (Route 117) eastbound approach consists of a channelized right turn lane, a through lane, and an exclusive left turn lane. The Main Street (Route 117) westbound approach consists of a exclusive left turn lane, a through lane, and a shared through/right turn lane. Directional flow along Main Street (Route 117) is separated by a marked centerline. The Sugar Road southbound approach consists of a single general-purpose lane with directional flow separted by a marked centerline. The I-495 Southbound Ramps northbound approach consists of an exclusive left turn lane, a through lane, and a channelized right turn lane. Sidewalks and crosswalks are not provided at the intersection. There are no bicycle accomodations at the intersection.

I-495 Northbound Ramps / Main Street (Route 117)

I-495 Northbound Ramps intersect Main Street (Route 117) to form a three-legged, fully-actuated, signalized intersection. The Main Street (Route 117) eastbound approach consists of an exclusive left turn lane and a through lane. The Main Street (Route 117) westbound approach consists of an channelized right turn lane and a through lane. Directional flow along Main Street (Route 117) west of the intersection is separated by a marked centerline, while Main Street (Route 117) east

of the intersection is separated by a median pavement marking approximately 350 feet long. The I-495 Northbound Ramps southbound approach consists of a channelized right turn lane and an exclusive left turn lane. Sidewalks and crosswalks are not provided at the intersection. There are no bicycle accomodations at the intersection.

Public Transportation

Currently, there are no public transportation services provided within the study area.

EXISTING TRAFFIC VOLUMES

Traffic volume data for this report was obtained from Manual Turning Movement Counts (TMCs) and supplemented with Automatic Traffic Recorder (ATR) counts conducted at the study area intersections. The details of the data collection effort for this project are described below.

Turning Movement Counts

To establish existing traffic volume conditions within the study area, manual Turning Movement Counts (TMCs) were conducted during a typical weekday morning (6:00 AM – 9:00 AM) and weekday evening (4:00 PM – 7:00 PM) peak periods on Thursday, June 10, 2021. Area schools were in regular session during the time of the traffic counts and regular activities were scheduled at the Bolton Country Manor. Occupancy of the existing office building was reduced due to increased work-from-home options provided by employers. The weekday morning peak hour occurred between 7:15 AM and 8:15 AM and the weekday evening peak hour occurred between 4:30 PM and 5:30 PM. A detailed summary of the TMCs, partitioned into 15-minute intervals, is provided within Appendix A.

Automatic Traffic Recorder Counts

Automatic Traffic Recorder (ATR) counts were conducted for a continuous 48-hour mid-week period on Main Street (Route 117), east of the Bolton Office Park Driveway / Main Street (Route 117) intersection on Wednesday, June 9, 2021 through Thursday, June 10, 2021. A summary of the weekday ATR traffic data is presented in Table 1. A detailed summary of the ATR data, partitioned into 15-minute intervals, is provided within Appendix B.

Table 1 –Existing Weekday Traffic Volume Summary

Location	Weekday Traffic Volume[a]	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
		Traffic Volume[b]	K Factor[c]	Directional Distribution	Traffic Volume	K Factor	Directional Distribution
Main Street east of Office Park Driveway	21,973	1,522	6.9%	43.7% WB	1,587	7.2%	57.2% WB

[a] Daily traffic expressed in vehicles per day
[b] Hourly traffic expressed in vehicles per hour
[c] Percent of daily traffic volumes which occurs during the peak hour
[d] Percent of peak-hour volume in the predominant direction of travel
EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound

The 85th percentile speed, or the speed at which 85 percent of the vehicles are traveling at or below, along Main Street (Route 117) was recorded as 40 mph in the eastbound direction and 43 mph in the westbound direction.

Seasonal Adjustments

In accordance with Massachusetts Department of Transportation (MassDOT) standards, traffic volumes are typically adjusted to average month conditions. To account for seasonal adjustment, TEC utilized MassDOT's weekday seasonal and axle correction factors as published in 2019 (most recent year published). The factors provide a month-to-month overview of traffic volumes statewide by roadway functional classification and land (urban vs. rural) type. For rural minor arterials, traffic volumes in the month of June were approximately eight percent higher than average month conditions. Therefore, the June 2021 traffic volumes were not adjusted in order to reflect a conservative seasonal analysis scenario. The compiled seasonal adjustment data is provided in Appendix C.

COVID-19 Pandemic Adjustments

Traffic volumes have been affected by and since the onset of the COVID-19 pandemic. During the peak of the pandemic, many schools were teaching remotely and/or teaching a hybrid remote/in-person method and office buildings were closed to employees. During the June 2021 counts, Bolton schools had returned to full in-person learning and many businesses had reopened. However, many offices continued to offer work-from-home options. Therefore, the existing traffic volumes present along the Bolton Office Park Driveway were presumed to be only associated with activities associated with the Bolton Country Manor age-restricted residential building to be conservative. In order to account for any remaining traffic volume decrease, a COVID-19 traffic adjustment calculation was prepared.

TEC adjusted the June 2021 traffic counts based on a review of historic traffic volume data collected by MassDOT at a permanent count station along I-495 in the vicinity of Route 62, which represents the closest permanent count station to the subject site. Historical traffic volumes were compared between June 4, 2015 (upwardly adjusted to 2021 based upon MassDOT background growth rates), and June 3, 2021. The direct traffic volume comparison shows that traffic volumes for June 2021 were 11 percent lower than the comparable pre-pandemic traffic volumes. Therefore, the June 2021 traffic volumes were upwardly adjusted by 11 percent for both weekday peak hours.

The compiled COVID-19 comparison data is provided in Appendix C. The resulting 2021 Base Year Condition weekday morning and evening peak hour traffic volume networks are illustrated in Figure 2.

SAFETY ANALYSIS

Sight Distance

TEC visited the site in June 2021 and measured the available sight distances at the existing Bolton Office Park Driveway. The available sight lines were compared to minimum requirements established by the American Association of State Highway and Transportation Officials (AASHTO).

Sight distance represents the length of roadway that is visible to a driver traveling within the roadway. Two types of sight distance are typically evaluated for driveways and intersections: stopping sight distance (SSD) and intersection sight distance (ISD). SSD is the minimum distance required for a driver traveling along a roadway to perceive an object in the roadway and stop

safely in advance of the object when traveling on a wet pavement surface. SSD is measured from an eye height of 3.5 feet to an object height of 2 feet above the ground, which is equivalent to a driver viewing the taillight of a vehicle ahead. SSD is measured along the centerline of the travel lane approaching a driveway or intersection.

ISD represents the length of the roadway visible to a driver waiting to exit a driveway or minor street. Minimum ISD requirements are based on the distance required for a driver to exit a minor street onto a major street without requiring an approaching vehicle to reduce its speed from the design speed to less than 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet and is measured from a distance 15 feet beyond the edge of the travel-way of the major roadway to represent a driver waiting to exit a driveway or minor roadway.

SSD is typically considered the critical sight distance, as it represents the minimum distance required for safe stopping, while ISD represents and acceptable speed reduction for approaching vehicles. The ISD, however, must be at least equal to the minimum required SSD in order to prevent a driver from entering the roadway when an approaching vehicle is too close to safely stop. The guidance provided by AASHTO states:

> *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."*

Tables 2 and 3 provide a summary of the available sight distances at the site access roadway along Main Street (Route 117).

Table 2 – Existing Stopping Sight Distance Measurements

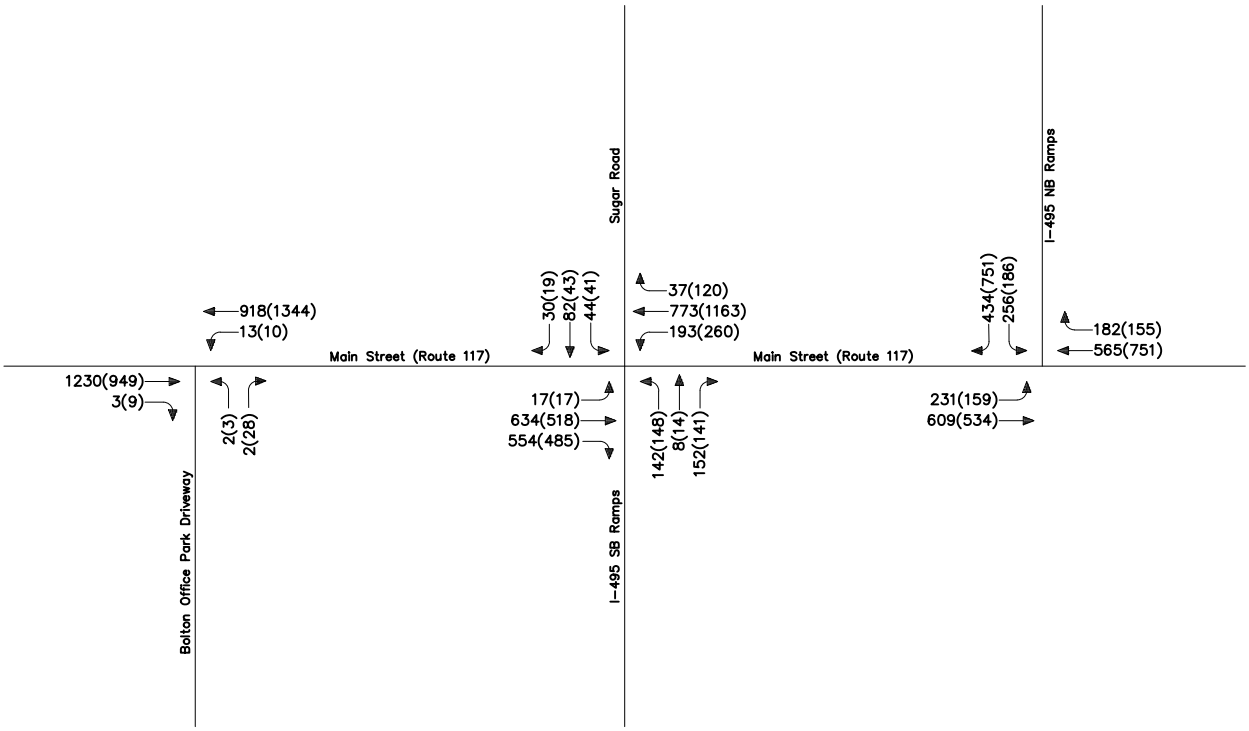
Approach / Direction	Operating Speed	AASHTO Recommended Minimum	Measured Stopping Sight Distance
Main Street (Route 117) at Site Access Roadway:			
West of Access	43 MPH	335 FT	> 400 FT
East of Access	40 MPH	305 FT	> 400 FT

Table 3 – Existing Intersection Sight Distance Measurements

Approach / Direction	Operating Speed	AASHTO Desired Minimum	Measured Intersection Sight Distance
Main Street (Route 117) at Site Access Roadway:			
West of Access	43 MPH	475 FT	>475 FT
East of Access	40 MPH	445 FT	>600 FT

As shown in Tables 2 and 3, the ISD and SSD along Main Street (Route 117) exceed AASHTO's minimum recommendations for safe operations at the site access.

Not to Scale



XXX(XXX) = Weekday Morning(Weekday Evening)

Figure 2

2021 Base Year Conditions
Weekday Morning and Weekday Evening
Peak Hour Traffic Volumes

TEC, Inc.
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Andover, MA 01810

Crash History and Summary

Crash data for the study area intersections was compiled and analyzed for the most recent consecutive six-year period (2014 - 2019) of complete data on file with MassDOT crash records. The motor vehicle crash data was reviewed to determine crash trends in the study area. A summary of the vehicle crash data and rates is provided in Table 4.

Five crashes were reported at the Bolton Office Park Driveway / Main Street (Route 117) intersection during the six-year study period. Of those crashes, one (1) was an angled crash, three (3) were rear-end crashes, and one (1) was a sideswipe crash. As less than one crash per year occurred at the intersection, no discernable crash trend exists.

A total of 53 crashes were reported at the I-495 Southbound Ramps and Main Street (Route 117) intersection during the six-year study period. Of those crashes, nineteen (19) were angled crashes, fifteen (15) were rear-end crashes, thirteen (13) were sideswipe crashes, and the remaining crashes were single vehicle crashes and a head-on crash.

A total of 17 crashes were reported at the I-495 Northbound Ramps and Main Street (Route 117) intersection during the six-year study period. Of those crashes, five (5) were angled crashes, nine (9) were rear-end crashes, and the remaining crashes were single sideswipe and single vehicle crashes.

The compiled crash data summary is provided in Appendix D.

Table 4 – Crash Data Summary

Parameter		Bolton Office Park Driveway/ Main Street (Route 117)	I-495 SB Ramps /Sugar Road / Main Street (Route 117)	I-495 NB Ramps / Main Street (Route 117)
Crash Year	2014	1	11	3
	2015	3	8	1
	2016	1	7	4
	2017	0	7	4
	2018	0	12	5
	2019	0	8	0
	TOTAL	***5***	***53***	***17***
Average Annual		***0.83***	***8.83***	***2.80***
Manner of Crash	Angle	1	19	5
	Rear-end	5	15	9
	Single Vehicle	0	4	1
	Sideswipe	1	13	2
	Head-on	0	1	0
	Other / NR	0	1	0
	TOTAL	***5***	***53***	***17***
Road Surface Conditions	Dry	4	38	13
	Wet	1	13	4
	Snow / Ice	0	2	0
	Other / Unknown	0	0	0
	TOTAL	***5***	***53***	***17***
Injury Status (Crash Severity)	Property Damage	5	46	12
	Non-Fatal Injury	0	7	4
	Fatal Injury	0	0	1
	Not Reported	0	0	0
	TOTAL	***5***	***53***	***17***
Time of Day	6:00AM-9:00AM	2	7	2
	9:00AM-12:00PM	0	12	4
	12:00PM-3:00PM	0	8	2
	3:00PM-6:00PM	2	11	8
	6:00PM-9:00PM	1	12	1
	9:00PM-6:00AM	0	3	0
	TOTAL	***5***	***53***	***17***

III. FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2028, which reflects a 7-year planning horizon. The traffic conditions for the year 2028, under No Build conditions, were developed to document the operating conditions independent of the potential development, including all existing traffic, new traffic resulting from general background growth, and new traffic generated by approved developments that may impact the study area. Anticipated site generated traffic volumes for the potential development were superimposed upon the No Build traffic networks to reflect the Build conditions with the potential new development traffic.

BACKGROUND TRAFFIC GROWTH

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 ambient growth rate for the area roadways and applies that percentage to all mainline and side street traffic volumes. The drawback to such a procedure is that some turning volumes may 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, the drawback of this procedure is that the potential growth in population and development external to the study area would not be accounted for in the traffic projections. To provide a conservative analysis framework, both procedures were used.

General Ambient Growth

To determine future traffic growth projections, TEC reutilized the MassDOT published year-by-year annual growth data between 2016 and 2019. The data indicates that for rural minor arterials, traffic volumes between 2016 and 2019 grew at an average of 0.8 percent per year. To provide a conservative analysis scenario, the average 0.8 percent growth rate per year was compounded annually to represent background traffic growth. The MassDOT Yearly Growth Rates for dates from 2016 to 2019 is provided in Appendix E.

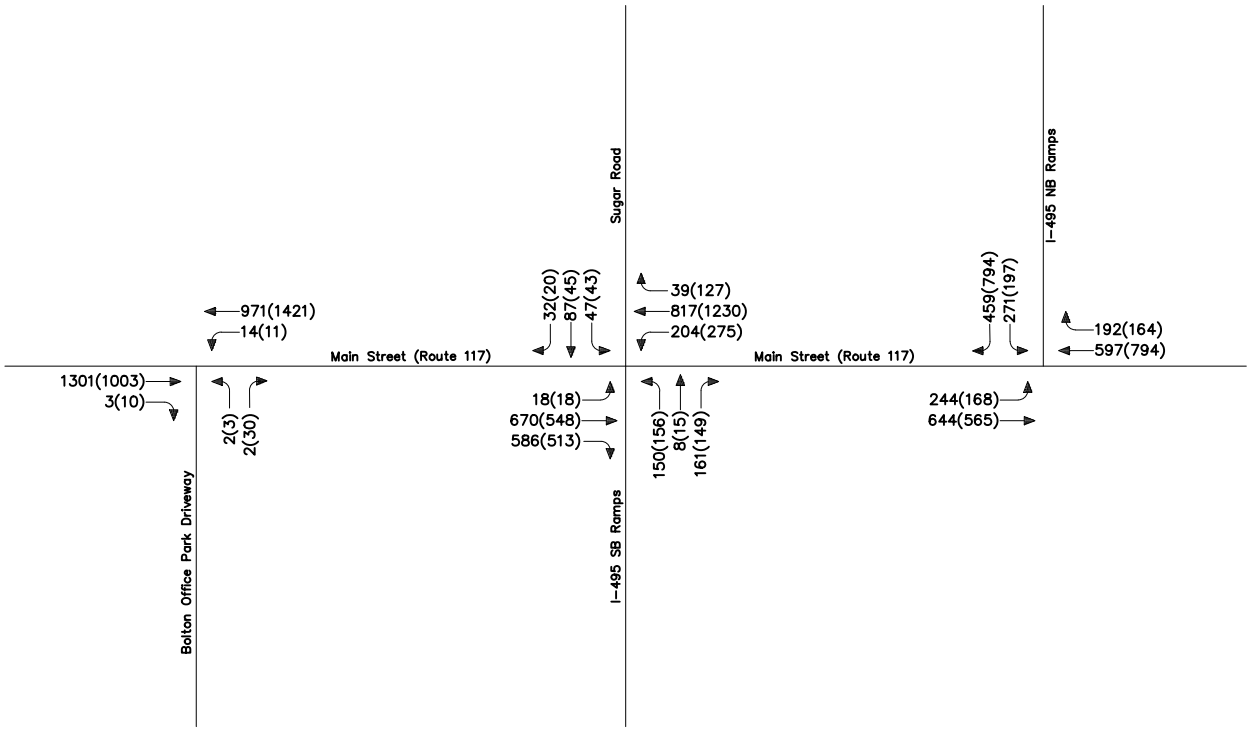
Specific Developments by Others

TEC coordinated with the Town of Bolton Planning Department to identify nearby private / public development projects in the vicinity of the study area that are either in the planning process or were recently approved but not yet occupied. Several modest sized developments were identified, with the largest outside of the study area influence. Therefore, the anticipated trip generation for these projects is expected to be accounted for within the background growth rate applied to the study area.

2028 NO BUILD TRAFFIC VOLUMES

The 2028 No Build Condition weekday morning and weekday evening peak hour traffic volume networks were developed by applying the 0.8 percent per year compounded annual background traffic growth rate on the 2021 Existing Condition peak hour traffic volumes over the 7-year design horizon. The resulting 2028 No Build Condition weekday morning and weekday evening peak hour traffic volume networks are illustrated in Figure 3.

Not to Scale



XXX(XXX) = Weekday Morning(Weekday Evening)

Figure 3

2028 No Build Conditions
Weekday Morning and Weekday Evening
Peak Hour Traffic Volumes

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SITE GENERATED TRAFFIC

The potential development consists of the addition of 229 apartment units at 580 Main Street (Route 117). The site generated traffic volumes for the project were estimated based on industry standard trip data published in the Institute of Transportation Engineers (ITE) publication *Trip Generation, 10th Edition* for Land Use Code (LUC) 220 – Multi-Family Housing (Low-Rise).

Credit for Existing Uses

There is an existing approximately 105,000 SF office building on the site. A portion of the existing office building is to be removed and 50,000 SF of office building is to remain. The existing portion of the office building to be removed from the site would previously have generated vehicular traffic volumes throughout the course of typical weekday on the adjacent roadway system. It is uncertain when the office building was last fully occupied and operational, therefore, no credit was applied for the existing use. The existing traffic volumes present along the Bolton Office Park Driveway were presumed to be associated with the Bolton Country Manor age-restricted residential building and were maintained as counted. In order to be conservative, this analysis assumes new traffic will be generated for the proposed remaining 50,000 SF office building using ITE LUC 710 – General Office.

Table 5 provides a summary of the resulting trip generation estimate. The detailed trip generation worksheet is provided in Appendix F.

Table 5 - Trip Generation Summary

Time Period	Prior Office Building 105,000 SF (LUC 710)	Apartments 229 Units (LUC 221)	Office Building 50,000 SF (LUC 710)	Total Trips	Difference (Proposed Uses - Prior Use)
Weekday Daily					
IN	556	845	271	**1116**	**+560**
OUT	556	845	271	**1116**	**+560**
TOTAL	1112	1690	542	**2232**	**+1120**
Weekday Morning					
IN	107	24	63	**87**	**-20**
OUT	18	81	10	**91**	**+73**
TOTAL	125	105	73	**178**	**+53**
Weekday Evening					
IN	19	77	9	**86**	**+67**
OUT	100	46	50	**96**	**-4**
TOTAL	119	123	59	**182**	**+63**

As shown in Table 5, the proposed 229 multi-family units and the 50,000 SF office building are anticipated to generate approximately 2,232 new vehicle trips during the average weekday, with 178 new vehicle trips (87 entering and 91 exiting) during the weekday morning peak hour and 182 new vehicle trips (86 entering and 96 exiting) during the weekday evening peak hour. When compared with the prior use on the site, the proposed development is projected to generate 53 “new” trips to the adjacent roadway system during the weekday morning peak hour, and 63 “new” trips during the weekday evening peak hour. The comparison to the prior use is for informational purposes only. As previously stated, all trips projected to be generated by the proposed

development were added to the adjacent roadway system, with no credit taken for the prior office use in order to be conservative.

TRIP DISTRIBUTION

The distribution of the residential and office site generated traffic volumes was compared with a gravity model using 2009-2013 U.S. Census Bureau Journey-to-Work/Home data for the Town of Bolton. Due to the wide dispersal of Bolton residents to work destinations throughout the area, no overall travel pattern was obtainable with a reasonable number of work destinations. Similarly, no overall travel pattern was obtainable with a reasonable number of residential destinations for the office building. Therefore, the current travel patterns of the primarily residential vehicles entering and exiting the Bolton Office Park Driveway was utilized to determine the distribution, which highlighted the proximity of the I-495 interchange. The resulting trip distribution is provided in Table 6.

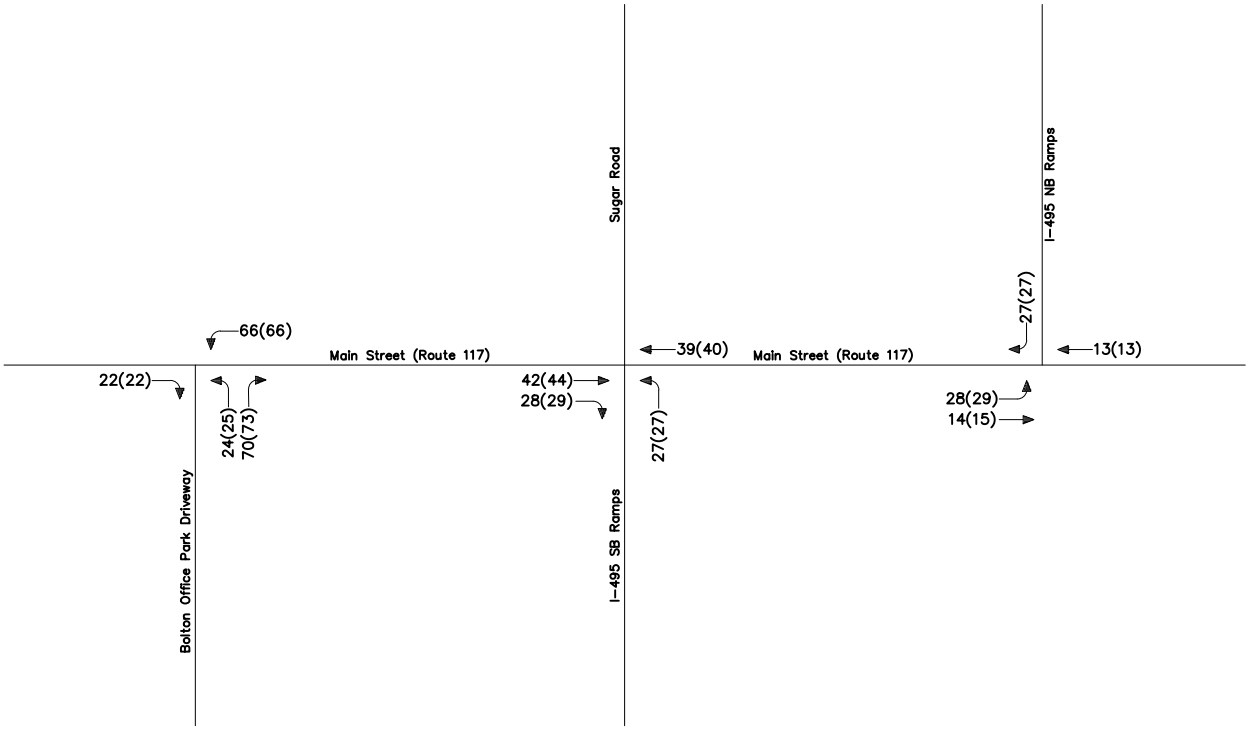
Table 6 - Trip Distribution Summary

Direction	Residential	Office
Main Street (Route 117) to/from east	15%	15%
Main Street (Route 117) to/from west	25%	25%
I-495 to/from North	30%	30%
I-495 to/from South	30%	30%
Total	**100%**	**100%**

Traffic volume networks for the weekday morning and weekday evening site generated trips are presented in Figure 4.

2028 BUILD TRAFFIC VOLUMES

The 2028 Build Condition traffic volume networks consist of 2028 No Build Condition peak hour traffic volumes with the addition of the additional site generated traffic. The resulting 2028 Build Condition weekday morning and weekday evening peak hour traffic volume networks are presented in Figure 5.



XXX(XXX) = Weekday Morning(Weekday Evening)

Figure 4

Site-Generated Traffic
Weekday Morning and Weekday Evening
Peak Hour Traffic Volumes

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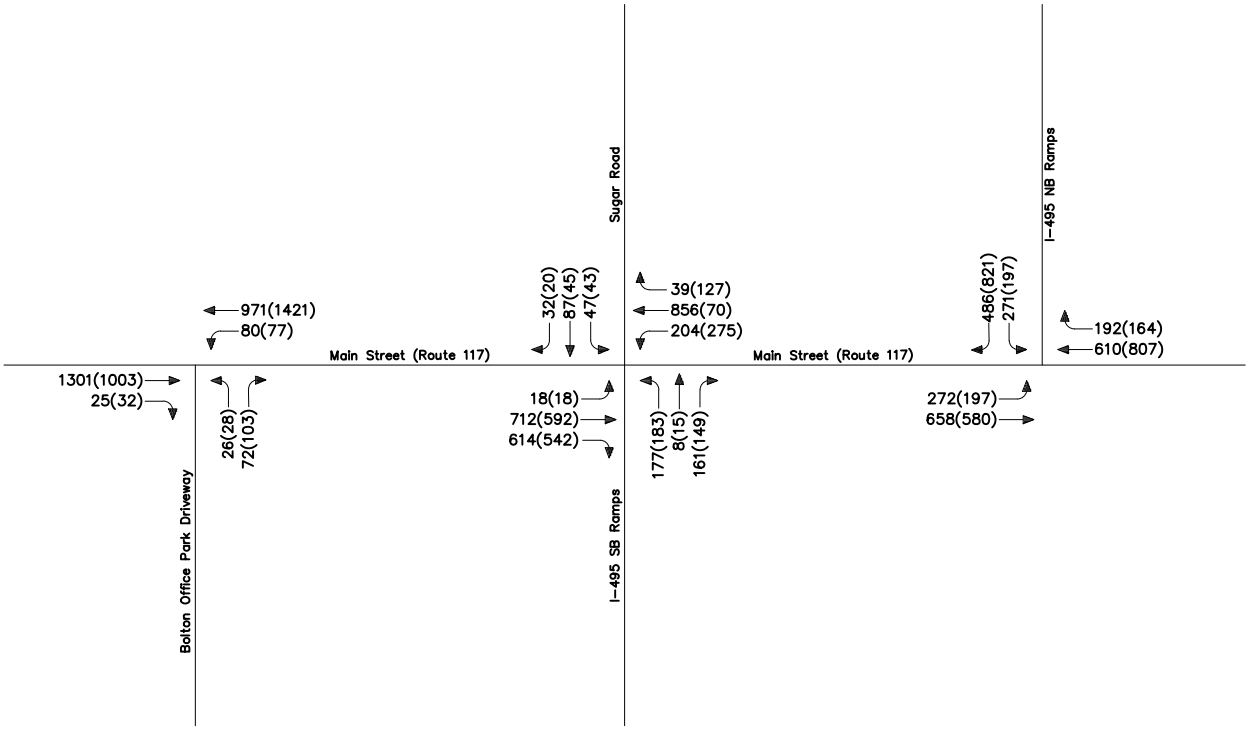

XXX(XXX) = Weekday Morning(Weekday Evening)

Figure 5

2028 Build Conditions
Weekday Morning and Weekday Evening
Peak Hour Traffic Volumes

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IV. 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.[1] 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 the worst. 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.

Queue Length Analysis

Vehicle queue analyses are a direct measurement of an intersections ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the Synchro 11™ intersection capacity analysis software which is also based upon the methodology and procedures presented in the HCM 2000 / 6th Edition. Synchro reports the 95th percentile queues for unsignalized intersections and both the 50th (average) and 95th percentile vehicle queues for signalized intersections, which are based on the number of vehicles that experience a delay of six seconds or more at an intersection and

[1]The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual 2000*; Transportation Research Board; Washington, DC; 2000 and *Highway Capacity Manual 6th Edition*; Transportation Research Board; Washington, DC; 2017.

is a function of the traffic signal timing; vehicle arrival patterns during the analysis period; and the saturation flow rate. The 50th percentile or average vehicle queue is the average number of vehicles that are projected to be delayed by six seconds or more at the intersection under study during the analysis period. The 95th percentile vehicle queue is the vehicle queue length that will be exceeded only five percent of the time; or approximately three minutes out of 60 minutes during the peak one hour of the day. During the remaining 57 minutes, the vehicle queue length will be less than the 95th percentile queue length.

PARAMETERS FOR TRAFFIC IMPACT ANALYSIS

Unsignalized Intersections

The levels of service of two-way stop-controlled unsignalized intersections are determined by application of a procedure described in the *HCM 6th Edition*. Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and stop signs. Control delay includes the effects of initial deceleration delay approaching a stop sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the *HCM 6th Edition*. Table 7 summarizes the relationship between level of service and average control delay for unsignalized intersections.

Table 7 – Level of service Criteria for Unsignalized Intersections [(a)]

Level of Service (v/c ≤ 1.0)	Level of Service (v/c > 1.0)	Average Control Delay (sec/veh)	Description
A	F	≤10.0	LOS A represents a condition with little or no control delay to minor street traffic.
B	F	10.1 to 15.0	LOS B represents a condition with short control delays to minor street traffic.
C	F	15.1 to 25.0	LOS C represents a condition with average control delays to minor street traffic.
D	F	25.1 to 35.0	LOS D represents a condition with long control delays to minor street traffic.
E	F	35.1 to 50.0	LOS E represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
F	F	>50.0	LOS F represents a condition where minor street demand volume exceeds capacity of an approach lane, with excessive control delays resulting.

[a] Source: *Highway Capacity Manual 6th Edition*; Transportation Research Board; Washington D.C.; 2017

Signalized Intersections

Level of service for the signalized intersection is calculated using the operational analysis methodology of the *HCM 6th Edition*. This method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on delay. Level of service designations are based on the criterion of control or signal delay per vehicle. Control or signal delay can be related to driver discomfort, frustration, and fuel consumption, and includes initial deceleration delay approaching the traffic signal, queue move-up time, stopped delay and final acceleration delay. Table 8 summarizes the relationship between level of service and control delay. The

tabulated control delay criterion may be applied in assigning level of service designations to individual lane groups, to individual intersection approaches, or to entire intersections.

Table 8 – Level of Service Criteria for Signalized Intersections[(a)]

Level of Service (v/c ≤ 1.0)	Average Control Delay (seconds per vehicle)	Description
A	≤10.0	LOS A describes operations with very low control delay; most vehicles do not stop at all.
B	10.1 to 20.0	LOS B describes operations with relatively low control delay. However, more vehicles stop than LOS A.
C	20.1 to 35.0	LOS C describes operations with higher control delays. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	35.1 to 55.0	LOS D describes operations with control delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop and individual cycle failures are noticeable, whereby motorists are not able to get through the signal on one cycle.
E	55.1 to 80.0	LOS E describes operations with high control delay values. Individual cycle failures are frequent occurrences.
F	>80.0	LOS F describes operations with high control delay values that often occur with over-saturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

[a] Source: *Highway Capacity Manual 6th Edition*; Transportation Research Board; Washington D.C.; 2017

TRAFFIC IMPACT ANALYSIS RESULTS

Level of service analyses were conducted for the 2021 Base Year conditions, 2028 No Build condition and 2028 Build condition for the study area intersections. The results of the intersection capacity analysis are summarized in Table 9. The capacity analysis worksheets are provided in Appendix G.

Bolton Office Park Driveway / Main Street (Route 117)

The intersection of the Bolton Office Park Driveway with Main Street (Route 117) currently operates with a level of service (LOS) F on the northbound left turn movement exiting the Office Park Driveway. The Driveway approach is unmarked but is wide enough to operate as a left turn lane and a right turn lane and was modeled with this geometry. The LOS F condition continues in the No Build and Build conditions, with and without the proposed Project in place. Vehicle delay experienced on the Bolton Office Park Driveway approach is not atypical for a side street approach to a stopped-controlled intersection during peak hour. Gaps in the through traffic along Main Street (Route 117) may be more frequent due to adjacent traffic signals, allowing for improved exiting movements from the site driveway. During the field visit, TEC noted an extensive queue along Main Street (Route 117) westbound extending from the Wattaquadock Hill Road / Main Street (Route 117) intersection toward the Driveway intersection. Minimal site generated traffic is distributed in this direction (24 vehicles in the morning peak hour and 25 vehicles in the evening peak hour, or one vehicle every 2.5 minutes) and the additional trips on the roadway system in this direction will likely not be noticeable. The presence of this queue may allow for some courtesy gaps for left turning vehicles exiting the site heading westbound. To improve intersection safety and efficiency, it is recommended to restripe the northbound approach to

provide exclusive left turn and right turn lanes. This intersection is under the jurisdiction of the Town of Bolton, therefore no approval by MassDOT is required to implement these improvements.

The existing westbound left turn lane along Main Street (Route 117) is approximately 225 feet in length, allowing for storage of over eight vehicles. In the Build condition, the maximum queue length projected for the westbound left turn movement is 25 feet, or one vehicle. Therefore, the existing queue length storage remains sufficient to accommodate the projected demand.

I-495 Southbound Ramps / Sugar Road / Main Street (Route 117)

The intersection of I-495 Southbound Ramps / Sugar Road / Main Street (Route 117) operates with an acceptable level of service (LOS D or better) on all approach movements during the morning and evening peak hours in the Base Year and No Build condition. With the addition of site generated traffic, these acceptable levels of service are maintained. The level of impact from the project does not warrant a change in control at the intersection or the reassignment of lane uses. The volume-to-capacity (V/C) ratios will be below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes.

I-495 Northbound Ramps / Main Street (Route 117)

All movements at the intersection of I-495 Northbound Ramps / Main Street (Route 117) operate with acceptable levels of service (LOS D or better) on all approach movements during the morning and evening peak hours studied for the Base Year Condition and the No Build condition. With the addition of site generated traffic, the acceptable levels of service are maintained. The level of impact from the project does not warrant a change in control at the intersection or the reassignment of lane uses. The volume-to-capacity (V/C) ratios will be below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes.

Table 9 – Intersection Capacity and Queue Analysis Summary

	2021 Existing				2028 No Build				2028 Build			
Intersection / Lane Group	V/C[a]	Delay[b]	LOS[c]	Queue[d]	V/C	Delay	LOS	Queue	V/C	Delay	LOS	Queue
Bolton Office Park Driveway / Main Street (Route 117)												
Weekday Morning Peak Period												
Main Street WBL	0.027	12.2	B	<25	0.032	12.7	B	<25	0.185	14.4	B	<25
Bolton Office Park Driveway NBL	0.057	105.4	F	<25	0.07	129.7	F	<25	1.413	628.8	F	95
Bolton Office Park Driveway NBR	0.012	24.5	C	<25	0.013	26.7	D	<25	0.474	45.1	E	55
Overall Intersection	**-**	**0.2**	**-**	**-**	**-**	**0.2**	**-**	**-**	**-**	**8.4**	**-**	**-**
Weekday Evening Peak Period												
Main Street WBL	0.016	10.5	B	<25	0.019	10.8	B	<25	0.135	11.7	B	<25
Bolton Office Park Driveway NBL	0.105	134.3	F	<25	0.13	169.5	F	<25	1.79	N/A	F	108
Bolton Office Park Driveway NBR	0.108	19.4	C	<25	0.126	20.9	C	<25	0.439	29.7	D	53
Overall Intersection	**-**	**0.5**	**-**	**-**	**-**	**0.5**	**-**	**-**	**-**	**10.4**	**-**	**-**
I-495 SB Ramps / Sugar Road & Main Street (Route 117)												
Weekday Morning Peak Period												
Main Street EBL	0.04	9.4	A	<25/<25	0.05	10.2	B	<25/<25	0.05	11.5	B	<25/<25
Main Street EBT	0.66	18.8	B	324/506	0.74	21.8	C	380/567	0.80	27.0	C	425/663
Main Street EBR	-	0.0	-	<25/<25	-	0.0	A	<25/<25	-	0.0	A	<25/<25
Main Street WBL	0.50	13.2	B	45/84	0.58	15.9	B	52/104	0.67	21.3	C	59/182
Main Street WBT	0.41	11.5	B	116/238	0.44	12.6	B	135/256	0.48	14.2	B	153/272
I-495 SB Ramp NBL	0.63	40.8	D	98/2196	0.64	41.1	D	102/214	0.68	42.5	D	121/254
I-495 SB Ramp NBT	0.02	31.8	C	<25/<25	0.02	30.8	C	<25/<25	0.02	29.1	C	<25/<25
I-495 SB Ramp NBR	-	0.0	-	<25/<25	-	0.0	A	<25/<25	-	0.0	A	<25/<25
Sugar Road SB	0.64	38.1	D	141/133	0.65	37.7	D	148/143	0.60	35.4	D	144/143
Overall Intersection	**-**	**19.1**	**B**	**-**	**-**	**20.7**	**C**	**-**	**-**	**23.4**	**C**	**-**
Weekday Evening Peak Period												
Main Street EBL	0.07	10.6	B	<25/<25	0.08	11.8	B	<25/<25	0.09	14.0	B	<25/<25
Main Street EBT	0.56	16.5	B	263/394	0.60	18.5	B	302/426	0.70	23.2	C	379/478
Main Street EBR	-	0.0	A	<25/<25	-	0.0	A	<25/<25	-	0.0	A	<25/<25
Main Street WBL	0.52	11.0	B	62/108	0.59	13.1	B	70/119	0.68	17.8	B	84/203
Main Street WBT	0.61	13.7	B	217/422	0.65	15.1	B	250/463	0.70	18.0	B	320/486
I-495 SB Ramp NBL	0.70	13.7	D	138/145	0.71	42.1	D	145/152	0.75	43.2	D	161/180
I-495 SB Ramp NBT	0.06	41.7	C	<25/<25	0.06	32.2	C	<25/<25	0.05	29.9	C	<25/<25
I-495 SB Ramp NBR	-	33.0	A	<25/<25	-	0.0	A	<25/<25	-	0.0	A	<25/<25
Sugar Road SB	0.33	35.2	D	58/99	0.33	3404	C	59/103	0.29	31.9	C	54/103
Overall Intersection	**-**	**17.7**	**B**	**-**	**-**	**19.1**	**B**	**-**	**-**	**22.3**	**C**	**-**
I-495 NB Ramps / Main Street (Route 117)												
Weekday Morning Peak Period												
Main Street EBL	0.47	8.6	A	43/73	0.52	10.2	A	47/77	0.59	10.9	B	54/104
Main Street EBT	0.48	6.6	A	153/238	0.51	7.2	A	175/259	0.52	7.2	A	181/268
Main Street WBT	0.57	13.3	B	240/404	0.62	149.9	B	272/456	0.64	15.8	B	293/489
Main Street WBR	-	0.0	A	<25/<25	-	0.0	A	<25/<25	-	0.0	A	<25/<25
I-495 SB Ramp SBL	0.87	51.1	D	145/232	0.62	52.9	D	152/264	0.88	52.9	D	152/264
I-495 SB Ramp SBR	-	0.0	A	<25/<25	-	0.0	A	<25/<25	-	0.0	A	<25/<25
Overall Intersection	**-**	**16.2**	**B**	**-**	**-**	**17.4**	**B**	**-**	**-**	**17.6**	**B**	**-**
Weekday Evening Peak Period												
Main Street EBL	0.43	10.0	B	26/59	0.50	12.3	B	29/93	0.60	13.8	B	65/133
Main Street EBT	0.44	4.9	A	124/214	0.47	5.4	A	139/232	0.48	5.4	A	145/241
Main Street WBT	0.70	13.8	B	331/705	0.75	15.7	B	382/772	0.76	1.62	B	418/>600
Main Street WBR	-	0.0	A	<25/<25	-	0.0	A	<25/<25	-	0.0	A	<25/<25
I-495 SB Ramp SBL	0.83	45.0	D	105/165	0.84	45.8	D	111/175	0.84	45.8	D	111/175
I-495 SB Ramp SBR	-	0.0	A	<25/<25	-	0.0	A	<25/<25	-	0.0	A	<25/<25
Overall Intersection	**-**	**10.8**	**B**	**-**	**-**	**13.1**	**B**	**-**	**-**	**15.4**	**B**	**-**

[a] Volume-to-capacity ratio,
[b] Delay expressed in seconds per vehicle (average)
[c] Level of service,
[d] 50th/95th Percentile Queue [95th Percentile Queue only for unsignalized intersections]

V. PARKING AND CIRCULATION

PARKING

The site plan provides a total of 382 parking spaces in support of the proposed residential portion of the development including on-site garage and surface parking at a ratio of 1.67 spaces per unit. The ITE publication, *Parking Generation, 5th Edition* for LUC 221 – Multifamily Housing (Mid-Rise) recommends 304 parking spaces for 229 apartment units at an average rate of 1.32 spaces per unit. The parking supply proposed will be adequate to support the projected demand for the residential units.

VI. CONCLUSION

TEC has examined the potential traffic impacts associated with the proposed 229 multi-family units at 580 Main Street (Route 117) Bolton, Massachusetts on the study area roadways. The following is a summary of the results and conclusions of this effort:

- Access and egress from the proposed site will be provided via the existing full movement access/egress Bolton Office Park Driveway onto Main Street (Route 117). Access to the Bolton Country Manor age-restricted residential building is also to be maintained via this Driveway.

- A total of 5 crashes were reported at the Bolton Office Park Driveway / Main Street (Route 117) intersection during the six-year study period, or less than one crash per year, indicating no discernable crash trend at this intersection.

- The proposed 229 multi-family units and the 50,000 SF office building are anticipated to generate approximately 2,264 new vehicle trips during the average weekday, with 180 new vehicle trips (88 entering and 92 exiting) during the weekday morning peak hour and 184 new vehicle trips (88 entering and 96 exiting) during the weekday evening peak hour. No trip credit was applied for the existing office building on the site.

- The sight distance characteristics measured at the Bolton Office Park Driveway exceeds AASHTO's minimum recommendations for safe operations for vehicles exiting the site.

- The Driveway approach at its intersection Main Street (Route 117) experiences delays on the northbound left turn movement in the No Build and Build conditions. Minimal site generated traffic is distributed on this movement (24 vehicles in the morning peak hour and 25 vehicles in the evening peak hour, or one vehicle every 2.5 minutes) and the additional trips on the roadway system in this direction will not be noticeable. It is recommended that this approach be restriped to provide an exclusive left turn lane and an exclusive right turn lane to improve the safety and efficiency of the intersection.

- The existing queue length storage provided in the westbound left turn lane along Main Street (Route 117) at the site Driveway remains sufficient to accommodate the projected queue length during the peak hours.

- The I-495 Southbound Ramps / Main Street (Route 117) intersection and the I-495 Northbound Ramps / Main Street (Route 117) intersection continue to operate with acceptable levels of service during both peak hours with the addition of site generated traffic.

- The proposed parking supply is adequate to meet the projected demand of the proposed residential development.

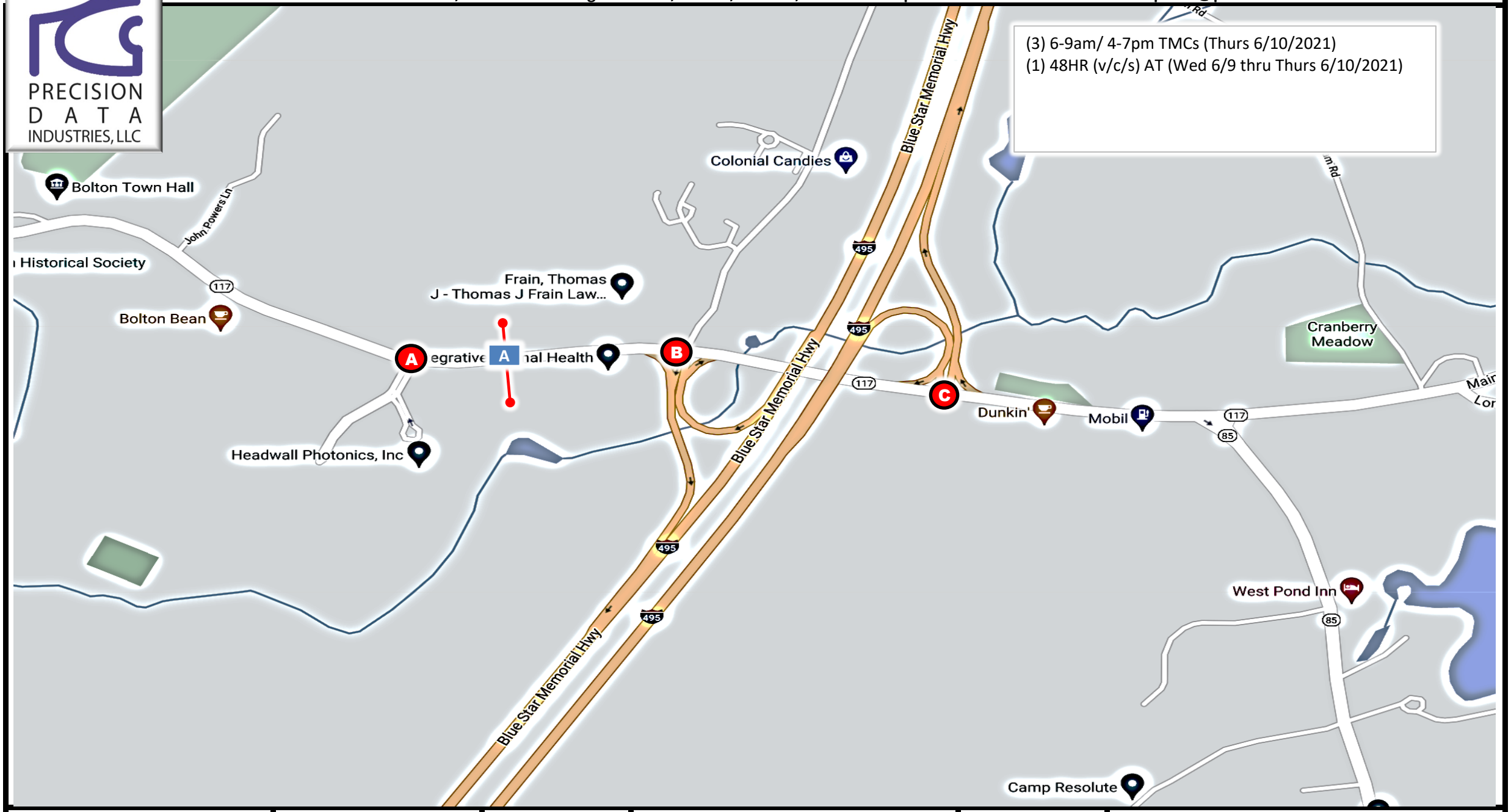
In conclusion, the proposed residential development can be safely and efficiently accommodated within the study area corridors and intersections and does not warrant any additional project-specific transportation mitigation beyond the itemized mitigation listed above.

Appendix A

Tuning Movement Counts (TMCs)

Location Map: 218000 Bolton, MA

Precision Data Industries, LLC 157 Washington Street, Suite 2, Hudson, MA 01749 ph: 508-875-0100 email: datarequests@pdillc.com



Client:	Engineer:	Site Code:	Date:	PDI Job #	City, State:
TEC	L. Oltman	TBA	Wed 6/9 thru Thurs 6/10/2021	218000	Bolton, MA

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars and Heavy Vehicles (Combined)

	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:00 AM	0	0	0	0	0	0	65	1	0	66	0	0	0	0	0	0	226	0	0	226	292
6:15 AM	0	0	0	0	0	0	95	0	0	95	0	0	0	0	0	0	294	0	0	294	389
6:30 AM	1	0	0	0	1	0	108	1	0	109	0	0	0	0	0	0	295	0	0	295	405
6:45 AM	0	0	0	0	0	0	148	0	0	148	0	0	1	0	1	1	287	0	0	288	437
Total	1	0	0	0	1	0	416	2	0	418	0	0	1	0	1	1	1102	0	0	1103	1523
7:00 AM	0	0	0	0	0	0	137	4	0	141	1	0	0	0	1	0	296	0	0	296	438
7:15 AM	0	0	0	0	0	0	215	0	0	215	0	0	1	0	1	0	302	0	0	302	518
7:30 AM	0	0	0	0	0	0	219	5	0	224	0	0	0	0	0	0	276	0	0	276	500
7:45 AM	0	0	0	0	0	0	210	4	0	214	1	0	1	0	2	0	272	0	0	272	488
Total	0	0	0	0	0	0	781	13	0	794	2	0	2	0	4	0	1146	0	0	1146	1944
8:00 AM	0	0	0	0	0	0	183	3	0	186	1	0	0	0	1	3	258	0	0	261	448
8:15 AM	0	0	0	0	0	0	200	8	0	208	2	0	0	0	2	3	230	0	0	233	443
8:30 AM	0	0	0	0	0	0	172	6	0	178	2	0	0	0	2	0	237	0	0	237	417
8:45 AM	0	0	0	0	0	0	188	3	0	191	0	0	2	0	2	3	245	0	0	248	441
Total	0	0	0	0	0	0	743	20	0	763	5	0	2	0	7	9	970	0	0	979	1749
Grand Total	1	0	0	0	1	0	1940	35	0	1975	7	0	5	0	12	10	3218	0	0	3228	5216
Approach %	100.0	0.0	0.0	0.0		0.0	98.2	1.8	0.0		58.3	0.0	41.7	0.0		0.3	99.7	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	37.2	0.7	0.0	37.9	0.1	0.0	0.1	0.0	0.2	0.2	61.7	0.0	0.0	61.9	
Exiting Leg Total					0					3225					45					1946	5216
Cars	1	0	0	0	1	0	1790	35	0	1825	7	0	5	0	12	10	3088	0	0	3098	4936
% Cars	100.0	0.0	0.0	0.0	100.0	0.0	92.3	100.0	0.0	92.4	100.0	0.0	100.0	0.0	100.0	100.0	96.0	0.0	0.0	96.0	94.6
Exiting Leg Total					0					3095					45					1796	4936
Heavy Vehicles	0	0	0	0	0	0	150	0	0	150	0	0	0	0	0	0	130	0	0	130	280
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	7.7	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	4.0	5.4
Exiting Leg Total					0					130					0					150	280

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

7:15 AM	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	0	0	0	0	0	0	215	0	0	215	0	0	1	0	1	0	302	0	0	302	518
7:30 AM	0	0	0	0	0	0	219	5	0	224	0	0	0	0	0	0	276	0	0	276	500
7:45 AM	0	0	0	0	0	0	210	4	0	214	1	0	1	0	2	0	272	0	0	272	488
8:00 AM	0	0	0	0	0	0	183	3	0	186	1	0	0	0	1	3	258	0	0	261	448
Total Volume	0	0	0	0	0	0	827	12	0	839	2	0	2	0	4	3	1108	0	0	1111	1954
% Approach Total	0.0	0.0	0.0	0.0		0.0	98.6	1.4	0.0		50.0	0.0	50.0	0.0		0.3	99.7	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.944	0.600	0.000	0.936	0.500	0.000	0.500	0.000	0.500	0.250	0.917	0.000	0.000	0.920	0.943
Cars	0	0	0	0	0	0	777	12	0	789	2	0	2	0	4	3	1075	0	0	1078	1871
Cars %	0.0	0.0	0.0	0.0	0.0	0.0	94.0	100.0	0.0	94.0	100.0	0.0	100.0	0.0	100.0	100.0	97.0	0.0	0.0	97.0	95.8
Heavy Vehicles	0	0	0	0	0	0	50	0	0	50	0	0	0	0	0	0	33	0	0	33	83
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	3.0	4.2
Cars Enter Leg	0	0	0	0	0	0	777	12	0	789	2	0	2	0	4	3	1075	0	0	1078	1871
Heavy Enter Leg	0	0	0	0	0	0	50	0	0	50	0	0	0	0	0	0	33	0	0	33	83
Total Entering Leg	0	0	0	0	0	0	827	12	0	839	2	0	2	0	4	3	1108	0	0	1111	1954
Cars Exiting Leg					0					1077					15					779	1871
Heavy Exiting Leg					0					33					0					50	83
Total Exiting Leg					0					1110					15					829	1954

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars

	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:00 AM	0	0	0	0	0	0	58	1	0	59	0	0	0	0	0	0	209	0	0	209	268
6:15 AM	0	0	0	0	0	0	90	0	0	90	0	0	0	0	0	0	281	0	0	281	371
6:30 AM	1	0	0	0	1	0	102	1	0	103	0	0	0	0	0	0	281	0	0	281	385
6:45 AM	0	0	0	0	0	0	143	0	0	143	0	0	1	0	1	1	274	0	0	275	419
Total	1	0	0	0	1	0	393	2	0	395	0	0	1	0	1	1	1045	0	0	1046	1443
7:00 AM	0	0	0	0	0	0	117	4	0	121	1	0	0	0	1	0	284	0	0	284	406
7:15 AM	0	0	0	0	0	0	201	0	0	201	0	0	1	0	1	0	295	0	0	295	497
7:30 AM	0	0	0	0	0	0	205	5	0	210	0	0	0	0	0	0	263	0	0	263	473
7:45 AM	0	0	0	0	0	0	199	4	0	203	1	0	1	0	2	0	267	0	0	267	472
Total	0	0	0	0	0	0	722	13	0	735	2	0	2	0	4	0	1109	0	0	1109	1848
8:00 AM	0	0	0	0	0	0	172	3	0	175	1	0	0	0	1	3	250	0	0	253	429
8:15 AM	0	0	0	0	0	0	181	8	0	189	2	0	0	0	2	3	222	0	0	225	416
8:30 AM	0	0	0	0	0	0	148	6	0	154	2	0	0	0	2	0	228	0	0	228	384
8:45 AM	0	0	0	0	0	0	174	3	0	177	0	0	2	0	2	3	234	0	0	237	416
Total	0	0	0	0	0	0	675	20	0	695	5	0	2	0	7	9	934	0	0	943	1645
Grand Total	1	0	0	0	1	0	1790	35	0	1825	7	0	5	0	12	10	3088	0	0	3098	4936
Approach %	100.0	0.0	0.0	0.0		0.0	98.1	1.9	0.0		58.3	0.0	41.7	0.0		0.3	99.7	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	36.3	0.7	0.0	37.0	0.1	0.0	0.1	0.0	0.2	0.2	62.6	0.0	0.0	62.8	
Exiting Leg Total					0					3095					45					1796	4936

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

7:15 AM	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	0	0	0	0	0	0	201	0	0	201	0	0	1	0	1	0	295	0	0	295	497
7:30 AM	0	0	0	0	0	0	205	5	0	210	0	0	0	0	0	0	263	0	0	263	473
7:45 AM	0	0	0	0	0	0	199	4	0	203	1	0	1	0	2	0	267	0	0	267	472
8:00 AM	0	0	0	0	0	0	172	3	0	175	1	0	0	0	1	3	250	0	0	253	429
Total Volume	0	0	0	0	0	0	777	12	0	789	2	0	2	0	4	3	1075	0	0	1078	1871
% Approach Total	0.0	0.0	0.0	0.0		0.0	98.5	1.5	0.0		50.0	0.0	50.0	0.0		0.3	99.7	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.948	0.600	0.000	0.939	0.500	0.000	0.500	0.000	0.500	0.250	0.911	0.000	0.000	0.914	0.941
Entering Leg	0	0	0	0	0	0	777	12	0	789	2	0	2	0	4	3	1075	0	0	1078	1871
Exiting Leg					0					1077					15					779	1871
Total					0					1866					19					1857	3742

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:00 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	17	0	0	17	24
6:15 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	13	0	0	13	18
6:30 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	14	0	0	14	20
6:45 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	13	0	0	13	18
Total	0	0	0	0	0	0	23	0	0	23	0	0	0	0	0	0	57	0	0	57	80
7:00 AM	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	0	12	0	0	12	32
7:15 AM	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	0	7	0	0	7	21
7:30 AM	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	0	13	0	0	13	27
7:45 AM	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	5	0	0	5	16
Total	0	0	0	0	0	0	59	0	0	59	0	0	0	0	0	0	37	0	0	37	96
8:00 AM	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	8	0	0	8	19
8:15 AM	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	8	0	0	8	27
8:30 AM	0	0	0	0	0	0	24	0	0	24	0	0	0	0	0	0	9	0	0	9	33
8:45 AM	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	0	11	0	0	11	25
Total	0	0	0	0	0	0	68	0	0	68	0	0	0	0	0	0	36	0	0	36	104
Grand Total	0	0	0	0	0	0	150	0	0	150	0	0	0	0	0	0	130	0	0	130	280
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	53.6	0.0	0.0	53.6	0.0	0.0	0.0	0.0	0.0	0.0	46.4	0.0	0.0	46.4	
Exiting Leg Total					0					130					0					150	280
Buses	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	18	0	0	18	37
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	12.7	0.0	0.0	12.7	0.0	0.0	0.0	0.0	0.0	0.0	13.8	0.0	0.0	13.8	13.2
Exiting Leg Total					0					18					0					19	37
Single-Unit Trucks	0	0	0	0	0	0	87	0	0	87	0	0	0	0	0	0	72	0	0	72	159
% Single-Unit	0.0	0.0	0.0	0.0	0.0	0.0	58.0	0.0	0.0	58.0	0.0	0.0	0.0	0.0	0.0	0.0	55.4	0.0	0.0	55.4	56.8
Exiting Leg Total					0					72					0					87	159
Articulated Trucks	0	0	0	0	0	0	44	0	0	44	0	0	0	0	0	0	40	0	0	40	84
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	29.3	0.0	0.0	29.3	0.0	0.0	0.0	0.0	0.0	0.0	30.8	0.0	0.0	30.8	30.0
Exiting Leg Total					0					40					0					44	84

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

8:00 AM	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	8	0	0	8	19
8:15 AM	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	8	0	0	8	27
8:30 AM	0	0	0	0	0	0	24	0	0	24	0	0	0	0	0	0	9	0	0	9	33
8:45 AM	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	0	11	0	0	11	25
Total Volume	0	0	0	0	0	0	68	0	0	68	0	0	0	0	0	0	36	0	0	36	104
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.708	0.000	0.000	0.708	0.000	0.000	0.000	0.000	0.000	0.000	0.818	0.000	0.000	0.818	0.788
Buses	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	2	0	0	2	12
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	14.7	0.0	0.0	14.7	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0	5.6	11.5
Single-Unit Trucks	0	0	0	0	0	0	41	0	0	41	0	0	0	0	0	0	22	0	0	22	63
Single-Unit %	0.0	0.0	0.0	0.0	0.0	0.0	60.3	0.0	0.0	60.3	0.0	0.0	0.0	0.0	0.0	0.0	61.1	0.0	0.0	61.1	60.6
Articulated Trucks	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	0	12	0	0	12	29
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	33.3	27.9
Buses	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	2	0	0	2	12
Single-Unit Trucks	0	0	0	0	0	0	41	0	0	41	0	0	0	0	0	0	22	0	0	22	63
Articulated Trucks	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	0	12	0	0	12	29
Total Entering Leg	0	0	0	0	0	0	68	0	0	68	0	0	0	0	0	0	36	0	0	36	104
Buses					0					2					0					10	12
Single-Unit Trucks					0					22					0					41	63
Articulated Trucks					0					12					0					17	29
Total Exiting Leg					0					36					0					68	104

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Buses

	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7	7
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	10	10
7:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	5
7:15 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	4
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	6
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	6	0	0	6	15
8:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	4
8:30 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	7
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	2	0	0	2	12
Grand Total	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	18	0	0	18	37
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	51.4	0.0	0.0	51.4	0.0	0.0	0.0	0.0	0.0	0.0	48.6	0.0	0.0	48.6	
Exiting Leg Total					0					18					0					19	37

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

6:30 AM	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7	7
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
7:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	5
7:15 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	4
Total Volume	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	9	0	0	9	18
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.450	0.000	0.000	0.450	0.000	0.000	0.000	0.000	0.000	0.000	0.321	0.000	0.000	0.321	0.643
Entering Leg	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	9	0	0	9	18
Exiting Leg					0					9					0					9	18
Total					0					18					0					18	36

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Single-Unit Trucks

	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:00 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	10	0	0	10	13
6:15 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	9	0	0	9	13
6:30 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	9
6:45 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	8	0	0	8	13
Total	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	0	32	0	0	32	48
7:00 AM	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	5	0	0	5	15
7:15 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	5	0	0	5	10
7:30 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	4	0	0	4	11
7:45 AM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	4	0	0	4	12
Total	0	0	0	0	0	0	30	0	0	30	0	0	0	0	0	0	18	0	0	18	48
8:00 AM	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	5	0	0	5	14
8:15 AM	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	4	0	0	4	13
8:30 AM	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	0	7	0	0	7	23
8:45 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	6	0	0	6	13
Total	0	0	0	0	0	0	41	0	0	41	0	0	0	0	0	0	22	0	0	22	63
Grand Total	0	0	0	0	0	0	87	0	0	87	0	0	0	0	0	0	72	0	0	72	159
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	54.7	0.0	0.0	54.7	0.0	0.0	0.0	0.0	0.0	0.0	45.3	0.0	0.0	45.3	
Exiting Leg Total					0					72					0					87	159

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

8:00 AM	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	5	0	0	5	14
8:15 AM	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	4	0	0	4	13
8:30 AM	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	0	7	0	0	7	23
8:45 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	6	0	0	6	13
Total Volume	0	0	0	0	0	0	41	0	0	41	0	0	0	0	0	0	22	0	0	22	63
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.641	0.000	0.000	0.641	0.000	0.000	0.000	0.000	0.000	0.000	0.786	0.000	0.000	0.786	0.685
Entering Leg	0	0	0	0	0	0	41	0	0	41	0	0	0	0	0	0	22	0	0	22	63
Exiting Leg					0					22					0					41	63
Total					0					63					0					63	126

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Articulated Trucks

	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:00 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	7	0	0	7	11
6:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
6:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
Total	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	15	0	0	15	22
7:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	7	0	0	7	12
7:15 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	7
7:30 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	3	0	0	3	10
7:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
Total	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	0	13	0	0	13	33
8:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
8:15 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	10
8:30 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	12
Total	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	0	12	0	0	12	29
Grand Total	0	0	0	0	0	0	44	0	0	44	0	0	0	0	0	0	40	0	0	40	84
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	52.4	0.0	0.0	52.4	0.0	0.0	0.0	0.0	0.0	0.0	47.6	0.0	0.0	47.6	
Exiting Leg Total					0					40					0					44	84

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

7:00 AM	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	7	0	0	7	12
7:15 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	7
7:30 AM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	3	0	0	3	10
7:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
Total Volume	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	0	13	0	0	13	33
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.714	0.000	0.000	0.714	0.000	0.000	0.000	0.000	0.000	0.000	0.464	0.000	0.000	0.464	0.688
Entering Leg	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	0	13	0	0	13	33
Exiting Leg					0					13					0					20	33
Total					0					33					0					33	66

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Bicycles (on Roadway and Crosswalks)

	Driveway							Main Street (Route 117)							Bolton Office Park Drive							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
6:00 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	1	4
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	4	0	0	0	0	4	0	0	0	0	0	0	0	0	2	0	0	0	0	2	6
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	33.3	
Exiting Leg Total							0							2							0							4	6

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

7:00 AM	Driveway							Main Street (Route 117)							Bolton Office Park Drive							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	1	4
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.333
Entering Leg	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	1	4
Exiting Leg							0							1							0							3	4
Total							0							4							0							4	8

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Pedestrians

	Driveway							Main Street (Route 117)							Bolton Office Park Drive							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

6:00 AM	Driveway							Main Street (Route 117)							Bolton Office Park Drive							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars and Heavy Vehicles (Combined)

	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	290	0	0	290	2	0	4	0	6	2	195	0	0	197	493
4:15 PM	0	0	0	0	0	0	280	1	0	281	2	0	2	0	4	0	209	0	0	209	494
4:30 PM	0	0	0	0	0	0	299	0	0	299	3	0	1	0	4	4	231	0	0	235	538
4:45 PM	0	0	0	0	0	0	312	8	0	320	6	0	0	0	6	2	207	0	0	209	535
Total	0	0	0	0	0	0	1181	9	0	1190	13	0	7	0	20	8	842	0	0	850	2060
5:00 PM	1	0	0	0	1	0	307	0	0	307	11	0	1	0	12	1	192	0	0	193	513
5:15 PM	0	0	0	0	0	0	293	1	0	294	5	0	1	0	6	1	225	0	0	226	526
5:30 PM	0	0	0	0	0	0	308	1	0	309	7	0	0	0	7	1	234	0	0	235	551
5:45 PM	2	0	0	0	2	0	303	0	0	303	2	0	0	0	2	0	223	0	0	223	530
Total	3	0	0	0	3	0	1211	2	0	1213	25	0	2	0	27	3	874	0	0	877	2120
6:00 PM	0	0	0	0	0	0	245	0	0	245	9	0	5	0	14	1	175	0	0	176	435
6:15 PM	0	0	0	0	0	0	254	1	0	255	1	0	0	0	1	0	155	0	0	155	411
6:30 PM	0	0	0	0	0	0	233	1	0	234	1	0	0	0	1	0	186	0	0	186	421
6:45 PM	0	0	0	0	0	0	218	0	0	218	1	0	1	0	2	0	124	0	0	124	344
Total	0	0	0	0	0	0	950	2	0	952	12	0	6	0	18	1	640	0	0	641	1611
Grand Total	3	0	0	0	3	0	3342	13	0	3355	50	0	15	0	65	12	2356	0	0	2368	5791
Approach %	100.0	0.0	0.0	0.0		0.0	99.6	0.4	0.0		76.9	0.0	23.1	0.0		0.5	99.5	0.0	0.0		
Total %	0.1	0.0	0.0	0.0	0.1	0.0	57.7	0.2	0.0	57.9	0.9	0.0	0.3	0.0	1.1	0.2	40.7	0.0	0.0	40.9	
Exiting Leg Total					0					2406					25					3360	5791
Cars	3	0	0	0	3	0	3276	13	0	3289	49	0	15	0	64	11	2289	0	0	2300	5656
% Cars	100.0	0.0	0.0	0.0	100.0	0.0	98.0	100.0	0.0	98.0	98.0	0.0	100.0	0.0	98.5	91.7	97.2	0.0	0.0	97.1	97.7
Exiting Leg Total					0					2338					24					3294	5656
Heavy Vehicles	0	0	0	0	0	0	66	0	0	66	1	0	0	0	1	1	67	0	0	68	135
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	1.5	8.3	2.8	0.0	0.0	2.9	2.3
Exiting Leg Total					0					68					1					66	135

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:45 PM	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:45 PM	0	0	0	0	0	0	312	8	0	320	6	0	0	0	6	2	207	0	0	209	535
5:00 PM	1	0	0	0	1	0	307	0	0	307	11	0	1	0	12	1	192	0	0	193	513
5:15 PM	0	0	0	0	0	0	293	1	0	294	5	0	1	0	6	1	225	0	0	226	526
5:30 PM	0	0	0	0	0	0	308	1	0	309	7	0	0	0	7	1	234	0	0	235	551
Total Volume	1	0	0	0	1	0	1220	10	0	1230	29	0	2	0	31	5	858	0	0	863	2125
% Approach Total	100.0	0.0	0.0	0.0		0.0	99.2	0.8	0.0		93.5	0.0	6.5	0.0		0.6	99.4	0.0	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.978	0.313	0.000	0.961	0.659	0.000	0.500	0.000	0.646	0.625	0.917	0.000	0.000	0.918	0.964
Cars	1	0	0	0	1	0	1196	10	0	1206	28	0	2	0	30	5	840	0	0	845	2082
Cars %	100.0	0.0	0.0	0.0	100.0	0.0	98.0	100.0	0.0	98.0	96.6	0.0	100.0	0.0	96.8	100.0	97.9	0.0	0.0	97.9	98.0
Heavy Vehicles	0	0	0	0	0	0	24	0	0	24	1	0	0	0	1	0	18	0	0	18	43
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	3.4	0.0	0.0	0.0	3.2	0.0	2.1	0.0	0.0	2.1	2.0
Cars Enter Leg	1	0	0	0	1	0	1196	10	0	1206	28	0	2	0	30	5	840	0	0	845	2082
Heavy Enter Leg	0	0	0	0	0	0	24	0	0	24	1	0	0	0	1	0	18	0	0	18	43
Total Entering Leg	1	0	0	0	1	0	1220	10	0	1230	29	0	2	0	31	5	858	0	0	863	2125
Cars Exiting Leg					0					868					15					1199	2082
Heavy Exiting Leg					0					19					0					24	43
Total Exiting Leg					0					887					15					1223	2125

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars

	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	279	0	0	279	2	0	4	0	6	2	182	0	0	184	469
4:15 PM	0	0	0	0	0	0	273	1	0	274	2	0	2	0	4	0	199	0	0	199	477
4:30 PM	0	0	0	0	0	0	292	0	0	292	3	0	1	0	4	3	225	0	0	228	524
4:45 PM	0	0	0	0	0	0	302	8	0	310	5	0	0	0	5	2	203	0	0	205	520
Total	0	0	0	0	0	0	1146	9	0	1155	12	0	7	0	19	7	809	0	0	816	1990
5:00 PM	1	0	0	0	1	0	303	0	0	303	11	0	1	0	12	1	187	0	0	188	504
5:15 PM	0	0	0	0	0	0	290	1	0	291	5	0	1	0	6	1	221	0	0	222	519
5:30 PM	0	0	0	0	0	0	301	1	0	302	7	0	0	0	7	1	229	0	0	230	539
5:45 PM	2	0	0	0	2	0	297	0	0	297	2	0	0	0	2	0	219	0	0	219	520
Total	3	0	0	0	3	0	1191	2	0	1193	25	0	2	0	27	3	856	0	0	859	2082
6:00 PM	0	0	0	0	0	0	241	0	0	241	9	0	5	0	14	1	171	0	0	172	427
6:15 PM	0	0	0	0	0	0	249	1	0	250	1	0	0	0	1	0	151	0	0	151	402
6:30 PM	0	0	0	0	0	0	231	1	0	232	1	0	0	0	1	0	182	0	0	182	415
6:45 PM	0	0	0	0	0	0	218	0	0	218	1	0	1	0	2	0	120	0	0	120	340
Total	0	0	0	0	0	0	939	2	0	941	12	0	6	0	18	1	624	0	0	625	1584
Grand Total	3	0	0	0	3	0	3276	13	0	3289	49	0	15	0	64	11	2289	0	0	2300	5656
Approach %	100.0	0.0	0.0	0.0		0.0	99.6	0.4	0.0		76.6	0.0	23.4	0.0		0.5	99.5	0.0	0.0		
Total %	0.1	0.0	0.0	0.0	0.1	0.0	57.9	0.2	0.0	58.2	0.9	0.0	0.3	0.0	1.1	0.2	40.5	0.0	0.0	40.7	
Exiting Leg Total					0					2338					24					3294	5656

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:45 PM	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:45 PM	0	0	0	0	0	0	302	8	0	310	5	0	0	0	5	2	203	0	0	205	520
5:00 PM	1	0	0	0	1	0	303	0	0	303	11	0	1	0	12	1	187	0	0	188	504
5:15 PM	0	0	0	0	0	0	290	1	0	291	5	0	1	0	6	1	221	0	0	222	519
5:30 PM	0	0	0	0	0	0	301	1	0	302	7	0	0	0	7	1	229	0	0	230	539
Total Volume	1	0	0	0	1	0	1196	10	0	1206	28	0	2	0	30	5	840	0	0	845	2082
% Approach Total	100.0	0.0	0.0	0.0		0.0	99.2	0.8	0.0		93.3	0.0	6.7	0.0		0.6	99.4	0.0	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.987	0.313	0.000	0.973	0.636	0.000	0.500	0.000	0.625	0.625	0.917	0.000	0.000	0.918	0.966
Entering Leg	1	0	0	0	1	0	1196	10	0	1206	28	0	2	0	30	5	840	0	0	845	2082
Exiting Leg					0					868					15					1199	2082
Total					1					2074					45					2044	4164

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	13	0	0	13	24
4:15 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	10	0	0	10	17
4:30 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	1	6	0	0	7	14
4:45 PM	0	0	0	0	0	0	10	0	0	10	1	0	0	0	1	0	4	0	0	4	15
Total	0	0	0	0	0	0	35	0	0	35	1	0	0	0	1	1	33	0	0	34	70
5:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	5	0	0	5	9
5:15 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	7
5:30 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	12
5:45 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	4	0	0	4	10
Total	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	0	18	0	0	18	38
6:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	8
6:15 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	4	0	0	4	9
6:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	6
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
Total	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	16	0	0	16	27
Grand Total	0	0	0	0	0	0	66	0	0	66	1	0	0	0	1	1	67	0	0	68	135
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		1.5	98.5	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	48.9	0.0	0.0	48.9	0.7	0.0	0.0	0.0	0.7	0.7	49.6	0.0	0.0	50.4	
Exiting Leg Total					0					68					1					66	135
Buses	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	2.9	3.7
Exiting Leg Total					0					2					0					3	5
Single-Unit Trucks	0	0	0	0	0	0	44	0	0	44	1	0	0	0	1	1	47	0	0	48	93
% Single-Unit	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	66.7	100.0	0.0	0.0	0.0	100.0	100.0	70.1	0.0	0.0	70.6	68.9
Exiting Leg Total					0					48					1					44	93
Articulated Trucks	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	18	0	0	18	37
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	28.8	0.0	0.0	28.8	0.0	0.0	0.0	0.0	0.0	0.0	26.9	0.0	0.0	26.5	27.4
Exiting Leg Total					0					18					0					19	37

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	13	0	0	13	24
4:15 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	10	0	0	10	17
4:30 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	1	6	0	0	7	14
4:45 PM	0	0	0	0	0	0	10	0	0	10	1	0	0	0	1	0	4	0	0	4	15
Total Volume	0	0	0	0	0	0	35	0	0	35	1	0	0	0	1	1	33	0	0	34	70
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		2.9	97.1	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.795	0.000	0.000	0.795	0.250	0.000	0.000	0.000	0.250	0.250	0.635	0.000	0.000	0.654	0.729
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	2.9	2.9
Single-Unit Trucks	0	0	0	0	0	0	24	0	0	24	1	0	0	0	1	1	25	0	0	26	51
Single-Unit %	0.0	0.0	0.0	0.0	0.0	0.0	68.6	0.0	0.0	68.6	100.0	0.0	0.0	0.0	100.0	100.0	75.8	0.0	0.0	76.5	72.9
Articulated Trucks	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	7	0	0	7	17
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0	0.0	28.6	0.0	0.0	0.0	0.0	0.0	0.0	21.2	0.0	0.0	20.6	24.3
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Single-Unit Trucks	0	0	0	0	0	0	24	0	0	24	1	0	0	0	1	1	25	0	0	26	51
Articulated Trucks	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	7	0	0	7	17
Total Entering Leg	0	0	0	0	0	0	35	0	0	35	1	0	0	0	1	1	33	0	0	34	70
Buses					0					1					0					1	2
Single-Unit Trucks					0					26					1					24	51
Articulated Trucks					0					7					0					10	17
Total Exiting Leg					0					34					1					35	70

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Buses

	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	60.0	0.0	0.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	40.0	
Exiting Leg Total					0					2					0					3	5

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:45 PM	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
5:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.750
Entering Leg	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
Exiting Leg					0					1					0					2	3
Total					0					3					0					3	6

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Single-Unit Trucks**

	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	10	0	0	10	17
4:15 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	8	0	0	8	13
4:30 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	1	4	0	0	5	9
4:45 PM	0	0	0	0	0	0	8	0	0	8	1	0	0	0	1	0	3	0	0	3	12
Total	0	0	0	0	0	0	24	0	0	24	1	0	0	0	1	1	25	0	0	26	51
5:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	8
5:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	4
5:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	7
5:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
Total	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	12	0	0	12	22
6:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
6:15 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	7
6:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
Total	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	10	0	0	10	20
Grand Total	0	0	0	0	0	0	44	0	0	44	1	0	0	0	1	1	47	0	0	48	93
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		2.1	97.9	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	47.3	0.0	0.0	47.3	1.1	0.0	0.0	0.0	1.1	1.1	50.5	0.0	0.0	51.6	
Exiting Leg Total					0					48					1					44	93

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	10	0	0	10	17
4:15 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	8	0	0	8	13
4:30 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	1	4	0	0	5	9
4:45 PM	0	0	0	0	0	0	8	0	0	8	1	0	0	0	1	0	3	0	0	3	12
Total Volume	0	0	0	0	0	0	24	0	0	24	1	0	0	0	1	1	25	0	0	26	51
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		100.0	0.0	0.0	0.0		3.8	96.2	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.000	0.750	0.250	0.000	0.000	0.000	0.250	0.250	0.625	0.000	0.000	0.650	0.750
Entering Leg	0	0	0	0	0	0	24	0	0	24	1	0	0	0	1	1	25	0	0	26	51
Exiting Leg					0					26					1					24	51
Total					0					50					2					50	102

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Articulated Trucks

	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
4:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
4:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
4:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
Total	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	7	0	0	7	17
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
5:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
5:45 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	3	0	0	3	7
Total	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	5	0	0	5	13
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
6:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	6	0	0	6	7
Grand Total	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	18	0	0	18	37
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	51.4	0.0	0.0	51.4	0.0	0.0	0.0	0.0	0.0	0.0	48.6	0.0	0.0	48.6	
Exiting Leg Total					0					18					0					19	37

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	Driveway					Main Street (Route 117)					Bolton Office Park Drive					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
4:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
4:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
4:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
Total Volume	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	7	0	0	7	17
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.833	0.000	0.000	0.833	0.000	0.000	0.000	0.000	0.000	0.000	0.875	0.000	0.000	0.875	0.850
Entering Leg	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	7	0	0	7	17
Exiting Leg					0					7					0					10	17
Total					0					17					0					17	34

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Bicycles (on Roadway and Crosswalks)

	Driveway							Main Street (Route 117)							Bolton Office Park Drive							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							1	1

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:15 PM	Driveway							Main Street (Route 117)							Bolton Office Park Drive							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg							0							0							0							1	1
Total							0							1							0							1	2

PDI File #: **218000 A**
Location: **N: Driveway S: Bolton Office Park Drive**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Pedestrians

	Driveway							Main Street (Route 117)							Bolton Office Park Drive							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	Driveway							Main Street (Route 117)							Bolton Office Park Drive							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars and Heavy Vehicles (Combined)

	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:00 AM	1	3	2	0	6	1	56	11	0	68	11	0	9	0	20	135	84	0	0	219	313
6:15 AM	0	8	1	0	9	2	86	26	0	114	13	0	12	0	25	164	133	0	0	297	445
6:30 AM	1	9	7	0	17	3	88	34	0	125	24	0	21	0	45	162	142	0	0	304	491
6:45 AM	1	18	8	0	27	2	119	38	0	159	30	0	31	0	61	154	129	1	0	284	531
Total	3	38	18	0	59	8	349	109	0	466	78	0	73	0	151	615	488	1	0	1104	1780
7:00 AM	2	13	11	0	26	5	119	35	0	159	25	0	19	0	44	143	142	1	0	286	515
7:15 AM	1	15	12	0	28	8	198	42	0	248	27	3	25	0	55	141	151	0	0	292	623
7:30 AM	2	12	8	0	22	8	179	54	0	241	35	0	41	0	76	106	149	2	0	257	596
7:45 AM	15	26	16	0	57	11	171	37	0	219	30	3	36	0	69	120	155	6	0	281	626
Total	20	66	47	0	133	32	667	168	0	867	117	6	121	0	244	510	597	9	0	1116	2360
8:00 AM	9	21	4	0	34	6	148	41	0	195	45	1	26	0	72	132	116	7	0	255	556
8:15 AM	11	17	7	0	35	9	179	44	0	232	26	3	30	0	59	147	92	3	0	242	568
8:30 AM	3	16	10	0	29	12	161	43	0	216	30	4	16	0	50	92	126	12	0	230	525
8:45 AM	4	11	16	0	31	6	164	36	0	206	24	1	23	0	48	112	127	4	0	243	528
Total	27	65	37	0	129	33	652	164	0	849	125	9	95	0	229	483	461	26	0	970	2177
Grand Total	50	169	102	0	321	73	1668	441	0	2182	320	15	289	0	624	1608	1546	36	0	3190	6317
Approach %	15.6	52.6	31.8	0.0		3.3	76.4	20.2	0.0		51.3	2.4	46.3	0.0		50.4	48.5	1.1	0.0		
Total %	0.8	2.7	1.6	0.0	5.1	1.2	26.4	7.0	0.0	34.5	5.1	0.2	4.6	0.0	9.9	25.5	24.5	0.6	0.0	50.5	
Exiting Leg Total					124					1968					2218					2007	6317
Cars	46	168	102	0	316	70	1535	423	0	2028	298	15	273	0	586	1549	1486	35	0	3070	6000
% Cars	92.0	99.4	100.0	0.0	98.4	95.9	92.0	95.9	0.0	92.9	93.1	100.0	94.5	0.0	93.9	96.3	96.1	97.2	0.0	96.2	95.0
Exiting Leg Total					120					1886					2140					1854	6000
Heavy Vehicles	4	1	0	0	5	3	133	18	0	154	22	0	16	0	38	59	60	1	0	120	317
% Heavy Vehicles	8.0	0.6	0.0	0.0	1.6	4.1	8.0	4.1	0.0	7.1	6.9	0.0	5.5	0.0	6.1	3.7	3.9	2.8	0.0	3.8	5.0
Exiting Leg Total					4					82					78					153	317

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

7:15 AM	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	1	15	12	0	28	8	198	42	0	248	27	3	25	0	55	141	151	0	0	292	623
7:30 AM	2	12	8	0	22	8	179	54	0	241	35	0	41	0	76	106	149	2	0	257	596
7:45 AM	15	26	16	0	57	11	171	37	0	219	30	3	36	0	69	120	155	6	0	281	626
8:00 AM	9	21	4	0	34	6	148	41	0	195	45	1	26	0	72	132	116	7	0	255	556
Total Volume	27	74	40	0	141	33	696	174	0	903	137	7	128	0	272	499	571	15	0	1085	2401
% Approach Total	19.1	52.5	28.4	0.0		3.7	77.1	19.3	0.0		50.4	2.6	47.1	0.0		46.0	52.6	1.4	0.0		
PHF	0.450	0.712	0.625	0.000	0.618	0.750	0.879	0.806	0.000	0.910	0.761	0.583	0.780	0.000	0.895	0.885	0.921	0.536	0.000	0.929	0.959
Cars	27	74	40	0	141	32	650	169	0	851	130	7	123	0	260	486	550	14	0	1050	2302
Cars %	100.0	100.0	100.0	0.0	100.0	97.0	93.4	97.1	0.0	94.2	94.9	100.0	96.1	0.0	95.6	97.4	96.3	93.3	0.0	96.8	95.9
Heavy Vehicles	0	0	0	0	0	1	46	5	0	52	7	0	5	0	12	13	21	1	0	35	99
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	3.0	6.6	2.9	0.0	5.8	5.1	0.0	3.9	0.0	4.4	2.6	3.7	6.7	0.0	3.2	4.1
Cars Enter Leg	27	74	40	0	141	32	650	169	0	851	130	7	123	0	260	486	550	14	0	1050	2302
Heavy Enter Leg	0	0	0	0	0	1	46	5	0	52	7	0	5	0	12	13	21	1	0	35	99
Total Entering Leg	27	74	40	0	141	33	696	174	0	903	137	7	128	0	272	499	571	15	0	1085	2401
Cars Exiting Leg					53					720					729					800	2302
Heavy Exiting Leg					2					28					18					51	99
Total Exiting Leg					55					748					747					851	2401

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars

	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:00 AM	1	3	2	0	6	1	50	10	0	61	11	0	8	0	19	123	83	0	0	206	292
6:15 AM	0	8	1	0	9	2	82	25	0	109	13	0	12	0	25	158	131	0	0	289	432
6:30 AM	1	9	7	0	17	3	83	34	0	120	22	0	19	0	41	157	131	0	0	288	466
6:45 AM	1	18	8	0	27	2	114	38	0	154	26	0	30	0	56	148	123	1	0	272	509
Total	3	38	18	0	59	8	329	107	0	444	72	0	69	0	141	586	468	1	0	1055	1699
7:00 AM	1	13	11	0	25	5	102	32	0	139	21	0	18	0	39	138	136	1	0	275	478
7:15 AM	1	15	12	0	28	8	185	39	0	232	24	3	24	0	51	137	149	0	0	286	597
7:30 AM	2	12	8	0	22	8	170	52	0	230	35	0	37	0	72	103	137	2	0	242	566
7:45 AM	15	26	16	0	57	11	158	37	0	206	28	3	36	0	67	118	151	6	0	275	605
Total	19	66	47	0	132	32	615	160	0	807	108	6	115	0	229	496	573	9	0	1078	2246
8:00 AM	9	21	4	0	34	5	137	41	0	183	43	1	26	0	70	128	113	6	0	247	534
8:15 AM	8	16	7	0	31	8	164	42	0	214	26	3	28	0	57	144	87	3	0	234	536
8:30 AM	3	16	10	0	29	11	137	40	0	188	28	4	16	0	48	87	123	12	0	222	487
8:45 AM	4	11	16	0	31	6	153	33	0	192	21	1	19	0	41	108	122	4	0	234	498
Total	24	64	37	0	125	30	591	156	0	777	118	9	89	0	216	467	445	25	0	937	2055
Grand Total	46	168	102	0	316	70	1535	423	0	2028	298	15	273	0	586	1549	1486	35	0	3070	6000
Approach %	14.6	53.2	32.3	0.0		3.5	75.7	20.9	0.0		50.9	2.6	46.6	0.0		50.5	48.4	1.1	0.0		
Total %	0.8	2.8	1.7	0.0	5.3	1.2	25.6	7.1	0.0	33.8	5.0	0.3	4.6	0.0	9.8	25.8	24.8	0.6	0.0	51.2	
Exiting Leg Total					120					1886					2140					1854	6000

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

7:15 AM	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:15 AM	1	15	12	0	28	8	185	39	0	232	24	3	24	0	51	137	149	0	0	286	597
7:30 AM	2	12	8	0	22	8	170	52	0	230	35	0	37	0	72	103	137	2	0	242	566
7:45 AM	15	26	16	0	57	11	158	37	0	206	28	3	36	0	67	118	151	6	0	275	605
8:00 AM	9	21	4	0	34	5	137	41	0	183	43	1	26	0	70	128	113	6	0	247	534
Total Volume	27	74	40	0	141	32	650	169	0	851	130	7	123	0	260	486	550	14	0	1050	2302
% Approach Total	19.1	52.5	28.4	0.0		3.8	76.4	19.9	0.0		50.0	2.7	47.3	0.0		46.3	52.4	1.3	0.0		
PHF	0.450	0.712	0.625	0.000	0.618	0.727	0.878	0.813	0.000	0.917	0.756	0.583	0.831	0.000	0.903	0.887	0.911	0.583	0.000	0.918	0.951
Entering Leg	27	74	40	0	141	32	650	169	0	851	130	7	123	0	260	486	550	14	0	1050	2302
Exiting Leg					53					720					729					800	2302
Total					194					1571					989					1850	4604

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)

	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:00 AM	0	0	0	0	0	0	6	1	0	7	0	0	1	0	1	12	1	0	0	13	21
6:15 AM	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	6	2	0	0	8	13
6:30 AM	0	0	0	0	0	0	5	0	0	5	2	0	2	0	4	5	11	0	0	16	25
6:45 AM	0	0	0	0	0	0	5	0	0	5	4	0	1	0	5	6	6	0	0	12	22
Total	0	0	0	0	0	0	20	2	0	22	6	0	4	0	10	29	20	0	0	49	81
7:00 AM	1	0	0	0	1	0	17	3	0	20	4	0	1	0	5	5	6	0	0	11	37
7:15 AM	0	0	0	0	0	0	13	3	0	16	3	0	1	0	4	4	2	0	0	6	26
7:30 AM	0	0	0	0	0	0	9	2	0	11	0	0	4	0	4	3	12	0	0	15	30
7:45 AM	0	0	0	0	0	0	13	0	0	13	2	0	0	0	2	2	4	0	0	6	21
Total	1	0	0	0	1	0	52	8	0	60	9	0	6	0	15	14	24	0	0	38	114
8:00 AM	0	0	0	0	0	1	11	0	0	12	2	0	0	0	2	4	3	1	0	8	22
8:15 AM	3	1	0	0	4	1	15	2	0	18	0	0	2	0	2	3	5	0	0	8	32
8:30 AM	0	0	0	0	0	1	24	3	0	28	2	0	0	0	2	5	3	0	0	8	38
8:45 AM	0	0	0	0	0	0	11	3	0	14	3	0	4	0	7	4	5	0	0	9	30
Total	3	1	0	0	4	3	61	8	0	72	7	0	6	0	13	16	16	1	0	33	122
Grand Total	4	1	0	0	5	3	133	18	0	154	22	0	16	0	38	59	60	1	0	120	317
Approach %	80.0	20.0	0.0	0.0		1.9	86.4	11.7	0.0		57.9	0.0	42.1	0.0		49.2	50.0	0.8	0.0		
Total %	1.3	0.3	0.0	0.0	1.6	0.9	42.0	5.7	0.0	48.6	6.9	0.0	5.0	0.0	12.0	18.6	18.9	0.3	0.0	37.9	
Exiting Leg Total					4					82					78					153	317
Buses	4	0	0	0	4	1	14	0	0	15	0	0	0	0	0	1	18	0	0	19	38
% Buses	100.0	0.0	0.0	0.0	80.0	33.3	10.5	0.0	0.0	9.7	0.0	0.0	0.0	0.0	0.0	1.7	30.0	0.0	0.0	15.8	12.0
Exiting Leg Total					1					18					1					18	38
Single-Unit Trucks	0	1	0	0	1	2	81	14	0	97	13	0	8	0	21	36	26	1	0	63	182
% Single-Unit	0.0	100.0	0.0	0.0	20.0	66.7	60.9	77.8	0.0	63.0	59.1	0.0	50.0	0.0	55.3	61.0	43.3	100.0	0.0	52.5	57.4
Exiting Leg Total					3					39					51					89	182
Articulated Trucks	0	0	0	0	0	0	38	4	0	42	9	0	8	0	17	22	16	0	0	38	97
% Articulated	0.0	0.0	0.0	0.0	0.0	0.0	28.6	22.2	0.0	27.3	40.9	0.0	50.0	0.0	44.7	37.3	26.7	0.0	0.0	31.7	30.6
Exiting Leg Total					0					25					26					46	97

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

8:00 AM	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	1	11	0	0	12	2	0	0	0	2	4	3	1	0	8	22
8:15 AM	3	1	0	0	4	1	15	2	0	18	0	0	2	0	2	3	5	0	0	8	32
8:30 AM	0	0	0	0	0	1	24	3	0	28	2	0	0	0	2	5	3	0	0	8	38
8:45 AM	0	0	0	0	0	0	11	3	0	14	3	0	4	0	7	4	5	0	0	9	30
Total Volume	3	1	0	0	4	3	61	8	0	72	7	0	6	0	13	16	16	1	0	33	122
% Approach Total	75.0	25.0	0.0	0.0		4.2	84.7	11.1	0.0		53.8	0.0	46.2	0.0		48.5	48.5	3.0	0.0		
PHF	0.250	0.250	0.000	0.000	0.250	0.750	0.635	0.667	0.000	0.643	0.583	0.000	0.375	0.000	0.464	0.800	0.800	0.250	0.000	0.917	0.803
Buses	3	0	0	0	3	1	7	0	0	8	0	0	0	0	0	1	1	0	0	2	13
Buses %	100.0	0.0	0.0	0.0	75.0	33.3	11.5	0.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0	6.3	6.3	0.0	0.0	6.1	10.7
Single-Unit Trucks	0	1	0	0	1	2	40	6	0	48	6	0	4	0	10	11	9	1	0	21	80
Single-Unit %	0.0	100.0	0.0	0.0	25.0	66.7	65.6	75.0	0.0	66.7	85.7	0.0	66.7	0.0	76.9	68.8	56.3	100.0	0.0	63.6	65.6
Articulated Trucks	0	0	0	0	0	0	14	2	0	16	1	0	2	0	3	4	6	0	0	10	29
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	23.0	25.0	0.0	22.2	14.3	0.0	33.3	0.0	23.1	25.0	37.5	0.0	0.0	30.3	23.8
Buses	3	0	0	0	3	1	7	0	0	8	0	0	0	0	0	1	1	0	0	2	13
Single-Unit Trucks	0	1	0	0	1	2	40	6	0	48	6	0	4	0	10	11	9	1	0	21	80
Articulated Trucks	0	0	0	0	0	0	14	2	0	16	1	0	2	0	3	4	6	0	0	10	29
Total Entering Leg	3	1	0	0	4	3	61	8	0	72	7	0	6	0	13	16	16	1	0	33	122
Buses					1					1					1					10	13
Single-Unit Trucks					3					15					18					44	80
Articulated Trucks					0					7					6					16	29
Total Exiting Leg					4					23					25					70	122

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Buses

	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	8
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	10	10
7:00 AM	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	5
7:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7	7
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	0	7	0	0	7	0	0	0	0	0	0	7	0	0	7	15
8:00 AM	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	2
8:15 AM	3	0	0	0	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	4
8:30 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	1	1	0	0	2	7
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	0	0	0	3	1	7	0	0	8	0	0	0	0	0	1	1	0	0	2	13
Grand Total	4	0	0	0	4	1	14	0	0	15	0	0	0	0	0	1	18	0	0	19	38
Approach %	100.0	0.0	0.0	0.0		6.7	93.3	0.0	0.0		0.0	0.0	0.0	0.0		5.3	94.7	0.0	0.0		
Total %	10.5	0.0	0.0	0.0	10.5	2.6	36.8	0.0	0.0	39.5	0.0	0.0	0.0	0.0	0.0	2.6	47.4	0.0	0.0	50.0	
Exiting Leg Total					1					18					1					18	38

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

6:30 AM	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8	8
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
7:00 AM	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	5
7:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
Total Volume	1	0	0	0	1	0	7	0	0	7	0	0	0	0	0	0	10	0	0	10	18
% Approach Total	100.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.438	0.000	0.000	0.438	0.000	0.000	0.000	0.000	0.000	0.000	0.313	0.000	0.000	0.313	0.563
Entering Leg	1	0	0	0	1	0	7	0	0	7	0	0	0	0	0	0	10	0	0	10	18
Exiting Leg					0					10					0					8	18
Total					1					17					0					18	36

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Single-Unit Trucks**

	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:00 AM	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	7	1	0	0	8	12
6:15 AM	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	3	2	0	0	5	9
6:30 AM	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	3	2	0	0	5	10
6:45 AM	0	0	0	0	0	0	4	0	0	4	2	0	1	0	3	4	3	0	0	7	14
Total	0	0	0	0	0	0	14	2	0	16	2	0	2	0	4	17	8	0	0	25	45
7:00 AM	0	0	0	0	0	0	8	3	0	11	2	0	1	0	3	2	2	0	0	4	18
7:15 AM	0	0	0	0	0	0	5	2	0	7	2	0	1	0	3	3	1	0	0	4	14
7:30 AM	0	0	0	0	0	0	6	1	0	7	0	0	0	0	0	1	4	0	0	5	12
7:45 AM	0	0	0	0	0	0	8	0	0	8	1	0	0	0	1	2	2	0	0	4	13
Total	0	0	0	0	0	0	27	6	0	33	5	0	2	0	7	8	9	0	0	17	57
8:00 AM	0	0	0	0	0	0	9	0	0	9	1	0	0	0	1	4	0	1	0	5	15
8:15 AM	0	1	0	0	1	1	10	1	0	12	0	0	1	0	1	2	2	0	0	4	18
8:30 AM	0	0	0	0	0	1	16	2	0	19	2	0	0	0	2	3	2	0	0	5	26
8:45 AM	0	0	0	0	0	0	5	3	0	8	3	0	3	0	6	2	5	0	0	7	21
Total	0	1	0	0	1	2	40	6	0	48	6	0	4	0	10	11	9	1	0	21	80
Grand Total	0	1	0	0	1	2	81	14	0	97	13	0	8	0	21	36	26	1	0	63	182
Approach %	0.0	100.0	0.0	0.0		2.1	83.5	14.4	0.0		61.9	0.0	38.1	0.0		57.1	41.3	1.6	0.0		
Total %	0.0	0.5	0.0	0.0	0.5	1.1	44.5	7.7	0.0	53.3	7.1	0.0	4.4	0.0	11.5	19.8	14.3	0.5	0.0	34.6	
Exiting Leg Total					3					39					51					89	182

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

8:00 AM	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
8:00 AM	0	0	0	0	0	0	9	0	0	9	1	0	0	0	1	4	0	1	0	5	15
8:15 AM	0	1	0	0	1	1	10	1	0	12	0	0	1	0	1	2	2	0	0	4	18
8:30 AM	0	0	0	0	0	1	16	2	0	19	2	0	0	0	2	3	2	0	0	5	26
8:45 AM	0	0	0	0	0	0	5	3	0	8	3	0	3	0	6	2	5	0	0	7	21
Total Volume	0	1	0	0	1	2	40	6	0	48	6	0	4	0	10	11	9	1	0	21	80
% Approach Total	0.0	100.0	0.0	0.0		4.2	83.3	12.5	0.0		60.0	0.0	40.0	0.0		52.4	42.9	4.8	0.0		
PHF	0.000	0.250	0.000	0.000	0.250	0.500	0.625	0.500	0.000	0.632	0.500	0.000	0.333	0.000	0.417	0.688	0.450	0.250	0.000	0.750	0.769
Entering Leg	0	1	0	0	1	2	40	6	0	48	6	0	4	0	10	11	9	1	0	21	80
Exiting Leg					3					15					18					44	80
Total					4					63					28					65	160

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Articulated Trucks

	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
6:00 AM	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	5	0	0	0	5	9
6:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3	0	0	0	3	4
6:30 AM	0	0	0	0	0	0	1	0	0	1	2	0	1	0	3	2	1	0	0	3	7
6:45 AM	0	0	0	0	0	0	1	0	0	1	2	0	0	0	2	2	1	0	0	3	6
Total	0	0	0	0	0	0	6	0	0	6	4	0	2	0	6	12	2	0	0	14	26
7:00 AM	0	0	0	0	0	0	5	0	0	5	2	0	0	0	2	3	4	0	0	7	14
7:15 AM	0	0	0	0	0	0	5	1	0	6	1	0	0	0	1	1	1	0	0	2	9
7:30 AM	0	0	0	0	0	0	3	1	0	4	0	0	4	0	4	2	1	0	0	3	11
7:45 AM	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	2	0	0	2	8
Total	0	0	0	0	0	0	18	2	0	20	4	0	4	0	8	6	8	0	0	14	42
8:00 AM	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	3	0	0	3	5
8:15 AM	0	0	0	0	0	0	4	1	0	5	0	0	1	0	1	1	3	0	0	4	10
8:30 AM	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	1	0	0	0	1	5
8:45 AM	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	2	0	0	0	2	9
Total	0	0	0	0	0	0	14	2	0	16	1	0	2	0	3	4	6	0	0	10	29
Grand Total	0	0	0	0	0	0	38	4	0	42	9	0	8	0	17	22	16	0	0	38	97
Approach %	0.0	0.0	0.0	0.0		0.0	90.5	9.5	0.0		52.9	0.0	47.1	0.0		57.9	42.1	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	39.2	4.1	0.0	43.3	9.3	0.0	8.2	0.0	17.5	22.7	16.5	0.0	0.0	39.2	
Exiting Leg Total					0					25					26					46	97

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

7:00 AM	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
7:00 AM	0	0	0	0	0	0	5	0	0	5	2	0	0	0	2	3	4	0	0	7	14
7:15 AM	0	0	0	0	0	0	5	1	0	6	1	0	0	0	1	1	1	0	0	2	9
7:30 AM	0	0	0	0	0	0	3	1	0	4	0	0	4	0	4	2	1	0	0	3	11
7:45 AM	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	2	0	0	2	8
Total Volume	0	0	0	0	0	0	18	2	0	20	4	0	4	0	8	6	8	0	0	14	42
% Approach Total	0.0	0.0	0.0	0.0		0.0	90.0	10.0	0.0		50.0	0.0	50.0	0.0		42.9	57.1	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.900	0.500	0.000	0.833	0.500	0.000	0.250	0.000	0.500	0.500	0.500	0.000	0.000	0.500	0.750
Entering Leg	0	0	0	0	0	0	18	2	0	20	4	0	4	0	8	6	8	0	0	14	42
Exiting Leg					0					12					8					22	42
Total					0					32					16					36	84

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Bicycles (on Roadway and Crosswalks)

	Sugar Road							Main Street (Route 117)							I-495 SB Ramps							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
6:00 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	1	0	0	0	0	0	1	0	2	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	1	4
Total	1	0	0	0	0	0	1	0	2	0	0	0	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	2	5
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	0	0	0	0	1	0	3	0	0	0	0	3	0	0	0	0	0	0	0	1	1	1	0	0	0	3	7
Approach %	100.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		33.3	33.3	33.3	0.0	0.0	0.0		
Total %	14.3	0.0	0.0	0.0	0.0	0.0	14.3	0.0	42.9	0.0	0.0	0.0	0.0	42.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.3	14.3	14.3	0.0	0.0	0.0	42.9	
Exiting Leg Total							1							1							1							4	7

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

7:00 AM	Sugar Road							Main Street (Route 117)							I-495 SB Ramps							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	1	0	0	0	0	0	1	0	2	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	1	4
Total Volume	1	0	0	0	0	0	1	0	2	0	0	0	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	2	5
% Approach Total	100.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		50.0	0.0	50.0	0.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.500	0.313
Entering Leg	1	0	0	0	0	0	1	0	2	0	0	0	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	2	5
Exiting Leg							1							0							1							3	5
Total							2							2							1							5	10

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Pedestrians

	Sugar Road							Main Street (Route 117)							I-495 SB Ramps							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

6:00 AM	Sugar Road							Main Street (Route 117)							I-495 SB Ramps							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars and Heavy Vehicles (Combined)

	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	5	8	12	0	25	30	251	40	0	321	29	1	38	0	68	104	86	8	0	198	612
4:15 PM	4	11	6	0	21	25	241	63	0	329	37	3	34	0	74	113	89	2	0	204	628
4:30 PM	3	8	9	0	20	29	264	59	0	352	35	3	32	1	71	123	128	4	0	255	698
4:45 PM	3	11	6	0	20	32	257	44	0	333	41	6	58	0	105	113	101	3	0	217	675
Total	15	38	33	0	86	116	1013	206	0	1335	142	13	162	1	318	453	404	17	0	874	2613
5:00 PM	8	9	9	0	26	25	257	60	0	342	25	2	21	0	48	97	112	3	0	212	628
5:15 PM	3	11	13	0	27	22	270	71	0	363	26	2	22	0	50	104	126	5	0	235	675
5:30 PM	4	10	11	0	25	19	256	50	0	325	47	7	48	0	102	120	121	5	0	246	698
5:45 PM	4	6	9	0	19	22	249	53	0	324	44	7	59	0	110	115	105	2	0	222	675
Total	19	36	42	0	97	88	1032	234	0	1354	142	18	150	0	310	436	464	15	0	915	2676
6:00 PM	5	6	8	0	19	19	192	47	0	258	27	0	45	0	72	87	101	6	0	194	543
6:15 PM	4	5	5	0	14	15	202	39	0	256	41	3	46	0	90	79	78	6	0	163	523
6:30 PM	1	5	9	0	15	13	184	38	0	235	24	2	55	0	81	85	94	6	0	185	516
6:45 PM	2	9	7	0	18	16	180	33	0	229	27	1	31	0	59	69	64	4	0	137	443
Total	12	25	29	0	66	63	758	157	0	978	119	6	177	0	302	320	337	22	0	679	2025
Grand Total	46	99	104	0	249	267	2803	597	0	3667	403	37	489	1	930	1209	1205	54	0	2468	7314
Approach %	18.5	39.8	41.8	0.0		7.3	76.4	16.3	0.0		43.3	4.0	52.6	0.1		49.0	48.8	2.2	0.0		
Total %	0.6	1.4	1.4	0.0	3.4	3.7	38.3	8.2	0.0	50.1	5.5	0.5	6.7	0.0	12.7	16.5	16.5	0.7	0.0	33.7	
Exiting Leg Total					358					1712					1906					3338	7314
Cars	45	99	103	0	247	266	2748	587	0	3601	396	36	482	1	915	1168	1183	53	0	2404	7167
% Cars	97.8	100.0	99.0	0.0	99.2	99.6	98.0	98.3	0.0	98.2	98.3	97.3	98.6	100.0	98.4	96.6	98.2	98.1	0.0	97.4	98.0
Exiting Leg Total					355					1682					1855					3275	7167
Heavy Vehicles	1	0	1	0	2	1	55	10	0	66	7	1	7	0	15	41	22	1	0	64	147
% Heavy Vehicles	2.2	0.0	1.0	0.0	0.8	0.4	2.0	1.7	0.0	1.8	1.7	2.7	1.4	0.0	1.6	3.4	1.8	1.9	0.0	2.6	2.0
Exiting Leg Total					3					30					51					63	147

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:30 PM	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:30 PM	3	8	9	0	20	29	264	59	0	352	35	3	32	1	71	123	128	4	0	255	698
4:45 PM	3	11	6	0	20	32	257	44	0	333	41	6	58	0	105	113	101	3	0	217	675
5:00 PM	8	9	9	0	26	25	257	60	0	342	25	2	21	0	48	97	112	3	0	212	628
5:15 PM	3	11	13	0	27	22	270	71	0	363	26	2	22	0	50	104	126	5	0	235	675
Total Volume	17	39	37	0	93	108	1048	234	0	1390	127	13	133	1	274	437	467	15	0	919	2676
% Approach Total	18.3	41.9	39.8	0.0		7.8	75.4	16.8	0.0		46.4	4.7	48.5	0.4		47.6	50.8	1.6	0.0		
PHF	0.531	0.886	0.712	0.000	0.861	0.844	0.970	0.824	0.000	0.957	0.774	0.542	0.573	0.250	0.652	0.888	0.912	0.750	0.000	0.901	0.958
Cars	17	39	37	0	93	107	1027	230	0	1364	124	12	131	1	268	425	460	15	0	900	2625
Cars %	100.0	100.0	100.0	0.0	100.0	99.1	98.0	98.3	0.0	98.1	97.6	92.3	98.5	100.0	97.8	97.3	98.5	100.0	0.0	97.9	98.1
Heavy Vehicles	0	0	0	0	0	1	21	4	0	26	3	1	2	0	6	12	7	0	0	19	51
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.9	2.0	1.7	0.0	1.9	2.4	7.7	1.5	0.0	2.2	2.7	1.5	0.0	0.0	2.1	1.9
Cars Enter Leg	17	39	37	0	93	107	1027	230	0	1364	124	12	131	1	268	425	460	15	0	900	2625
Heavy Enter Leg	0	0	0	0	0	1	21	4	0	26	3	1	2	0	6	12	7	0	0	19	51
Total Entering Leg	17	39	37	0	93	108	1048	234	0	1390	127	13	133	1	274	437	467	15	0	919	2676
Cars Exiting Leg					134					621					695					1175	2625
Heavy Exiting Leg					2					10					16					23	51
Total Exiting Leg					136					631					711					1198	2676

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars

	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	5	8	12	0	25	30	241	40	0	311	29	1	37	0	67	96	80	8	0	184	587
4:15 PM	3	11	6	0	20	25	235	60	0	320	36	3	34	0	73	107	86	2	0	195	608
4:30 PM	3	8	9	0	20	29	258	59	0	346	35	3	30	1	69	119	126	4	0	249	684
4:45 PM	3	11	6	0	20	31	247	43	0	321	39	5	58	0	102	110	100	3	0	213	656
Total	14	38	33	0	85	115	981	202	0	1298	139	12	159	1	311	432	392	17	0	841	2535
5:00 PM	8	9	9	0	26	25	254	58	0	337	25	2	21	0	48	95	109	3	0	207	618
5:15 PM	3	11	13	0	27	22	268	70	0	360	25	2	22	0	49	101	125	5	0	231	667
5:30 PM	4	10	10	0	24	19	251	50	0	320	44	7	46	0	97	117	120	5	0	242	683
5:45 PM	4	6	9	0	19	22	244	52	0	318	44	7	58	0	109	113	104	2	0	219	665
Total	19	36	41	0	96	88	1017	230	0	1335	138	18	147	0	303	426	458	15	0	899	2633
6:00 PM	5	6	8	0	19	19	188	47	0	254	27	0	45	0	72	84	100	6	0	190	535
6:15 PM	4	5	5	0	14	15	199	39	0	253	41	3	46	0	90	78	76	5	0	159	516
6:30 PM	1	5	9	0	15	13	183	38	0	234	24	2	54	0	80	81	94	6	0	181	510
6:45 PM	2	9	7	0	18	16	180	31	0	227	27	1	31	0	59	67	63	4	0	134	438
Total	12	25	29	0	66	63	750	155	0	968	119	6	176	0	301	310	333	21	0	664	1999
Grand Total	45	99	103	0	247	266	2748	587	0	3601	396	36	482	1	915	1168	1183	53	0	2404	7167
Approach %	18.2	40.1	41.7	0.0		7.4	76.3	16.3	0.0		43.3	3.9	52.7	0.1		48.6	49.2	2.2	0.0		
Total %	0.6	1.4	1.4	0.0	3.4	3.7	38.3	8.2	0.0	50.2	5.5	0.5	6.7	0.0	12.8	16.3	16.5	0.7	0.0	33.5	
Exiting Leg Total					355					1682					1855					3275	7167

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

5:00 PM	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
5:00 PM	8	9	9	0	26	25	254	58	0	337	25	2	21	0	48	95	109	3	0	207	618
5:15 PM	3	11	13	0	27	22	268	70	0	360	25	2	22	0	49	101	125	5	0	231	667
5:30 PM	4	10	10	0	24	19	251	50	0	320	44	7	46	0	97	117	120	5	0	242	683
5:45 PM	4	6	9	0	19	22	244	52	0	318	44	7	58	0	109	113	104	2	0	219	665
Total Volume	19	36	41	0	96	88	1017	230	0	1335	138	18	147	0	303	426	458	15	0	899	2633
% Approach Total	19.8	37.5	42.7	0.0		6.6	76.2	17.2	0.0		45.5	5.9	48.5	0.0		47.4	50.9	1.7	0.0		
PHF	0.594	0.818	0.788	0.000	0.889	0.880	0.949	0.821	0.000	0.927	0.784	0.643	0.634	0.000	0.695	0.910	0.916	0.750	0.000	0.929	0.964
Entering Leg	19	36	41	0	96	88	1017	230	0	1335	138	18	147	0	303	426	458	15	0	899	2633
Exiting Leg					121					637					692					1183	2633
Total					217					1972					995					2082	5266

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	10	0	0	10	0	0	1	0	1	8	6	0	0	14	25
4:15 PM	1	0	0	0	1	0	6	3	0	9	1	0	0	0	1	6	3	0	0	9	20
4:30 PM	0	0	0	0	0	0	6	0	0	6	0	0	2	0	2	4	2	0	0	6	14
4:45 PM	0	0	0	0	0	1	10	1	0	12	2	1	0	0	3	3	1	0	0	4	19
Total	1	0	0	0	1	1	32	4	0	37	3	1	3	0	7	21	12	0	0	33	78
5:00 PM	0	0	0	0	0	0	3	2	0	5	0	0	0	0	0	2	3	0	0	5	10
5:15 PM	0	0	0	0	0	0	2	1	0	3	1	0	0	0	1	3	1	0	0	4	8
5:30 PM	0	0	1	0	1	0	5	0	0	5	3	0	2	0	5	3	1	0	0	4	15
5:45 PM	0	0	0	0	0	0	5	1	0	6	0	0	1	0	1	2	1	0	0	3	10
Total	0	0	1	0	1	0	15	4	0	19	4	0	3	0	7	10	6	0	0	16	43
6:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	3	1	0	0	4	8
6:15 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	1	2	1	0	4	7
6:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	4	0	0	0	4	6
6:45 PM	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2	1	0	0	3	5
Total	0	0	0	0	0	0	8	2	0	10	0	0	1	0	1	10	4	1	0	15	26
Grand Total	1	0	1	0	2	1	55	10	0	66	7	1	7	0	15	41	22	1	0	64	147
Approach %	50.0	0.0	50.0	0.0		1.5	83.3	15.2	0.0		46.7	6.7	46.7	0.0		64.1	34.4	1.6	0.0		
Total %	0.7	0.0	0.7	0.0	1.4	0.7	37.4	6.8	0.0	44.9	4.8	0.7	4.8	0.0	10.2	27.9	15.0	0.7	0.0	43.5	
Exiting Leg Total					3					30					51					63	147
Buses	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	1	0	0	2	4
% Buses	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	2.4	4.5	0.0	0.0	3.1	2.7
Exiting Leg Total					0					1					1					2	4
Single-Unit Trucks	1	0	1	0	2	0	35	9	0	44	5	1	4	0	10	27	16	1	0	44	100
% Single-Unit	100.0	0.0	100.0	0.0	100.0	0.0	63.6	90.0	0.0	66.7	71.4	100.0	57.1	0.0	66.7	65.9	72.7	100.0	0.0	68.8	68.0
Exiting Leg Total					2					22					36					40	100
Articulated Trucks	0	0	0	0	0	1	18	1	0	20	2	0	3	0	5	13	5	0	0	18	43
% Articulated	0.0	0.0	0.0	0.0	0.0	100.0	32.7	10.0	0.0	30.3	28.6	0.0	42.9	0.0	33.3	31.7	22.7	0.0	0.0	28.1	29.3
Exiting Leg Total					1					7					14					21	43

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	10	0	0	10	0	0	1	0	1	8	6	0	0	14	25
4:15 PM	1	0	0	0	1	0	6	3	0	9	1	0	0	0	1	6	3	0	0	9	20
4:30 PM	0	0	0	0	0	0	6	0	0	6	0	0	2	0	2	4	2	0	0	6	14
4:45 PM	0	0	0	0	0	1	10	1	0	12	2	1	0	0	3	3	1	0	0	4	19
Total Volume	1	0	0	0	1	1	32	4	0	37	3	1	3	0	7	21	12	0	0	33	78
% Approach Total	100.0	0.0	0.0	0.0		2.7	86.5	10.8	0.0		42.9	14.3	42.9	0.0		63.6	36.4	0.0	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.250	0.800	0.333	0.000	0.771	0.375	0.250	0.375	0.000	0.583	0.656	0.500	0.000	0.000	0.589	0.780
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	0.0	3.0	2.6
Single-Unit Trucks	1	0	0	0	1	0	23	3	0	26	2	1	2	0	5	16	9	0	0	25	57
Single-Unit %	100.0	0.0	0.0	0.0	100.0	0.0	71.9	75.0	0.0	70.3	66.7	100.0	66.7	0.0	71.4	76.2	75.0	0.0	0.0	75.8	73.1
Articulated Trucks	0	0	0	0	0	1	8	1	0	10	1	0	1	0	2	5	2	0	0	7	19
Articulated %	0.0	0.0	0.0	0.0	0.0	100.0	25.0	25.0	0.0	27.0	33.3	0.0	33.3	0.0	28.6	23.8	16.7	0.0	0.0	21.2	24.4
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Single-Unit Trucks	1	0	0	0	1	0	23	3	0	26	2	1	2	0	5	16	9	0	0	25	57
Articulated Trucks	0	0	0	0	0	1	8	1	0	10	1	0	1	0	2	5	2	0	0	7	19
Total Entering Leg	1	0	0	0	1	1	32	4	0	37	3	1	3	0	7	21	12	0	0	33	78
Buses					0					1					0					1	2
Single-Unit Trucks					1					11					19					26	57
Articulated Trucks					1					3					6					9	19
Total Exiting Leg					2					15					25					36	78

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Buses

	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	2
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	1	0	0	2	4
Approach %	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		50.0	50.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0	0.0	50.0	
Exiting Leg Total					0					1					1					2	4

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% Approach Total	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.250
Entering Leg	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
Exiting Leg					0					1					0					1	2
Total					0					2					0					2	4

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Single-Unit Trucks**

	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	7	4	0	0	11	19
4:15 PM	1	0	0	0	1	0	4	2	0	6	1	0	0	0	1	5	2	0	0	7	15
4:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	2	2	0	0	4	9
4:45 PM	0	0	0	0	0	0	8	1	0	9	1	1	0	0	2	2	1	0	0	3	14
Total	1	0	0	0	1	0	23	3	0	26	2	1	2	0	5	16	9	0	0	25	57
5:00 PM	0	0	0	0	0	0	3	2	0	5	0	0	0	0	0	1	3	0	0	4	9
5:15 PM	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	2	1	0	0	3	5
5:30 PM	0	0	1	0	1	0	1	0	0	1	3	0	1	0	4	3	0	0	0	3	9
5:45 PM	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	3
Total	0	0	1	0	1	0	6	4	0	10	3	0	1	0	4	6	5	0	0	11	26
6:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	2	0	0	0	2	6
6:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	1	0	2	4
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	2	3
6:45 PM	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	1	1	0	0	2	4
Total	0	0	0	0	0	0	6	2	0	8	0	0	1	0	1	5	2	1	0	8	17
Grand Total	1	0	1	0	2	0	35	9	0	44	5	1	4	0	10	27	16	1	0	44	100
Approach %	50.0	0.0	50.0	0.0		0.0	79.5	20.5	0.0		50.0	10.0	40.0	0.0		61.4	36.4	2.3	0.0		
Total %	1.0	0.0	1.0	0.0	2.0	0.0	35.0	9.0	0.0	44.0	5.0	1.0	4.0	0.0	10.0	27.0	16.0	1.0	0.0	44.0	
Exiting Leg Total					2					22					36					40	100

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	7	4	0	0	11	19
4:15 PM	1	0	0	0	1	0	4	2	0	6	1	0	0	0	1	5	2	0	0	7	15
4:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	2	2	0	0	4	9
4:45 PM	0	0	0	0	0	0	8	1	0	9	1	1	0	0	2	2	1	0	0	3	14
Total Volume	1	0	0	0	1	0	23	3	0	26	2	1	2	0	5	16	9	0	0	25	57
% Approach Total	100.0	0.0	0.0	0.0		0.0	88.5	11.5	0.0		40.0	20.0	40.0	0.0		64.0	36.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.000	0.250	0.000	0.719	0.375	0.000	0.722	0.500	0.250	0.250	0.000	0.625	0.571	0.563	0.000	0.000	0.568	0.750
Entering Leg	1	0	0	0	1	0	23	3	0	26	2	1	2	0	5	16	9	0	0	25	57
Exiting Leg					1					11					19					26	57
Total					2					37					24					51	114

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Articulated Trucks

	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	1	1	0	0	2	4
4:15 PM	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	1	1	0	0	2	5
4:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	2	0	0	0	2	5
4:45 PM	0	0	0	0	0	1	2	0	0	3	1	0	0	0	1	1	0	0	0	1	5
Total	0	0	0	0	0	1	8	1	0	10	1	0	1	0	2	5	2	0	0	7	19
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	1	0	0	0	1	3
5:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	0	1	0	0	1	5
5:45 PM	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	2	0	0	0	2	7
Total	0	0	0	0	0	0	8	0	0	8	1	0	2	0	3	3	1	0	0	4	15
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2
6:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	3
6:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0	0	0	2	3
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5	2	0	0	7	9
Grand Total	0	0	0	0	0	1	18	1	0	20	2	0	3	0	5	13	5	0	0	18	43
Approach %	0.0	0.0	0.0	0.0		5.0	90.0	5.0	0.0		40.0	0.0	60.0	0.0		72.2	27.8	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	2.3	41.9	2.3	0.0	46.5	4.7	0.0	7.0	0.0	11.6	30.2	11.6	0.0	0.0	41.9	
Exiting Leg Total					1					7					14					21	43

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	Sugar Road					Main Street (Route 117)					I-495 SB Ramps					Main Street (Route 117)					
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	1	1	0	0	2	4
4:15 PM	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	1	1	0	0	2	5
4:30 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	2	0	0	0	2	5
4:45 PM	0	0	0	0	0	1	2	0	0	3	1	0	0	0	1	1	0	0	0	1	5
Total Volume	0	0	0	0	0	1	8	1	0	10	1	0	1	0	2	5	2	0	0	7	19
% Approach Total	0.0	0.0	0.0	0.0		10.0	80.0	10.0	0.0		50.0	0.0	50.0	0.0		71.4	28.6	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.250	0.667	0.250	0.000	0.833	0.250	0.000	0.250	0.000	0.500	0.625	0.500	0.000	0.000	0.875	0.950
Entering Leg	0	0	0	0	0	1	8	1	0	10	1	0	1	0	2	5	2	0	0	7	19
Exiting Leg					1					3					6					9	19
Total					1					13					8					16	38

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Bicycles (on Roadway and Crosswalks)

	Sugar Road							Main Street (Route 117)							I-495 SB Ramps							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	Sugar Road							Main Street (Route 117)							I-495 SB Ramps							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **218000 B**
Location: **N: Sugar Road S: I-495 SB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Pedestrians

	Sugar Road							Main Street (Route 117)							I-495 SB Ramps							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total							0							0							0							0	0

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	Sugar Road							Main Street (Route 117)							I-495 SB Ramps							Main Street (Route 117)							
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg							0							0							0							0	0
Total							0							0							0							0	0

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars and Heavy Vehicles (Combined)

	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
6:00 AM	48	19	0	67	34	23	0	57	56	38	0	94	218
6:15 AM	65	32	0	97	34	50	0	84	86	42	0	128	309
6:30 AM	63	44	0	107	39	70	0	109	107	54	0	161	377
6:45 AM	77	44	0	121	28	77	0	105	100	57	0	157	383
Total	253	139	0	392	135	220	0	355	349	191	0	540	1287
7:00 AM	87	58	0	145	33	88	0	121	127	58	0	185	451
7:15 AM	98	61	0	159	35	141	0	176	141	54	0	195	530
7:30 AM	93	59	0	152	43	147	0	190	136	62	0	198	540
7:45 AM	110	58	0	168	46	113	0	159	151	47	0	198	525
Total	388	236	0	624	157	489	0	646	555	221	0	776	2046
8:00 AM	90	53	0	143	40	108	0	148	121	45	0	166	457
8:15 AM	119	41	0	160	42	111	0	153	99	32	0	131	444
8:30 AM	96	39	0	135	31	117	0	148	116	47	0	163	446
8:45 AM	76	60	0	136	44	133	0	177	123	48	0	171	484
Total	381	193	0	574	157	469	0	626	459	172	0	631	1831
Grand Total	1022	568	0	1590	449	1178	0	1627	1363	584	0	1947	5164
Approach %	64.3	35.7	0.0		27.6	72.4	0.0		70.0	30.0	0.0		
Total %	19.8	11.0	0.0	30.8	8.7	22.8	0.0	31.5	26.4	11.3	0.0	37.7	
Exiting Leg Total				1033				1931				2200	5164
Cars	935	534	0	1469	419	1118	0	1537	1297	568	0	1865	4871
% Cars	91.5	94.0	0.0	92.4	93.3	94.9	0.0	94.5	95.2	97.3	0.0	95.8	94.3
Exiting Leg Total				987				1831				2053	4871
Heavy Vehicles	87	34	0	121	30	60	0	90	66	16	0	82	293
% Heavy Vehicles	8.5	6.0	0.0	7.6	6.7	5.1	0.0	5.5	4.8	2.7	0.0	4.2	5.7
Exiting Leg Total				46				100				147	293

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

7:15 AM	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:15 AM	98	61	0	159	35	141	0	176	141	54	0	195	530
7:30 AM	93	59	0	152	43	147	0	190	136	62	0	198	540
7:45 AM	110	58	0	168	46	113	0	159	151	47	0	198	525
8:00 AM	90	53	0	143	40	108	0	148	121	45	0	166	457
Total Volume	391	231	0	622	164	509	0	673	549	208	0	757	2052
% Approach Total	62.9	37.1	0.0		24.4	75.6	0.0		72.5	27.5	0.0		
PHF	0.889	0.947	0.000	0.926	0.891	0.866	0.000	0.886	0.909	0.839	0.000	0.956	0.950
Cars	365	221	0	586	153	490	0	643	525	203	0	728	1957
Cars %	93.4	95.7	0.0	94.2	93.3	96.3	0.0	95.5	95.6	97.6	0.0	96.2	95.4
Heavy Vehicles	26	10	0	36	11	19	0	30	24	5	0	29	95
Heavy Vehicles %	6.6	4.3	0.0	5.8	6.7	3.7	0.0	4.5	4.4	2.4	0.0	3.8	4.6
Cars Enter Leg	365	221	0	586	153	490	0	643	525	203	0	728	1957
Heavy Enter Leg	26	10	0	36	11	19	0	30	24	5	0	29	95
Total Entering Leg	391	231	0	622	164	509	0	673	549	208	0	757	2052
Cars Exiting Leg				356				746				855	1957
Heavy Exiting Leg				16				34				45	95
Total Exiting Leg				372				780				900	2052

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars

	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
6:00 AM	42	18	0	60	34	22	0	56	55	37	0	92	208
6:15 AM	63	29	0	92	33	47	0	80	84	41	0	125	297
6:30 AM	60	40	0	100	33	68	0	101	95	53	0	148	349
6:45 AM	73	42	0	115	27	76	0	103	92	56	0	148	366
Total	238	129	0	367	127	213	0	340	326	187	0	513	1220
7:00 AM	74	54	0	128	31	81	0	112	120	56	0	176	416
7:15 AM	91	59	0	150	30	135	0	165	136	53	0	189	504
7:30 AM	87	56	0	143	43	145	0	188	127	59	0	186	517
7:45 AM	102	55	0	157	41	108	0	149	146	46	0	192	498
Total	354	224	0	578	145	469	0	614	529	214	0	743	1935
8:00 AM	85	51	0	136	39	102	0	141	116	45	0	161	438
8:15 AM	108	38	0	146	41	102	0	143	98	29	0	127	416
8:30 AM	83	35	0	118	28	105	0	133	111	47	0	158	409
8:45 AM	67	57	0	124	39	127	0	166	117	46	0	163	453
Total	343	181	0	524	147	436	0	583	442	167	0	609	1716
Grand Total	935	534	0	1469	419	1118	0	1537	1297	568	0	1865	4871
Approach %	63.6	36.4	0.0		27.3	72.7	0.0		69.5	30.5	0.0		
Total %	19.2	11.0	0.0	30.2	8.6	23.0	0.0	31.6	26.6	11.7	0.0	38.3	
Exiting Leg Total				987				1831				2053	4871

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

7:15 AM	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:15 AM	91	59	0	150	30	135	0	165	136	53	0	189	504
7:30 AM	87	56	0	143	43	145	0	188	127	59	0	186	517
7:45 AM	102	55	0	157	41	108	0	149	146	46	0	192	498
8:00 AM	85	51	0	136	39	102	0	141	116	45	0	161	438
Total Volume	365	221	0	586	153	490	0	643	525	203	0	728	1957
% Approach Total	62.3	37.7	0.0		23.8	76.2	0.0		72.1	27.9	0.0		
PHF	0.895	0.936	0.000	0.933	0.890	0.845	0.000	0.855	0.899	0.860	0.000	0.948	0.946
Entering Leg	365	221	0	586	153	490	0	643	525	203	0	728	1957
Exiting Leg				356				746				855	1957
Total				942				1389				1583	3914

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
6:00 AM	6	1	0	7	0	1	0	1	1	1	0	2	10
6:15 AM	2	3	0	5	1	3	0	4	2	1	0	3	12
6:30 AM	3	4	0	7	6	2	0	8	12	1	0	13	28
6:45 AM	4	2	0	6	1	1	0	2	8	1	0	9	17
Total	15	10	0	25	8	7	0	15	23	4	0	27	67
7:00 AM	13	4	0	17	2	7	0	9	7	2	0	9	35
7:15 AM	7	2	0	9	5	6	0	11	5	1	0	6	26
7:30 AM	6	3	0	9	0	2	0	2	9	3	0	12	23
7:45 AM	8	3	0	11	5	5	0	10	5	1	0	6	27
Total	34	12	0	46	12	20	0	32	26	7	0	33	111
8:00 AM	5	2	0	7	1	6	0	7	5	0	0	5	19
8:15 AM	11	3	0	14	1	9	0	10	1	3	0	4	28
8:30 AM	13	4	0	17	3	12	0	15	5	0	0	5	37
8:45 AM	9	3	0	12	5	6	0	11	6	2	0	8	31
Total	38	12	0	50	10	33	0	43	17	5	0	22	115
Grand Total	87	34	0	121	30	60	0	90	66	16	0	82	293
Approach %	71.9	28.1	0.0		33.3	66.7	0.0		80.5	19.5	0.0		
Total %	29.7	11.6	0.0	41.3	10.2	20.5	0.0	30.7	22.5	5.5	0.0	28.0	
Exiting Leg Total				46				100				147	293
Buses	0	2	0	2	2	15	0	17	17	1	0	18	37
% Buses	0.0	5.9	0.0	1.7	6.7	25.0	0.0	18.9	25.8	6.3	0.0	22.0	12.6
Exiting Leg Total				3				19				15	37
Single-Unit Trucks	57	22	0	79	18	35	0	53	31	10	0	41	173
% Single-Unit	65.5	64.7	0.0	65.3	60.0	58.3	0.0	58.9	47.0	62.5	0.0	50.0	59.0
Exiting Leg Total				28				53				92	173
Articulated Trucks	30	10	0	40	10	10	0	20	18	5	0	23	83
% Articulated	34.5	29.4	0.0	33.1	33.3	16.7	0.0	22.2	27.3	31.3	0.0	28.0	28.3
Exiting Leg Total				15				28				40	83

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

8:00 AM	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
8:00 AM	5	2	0	7	1	6	0	7	5	0	0	5	19
8:15 AM	11	3	0	14	1	9	0	10	1	3	0	4	28
8:30 AM	13	4	0	17	3	12	0	15	5	0	0	5	37
8:45 AM	9	3	0	12	5	6	0	11	6	2	0	8	31
Total Volume	38	12	0	50	10	33	0	43	17	5	0	22	115
% Approach Total	76.0	24.0	0.0		23.3	76.7	0.0		77.3	22.7	0.0		
PHF	0.731	0.750	0.000	0.735	0.500	0.688	0.000	0.717	0.708	0.417	0.000	0.688	0.777
Buses	0	0	0	0	1	8	0	9	1	0	0	1	10
Buses %	0.0	0.0	0.0	0.0	10.0	24.2	0.0	20.9	5.9	0.0	0.0	4.5	8.7
Single-Unit Trucks	25	6	0	31	4	21	0	25	12	3	0	15	71
Single-Unit %	65.8	50.0	0.0	62.0	40.0	63.6	0.0	58.1	70.6	60.0	0.0	68.2	61.7
Articulated Trucks	13	6	0	19	5	4	0	9	4	2	0	6	34
Articulated %	34.2	50.0	0.0	38.0	50.0	12.1	0.0	20.9	23.5	40.0	0.0	27.3	29.6
Buses	0	0	0	0	1	8	0	9	1	0	0	1	10
Single-Unit Trucks	25	6	0	31	4	21	0	25	12	3	0	15	71
Articulated Trucks	13	6	0	19	5	4	0	9	4	2	0	6	34
Total Entering Leg	38	12	0	50	10	33	0	43	17	5	0	22	115
Buses				1				1				8	10
Single-Unit Trucks				7				18				46	71
Articulated Trucks				7				10				17	34
Total Exiting Leg				15				29				71	115

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Buses

	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	2	0	2	1	0	0	1	7	1	0	8	11
6:45 AM	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	2	0	2	1	0	0	1	9	1	0	10	13
7:00 AM	0	0	0	0	0	4	0	4	0	0	0	0	4
7:15 AM	0	0	0	0	0	3	0	3	0	0	0	0	3
7:30 AM	0	0	0	0	0	0	0	0	7	0	0	7	7
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	7	0	7	7	0	0	7	14
8:00 AM	0	0	0	0	1	2	0	3	0	0	0	0	3
8:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
8:30 AM	0	0	0	0	0	5	0	5	1	0	0	1	6
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	8	0	9	1	0	0	1	10
Grand Total	0	2	0	2	2	15	0	17	17	1	0	18	37
Approach %	0.0	100.0	0.0		11.8	88.2	0.0		94.4	5.6	0.0		
Total %	0.0	5.4	0.0	5.4	5.4	40.5	0.0	45.9	45.9	2.7	0.0	48.6	
Exiting Leg Total				3				19				15	37

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

6:30 AM	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
6:30 AM	0	2	0	2	1	0	0	1	7	1	0	8	11
6:45 AM	0	0	0	0	0	0	0	0	2	0	0	2	2
7:00 AM	0	0	0	0	0	4	0	4	0	0	0	0	4
7:15 AM	0	0	0	0	0	3	0	3	0	0	0	0	3
Total Volume	0	2	0	2	1	7	0	8	9	1	0	10	20
% Approach Total	0.0	100.0	0.0		12.5	87.5	0.0		90.0	10.0	0.0		
PHF	0.000	0.250	0.000	0.250	0.250	0.438	0.000	0.500	0.321	0.250	0.000	0.313	0.455
Entering Leg	0	2	0	2	1	7	0	8	9	1	0	10	20
Exiting Leg				2				11				7	20
Total				4				19				17	40

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Single-Unit Trucks**

	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
6:00 AM	3	1	0	4	0	1	0	1	1	1	0	2	7
6:15 AM	1	3	0	4	1	3	0	4	2	1	0	3	11
6:30 AM	2	2	0	4	2	2	0	4	3	0	0	3	11
6:45 AM	4	2	0	6	1	1	0	2	3	1	0	4	12
Total	10	8	0	18	4	7	0	11	9	3	0	12	41
7:00 AM	7	2	0	9	1	2	0	3	3	1	0	4	16
7:15 AM	6	0	0	6	5	0	0	5	3	0	0	3	14
7:30 AM	5	3	0	8	0	1	0	1	2	2	0	4	13
7:45 AM	4	3	0	7	4	4	0	8	2	1	0	3	18
Total	22	8	0	30	10	7	0	17	10	4	0	14	61
8:00 AM	5	1	0	6	0	4	0	4	1	0	0	1	11
8:15 AM	6	0	0	6	0	5	0	5	1	1	0	2	13
8:30 AM	10	3	0	13	1	7	0	8	4	0	0	4	25
8:45 AM	4	2	0	6	3	5	0	8	6	2	0	8	22
Total	25	6	0	31	4	21	0	25	12	3	0	15	71
Grand Total	57	22	0	79	18	35	0	53	31	10	0	41	173
Approach %	72.2	27.8	0.0		34.0	66.0	0.0		75.6	24.4	0.0		
Total %	32.9	12.7	0.0	45.7	10.4	20.2	0.0	30.6	17.9	5.8	0.0	23.7	
Exiting Leg Total				28				53				92	173

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

8:00 AM	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
8:00 AM	5	1	0	6	0	4	0	4	1	0	0	1	11
8:15 AM	6	0	0	6	0	5	0	5	1	1	0	2	13
8:30 AM	10	3	0	13	1	7	0	8	4	0	0	4	25
8:45 AM	4	2	0	6	3	5	0	8	6	2	0	8	22
Total Volume	25	6	0	31	4	21	0	25	12	3	0	15	71
% Approach Total	80.6	19.4	0.0		16.0	84.0	0.0		80.0	20.0	0.0		
PHF	0.625	0.500	0.000	0.596	0.333	0.750	0.000	0.781	0.500	0.375	0.000	0.469	0.710
Entering Leg	25	6	0	31	4	21	0	25	12	3	0	15	71
Exiting Leg				7				18				46	71
Total				38				43				61	142

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Articulated Trucks

	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
6:00 AM	3	0	0	3	0	0	0	0	0	0	0	0	3
6:15 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
6:30 AM	1	0	0	1	3	0	0	3	2	0	0	2	6
6:45 AM	0	0	0	0	0	0	0	0	3	0	0	3	3
Total	5	0	0	5	3	0	0	3	5	0	0	5	13
7:00 AM	6	2	0	8	1	1	0	2	4	1	0	5	15
7:15 AM	1	2	0	3	0	3	0	3	2	1	0	3	9
7:30 AM	1	0	0	1	0	1	0	1	0	1	0	1	3
7:45 AM	4	0	0	4	1	1	0	2	3	0	0	3	9
Total	12	4	0	16	2	6	0	8	9	3	0	12	36
8:00 AM	0	1	0	1	0	0	0	0	4	0	0	4	5
8:15 AM	5	3	0	8	1	3	0	4	0	2	0	2	14
8:30 AM	3	1	0	4	2	0	0	2	0	0	0	0	6
8:45 AM	5	1	0	6	2	1	0	3	0	0	0	0	9
Total	13	6	0	19	5	4	0	9	4	2	0	6	34
Grand Total	30	10	0	40	10	10	0	20	18	5	0	23	83
Approach %	75.0	25.0	0.0		50.0	50.0	0.0		78.3	21.7	0.0		
Total %	36.1	12.0	0.0	48.2	12.0	12.0	0.0	24.1	21.7	6.0	0.0	27.7	
Exiting Leg Total				15				28				40	83

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

7:00 AM	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
7:00 AM	6	2	0	8	1	1	0	2	4	1	0	5	15
7:15 AM	1	2	0	3	0	3	0	3	2	1	0	3	9
7:30 AM	1	0	0	1	0	1	0	1	0	1	0	1	3
7:45 AM	4	0	0	4	1	1	0	2	3	0	0	3	9
Total Volume	12	4	0	16	2	6	0	8	9	3	0	12	36
% Approach Total	75.0	25.0	0.0		25.0	75.0	0.0		75.0	25.0	0.0		
PHF	0.500	0.500	0.000	0.500	0.500	0.500	0.000	0.667	0.563	0.750	0.000	0.600	0.600
Entering Leg	12	4	0	16	2	6	0	8	9	3	0	12	36
Exiting Leg				5				13				18	36
Total				21				21				30	72

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Bicycles (on Roadway and Crosswalks)

	I-495 NB Ramps from North						Main Street (Route 117) from East						Main Street (Route 117) from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
6:00 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	2
Total	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	3
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						3	3

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

7:00 AM	I-495 NB Ramps from North						Main Street (Route 117) from East						Main Street (Route 117) from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	2
Total Volume	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	2
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	2
Exiting Leg						0						0						2	2
Total						0						2						2	4

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **6:00 AM**
End Time: **9:00 AM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Pedestrians

	I-495 NB Ramps from North						Main Street (Route 117) from East						Main Street (Route 117) from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 06:00 AM to 09:00 AM begins at:

6:00 AM	I-495 NB Ramps from North						Main Street (Route 117) from East						Main Street (Route 117) from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars and Heavy Vehicles (Combined)

	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	165	42	0	207	27	135	0	162	109	35	0	144	513
4:15 PM	184	45	1	230	32	151	0	183	100	27	0	127	540
4:30 PM	166	39	0	205	39	167	0	206	137	34	0	171	582
4:45 PM	176	52	0	228	31	150	0	181	121	28	0	149	558
Total	691	178	1	870	129	603	0	732	467	124	0	591	2193
5:00 PM	169	37	0	206	29	171	0	200	115	37	0	152	558
5:15 PM	166	40	0	206	41	189	0	230	108	44	0	152	588
5:30 PM	160	43	0	203	43	160	0	203	146	42	0	188	594
5:45 PM	171	38	0	209	33	143	0	176	133	30	0	163	548
Total	666	158	0	824	146	663	0	809	502	153	0	655	2288
6:00 PM	141	42	0	183	30	129	0	159	107	33	0	140	482
6:15 PM	159	36	0	195	24	111	0	135	105	20	0	125	455
6:30 PM	159	21	0	180	30	101	0	131	100	26	0	126	437
6:45 PM	122	32	0	154	23	111	0	134	77	18	0	95	383
Total	581	131	0	712	107	452	0	559	389	97	0	486	1757
Grand Total	1938	467	1	2406	382	1718	0	2100	1358	374	0	1732	6238
Approach %	80.5	19.4	0.0		18.2	81.8	0.0		78.4	21.6	0.0		
Total %	31.1	7.5	0.0	38.6	6.1	27.5	0.0	33.7	21.8	6.0	0.0	27.8	
Exiting Leg Total				757				1825				3656	6238
Cars	1906	457	1	2364	368	1686	0	2054	1334	367	0	1701	6119
% Cars	98.3	97.9	100.0	98.3	96.3	98.1	0.0	97.8	98.2	98.1	0.0	98.2	98.1
Exiting Leg Total				736				1791				3592	6119
Heavy Vehicles	32	10	0	42	14	32	0	46	24	7	0	31	119
% Heavy Vehicles	1.7	2.1	0.0	1.7	3.7	1.9	0.0	2.2	1.8	1.9	0.0	1.8	1.9
Exiting Leg Total				21				34				64	119

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:45 PM	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:45 PM	176	52	0	228	31	150	0	181	121	28	0	149	558
5:00 PM	169	37	0	206	29	171	0	200	115	37	0	152	558
5:15 PM	166	40	0	206	41	189	0	230	108	44	0	152	588
5:30 PM	160	43	0	203	43	160	0	203	146	42	0	188	594
Total Volume	671	172	0	843	144	670	0	814	490	151	0	641	2298
% Approach Total	79.6	20.4	0.0		17.7	82.3	0.0		76.4	23.6	0.0		
PHF	0.953	0.827	0.000	0.924	0.837	0.886	0.000	0.885	0.839	0.858	0.000	0.852	0.967
Cars	661	168	0	829	139	658	0	797	480	149	0	629	2255
Cars %	98.5	97.7	0.0	98.3	96.5	98.2	0.0	97.9	98.0	98.7	0.0	98.1	98.1
Heavy Vehicles	10	4	0	14	5	12	0	17	10	2	0	12	43
Heavy Vehicles %	1.5	2.3	0.0	1.7	3.5	1.8	0.0	2.1	2.0	1.3	0.0	1.9	1.9
Cars Enter Leg	661	168	0	829	139	658	0	797	480	149	0	629	2255
Heavy Enter Leg	10	4	0	14	5	12	0	17	10	2	0	12	43
Total Entering Leg	671	172	0	843	144	670	0	814	490	151	0	641	2298
Cars Exiting Leg				288				648				1319	2255
Heavy Exiting Leg				7				14				22	43
Total Exiting Leg				295				662				1341	2298

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Cars

	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	158	39	0	197	26	131	0	157	104	34	0	138	492
4:15 PM	183	45	1	229	32	145	0	177	97	26	0	123	529
4:30 PM	163	37	0	200	36	163	0	199	135	34	0	169	568
4:45 PM	169	51	0	220	30	146	0	176	119	28	0	147	543
Total	673	172	1	846	124	585	0	709	455	122	0	577	2132
5:00 PM	169	36	0	205	27	168	0	195	112	37	0	149	549
5:15 PM	166	39	0	205	39	186	0	225	107	44	0	151	581
5:30 PM	157	42	0	199	43	158	0	201	142	40	0	182	582
5:45 PM	168	38	0	206	31	139	0	170	133	29	0	162	538
Total	660	155	0	815	140	651	0	791	494	150	0	644	2250
6:00 PM	137	42	0	179	28	129	0	157	106	33	0	139	475
6:15 PM	156	36	0	192	24	111	0	135	103	19	0	122	449
6:30 PM	158	21	0	179	30	101	0	131	100	26	0	126	436
6:45 PM	122	31	0	153	22	109	0	131	76	17	0	93	377
Total	573	130	0	703	104	450	0	554	385	95	0	480	1737
Grand Total	1906	457	1	2364	368	1686	0	2054	1334	367	0	1701	6119
Approach %	80.6	19.3	0.0		17.9	82.1	0.0		78.4	21.6	0.0		
Total %	31.1	7.5	0.0	38.6	6.0	27.6	0.0	33.6	21.8	6.0	0.0	27.8	
Exiting Leg Total				736				1791				3592	6119

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:45 PM	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:45 PM	169	51	0	220	30	146	0	176	119	28	0	147	543
5:00 PM	169	36	0	205	27	168	0	195	112	37	0	149	549
5:15 PM	166	39	0	205	39	186	0	225	107	44	0	151	581
5:30 PM	157	42	0	199	43	158	0	201	142	40	0	182	582
Total Volume	661	168	0	829	139	658	0	797	480	149	0	629	2255
% Approach Total	79.7	20.3	0.0		17.4	82.6	0.0		76.3	23.7	0.0		
PHF	0.978	0.824	0.000	0.942	0.808	0.884	0.000	0.886	0.845	0.847	0.000	0.864	0.969
Entering Leg	661	168	0	829	139	658	0	797	480	149	0	629	2255
Exiting Leg				288				648				1319	2255
Total				1117				1445				1948	4510

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	7	3	0	10	1	4	0	5	5	1	0	6	21
4:15 PM	1	0	0	1	0	6	0	6	3	1	0	4	11
4:30 PM	3	2	0	5	3	4	0	7	2	0	0	2	14
4:45 PM	7	1	0	8	1	4	0	5	2	0	0	2	15
Total	18	6	0	24	5	18	0	23	12	2	0	14	61
5:00 PM	0	1	0	1	2	3	0	5	3	0	0	3	9
5:15 PM	0	1	0	1	2	3	0	5	1	0	0	1	7
5:30 PM	3	1	0	4	0	2	0	2	4	2	0	6	12
5:45 PM	3	0	0	3	2	4	0	6	0	1	0	1	10
Total	6	3	0	9	6	12	0	18	8	3	0	11	38
6:00 PM	4	0	0	4	2	0	0	2	1	0	0	1	7
6:15 PM	3	0	0	3	0	0	0	0	2	1	0	3	6
6:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
6:45 PM	0	1	0	1	1	2	0	3	1	1	0	2	6
Total	8	1	0	9	3	2	0	5	4	2	0	6	20
Grand Total	32	10	0	42	14	32	0	46	24	7	0	31	119
Approach %	76.2	23.8	0.0		30.4	69.6	0.0		77.4	22.6	0.0		
Total %	26.9	8.4	0.0	35.3	11.8	26.9	0.0	38.7	20.2	5.9	0.0	26.1	
Exiting Leg Total				21				34				64	119
Buses	1	0	0	1	2	1	0	3	1	0	0	1	5
% Buses	3.1	0.0	0.0	2.4	14.3	3.1	0.0	6.5	4.2	0.0	0.0	3.2	4.2
Exiting Leg Total				2				1				2	5
Single-Unit Trucks	20	8	0	28	11	25	0	36	19	5	0	24	88
% Single-Unit	62.5	80.0	0.0	66.7	78.6	78.1	0.0	78.3	79.2	71.4	0.0	77.4	73.9
Exiting Leg Total				16				27				45	88
Articulated Trucks	11	2	0	13	1	6	0	7	4	2	0	6	26
% Articulated	34.4	20.0	0.0	31.0	7.1	18.8	0.0	15.2	16.7	28.6	0.0	19.4	21.8
Exiting Leg Total				3				6				17	26

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	7	3	0	10	1	4	0	5	5	1	0	6	21
4:15 PM	1	0	0	1	0	6	0	6	3	1	0	4	11
4:30 PM	3	2	0	5	3	4	0	7	2	0	0	2	14
4:45 PM	7	1	0	8	1	4	0	5	2	0	0	2	15
Total Volume	18	6	0	24	5	18	0	23	12	2	0	14	61
% Approach Total	75.0	25.0	0.0		21.7	78.3	0.0		85.7	14.3	0.0		
PHF	0.643	0.500	0.000	0.600	0.417	0.750	0.000	0.821	0.600	0.500	0.000	0.583	0.726
Buses	0	0	0	0	0	1	0	1	1	0	0	1	2
Buses %	0.0	0.0	0.0	0.0	0.0	5.6	0.0	4.3	8.3	0.0	0.0	7.1	3.3
Single-Unit Trucks	12	6	0	18	5	14	0	19	9	2	0	11	48
Single-Unit %	66.7	100.0	0.0	75.0	100.0	77.8	0.0	82.6	75.0	100.0	0.0	78.6	78.7
Articulated Trucks	6	0	0	6	0	3	0	3	2	0	0	2	11
Articulated %	33.3	0.0	0.0	25.0	0.0	16.7	0.0	13.0	16.7	0.0	0.0	14.3	18.0
Buses	0	0	0	0	0	1	0	1	1	0	0	1	2
Single-Unit Trucks	12	6	0	18	5	14	0	19	9	2	0	11	48
Articulated Trucks	6	0	0	6	0	3	0	3	2	0	0	2	11
Total Entering Leg	18	6	0	24	5	18	0	23	12	2	0	14	61
Buses				0				1				1	2
Single-Unit Trucks				7				15				26	48
Articulated Trucks				0				2				9	11
Total Exiting Leg				7				18				36	61

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Buses

	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	0	0	0	0	0	1	0	1	1	0	0	1	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	1	0	0	1	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	1	0	0	1	1	0	0	1	0	0	0	0	2
6:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	1	0	0	0	0	1
Grand Total	1	0	0	1	2	1	0	3	1	0	0	1	5
Approach %	100.0	0.0	0.0		66.7	33.3	0.0		100.0	0.0	0.0		
Total %	20.0	0.0	0.0	20.0	40.0	20.0	0.0	60.0	20.0	0.0	0.0	20.0	
Exiting Leg Total				2				1				2	5

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

5:15 PM	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
6:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total Volume	1	0	0	1	2	0	0	2	0	0	0	0	3
% Approach Total	100.0	0.0	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.250	0.000	0.000	0.250	0.500	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.750
Entering Leg	1	0	0	1	2	0	0	2	0	0	0	0	3
Exiting Leg				2				0				1	3
Total				3				2				1	6

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Class: **Single-Unit Trucks**

	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	5	3	0	8	1	3	0	4	3	1	0	4	16
4:15 PM	0	0	0	0	0	5	0	5	2	1	0	3	8
4:30 PM	1	2	0	3	3	3	0	6	2	0	0	2	11
4:45 PM	6	1	0	7	1	3	0	4	2	0	0	2	13
Total	12	6	0	18	5	14	0	19	9	2	0	11	48
5:00 PM	0	1	0	1	2	3	0	5	3	0	0	3	9
5:15 PM	0	0	0	0	2	2	0	4	1	0	0	1	5
5:30 PM	0	0	0	0	0	1	0	1	3	1	0	4	5
5:45 PM	2	0	0	2	1	3	0	4	0	1	0	1	7
Total	2	1	0	3	5	9	0	14	7	2	0	9	26
6:00 PM	4	0	0	4	0	0	0	0	0	0	0	0	4
6:15 PM	2	0	0	2	0	0	0	0	2	0	0	2	4
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	1	0	1	1	2	0	3	1	1	0	2	6
Total	6	1	0	7	1	2	0	3	3	1	0	4	14
Grand Total	20	8	0	28	11	25	0	36	19	5	0	24	88
Approach %	71.4	28.6	0.0		30.6	69.4	0.0		79.2	20.8	0.0		
Total %	22.7	9.1	0.0	31.8	12.5	28.4	0.0	40.9	21.6	5.7	0.0	27.3	
Exiting Leg Total				16				27				45	88

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	5	3	0	8	1	3	0	4	3	1	0	4	16
4:15 PM	0	0	0	0	0	5	0	5	2	1	0	3	8
4:30 PM	1	2	0	3	3	3	0	6	2	0	0	2	11
4:45 PM	6	1	0	7	1	3	0	4	2	0	0	2	13
Total Volume	12	6	0	18	5	14	0	19	9	2	0	11	48
% Approach Total	66.7	33.3	0.0		26.3	73.7	0.0		81.8	18.2	0.0		
PHF	0.500	0.500	0.000	0.563	0.417	0.700	0.000	0.792	0.750	0.500	0.000	0.688	0.750
Entering Leg	12	6	0	18	5	14	0	19	9	2	0	11	48
Exiting Leg				7				15				26	48
Total				25				34				37	96

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Articulated Trucks

	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
4:00 PM	2	0	0	2	0	0	0	0	1	0	0	1	3
4:15 PM	1	0	0	1	0	1	0	1	1	0	0	1	3
4:30 PM	2	0	0	2	0	1	0	1	0	0	0	0	3
4:45 PM	1	0	0	1	0	1	0	1	0	0	0	0	2
Total	6	0	0	6	0	3	0	3	2	0	0	2	11
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	1	0	1	0	1	0	0	0	0	2
5:30 PM	2	1	0	3	0	1	0	1	1	1	0	2	6
5:45 PM	1	0	0	1	0	1	0	1	0	0	0	0	2
Total	3	2	0	5	0	3	0	3	1	1	0	2	10
6:00 PM	0	0	0	0	1	0	0	1	1	0	0	1	2
6:15 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
6:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	2	1	0	0	1	1	1	0	2	5
Grand Total	11	2	0	13	1	6	0	7	4	2	0	6	26
Approach %	84.6	15.4	0.0		14.3	85.7	0.0		66.7	33.3	0.0		
Total %	42.3	7.7	0.0	50.0	3.8	23.1	0.0	26.9	15.4	7.7	0.0	23.1	
Exiting Leg Total				3				6				17	26

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

5:15 PM	I-495 NB Ramps				Main Street (Route 117)				Main Street (Route 117)				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Total
5:15 PM	0	1	0	1	0	1	0	1	0	0	0	0	2
5:30 PM	2	1	0	3	0	1	0	1	1	1	0	2	6
5:45 PM	1	0	0	1	0	1	0	1	0	0	0	0	2
6:00 PM	0	0	0	0	1	0	0	1	1	0	0	1	2
Total Volume	3	2	0	5	1	3	0	4	2	1	0	3	12
% Approach Total	60.0	40.0	0.0		25.0	75.0	0.0		66.7	33.3	0.0		
PHF	0.375	0.500	0.000	0.417	0.250	0.750	0.000	1.000	0.500	0.250	0.000	0.375	0.500
Entering Leg	3	2	0	5	1	3	0	4	2	1	0	3	12
Exiting Leg				2				4				6	12
Total				7				8				9	24

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Bicycles (on Roadway and Crosswalks)

	I-495 NB Ramps						Main Street (Route 117)						Main Street (Route 117)						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total						0						0						0	0

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

4:00 PM	I-495 NB Ramps						Main Street (Route 117)						Main Street (Route 117)						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg						0						0						0	0
Total						0						0						0	0

PDI File #: **218000 C**
Location: **N: I-495 NB Ramps**
Location: **E: Main Street (Route 117) W: Main Street (Route 117)**
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**
Count Date: **Thursday, June 10, 2021**
Start Time: **4:00 PM**
End Time: **7:00 PM**
Class:

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

Pedestrians

	I-495 NB Ramps						Main Street (Route 117)						Main Street (Route 117)						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Approach %	0	0	0	100	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	0	0	100	0	100	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total						1						0						0	1

Peak Hour Analysis from 04:00 PM to 07:00 PM begins at:

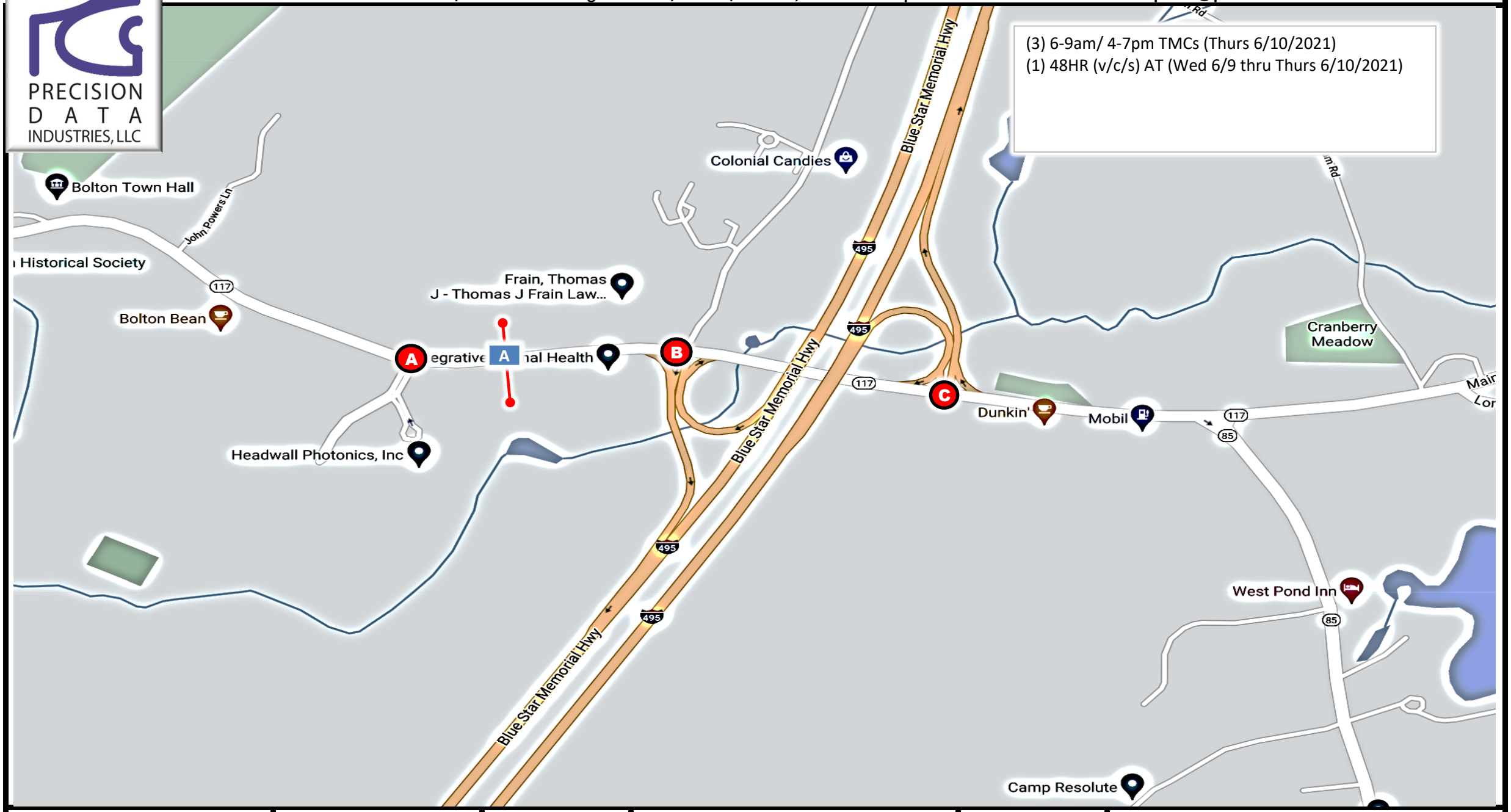
6:00 PM	I-495 NB Ramps						Main Street (Route 117)						Main Street (Route 117)						
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	Total
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg						1						0						0	1
Total						2						0						0	2

Appendix B

Automatic Traffic Recorder (ATR) Counts

Location Map: 218000 Bolton, MA

Precision Data Industries, LLC 157 Washington Street, Suite 2, Hudson, MA 01749 ph: 508-875-0100 email: datarequests@pdillc.com



Client:	Engineer:	Site Code:	Date:	PDI Job #	City, State:
TEC	L. Oltman	TBA	Wed 6/9 thru Thurs 6/10/2021	218000	Bolton, MA

Main Street (Route 117)
east of Bolton Office Park Drive
City, State: **Bolton, MA**
Client: **TEC/ L. Oltman**
Site Code: **TBA**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: **218000 ATR-A**

Count Date:
Wednesday, June, 09, 2021

Volume

WB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	25		12:00 PM	164	
12:15 AM	25		12:15 PM	152	
12:30 AM	13		12:30 PM	159	
12:45 AM	13	76	12:45 PM	165	640
1:00 AM	18		1:00 PM	146	
1:15 AM	11		1:15 PM	165	
1:30 AM	5		1:30 PM	194	
1:45 AM	2	36	1:45 PM	179	684
2:00 AM	6		2:00 PM	187	
2:15 AM	5		2:15 PM	220	
2:30 AM	7		2:30 PM	210	
2:45 AM	10	28	2:45 PM	200	817
3:00 AM	5		3:00 PM	222	
3:15 AM	5		3:15 PM	164	
3:30 AM	3		3:30 PM	226	
3:45 AM	6	19	3:45 PM	232	844
4:00 AM	4		4:00 PM	195	
4:15 AM	8		4:15 PM	208	
4:30 AM	20		4:30 PM	185	
4:45 AM	16	48	4:45 PM	206	794
5:00 AM	18		5:00 PM	247	
5:15 AM	24		5:15 PM	212	
5:30 AM	32		5:30 PM	202	
5:45 AM	62	136	5:45 PM	243	904
6:00 AM	54		6:00 PM	205	
6:15 AM	103		6:15 PM	210	
6:30 AM	116		6:30 PM	211	
6:45 AM	134	407	6:45 PM	172	798
7:00 AM	141		7:00 PM	169	
7:15 AM	142		7:15 PM	167	
7:30 AM	186		7:30 PM	178	
7:45 AM	154	623	7:45 PM	140	654
8:00 AM	149		8:00 PM	122	
8:15 AM	164		8:15 PM	118	
8:30 AM	139		8:30 PM	104	
8:45 AM	132	584	8:45 PM	118	462
9:00 AM	129		9:00 PM	122	
9:15 AM	130		9:15 PM	113	
9:30 AM	152		9:30 PM	102	
9:45 AM	109	520	9:45 PM	81	418
10:00 AM	140		10:00 PM	85	
10:15 AM	158		10:15 PM	70	
10:30 AM	138		10:30 PM	45	
10:45 AM	137	573	10:45 PM	57	257
11:00 AM	126		11:00 PM	44	
11:15 AM	136		11:15 PM	51	
11:30 AM	126		11:30 PM	39	
11:45 AM	148	536	11:45 PM	33	167
Total	3586			7439	
Percent	32.53%			67.47%	
Day Total			11025		
Peak Hour	7:30 AM			5:00 PM	
Volume	653			904	
P.H.F.	0.878			0.915	

EB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	10		12:00 PM	142	
12:15 AM	6		12:15 PM	141	
12:30 AM	6		12:30 PM	165	
12:45 AM	3	25	12:45 PM	138	586
1:00 AM	6		1:00 PM	149	
1:15 AM	7		1:15 PM	147	
1:30 AM	2		1:30 PM	161	
1:45 AM	3	18	1:45 PM	163	620
2:00 AM	4		2:00 PM	149	
2:15 AM	2		2:15 PM	169	
2:30 AM	2		2:30 PM	217	
2:45 AM	4	12	2:45 PM	179	714
3:00 AM	7		3:00 PM	178	
3:15 AM	3		3:15 PM	150	
3:30 AM	12		3:30 PM	90	
3:45 AM	12	34	3:45 PM	107	525
4:00 AM	17		4:00 PM	96	
4:15 AM	31		4:15 PM	88	
4:30 AM	48		4:30 PM	113	
4:45 AM	44	140	4:45 PM	89	386
5:00 AM	95		5:00 PM	136	
5:15 AM	147		5:15 PM	109	
5:30 AM	181		5:30 PM	95	
5:45 AM	214	637	5:45 PM	132	472
6:00 AM	235		6:00 PM	135	
6:15 AM	286		6:15 PM	141	
6:30 AM	249		6:30 PM	148	
6:45 AM	239	1009	6:45 PM	136	560
7:00 AM	259		7:00 PM	138	
7:15 AM	194		7:15 PM	111	
7:30 AM	241		7:30 PM	73	
7:45 AM	235	929	7:45 PM	116	438
8:00 AM	203		8:00 PM	97	
8:15 AM	207		8:15 PM	77	
8:30 AM	199		8:30 PM	65	
8:45 AM	233	842	8:45 PM	53	292
9:00 AM	201		9:00 PM	49	
9:15 AM	151		9:15 PM	44	
9:30 AM	158		9:30 PM	55	
9:45 AM	158	668	9:45 PM	38	186
10:00 AM	123		10:00 PM	45	
10:15 AM	146		10:15 PM	28	
10:30 AM	153		10:30 PM	41	
10:45 AM	155	577	10:45 PM	28	142
11:00 AM	158		11:00 PM	22	
11:15 AM	146		11:15 PM	23	
11:30 AM	131		11:30 PM	13	
11:45 AM	130	565	11:45 PM	8	66
Total	5456			4987	
Percent	52.25%			47.75%	
Day Total			10443		
Peak Hour	6:15 AM			2:15 PM	
Volume	1033			743	
P.H.F.	0.903			0.856	

Combined

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	35		12:00 PM	306	
12:15 AM	31		12:15 PM	293	
12:30 AM	19		12:30 PM	324	
12:45 AM	16	101	12:45 PM	303	1226
1:00 AM	24		1:00 PM	295	
1:15 AM	18		1:15 PM	312	
1:30 AM	7		1:30 PM	355	
1:45 AM	5	54	1:45 PM	342	1304
2:00 AM	10		2:00 PM	336	
2:15 AM	7		2:15 PM	389	
2:30 AM	9		2:30 PM	427	
2:45 AM	14	40	2:45 PM	379	1531
3:00 AM	12		3:00 PM	400	
3:15 AM	8		3:15 PM	314	
3:30 AM	15		3:30 PM	316	
3:45 AM	18	53	3:45 PM	339	1369
4:00 AM	21		4:00 PM	291	
4:15 AM	39		4:15 PM	296	
4:30 AM	68		4:30 PM	298	
4:45 AM	60	188	4:45 PM	295	1180
5:00 AM	113		5:00 PM	383	
5:15 AM	171		5:15 PM	321	
5:30 AM	213		5:30 PM	297	
5:45 AM	276	773	5:45 PM	375	1376
6:00 AM	289		6:00 PM	340	
6:15 AM	389		6:15 PM	351	
6:30 AM	365		6:30 PM	359	
6:45 AM	373	1416	6:45 PM	308	1358
7:00 AM	400		7:00 PM	307	
7:15 AM	336		7:15 PM	278	
7:30 AM	427		7:30 PM	251	
7:45 AM	389	1552	7:45 PM	256	1092
8:00 AM	352		8:00 PM	219	
8:15 AM	371		8:15 PM	195	
8:30 AM	338		8:30 PM	169	
8:45 AM	365	1426	8:45 PM	171	754
9:00 AM	330		9:00 PM	171	
9:15 AM	281		9:15 PM	157	
9:30 AM	310		9:30 PM	157	
9:45 AM	267	1188	9:45 PM	119	604
10:00 AM	263		10:00 PM	130	
10:15 AM	304		10:15 PM	98	
10:30 AM	291		10:30 PM	86	
10:45 AM	292	1150	10:45 PM	85	399
11:00 AM	284		11:00 PM	66	
11:15 AM	282		11:15 PM	74	
11:30 AM	257		11:30 PM	52	
11:45 AM	278	1101	11:45 PM	41	233
Total	9042			12426	
Percent	42.12%			57.88%	
Day Total			21468		
Peak Hour	7:00 AM			2:15 PM	
Volume	1552			1595	
P.H.F.	0.909			0.934	

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east of Bolton Office Park Drive
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Site Code: **TBA**

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157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: **218000 ATR-A**

Count Date:
Thursday, June 10, 2021

Volume

WB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	26		12:00 PM	137	
12:15 AM	15		12:15 PM	162	
12:30 AM	11		12:30 PM	152	
12:45 AM	14	66	12:45 PM	150	601
1:00 AM	9		1:00 PM	180	
1:15 AM	15		1:15 PM	149	
1:30 AM	10		1:30 PM	167	
1:45 AM	4	38	1:45 PM	199	695
2:00 AM	8		2:00 PM	191	
2:15 AM	8		2:15 PM	196	
2:30 AM	5		2:30 PM	206	
2:45 AM	12	33	2:45 PM	207	800
3:00 AM	3		3:00 PM	203	
3:15 AM	6		3:15 PM	156	
3:30 AM	3		3:30 PM	175	
3:45 AM	9	21	3:45 PM	190	724
4:00 AM	8		4:00 PM	193	
4:15 AM	14		4:15 PM	226	
4:30 AM	11		4:30 PM	200	
4:45 AM	24	57	4:45 PM	215	834
5:00 AM	23		5:00 PM	203	
5:15 AM	24		5:15 PM	235	
5:30 AM	46		5:30 PM	235	
5:45 AM	61	154	5:45 PM	227	900
6:00 AM	64		6:00 PM	210	
6:15 AM	88		6:15 PM	227	
6:30 AM	92		6:30 PM	217	
6:45 AM	139	383	6:45 PM	206	860
7:00 AM	124		7:00 PM	224	
7:15 AM	157		7:15 PM	164	
7:30 AM	144		7:30 PM	151	
7:45 AM	169	594	7:45 PM	162	701
8:00 AM	171		8:00 PM	140	
8:15 AM	170		8:15 PM	129	
8:30 AM	155		8:30 PM	108	
8:45 AM	161	657	8:45 PM	102	479
9:00 AM	147		9:00 PM	109	
9:15 AM	134		9:15 PM	95	
9:30 AM	171		9:30 PM	119	
9:45 AM	116	568	9:45 PM	71	394
10:00 AM	133		10:00 PM	57	
10:15 AM	141		10:15 PM	81	
10:30 AM	126		10:30 PM	54	
10:45 AM	144	544	10:45 PM	54	246
11:00 AM	157		11:00 PM	48	
11:15 AM	146		11:15 PM	54	
11:30 AM	149		11:30 PM	40	
11:45 AM	145	597	11:45 PM	35	177
Total	3712			7411	
Percent	33.37%			66.63%	
Day Total			11123		
Peak Hour	7:45 AM			5:15 PM	
Volume	665			907	
P.H.F.	0.972			0.965	

EB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	11		12:00 PM	145	
12:15 AM	3		12:15 PM	162	
12:30 AM	10		12:30 PM	166	
12:45 AM	7	31	12:45 PM	175	648
1:00 AM	6		1:00 PM	148	
1:15 AM	7		1:15 PM	159	
1:30 AM	2		1:30 PM	177	
1:45 AM	5	20	1:45 PM	176	660
2:00 AM	6		2:00 PM	153	
2:15 AM	5		2:15 PM	195	
2:30 AM	4		2:30 PM	135	
2:45 AM	7	22	2:45 PM	192	675
3:00 AM	10		3:00 PM	175	
3:15 AM	8		3:15 PM	127	
3:30 AM	10		3:30 PM	134	
3:45 AM	12	40	3:45 PM	131	567
4:00 AM	17		4:00 PM	89	
4:15 AM	22		4:15 PM	69	
4:30 AM	57		4:30 PM	109	
4:45 AM	51	147	4:45 PM	104	371
5:00 AM	94		5:00 PM	133	
5:15 AM	130		5:15 PM	180	
5:30 AM	202		5:30 PM	181	
5:45 AM	222	648	5:45 PM	158	652
6:00 AM	210		6:00 PM	161	
6:15 AM	278		6:15 PM	131	
6:30 AM	258		6:30 PM	145	
6:45 AM	239	985	6:45 PM	117	554
7:00 AM	242		7:00 PM	118	
7:15 AM	257		7:15 PM	132	
7:30 AM	200		7:30 PM	101	
7:45 AM	217	916	7:45 PM	90	441
8:00 AM	223		8:00 PM	70	
8:15 AM	209		8:15 PM	90	
8:30 AM	208		8:30 PM	88	
8:45 AM	173	813	8:45 PM	55	303
9:00 AM	152		9:00 PM	78	
9:15 AM	166		9:15 PM	59	
9:30 AM	162		9:30 PM	42	
9:45 AM	156	636	9:45 PM	46	225
10:00 AM	147		10:00 PM	54	
10:15 AM	182		10:15 PM	44	
10:30 AM	175		10:30 PM	36	
10:45 AM	173	677	10:45 PM	23	157
11:00 AM	166		11:00 PM	18	
11:15 AM	136		11:15 PM	21	
11:30 AM	140		11:30 PM	16	
11:45 AM	152	594	11:45 PM	13	68
Total	5529			5321	
Percent	50.96%			49.04%	
Day Total			10850		
Peak Hour	6:15 AM			1:30 PM	
Volume	1017			701	
P.H.F.	0.915			0.899	

Combined

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	37		12:00 PM	282	
12:15 AM	18		12:15 PM	324	
12:30 AM	21		12:30 PM	318	
12:45 AM	21	97	12:45 PM	325	1249
1:00 AM	15		1:00 PM	328	
1:15 AM	22		1:15 PM	308	
1:30 AM	12		1:30 PM	344	
1:45 AM	9	58	1:45 PM	375	1355
2:00 AM	14		2:00 PM	344	
2:15 AM	13		2:15 PM	391	
2:30 AM	9		2:30 PM	341	
2:45 AM	19	55	2:45 PM	399	1475
3:00 AM	13		3:00 PM	378	
3:15 AM	14		3:15 PM	283	
3:30 AM	13		3:30 PM	309	
3:45 AM	21	61	3:45 PM	321	1291
4:00 AM	25		4:00 PM	282	
4:15 AM	36		4:15 PM	295	
4:30 AM	68		4:30 PM	309	
4:45 AM	75	204	4:45 PM	319	1205
5:00 AM	117		5:00 PM	336	
5:15 AM	154		5:15 PM	415	
5:30 AM	248		5:30 PM	416	
5:45 AM	283	802	5:45 PM	385	1552
6:00 AM	274		6:00 PM	371	
6:15 AM	366		6:15 PM	358	
6:30 AM	350		6:30 PM	362	
6:45 AM	378	1368	6:45 PM	323	1414
7:00 AM	366		7:00 PM	342	
7:15 AM	414		7:15 PM	296	
7:30 AM	344		7:30 PM	252	
7:45 AM	386	1510	7:45 PM	252	1142
8:00 AM	394		8:00 PM	210	
8:15 AM	379		8:15 PM	219	
8:30 AM	363		8:30 PM	196	
8:45 AM	334	1470	8:45 PM	157	782
9:00 AM	299		9:00 PM	187	
9:15 AM	300		9:15 PM	154	
9:30 AM	333		9:30 PM	161	
9:45 AM	272	1204	9:45 PM	117	619
10:00 AM	280		10:00 PM	111	
10:15 AM	323		10:15 PM	125	
10:30 AM	301		10:30 PM	90	
10:45 AM	317	1221	10:45 PM	77	403
11:00 AM	323		11:00 PM	66	
11:15 AM	282		11:15 PM	75	
11:30 AM	289		11:30 PM	56	
11:45 AM	297	1191	11:45 PM	48	245
Total	9241			12732	
Percent	42.06%			57.94%	
Day Total			21973		
Peak Hour	7:15 AM			5:15 PM	
Volume	1538			1587	
P.H.F.	0.929			0.954	

Main Street (Route 117)
east of Bolton Office Park Drive
City, State: Bolton, MA
Client: TEC/ L. Oltman
Site Code: TBA

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Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 218000 ATR-A

Count Date
Wednesday, June, 09, 2021

Classification (60-minute)

WB														
Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	62	9	0	4	0	0	0	1	0	0	0	0	76
1:00 AM	0	30	0	2	4	0	0	0	0	0	0	0	0	36
2:00 AM	0	22	2	1	3	0	0	0	0	0	0	0	0	28
3:00 AM	0	11	2	2	1	1	0	0	1	0	1	0	0	19
4:00 AM	0	28	10	4	6	0	0	0	0	0	0	0	0	48
5:00 AM	0	75	28	2	26	1	0	1	3	0	0	0	0	136
6:00 AM	5	252	56	23	55	7	0	3	5	0	1	0	0	407
7:00 AM	6	392	99	43	63	4	0	6	6	3	1	0	0	623
8:00 AM	4	361	94	27	71	1	1	13	9	2	0	1	0	584
9:00 AM	4	319	99	12	61	6	1	6	11	1	0	0	0	520
10:00 AM	4	335	108	26	61	9	0	5	22	3	0	0	0	573
11:00 AM	2	333	90	20	54	9	0	8	17	2	0	0	1	536
12:00 PM	3	408	100	13	80	6	1	14	14	0	0	0	1	640
1:00 PM	2	439	118	23	70	6	2	8	12	1	2	1	0	684
2:00 PM	5	575	117	25	68	3	0	13	6	3	0	0	2	817
3:00 PM	20	542	84	67	59	9	0	43	5	7	6	1	1	844
4:00 PM	21	533	51	66	38	4	2	52	4	6	12	2	3	794
5:00 PM	13	620	78	75	60	7	2	29	4	5	9	2	0	904
6:00 PM	6	608	100	12	52	1	0	12	4	2	0	0	1	798
7:00 PM	6	483	88	4	55	1	0	11	4	1	1	0	0	654
8:00 PM	3	360	75	1	18	1	0	2	2	0	0	0	0	462
9:00 PM	1	314	68	1	27	0	0	3	4	0	0	0	0	418
10:00 PM	0	193	40	0	22	0	0	1	0	1	0	0	0	257
11:00 PM	1	138	14	0	13	1	0	0	0	0	0	0	0	167
Total	106	7433	1530	449	971	77	9	230	134	37	33	7	9	11025
Percent	0.96%	67.42%	13.88%	4.07%	8.81%	0.70%	0.08%	2.09%	1.22%	0.34%	0.30%	0.06%	0.08%	
AM Peak	7:00 AM	7:00 AM	10:00 AM	7:00 AM	8:00 AM	10:00 AM	8:00 AM	8:00 AM	10:00 AM	7:00 AM	3:00 AM	8:00 AM	11:00 AM	7:00 AM
Volume	6	392	108	43	71	9	1	13	22	3	1	1	1	623
PM Peak	4:00 PM	5:00 PM	1:00 PM	5:00 PM	12:00 PM	3:00 PM	1:00 PM	4:00 PM	12:00 PM	3:00 PM	4:00 PM	4:00 PM	4:00 PM	5:00 PM
Volume	21	620	118	75	80	9	2	52	14	7	12	2	3	904

Cycles:	106	1.0%
Cars and Light Trucks:	8963	81.3%
Heavy Vehicles:	1956	17.7%

Main Street (Route 117)
east of Bolton Office Park Drive
City, State: Bolton, MA
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Site Code: TBA

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PDI File #: 218000 ATR-A

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Wednesday, June, 09, 2021

Classification (60-minute)

EB														
Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	24	0	0	1	0	0	0	0	0	0	0	0	25
1:00 AM	0	13	1	2	2	0	0	0	0	0	0	0	0	18
2:00 AM	0	10	1	0	0	0	0	0	1	0	0	0	0	12
3:00 AM	0	25	5	0	2	0	0	1	1	0	0	0	0	34
4:00 AM	0	89	35	3	9	2	0	0	2	0	0	0	0	140
5:00 AM	2	423	164	0	35	1	2	4	5	1	0	0	0	637
6:00 AM	7	644	230	24	67	5	9	14	6	2	1	0	0	1009
7:00 AM	14	670	128	39	38	6	3	19	10	0	2	0	0	929
8:00 AM	7	623	114	28	42	5	7	4	11	0	1	0	0	842
9:00 AM	5	477	104	14	32	3	3	10	20	0	0	0	0	668
10:00 AM	7	386	107	17	36	5	6	7	4	2	0	0	0	577
11:00 AM	2	403	88	13	32	3	6	7	10	1	0	0	0	565
12:00 PM	6	411	87	18	33	5	8	8	10	0	0	0	0	586
1:00 PM	7	433	110	15	35	3	3	5	9	0	0	0	0	620
2:00 PM	9	520	101	28	31	2	3	11	7	1	1	0	0	714
3:00 PM	10	376	38	54	25	4	1	11	3	2	1	0	0	525
4:00 PM	19	224	19	86	21	3	2	10	2	0	0	0	0	386
5:00 PM	20	328	40	42	28	4	0	9	1	0	0	0	0	472
6:00 PM	6	424	74	12	20	2	0	14	6	1	1	0	0	560
7:00 PM	5	334	68	5	24	0	0	2	0	0	0	0	0	438
8:00 PM	0	236	45	1	10	0	0	0	0	0	0	0	0	292
9:00 PM	1	146	28	1	8	0	0	1	1	0	0	0	0	186
10:00 PM	2	115	17	1	4	0	0	1	2	0	0	0	0	142
11:00 PM	0	55	7	2	1	0	0	1	0	0	0	0	0	66
PM Total	129	7389	1611	405	536	53	53	139	111	10	7	0	0	10443
Percent	1.24%	70.76%	15.43%	3.88%	5.13%	0.51%	0.51%	1.33%	1.06%	0.10%	0.07%	0.00%	0.00%	
AM Peak	7:00 AM	7:00 AM	6:00 AM	7:00 AM	6:00 AM	7:00 AM	6:00 AM	7:00 AM	9:00 AM	6:00 AM	7:00 AM			6:00 AM
Volume	14	670	230	39	67	6	9	19	20	2	2	0	0	1009
PM Peak	5:00 PM	2:00 PM	1:00 PM	4:00 PM	1:00 PM	12:00 PM	12:00 PM	6:00 PM	12:00 PM	3:00 PM	2:00 PM			2:00 PM
Volume	20	520	110	86	35	5	8	14	10	2	1	0	0	714

Cycles:	129	1.2%
Cars and Light Trucks:	9000	86.2%
Heavy Vehicles:	1314	12.6%

Main Street (Route 117)
east of Bolton Office Park Drive
City, State: Bolton, MA
Client: TEC/ L. Oltman
Site Code: TBA

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 218000 ATR-A

Count Date
Wednesday, June, 09, 2021

Classification (60-minute)

Combined

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	86	9	0	5	0	0	0	1	0	0	0	0	101
1:00 AM	0	43	1	4	6	0	0	0	0	0	0	0	0	54
2:00 AM	0	32	3	1	3	0	0	0	1	0	0	0	0	40
3:00 AM	0	36	7	2	3	1	0	1	2	0	1	0	0	53
4:00 AM	0	117	45	7	15	2	0	0	2	0	0	0	0	188
5:00 AM	2	498	192	2	61	2	2	5	8	1	0	0	0	773
6:00 AM	12	896	286	47	122	12	9	17	11	2	2	0	0	1416
7:00 AM	20	1062	227	82	101	10	3	25	16	3	3	0	0	1552
8:00 AM	11	984	208	55	113	6	8	17	20	2	1	1	0	1426
9:00 AM	9	796	203	26	93	9	4	16	31	1	0	0	0	1188
10:00 AM	11	721	215	43	97	14	6	12	26	5	0	0	0	1150
11:00 AM	4	736	178	33	86	12	6	15	27	3	0	0	1	1101
12:00 PM	9	819	187	31	113	11	9	22	24	0	0	0	1	1226
1:00 PM	9	872	228	38	105	9	5	13	21	1	2	1	0	1304
2:00 PM	14	1095	218	53	99	5	3	24	13	4	1	0	2	1531
3:00 PM	30	918	122	121	84	13	1	54	8	9	7	1	1	1369
4:00 PM	40	757	70	152	59	7	4	62	6	6	12	2	3	1180
5:00 PM	33	948	118	117	88	11	2	38	5	5	9	2	0	1376
6:00 PM	12	1032	174	24	72	3	0	26	10	3	1	0	1	1358
7:00 PM	11	817	156	9	79	1	0	13	4	1	1	0	0	1092
8:00 PM	3	596	120	2	28	1	0	2	2	0	0	0	0	754
9:00 PM	2	460	96	2	35	0	0	4	5	0	0	0	0	604
10:00 PM	2	308	57	1	26	0	0	2	2	1	0	0	0	399
11:00 PM	1	193	21	2	14	1	0	1	0	0	0	0	0	233
PM Total	235	14822	3141	854	1507	130	62	369	245	47	40	7	9	21468
Percent	1.09%	69.04%	14.63%	3.98%	7.02%	0.61%	0.29%	1.72%	1.14%	0.22%	0.19%	0.03%	0.04%	
AM Peak	7:00 AM	7:00 AM	6:00 AM	7:00 AM	6:00 AM	10:00 AM	6:00 AM	7:00 AM	9:00 AM	10:00 AM	7:00 AM	8:00 AM	11:00 AM	7:00 AM
Volume	20	1062	286	82	122	14	9	25	31	5	3	1	1	1552
PM Peak	4:00 PM	2:00 PM	1:00 PM	4:00 PM	12:00 PM	3:00 PM	12:00 PM	4:00 PM	12:00 PM	3:00 PM	4:00 PM	4:00 PM	4:00 PM	2:00 PM
Volume	40	1095	228	152	113	13	9	62	24	9	12	2	3	1531

Cycles:	235	1.1%
Cars and Light Trucks:	17963	83.7%
Heavy Vehicles:	3270	15.2%

Main Street (Route 117)
east of Bolton Office Park Drive
City, State: Bolton, MA
Client: TEC/ L. Oltman
Site Code: TBA

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 218000 ATR-A

Count Date
Thursday, June 10, 2021

Classification (60-minute)

WB														
Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	50	6	1	5	1	0	2	0	0	1	0	0	66
1:00 AM	0	29	4	0	4	0	0	1	0	0	0	0	0	38
2:00 AM	0	25	3	1	1	0	0	0	3	0	0	0	0	33
3:00 AM	0	10	5	1	3	0	0	0	0	1	1	0	0	21
4:00 AM	1	28	14	3	9	1	0	0	1	0	0	0	0	57
5:00 AM	2	89	31	6	20	1	0	2	3	0	0	0	0	154
6:00 AM	3	230	57	16	62	3	0	4	7	1	0	0	0	383
7:00 AM	11	370	90	39	48	7	0	21	5	3	0	0	0	594
8:00 AM	7	403	117	27	72	6	2	13	9	0	1	0	0	657
9:00 AM	4	348	102	14	64	10	1	9	14	2	0	0	0	568
10:00 AM	3	319	105	15	68	8	0	14	11	1	0	0	0	544
11:00 AM	14	359	98	17	69	8	1	13	16	1	0	0	1	597
12:00 PM	5	375	111	18	59	8	1	10	11	1	1	0	1	601
1:00 PM	8	461	115	23	64	3	0	9	12	0	0	0	0	695
2:00 PM	10	513	135	35	68	8	0	17	7	5	1	0	1	800
3:00 PM	30	444	68	67	38	10	0	46	7	6	2	2	4	724
4:00 PM	33	538	46	83	51	12	0	49	4	1	15	0	2	834
5:00 PM	20	645	100	28	61	3	0	24	8	5	6	0	0	900
6:00 PM	7	637	124	6	71	2	0	11	1	0	0	1	0	860
7:00 PM	10	533	100	5	43	1	0	7	0	1	0	0	1	701
8:00 PM	1	362	64	1	38	2	0	7	2	1	0	0	1	479
9:00 PM	1	291	63	1	33	0	0	4	1	0	0	0	0	394
10:00 PM	1	173	47	2	21	0	0	2	0	0	0	0	0	246
11:00 PM	1	136	27	2	7	0	0	1	3	0	0	0	0	177
Total	172	7368	1632	411	979	94	5	266	125	29	28	3	11	11123
Percent	1.55%	66.24%	14.67%	3.70%	8.80%	0.85%	0.04%	2.39%	1.12%	0.26%	0.25%	0.03%	0.10%	
AM Peak	11:00 AM	8:00 AM	8:00 AM	7:00 AM	8:00 AM	9:00 AM	8:00 AM	7:00 AM	11:00 AM	7:00 AM	12:00 AM		11:00 AM	8:00 AM
Volume	14	403	117	39	72	10	2	21	16	3	1	0	1	657
PM Peak	4:00 PM	5:00 PM	2:00 PM	4:00 PM	6:00 PM	4:00 PM	12:00 PM	4:00 PM	1:00 PM	3:00 PM	4:00 PM	3:00 PM	3:00 PM	5:00 PM
Volume	33	645	135	83	71	12	1	49	12	6	15	2	4	900

Cycles:	172	1.5%
Cars and Light Trucks:	9000	80.9%
Heavy Vehicles:	1951	17.5%

Main Street (Route 117)
east of Bolton Office Park Drive
City, State: Bolton, MA
Client: TEC/ L. Oltman
Site Code: TBA

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 218000 ATR-A

Count Date
Thursday, June 10, 2021

Classification (60-minute)

EB														
Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	26	3	1	1	0	0	0	0	0	0	0	0	31
1:00 AM	0	13	4	1	2	0	0	0	0	0	0	0	0	20
2:00 AM	0	18	1	0	2	0	0	0	1	0	0	0	0	22
3:00 AM	0	28	6	0	4	1	0	0	1	0	0	0	0	40
4:00 AM	1	95	39	2	7	2	0	0	1	0	0	0	0	147
5:00 AM	0	443	150	4	35	4	1	6	5	0	0	0	0	648
6:00 AM	12	647	217	13	55	6	3	22	6	0	4	0	0	985
7:00 AM	11	684	121	27	30	7	3	22	5	2	3	1	0	916
8:00 AM	13	600	117	15	39	4	3	14	5	1	0	1	1	813
9:00 AM	6	441	124	9	34	5	3	10	4	0	0	0	0	636
10:00 AM	3	485	100	15	39	8	6	8	9	2	0	1	1	677
11:00 AM	6	419	103	13	26	2	5	9	11	0	0	0	0	594
12:00 PM	8	434	111	20	33	7	4	15	12	2	2	0	0	648
1:00 PM	5	452	112	16	40	8	5	13	7	2	0	0	0	660
2:00 PM	15	481	98	27	25	6	1	15	7	0	0	0	0	675
3:00 PM	13	414	42	55	22	6	1	8	3	1	1	1	0	567
4:00 PM	19	235	20	58	19	2	1	12	4	1	0	0	0	371
5:00 PM	20	480	74	36	29	3	0	7	1	1	1	0	0	652
6:00 PM	2	452	68	6	16	1	0	6	2	1	0	0	0	554
7:00 PM	4	324	78	8	21	0	1	3	2	0	0	0	0	441
8:00 PM	5	236	49	1	12	0	0	0	0	0	0	0	0	303
9:00 PM	0	181	34	2	5	0	0	2	1	0	0	0	0	225
10:00 PM	0	130	15	1	8	0	0	2	1	0	0	0	0	157
11:00 PM	0	60	5	0	2	0	0	0	1	0	0	0	0	68
PM Total	143	7778	1691	330	506	72	37	174	89	13	11	4	2	10850
Percent	1.32%	71.69%	15.59%	3.04%	4.66%	0.66%	0.34%	1.60%	0.82%	0.12%	0.10%	0.04%	0.02%	
AM Peak	8:00 AM	7:00 AM	6:00 AM	7:00 AM	6:00 AM	10:00 AM	10:00 AM	6:00 AM	11:00 AM	7:00 AM	6:00 AM	7:00 AM	8:00 AM	6:00 AM
Volume	13	684	217	27	55	8	6	22	11	2	4	1	1	985
PM Peak	5:00 PM	2:00 PM	1:00 PM	4:00 PM	1:00 PM	1:00 PM	1:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	3:00 PM		2:00 PM
Volume	20	481	112	58	40	8	5	15	12	2	2	1	0	675

Cycles:	143	1.3%
Cars and Light Trucks:	9469	87.3%
Heavy Vehicles:	1238	11.4%

Main Street (Route 117)
east of Bolton Office Park Drive
City, State: Bolton, MA
Client: TEC/ L. Oltman
Site Code: TBA

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 218000 ATR-A

Count Date
Thursday, June 10, 2021

Classification (60-minute)

Combined

Start Time:	Cycles	Cars and Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Total
12:00 AM	0	76	9	2	6	1	0	2	0	0	1	0	0	97
1:00 AM	0	42	8	1	6	0	0	1	0	0	0	0	0	58
2:00 AM	0	43	4	1	3	0	0	0	4	0	0	0	0	55
3:00 AM	0	38	11	1	7	1	0	0	1	1	1	0	0	61
4:00 AM	2	123	53	5	16	3	0	0	2	0	0	0	0	204
5:00 AM	2	532	181	10	55	5	1	8	8	0	0	0	0	802
6:00 AM	15	877	274	29	117	9	3	26	13	1	4	0	0	1368
7:00 AM	22	1054	211	66	78	14	3	43	10	5	3	1	0	1510
8:00 AM	20	1003	234	42	111	10	5	27	14	1	1	1	1	1470
9:00 AM	10	789	226	23	98	15	4	19	18	2	0	0	0	1204
10:00 AM	6	804	205	30	107	16	6	22	20	3	0	1	1	1221
11:00 AM	20	778	201	30	95	10	6	22	27	1	0	0	1	1191
12:00 PM	13	809	222	38	92	15	5	25	23	3	3	0	1	1249
1:00 PM	13	913	227	39	104	11	5	22	19	2	0	0	0	1355
2:00 PM	25	994	233	62	93	14	1	32	14	5	1	0	1	1475
3:00 PM	43	858	110	122	60	16	1	54	10	7	3	3	4	1291
4:00 PM	52	773	66	141	70	14	1	61	8	2	15	0	2	1205
5:00 PM	40	1125	174	64	90	6	0	31	9	6	7	0	0	1552
6:00 PM	9	1089	192	12	87	3	0	17	3	1	0	1	0	1414
7:00 PM	14	857	178	13	64	1	1	10	2	1	0	0	1	1142
8:00 PM	6	598	113	2	50	2	0	7	2	1	0	0	1	782
9:00 PM	1	472	97	3	38	0	0	6	2	0	0	0	0	619
10:00 PM	1	303	62	3	29	0	0	4	1	0	0	0	0	403
11:00 PM	1	196	32	2	9	0	0	1	4	0	0	0	0	245
PM Total	315	15146	3323	741	1485	166	42	440	214	42	39	7	13	21973
Percent	1.43%	68.93%	15.12%	3.37%	6.76%	0.76%	0.19%	2.00%	0.97%	0.19%	0.18%	0.03%	0.06%	
AM Peak	7:00 AM	7:00 AM	6:00 AM	7:00 AM	6:00 AM	10:00 AM	10:00 AM	7:00 AM	11:00 AM	7:00 AM	6:00 AM	7:00 AM	8:00 AM	7:00 AM
Volume	22	1054	274	66	117	16	6	43	27	5	4	1	1	1510
PM Peak	4:00 PM	5:00 PM	2:00 PM	4:00 PM	1:00 PM	3:00 PM	12:00 PM	4:00 PM	12:00 PM	3:00 PM	4:00 PM	3:00 PM	3:00 PM	5:00 PM
Volume	52	1125	233	141	104	16	5	61	23	7	15	3	4	1552

Cycles:	315	1.4%
Cars and Light Trucks:	18469	84.1%
Heavy Vehicles:	3189	14.5%

Main Street (Route 117)
east of Bolton Office Park Drive
City, State: Bolton, MA
Client: TEC/ L. Oltman
Site Code: TBA

PRECISION DATA INDUSTRIES, LLC
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Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 218000 ATR-A

Count Date
Wednesday, June, 09, 2021

Speed (60-minute)

WB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	2	1	7	26	24	7	6	2	1	0	0	0	76	41.0	35.5
1:00 AM	0	0	0	0	5	13	12	5	1	0	0	0	0	36	44.8	39.9
2:00 AM	0	0	0	0	1	4	14	6	3	0	0	0	0	28	46.0	42.7
3:00 AM	0	0	0	0	2	7	5	3	2	0	0	0	0	19	45.6	40.3
4:00 AM	0	0	0	0	5	14	14	13	2	0	0	0	0	48	46.0	41.0
5:00 AM	1	1	0	0	8	39	60	19	7	1	0	0	0	136	46.0	40.9
6:00 AM	29	11	7	12	26	104	140	61	16	0	1	0	0	407	45.0	37.2
7:00 AM	74	4	9	31	83	220	154	34	10	2	0	1	1	623	42.7	34.4
8:00 AM	33	15	7	30	110	222	125	37	2	3	0	0	0	584	42.0	35.1
9:00 AM	11	10	10	8	78	161	168	62	11	1	0	0	0	520	44.0	37.9
10:00 AM	20	9	3	17	82	210	161	59	8	2	1	0	1	573	44.0	37.3
11:00 AM	11	7	2	13	87	184	152	62	15	3	0	0	0	536	44.0	38.2
12:00 PM	12	5	3	9	98	244	191	65	11	2	0	0	0	640	44.0	38.2
1:00 PM	16	11	5	39	99	251	202	61	0	0	0	0	0	684	43.0	36.8
2:00 PM	49	19	21	66	169	257	168	59	6	2	1	0	0	817	42.0	34.4
3:00 PM	412	185	23	33	62	70	53	6	0	0	0	0	0	844	35.0	18.2
4:00 PM	512	239	26	2	9	5	1	0	0	0	0	0	0	794	17.0	12.3
5:00 PM	354	216	52	26	82	99	62	11	1	0	1	0	0	904	36.0	20.2
6:00 PM	13	8	14	46	115	304	224	63	11	0	0	0	0	798	43.0	37.1
7:00 PM	5	5	6	23	88	195	244	71	15	1	1	0	0	654	44.0	38.8
8:00 PM	1	2	1	2	44	189	164	51	8	0	0	0	0	462	44.0	39.4
9:00 PM	1	0	1	9	59	166	120	53	8	1	0	0	0	418	44.0	39.1
10:00 PM	0	0	1	5	18	81	104	40	8	0	0	0	0	257	45.0	40.3
11:00 PM	0	0	0	0	14	53	64	25	8	3	0	0	0	167	46.0	41.0
Total	1554	749	192	378	1370	3116	2609	872	155	22	5	1	2	11025	43.0	32.7
Percent	14.10%	6.79%	1.74%	3.43%	12.43%	28.26%	23.66%	7.91%	1.41%	0.20%	0.05%	0.01%	0.02%			
AM Peak	7:00 AM	8:00 AM	9:00 AM	7:00 AM	8:00 AM	8:00 AM	9:00 AM	9:00 AM	6:00 AM	8:00 AM	6:00 AM	7:00 AM	7:00 AM	7:00 AM		
Volume	74	15	10	31	110	222	168	62	16	3	1	1	1	623		
PM Peak	4:00 PM	4:00 PM	5:00 PM	2:00 PM	2:00 PM	6:00 PM	7:00 PM	7:00 PM	7:00 PM	11:00 PM	2:00 PM			5:00 PM		
Volume	512	239	52	66	169	304	244	71	15	3	1	0	0	904		

15th Percentile:	15.0 MPH	Average Speed:	32.7 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	37.0 MPH	10 MPH Pace:	34 to 43 MPH	Number of Vehicles > 35 MPH:	6262
85th Percentile:	43.0 MPH	Number in Pace:	5797	Percent of Vehicles > 35 MPH:	56.8%
95th Percentile:	46.0 MPH	Percent in Pace:	52.6%		

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PDI File #: 218000 ATR-A

Count Date
Wednesday, June, 09, 2021

Speed (60-minute)

EB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	2	9	12	1	1	0	0	0	0	0	25	39.0	35.1
1:00 AM	0	0	0	0	4	8	6	0	0	0	0	0	0	18	41.0	37.6
2:00 AM	0	0	0	0	2	7	3	0	0	0	0	0	0	12	40.4	37.5
3:00 AM	0	0	0	0	5	18	9	2	0	0	0	0	0	34	42.0	38.2
4:00 AM	0	0	0	0	8	62	61	8	1	0	0	0	0	140	43.0	39.7
5:00 AM	0	2	0	8	84	310	218	13	2	0	0	0	0	637	42.0	38.2
6:00 AM	32	44	25	50	200	488	166	4	0	0	0	0	0	1009	40.0	34.2
7:00 AM	86	86	131	77	146	295	101	6	0	1	0	0	0	929	39.0	29.4
8:00 AM	59	43	58	112	203	297	62	5	0	1	1	0	1	842	38.0	30.9
9:00 AM	15	6	3	22	143	347	122	9	0	0	0	0	1	668	40.0	35.7
10:00 AM	14	8	6	36	132	269	103	9	0	0	0	0	0	577	40.0	35.2
11:00 AM	5	4	5	35	127	290	93	5	1	0	0	0	0	565	40.0	35.8
12:00 PM	13	8	16	37	101	266	130	14	1	0	0	0	0	586	41.0	35.7
1:00 PM	12	12	9	24	118	311	116	16	1	0	0	0	1	620	40.0	35.7
2:00 PM	49	36	35	44	187	286	71	6	0	0	0	0	0	714	39.0	31.9
3:00 PM	170	14	14	39	110	129	45	3	0	1	0	0	0	525	38.0	24.8
4:00 PM	250	3	4	8	28	67	18	7	0	0	0	0	1	386	37.0	17.0
5:00 PM	150	4	6	13	80	174	42	3	0	0	0	0	0	472	38.4	26.5
6:00 PM	16	5	9	24	101	312	82	10	1	0	0	0	0	560	40.0	35.2
7:00 PM	8	2	1	5	54	216	134	14	2	0	0	1	1	438	42.0	37.6
8:00 PM	0	2	1	2	38	154	80	13	2	0	0	0	0	292	42.0	38.0
9:00 PM	0	1	2	2	18	75	76	10	1	0	1	0	0	186	42.3	38.8
10:00 PM	0	2	0	1	14	60	49	14	2	0	0	0	0	142	43.0	39.0
11:00 PM	0	0	0	1	7	24	30	2	2	0	0	0	0	66	43.0	39.5
Total	879	282	325	542	1919	4477	1818	174	16	3	2	1	5	10443	40.0	33.1
Percent	8.42%	2.70%	3.11%	5.19%	18.38%	42.87%	17.41%	1.67%	0.15%	0.03%	0.02%	0.01%	0.05%			
AM Peak	7:00 AM	7:00 AM	7:00 AM	8:00 AM	8:00 AM	6:00 AM	5:00 AM	5:00 AM	5:00 AM	7:00 AM	8:00 AM		8:00 AM	6:00 AM		
Volume	86	86	131	112	203	488	218	13	2	1	1	0	1	1009		
PM Peak	4:00 PM	2:00 PM	2:00 PM	2:00 PM	2:00 PM	6:00 PM	7:00 PM	1:00 PM	7:00 PM	3:00 PM	9:00 PM	7:00 PM	1:00 PM	2:00 PM		
Volume	250	36	35	44	187	312	134	16	2	1	1	1	1	714		

15th Percentile:	25.0 MPH	Average Speed:	33.1 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	36.0 MPH	10 MPH Pace:	32 to 41 MPH	Number of Vehicles > 35 MPH:	5715
85th Percentile:	40.0 MPH	Number in Pace:	7088	Percent of Vehicles > 35 MPH:	54.7%
95th Percentile:	43.0 MPH	Percent in Pace:	67.9%		

Main Street (Route 117)
east of Bolton Office Park Drive
City, State: Bolton, MA
Client: TEC/ L. Oltman
Site Code: TBA

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 218000 ATR-A

Count Date
Wednesday, June, 09, 2021

Speed (60-minute)

Combined WB and EB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	2	1	9	35	36	8	7	2	1	0	0	0	101	40.0	35.4
1:00 AM	0	0	0	0	9	21	18	5	1	0	0	0	0	54	44.0	39.1
2:00 AM	0	0	0	0	3	11	17	6	3	0	0	0	0	40	45.2	41.2
3:00 AM	0	0	0	0	7	25	14	5	2	0	0	0	0	53	43.0	38.9
4:00 AM	0	0	0	0	13	76	75	21	3	0	0	0	0	188	44.0	40.0
5:00 AM	1	3	0	8	92	349	278	32	9	1	0	0	0	773	42.0	38.7
6:00 AM	61	55	32	62	226	592	306	65	16	0	1	0	0	1416	41.0	35.1
7:00 AM	160	90	140	108	229	515	255	40	10	3	0	1	1	1552	40.0	31.4
8:00 AM	92	58	65	142	313	519	187	42	2	4	1	0	1	1426	40.0	32.6
9:00 AM	26	16	13	30	221	508	290	71	11	1	0	0	1	1188	42.0	36.7
10:00 AM	34	17	9	53	214	479	264	68	8	2	1	0	1	1150	42.0	36.3
11:00 AM	16	11	7	48	214	474	245	67	16	3	0	0	0	1101	42.0	37.0
12:00 PM	25	13	19	46	199	510	321	79	12	2	0	0	0	1226	43.0	37.0
1:00 PM	28	23	14	63	217	562	318	77	1	0	0	0	1	1304	42.0	36.3
2:00 PM	98	55	56	110	356	543	239	65	6	2	1	0	0	1531	41.0	33.3
3:00 PM	582	199	37	72	172	199	98	9	0	1	0	0	0	1369	37.0	20.8
4:00 PM	762	242	30	10	37	72	19	7	0	0	0	0	1	1180	19.0	13.8
5:00 PM	504	220	58	39	162	273	104	14	1	0	1	0	0	1376	38.0	22.4
6:00 PM	29	13	23	70	216	616	306	73	12	0	0	0	0	1358	42.0	36.3
7:00 PM	13	7	7	28	142	411	378	85	17	1	1	1	1	1092	43.0	38.3
8:00 PM	1	4	2	4	82	343	244	64	10	0	0	0	0	754	43.0	38.9
9:00 PM	1	1	3	11	77	241	196	63	9	1	1	0	0	604	44.0	39.0
10:00 PM	0	2	1	6	32	141	153	54	10	0	0	0	0	399	45.0	39.9
11:00 PM	0	0	0	1	21	77	94	27	10	3	0	0	0	233	45.0	40.5
Total	2433	1031	517	920	3289	7593	4427	1046	171	25	7	2	7	21468	42.0	32.9
Percent	11.33%	4.80%	2.41%	4.29%	15.32%	35.37%	20.62%	4.87%	0.80%	0.12%	0.03%	0.01%	0.03%			
AM Peak	7:00 AM	7:00 AM	7:00 AM	8:00 AM	8:00 AM	6:00 AM	6:00 AM	9:00 AM	6:00 AM	8:00 AM	6:00 AM	7:00 AM	7:00 AM	7:00 AM		
Volume	160	90	140	142	313	592	306	71	16	4	1	1	1	1552		
PM Peak	4:00 PM	4:00 PM	5:00 PM	2:00 PM	2:00 PM	6:00 PM	7:00 PM	7:00 PM	7:00 PM	11:00 PM	2:00 PM	7:00 PM	1:00 PM	2:00 PM		
Volume	762	242	58	110	356	616	378	85	17	3	1	1	1	1531		

15th Percentile:	18.0 MPH	Average Speed:	32.9 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	36.0 MPH	10 MPH Pace:	33 to 42 MPH	Number of Vehicles > 35 MPH:	11977
85th Percentile:	42.0 MPH	Number in Pace:	12749	Percent of Vehicles > 35 MPH:	55.8%
95th Percentile:	45.0 MPH	Percent in Pace:	59.4%		

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east of Bolton Office Park Drive
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Site Code: TBA

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Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

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Count Date
Thursday, June 10, 2021

Speed (60-minute)

WB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	2	5	24	21	10	4	0	0	0	0	66	45.3	40.4
1:00 AM	0	0	0	1	3	7	16	8	3	0	0	0	0	38	47.5	41.6
2:00 AM	0	0	0	1	3	10	13	5	1	0	0	0	0	33	45.2	39.9
3:00 AM	0	0	0	0	1	6	8	6	0	0	0	0	0	21	46.0	41.2
4:00 AM	0	0	0	0	6	14	15	15	6	1	0	0	0	57	48.0	42.2
5:00 AM	1	0	3	0	13	31	59	36	11	0	0	0	0	154	47.0	41.4
6:00 AM	23	4	3	4	24	101	141	64	12	6	1	0	0	383	46.0	38.9
7:00 AM	96	6	12	38	88	157	152	37	5	2	0	0	1	594	42.0	32.6
8:00 AM	35	18	9	53	114	207	169	49	2	1	0	0	0	657	43.0	35.1
9:00 AM	10	11	3	17	94	218	151	57	6	0	0	0	1	568	44.0	37.4
10:00 AM	9	5	0	23	66	189	182	57	12	1	0	0	0	544	44.0	38.3
11:00 AM	22	14	24	40	116	173	160	39	8	1	0	0	0	597	43.0	35.5
12:00 PM	20	4	6	14	91	203	196	60	6	1	0	0	0	601	44.0	37.5
1:00 PM	14	6	10	44	121	254	185	51	7	1	0	0	2	695	43.0	36.9
2:00 PM	101	60	26	62	145	236	132	35	2	0	0	0	1	800	41.0	30.9
3:00 PM	357	197	43	23	27	43	23	9	0	0	0	1	1	724	28.6	16.6
4:00 PM	523	266	36	4	4	1	0	0	0	0	0	0	0	834	17.0	12.1
5:00 PM	150	95	95	89	157	203	88	19	3	1	0	0	0	900	39.0	27.5
6:00 PM	12	11	17	52	140	327	235	57	8	1	0	0	0	860	43.0	36.7
7:00 PM	6	6	10	21	101	241	248	59	8	0	0	1	0	701	43.0	38.2
8:00 PM	1	4	9	12	82	181	148	35	6	1	0	0	0	479	43.0	37.8
9:00 PM	0	1	2	8	43	169	123	38	5	3	1	0	1	394	44.0	39.2
10:00 PM	1	0	0	3	28	88	96	24	6	0	0	0	0	246	44.0	39.5
11:00 PM	0	0	0	0	12	59	52	47	7	0	0	0	0	177	46.0	41.3
Total	1381	708	308	511	1484	3142	2613	817	128	20	2	2	7	11123	43.0	32.8
Percent	12.42%	6.37%	2.77%	4.59%	13.34%	28.25%	23.49%	7.35%	1.15%	0.18%	0.02%	0.02%	0.06%			
AM Peak	7:00 AM	8:00 AM	11:00 AM	8:00 AM	11:00 AM	9:00 AM	10:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM		7:00 AM	8:00 AM		
Volume	96	18	24	53	116	218	182	64	12	6	1	0	1	657		
PM Peak	4:00 PM	4:00 PM	5:00 PM	5:00 PM	5:00 PM	6:00 PM	7:00 PM	12:00 PM	6:00 PM	9:00 PM	9:00 PM	3:00 PM	1:00 PM	5:00 PM		
Volume	523	266	95	89	157	327	248	60	8	3	1	1	2	900		

15th Percentile:	16.0 MPH	Average Speed:	32.8 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	37.0 MPH	10 MPH Pace:	34 to 43 MPH	Number of Vehicles > 35 MPH:	6196
85th Percentile:	43.0 MPH	Number in Pace:	5846	Percent of Vehicles > 35 MPH:	55.7%
95th Percentile:	46.0 MPH	Percent in Pace:	52.6%		

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Speed (60-minute)

EB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	2	7	12	7	2	1	0	0	0	31	46.0	42.5
1:00 AM	0	0	0	0	1	12	3	3	0	0	1	0	0	20	45.2	40.4
2:00 AM	0	0	0	0	3	12	5	2	0	0	0	0	0	22	42.9	38.1
3:00 AM	0	0	0	2	1	20	8	9	0	0	0	0	0	40	45.0	39.8
4:00 AM	0	0	0	0	6	52	74	14	1	0	0	0	0	147	44.0	40.6
5:00 AM	1	0	0	4	47	317	254	24	1	0	0	0	0	648	42.0	38.8
6:00 AM	19	37	56	85	194	432	156	6	0	0	0	0	0	985	40.0	33.8
7:00 AM	106	129	138	123	142	218	58	1	1	0	0	0	0	916	37.0	26.9
8:00 AM	48	46	41	52	180	324	114	5	2	0	0	1	0	813	39.2	32.6
9:00 AM	20	5	5	34	122	315	126	7	0	1	0	0	1	636	40.0	35.4
10:00 AM	14	10	8	46	163	313	118	3	0	0	1	0	1	677	40.0	35.0
11:00 AM	21	14	11	52	152	243	91	10	0	0	0	0	0	594	40.0	33.9
12:00 PM	25	34	25	54	104	286	110	5	1	0	1	1	2	648	40.0	33.8
1:00 PM	12	2	4	36	169	313	114	6	3	0	0	0	1	660	40.0	35.6
2:00 PM	60	22	22	54	178	247	85	6	1	0	0	0	0	675	39.0	31.9
3:00 PM	184	11	7	35	125	172	32	1	0	0	0	0	0	567	37.0	25.2
4:00 PM	199	10	7	26	49	64	13	3	0	0	0	0	0	371	36.0	19.1
5:00 PM	112	34	18	46	132	224	76	9	0	0	0	0	1	652	39.0	29.6
6:00 PM	14	9	6	9	68	286	144	17	0	0	0	0	1	554	41.0	36.7
7:00 PM	11	7	0	10	42	222	138	11	0	0	0	0	0	441	42.0	37.2
8:00 PM	2	0	13	19	50	153	61	4	1	0	0	0	0	303	40.0	35.9
9:00 PM	1	0	0	10	44	99	64	7	0	0	0	0	0	225	41.0	37.3
10:00 PM	0	0	0	1	13	82	52	8	1	0	0	0	0	157	42.6	38.8
11:00 PM	0	0	0	0	3	27	27	10	1	0	0	0	0	68	45.0	40.5
Total	849	370	361	698	1990	4440	1935	178	15	2	3	2	7	10850	40.0	33.1
Percent	7.82%	3.41%	3.33%	6.43%	18.34%	40.92%	17.83%	1.64%	0.14%	0.02%	0.03%	0.02%	0.06%			
AM Peak	7:00 AM	7:00 AM	7:00 AM	7:00 AM	6:00 AM	6:00 AM	5:00 AM	5:00 AM	12:00 AM	12:00 AM	1:00 AM	8:00 AM	9:00 AM	6:00 AM		
Volume	106	129	138	123	194	432	254	24	2	1	1	1	1	985		
PM Peak	4:00 PM	12:00 PM	12:00 PM	12:00 PM	2:00 PM	1:00 PM	6:00 PM	6:00 PM	1:00 PM		12:00 PM	12:00 PM	12:00 PM	2:00 PM		
Volume	199	34	25	54	178	313	144	17	3	0	1	1	2	675		

15th Percentile:	25.0 MPH	Average Speed:	33.1 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	36.0 MPH	10 MPH Pace:	33 to 42 MPH	Number of Vehicles > 35 MPH:	5760
85th Percentile:	40.0 MPH	Number in Pace:	7160	Percent of Vehicles > 35 MPH:	53.1%
95th Percentile:	43.0 MPH	Percent in Pace:	66.0%		

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Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	2	7	31	33	17	6	1	0	0	0	97	45.6	41.0
1:00 AM	0	0	0	1	4	19	19	11	3	0	1	0	0	58	46.5	41.2
2:00 AM	0	0	0	1	6	22	18	7	1	0	0	0	0	55	43.9	39.2
3:00 AM	0	0	0	2	2	26	16	15	0	0	0	0	0	61	45.0	40.3
4:00 AM	0	0	0	0	12	66	89	29	7	1	0	0	0	204	45.0	41.0
5:00 AM	2	0	3	4	60	348	313	60	12	0	0	0	0	802	43.0	39.3
6:00 AM	42	41	59	89	218	533	297	70	12	6	1	0	0	1368	42.0	35.2
7:00 AM	202	135	150	161	230	375	210	38	6	2	0	0	1	1510	40.0	29.2
8:00 AM	83	64	50	105	294	531	283	54	4	1	0	1	0	1470	41.0	33.7
9:00 AM	30	16	8	51	216	533	277	64	6	1	0	0	2	1204	42.0	36.3
10:00 AM	23	15	8	69	229	502	300	60	12	1	1	0	1	1221	42.0	36.5
11:00 AM	43	28	35	92	268	416	251	49	8	1	0	0	0	1191	42.0	34.7
12:00 PM	45	38	31	68	195	489	306	65	7	1	1	1	2	1249	42.0	35.6
1:00 PM	26	8	14	80	290	567	299	57	10	1	0	0	3	1355	41.0	36.2
2:00 PM	161	82	48	116	323	483	217	41	3	0	0	0	1	1475	40.0	31.4
3:00 PM	541	208	50	58	152	215	55	10	0	0	0	1	1	1291	36.0	20.4
4:00 PM	722	276	43	30	53	65	13	3	0	0	0	0	0	1205	22.4	14.3
5:00 PM	262	129	113	135	289	427	164	28	3	1	0	0	1	1552	39.0	28.4
6:00 PM	26	20	23	61	208	613	379	74	8	1	0	0	1	1414	42.0	36.7
7:00 PM	17	13	10	31	143	463	386	70	8	0	0	1	0	1142	43.0	37.8
8:00 PM	3	4	22	31	132	334	209	39	7	1	0	0	0	782	42.0	37.1
9:00 PM	1	1	2	18	87	268	187	45	5	3	1	0	1	619	43.0	38.5
10:00 PM	1	0	0	4	41	170	148	32	7	0	0	0	0	403	43.0	39.2
11:00 PM	0	0	0	0	15	86	79	57	8	0	0	0	0	245	46.0	41.1
Total	2230	1078	669	1209	3474	7582	4548	995	143	22	5	4	14	21973	41.0	32.9
Percent	10.15%	4.91%	3.04%	5.50%	15.81%	34.51%	20.70%	4.53%	0.65%	0.10%	0.02%	0.02%	0.06%			
AM Peak	7:00 AM	7:00 AM	7:00 AM	7:00 AM	8:00 AM	6:00 AM	5:00 AM	6:00 AM	5:00 AM	6:00 AM	1:00 AM	8:00 AM	9:00 AM	7:00 AM		
Volume	202	135	150	161	294	533	313	70	12	6	1	1	2	1510		
PM Peak	4:00 PM	4:00 PM	5:00 PM	5:00 PM	2:00 PM	6:00 PM	7:00 PM	6:00 PM	1:00 PM	9:00 PM	12:00 PM	12:00 PM	1:00 PM	5:00 PM		
Volume	722	276	113	135	323	613	386	74	10	3	1	1	3	1552		

15th Percentile:	19.0 MPH	Average Speed:	32.9 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	36.0 MPH	10 MPH Pace:	33 to 42 MPH	Number of Vehicles > 35 MPH:	11956
85th Percentile:	41.0 MPH	Number in Pace:	12910	Percent of Vehicles > 35 MPH:	54.4%
95th Percentile:	45.0 MPH	Percent in Pace:	58.8%		

Appendix C

Seasonal Adjustment Data

Massachusetts Highway Department
Statewide Traffic Data Collection
2019 Weekday Seasonal Factors

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

Round off:
0-999 = 10
>1000 = 100

U = Urban
R = Rural

1 - Interstate
2 - Freeway and Expressway
3 - Other Principal Arterial
4 - Minor Arterial
5 - Major Collector
6 - Minor Collector
7 - Local Road and Street

Recreational - East Group - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.
Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.

2/3/2021

Appendix D

Crash Data

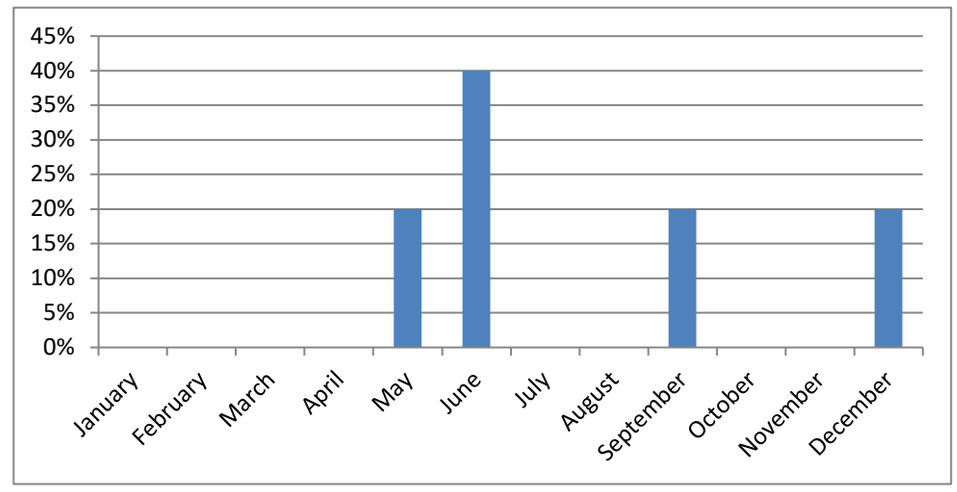
Crash Data Summary Tables
580 Main Street Driveway @ Main Street (Route 117) - Bolton, MA
01/01/2014 - 12/31/2020

Collision Diagram	Crash Number	Crash Date	Year	Month	Weekday	Crash Time	Time Block	Ambient Light	Weather Condition	Weather Condition	Road Surface	Road Surface	Number of Vehicles	Vehicle Travel Directions				Crash Severity	Crash Severity	Number of NonFatal Injuries	Manner of Collision	Manner of Collision	Driver Contributing Codes	Driver Contributing Codes	Detailed Narrative (from Crash Report)
														V1	V2	V3	V4								
1	3865843	5/15/2014	2014	5	5	7:02 AM	1	Daylight	Cloudy	2	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Followed Too Closely	1	
2	4072706	6/9/2015	2015	6	3	7:03 AM	1	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Inattention / Distracted	4	
3	4072707	6/9/2015	2015	6	3	4:39 PM	4	Daylight	Cloudy	2	Dry	1	2					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
4	4156823	12/14/2015	2015	12	2	7:54 PM	5	Dark - Lighted	Other	5	Wet	2	2					Property Damage Only	1	0	Sideswipe	4	Failure to Yield Right-of-Way	3	
5	4257601	9/15/2016	2016	9	5	5:56 PM	5	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Followed Too Closely	1	

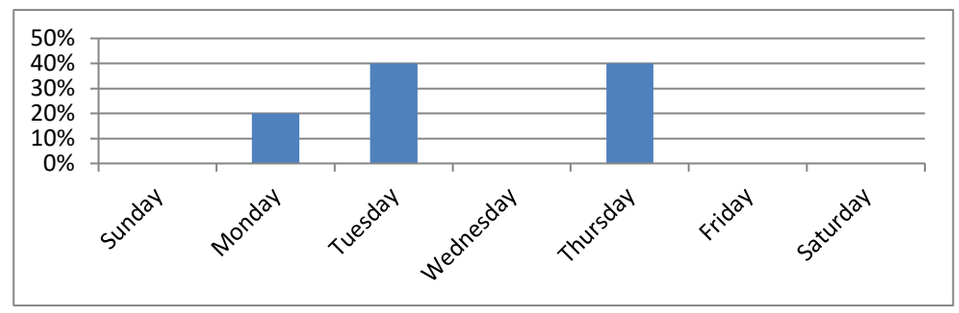
Crash Data Summary Charts
'St580 Main Street Driveway @ Main Street (Route 117) - Bolton, MA
01/01/2014 - 12/31/2020

Driveway @ Main Street *5*

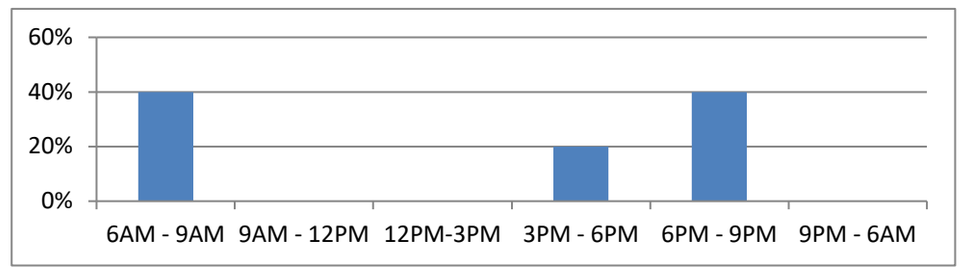
Month	#	%
January	0	0%
February	0	0%
March	0	0%
April	0	0%
May	1	20%
June	2	40%
July	0	0%
August	0	0%
September	1	20%
October	0	0%
November	0	0%
December	1	20%



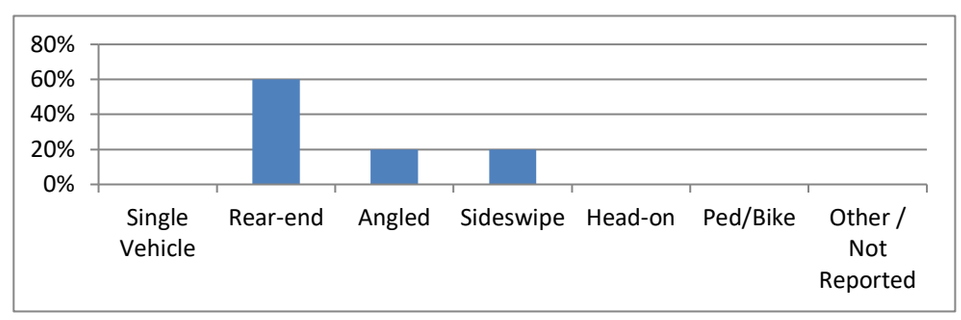
Day of Week	#	%
Sunday	0	0%
Monday	1	20%
Tuesday	2	40%
Wednesday	0	0%
Thursday	2	40%
Friday	0	0%
Saturday	0	0%



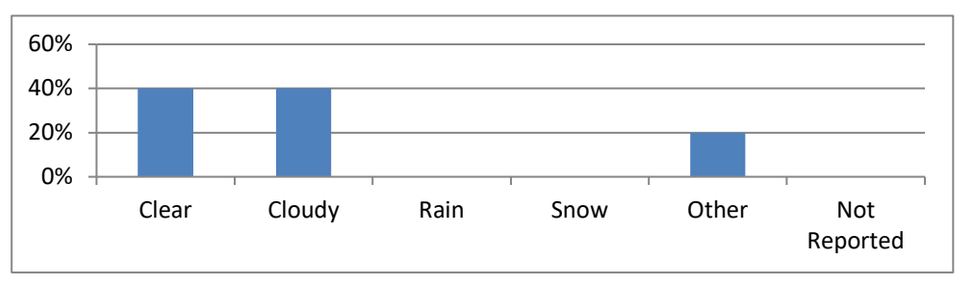
Time of Day	#	%
6AM - 9AM	2	40%
9AM - 12PM	0	0%
12PM-3PM	0	0%
3PM - 6PM	1	20%
6PM - 9PM	2	40%
9PM - 6AM	0	0%



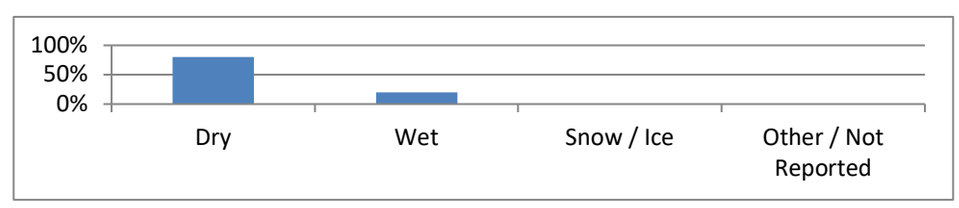
Manner of Collision	#	%
Single Vehicle	0	0%
Rear-end	3	60%
Angled	1	20%
Sideswipe	1	20%
Head-on	0	0%
Ped/Bike	0	0%
Other / Not Reported	0	0%



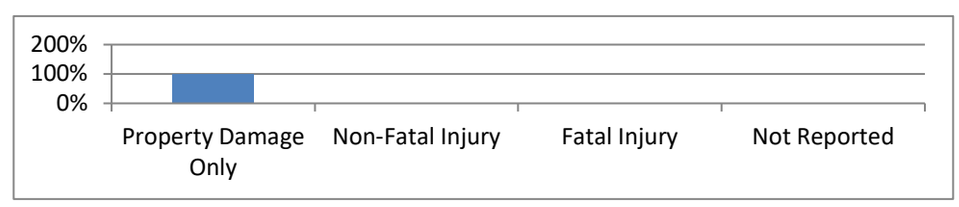
Weather Conditions	#	%
Clear	2	40%
Cloudy	2	40%
Rain	0	0%
Snow	0	0%
Other	1	20%
Not Reported	0	0%



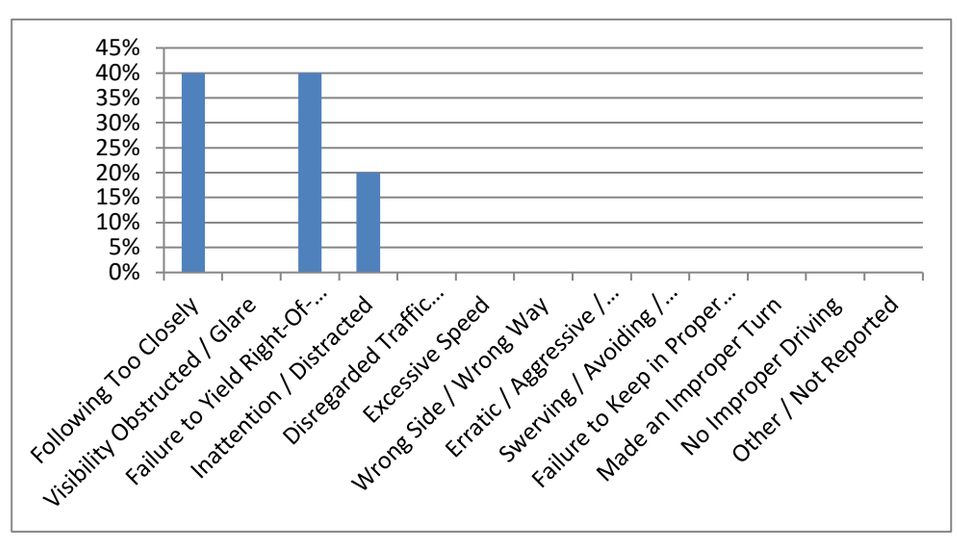
Road Surface	#	%
Dry	4	80%
Wet	1	20%
Snow / Ice	0	0%
Other / Not Reported	0	0%



Crash Severity	#	%
Property Damage Only	5	100%
Non-Fatal Injury	0	0%
Fatal Injury	0	0%
Not Reported	0	0%



Main Contributing Factor from Narrative	#	%
Following Too Closely	2	40%
Visibility Obstructed / Glare	0	0%
Failure to Yield Right-Of-Way	2	40%
Inattention / Distracted	1	20%
Disregarded Traffic Controls	0	0%
Excessive Speed	0	0%
Wrong Side / Wrong Way	0	0%
Erratic / Aggressive / Reckless Driving	0	0%
Swerving / Avoiding / Over-Steering / Over-Correcting	0	0%
Failure to Keep in Proper Lane	0	0%
Made an Improper Turn	0	0%
No Improper Driving	0	0%
Other / Not Reported	0	0%



Crash Data Summary Tables
Sugar Road I-495 SB Ramps @ Main Street (Route 117) - Bolton, MA
01/01/2014 - 12/31/2020

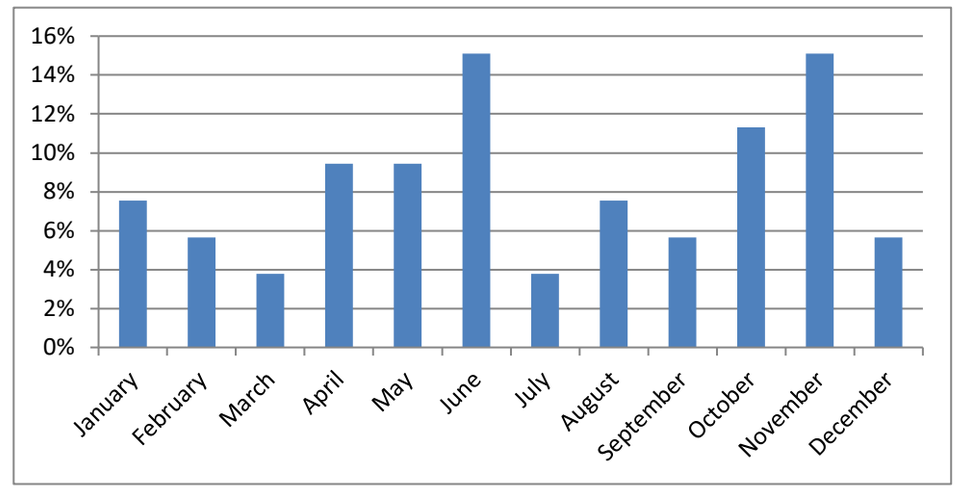
Collision Diagram	Crash Number	Crash Date	Year	Month	Weekday	Crash Time	Time Block	Ambient Light	Weather Condition	Weather Condition	Road Surface	Road Surface	Number of Vehicles	Vehicle Travel Directions				Crash Severity	Crash Severity	Number of NonFatal Injuries	Manner of Collision	Manner of Collision	Driver Contributing Codes	Driver Contributing Codes	Detailed Narrative (from Crash Report)
														V1	V2	V3	V4								
1	3801671	1/8/2014	2014	1	4	5:23 PM	5	Dark - Not Lighted	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Followed Too Closely	1	
2	3826265	3/27/2014	2014	3	5	2:46 PM	3	Daylight	Clear	1	Wet	2	2					Non-fatal injury	2	1	Rear-end	2	Inattention / Distracted	4	
3	3859133	5/11/2014	2014	5	1	11:09 AM	2	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Sideswipe	4	Failure to Yield Right-of-Way	3	
4	3863040	4/4/2014	2014	4	6	11:18 AM	2	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
5	3869834	6/6/2014	2014	6	6	8:59 PM	5	Dark - lighted roadway	Clear	1	Dry	1	2					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
6	3882735	6/2/2014	2014	6	2	5:11 PM	5	Daylight	Clear	1	Dry	1	1					Non-fatal injury	2	1	Single Vehicle	1	Inattention / Distracted	4	
7	3904340	6/16/2014	2014	6	2	9:12 AM	2	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
8	3910336	8/1/2014	2014	8	6	1:47 PM	3	Daylight	Cloudy	2	Dry	1	2					Property Damage Only	1	0	Angled	3	Made an Improper Turn	11	
9	3949105	8/25/2014	2014	8	2	12:49 AM	6	Dark - lighted roadway	Clear	1	Dry	1	1					Property Damage Only	1	0	Single Vehicle	1	No Improper Driving	12	
10	3981011	11/21/2014	2014	11	6	6:04 PM	5	Dark - lighted roadway	Clear	1	Dry	1	2					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
11	4011100	12/10/2014	2014	12	4	5:58 PM	5	Dark - lighted roadway	Rain	3	Wet	2	2					Property Damage Only	1	0	Sideswipe	4	No Improper Driving	12	
12	4045611	2/23/2015	2015	2	2	9:44 AM	2	Daylight	Cloudy	2	Wet	2	2					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
13	4053920	4/2/2015	2015	4	5	5:28 PM	5	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Inattention / Distracted	4	
14	4057200	3/28/2015	2015	3	7	12:06 PM	3	Daylight	Snow	4	Wet	2	2					Property Damage Only	1	0	Angled	3	Disregarded Traffic Controls	5	
15	4069536	5/26/2015	2015	5	3	4:23 PM	4	Dawn	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Inattention / Distracted	4	
16	4099718	7/16/2015	2015	7	5	3:45 PM	4	Daylight	Clear	1	Dry	1	1					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
17	4112427	11/13/2015	2015	11	6	8:52 AM	1	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
18	4132352	10/17/2015	2015	10	7	10:28 AM	2	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
19	4149014	12/1/2015	2015	12	3	3:25 PM	4	Daylight	Rain	3	Wet	2	2					Property Damage Only	1	0	Rear-end	2	Followed Too Closely	1	
20	4173052	1/18/2016	2016	1	2	7:57 AM	1	Daylight	Cloudy	2	Snow	3	2					Property Damage Only	1	0	Angled	3	Disregarded Traffic Controls	5	
21	4183489	2/25/2016	2016	2	5	1:45 PM	3	Daylight	Cloudy	2	Dry	1	2					Non-fatal injury	2	1	Angled	3	Failure to Yield Right-of-Way	3	
22	4231130	6/20/2016	2016	6	2	9:36 PM	6	Dark - lighted roadway	Clear	1	Dry	1	2					Property Damage Only	1	0	Angled	3	Made an Improper Turn	11	
23	4231658	7/24/2016	2016	7	1	12:49 PM	3	Daylight	Cloudy	2	Dry	1	2					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
24	4248281	9/2/2016	2016	9	6	2:41 PM	3	Daylight	Clear	1	Dry	1	3					Non-fatal injury	2	1	Rear-end	2	Followed Too Closely	1	
25	4289175	11/5/2016	2016	11	7	7:50 AM	1	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Inattention / Distracted	4	
26	4319650	12/14/2016	2016	12	4	6:46 PM	5	Dark - lighted roadway	Clear	1	Dry	1	2					Property Damage Only	1	0	Sideswipe	4	Failure to Yield Right-of-Way	3	
27	4360877	4/14/2017	2017	4	6	10:21 AM	2	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Followed Too Closely	1	
28	4360878	4/25/2017	2017	4	3	2:07 PM	3	Daylight	Rain	3	Wet	2	2					Property Damage Only	1	0	Rear-end	2	Disregarded Traffic Controls	5	
29	4413048	8/12/2017	2017	8	7	10:00 AM	2	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Single Vehicle	1	Wrong Side / Wrong Way	7	
30	4464985	11/6/2017	2017	11	2	5:32 PM	5	Dark - lighted roadway	Rain	3	Wet	2	2					Property Damage Only	1	0	Angled	3	Inattention / Distracted	4	
31	4484889	6/30/2017	2017	6	6	11:08 AM	2	Daylight	Cloudy	2	Dry	1	2					Property Damage Only	1	0	Unknown	7	No Improper Driving	12	
32	4484907	9/7/2017	2017	9	5	3:45 PM	4	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Angled	3	Disregarded Traffic Controls	5	
33	4485072	10/31/2017	2017	10	3	6:47 PM	5	Dark - lighted roadway	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Inattention / Distracted	4	
34	4497827	1/4/2018	2018	1	5	9:45 AM	2	Daylight	Snow	4	Snow	3	1					Property Damage Only	1	0	Single Vehicle	1	Excessive Speed	6	
35	4535493	4/25/2018	2018	4	4	3:00 PM	4	Daylight	Rain	3	Wet	2	2					Property Damage Only	1	0	Rear-end	2	Followed Too Closely	1	
36	4535497	5/3/2018	2018	5	5	7:28 PM	5	Dark - lighted roadway	Cloudy	2	Dry	1	2					Property Damage Only	1	0	Sideswipe	4	Made an Improper Turn	11	
37	4547283	5/16/2018	2018	5	4	3:21 PM	4	Daylight	Cloudy	2	Dry	1	3					Property Damage Only	1	0	Sideswipe	4	Failure to Keep in Proper Lane	10	
38	4547452	5/15/2018	2018	5	3	4:36 PM	4	Dusk	Rain	3	Wet	2	2					Property Damage Only	1	0	Sideswipe	4	Failure to Yield Right-of-Way	3	
39	4564303	6/14/2018	2018	6	5	2:46 PM	3	Daylight	Cloudy	2	Dry	1	2					Non-fatal injury	2	1	Rear-end	2	Inattention / Distracted	4	
40	4564312	6/24/2018	2018	6	1	6:46 PM	5	Daylight	Rain	3	Wet	2	2					Non-fatal injury	2	1	Angled	3	Failure to Yield Right-of-Way	3	
41	4564314	6/29/2018	2018	6	6	10:31 AM	2	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Followed Too Closely	1	
42	4590247	8/26/2018	2018	8	1	8:49 AM	1	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Inattention / Distracted	4	
43	4618323	10/16/2018	2018	10	3	8:12 AM	1	Daylight	Cloudy	2	Dry	1	2					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
44	4618328	10/26/2018	2018	10	6	9:11 PM	6	Dark - Not Lighted	Cloudy	2	Dry	1	2					Property Damage Only	1	0	Sideswipe	4	Failure to Yield Right-of-Way	3	
45	4637058	11/15/2018	2018	11	5	7:35 AM	1	Daylight	Cloudy	2	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Other	13	
46	4661451	1/11/2019	2019	1	6	7:58 PM	5	Dark - Not Lighted	Clear	1	Dry	1	2					Non-fatal injury	2	1	Head-on	5	Disregarded Traffic Controls	5	
47	4664210	2/7/2019	2019	2	5	4:46 PM	4	Daylight	Rain	3	Wet	2	2					Property Damage Only	1	0	Sideswipe	4	Inattention / Distracted	4	
48	4764970	9/9/2019	2019	9	2	4:04 PM	4	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Sideswipe	4	Other	13	
49	4779168	10/14/2019	2019	10	2	4:05 PM	4	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Sideswipe	4	Erratic / Aggressive / Reckless Driving	8	
50	4779171	10/19/2019	2019	10	7	9:18 AM	2	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Sideswipe	4	Made an Improper Turn	11	
51	4779183	11/1/2019	2019	11	6	3:38 PM	4	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
52	4789854	11/20/2019	2019	11	4	8:13 AM	1	Daylight	Rain	3	Wet	2	2					Property Damage Only	1	0	Sideswipe	4	No Improper Driving	12	
53	4789857	11/21/2019	2019	11	5	9:09 AM	2	Daylight	Clear	1	Wet	2	2					Property Damage Only	1	0	Sideswipe	4	No Improper Driving	12	

Crash Data Summary Charts
Sugar Road I-495 SB Ramps @ Main Street (Route 117) - Bolton, MA
01/01/2014 - 12/31/2020

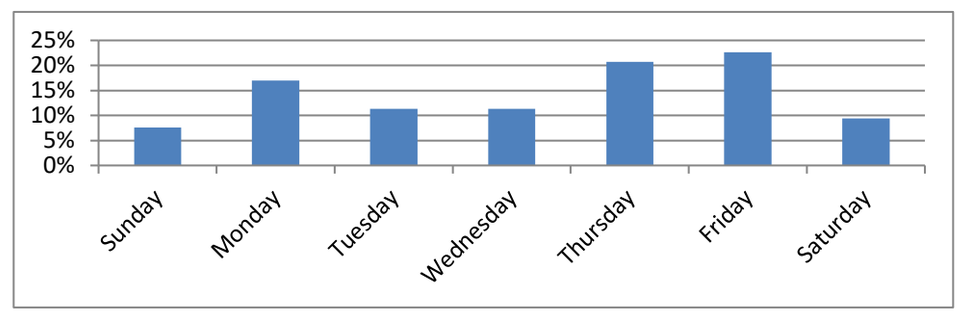
Sugar Road @ Main Street

53

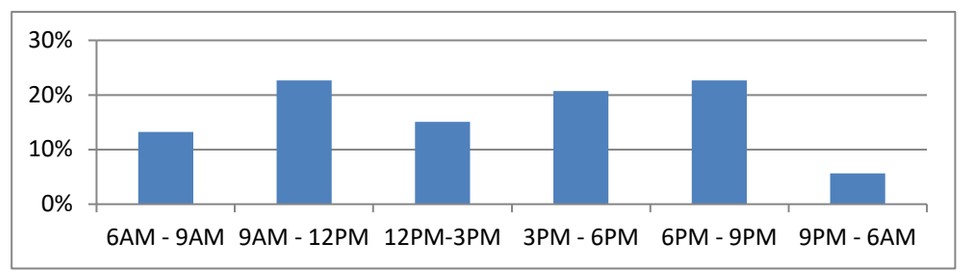
Month	#	%
January	4	8%
February	3	6%
March	2	4%
April	5	9%
May	5	9%
June	8	15%
July	2	4%
August	4	8%
September	3	6%
October	6	11%
November	8	15%
December	3	6%



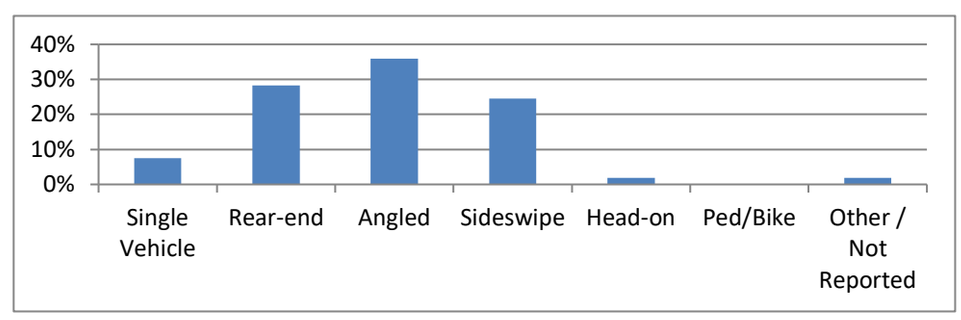
Day of Week	#	%
Sunday	4	8%
Monday	9	17%
Tuesday	6	11%
Wednesday	6	11%
Thursday	11	21%
Friday	12	23%
Saturday	5	9%



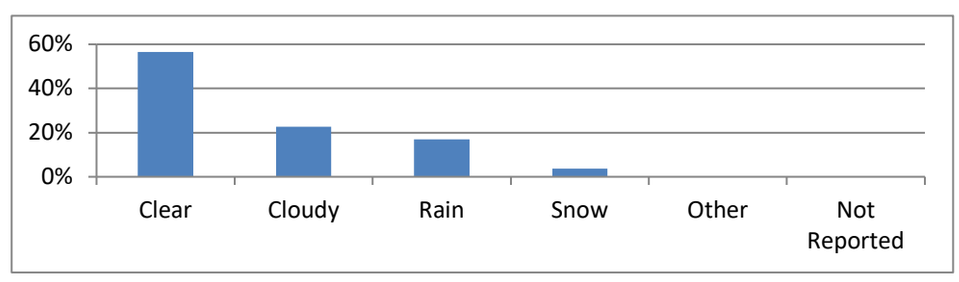
Time of Day	#	%
6AM - 9AM	7	13%
9AM - 12PM	12	23%
12PM-3PM	8	15%
3PM - 6PM	11	21%
6PM - 9PM	12	23%
9PM - 6AM	3	6%



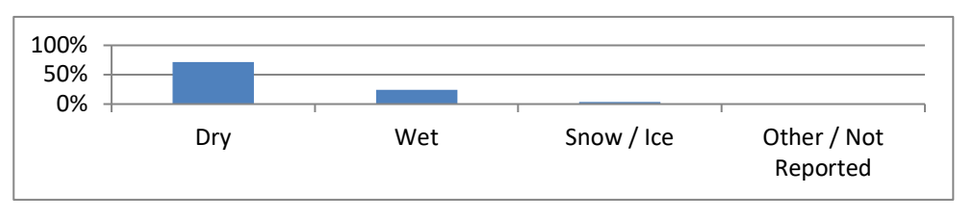
Manner of Collision	#	%
Single Vehicle	4	8%
Rear-end	15	28%
Angled	19	36%
Sideswipe	13	25%
Head-on	1	2%
Ped/Bike	0	0%
Other / Not Reported	1	2%



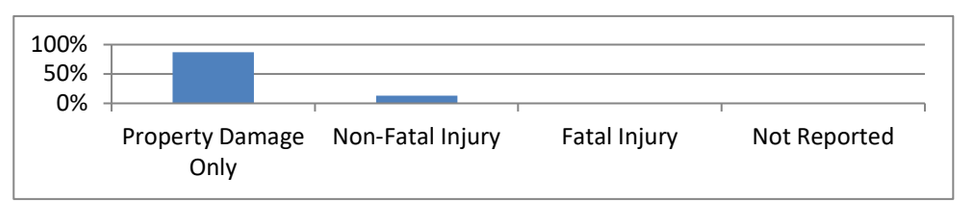
Weather Conditions	#	%
Clear	30	57%
Cloudy	12	23%
Rain	9	17%
Snow	2	4%
Other	0	0%
Not Reported	0	0%



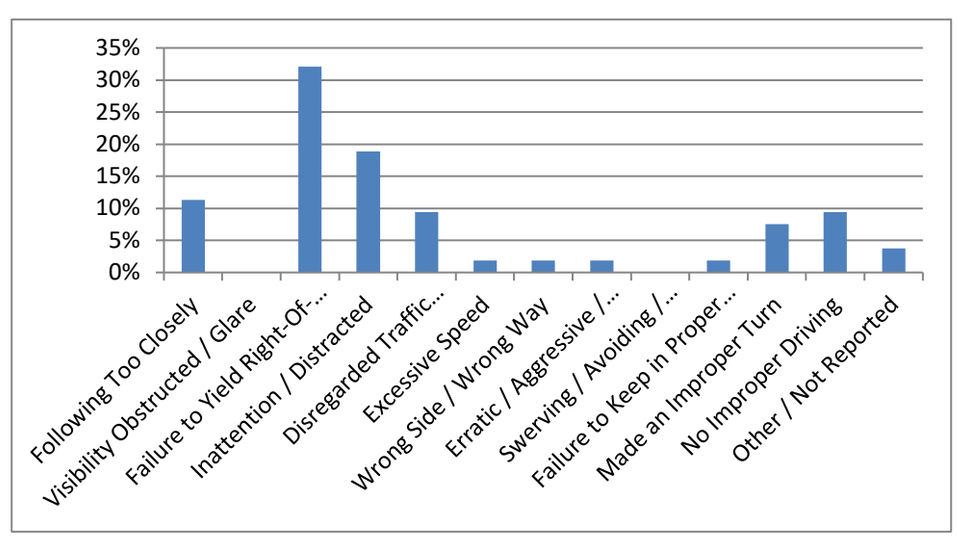
Road Surface	#	%
Dry	38	72%
Wet	13	25%
Snow / Ice	2	4%
Other / Not Reported	0	0%



Crash Severity	#	%
Property Damage Only	46	87%
Non-Fatal Injury	7	13%
Fatal Injury	0	0%
Not Reported	0	0%



Main Contributing Factor from Narrative	#	%
Following Too Closely	6	11%
Visibility Obstructed / Glare	0	0%
Failure to Yield Right-Of-Way	17	32%
Inattention / Distracted	10	19%
Disregarded Traffic Controls	5	9%
Excessive Speed	1	2%
Wrong Side / Wrong Way	1	2%
Erratic / Aggressive / Reckless Driving	1	2%
Swerving / Avoiding / Over-Steering / Over-Correcting	0	0%
Failure to Keep in Proper Lane	1	2%
Made an Improper Turn	4	8%
No Improper Driving	5	9%
Other / Not Reported	2	4%



Crash Data Summary Tables
I-495 NB Ramps @ Main Street (Route 117) - Bolton, MA
01/01/2014 - 12/31/2020

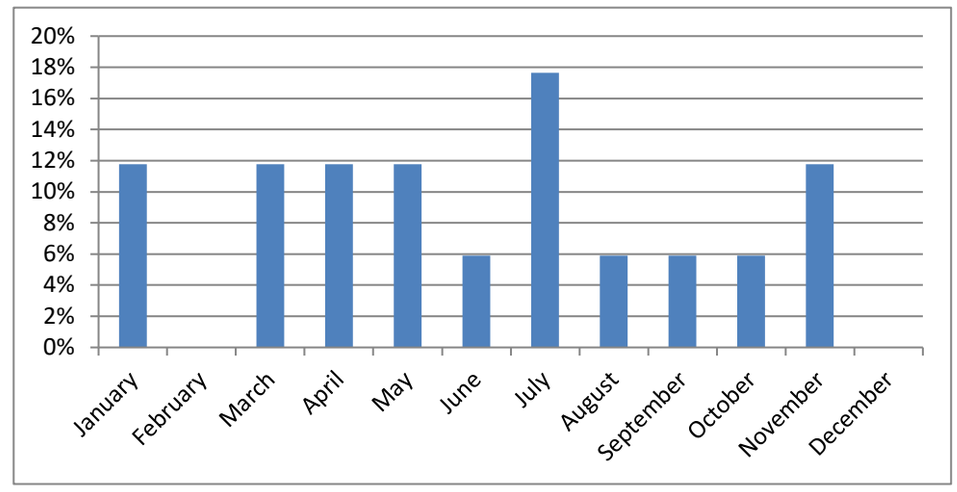
Collision Diagram	Crash Number	Crash Date	Year	Month	Weekday	Crash Time	Time Block	Ambient Light	Weather Condition	Weather Condition	Road Surface	Road Surface	Number of Vehicles	Vehicle Travel Directions				Crash Severity	Crash Severity	Number of NonFatal Injuries	Manner of Collision	Manner of Collision	Driver Contributing Codes	Driver Contributing Codes	Detailed Narrative (from Crash Report)
														V1	V2	V3	V4								
1	3821545	3/17/2014	2014	3	2	3:37 PM	4	Daylight	Clear	1	Dry	1	3					Property Damage Only	1	0	Rear-end	2	Followed Too Closely	1	
2	3963283	9/20/2014	2014	9	7	9:17 AM	2	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Angled	3	Failure to Yield Right-of-Way	3	
3	3968745	10/22/2014	2014	10	4	4:08 PM	4	Daylight	Rain	3	Wet	2	2					Property Damage Only	1	0	Angled	3	Failure to Keep in Proper Lane	10	
4	4092783	8/6/2015	2015	8	5	6:04 PM	5	Daylight	Clear	1	Dry	1	4					Non-fatal injury	2	3	Rear-end	2	No Improper Driving	12	
5	4173037	1/7/2016	2016	1	5	7:30 AM	1	Daylight	Clear	1	Dry	1	3					Property Damage Only	1	0	Rear-end	2	Visibility Obstructed	2	
6	4173640	1/26/2016	2016	1	3	4:21 PM	4	Dusk	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Followed Too Closely	1	
7	4214519	6/29/2016	2016	6	4	7:44 AM	1	Daylight	Rain	3	Wet	2	2					Property Damage Only	1	0	Sideswipe	4	Other	13	
8	4231131	7/5/2016	2016	7	3	11:20 AM	2	Daylight	Cloudy	2	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Inattention / Distracted	4	
9	4349601	3/16/2017	2017	3	5	11:48 AM	2	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Angled	3	Other	13	
10	4376845	5/17/2017	2017	5	4	10:14 AM	2	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	No Improper Driving	12	
11	4404905	7/2/2017	2017	7	1	4:05 PM	4	Daylight	Clear	1	Dry	1	1					Fatal injury	3	1	Single Vehicle	1	Failure to Keep in Proper Lane	10	
12	4485052	7/23/2017	2017	7	1	4:58 PM	4	Daylight	Cloudy	2	Dry	1	2					Non-fatal injury	2	1	Rear-end	2	Followed Too Closely	1	
13	4523116	4/3/2018	2018	4	3	4:45 PM	4	Daylight	Rain	3	Wet	2	2					Non-fatal injury	2	1	Rear-end	2	Inattention / Distracted	4	
14	4535487	4/8/2018	2018	4	1	2:40 PM	3	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Rear-end	2	Inattention / Distracted	4	
15	4547196	5/26/2018	2018	5	7	4:43 PM	4	Daylight	Clear	1	Dry	1	2					Property Damage Only	1	0	Angled	3	No Improper Driving	12	
16	4623998	11/4/2018	2018	11	1	3:03 PM	4	Daylight	Clear	1	Dry	1	2					Non-fatal injury	2	2	Angled	3	Disregarded Traffic Controls	5	
17	4637060	11/17/2018	2018	11	7	1:42 PM	3	Daylight	Cloudy	2	Wet	2	2					Property Damage Only	1	0	Sideswipe	4	Failure to Yield Right-of-Way	3	

Crash Data Summary Charts
I-495 NB Ramps @ Main Street (Route 117) - Bolton, MA
01/01/2014 - 12/31/2020

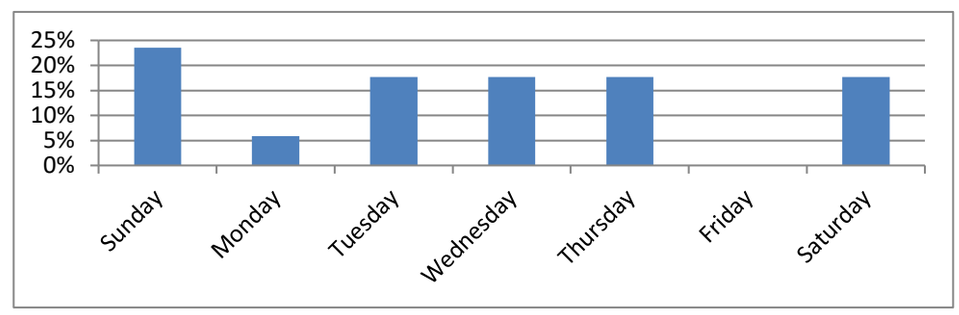
I-495 NB @ Main Street

17

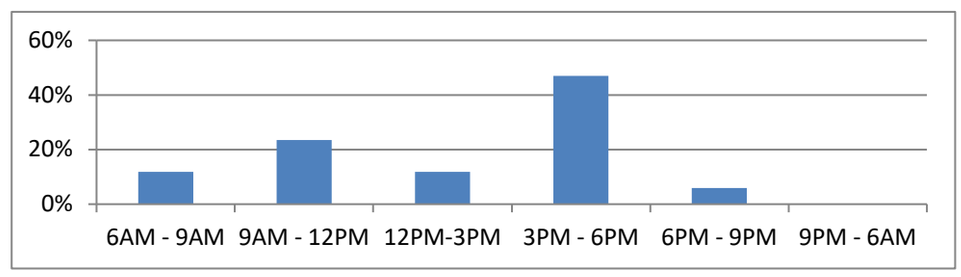
Month	#	%
January	2	12%
February	0	0%
March	2	12%
April	2	12%
May	2	12%
June	1	6%
July	3	18%
August	1	6%
September	1	6%
October	1	6%
November	2	12%
December	0	0%



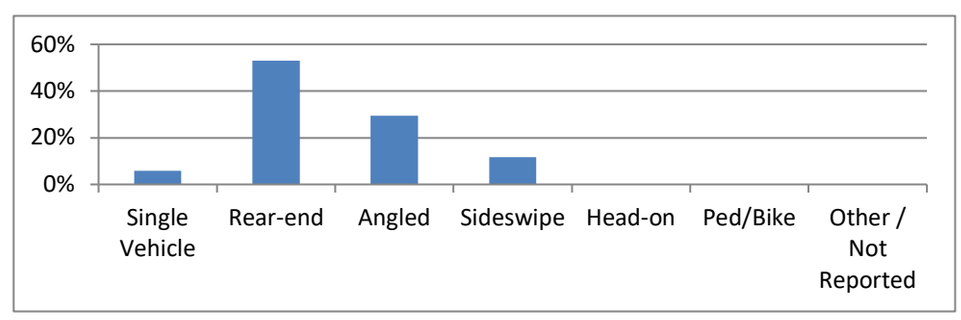
Day of Week	#	%
Sunday	4	24%
Monday	1	6%
Tuesday	3	18%
Wednesday	3	18%
Thursday	3	18%
Friday	0	0%
Saturday	3	18%



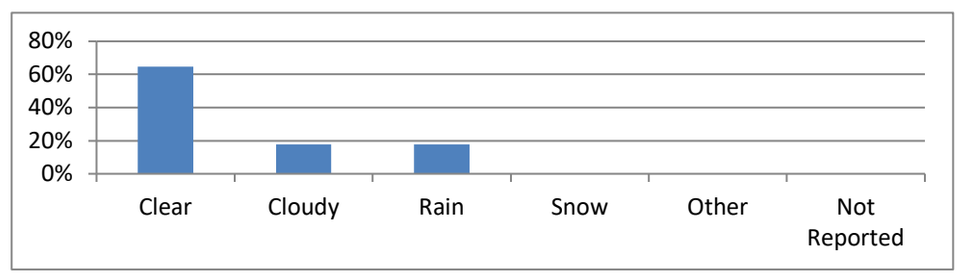
Time of Day	#	%
6AM - 9AM	2	12%
9AM - 12PM	4	24%
12PM-3PM	2	12%
3PM - 6PM	8	47%
6PM - 9PM	1	6%
9PM - 6AM	0	0%



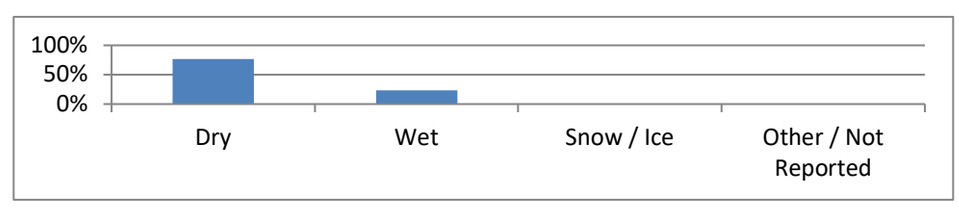
Manner of Collision	#	%
Single Vehicle	1	6%
Rear-end	9	53%
Angled	5	29%
Sideswipe	2	12%
Head-on	0	0%
Ped/Bike	0	0%
Other / Not Reported	0	0%



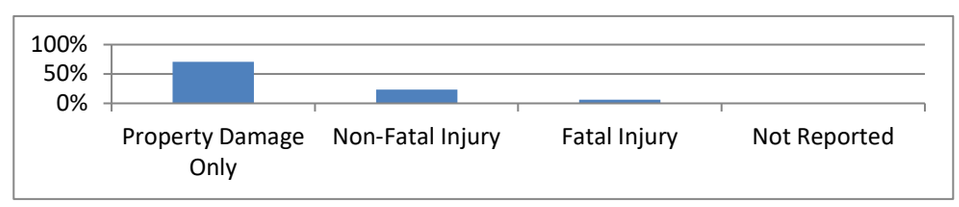
Weather Conditions	#	%
Clear	11	65%
Cloudy	3	18%
Rain	3	18%
Snow	0	0%
Other	0	0%
Not Reported	0	0%



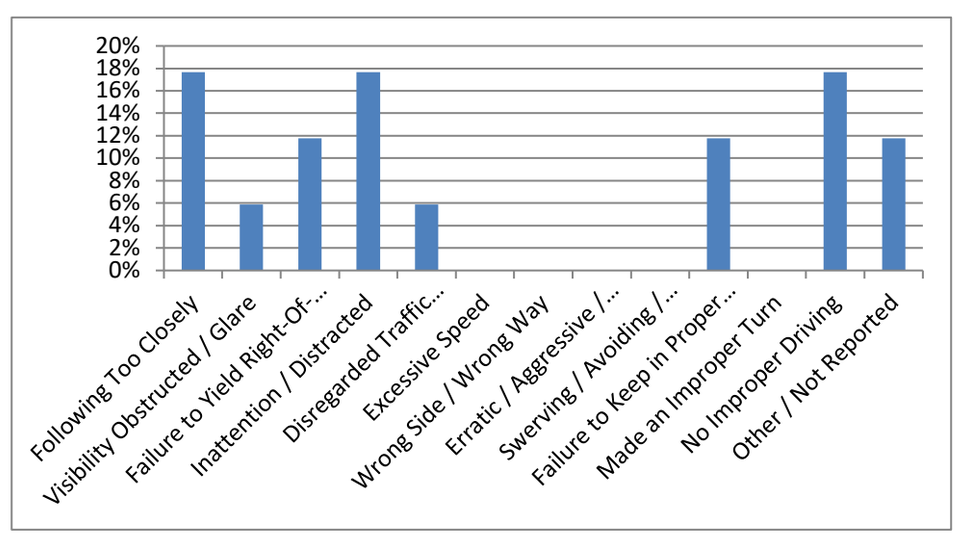
Road Surface	#	%
Dry	13	76%
Wet	4	24%
Snow / Ice	0	0%
Other / Not Reported	0	0%



Crash Severity	#	%
Property Damage Only	12	71%
Non-Fatal Injury	4	24%
Fatal Injury	1	6%
Not Reported	0	0%



Main Contributing Factor from Narrative	#	%
Following Too Closely	3	18%
Visibility Obstructed / Glare	1	6%
Failure to Yield Right-Of-Way	2	12%
Inattention / Distracted	3	18%
Disregarded Traffic Controls	1	6%
Excessive Speed	0	0%
Wrong Side / Wrong Way	0	0%
Erratic / Aggressive / Reckless Driving	0	0%
Swerving / Avoiding / Over-Steering / Over-Correcting	0	0%
Failure to Keep in Proper Lane	2	12%
Made an Improper Turn	0	0%
No Improper Driving	3	18%
Other / Not Reported	2	12%



6/29/2021

Appendix E

Ambient Growth Rate Data

MassDOT Yearly Growth Rates

for data from 2014 to 2018

Growth					
Group	Grow 2014 to 2015	Grow 2015 to 2016	Grow 2016 to 2017	Grow 2017 to 2018	Grow 2018 to 2019
R1	0	0.023	0.004	0.018	0.016
R2	0.05	0.068	0.004	0.014	0.014
R3	-0.038	0.002	0.008	0.011	0.06
R4-7	-0.01	0.003	0.001	0.011	0.012
Rec - East		0.032	0.02	0.041	0.025
Rec - West		0.051	-0.008	0.029	0
U1-Boston	0.061	0.07	-0.003	0.012	0.006
U1-Essex	0.024	0.025	0.007	0.014	0.011
U1-Southeast	0.05	0.062	0.021	0.014	0
U1-West	0.03	-0.027	0.02	0.028	0.013
U1-Worcester	0.042	0.005	0.018	0.01	0.01
U2	0.04	0.048	0.008	0.01	0.02
U3	0.011	0.013	0.011	0.014	0.004
U4-7	0.023	0.062	0.017	0.003	-0.004

updated 5/1/2020

Appendix F

Trip Generation

580 Main Street, Bolton, MA
Trip Generation Comparison
July 1, 2021

Prior land use - 105,000 SF Office
ITE Land Use Code 710 - General Office

	Daily			AM Peak Hour			PM Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
105,000 SF Office	556	556	1112	107	18	125	19	100	119

Proposed land uses - 50,000 SF Office, 233 Units Residential Apartments/Townhouse
ITE Land Use Code 710 - General Office
ITE Land Use Code 220 - Multi-family Housing (Low-Rise)

	Daily			AM Peak Hour			PM Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
50,000 SF Office	271	271	542	63	10	73	9	50	59
229 Apartment Units	845	845	1690	24	81	105	77	46	123
Total Projected	1116	1116	2232	87	91	178	86	96	182

Appendix G

Intersection Capacity and Queue Analysis

1: Bolton Office Park Driveway & Main Street (Route 117)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1230	3	13	918	2	2
Future Volume (vph)	1230	3	13	918	2	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	200
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	30			30	30	
Link Distance (ft)	500			1215	500	
Travel Time (s)	11.4			27.6	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1230	3	13	918	2	2
Future Vol, veh/h	1230	3	13	918	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	200
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	1337	3	14	998	2	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1340	0	2365	1339
Stage 1	-	-	-	-	1339	-
Stage 2	-	-	-	-	1026	-
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	-	-	514	-	39	187
Stage 1	-	-	-	-	244	-
Stage 2	-	-	-	-	346	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	514	-	38	187
Mov Cap-2 Maneuver	-	-	-	-	38	-
Stage 1	-	-	-	-	244	-
Stage 2	-	-	-	-	337	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	65
HCM LOS			F

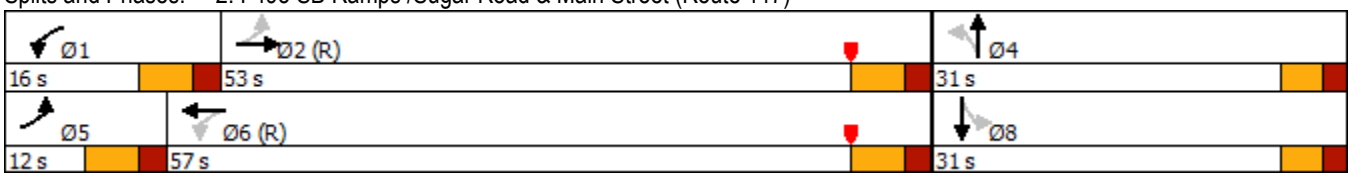
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	38	187	-	-	514	-
HCM Lane V/C Ratio	0.057	0.012	-	-	0.027	-
HCM Control Delay (s)	105.4	24.5	-	-	12.2	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	634	554	193	773	37	142	8	152	44	82	30
Future Volume (vph)	17	634	554	193	773	37	142	8	152	44	82	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	250		0	200		200	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1215			1180			500			500	
Travel Time (s)		27.6			26.8			11.4			11.4	
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91	0.90	0.90	0.90	0.62	0.62	0.62
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Free	pm+pt	NA		Perm	NA	Free	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		Free	6			4		Free	8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		11.0	11.0		11.0	11.0	
Total Split (s)	12.0	53.0		16.0	57.0		31.0	31.0		31.0	31.0	
Total Split (%)	12.0%	53.0%		16.0%	57.0%		31.0%	31.0%		31.0%	31.0%	
Maximum Green (s)	6.0	47.0		10.0	51.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 2: I-495 SB Ramps /Sugar Road & Main Street (Route 117)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	18	682	596	212	890	158	9	169	251
v/c Ratio	0.04	0.69	0.38	0.54	0.40	0.93	0.02	0.11	0.72
Control Delay	7.4	23.8	0.7	12.0	11.4	91.9	28.4	0.1	46.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	23.8	0.7	12.0	11.4	91.9	28.4	0.1	46.7
Queue Length 50th (ft)	3	324	0	45	116	98	5	0	141
Queue Length 95th (ft)	12	506	0	84	238	#196	17	0	133
Internal Link Dist (ft)		1135			1100		420		420
Turn Bay Length (ft)	200		200	250		200		200	
Base Capacity (vph)	415	987	1583	402	2236	214	484	1583	434
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.69	0.38	0.53	0.40	0.74	0.02	0.11	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	634	554	193	773	37	142	8	152	44	82	30
Future Volume (veh/h)	17	634	554	193	773	37	142	8	152	44	82	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	682	0	212	849	41	158	9	0	71	132	48
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91	0.90	0.90	0.90	0.62	0.62	0.62
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	409	1038		426	2079	100	252	381		126	198	66
Arrive On Green	0.02	0.56	0.00	0.07	0.60	0.60	0.20	0.20	0.00	0.20	0.20	0.20
Sat Flow, veh/h	1781	1870	1585	1781	3451	167	1204	1870	1585	390	972	322
Grp Volume(v), veh/h	18	682	0	212	437	453	158	9	0	251	0	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1840	1204	1870	1585	1684	0	0
Q Serve(g_s), s	0.4	25.5	0.0	5.0	13.0	13.0	4.4	0.4	0.0	10.4	0.0	0.0
Cycle Q Clear(g_c), s	0.4	25.5	0.0	5.0	13.0	13.0	18.2	0.4	0.0	13.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.09	1.00		1.00	0.28		0.19
Lane Grp Cap(c), veh/h	409	1038		426	1070	1109	252	381		390	0	0
V/C Ratio(X)	0.04	0.66		0.50	0.41	0.41	0.63	0.02		0.64	0.00	0.00
Avail Cap(c_a), veh/h	474	1038		478	1070	1109	320	486		483	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.86	0.86	0.86	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.3	15.6	0.0	12.4	10.5	10.5	39.9	31.8	0.0	37.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.3	0.0	0.8	1.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	11.1	0.0	1.8	5.0	5.2	3.8	0.2	0.0	5.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.4	18.8	0.0	13.2	11.5	11.4	40.8	31.8	0.0	38.1	0.0	0.0
LnGrp LOS	A	B		B	B	B	D	C		D	A	A
Approach Vol, veh/h		700	A		1102			167	A		251	
Approach Delay, s/veh		18.6			11.8			40.3			38.1	
Approach LOS		B			B			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.1	61.5		25.4	8.4	66.2		25.4				
Change Period (Y+Rc), s	6.0	6.0		5.0	6.0	6.0		5.0				
Max Green Setting (Gmax), s	10.0	47.0		26.0	6.0	51.0		26.0				
Max Q Clear Time (g_c+I1), s	7.0	27.5		20.2	2.4	15.0		15.8				
Green Ext Time (p_c), s	0.2	4.7		0.1	0.0	6.7		0.7				

Intersection Summary

HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

Notes

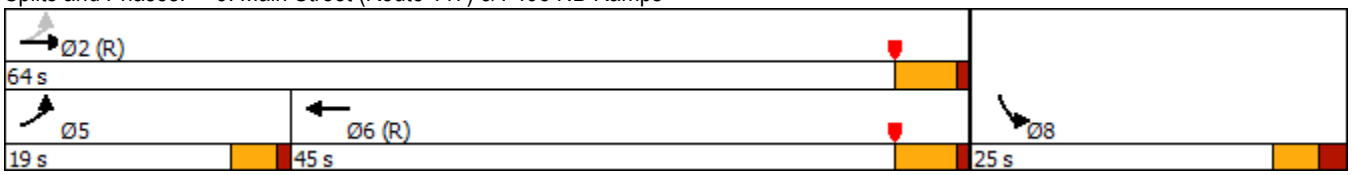
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	231	609	565	182	256	434
Future Volume (vph)	231	609	565	182	256	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			200	0	200
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		30	30		30	
Link Distance (ft)		1180	500		500	
Travel Time (s)		26.8	11.4		11.4	
Peak Hour Factor	0.96	0.96	0.89	0.89	0.93	0.93
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	Free	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases	2			Free		Free
Detector Phase	5	2	6		8	
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0		6.0	
Minimum Split (s)	10.0	15.0	15.0		11.0	
Total Split (s)	19.0	64.0	45.0		25.0	
Total Split (%)	21.3%	71.9%	50.6%		28.1%	
Maximum Green (s)	15.0	59.0	40.0		20.0	
Yellow Time (s)	3.0	4.0	4.0		3.0	
All-Red Time (s)	1.0	1.0	1.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	4.0	5.0	5.0		5.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0	2.0	2.0		3.0	
Recall Mode	None	C-Min	C-Min		None	

Intersection Summary

Area Type: Other
Cycle Length: 89
Actuated Cycle Length: 89
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 3: Main Street (Route 117) & I-495 NB Ramps



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	241	634	635	204	275	467
v/c Ratio	0.53	0.50	0.64	0.13	0.77	0.30
Control Delay	9.5	8.8	19.6	0.2	48.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.5	8.8	19.6	0.2	48.7	0.5
Queue Length 50th (ft)	43	153	240	0	145	0
Queue Length 95th (ft)	73	238	404	0	#232	0
Internal Link Dist (ft)		1100	420		420	
Turn Bay Length (ft)	200			200		200
Base Capacity (vph)	542	1285	1000	1583	403	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.49	0.64	0.13	0.68	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	231	609	565	182	256	434	
Future Volume (veh/h)	231	609	565	182	256	434	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach		No	No		No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	
Adj Flow Rate, veh/h	241	634	635	0	275	0	
Peak Hour Factor	0.96	0.96	0.89	0.89	0.93	0.93	
Percent Heavy Veh, %	2	2	2	2	2	2	
Cap, veh/h	516	1330	1108		314		
Arrive On Green	0.07	0.71	0.59	0.00	0.18	0.00	
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585	
Grp Volume(v), veh/h	241	634	635	0	275	0	
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585	
Q Serve(g_s), s	4.3	13.2	18.6	0.0	13.4	0.0	
Cycle Q Clear(g_c), s	4.3	13.2	18.6	0.0	13.4	0.0	
Prop In Lane	1.00			1.00	1.00	1.00	
Lane Grp Cap(c), veh/h	516	1330	1108		314		
V/C Ratio(X)	0.47	0.48	0.57		0.87		
Avail Cap(c_a), veh/h	685	1330	1108		400		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	0.79	0.79	1.00	0.00	1.00	0.00	
Uniform Delay (d), s/veh	8.4	5.6	11.2	0.0	35.7	0.0	
Incr Delay (d2), s/veh	0.2	1.0	2.2	0.0	15.9	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	1.4	4.4	7.6	0.0	7.1	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	8.6	6.6	13.3	0.0	51.5	0.0	
LnGrp LOS	A	A	B		D		
Approach Vol, veh/h		875	635	A	275	A	
Approach Delay, s/veh		7.1	13.3		51.5		
Approach LOS		A	B		D		
Timer - Assigned Phs		2			5	6	8
Phs Duration (G+Y+Rc), s		68.3			10.6	57.7	20.7
Change Period (Y+Rc), s		5.0			4.0	5.0	5.0
Max Green Setting (Gmax), s		59.0			15.0	40.0	20.0
Max Q Clear Time (g_c+I1), s		15.2			6.3	20.6	15.4
Green Ext Time (p_c), s		3.0			0.2	2.8	0.3

Intersection Summary	
HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

1: Bolton Office Park Driveway & Main Street (Route 117)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	949	9	10	1344	3	28
Future Volume (vph)	949	9	10	1344	3	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	200
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	30			30	30	
Link Distance (ft)	500			1215	500	
Travel Time (s)	11.4			27.6	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	949	9	10	1344	3	28
Future Vol, veh/h	949	9	10	1344	3	28
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	-	0	200
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	1032	10	11	1461	3	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1042	0	2520	1037
Stage 1	-	-	-	-	1037	-
Stage 2	-	-	-	-	1483	-
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	-	-	667	-	31	281
Stage 1	-	-	-	-	342	-
Stage 2	-	-	-	-	208	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	667	-	31	281
Mov Cap-2 Maneuver	-	-	-	-	31	-
Stage 1	-	-	-	-	342	-
Stage 2	-	-	-	-	205	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	30.5
HCM LOS			D

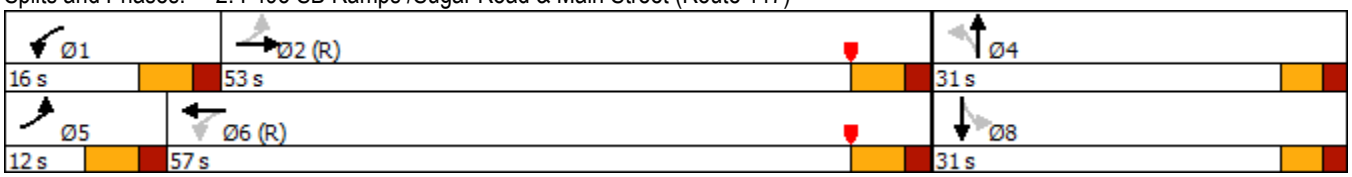
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	31	281	-	-	667	-
HCM Lane V/C Ratio	0.105	0.108	-	-	0.016	-
HCM Control Delay (s)	134.3	19.4	-	-	10.5	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	0.3	0.4	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	518	485	260	1163	120	148	14	141	41	43	19
Future Volume (vph)	17	518	485	260	1163	120	148	14	141	41	43	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	250		0	200		200	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1215			1180			500			500	
Travel Time (s)		27.6			26.8			11.4			11.4	
Peak Hour Factor	0.90	0.90	0.90	0.96	0.96	0.96	0.65	0.65	0.65	0.86	0.86	0.86
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Free	pm+pt	NA		Perm	NA	Free	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		Free	6			4		Free	8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		11.0	11.0		11.0	11.0	
Total Split (s)	12.0	53.0		16.0	57.0		31.0	31.0		31.0	31.0	
Total Split (%)	12.0%	53.0%		16.0%	57.0%		31.0%	31.0%		31.0%	31.0%	
Maximum Green (s)	6.0	47.0		10.0	51.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 2: I-495 SB Ramps /Sugar Road & Main Street (Route 117)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	19	576	539	271	1336	228	22	217	120
v/c Ratio	0.07	0.60	0.34	0.59	0.61	0.86	0.05	0.14	0.34
Control Delay	7.9	21.6	0.6	12.6	14.7	66.7	29.0	0.2	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	21.6	0.6	12.6	14.7	66.7	29.0	0.2	31.5
Queue Length 50th (ft)	4	263	0	62	217	138	11	0	58
Queue Length 95th (ft)	12	394	0	108	422	145	21	0	99
Internal Link Dist (ft)		1135			1100		420		420
Turn Bay Length (ft)	200		200	250		200		200	
Base Capacity (vph)	254	959	1583	467	2192	319	484	1583	422
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.60	0.34	0.58	0.61	0.71	0.05	0.14	0.28

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	518	485	260	1163	120	148	14	141	41	43	19
Future Volume (veh/h)	17	518	485	260	1163	120	148	14	141	41	43	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	19	576	0	271	1211	125	228	22	0	48	50	22
Peak Hour Factor	0.90	0.90	0.90	0.96	0.96	0.96	0.65	0.65	0.65	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	1037		519	1994	205	325	360		154	152	57
Arrive On Green	0.02	0.55	0.00	0.08	0.61	0.61	0.19	0.19	0.00	0.19	0.19	0.19
Sat Flow, veh/h	1781	1870	1585	1781	3252	335	1328	1870	1585	540	791	299
Grp Volume(v), veh/h	19	576	0	271	660	676	228	22	0	120	0	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1810	1328	1870	1585	1630	0	0
Q Serve(g_s), s	0.5	19.8	0.0	6.2	22.9	23.0	10.8	1.0	0.0	3.2	0.0	0.0
Cycle Q Clear(g_c), s	0.5	19.8	0.0	6.2	22.9	23.0	17.0	1.0	0.0	6.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.18	1.00		1.00	0.40		0.18
Lane Grp Cap(c), veh/h	273	1037		519	1089	1110	325	360		364	0	0
V/C Ratio(X)	0.07	0.56		0.52	0.61	0.61	0.70	0.06		0.33	0.00	0.00
Avail Cap(c_a), veh/h	336	1037		548	1089	1110	415	486		472	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.71	0.71	0.71	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.5	14.3	0.0	10.4	11.9	11.9	39.5	33.0	0.0	35.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	2.1	0.0	0.6	1.8	1.8	2.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	8.5	0.0	2.2	8.8	9.0	5.6	0.4	0.0	2.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.6	16.5	0.0	11.0	13.7	13.7	41.7	33.0	0.0	35.2	0.0	0.0
LnGrp LOS	B	B		B	B	B	D	C		D	A	A
Approach Vol, veh/h		595	A		1607			250	A		120	
Approach Delay, s/veh		16.3			13.3			41.0			35.2	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.3	61.5		24.2	8.5	67.3		24.2
Change Period (Y+Rc), s	6.0	6.0		5.0	6.0	6.0		5.0
Max Green Setting (Gmax), s	10.0	47.0		26.0	6.0	51.0		26.0
Max Q Clear Time (g_c+I1), s	8.2	21.8		19.0	2.5	25.0		8.1
Green Ext Time (p_c), s	0.2	4.1		0.3	0.0	11.0		0.3

Intersection Summary	
HCM 6th Ctrl Delay	17.7
HCM 6th LOS	B

Notes

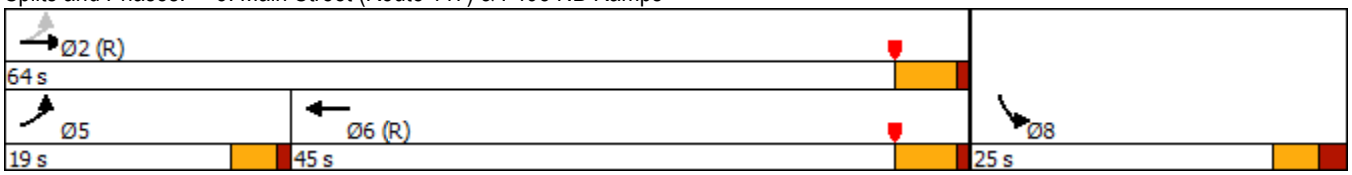
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	159	534	751	155	186	751
Future Volume (vph)	159	534	751	155	186	751
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			200	0	200
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		30	30		30	
Link Distance (ft)		1180	500		500	
Travel Time (s)		26.8	11.4		11.4	
Peak Hour Factor	0.86	0.86	0.89	0.89	0.94	0.94
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	Free	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases	2			Free		Free
Detector Phase	5	2	6		8	
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0		6.0	
Minimum Split (s)	10.0	15.0	15.0		11.0	
Total Split (s)	19.0	64.0	45.0		25.0	
Total Split (%)	21.3%	71.9%	50.6%		28.1%	
Maximum Green (s)	15.0	59.0	40.0		20.0	
Yellow Time (s)	3.0	4.0	4.0		3.0	
All-Red Time (s)	1.0	1.0	1.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	4.0	5.0	5.0		5.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0	2.0	2.0		3.0	
Recall Mode	None	C-Min	C-Min		None	

Intersection Summary

Area Type: Other
Cycle Length: 89
Actuated Cycle Length: 89
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 3: Main Street (Route 117) & I-495 NB Ramps



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	185	621	844	174	198	799
v/c Ratio	0.54	0.46	0.79	0.11	0.67	0.50
Control Delay	11.1	7.2	24.3	0.1	45.2	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	7.2	24.3	0.1	45.2	1.2
Queue Length 50th (ft)	26	124	331	0	105	0
Queue Length 95th (ft)	59	214	#705	0	165	0
Internal Link Dist (ft)		1100	420		420	
Turn Bay Length (ft)	200			200		200
Base Capacity (vph)	447	1340	1067	1583	397	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.46	0.79	0.11	0.50	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	159	534	751	155	186	751
Future Volume (veh/h)	159	534	751	155	186	751
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	185	621	844	0	198	0
Peak Hour Factor	0.86	0.86	0.89	0.89	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	427	1410	1201		238	
Arrive On Green	0.07	0.75	0.64	0.00	0.13	0.00
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	185	621	844	0	198	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	2.8	10.9	26.2	0.0	9.6	0.0
Cycle Q Clear(g_c), s	2.8	10.9	26.2	0.0	9.6	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	427	1410	1201		238	
V/C Ratio(X)	0.43	0.44	0.70		0.83	
Avail Cap(c_a), veh/h	608	1410	1201		400	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	9.8	4.0	10.4	0.0	37.6	0.0
Incr Delay (d2), s/veh	0.2	0.9	3.4	0.0	7.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	3.3	10.3	0.0	4.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.0	4.9	13.8	0.0	45.0	0.0
LnGrp LOS	B	A	B		D	
Approach Vol, veh/h		806	844	A	198	A
Approach Delay, s/veh		6.1	13.8		45.0	
Approach LOS		A	B		D	

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		72.1			9.9	62.2		16.9
Change Period (Y+Rc), s		5.0			4.0	5.0		5.0
Max Green Setting (Gmax), s		59.0			15.0	40.0		20.0
Max Q Clear Time (g_c+I1), s		12.9			4.8	28.2		11.6
Green Ext Time (p_c), s		3.0			0.2	3.4		0.3

Intersection Summary	
HCM 6th Ctrl Delay	13.8
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

1: Bolton Office Park Driveway & Main Street (Route 117)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1301	3	14	971	2	2
Future Volume (vph)	1301	3	14	971	2	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	200
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	30			30	30	
Link Distance (ft)	500			1215	500	
Travel Time (s)	11.4			27.6	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1301	3	14	971	2	2
Future Vol, veh/h	1301	3	14	971	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	200
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	1414	3	15	1055	2	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1417	0	2501	1416
Stage 1	-	-	-	-	1416	-
Stage 2	-	-	-	-	1085	-
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	-	-	481	-	32	168
Stage 1	-	-	-	-	224	-
Stage 2	-	-	-	-	324	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	481	-	31	168
Mov Cap-2 Maneuver	-	-	-	-	31	-
Stage 1	-	-	-	-	224	-
Stage 2	-	-	-	-	314	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	78.2
HCM LOS			F

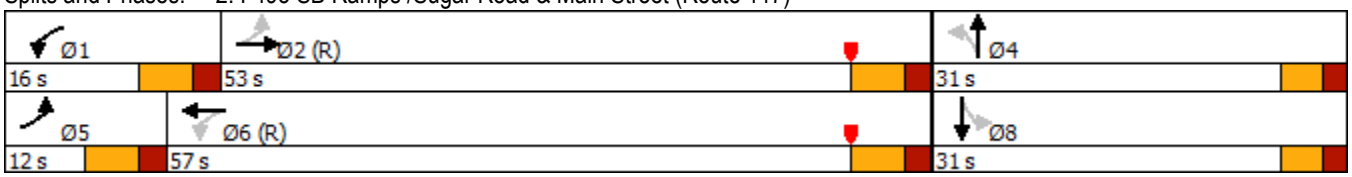
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	31	168	-	-	481	-
HCM Lane V/C Ratio	0.07	0.013	-	-	0.032	-
HCM Control Delay (s)	129.7	26.7	-	-	12.7	-
HCM Lane LOS	F	D	-	-	B	-
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	670	586	204	817	39	150	8	161	47	87	32
Future Volume (vph)	18	670	586	204	817	39	150	8	161	47	87	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	250		0	200		200	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1215			1180			500			500	
Travel Time (s)		27.6			26.8			11.4			11.4	
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91	0.90	0.90	0.90	0.62	0.62	0.62
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Free	pm+pt	NA		Perm	NA	Free	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		Free	6			4		Free	8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		11.0	11.0		11.0	11.0	
Total Split (s)	12.0	53.0		16.0	57.0		31.0	31.0		31.0	31.0	
Total Split (%)	12.0%	53.0%		16.0%	57.0%		31.0%	31.0%		31.0%	31.0%	
Maximum Green (s)	6.0	47.0		10.0	51.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 2: I-495 SB Ramps /Sugar Road & Main Street (Route 117)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	19	720	630	224	941	167	9	179	268
v/c Ratio	0.05	0.76	0.40	0.63	0.43	0.95	0.02	0.11	0.74
Control Delay	7.6	27.3	0.7	16.6	12.1	94.4	28.0	0.1	46.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	27.3	0.7	16.6	12.1	94.4	28.0	0.1	46.6
Queue Length 50th (ft)	4	380	0	52	135	102	4	0	148
Queue Length 95th (ft)	12	#567	0	104	256	#214	17	0	143
Internal Link Dist (ft)		1135			1100		420		420
Turn Bay Length (ft)	200		200	250		200		200	
Base Capacity (vph)	385	953	1583	361	2198	211	484	1583	434
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.76	0.40	0.62	0.43	0.79	0.02	0.11	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	670	586	204	817	39	150	8	161	47	87	32
Future Volume (veh/h)	18	670	586	204	817	39	150	8	161	47	87	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	19	720	0	224	898	43	167	9	0	76	140	52
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91	0.90	0.90	0.90	0.62	0.62	0.62
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	380	1004		387	2029	97	261	407		132	209	71
Arrive On Green	0.02	0.54	0.00	0.08	0.59	0.59	0.22	0.22	0.00	0.22	0.22	0.22
Sat Flow, veh/h	1781	1870	1585	1781	3452	165	1191	1870	1585	394	961	326
Grp Volume(v), veh/h	19	720	0	224	462	479	167	9	0	268	0	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1841	1191	1870	1585	1681	0	0
Q Serve(g_s), s	0.5	29.0	0.0	5.4	14.5	14.5	4.9	0.4	0.0	11.2	0.0	0.0
Cycle Q Clear(g_c), s	0.5	29.0	0.0	5.4	14.5	14.5	19.6	0.4	0.0	14.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.09	1.00		1.00	0.28		0.19
Lane Grp Cap(c), veh/h	380	1004		387	1044	1082	261	407		412	0	0
V/C Ratio(X)	0.05	0.72		0.58	0.44	0.44	0.64	0.02		0.65	0.00	0.00
Avail Cap(c_a), veh/h	443	1004		431	1044	1082	311	486		482	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.84	0.84	0.84	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	10.2	17.4	0.0	14.6	11.5	11.5	39.3	30.8	0.0	36.3	0.0	0.0
Incr Delay (d2), s/veh	0.1	4.4	0.0	1.3	1.1	1.1	1.8	0.0	0.0	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	12.9	0.0	2.1	5.7	5.9	4.1	0.2	0.0	6.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.2	21.8	0.0	15.9	12.6	12.6	41.1	30.8	0.0	37.7	0.0	0.0
LnGrp LOS	B	C		B	B	B	D	C		D	A	A
Approach Vol, veh/h		739	A		1165			176	A		268	
Approach Delay, s/veh		21.5			13.3			40.6			37.7	
Approach LOS		C			B			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.6	59.7		26.8	8.5	64.8		26.8				
Change Period (Y+Rc), s	6.0	6.0		5.0	6.0	6.0		5.0				
Max Green Setting (Gmax), s	10.0	47.0		26.0	6.0	51.0		26.0				
Max Q Clear Time (g_c+I1), s	7.4	31.0		21.6	2.5	16.5		16.7				
Green Ext Time (p_c), s	0.2	4.7		0.1	0.0	7.2		0.7				

Intersection Summary

HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Notes

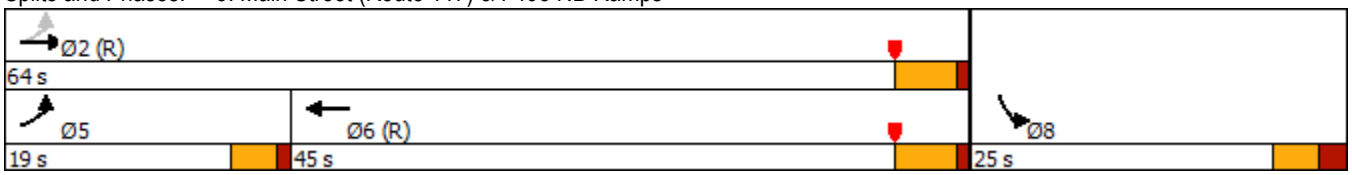
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	244	644	597	192	271	459
Future Volume (vph)	244	644	597	192	271	459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			200	0	200
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		30	30		30	
Link Distance (ft)		1180	500		500	
Travel Time (s)		26.8	11.4		11.4	
Peak Hour Factor	0.96	0.96	0.89	0.89	0.93	0.93
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	Free	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases	2			Free		Free
Detector Phase	5	2	6		8	
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0		6.0	
Minimum Split (s)	10.0	15.0	15.0		11.0	
Total Split (s)	19.0	64.0	45.0		25.0	
Total Split (%)	21.3%	71.9%	50.6%		28.1%	
Maximum Green (s)	15.0	59.0	40.0		20.0	
Yellow Time (s)	3.0	4.0	4.0		3.0	
All-Red Time (s)	1.0	1.0	1.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	4.0	5.0	5.0		5.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0	2.0	2.0		3.0	
Recall Mode	None	C-Min	C-Min		None	

Intersection Summary

Area Type: Other
Cycle Length: 89
Actuated Cycle Length: 89
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 3: Main Street (Route 117) & I-495 NB Ramps



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	254	671	671	216	291	494
v/c Ratio	0.59	0.53	0.69	0.14	0.80	0.31
Control Delay	11.2	9.3	22.1	0.2	50.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	9.3	22.1	0.2	50.8	0.5
Queue Length 50th (ft)	47	175	272	0	152	0
Queue Length 95th (ft)	77	259	#456	0	#264	0
Internal Link Dist (ft)		1100	420		420	
Turn Bay Length (ft)	200			200		200
Base Capacity (vph)	508	1274	977	1583	400	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.53	0.69	0.14	0.73	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	244	644	597	192	271	459
Future Volume (veh/h)	244	644	597	192	271	459
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	254	671	671	0	291	0
Peak Hour Factor	0.96	0.96	0.89	0.89	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	484	1314	1083		330	
Arrive On Green	0.08	0.70	0.58	0.00	0.19	0.00
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	254	671	671	0	291	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	4.7	14.8	20.9	0.0	14.2	0.0
Cycle Q Clear(g_c), s	4.7	14.8	20.9	0.0	14.2	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	484	1314	1083		330	
V/C Ratio(X)	0.52	0.51	0.62		0.88	
Avail Cap(c_a), veh/h	645	1314	1083		400	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	9.7	6.1	12.3	0.0	35.3	0.0
Incr Delay (d2), s/veh	0.2	1.1	2.7	0.0	17.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	5.1	8.7	0.0	7.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.0	7.2	14.9	0.0	52.9	0.0
LnGrp LOS	A	A	B		D	
Approach Vol, veh/h		925	671	A	291	A
Approach Delay, s/veh		8.0	14.9		52.9	
Approach LOS		A	B		D	

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		67.5			11.0	56.6		21.5
Change Period (Y+Rc), s		5.0			4.0	5.0		5.0
Max Green Setting (Gmax), s		59.0			15.0	40.0		20.0
Max Q Clear Time (g_c+I1), s		16.8			6.7	22.9		16.2
Green Ext Time (p_c), s		3.3			0.2	2.9		0.3

Intersection Summary	
HCM 6th Ctrl Delay	17.4
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

1: Bolton Office Park Driveway & Main Street (Route 117)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1003	10	11	1421	3	30
Future Volume (vph)	1003	10	11	1421	3	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	200
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	30			30	30	
Link Distance (ft)	500			1215	500	
Travel Time (s)	11.4			27.6	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1003	10	11	1421	3	30
Future Vol, veh/h	1003	10	11	1421	3	30
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	-	0	200
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	1090	11	12	1545	3	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1101	0	2665	1096
Stage 1	-	-	-	-	1096	-
Stage 2	-	-	-	-	1569	-
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	-	-	634	-	25	259
Stage 1	-	-	-	-	320	-
Stage 2	-	-	-	-	189	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	634	-	25	259
Mov Cap-2 Maneuver	-	-	-	-	25	-
Stage 1	-	-	-	-	320	-
Stage 2	-	-	-	-	185	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	34.4
HCM LOS			D

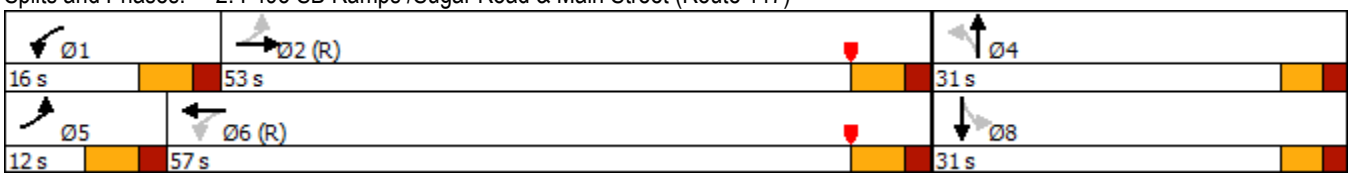
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	25	259	-	-	634	-
HCM Lane V/C Ratio	0.13	0.126	-	-	0.019	-
HCM Control Delay (s)	169.5	20.9	-	-	10.8	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	0.4	0.4	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	548	513	275	1230	127	156	15	149	43	45	20
Future Volume (vph)	18	548	513	275	1230	127	156	15	149	43	45	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	250		0	200		200	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1215			1180			500			500	
Travel Time (s)		27.6			26.8			11.4			11.4	
Peak Hour Factor	0.90	0.90	0.90	0.96	0.96	0.96	0.65	0.65	0.65	0.86	0.86	0.86
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Free	pm+pt	NA		Perm	NA	Free	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		Free	6			4		Free	8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		11.0	11.0		11.0	11.0	
Total Split (s)	12.0	53.0		16.0	57.0		31.0	31.0		31.0	31.0	
Total Split (%)	12.0%	53.0%		16.0%	57.0%		31.0%	31.0%		31.0%	31.0%	
Maximum Green (s)	6.0	47.0		10.0	51.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 2: I-495 SB Ramps /Sugar Road & Main Street (Route 117)



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	20	609	570	286	1413	240	23	229	125
v/c Ratio	0.09	0.65	0.36	0.66	0.65	0.89	0.06	0.14	0.34
Control Delay	8.2	23.8	0.6	16.1	15.9	69.2	28.8	0.2	31.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.2	23.8	0.6	16.1	15.9	69.2	28.8	0.2	31.3
Queue Length 50th (ft)	4	302	0	70	250	145	11	0	59
Queue Length 95th (ft)	13	426	0	#119	463	152	22	0	103
Internal Link Dist (ft)		1135			1100		420		420
Turn Bay Length (ft)	200		200	250		200		200	
Base Capacity (vph)	229	935	1583	434	2164	316	484	1583	422
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.65	0.36	0.66	0.65	0.76	0.05	0.14	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	548	513	275	1230	127	156	15	149	43	45	20
Future Volume (veh/h)	18	548	513	275	1230	127	156	15	149	43	45	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	609	0	286	1281	132	240	23	0	50	52	23
Peak Hour Factor	0.90	0.90	0.90	0.96	0.96	0.96	0.65	0.65	0.65	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	247	1008		486	1958	201	336	379		161	159	61
Arrive On Green	0.03	0.54	0.00	0.09	0.60	0.60	0.20	0.20	0.00	0.20	0.20	0.20
Sat Flow, veh/h	1781	1870	1585	1781	3253	334	1325	1870	1585	544	784	299
Grp Volume(v), veh/h	20	609	0	286	698	715	240	23	0	125	0	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1810	1325	1870	1585	1627	0	0
Q Serve(g_s), s	0.5	22.3	0.0	6.7	25.7	26.0	11.7	1.0	0.0	3.4	0.0	0.0
Cycle Q Clear(g_c), s	0.5	22.3	0.0	6.7	25.7	26.0	18.0	1.0	0.0	6.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.18	1.00		1.00	0.40		0.18
Lane Grp Cap(c), veh/h	247	1008		486	1069	1089	336	379		380	0	0
V/C Ratio(X)	0.08	0.60		0.59	0.65	0.66	0.71	0.06		0.33	0.00	0.00
Avail Cap(c_a), veh/h	309	1008		507	1069	1089	412	486		472	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.66	0.66	0.66	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.7	15.8	0.0	12.0	13.1	13.1	39.1	32.2	0.0	34.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	2.7	0.0	1.1	2.1	2.1	3.0	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	9.7	0.0	2.5	10.0	10.3	6.0	0.5	0.0	2.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.8	18.5	0.0	13.1	15.1	15.2	42.1	32.2	0.0	34.4	0.0	0.0
LnGrp LOS	B	B		B	B	B	D	C		C	A	A
Approach Vol, veh/h		629	A		1699			263	A		125	
Approach Delay, s/veh		18.3			14.8			41.2			34.4	
Approach LOS		B			B			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.9	59.9		25.3	8.6	66.2		25.3
Change Period (Y+Rc), s	6.0	6.0		5.0	6.0	6.0		5.0
Max Green Setting (Gmax), s	10.0	47.0		26.0	6.0	51.0		26.0
Max Q Clear Time (g_c+I1), s	8.7	24.3		20.0	2.5	28.0		8.3
Green Ext Time (p_c), s	0.1	4.3		0.2	0.0	11.2		0.4

Intersection Summary

HCM 6th Ctrl Delay			19.1
HCM 6th LOS			B

Notes

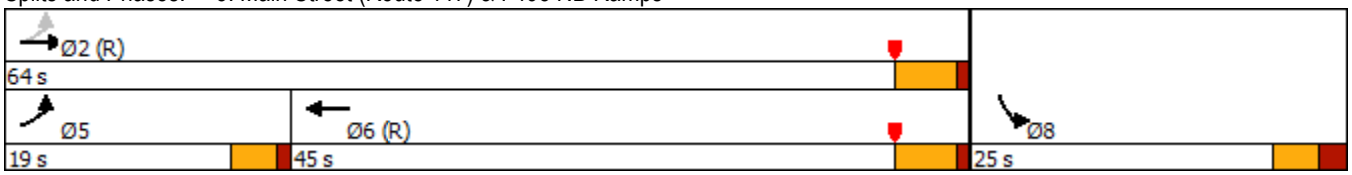
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	168	565	794	164	197	794
Future Volume (vph)	168	565	794	164	197	794
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			200	0	200
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		30	30		30	
Link Distance (ft)		1180	500		500	
Travel Time (s)		26.8	11.4		11.4	
Peak Hour Factor	0.86	0.86	0.89	0.89	0.94	0.94
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	Free	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases	2			Free		Free
Detector Phase	5	2	6		8	
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0		6.0	
Minimum Split (s)	10.0	15.0	15.0		11.0	
Total Split (s)	19.0	64.0	45.0		25.0	
Total Split (%)	21.3%	71.9%	50.6%		28.1%	
Maximum Green (s)	15.0	59.0	40.0		20.0	
Yellow Time (s)	3.0	4.0	4.0		3.0	
All-Red Time (s)	1.0	1.0	1.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	4.0	5.0	5.0		5.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0	2.0	2.0		3.0	
Recall Mode	None	C-Min	C-Min		None	

Intersection Summary

Area Type: Other
Cycle Length: 89
Actuated Cycle Length: 89
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 3: Main Street (Route 117) & I-495 NB Ramps



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	195	657	892	184	210	845
v/c Ratio	0.63	0.49	0.85	0.12	0.69	0.53
Control Delay	18.9	7.8	28.6	0.2	45.8	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	7.8	28.6	0.2	45.8	1.3
Queue Length 50th (ft)	29	139	382	0	111	0
Queue Length 95th (ft)	93	232	#772	0	175	0
Internal Link Dist (ft)		1100	420		420	
Turn Bay Length (ft)	200			200		200
Base Capacity (vph)	407	1331	1050	1583	397	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.49	0.85	0.12	0.53	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	168	565	794	164	197	794
Future Volume (veh/h)	168	565	794	164	197	794
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	195	657	892	0	210	0
Peak Hour Factor	0.86	0.86	0.89	0.89	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	389	1397	1188		250	
Arrive On Green	0.07	0.75	0.64	0.00	0.14	0.00
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	195	657	892	0	210	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	3.0	12.2	29.6	0.0	10.2	0.0
Cycle Q Clear(g_c), s	3.0	12.2	29.6	0.0	10.2	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	389	1397	1188		250	
V/C Ratio(X)	0.50	0.47	0.75		0.84	
Avail Cap(c_a), veh/h	570	1397	1188		400	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	11.9	4.4	11.3	0.0	37.3	0.0
Incr Delay (d2), s/veh	0.3	1.0	4.4	0.0	8.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	3.8	11.9	0.0	5.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.3	5.4	15.7	0.0	45.8	0.0
LnGrp LOS	B	A	B		D	
Approach Vol, veh/h		852	892	A	210	A
Approach Delay, s/veh		6.9	15.7		45.8	
Approach LOS		A	B		D	

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		71.5			10.0	61.5		17.5
Change Period (Y+Rc), s		5.0			4.0	5.0		5.0
Max Green Setting (Gmax), s		59.0			15.0	40.0		20.0
Max Q Clear Time (g_c+I1), s		14.2			5.0	31.6		12.2
Green Ext Time (p_c), s		3.2			0.2	3.0		0.3

Intersection Summary	
HCM 6th Ctrl Delay	15.1
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

1: Bolton Office Park Driveway & Main Street (Route 117)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1301	25	80	971	26	72
Future Volume (vph)	1301	25	80	971	26	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	200
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	30			30	30	
Link Distance (ft)	500			1215	500	
Travel Time (s)	11.4			27.6	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection	
Int Delay, s/veh	8.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1301	25	80	971	26	72
Future Vol, veh/h	1301	25	80	971	26	72
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	-	0	200
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	1414	27	87	1055	28	78

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1441	0	2657	1428
Stage 1	-	-	-	-	1428	-
Stage 2	-	-	-	-	1229	-
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	-	-	471	-	~ 25	165
Stage 1	-	-	-	-	221	-
Stage 2	-	-	-	-	276	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	471	-	~ 20	165
Mov Cap-2 Maneuver	-	-	-	-	~ 20	-
Stage 1	-	-	-	-	221	-
Stage 2	-	-	-	-	225	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	200
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	20	165	-	-	471	-
HCM Lane V/C Ratio	1.413	0.474	-	-	0.185	-
HCM Control Delay (s)	$ 628.8	45.1	-	-	14.4	-
HCM Lane LOS	F	E	-	-	B	-
HCM 95th %tile Q(veh)	3.8	2.2	-	-	0.7	-

Notes

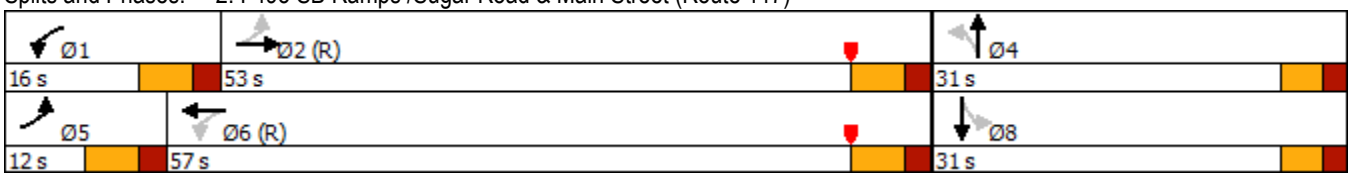
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	712	614	204	856	39	177	8	161	47	87	32
Future Volume (vph)	18	712	614	204	856	39	177	8	161	47	87	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	250		0	200		200	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1215			1180			500			500	
Travel Time (s)		27.6			26.8			11.4			11.4	
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91	0.90	0.90	0.90	0.62	0.62	0.62
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Free	pm+pt	NA		Perm	NA	Free	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		Free	6			4		Free	8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		11.0	11.0		11.0	11.0	
Total Split (s)	12.0	53.0		16.0	57.0		31.0	31.0		31.0	31.0	
Total Split (%)	12.0%	53.0%		16.0%	57.0%		31.0%	31.0%		31.0%	31.0%	
Maximum Green (s)	6.0	47.0		10.0	51.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 2: I-495 SB Ramps /Sugar Road & Main Street (Route 117)



2: I-495 SB Ramps /Sugar Road & Main Street (Route 117)

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	19	766	660	224	984	197	9	179	268
v/c Ratio	0.05	0.84	0.42	0.76	0.46	0.96	0.02	0.11	0.67
Control Delay	7.8	33.6	0.8	31.8	13.2	92.5	27.8	0.1	41.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	33.6	0.8	31.8	13.2	92.5	27.8	0.1	41.1
Queue Length 50th (ft)	4	425	0	59	153	121	4	0	144
Queue Length 95th (ft)	12	#663	0	#182	272	#254	17	0	143
Internal Link Dist (ft)		1135			1100		420		420
Turn Bay Length (ft)	200		200	250		200		200	
Base Capacity (vph)	350	909	1583	298	2118	222	484	1583	435
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.84	0.42	0.75	0.46	0.89	0.02	0.11	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	712	614	204	856	39	177	8	161	47	87	32
Future Volume (veh/h)	18	712	614	204	856	39	177	8	161	47	87	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	19	766	0	224	941	43	197	9	0	76	140	52
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91	0.90	0.90	0.90	0.62	0.62	0.62
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	347	960		334	1961	90	290	447		139	231	78
Arrive On Green	0.02	0.51	0.00	0.08	0.57	0.57	0.24	0.24	0.00	0.24	0.24	0.24
Sat Flow, veh/h	1781	1870	1585	1781	3461	158	1191	1870	1585	391	965	326
Grp Volume(v), veh/h	19	766	0	224	483	501	197	9	0	268	0	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1842	1191	1870	1585	1683	0	0
Q Serve(g_s), s	0.5	33.8	0.0	5.7	16.2	16.2	7.5	0.4	0.0	10.2	0.0	0.0
Cycle Q Clear(g_c), s	0.5	33.8	0.0	5.7	16.2	16.2	21.8	0.4	0.0	14.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.09	1.00		1.00	0.28		0.19
Lane Grp Cap(c), veh/h	347	960		334	1007	1044	290	447		448	0	0
V/C Ratio(X)	0.05	0.80		0.67	0.48	0.48	0.68	0.02		0.60	0.00	0.00
Avail Cap(c_a), veh/h	410	960		373	1007	1044	315	486		483	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.82	0.82	0.82	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.4	20.1	0.0	18.0	12.9	12.9	38.5	29.1	0.0	34.3	0.0	0.0
Incr Delay (d2), s/veh	0.1	6.9	0.0	3.3	1.3	1.3	4.0	0.0	0.0	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	15.6	0.0	2.6	6.5	6.7	5.0	0.2	0.0	5.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.5	27.0	0.0	21.3	14.2	14.2	42.5	29.1	0.0	35.4	0.0	0.0
LnGrp LOS	B	C		C	B	B	D	C		D	A	A
Approach Vol, veh/h		785	A		1208			206	A		268	
Approach Delay, s/veh		26.6			15.5			41.9			35.4	
Approach LOS		C			B			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.8	57.3		28.9	8.5	62.7		28.9
Change Period (Y+Rc), s	6.0	6.0		5.0	6.0	6.0		5.0
Max Green Setting (Gmax), s	10.0	47.0		26.0	6.0	51.0		26.0
Max Q Clear Time (g_c+I1), s	7.7	35.8		23.8	2.5	18.2		16.2
Green Ext Time (p_c), s	0.1	4.2		0.1	0.0	7.6		0.7

Intersection Summary	
HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

Notes

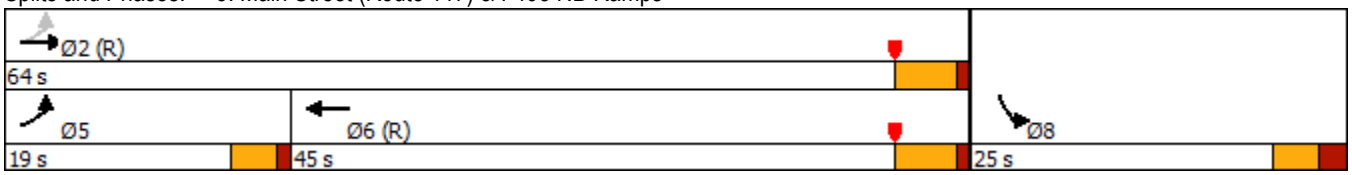
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	272	658	610	192	271	486
Future Volume (vph)	272	658	610	192	271	486
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			200	0	200
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		30	30		30	
Link Distance (ft)		1180	500		500	
Travel Time (s)		26.8	11.4		11.4	
Peak Hour Factor	0.96	0.96	0.89	0.89	0.93	0.93
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	Free	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases	2			Free		Free
Detector Phase	5	2	6		8	
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0		6.0	
Minimum Split (s)	10.0	15.0	15.0		11.0	
Total Split (s)	19.0	64.0	45.0		25.0	
Total Split (%)	21.3%	71.9%	50.6%		28.1%	
Maximum Green (s)	15.0	59.0	40.0		20.0	
Yellow Time (s)	3.0	4.0	4.0		3.0	
All-Red Time (s)	1.0	1.0	1.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	4.0	5.0	5.0		5.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0	2.0	2.0		3.0	
Recall Mode	None	C-Min	C-Min		None	

Intersection Summary

Area Type: Other
Cycle Length: 89
Actuated Cycle Length: 89
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 3: Main Street (Route 117) & I-495 NB Ramps



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	283	685	685	216	291	523
v/c Ratio	0.66	0.54	0.71	0.14	0.81	0.33
Control Delay	14.2	9.4	23.6	0.2	51.7	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	9.4	23.6	0.2	51.7	0.6
Queue Length 50th (ft)	54	181	293	0	152	0
Queue Length 95th (ft)	104	268	#489	0	#264	0
Internal Link Dist (ft)		1100	420		420	
Turn Bay Length (ft)	200			200		200
Base Capacity (vph)	492	1274	960	1583	397	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.54	0.71	0.14	0.73	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	272	658	610	192	271	486
Future Volume (veh/h)	272	658	610	192	271	486
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	283	685	685	0	291	0
Peak Hour Factor	0.96	0.96	0.89	0.89	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	479	1314	1069		330	
Arrive On Green	0.09	0.70	0.57	0.00	0.19	0.00
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	283	685	685	0	291	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	5.4	15.3	22.0	0.0	14.2	0.0
Cycle Q Clear(g_c), s	5.4	15.3	22.0	0.0	14.2	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	479	1314	1069		330	
V/C Ratio(X)	0.59	0.52	0.64		0.88	
Avail Cap(c_a), veh/h	626	1314	1069		400	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.64	0.64	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	10.6	6.2	12.9	0.0	35.3	0.0
Incr Delay (d2), s/veh	0.3	1.0	2.9	0.0	17.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	5.2	9.2	0.0	7.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.9	7.2	15.8	0.0	52.9	0.0
LnGrp LOS	B	A	B		D	
Approach Vol, veh/h		968	685	A	291	A
Approach Delay, s/veh		8.2	15.8		52.9	
Approach LOS		A	B		D	

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		67.5			11.6	55.9		21.5
Change Period (Y+Rc), s		5.0			4.0	5.0		5.0
Max Green Setting (Gmax), s		59.0			15.0	40.0		20.0
Max Q Clear Time (g_c+I1), s		17.3			7.4	24.0		16.2
Green Ext Time (p_c), s		3.4			0.3	2.9		0.3

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

1: Bolton Office Park Driveway & Main Street (Route 117)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1003	32	77	1421	28	103
Future Volume (vph)	1003	32	77	1421	28	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	200
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	30			30	30	
Link Distance (ft)	500			1215	500	
Travel Time (s)	11.4			27.6	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Intersection

Int Delay, s/veh	10.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1003	32	77	1421	28	103
Future Vol, veh/h	1003	32	77	1421	28	103
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	-	0	200
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	1090	35	84	1545	30	112

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1125	0	2821	1108
Stage 1	-	-	-	-	1108	-
Stage 2	-	-	-	-	1713	-
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	-	-	621	-	~ 20	255
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	160	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	621	-	~ 17	255
Mov Cap-2 Maneuver	-	-	-	-	~ 17	-
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	138	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	203.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	17	255	-	-	621	-
HCM Lane V/C Ratio	1.79	0.439	-	-	0.135	-
HCM Control Delay (s)	$ 844.3	29.7	-	-	11.7	-
HCM Lane LOS	F	D	-	-	B	-
HCM 95th %tile Q(veh)	4.3	2.1	-	-	0.5	-

Notes

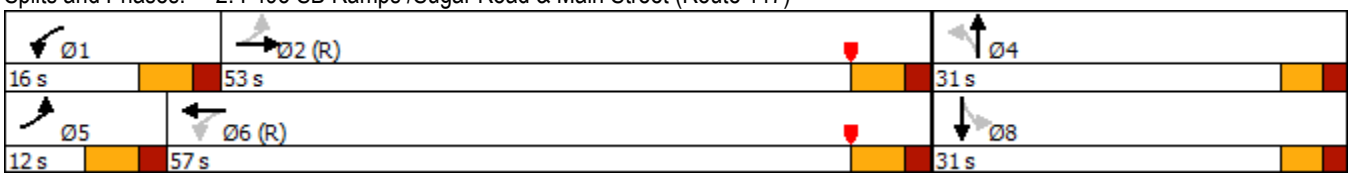
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	592	542	275	1270	127	183	15	149	43	45	20
Future Volume (vph)	18	592	542	275	1270	127	183	15	149	43	45	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		200	250		0	200		200	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1215			1180			500			500	
Travel Time (s)		27.6			26.8			11.4			11.4	
Peak Hour Factor	0.90	0.90	0.90	0.96	0.96	0.96	0.65	0.65	0.65	0.86	0.86	0.86
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA	Free	pm+pt	NA		Perm	NA	Free	Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		Free	6			4		Free	8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	16.0		12.0	16.0		11.0	11.0		11.0	11.0	
Total Split (s)	12.0	53.0		16.0	57.0		31.0	31.0		31.0	31.0	
Total Split (%)	12.0%	53.0%		16.0%	57.0%		31.0%	31.0%		31.0%	31.0%	
Maximum Green (s)	6.0	47.0		10.0	51.0		26.0	26.0		26.0	26.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 2: I-495 SB Ramps /Sugar Road & Main Street (Route 117)



2: I-495 SB Ramps /Sugar Road & Main Street (Route 117)

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Group Flow (vph)	20	658	602	286	1455	282	23	229	125
v/c Ratio	0.10	0.76	0.38	0.79	0.71	0.90	0.05	0.14	0.30
Control Delay	8.9	29.3	0.7	29.2	18.4	67.6	27.7	0.2	29.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	29.3	0.7	29.2	18.4	67.6	27.7	0.2	29.0
Queue Length 50th (ft)	5	379	0	84	320	161	10	0	54
Queue Length 95th (ft)	13	478	0	#203	486	180	22	0	103
Internal Link Dist (ft)		1135			1100		420		420
Turn Bay Length (ft)	200		200	250		200		200	
Base Capacity (vph)	201	900	1583	360	2056	332	501	1583	437
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.73	0.38	0.79	0.71	0.85	0.05	0.14	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	592	542	275	1270	127	183	15	149	43	45	20
Future Volume (veh/h)	18	592	542	275	1270	127	183	15	149	43	45	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	658	0	286	1323	132	282	23	0	50	52	23
Peak Hour Factor	0.90	0.90	0.90	0.96	0.96	0.96	0.65	0.65	0.65	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	220	944		422	1870	186	377	433		179	178	69
Arrive On Green	0.03	0.50	0.00	0.09	0.57	0.57	0.23	0.23	0.00	0.23	0.23	0.23
Sat Flow, veh/h	1781	1870	1585	1781	3264	324	1325	1870	1585	556	769	299
Grp Volume(v), veh/h	20	658	0	286	718	737	282	23	0	125	0	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1812	1325	1870	1585	1624	0	0
Q Serve(g_s), s	0.5	26.9	0.0	7.3	28.9	29.3	14.9	1.0	0.0	3.1	0.0	0.0
Cycle Q Clear(g_c), s	0.5	26.9	0.0	7.3	28.9	29.3	21.0	1.0	0.0	6.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.18	1.00		1.00	0.40		0.18
Lane Grp Cap(c), veh/h	220	944		422	1018	1038	377	433		426	0	0
V/C Ratio(X)	0.09	0.70		0.68	0.70	0.71	0.75	0.05		0.29	0.00	0.00
Avail Cap(c_a), veh/h	281	944		433	1018	1038	414	486		472	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.62	0.62	0.62	1.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.8	18.9	0.0	15.3	15.3	15.4	37.6	29.9	0.0	31.8	0.0	0.0
Incr Delay (d2), s/veh	0.2	4.3	0.0	2.6	2.6	2.6	5.6	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	12.2	0.0	2.9	11.6	11.9	7.2	0.4	0.0	2.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	23.2	0.0	17.8	17.9	18.0	43.2	29.9	0.0	31.9	0.0	0.0
LnGrp LOS	B	C		B	B	B	D	C		C	A	A
Approach Vol, veh/h		678	A		1741			305	A		125	
Approach Delay, s/veh		22.9			17.9			42.2			31.9	
Approach LOS		C			B			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.4	56.5		28.2	8.6	63.3		28.2				
Change Period (Y+Rc), s	6.0	6.0		5.0	6.0	6.0		5.0				
Max Green Setting (Gmax), s	10.0	47.0		26.0	6.0	51.0		26.0				
Max Q Clear Time (g_c+I1), s	9.3	28.9		23.0	2.5	31.3		8.1				
Green Ext Time (p_c), s	0.1	4.4		0.2	0.0	10.6		0.4				

Intersection Summary

HCM 6th Ctrl Delay	22.3
HCM 6th LOS	C

Notes

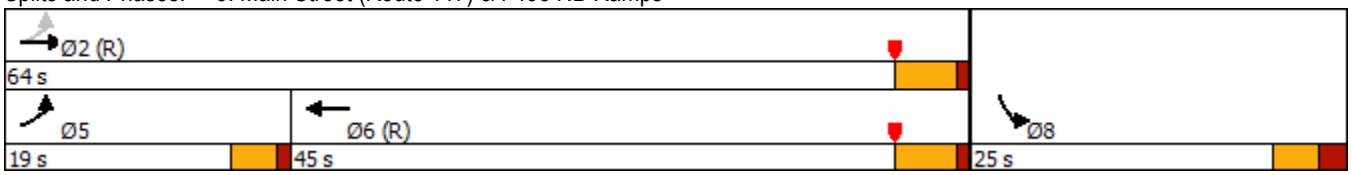
Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	197	580	807	164	197	821
Future Volume (vph)	197	580	807	164	197	821
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			200	0	200
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Right Turn on Red				Yes		Yes
Link Speed (mph)		30	30		30	
Link Distance (ft)		1180	500		500	
Travel Time (s)		26.8	11.4		11.4	
Peak Hour Factor	0.86	0.86	0.89	0.89	0.94	0.94
Shared Lane Traffic (%)						
Turn Type	pm+pt	NA	NA	Free	Prot	Free
Protected Phases	5	2	6		8	
Permitted Phases	2			Free		Free
Detector Phase	5	2	6		8	
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0		6.0	
Minimum Split (s)	10.0	15.0	15.0		11.0	
Total Split (s)	19.0	64.0	45.0		25.0	
Total Split (%)	21.3%	71.9%	50.6%		28.1%	
Maximum Green (s)	15.0	59.0	40.0		20.0	
Yellow Time (s)	3.0	4.0	4.0		3.0	
All-Red Time (s)	1.0	1.0	1.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	4.0	5.0	5.0		5.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.0	2.0	2.0		3.0	
Recall Mode	None	C-Min	C-Min		None	

Intersection Summary

Area Type: Other
Cycle Length: 89
Actuated Cycle Length: 89
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: Main Street (Route 117) & I-495 NB Ramps



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	229	674	907	184	210	873
v/c Ratio	0.76	0.51	0.88	0.12	0.69	0.55
Control Delay	32.2	7.9	32.0	0.2	45.8	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	7.9	32.0	0.2	45.8	1.4
Queue Length 50th (ft)	65	145	418	0	111	0
Queue Length 95th (ft)	133	241	#791	0	175	0
Internal Link Dist (ft)		1100	420		420	
Turn Bay Length (ft)	200			200		200
Base Capacity (vph)	386	1331	1029	1583	397	1583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.51	0.88	0.12	0.53	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	197	580	807	164	197	821
Future Volume (veh/h)	197	580	807	164	197	821
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	229	674	907	0	210	0
Peak Hour Factor	0.86	0.86	0.89	0.89	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	380	1397	1188		250	
Arrive On Green	0.07	0.75	0.64	0.00	0.14	0.00
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	229	674	907	0	210	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	3.6	12.7	30.6	0.0	10.2	0.0
Cycle Q Clear(g_c), s	3.6	12.7	30.6	0.0	10.2	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	380	1397	1188		250	
V/C Ratio(X)	0.60	0.48	0.76		0.84	
Avail Cap(c_a), veh/h	560	1397	1188		400	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.77	0.77	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	13.4	4.4	11.5	0.0	37.3	0.0
Incr Delay (d2), s/veh	0.4	0.9	4.7	0.0	8.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	3.9	12.4	0.0	5.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.8	5.4	16.2	0.0	45.8	0.0
LnGrp LOS	B	A	B		D	
Approach Vol, veh/h		903	907	A	210	A
Approach Delay, s/veh		7.5	16.2		45.8	
Approach LOS		A	B		D	

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		71.5			10.0	61.5		17.5
Change Period (Y+Rc), s		5.0			4.0	5.0		5.0
Max Green Setting (Gmax), s		59.0			15.0	40.0		20.0
Max Q Clear Time (g_c+I1), s		14.7			5.6	32.6		12.2
Green Ext Time (p_c), s		3.3			0.2	2.9		0.3

Intersection Summary	
HCM 6th Ctrl Delay	15.4
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

APPENDIX E
ARCHITECTURAL

Architectural Design Narrative

Alta-Nashoba Valley is a 229-unit apartment community located behind an existing office building at 580 Main Street in Bolton, Massachusetts. The project consists of four (4) three-story residential buildings with a mix of one, two and three-bedroom apartments. A single-story Amenity building and a Mail & Package building flank the entry drive to the site upon arrival.

The Amenity building is a single-story farmhouse inspired space for the residents to gather which contains a leasing office, fitness center, work from home spaces, game room and lounge which connects directly to the outdoor Amenity courtyard which includes a swimming pool, outdoor fire pits and grill stations. The parking areas are located at the perimeter of the buildings for easy parking access along with three (3) stand-alone garage structures.

The building facades utilize color palettes inspired by local New England farmhouses and the natural surroundings of the site. The Amenity, Mail & Package buildings are both single story structures with pitched roofs. The residential buildings are 3 levels with pitched roofs. The residential building facades are broken up with balconies and bay projections. The massing of Buildings 1 and 2 create a large passive courtyard with quiet seating areas and pathways around a central lawn area. Buildings 3 and 4 are located at the southern end of the site and take advantage of the scenic wetland views.

The buildings are designed with materials that reflect the farmhouse and colonial styles commonly found in Bolton and the surrounding Nashoba Valley towns. The exterior cladding will be a mix of lap siding and vertical panels with board and batten, both are traditional New England siding applications. Windows will be double-hung and include a mix of single and double windows to create a variety of openings along the facades of the buildings with simple detailing similar to the Bolton Bean building located at 626 Main Street. The roofs are gray pitched asphalt shingles. The Amenity building is designed to reflect elements of the architecture in the converted barn building directly across the street at 579 Main Street with white lap siding, dark wood entry doors, pitched roof lines and simple detailing. Most of the apartments will have direct access to exterior balconies or patios. Detailing will be kept clean and simple, providing a contemporary approach to the traditional farmhouse style building.

APPENDIX F
GEOTECHNICAL REPORT

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REPORT ON

PRELIMINARY GEOTECHNICAL REPORT
PROPOSED DEVELOPMENT
580 MAIN STREET
BOLTON, MASSACHUSETTS

by
Haley & Aldrich, Inc.
Boston, Massachusetts

for
WP East Acquisitions, LLC
Lexington, Massachusetts

File No. 135679-002
April 2021

HALEY & ALDRICH, INC.
465 Medford St.
Suite 2200
Boston, MA 02129
617.886.7400

SIGNATURE PAGE FOR

REPORT ON

PRELIMINARY GEOTECHNICAL REPORT
PROPOSED DEVELOPMENT
580 MAIN STREET
BOLTON, MASSACHUSETTS

PREPARED FOR

WP EAST ACQUISITIONS, LLC
LEXINGTON, MASSACHUSETTS

PREPARED BY:

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REVIEWED AND APPROVED BY:

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1 April 2021
File No. 135679-002

WP East Acquisitions, LLC
c/o Wood Partners
91 Hartwell Avenue
Lexington, Massachusetts 02421

Attention: David Moore

Subject: Preliminary Geotechnical Report
Proposed Residential Development
580 Main Street
Bolton, Massachusetts

Ladies and Gentlemen:

This letter report summarizes the results of a preliminary geotechnical investigation performed by Haley & Aldrich, Inc. (Haley & Aldrich) for a proposed multi-family residential development project located at 580 Main Street, Bolton, Massachusetts. The work summarized in this report was performed in accordance with our proposal dated 2 September 2020 and your subsequent authorization.

The information presented in this report is intended for initial project planning and preliminary cost estimating purposes only. Final design recommendations and associated construction requirements will be developed during the final design phase of the project upon completion of final design explorations.

Introduction

SITE CONDITIONS

The project site is located at 580 Main Street in Bolton, Massachusetts as shown on the attached Figure 1. It is bordered to the north by an existing residential building, the east by Main Street, and the south and west by forested land.

The site is currently developed with one, 2-story brick office/industrial building. The remainder of the site consists of paved parking areas, grassed/landscaped areas, and detention ponds. The ground floor of the building is set at approximately El. 353 such that it walks out to existing site grades on its north and west sides. The existing building has a basement at approximately El. 340 that is accessed by a loading dock area on the south side of the building.

Existing site grades along Main Street generally range from El. 350 (north end) to El. 345 (south end). Within the site, grades range from approximately El. 350 to El. 353 around the existing building and slope down to approximately El. 346 in the parking area along the western edge of the site adjacent to the detention pond area. There is also a groundwater well and pump house located along the north side of the property that services the building.

PROPOSED DEVELOPMENT

Based on the Wood Partner Concept Plan dated 9 March 2021 (provided in Appendix A), we understand that the proposed development will consist of the construction of four, 3-story residential buildings, four - three story townhouse buildings, and an amenity building. The residential buildings will each have 36 to 75 units and will occupy footprints ranging from approximately 17,500 to 30,000 square feet (sq ft). Each townhouse building will occupy a footprint of approximately 850 sq ft, and the amenity building will be 1-story in height and have a footprint of approximately 5,000 sq ft. No below grade space is planned for the buildings. At grade parking will surround each of the buildings. The west approximate half of the existing office building will be demolished, while its approximate east half will remain and continue to be used as office space. The locations of the proposed buildings relative to existing site conditions is shown on the attached Figure 2.

Proposed site grading was not available at the time this report was prepared, but based on the existing site grades, we anticipate that the new development will have grades similar to the existing site grades and as such no significant cuts or fills will be required across the site. Site development also includes the installation of new wastewater leaching fields to be design by others. The proposed leaching fields are to be located in the northeast portion of the site adjacent to the access road and Main Street.

Subsurface Explorations and Laboratory Testing

SUBSURFACE EXPLORATIONS

Haley & Aldrich conducted a subsurface exploration program consisting of nine (9) soil test borings (designated HA-1 through HA-9) and five test pits (designated TP20-1 to TP20-5) at the proposed project site.

The test borings were performed by Northern Drill Service during the period 5 through 7 October 2020 and were monitored in the field by a Haley & Aldrich geologist. The test borings were drilled using casing to depths ranging from 7 to 16 ft below the existing ground surface (bgs). Standard Penetration Tests (SPTs) using an automatic hammer were conducted continuously in the upper 6 ft of each test boring and then generally at 5-ft intervals thereafter. Two groundwater observation wells were installed in two completed boreholes (HA-1(OW) and HA-7(OW)).

The test pits were performed by Earthworks Industries, Inc. on 11 December 2020 and were monitored in the field by a Haley & Aldrich geologist and a representative from Onsite Engineering. The test pits were advanced in the vicinity of the existing leaching field to depths ranging from 4 to 8.5 feet bgs.

The approximate locations of the explorations relative to existing site conditions and proposed building locations are shown on Figure 2. Locations of explorations were estimated in the field by taping from existing site features by Haley & Aldrich field staff. Ground surface elevations at exploration locations were estimated using a site plan provided to us. As such, locations of and ground surface elevations at exploration locations should be considered approximate. Logs describing conditions encountered in each exploration (including form 11 documentation of the test pits) are provided in Appendix B.

LABORATORY TESTING

A geotechnical laboratory testing program consisting of grain size analysis and in-situ moisture content testing was conducted on four soil samples (two existing site fill, two glacial till) obtained from the test borings to aid with soil classification and on-site reuse evaluation. Laboratory testing results are presented in Appendix C.

Subsurface Conditions

SOIL AND BEDROCK

Subsurface conditions encountered at the exploration locations consisted of the following stratigraphic units starting at existing ground surface:

Subsurface Unit	Top of Stratum (approx.)	Range in Thickness (ft) (approx.)
Fill	El. 346 to El. 351	0.4 to 7
Glacial Till	El. 343 to El. 349	2 to >15
Bedrock	El. 333 to El. 345 (where encountered)	N/A

The generalized descriptions of the units are as follows:

- Fill was encountered to depths ranging from 0.4 to 7 ft bgs. In landscaped areas, the Fill consisted of loose to medium dense sandy ORGANIC SOIL. In areas below existing pavements, the Fill generally consisted of loose to medium dense silty SAND or poorly graded SAND with silt. The deepest Fill was encountered in boring HA-4 where a surficial layer of ORGANIC SOIL was underlain silty SAND fill.
- Glacial Till was encountered below the Fill at each boring location. The Glacial Till consisted of medium to very dense silty SAND with gravel. The Glacial Deposits ranged in thickness between about 2 ft to greater than 15 ft. Cobbles were noted to be present in the Glacial Till during drilling.
- Bedrock (probable) was encountered below the Glacial Till (where the Glacial Till was fully penetrated) at HA-1, HA-2, HA-7, HA-8, and HA-9 at depths ranging from about 4 ft to 14 ft bgs (corresponding to approximately El. 333 to El. 345). These estimates of probable bedrock were based on drill action, limited sample recoveries in split spoons, and refusal to the drilling

equipment (i.e., no coring of bedrock was conducted for this preliminary evaluation). Bedrock outcrops were observed near HA-4 and suspected bedrock outcrops were observed near HA-9.

GROUNDWATER

Two groundwater observation wells were installed as part of this preliminary evaluation (HA-1(OW) and HA-7(OW)). Water level readings obtained on 7 October 2020 (i.e., 1 to 2 days following well installation) indicate water levels of approximately 8.9 ft bgs (approximately El. 340) in HA-1(OW) and 5.5 ft bgs (approximately El. 340.5) in HA-7 (OW).

Based on our understanding of the subsurface conditions at the site, we anticipate groundwater may locally perch on the low permeability Glacial Till and Bedrock, particularly following precipitation events or during snowmelt. As such, it should be anticipated that groundwater levels at the site will fluctuate from those indicated herein. We recommend additional well readings be taken in support of final design and construction.

Preliminary Geotechnical Considerations

The preliminary geotechnical recommendations presented in this section are based on the conceptual design of the project and the subsurface conditions identified in the explorations referenced herein. Our preliminary geotechnical evaluations and subsequent preliminary geotechnical recommendations are provided in accordance with the 9th Edition of the Massachusetts State Building Code, and are intended to aid in your initial planning and preliminary cost estimating (i.e., not intended for project final design).

BUILDING FOUNDATIONS

Based on the subsurface conditions encountered in the test borings, the wall and column loads for the proposed buildings can be supported on shallow spread footing foundations bearing at conventional foundation depths on the Glacial Till, compacted structural fill placed above the Glacial Till following removal of existing Fill (if/where present) within the zone of influence of the footings, or on a 6 in. thickness of crushed stone (wrapped with filter fabric) placed over Bedrock.

For initial planning, we recommend that footings bearing on the Glacial Till or on compacted structural fill be sized for a maximum allowable bearing pressure of 6 kips per square foot (ksf). Foundations bearing on Bedrock may be designed using a maximum allowable bearing pressure of 10 ksf. For ease of design and construction, a single value of 6 ksf could be used for all footing regardless of bearing condition. These maximum bearing pressures apply to footings having a minimum width of 3 ft. Bearing pressures for footings less than 3 ft should be reduced proportionally to the footing width. We recommend a minimum footing width of 18 in.

For initial planning purposes, settlements of footings sized for these bearing pressures would be on the order of up to 1-in. total and ½ in. differential (over a distance of approximately 30 ft).

LOWEST LEVEL SLAB

The lowest level building slabs can be designed as conventional soil support slab-on-grades. We recommend that slabs bear on a minimum of 8 in. of imported Structural Fill or ¾ in. crushed stone separated from underlying/adjacent soils using a geotextile filter fabric (6 oz minimum, needle-punched, non-woven). Existing fill soils (with the exception of the surficial organic fill) may be left in-place below the slabs provided these soils are observed to be stable during re-compaction and some risk of minor slab cracking is tolerable. If not tolerable or where unsuitable soils are present during re-compaction, we recommend the existing fill be over-excavated a minimum of 12 in. below the slab base course level and replaced with compacted structural fill.

SEISMIC DESIGN CONSIDERATIONS

Based on the preliminary test borings, the Seismic Site Class is considered to be a C. The soils at the site are not considered to be susceptible to liquefaction under the Building Code design earthquake.

GROUNDWATER AND PERMANENT FOUNDATION DRAINAGE

Based on observations of water level in test borings, a design maximum groundwater level at about El. 343 or 100-yr flood elevation, whichever is higher should be used for preliminary design. At this time, slab waterproofing or permanent underslab drainage are not required for the indicated design maximum groundwater elevation (this recommendation may be subject to modification if the flood elevation is higher than the design maximum groundwater elevation). Perimeter drainage systems are not needed assuming that the lowest level slabs of the buildings are not finished more than 1 ft below the adjacent finished grades.

A moisture vapor retarded membrane is recommended directly beneath the ground floor slabs in occupied and finished spaces, or those with moisture sensitive spaces or floor coverings. Drainage should be provided behind site retaining walls (with discharge direct to the site storm drain or via a series of weep holes along the base of the wall).

RADON MITIGATION SYSTEM

Given the shallow depth to bedrock in the area, the project may want to consider the installation of a radon mitigation system below occupiable building space. A radon mitigation system typically consists of an 8-in. thick layer of ¾ in. crushed stone below a 15 mil Class A vapor barrier under the lowest building slab. Within the ¾ in. crushed stone layer is a network of perforate PVC pipes that are vented to the exterior of the building, typically within walls or column box-outs to the roof. The design should include routing power to the roof area in the event the system needs to be activated with mechanical fans.

UTILITIES AND OTHER SITE IMPROVEMENTS

We recommend that the following considerations be incorporated into the preliminary design:

- Utilities below soil-supported slabs-on-grade within the building footprint may be earth-supported and installed using conventional methods.
- Site utilities can be supported in the natural Glacial Till or Fill soils provided they are stable under re-compaction. Oversized materials, if present at the subgrade level, should be removed to preclude a "hard spot" along the utility bottom that could damage or break the utility. Similarly, if Bedrock is encountered within utility trenches it should be excavated to at least 6 in. below the bottom of the pipe to allow for uniform pipe bedding conditions.
- Foundations for light pole bases, guard rails, small signs, and similar lightweight ancillary structures can be designed and installed using conventional methods.
- Low-height retaining walls (in the range of 2 to 6 ft in height) may be required along the southern and western site limits to achieve the final site grades. The retaining walls may consist of gravity block walls or mechanically stabilized (grid reinforced) earth walls pending the retained height and required surcharge loads. Positioning of grid reinforced walls relative to property lines and other site constraints should consider lengths of grid reinforcement and excavation requirements for installation of grid reinforcement. For initially planning, it should be assumed that grid reinforcement lengths may be on the order of one times the wall height (for walls with level backslope grades), and that excavation limits would extend to 1.5 times the wall height from the back of the grid reinforcement (where existing grades are flat behind the wall).
- The existing Fill and Glacial Till were noted to be silty in nature (fines contents measured in the 16% to 50% range), which will pose some challenges to infiltration of stormwater on the site, possibly resulting in large systems for modest flows.
- As noted above, the existing site soils are poorly draining and as a result, a thicker than normal pavement section (thicker base course and thicker binder course) may be desirable to limit long term maintenance. For preliminary planning purposes, we recommend the following pavement section: 3.5 in. of pavement (1.5 in. wear course, 2 in. binder) over 12 in. of dense-graded crushed stone.

EARTHWORK AND DEWATERING

Based on anticipated grading for the proposed construction and subsurface conditions encountered in the test borings, conventional earthwork procedures and equipment can be used. Building excavations are anticipated to be above normal groundwater levels such that temporary dewatering to allow for construction in-the-dry is anticipated to largely consist of removal of precipitation that falls on and surface water that runs into excavations, and that this dewatering would be competed using local sumps, trenches, and pumps. Additional dewatering effort may be required for locally deeper excavations or on an intermittent basis during periods of moderate to heavy precipitation or snow melt.

Based on our visual classifications in the field and the results of the geotechnical laboratory testing undertaken on select soil samples (provided in Appendix C), the on-site Fill (not ORGANIC SOIL) and natural Glacial Till contain fines contents in the 16% to 50% range, which makes them very sensitive to moisture and freeze-thaw. As such, re-use of these soils as compacted fill to raise grades inside and outside of the building footprints will only be possible during periods of favorable weather and subject to their moisture content at the time of placement. Specifically, the on-site soils may be difficult or impossible to place and compact as compacted fill in wet weather seasons (i.e., spring, winter, and fall). Stockpiles of excavated soils that are intended to be reused as compacted fill should be protected from precipitation by covering with poly sheeting.

The existing Fill consisting of Organic Soil should be removed within the building footprints and in areas that will be paved in the future. The existing Fill below currently paved areas could remain below building slabs following proper proof compaction of the materials. Due to it's loose in-place density, the locally deeper Fill in the vicinity of HA-4 should be investigated further during final design to determine if it needs to be excavated and replaced or if it can stay in place with proof compaction as indicated above.

A local bedrock outcrop was observed near HA-4 and shallow bedrock was encountered in HA-2, HA-8, and HA-9. As a result, Bedrock will be encountered within the excavation for Building 7 and likely within excavations for Buildings 1, 2, 5, and 6. Additionally, the presence of local bedrock may impact future site utilities or below grade structures in this area. Blasting or hoe-ramming may be required to remove such outcrops.

Due to the fine-grained nature of the Glacial Till, foundation subgrades will be susceptible to disturbance from storm water and traffic. As such, placement of 3 to 6 in. of crushed stone on prepared foundations subgrades (with geotextile filter fabric separation) is recommended to protect the subgrades from disturbance during placement of re-bar and forms.

Based on the results of the explorations, the Glacial Till may contain cobbles and boulders that will require segregation prior to reuse as compacted fill and handling during construction.

ADDITIONAL EXPLORATIONS AND TESTING

Based on the observations during this due diligence phase, we recommend that additional explorations consisting of test pits, borings, and/or rock probes be conducted at the site to further investigate the locally thicker fill in the vicinity of HA-4, within the limits of the leaching fields, and to confirm subsurface conditions elsewhere on-site. The types, numbers, and locations will depend on the final development layout and proposed grading.

Closure

We appreciate the opportunity to provide these preliminary geotechnical engineering services on this project. Please do not hesitate to call if you would like to discuss any aspect of this report or the project.

Sincerely yours,
HALEY & ALDRICH, INC.

Michael J. Weaver, P.E. (MA)
Senior Associate

John T. Difini, P.E. (MA)
Principal

Enclosures:

- Figure 1 – Project Locus
- Figure 2 – Site and Subsurface Exploration Location Plan
- Appendix A – Concept Plans dated 9 March 2021
- Appendix B – Subsurface Exploration Logs
- Appendix C – Laboratory Testing Results

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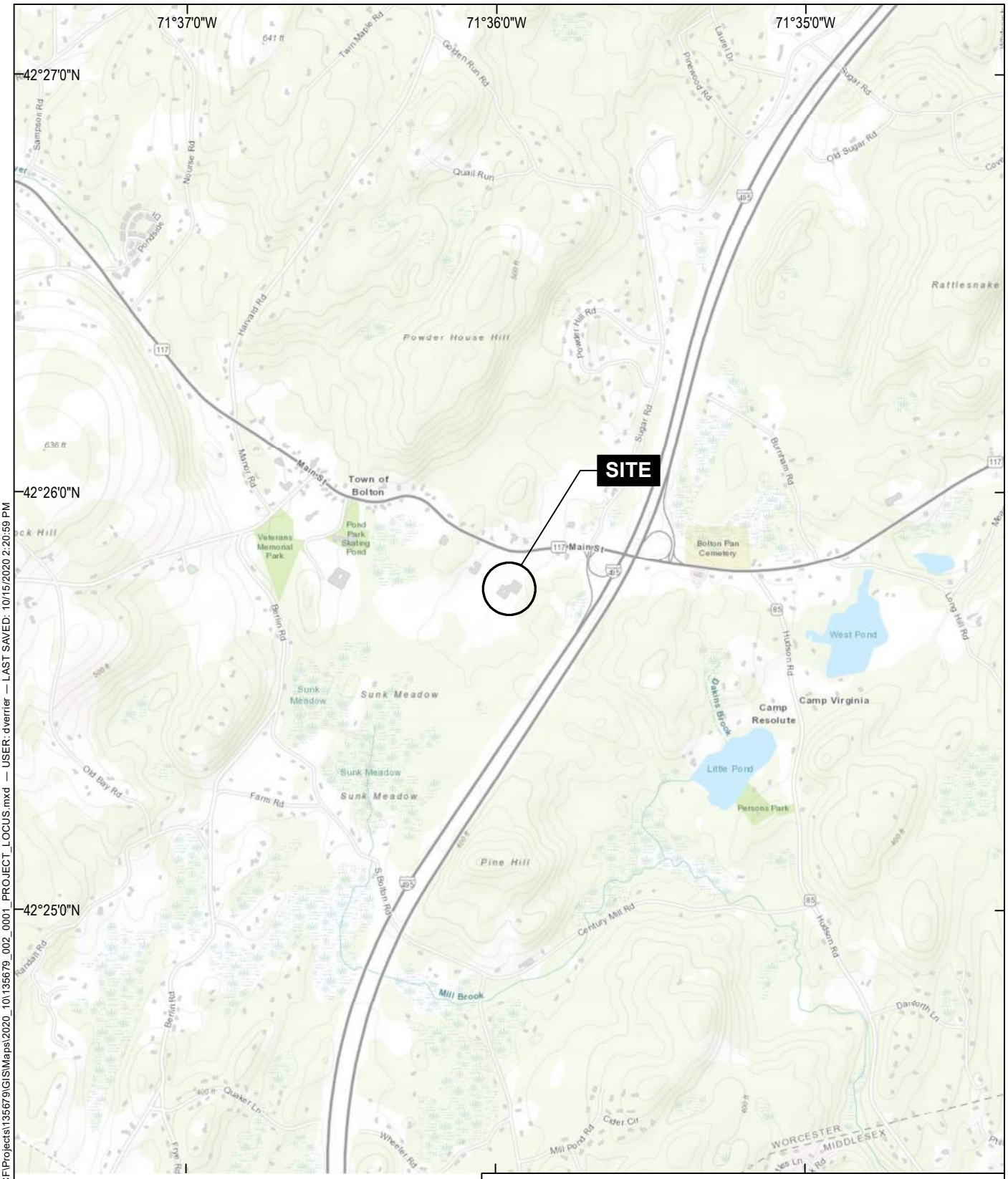
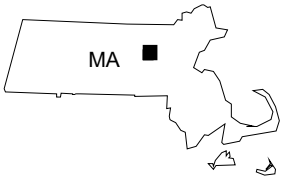
FIGURES





MAP SOURCE: ESRI
SITE COORDINATES: 42°25'46"N, 71°35'57"W

HALEY ALDRICH

580 MAIN STREET REDEVELOPMENT
580 MAIN STREET
BOLTON, MASSACHUSETTS

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
APRIL 2021

FIGURE 1

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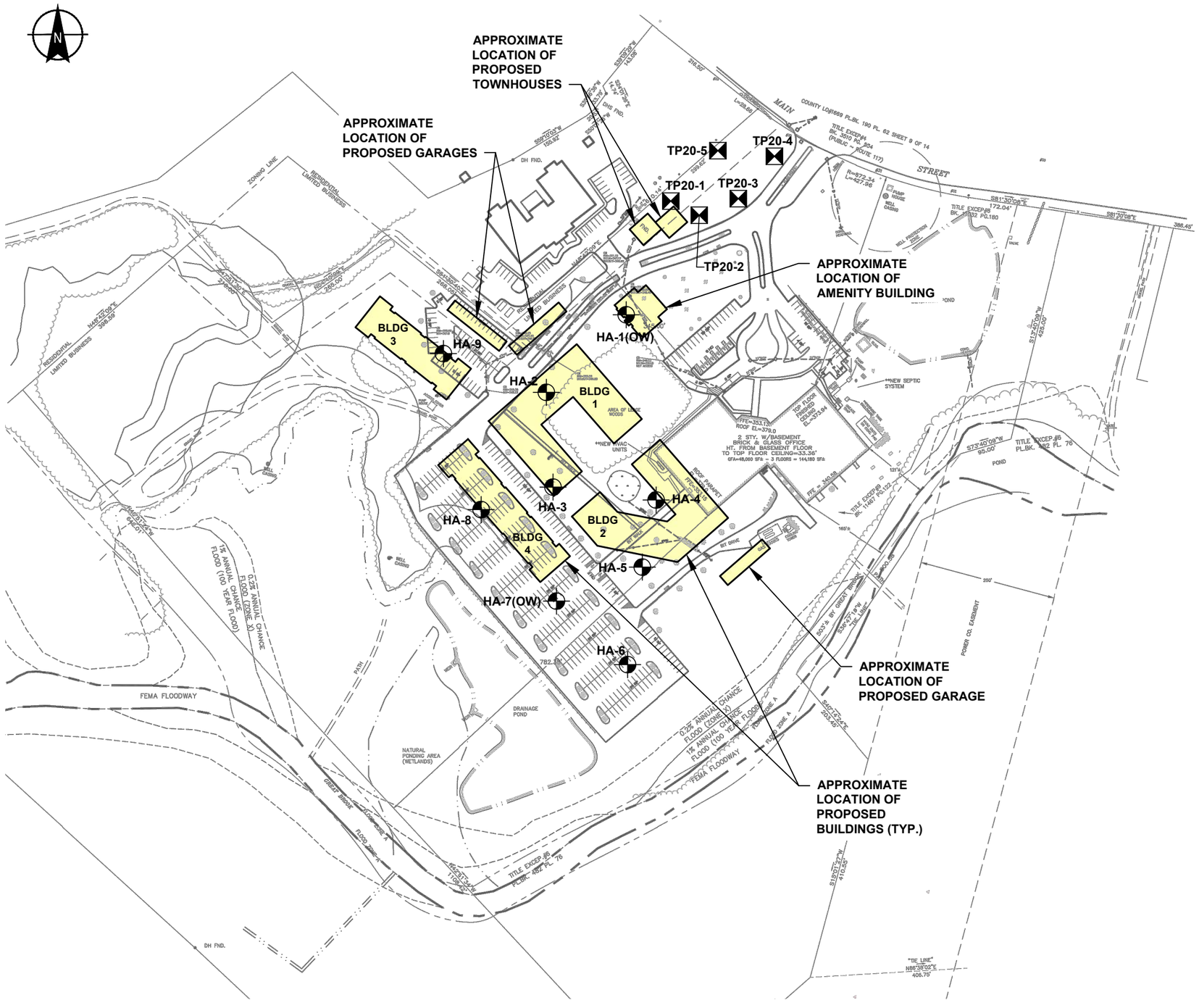

LEGEND

TP20-1	DESIGNATION AND APPROXIMATE LOCATION OF TEST PIT ADVANCED BY EARTHWORKS INDUSTRIES ON 11 DECEMBER 2020 UNDER OBSERVATION BY HALEY & ALDRICH REPRESENTATIVES
HA-2	DESIGNATION AND APPROXIMATE LOCATION OF TEST BORINGS ADVANCED BY NORTHERN DRILL SERVICE BETWEEN 5 AND 7 OCTOBER 2020 UNDER OBSERVATION BY HALEY & ALDRICH REPRESENTATIVES
(OW)	INDICATES OBSERVATION WELL INSTALLED IN COMPLETED BOREHOLE

NOTES

1. EXPLORATION LOCATIONS ARE CONSIDERED APPROXIMATE AND WERE DETERMINED BY TAPING TO EXISTING SITE FEATURES.
2. BASE PLAN TAKEN FROM PLAN ENTITLED "OVERALL PLAN - EXISTING CONDITION", DATED 7 MARCH 2014, PREPARED BY CONDYNE ENGINEERING.
3. LOCATION OF PROPOSED BUILDINGS OBTAINED FROM PLAN ENTITLED "CONCEPT PLAN", DATED 9 MARCH 2021, PREPARED BY WOOD PARTNERS.

0 200 400
SCALE IN FEET

HALEY ALDRICH

580 MAIN STREET REDEVELOPMENT
580 MAIN STREET
BOLTON, MASSACHUSETTS

SITE AND SUBSURFACE EXPLORATION LOCATION PLAN

SCALE: AS SHOWN
APRIL 2021

FIGURE 2

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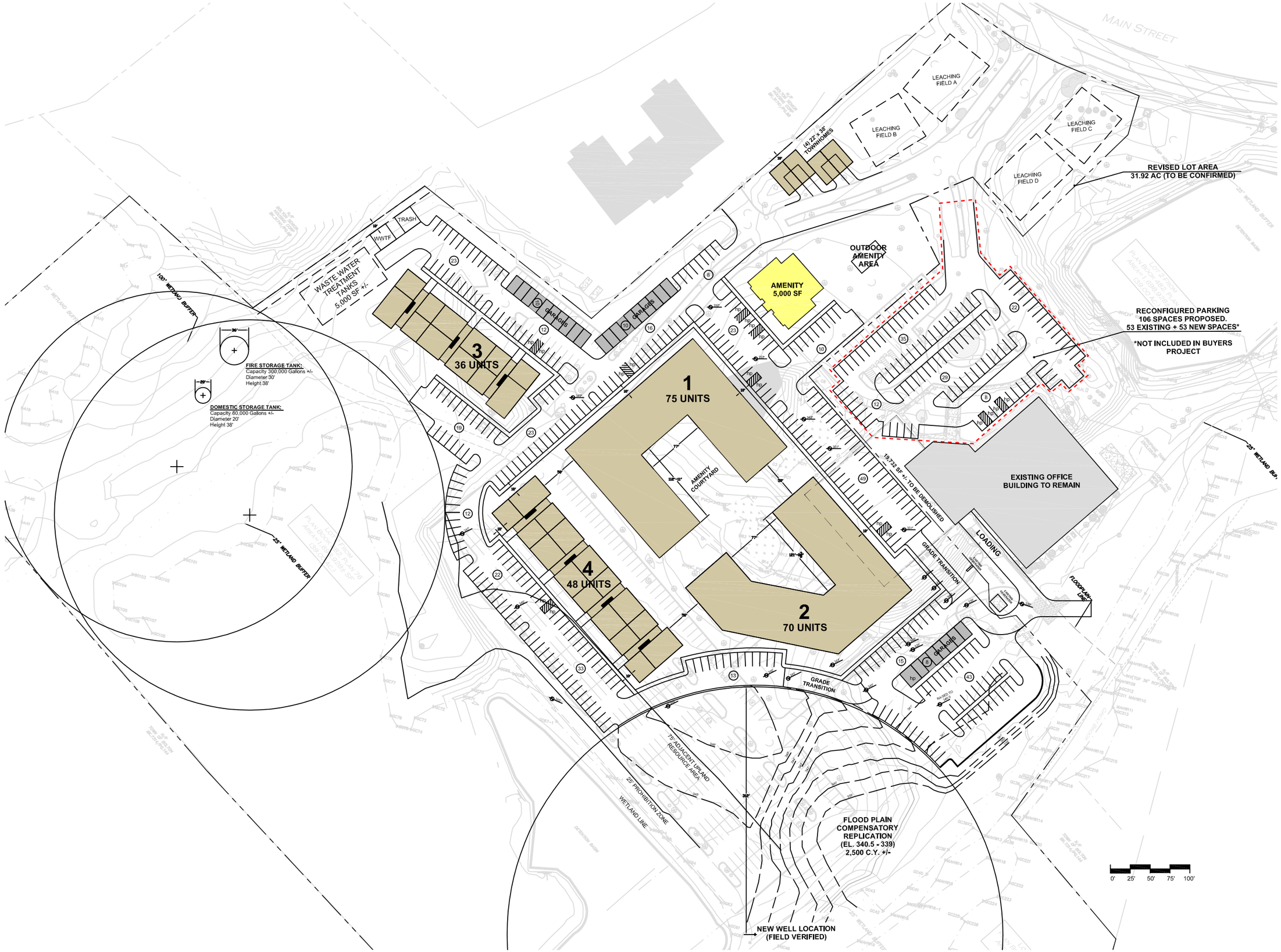
APPENDIX A

Concept Plans dated 9 March 2021

BOLTON
580 MAIN ST.



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CONCEPT PLAN

3.9.21

WOOD PARTNERS

BOLTON
580 MAIN ST.

48 UNIT: BUILDING #4		3 story walk up				# of buildings	1			
UNIT TYPE	NRSF	FLOOR 1	FLOOR 2	FLOOR 3	TOTAL UNITS	NRSF	%		FLOOR	GSF
1 Bed/1 BA	750	6			6	4,500	13%		3	17,540
1 Bed/1 BA	810	2	2	2	6	4,860	13%		2	17,540
1 Bed/1 BA + den	850		6	6	12	10,200	25%	50%	1	17,540
2 Bed/2 BA	1,080	6	4	4	14	15,120	29%			
2 Bed/2 BA + den	1,180		2	2	4	4,720	8%	38%		52,620
3 Bed/2 BA	1,350	2	2	2	6	8,100	13%	13%	Efficiency	90.3%
		16	16	16	48	47,500	100%	100%		

36 UNIT: BUILDING #3		3 story walk up				# of buildings	1			
UNIT TYPE	NRSF	FLOOR 1	FLOOR 2	FLOOR 3	TOTAL UNITS	NRSF	%		FLOOR	GSF
1 Bed/1 BA	750	4			4	3,000	11%		3	13,320
1 Bed/1 BA	810	2	2	2	6	4,860	17%		2	13,320
1 Bed/1 BA + den	850		4	4	8	6,800	22%	50%	1	13,320
2 Bed/2 BA	1,080	4	2	2	8	8,640	22%			
2 Bed/2 BA + den	1,180		2	2	4	4,720	11%	33%		39,960
3 Bed/2 BA	1,350	2	2	2	6	8,100	17%	17%	Efficiency	90.4%
		12	12	12	36	36,120	100%	100%		

75 UNIT: BUILDING #1		3 story walk up				# of buildings	1			
UNIT TYPE	NRSF	FLOOR 1	FLOOR 2	FLOOR 3	TOTAL UNITS	NRSF	%		FLOOR	GSF
1 Bed/1 BA	750	3	6	6	15	11,250	20%		3	29,842
1 Bed/1 BA	810	1	1	1	3	2,430	4%		2	29,842
1 Bed/1 BA + den	850	4	4	4	12	10,200	16%	40%	1	29,842
2 Bed/2 BA	1,080	13	13	13	39	42,120	52%			
2 Bed/2 BA + den	1,180					-	0%	52%		89,526
3 Bed/2 BA	1,350	2	2	2	6	8,100	8%	8%	Efficiency	82.8%
		23	26	26	75	74,100	100%	100%		

75 UNITS: BUILDING #2		3 story walk up				# of buildings	1			
UNIT TYPE	NRSF	FLOOR 1	FLOOR 2	FLOOR 3	TOTAL UNITS	NRSF	%		FLOOR	GSF
1 Bed/1 BA	750	4	6	6	16	12,000	23%		3	27,625
1 Bed/1 BA	810					-	0%		2	27,625
1 Bed/1 BA + den	850	4	4	4	12	10,200	17%	40%	1	27,625
2 Bed/2 BA	1,080	12	12	12	36	38,880	51%			
2 Bed/2 BA + den	1,180					-	0%	51%		82,875
3 Bed/2 BA	1,350	2	2	2	6	8,100	9%	9%	Efficiency	83.5%
		22	24	24	70	69,180	100%	100%		

TOWNHOMES		3 story walk up				# of buildings	4			
UNIT TYPE	NRSF					NRSF	%		FLOOR	GSF
3 Bed /2.5 BA	2,505	4				10,020	100%		3	835
									2	835
									1	835
									NRSF per townhome	2,505
		4				10,020	100%		GSF total	10,020

PROJECT TOTALS										
								# of beds		
1 Bed/1 BA	750				41	30,750	18%	41	Amenity Space	5,000
1 Bed/1 BA	810				15	12,150	6%	15		
1 Bed/1 BA + den	850				44	37,400	19%	44	**PARKING TOTALS**	
2 Bed/2 BA	1,080				97	104,760	42%	194	At Grade Spaces	325
2 Bed/2 BA + den	1,180				8	9,440	3%	16	Garage Spaces	32
3 Bed/2 BA	1,350				24	32,400	10%	72	Total	357
3 bed townhomes	2,505				4	10,020	2%	12	Ratio per unit	1.53
					233	236,920	100%	394	Ratio per bedroom	0.91
				Total GSF		275,001				
				Efficiency		86.2%				

CONCEPT PLAN

3.9.21

WOOD PARTNERS