

DEPARTMENT OF  
HOUSING &  
COMMUNITY  
DEVELOPMENT

HOUSING APPEALS COMMITTEE

Shelagh A. Ellman-Pearl, Chair  
John M. Donnelly, Jr., Hearing Officer  
Lorraine Nessar, Clerk



Charles D. Baker, Governor  
Karyn E. Polito, Lt. Governor  
Chrystal Kornegay, Undersecretary

May 18, 2016

RECEIVED  
MAY 20 2016  
BOARD OF APPEALS

Robert Saltzman, Chair  
Zoning Board of Appeals  
35 Central Street  
Stoneham, MA 02180

RE: Weiss Farm Apartments, LLC v. Stoneham Board of Appeals; H.A.C No. 2014-10

Dear Mr. Saltzman:

Pursuant to 760 CMR 56.06(4)(b), I am enclosing a copy of the Initial Pleading filed in the above case, appealing the decision of your Board.

Since Jonathan D. Witten, Esq., has represented the Board thus far in this matter, I have taken the liberty of sending him a copy of this letter and the enclosed Initial Pleading, in case he should represent you in this case, as well. Pursuant to Sections 56.06(6)(b) and (c) of the Regulations, Attorney Witten should also provide us with a Notice of Appearance.

Also enclosed is a scheduling notice for the Conference of Counsel in this case.

Sincerely,

A handwritten signature in cursive script that reads "Lorraine Nessar".

Lorraine Nessar  
Clerk

Enclosures

cc: Jonathan D. Witten, Esq.  
Brian M. Hurley, Esq.

100 Cambridge Street, Suite 300  
Boston, Massachusetts 02114  
Phone: 617-573-1520; Fax: 617-573-1515  
[www.mass.gov/dhcd/hac](http://www.mass.gov/dhcd/hac)



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Charles D. Baker, Governor  
Karyn E. Polito, Lt. Governor  
Chrystal Kornegay, Undersecretary

Docket No.: 2014-10

Date: May 18, 2016

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**NOTICE OF**

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- X Receipt of Appeal under G.L. c. 40B, §§ 20-23
- X Conference of Counsel
  - Pre-Hearing Conference
  - Site Visit
  - Hearing Session
  - Motion Session
  - Mediation Session

Weiss Farm Apartments, LLC

v.

Stoneham Zoning Board of Appeals

The above matter has been scheduled as follows:

Wednesday, June 1, 2016  
2:00 PM

100 Cambridge Street, 3rd Floor, Conference Room F, Boston, Massachusetts  
Please Report to 3rd Floor Receptionist

Presiding Officer: Shelagh A. Ellman-Pearl

*For procedures governing hearings before the Housing Appeals Committee, please refer to 760 CMR 56.06. Note that pursuant to 760 CMR 56.06(6), all documents filed with the Committee must be served simultaneously on all parties, interveners, and interested persons. Additional information, including Housing Appeals Committee Practice Guidelines, may be found on the Committee's website by following the link to "Housing Appeals Committee" found at "<http://www.mass.gov/hed/hac>".*



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May 18, 2016

***NOTICE OF MEDIATION SCREENING***

Weiss Farm Apartments, LLC

v.

Stoneham Board of Appeals

The parties are required to participate in a Mediation Screening with the Massachusetts Office of Public Collaboration (MOPC) on the day of your Conference of Counsel. You will meet with the MOPC Mediation Screener immediately following your scheduled Conference of Counsel.

Before the Conference of Counsel/Mediation Screening, **all counsel must:**

- **Discuss mediation with their clients**
- **Notify them that the first eight (8) hours of mediation are available at no cost to the parties.**

Most cases have some potential for negotiated settlement, particularly with the assistance of a neutral mediator. Mediation Screening is an opportunity for counsel, and principals, if they choose to attend, to meet with each other and to discuss with the MOPC Screener the needs of their case, the benefits of participating in mediation, and the Housing Appeals Mediation Program.

The Mediation Screening is a separate event. It does not affect any scheduled Housing Appeals Committee events or constitute grounds for the rescheduling of such events. There is no charge for the screening. For additional information about the Mediation Program, see the enclosed information sheet.

If you have any questions about mediation or if you and opposing counsel are ready to schedule a mediation session at this time, please contact MOPC at (617) 287-4040.





MASSACHUSETTS OFFICE OF PUBLIC COLLABORATION  
JOHN W. MCCORMACK GRADUATE SCHOOL OF POLICY AND GLOBAL STUDIES  
UNIVERSITY OF MASSACHUSETTS BOSTON

100 Morrissey Blvd  
Boston, MA 02125  
P: 617.287.4040  
F: 617.287.4049  
www.mopc.umb.edu

## Mediation Information

Mediation is a voluntary, confidential and flexible agreement-building process in which a trained neutral assists negotiations between disputing parties. The mediator is not a decision-maker. Other forums for resolution are not precluded by opting to mediate. Mediation is a vehicle for efficient and productive communication among multiple parties. It provides a forum for the exchange of the best available technical information, thereby saving time and money by reducing the need for dueling experts and legal testimony. Because parties together devise creative solutions, mediation is often successful in producing mutually-acceptable, high quality settlements and durable agreements that offer greater satisfaction than litigation. Parties involved in land use disputes should consider mediation when these factors are present: the issues in dispute are clearly defined and are of significant public concern; key parties are willing to explore settlement; and the outcome of the dispute is uncertain.

The Housing Appeals Committee, with additional financial sponsorship from the Massachusetts Housing Partnership, offers a mediation program under the authority of Standing Order 07-01. The program is administered by the Massachusetts Office of Public Collaboration (MOPC)<sup>1</sup> and provides a neutral forum for developers, municipal officials, and interested citizens to exchange information and create new options for the settlement of affordable housing disputes arising under MGL Chapter 40B, §20-23, the state's Comprehensive Permit Law.

**Mediation Screening** – Following the initial meeting with the presiding officer at opening Conferences of Counsel, a MOPC program coordinator, also trained as a mediator, will meet briefly with the parties to explain the program and answer questions. The coordinator may meet with each party in a private session to assess the ripeness of the dispute for mediation and the parties' interest in working toward a negotiated resolution. If the case is not being ordered to mediation by the presiding hearing officer, the parties may at this stage elect to mediate the appeal or they may choose to continue the hearing process, while reserving their right to elect mediation at a later time.

**Voluntary Mediation** – When the parties elect to participate in mediation, including interveners and interested persons if the parties agree, the MOPC program coordinator works with parties to select a mediator and schedule a mutually convenient session.

**Mandatory Session** – The presiding hearing officer may order the parties to a mediation session if in the officer's opinion the matter is appropriate for mediation and the parties would benefit from the opportunity to assess the case with a skilled neutral. This session may be ordered at any point in the hearing process. The mandatory mediation session is typically held at HAC offices and scheduled for four hours.

**Subsidized Mediation** – In a case with three or less parties, a total of \$2,400 is available for mediation. These hours may be used for the mediator's preparation, mediation, site visits and travel. The mediator will work out with the parties how the hours should be allocated. As general guide, the mediator will consider allocating 2 hours for prep (includes reading documents and conferring with parties on logistics), and 1-2 hours for site visits. Travel beyond 25 miles from the mediator's office is billed at \$75 per hour (capped at \$300).

**Mediators** – All mediators are drawn from MOPC's panel of qualified private sector dispute resolution professionals. They have specialized training and/or expertise in affordable housing issues and have backgrounds

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<sup>1</sup> MOPC is an institute of the University of Massachusetts Boston providing mediation, training, meeting facilitation, system design and other alternative dispute resolution services.



in the areas most critical to these disputes, including: environmental law, land use and construction, municipal law and public policy. They have extensive professional experience working with municipalities and developers in complex multiparty disputes.

## **Preparing for Mediation**

**Who should plan to attend?** All parties to the dispute and any other persons needed to agree to a settlement should attend the mediation session. It is important that all decision-makers are present to work with the mediator, or available by phone.

**Who may attend?** Parties may be accompanied by their counsel and financial and engineering experts who can assist them in weighing settlement options. All participants in each mediation session must be identified to the program coordinator in advance to permit checks of conflicts-of-interest with the mediator.

**What materials will be needed?** All participants must sign an "Agreement to Participate in Mediation" in order to invoke confidentiality protections. MOPC's standard agreement outlines the responsibilities of the parties and the parameters of the mediation process. Additionally, the mediator may ask the parties to submit a brief written outline describing the facts, issues, and negotiation history of the case in advance of the session. The outline is confidential and provides the mediator with each party's perspective on the dispute.

**Is the mediation session confidential?** Yes, the confidentiality of the session is protected by M.G.L. Chapter 233, Section 23C.

**What happens in a mediation session?** At the outset in a meeting with all parties present, the mediator explains the mediation process, answers questions, and asks each party to describe the dispute. After this joint meeting, the mediator may meet individually with each party at which time the mediator listens to the parties' concerns, asks questions to learn more about the dispute, and helps the parties to identify areas for possible agreement. Once the mediator has this information, the mediator assists the parties to negotiate an agreement by:

- Clarifying misunderstandings and ambiguities;
- Facilitating the evaluation of the strengths and weaknesses of each party's case;
- Exploring options for mutual gains and realistic trade-offs;
- Enabling parties to shape their own settlement terms leading to a mutually-acceptable resolution

**How long does a mediation session last?** The typical 2- to 3-party mediation session can be set up for a half-day or a full day. For a mandatory session, parties must make themselves available for a four-hour mandated session and this may include a site visit within the allotted hours. MOPC encourages mediation participants to reserve the entire day or an additional couple of hours so that productive sessions may continue.

**Where is the mediation session held?** Mediations may be held at HAC's offices, the mediator's office, counsel's offices, in the local town hall or other local facility, such as a library or community center. The mandatory sessions ordered by the presiding hearing officer will typically be held at HAC offices unless a site visit is useful.

**Who pays the cost after the subsidized hours are used?** In participating, each party agrees to pay an equal share of the mediator's fee: for cases with up to three (3) parties the fee is \$200 per hour, and for four (4) or more parties, the mediator's fee is \$300 per hour. If mediation takes place outside of a 25-mile radius of the mediator's home or office, the parties will share the costs of mediator's travel if so requested by the mediator.

**What are the possible outcomes of mediation?** The parties may agree on the terms of a settlement of some, all or none of the issues in the appeal. A resolution of all issues would lead to an agreement for dismissal or judgment.

**For Additional Information:** Massachusetts Office of Public Collaboration: University of Massachusetts Boston, M-1-627, 100 Morrissey Blvd., Boston, MA 02125; Tel: 617-287-4040, Fax: 617-287-4049



# RACKEMANN SAWYER & BREWSTER

PROFESSIONAL CORPORATION  
COUNSELLORS AT LAW

Established 1886

Jesse W. Abair  
(617) 951-1103  
jabair@rackemann.com

May 16, 2016

## BY HAND-ROUNDRIP

Ms. Lorraine Nessar, Clerk  
Housing Appeals Committee  
Department of Housing and Community  
Development  
100 Cambridge Street  
3rd Floor  
Boston, MA 02114

RECEIVED

MAY 16 2016

Per Sarp

Re: Weiss Farm Apartments, LLC v. Town of Stoneham Board of Appeals

Dear Ms. Nessar:

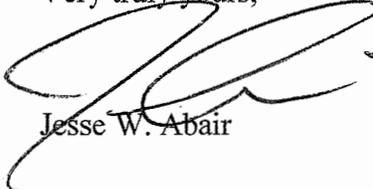
2014-10

Please find enclosed for filing and docketing the following:

1. Initial Pleading of Weiss Farm Apartments, LLC;
2. Initial Pleading Cover Sheet; and
3. Check in the sum of \$13,020.00, representing the filing fee.

Kindly date stamp the enclosed copy of this letter and return to the person delivering this package. Thank you for your cooperation.

Very truly yours,



Jesse W. Abair

JWA:slf  
Enclosures



COMMONWEALTH OF MASSACHUSETTS  
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT  
HOUSING APPEALS COMMITTEE

HAC NO. 2016

RECEIVED

MAY 18 2016

Per Sep

\_\_\_\_\_  
WEISS FARM APARTMENTS, LLC, )

Appellant )

v. )

TOWN OF STONEHAM BOARD  
OF APPEALS )

Respondent )  
\_\_\_\_\_

**APPELLANT'S INITIAL PLEADING**

Pursuant to G.L.c. 40B §§ 20 – 23 and 760 CMR 56.06, the Appellant, Weiss Farm Apartments, LLC (“Weiss Farm”), hereby appeals the comprehensive permit decision (the “Decision”) of the Town of Stoneham Zoning Board of Appeals (the “Board”) filed with the Stoneham Town Clerk on April 28, 2016. The Decision granted a comprehensive permit to Weiss Farm, subject to 172 conditions.<sup>1</sup> A copy of the Decision is attached as **Exhibit A**.

<sup>1</sup>The format of the Decision makes it difficult to identify and determine the exact number of conditions. Under the heading “VI Grant of Permit and Conditions Thereto,” there are 37 conditions numbered 1 through 37. Under the heading “Conditions Precedent to Commencement of Project,” there are 87 conditions numbered 1 through 87. Under the heading “Conditions Precedent to Marking Application for Building Permits,” there are 48 conditions numbered 1 through 48. In order to add some clarity, the conditions numbered 1 through 37 under the heading “VI. Grant of Permit and Conditions Thereto” are referenced herein as the “Group A Conditions.” The conditions numbered 1 through 87 under the heading “Conditions Precedent to Commencement of Project” are referenced herein as the “Group B Conditions.” Finally, the conditions numbered 1 through 47 under the heading “Conditions Precedent to Marking Application for Building Permits,” are referenced herein as the “Group C Conditions.”



**A. STATEMENT OF PRIOR PROCEEDINGS**

1. On or about June 30, 2014, Weiss Farm submitted an application for a comprehensive permit to the Board (the "Application"). Weiss Farm proposed to construct a 264-unit rental apartment complex (subsequently reduced to 259 units) (the "Project"). The Project includes 65 units for households earning at or below 80 percent of the area median income. 244 apartments will be constructed in three five-story buildings. In addition, 15 rental units will be located in five townhouse buildings with three units each. A copy of the Application is attached as Exhibit B.
2. The Project will provide 428 parking spaces, including 21 spaces in one of the five-story buildings, 7 spaces in a parking garage, 15 spaces within the townhouse buildings and 385 spaces in a surface parking lot. The Project will also include a maintenance building, a clubhouse with an outdoor swimming pool, walkways, driveways, landscaping, and a stormwater management system.
3. The Project is located on a 25.7± acre parcel of land located at 170 Franklin Street in Stoneham (the "Land").
4. The Land is located in the Residence A District under the Town of Stoneham Zoning Map.
5. In a letter dated June 23, 2014, MassHousing issued a Project Eligibility Letter ("PEL") to Weiss Farm, under the New England Fund Program of the Federal Home Loan Bank of Boston.



6. At a Special Town Meeting held on September 3, 2013, a full 9 months prior to the filing of the Application, and one month prior to the submission of the Project Eligibility Application, the Town of Stoneham (the "Town") voted to appropriate the sum of \$250,000.00 to defend or pursue any legal action or a decision of any Town Board or Commission which opposes the construction of residential dwelling units on the Land:
7. The Board commenced a public hearing on the Application on July 24, 2014, and held a continued hearing on September 17, 2014.
8. The regulations applicable to comprehensive permits are set forth in 760 CMR 56.00 (the "DHCD Regulations"). Pursuant to the provisions of 760 CMR 56.03(8)(a), by letter dated July 24, 2014, the Board informed the Department of Housing and Community Development ("DHCD"), with a copy to Weiss Farm, that it believed the Town was consistent with local needs, as that term is set forth in G.L. Chapter 40B, Section 20 and 760 CMR 56.02, as the Town had met the 1.5% General Land Area Minimum threshold set forth in 760 CMR 56.03(3)(b), and that Weiss Farm had triggered the Related Application provisions of 760 CMR 56.03(7).
9. By letter to DHCD dated August 7, 2014, Weiss Farm challenged the Board's assertion that the Town had met the 1.5% General Land Area Minimum and that Weiss Farm had triggered the Related Application provisions of the DHCD Regulations.



10. By letter dated September 2, 2014, DHCD ruled that the Board failed to establish that it met the 1.5% General Land Area Minimum threshold or the Related Application provisions of the DHCD Regulations (the “DHCD Decision”).
11. On September 18, 2014, the Board filed an interlocutory appeal of the DHCD Decision with the Housing Appeals Committee (“HAC”). Pursuant to 760 CMR 56.03(8)(c), the Board’s hearing on the Application was stayed pending conclusion of the interlocutory appeal.
12. In a decision dated June 26, 2015, the HAC denied the Board’s claims that the Town is entitled to a safe harbor under either the General Land Area Minimum threshold or the Related Application provisions. In the Matter of Stoneham Board of Appeals and Weiss Farm Apartments, LLC, 10 MHACR 22 (2015), (the “HAC Decision”).
13. On July 21, 2015, the Board filed a complaint in Middlesex Superior Court (Town of Stoneham and Stoneham Board of Appeals v. Housing Appeals Committee, et al., Civil Action No. 1581CV05104) appealing the HAC Decision and challenging the validity of portions of DHCD’s Regulations.
14. Subsequently, the Board commenced a public hearing on the Application on July 12, 2015, and held continued sessions of the public hearing on the following dates: August 26, 2015, September 10, 2015, October 1, 2015, October 20, 2015, October 28, 2015, November 12, 2015, December 1, 2015, December 16, 2015, March 15, 2016, March 22, 2016, March 23, 2016, April 6, 2016, April 7, 2015 and April 13, 2016.



15. Pursuant to G.L. Chapter 44, Section 53B, Weiss Farm paid for certain professional services retained by the Board and the Stoneham Conservation Commission. The amount of such payments to date by Weiss Farm totals \$83,000.00. According to the Board, the amount of fees owed for professional services related to the Application and unpaid by Weiss Farm is \$12,795.29.
16. The Board retained various experts under G.L. c. 44, Section 53G, including Vanasse & Associates (traffic), Professional Services Corporation, PC (land use and engineering), and CBIZ Tofias (financial).
17. Weiss Farm presented expert testimony from the following: Greenman-Pedersen, Inc. (traffic), The Cecil Group (planning, design and landscaping), Russell, Scott, Steedle & Capone (architecture), AECOM (wetlands), H.W. Moore & Associates (engineering), and SEB (financial).
18. The public hearing closed on April 13, 2016.
19. On or about April 27, 2016, the Board voted to grant a comprehensive permit to Weiss Farm, imposing 172 conditions and denying or modifying 23 of 26 requested waivers (the "Decision"). Among other conditions, the Decision limits the number of dwelling units to 124.
20. The Decision was filed with the Stoneham Town Clerk on April 28, 2016.
21. At the time of the Decision, the most recent Subsidized Housing Inventory ("SHI") prepared by DHCD indicated that 5.3% of Stoneham's housing stock was affordable to low or moderate income households.



**B. APPELLANT'S OBJECTIONS TO THE DECISION AND THE REASONS UPON WHICH THE APPEAL IS BASED.**

1. Weiss Farm objects to Section IV.A. of the Decision for the reasons set forth in the HAC Decision. As noted above, the HAC has already denied the Board's claims that the Town is entitled to a safe harbor under either the General Land Area Minimum threshold or the Related Application provisions of the DHCD Regulations. In the Matter of Stoneham Board of Appeals and Weiss Farm Apartments, LLC, 10 MHACR 22 (2015).
2. Weiss Farm objects to Section IV.B. of the Decision. Compliance with the Stoneham Town Center Strategic Action Plan is not a prerequisite to issuance of a comprehensive permit for the Project. Moreover, the Strategic Action Plan is dated December 2014, six months after the Application was filed with the Board.
3. Weiss Farm objects to Section IV.C. of the Decision. Compliance with MassHousing's PEL Requirements will be confirmed by MassHousing in connection with Final Approval under 760 CMR 56.04(7). The Decision unlawfully seeks to interfere with the regulatory responsibilities of the Subsidizing Agency. Amesbury Zoning Board of Appeals v. Housing Appeals Committee, 457 Mass. 748 (2010).
4. Weiss Farm objects to Section IV.D. of the Decision. The Decision contains 172 conditions, many of which adversely affect the economics of the Project. As these conditions were not presented to Weiss Farm prior to issuance of the Decision on April 28, 2016, it was impossible for Weiss Farm's financial consultant to address the financial impact of the conditions imposed by the Board.



Contrary to the Board's conclusion, the three HAC decisions cited by the Board in Section IV.D. of the Decision support Weiss Farm's position that it may submit additional data to the HAC relative to the economics of the Project and the impact of the conditions imposed by the Board in the Decision.

5. Weiss Farm objects to the Board's modification and denial of 23 of 26 waivers that Weiss Farm requested as set forth in Attachment B of the Decision. The Decision's denial or modification of waiver request numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24 and 26 does not permit the construction and development of the Project in accordance with the Application. The failure to grant the requested waivers is not consistent with local needs and makes it impossible to proceed and still realize a reasonable rate of return, thereby causing the Project to be uneconomic.
6. Weiss Farm objects to the following conditions set forth in the Decision on the ground that they exceed the Board's authority under G.L. c. 40B, Section 21: Group A Conditions Numbered 1, 2, 4, 5, 9, 11, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36 and 37; Group B Conditions Numbered 4, 5 and 13; and Group C Conditions Numbered 7 and 42. See Zoning Board of Appeals of Amesbury v. Housing Appeals Committee, 457 Mass. 748 (2010).
7. Weiss Farm objects to the following conditions set forth in the Decision on the ground that they render the Project uneconomic and/or significantly more uneconomic: Group A Conditions Numbered 10, 22, 23, 24 and 25; Group B Conditions Numbered 10, 20, 22, 29, 30, 31, 34, 36, 37, 38, 39, 40, 41, 42, 43, 45,



46, 47, 50, 51, 52, 53, 54, 55, 56, 57, 59, 60, 61, 62, 63, 64, 65, 71, 72, 73, 74, 75, 76, 79, 80, 83 and 85; and Group C Conditions Numbered: 12, 13, 24, 25, 26, 27, 30, 33, 37, 43, 45, 46 and 47. The foregoing conditions render the Project uneconomic for many reasons, including the fact that they require Weiss Farm to pay for the cost of public infrastructure and improvements off-site that are generally not imposed by the Board on unsubsidized housing, that address pre-existing conditions and that are disproportionate to the impacts attributable to the Project. See 760 CMR 56.05(8)(d)(1).

8. Weiss Farm objects to the following conditions set forth in the Decision on the ground that they demonstrate the disparate treatment of subsidized versus unsubsidized housing: Group B Conditions Numbered 1, 2, 11, 12, 13, 20, 21, 22, 72, 79, 80, 82 and 85; and Group C Conditions Numbered 3, 9, 12, 13, 15, 18, 23, 27, 35, 37 and 43. The foregoing conditions result in disparate treatment through the imposition of conditions that have not been applied to unsubsidized housing or are not authorized by any law or regulation. See 760 CMR 56.07(2)(a)(4).

9. Weiss Farm objects to the following conditions set forth in the Decision on the ground that they require Weiss Farm to secure future approvals from the Board and therefore constitute an impermissible condition subsequent. Group A Conditions Numbered 9, 17, 23, 24 and 32; Group B Conditions Numbered 1, 3, 7, 8, 9, 10, 11, 12, 13, 15, 16, 18, 20, 23, 25, 67, 68, 69, 70, 81, 87; and Group C Conditions Numbered 1, 3, 13, 22, 27, 38, 44. See Attitash Views, LLC v. Amesbury Zoning Board of Appeals, 2 MHACR 01 (2007).



**C. PRAYER FOR RELIEF**

1. Weiss Farm prays that the Housing Appeals Committee:
- (a) Declare that the Decision is not consistent with local needs;
  - (b) Declare that the conditions to which Weiss Farm objects and the modification and denials of the waivers requested render the Project uneconomic; and
  - (c) Issue a comprehensive permit without the conditions to which Weiss Farm objects and grant all requested waivers without modification.

**D. NAME AND ADDRESS OF APPELLANT**

Weiss Farm Apartments, LLC  
c/o Peter Mahoney  
100 Grandview Road, Suite 207  
Braintree, MA 02184

**E. NAME AND ADDRESS OF APPELLANT'S ATTORNEYS**

Brian M. Hurley, Esquire  
Jesse W. Abair, Esquire  
Rackemann, Sawyer & Brewster, P.C.  
160 Federal Street  
Boston, MA 02110  
*bhurley@rackemann.com*  
*jabair@rackemann.com*

**F. COPY OF APPLICATION**

A copy of the application is attached to this Initial Pleading as **Exhibit B**.

**G. COPY OF DECISION**

A copy of the Decision is attached to this Initial Pleading as **Exhibit A**



WEISS FARM APARTMENTS, LLC

By their attorneys,



Brian M. Hurley, Esquire, BBO #245240

Jesse W. Abair, Esquire, BBO #668791

RACKEMANN, SAWYER &

BREWSTER

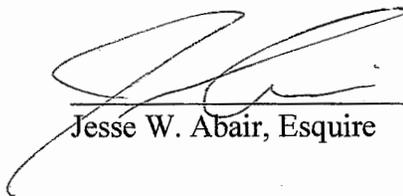
160 Federal Street

Boston, Massachusetts 02110

(617) 542-2300

**CERTIFICATE OF SERVICE**

I hereby certify that on this date I served a true copy of the foregoing document on all other counsel of record by hand delivery.



Jesse W. Abair, Esquire

Dated: May 16, 2016

A1224772.4







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Date: 5/18/2016  
Time: 12:40:51 PM



**LOCAL INITIATIVE PROGRAM**

ELIGIBLE PURCHASER CERTIFICATE

The undersigned, being the \_\_\_\_\_ of the Town of Dracut (the "Municipality") and being the Chief Executive Officer of the Municipality, as that term is defined in regulations promulgated at 760 CMR 56.00 et seq. (the "regulations") which establish the Local Initiative Program (LIP), and the undersigned, being the Undersecretary of the Department of Housing and Community Development, a department duly organized and existing pursuant to Massachusetts General Laws Chapter 23B as amended by Chapter 19 of the Acts of 2007 or being the Undersecretary's duly authorized designee, ("the Undersecretary"), certify as follows with respect to a certain deed rider annexed to and made part of that certain Deed from Kirk MacKenzie to Carrie M. Gendron n/k/a Carrie Garau ("Seller") dated February 28, 2006, recorded with the Middlesex North District Registry of Deeds in Book 19864, Page 65 (the "Existing Deed Rider"):

1. The Property referred to herein is the Property described in the Deed. The Property address is 43 Lindsay Lane, Dracut, Massachusetts 01826.
2. Jessica E. Mieczkowski is(are) the Eligible Purchaser(s) of the Property.
3. The total consideration to be paid to the Seller for the purchase of the Property is \$196,520.00. The Resale Price Multiplier to be used in subsequent transactions is 2.22.
4. The conveyance of the Property by the Seller to the Eligible Purchaser(s) is in compliance with the rights, restrictions, covenants and agreements contained in the Existing Deed Rider.
5. The Eligible Purchaser(s) of the Property have executed a new deed rider with respect to the Property (the "New Deed Rider") which is satisfactory in form and substance to the Department of Housing and Community Development ("DHCD") and the Municipality.
6. The Municipality and the Undersecretary hereby acknowledge and confirm that upon the conveyance of the Property by the Seller to the eligible purchaser(s), the recording of the New Deed Rider executed by the Eligible Purchaser(s) more fully described in Paragraph 5 hereof, and the recording of this Eligible Purchaser Certificate, the rights, restrictions, agreements, and covenants contained in the Existing Deed Rider shall be null and void.
7. All defined terms used herein shall have the definitions set forth in the Existing Deed Rider unless otherwise defined herein.

Executed as a sealed instrument this \_\_\_\_ day of \_\_\_\_\_, 2016.

Town of Dracut,  
acting by its Chief Executive Officer

The Undersecretary of the Department of Housing  
and Community Development

\_\_\_\_\_  
Its \_\_\_\_\_

\_\_\_\_\_  
Catherine Racer, Associate Director  
Duly Authorized Designee



COMMONWEALTH OF MASSACHUSETTS

Suffolk, ss

On this \_\_\_\_\_ day of May, 2016, before me, the undersigned Notary Public, personally appeared Catherine Racer, Associate Director of the Department of Housing and Community Development (DHCD), duly authorized designee of the Undersecretary, and proved to me, through satisfactory evidence of identification which was my personal knowledge, that she is the person whose name is signed on the foregoing Eligible Purchaser Certificate and acknowledged to me that she signed it voluntarily for its stated purpose and that it is the free act and deed of DHCD.

\_\_\_\_\_  
Notary Public  
My Commission Expires:

COMMONWEALTH OF MASSACHUSETTS

\_\_\_\_\_, ss.

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned notary public, personally appeared \_\_\_\_\_, Chief Executive Officer of the Town of Dracut, and proved to me, through satisfactory evidence of identification which was \_\_\_\_\_, that he/she is the person whose name is signed on the foregoing Eligible Purchaser Certificate and acknowledged to me that he/she signed it voluntarily for its stated purpose and that it is the free act and deed of the Town of Dracut.

\_\_\_\_\_  
Notary Public  
Commission Expires:



Town of Stoneham, Massachusetts  
Zoning Board of Appeals

STONEHAM  
TOWN CLERK  
REGISTRARS

Decision on Application for Comprehensive Permit 2016 APR 28 A 7 29

Applicant: Weiss Farm Apartments, LLC

Decision Date: April 27, 2016

**I. BACKGROUND**

On or about June 30, 2014, Weiss Farm Apartments, LLC (the "Applicant"), applied for a comprehensive permit, pursuant to G.L. c. 40B, s.20-23, to construct 264 rental dwelling units on a roughly 25.67 acre parcel (the "locus") in a Residence District "A" zoning district in the Town of Stoneham. Thereafter, the applicant revised the application to consist of 259 dwelling units to include 66 below market rate rental dwelling units. The Decision that follows is based upon the Applicant's 259 dwelling unit submission and the project plans identified as "Conservation Commission [sic] Notice of Intent Submission [sic], The Commons At Weiss Farm, June 25, 2014 with a final revision date of April 4, 2016, consisting of twelve (12) sheets at varying scales. The public hearing in this matter was opened on July 24, 2014 and closed, following agreed upon continuances, on April 13, 2016.

The above noted application was submitted in reliance on a project eligibility letter issued by MassHousing dated June 23, 2014 and is entitled, "The Commons at Weiss Farm" (hereinafter "the Project"). The application contained a "Purchase and Sales Agreement", dated April 10, 2013, an Assignment of the same and three Amendments, the last Amendment, entitled "Third Amendment of Purchase and Sales Agreement is dated January 21, 2015<sup>1</sup>. In reviewing the application for the Project and in reaching the findings and conditions contained in the present Decision, the Stoneham Board of Appeals (the "Board") relies on the representations contained in the Purchase and Sales Agreement and Amendments for evidence of site control and financial information contained therein.

As of the date of this Decision, the Board was informed by the Applicant that the Applicant refused to pay for certain professional services obtained by the Board pursuant to G.L. c.44, s.53G, notwithstanding the Applicant's commitment to pay for such services. The Applicant's refusal to pay for these professional services is based upon a clearly wrong reference to portions of Section 18-21 of the Board's regulations (as found in the Stoneham Town Code) that the Board "may not require Weiss Farm to pay a review fee related to the MEPA filing".

The Board has no hesitation concluding that the unambiguous portions of Section 18-21, that states, "When conducting any hearing including those for...comprehensive permits (pursuant to G.L.c.40B, secs.20-23) or deciding any issue raised by an application, petition or appeal...the

<sup>1</sup> In its initial comments to MassHousing prior to MassHousing's issuance of the Project Eligibility letter for this Project, the Town brought to MassHousing's attention that the claimed land value of \$7,686,200 was in gross violation of MassHousing's Acquisition Value Policy. MassHousing thereafter limited the "maximum permissible acquisition value" for the locus to \$1,800,000. See Project Eligibility letter, page 3.

Board of Appeals may determine that the assistance of outside consultants is warranted due to the size, scale or complexity of the proposal or because of its potential impact". (Emphasis added).

Quite obviously, the MEPA process, and the issues raised by the MEPA process more fully discussed herein—triggered by the size, scale, complexity and potential impact of the Weiss Farm proposal—constitutes an “issue raised by” the Weiss Farm comprehensive permit application. Moreover, every issue addressed by the consultants whose invoices are being challenged, including maintaining a stenographic record, relate to issues squarely before the Board of Appeals as raised by the comprehensive permit application. Section 18-21(c) states in relevant part, "Failure of the applicant to pay a review fee shall be grounds for the denial of the variance, special permit or comprehensive permit at issue".

Rather than deny the comprehensive permit application as is the Board’s authority pursuant to the Board’s Regulations, the Board requires as a condition of this approval the full payment of all fees owed for the payment of the Board’s consultants employed during the review of this project, said payment to be made within twenty (20) days of the recording of this Decision with the Stoneham Town Clerk. The Board reserves all rights in equity and at law to pursue collection of these fees. Moreover, failure to pay these fees within the required time period constitutes a violation of G.L. c.40, s.57 and the Board shall notify the Building Department, Conservation Commission, Tax Collector and other relevant boards and departments, as well as the Housing Appeals Committee, if relevant, of the Applicant’s failure to make payment as discussed above.

## **II. THE RECORD AND EVIDENCE ASSEMBLED BEFORE THE BOARD OF APPEALS**

The materials identified in Appendix A have been assembled and submitted during the public hearings in this matter, and include materials submitted during hearings before the Stoneham Conservation Commission and the Board of Selectmen that are relevant to the Board’s deliberations. In addition, the record before the Board is deemed to include evidence assembled during the Board’s 2014-2015 appeal of the Department of Housing and Community Development’s decision to the Housing Appeals Committee with respect to the Town of Stoneham’s status as consistent with local needs pursuant to both statutory and regulatory standards. All of these materials are incorporated herein.

## **III. SUMMARY OF DECISION**

This Decision approves the construction of one hundred and twenty-four (124) rental dwelling units with conditions as specified herein.

## **IV. STATEMENT OF RELEVANT MATERIAL FACTS**

### **A. The Town of Stoneham is Consistent with Local Needs**

Pursuant to G.L. c.40B, s.20, the Board voted on April 13, 2016 that the Town of Stoneham is "consistent with local needs" as that term is defined with respect to the Town's status with the statute's "1.5%" status. The Board previously asserted this status pursuant to 760 CMR 56.00 et seq.

On appeal at the Housing Appeals Committee, currently pending before the Middlesex Superior Court (see Town of Stoneham and Stoneham Board of Appeals v. Housing Appeals Committee, et al., 1581CV05104, "Complaint") and now again, the Board restates its belief that the regulatory requirements contained in 760 CMR 56.00 requiring the Board's assertion of "consistent with local needs" status must occur within 15 days of the opening of the public hearing is impermissibly inconsistent with G.L. c.40B, s.20. See Transcript and record developed before the Housing Appeals Committee dated December 11, 2014 and January 9, 2015, hereinafter referenced as "Tr. Vol." and "Exhibit", all of which is incorporated herein.

Accordingly, the Board has challenged the validity of portions of 760 CMR 56.03(3) and (8). See Complaint at para. 62-86 and Count II. Specifically, the Board challenges those provisions of 760 CMR 56.03 imposing procedures that a Board must follow *prior* to hearing a comprehensive permit application, should the Board seek to assert achievement of any of the "safe harbors" found in the statute (e.g., 1.5% land area minimum). These proceedings under 760 CMR 56.03 - including a requirement that the Board make such assertion within 15 days of opening public hearing - conflict directly with G.L. 40B, s. 20, which explicitly defers such assertion until *after* the Board has heard the application. See G.L. c. 40, s. 20; see also Town of Wrentham v. Housing Appeals Committee, 69 Mass. App Ct. 449, 454 (2007)("[t]he conclusive presumption afforded to a community that has already met its minimum housing obligation only arises "*after comprehensive hearing*")(emphasis in original).

1. Consistency with Local Needs under G.L. c. 40B, s. 20

G.L. c. 40B, s. 20 provides in relevant part:

"Consistent with local needs", requirements and regulations shall be considered consistent with local needs if they are reasonable in view of the regional need for low and moderate income housing considered with the number of low income persons in the city or town affected and the need to protect the health or safety of the occupants of the proposed housing or of the residents of the city or town, to promote better site and building design in relation to the surroundings, or to preserve open spaces, and if such requirements and regulations are applied as equally as possible to both subsidized and unsubsidized housing. *Requirements or regulations shall be consistent with local needs when imposed by a board of zoning appeals after comprehensive hearing in a city or town where (1) low or moderate income housing exists which is in excess of ten per cent of the housing units reported in the latest federal decennial census of the city or town or on sites comprising one and one half per cent or more of the total land area zoned for residential, commercial or industrial use or (2) the application before the board would result in the commencement of construction of such housing on sites comprising more than three tenths of one per cent of such land area or ten acres, whichever is larger, in any one calendar year; provided, however, that land area owned by the United States, the*

commonwealth or any political subdivision thereof, or any public authority shall be excluded from the total land area referred to above when making such determination of consistency with local needs.

G.L. c. 40B, s. 20, "Definitions" (emphasis supplied). Pursuant to G.L. c.40B, s.20, the Board asserts that the Town is consistent with local needs in that "low or moderate income housing exists . . . on sites comprising one and one half per cent or more of the total land area zoned for residential, commercial or industrial use." G.L. c. 40B, s. 20.

A. The Starting Point - Total Land Area Zoned for Residential, Commercial or Industrial Use

The DHCD regulation providing guidance on the calculation of statutory minima restates the formula contained in G.L. c 40B, s. 20:

"General Land Area Minimum. For the purposes of calculating whether SHI Eligible Housing exists in the city or town on sites comprising more than 1-1/2% of the total land area zoned for residential, commercial, or industrial use, pursuant to M.G.L. c. 40B, § 20:

1. Total land area shall include all districts in which any residential, commercial, or industrial use is permitted, regardless of how such district is designated by name in the city or town's zoning bylaw[.]

760 CMR 56.03(3)(b)(1). Under both G.L. c. 40B, s. 20 and 760 CMR 56.03, therefore, the "numerator" (the 1.5% target) is land area containing SHI-eligible housing; the "denominator" (100%) is "the total land area zoned for residential, commercial or industrial use," subject to certain adjustments under 760 CMR 56.03(3)(b). The starting point for the denominator is *not* the total area of the municipality, nor is it the total land area of the municipality.<sup>2</sup> Rather, the starting point is a *subset* of the municipality's total area, containing exclusively land zoned to allow the enumerated uses. See G.L. c. 40B, s. 20 and 760 CMR 56.03(3)(b)(1).

The Legislature *could have*, but *did not* craft the statute to provide that the denominator (the 100%) is a municipality's total area or total land area; these are more expansive and would thus provide a larger area against which the numerator (the 1.5%) would be measured. A statute is presumed to mean what it says. See Commonwealth v. Williamson, 462 Mass. 676, 679 (2012)

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<sup>2</sup> The Board concludes that any analysis that takes as its starting point the *total area* of the Town of Stoneham is fundamentally flawed. Beginning the analysis with the *total area* of the Town of Stoneham, as oppose to the "*total land area zoned for residential, commercial or industrial use*," inflates the denominator beyond the value dictated by both statute and regulations. The result is a grossly incorrect denominator, to the Town's disadvantage. As discussed *infra*, the methodology employed by the statute (and to a lesser extent, the regulations) was clearly designed to provide municipalities containing sizeable tracts of land prohibiting residential, commercial, or industrial development (for example, state parks) to nevertheless reach the 1.5% threshold. In Stoneham, 1,400 plus acres are owned by the Commonwealth; none of this property is zoned for residential, commercial or industrial development. If the denominator were to include the total area of a municipality, it would be nearly impossible for a municipality with large tracts of land not open to development to achieve the 1.5% threshold.

Commonwealth v. Young, 453 Mass. 707, 713, (2009); Collatos v. Boston Retirement Bd., 396 Mass. 684, 687 (1986) ("We presume, as we must, that the Legislature intended what the words of the statute say"). Section 20 of G.L. c 40B *could have*, but *was not* written to provide that consistency with local needs is established where "low or moderate income housing exists . . . on sites comprising one and one half per cent or more of the total land area" of the city or town. Rather, the Legislature included additional language to provide that the denominator is "the total land area zoned for residential, commercial or industrial use." G.L. c. 20 (emphasis supplied). Each word of the statute must be given effect. Ropes and Gray LLP v. Jalbert, 454 Mass. 407, 412 (2009). See also Wolfe v. Gormally, 440 Mass. 699, 704 (2004) ("A statute should be construed so as to give effect to each word, and no word shall be regarded as surplusage"); Bankers Life & Cas. Co. v. Commissioner of Ins., 427 Mass. 136, 140 (1998).

The Legislature's clear intent in G.L. c. 40B, s. 20 was that the area dedicated to affordable housing (the 1.5%) would be measured not against the city or town's *total* area, but rather against a subset of that area: *developable* land.<sup>3</sup> The denominator in the 1.5% calculation is thus unambiguously defined as the "total land area zoned for residential, commercial or industrial use." G.L. 40B and 760 CMR 56.03(3)(b)(1). "Where the language of a statute is unambiguous, it is conclusive of the Legislature's purpose." Ropes and Gray LLP v. Jalbert, 454 Mass. 407, 412 (2009); Pyle v. School Comm. of S. Hadley, 423 Mass. 283, 285-286 (1996).

The "total land area zoned for residential, commercial or industrial use" in Stoneham is 2,437.34 acres. Tr. Vol. I at p. 41; Exhibit 15, line 7. This figure is derived by subtracting all land *not zoned for residential, commercial or industrial use* from the total land area of the Town. The total land area of the Town is 6.14 square miles or 3,929.60 acres. See Ex. 9; Tr. Vol. I at p. 32-33.<sup>4</sup>

Land *not zoned for residential, commercial, or industrial use* in Stoneham includes: land held by the Department of Conservation and Recreation (1,408.47 acres; see Ex. 3; Ex 15, line 2; and Tr.

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<sup>3</sup> This Legislative choice makes sense when it is considered that the Commonwealth's cities and towns vary greatly in composition with respect to water bodies; federal, state, and local parks, forests, and other natural areas; and areas otherwise not available for development. A law that did not take such factors into consideration would produce inconsistent and inequitable results. Providing that the baseline in all cities and towns is *developable* area - that is, the area within the municipality upon which something might actually be built - was the Legislature's rational and sensible means of placing all cities and towns on equal footing. See Goodridge v. Department of Public Health, 440 Mass. 309, 385-86 (2003)(discussing "rational basis of fact that can be reasonably conceived" to support a legislative finding; noting that "Legislature may be supposed to have known relevant facts").

<sup>4</sup> For this reason, it would be wrong to suggest that the Town has "double counted" excluded areas. Such "double counting" is precluded by 760 CMR 56.03(3)(b)(7). Such argument would be that by beginning the analysis with "total land area," as opposed to "total area", water bodies are being excluded twice. Yet as the analysis above makes clear, the starting point designated by both statute and regulation is neither the Town's "total area" nor its "total land area." Rather, the starting point is the *total land area zoned for residential, commercial or industrial use*. See G.L. c. 40B, s. 20 and 760 CMR 56.03(3)(b)(1). The entire DCR reservation - including the 381 acres of water contained within it - is zoned Recreation Open Space, in which residential, commercial and industrial uses are prohibited. See Exhibits 1 and 2 (Zoning Bylaw and Map); Tr. Vol. I, p. 11; 34-35. Accordingly, the 381 acres of water within the DCR reservation *form no part of the denominator* as established by the statute and regulation: "total land area zoned for residential, commercial or industrial use." See G.L. c. 40B, s. 20 and 760 CMR 56.03(3)(b)(1). There is no "double counting" or "double excluding" of water bodies within the DCR land, where such water and land - not being zoned residential, commercial or industrial - formed no part of the denominator in the first place. As the water bodies were never included in the denominator, they could not be (and were not) subtracted from the denominator in subsequent calculations.

Vol. I at p. 35). The DCR land is zoned Recreation Open Space. Tr. Vol. I at p. 34-35. Residential, commercial, and industrial uses are not permitted in Recreation Open Space. Tr. Vol. I at p. 11.

Land *not zoned for residential, commercial, or industrial* also includes the Bear Hill Golf Course (55.48 acres, zoned Recreation Open Space; see Ex. 12; Ex. 15, line 3 and Tr. Vol. I at p. 36-37); the Railroad Right of Way (8.81 acres, zoned Recreation Open Space; see Ex. 2; Ex. 15, line 4; and Tr. 38-39); and the St. Patrick's Cemetery (19.5 acres, zoned Recreation Open Space; see Ex. 2; Ex. 15, line 5 and Tr. Vol. I at p. 39).

The total land *not zoned for residential, commercial or industrial use*, determined by adding the above four properties, is 1,492.26 acres. See Tr. Vol. I at p. 39-40; Ex. 15, line 6. Subtracting the total *land not zoned for residential, commercial or industrial use* (1,492.26 acres) from the Town's total land area (3,929.60 acres) provides the "total land area zoned for residential, commercial or industrial use": 2,437.34 acres. See Tr. Vol. I at p. 41; Exhibits 2, 3, 9, 12, and Ex. 15, line 7.

B. Adjustments to the denominator pursuant to 760 CMR 56.03(3)

This figure - the statutory and regulatory "denominator" - is subject to several adjustments specified in 760 CMR 56.03(3)(b). First, certain categories are excluded from the denominator. That is, the area of such parcels are *subtracted* from the denominator - which, as discussed above, is the "total land area zoned for residential, commercial, or industrial use," or 2,437.34 acres in this case. 760 CMR 56.03(3)(b)(3) provides for the exclusion of "land owned by the United States, the Commonwealth or any other political division thereof, the Department of Conservation and Recreation or any state public authority."

Land conforming to this exclusion in Stoneham includes public roads (480.16 acres; see Tr. Vol. I at p. 41-42; Ex. 4 and 5; Ex. 15, line 8); land owned by the Town of Stoneham (349.29 acres; see Tr. Vol. I at p. 43-44; Ex. 7; Ex. 15, line 9); and land owned by the Town of Wakefield within Stoneham (26.46 acres; see Tr. Vol. I at p. 43-44; Ex. 7; Ex. 15, line 10).<sup>5</sup>

The total land subject to the exclusion of 760 CMR 56.03(3)(b)(3), computed by adding the above three figures, is 855.91 acres. See Tr. Vol. I at p. 44; Exhibits 4, 5; 7 and Ex. 15, line 11. The subtraction of this excluded area (855.91 acres) from the denominator (the "total land area zoned for residential, commercial, or industrial use," 2,437.34 acres in this case) yields an adjusted denominator of 1,581.43 acres. Tr. Vol. I at p. 44; Ex. 15, line 12.

760 CMR 56.03(3)(b)(3) provides for a further adjustment to the denominator. In particular - and contrary to G.L. c. 40B, s. 20 - this regulation provides for the *inclusion* - that is, the *adding back in* of "any land owned by a housing authority and containing SHI Eligible Housing." In Stoneham, land owned by the Stoneham Housing Authority containing SHI housing comprises 16.55 acres. Tr. Vol. I at p. 44-45; Ex. 6; Ex. 15, line 13. The addition of this area (6.55 acres)

<sup>5</sup> Note that the acreage in Stoneham owned by the Department of Conservation and Recreation is *not* claimed by the Board as excludable under this provision. This is because the DCR-owned acreage was never included in the denominator in the first place, as such land is not zoned for residential, commercial, or industrial use.

back into the adjusted denominator of 1,581.43 acres (see preceding paragraph) yields a figure of 1,597.98 acres.

C. Calculation of the 1.5% "target"

The denominator has been calculated by determining the "total land area zoned for residential, commercial, or industrial use" and making the adjustments specified by G.L. c. 40B, s. 20 and 760 CMR 56.03(3)(b). See sections A and B above. The 1.5% "target" - that is, the acreage that must be equaled or exceeded for the Town to be deemed "consistent with local needs" pursuant to the 1.5% statutory minimum - is next determined by multiplying the denominator (1,597.98 acres) by 1.5. That 1.5% target is 23.97 acres. See Tr. Vol. I at p. 45; 54; Tr. Vol. II at p. 14; Ex. 15, line 15.

4. Calculation of the numerator

Having determined the denominator, and from it, the 1.5% target (23.97 acres), the final step in determining whether the Town has achieved this statutory minimum is a calculation of the numerator: the area of "sites" containing SHI-eligible housing units. See G.L. c. 40B, s. 20. Land on which SHI Housing exists, *not* including the land area of fourteen group homes known to exist in Stoneham, totals 24.98 acres. Tr. Vol. I at p. 46; 53; Ex. 10; Ex. 11A-J; Ex. 15, line 16. This includes a parcel at Washington Street and Washington Avenue, DHCD identification number 9648, containing 4.95 acres. Tr. Vol. I at p. 47, 52; Ex. 10, 11A, 11J. This parcel is built out. Tr. Vol. I at p. 47.

This further includes a parcel on Prospect Street, DHCD identification numbers 3042, 3043, 3044 and 3045, containing 8.77 acres. Tr. Vol. I at p. 47-50; Ex. 10 and 11B-11E. This parcel is "developed to its current capacity" with road access, residential structures, parking lots, and open space insufficient to support further development. Tr. Vol. I at p. 49.

This further includes a parcel on Duncklee Avenue, DHCD identification number 3046, containing 2.83 acres and one hundred units. Tr. Vol. I at p. 50; Ex. 10 and 11F.

This further includes a parcel on Mountain View Terrace, DHCD identification number 3049, containing 8.17 acres and one hundred and ninety-four units. Tr. Vol. I at p. 51; Ex. 10 and 11G.

This further includes a parcel on Christopher Street, DHCD identification number 9094, containing 1.017 (1.02) acres, only 0.26 of which are counted for purposes of this calculation. Tr. Vol. I at p. 52; Ex 10 and 11I.

Group Homes

Fourteen group homes are located within the Town of Stoneham and are included on the Town's SHI.<sup>6</sup> See Ex. 10. Although these group homes are listed by DHCD on the Town's SHI,

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<sup>6</sup> According to DHCD's "Comprehensive Permit Guidelines," a "Group Home" is:

the location and land area associated with these group homes are unknown to the Town, save one. See Ex. 10; see also Tr. Vol. I, p. 11, 14-15; 51; Tr. Vol. II at p. 41-43. This is because, despite the fact that DHCD is charged with maintaining the SHI, that agency does not possess records of the location of these units. The Department of Developmental Services has refused to provide information regarding the location of the group homes. The Town is thus prevented by two agencies of the Commonwealth from obtaining information relevant to its burden of proof in this appeal: establishing the area of "sites" on which SHI-eligible housing exists. This is a violation of due process under the United States Constitution and the Commonwealth's Declaration of Rights. It is particularly egregious where DHCD has 1) promulgated regulations assigning itself "keeper of the list" and providing that the SHI is presumptively accurate, see 760 CMR 56.03(2) and (3); 2) placed the burden on the municipality to establish that sufficient SHI housing exists to satisfy the statutory minima, see 760 CMR 56.03(8); and then 3) refused to provide the municipality with the information necessary to satisfy that burden. Notwithstanding that the Board has established that the land area on which SHI housing exists, *not* including the land area of the group homes, exceeds the 1.5% statutory threshold.

The total area on which SHI-eligible Housing exists in Stoneham (excluding group homes), 24.98 acres, exceeds 1.5% of the Town's "total land area zoned for residential, commercial, or industrial use," 23.97 acres. Tr. Vol. I at p. 54. The Town is thus "consistent with local needs" pursuant to G.L c. 40B, s. 20.

The undisputed evidence is summarized as follows:

<b>1. Total Land Area</b>	<b>6.14 square miles or 3,929.60 acres</b>	<b>Source: Exhibit 9<sup>7</sup></b>
<b>2. Land Area NOT Zoned Residential, Commercial or Industrial</b>	<b>1,408.47/DCR Land</b>	<b>Source: Exhibit 3</b>
<b>3.</b>	<b>55.48 ac./Bear Hill Golf Course</b>	<b>Source: Exhibit 12</b>
<b>4.</b>	<b>8.81 ac./Railroad Right of Way</b>	<b>Source: Exhibit 2</b>

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"A residence licensed by or operated by the Department of Mental Health or the Department of Mental Retardation for adult individuals who are capable, both mentally and physically, to take action to preserve one's own life as defined by the Massachusetts State Building Code, and that, pursuant to the Massachusetts State Building Code, is treated as a single-family residential building for building code purposes."

<sup>7</sup> Exhibit 13 (United States Census Bureau) identifies the total land area for the Town of Stoneham as 6.02 square miles or 3,852.80 acres. The calculations summarized above are based upon the larger land area, that is, that the Town of Stoneham land area consists of 6.14 square miles or 3,929.60 acres. See Tr. Vol. II at p. 52.

5.	19.5 ac./St. Patrick's Cemetery	Source: Exhibit 2
6. Total Land Area NOT Zoned Residential, Commercial or Industrial	1,492.26 acres	Source: Addition of Lines 2 through 5
7. Total Land Area Zoned Residential, Commercial or Industrial	2,437.34 acres	Source: Subtraction of Line 6 from Line 1
8. Public Roads in Stoneham	480.16 acres	Source: Exhibits 4 and 5
9. Land Owned by the Town of Stoneham	349.29 acres	Source: Exhibit 7
10. Land Owned by the Town of Wakefield within Stoneham	26.46 acres	Source: Exhibit 7
11. Total Land Area of Roads, Stoneham and Wakefield-owned land.	855.91 acres	Source: Addition of Lines 8-11
12. Total Land Area Zoned Residential, Commercial or Industrial less Land Area of Roads, Stoneham and Wakefield-owned land.	1,581.43 acres	Source: Subtraction of Line 11 from Line 7
13. Land owned by the Stoneham Housing Authority with SHI Housing	16.55 acres	Source: Exhibit 6
14. Land owned by the Stoneham Housing Authority with SHI Housing added to Total Land Area	1,597.98 acres	Source: Addition of Lines 12 and 13

<b>Zoned Residential, Commercial or Industrial less Land Area of Roads, Stoneham and Wakefield-owned land.</b>		
<b>15. 1.5% of 1,597.98 acres</b>	<b>23.97 acres</b>	<b>Source: Line 14 multiplied by 1.5%</b>
<b>16. Land Area on Which SHI Housing Exists, <u>Not Including Land Area of 14 Group Homes</u></b>	<b>24.98 acres<sup>8</sup></b>	<b>Source: Exhibits 10 and 11A-11J</b>

For these reasons and based upon the evidence discussed above and incorporated herein, the Board of Appeals asserts that the Town of Stoneham is “consistent with local needs” pursuant to G.L. c.40B, s.20 and, therefore, the Housing Appeals Committee lacks jurisdiction to hear an appeal of this decision brought pursuant to G.L. c.40B, s.22.

**B. The Project Is Inconsistent with Stoneham’s Town Center Strategic Action Plan and Is Therefore Not Consistent with Local Needs**

Prepared by the Metropolitan Area Planning Council (MAPC) and issued December of 2014, Stoneham has gone to great lengths to implement the "Stoneham Town Center Strategic Action Plan". The applicant has ignored this Plan in its entirety.

The Town Center Strategic Action Plan identifies Stoneham's Town Center - where, the Plan directs, residential and economic development should be targeted - as centered along Route 28 (Main Street), and including Stoneham Square, the Town Common, primary entry corridors, and

<sup>8</sup> Line 16 includes 0.26 acres for the Christopher Street condominium project whereas the locus contains 1.017 acres. Tr. Vol. I at p. 51-52. This project contains 8 dwelling units, 2 of which are included on the SHI. Ex. 10, Ex. 11I. According to the regulations (760 CMR 56.03(3)(b)), the total qualifying area for this parcel should be 0.26 acres. Requiring that only a proportion of the land area count toward qualifying SHI housing—e.g. in this case, 25% of the land area—is inconsistent with the statute which states, in relevant part, “or on sites comprising one and one half percent or more of the total land area zoned for residential, commercial or industrial use”. G.L. c.40B, s.20 (emphasis added). In any event, the Town of Stoneham has achieved the 1.5% threshold even with compliance with the above-noted regulation, and without inclusion of the acreage attributable to group homes.

surrounding blocks.<sup>9</sup> While noting that the Town Center remains the "civic center of the town," the Plan further notes that development just outside the Town Center area has "drawn much of the area's vibrancy away," specifically, "drawing businesses and consumers away from the Town Center." The Town Center Plan calls for increased residential uses and densities in the Town Center to support an active retail environment, while also providing housing in "a walkable, amenity-rich Town Center." The Plan also calls for improved transportation options serving the Town Center.

The Project locus is outside the Town Center. As such, it is directly at odds with the Town Center Plan. The proposed project places dense residential development in an area where it will serve neither goal of supporting retail or providing a "walkable, amenity-rich" housing option in the Town Center. In fact, in its location outside the Town Center, the project will draw vibrancy away from the Town Center, as indicated by the Plan. The proposed project is thus wholly inconsistent with the Plan with respect to economic development. Further, by locating dense development outside the Town Center - where, presumably, the benefits of concentrated development, such as open space, should manifest - the proposed project in fact eliminates open space and is incompatible with the adjacent single-family land use. The project is thus wholly inconsistent with the Plan with respect to "open space impacts" and "compatibility with adjacent land uses."

In its submission to the MEPA, the Applicant relied on a few lazily-selected generalities from the 2008 MAPC "MetroFuture" Plan, which - not surprisingly - is consistent with MAPC's recommendations in the Town Center Plan. The Applicant's problem is that the proposed project does not conform even to those principles the applicant has extracted from the MetroFuture Plan. Like the Town Center Plan, the MetroFuture Plan calls for targeted, transit-oriented residential development in existing town centers. By contrast, the project site is outside the Town Center; is more than half a mile from a bus stop, and almost one mile from a rail station. As such, it is automobile-dependant; at odds with the goal cited by the Applicant;<sup>10</sup> and inconsistent with the MetroFuture Plan with respect to "adequacy of infrastructure." Further, where the project is outside the Town Center, it does not constitute or support "economic development with a Smart Growth perspective," nor is it consistent with the MetroFuture Plan's recommendations for economic development - unless every addition of housing units, anywhere, is said to promote economic development.

Further, the proposed Project eliminates all functional open space from the parcel, cramming buildings, roadways, parking areas and other infrastructure into an historically agricultural and undeveloped parcel. This is entirely inconsistent with the MetroFuture principal cited by the applicant in its ENF filing that "new growth will occur through reuse of previously developed land and buildings." The applicant's statement that "the existing open space on the site will remain as open space" is inaccurate and misleading. The "open space" referenced by the

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<sup>9</sup> A primary Town Center along Main Street and surrounding blocks was identified as the core of the district; a larger, secondary area included this core and extended to the "gateway corridors into the Town Center." The project locus lies outside both areas.

<sup>10</sup> In its submission to MEPA, the applicant cites to a goal relating to "low income households" and a related objective that affordable housing units "be located within 1/2 mile of fixed-route transit service." See ENF at p. 15. The proposed project consists of 75% market rate units and 25% moderate-income units, none of which will be priced for "low income households".

applicant consists of remnants of land, like carpet scraps, left over following the placement of buildings surrounded by acres of parking lots, drainage structures, and roadways. These remnants of open space are accessible only by traversing active parking lots and roadways, and as such, are unrelated to the preservation of open space as that term is used in the MetroFuture Plan.

**C. The Project Does Not Comply with the Commonwealth's "Sustainable Development Principles" and Therefore Does Not Comply with MassHousing's Project Eligibility Letter Requirements**

Based upon the evidence before it, the Board concludes that the Project scores an unenviable zero (0) when evaluated pursuant to the Commonwealth's "Sustainable Development Principles" as the same are incorporated into MassHousing's "Smart Growth Scorecard". As compliance with the Commonwealth's "Sustainable Development Principles" is a requirement of MassHousing's Project Eligibility approval (see page 3, ¶7), the Board has included as a condition of approval the submission of revised plans that comply with MassHousing's requirement.

- The project does not "contribute to revitalization of town center";
- The project is not "walkable" or "located in a municipally approved growth center";
- The project does not "concentrate development" most notably in that the proposed development is not "compact and/or clustered so as to preserve undeveloped land";
- The project does not "restore and enhance environment [sic]";
- The project is not "fair"; it does not "improve the neighborhood";
- The project does not "conserve resources";
- The project does not "provide transportation choice" and is totally "unwalkable" to public transportation;
- The project does not "increase job opportunities";
- The project does not "foster sustainable businesses"; and
- The project does not "plan regionally", rather, as the evidence made clear, the proposed project will have dramatic regional impacts and will permanently destroy the Town of Stoneham and the region's ability to create a safe bicycle corridor along Franklin Street.

**D. Project "Economics"**

The Applicant submitted two "development budgets", dated June 14, 2014 and November 20, 2015. As discussed by the Board's retained expert, a certified public account and forensic accountant, the November 20, 2015 budget, while based upon a project containing fewer dwelling units than the June 14, 2014 budget, presents a budget with a cost increase of \$12,295,700. Support for this increase was not provided the Board.

Moreover, the Applicant's consultant, while refusing to provide the Board with support for the inputs provided in either budget, but most notably the November 20, 2015 budget, remarked during the Board's April 7, 2016 public hearing, "the truth is, it's a de novo hearing and we can turn in a new budget based on April's or May's number, not last November, and we can provide as much backup as we feel necessary to support our case at the Housing Appeals Committee.

Totally different. Totally new. We're not going in with two pages from November".

Thereafter, on April 12, 2016 the Applicant's consultant provided the Board with a two page letter containing excerpts from a MassHousing report and policy together with a one half page supplement, again without source or attribution, to the inputs identified in the November 20, 2015 budget for "Site Work". In submitting the April 12, 2016 response to the Board, the Applicant's consultant neither shed light on the foundation or credibility of the inputs contained in his November 20, 2015 budget nor answered the questions posed by the Board's expert, that is, what is the "granularity"—the origin or source—of the numbers found in the November 20, 2015 budget.

The Board's expert was asked, using the Applicant's submitted metrics, to analyze the project "economics" as that phrase is defined in G.L. c.40B, s.20, for a development density of 125 dwelling units. The density of 125 was selected based upon the testimony of the Board's traffic engineer whose testimony the Board found significantly more credible than the Applicant's traffic consultant particularly as it related to the level of development that would obviate the need for a "left turn lane" on Franklin Street. Discussed in detail in the section entitled Density; Dwelling Units, below, construction of a "left turn lane" on Franklin Street would require the Town of Stoneham to abandon and/or convey a property interest in Franklin Street, an action that is beyond the authority of the Board to implement or impose as a condition. Accordingly, the Board inquired as to the project "economics" of a development density that would not require the abandonment or conveyance of an interest in Town owned real property.

Complicating the "economic" analysis is the fact, as admitted by the Applicant's financial consultant, that the November 20, 2015 development budget illustrates a project that is already—at the time the project was submitted to the Board—"uneconomic" pursuant to DHCD's "Comprehensive Permit Guidelines" (December 2014).

The Applicant's consultant testified that in his opinion the Board cannot render an already "uneconomic" project "*significantly*" more uneconomic. The Applicant's consultant provided no clarity was provided as to how to evaluate or measure what conditions would render an already uneconomic project, "significantly more uneconomic". Moreover, the Applicant's consultant conceded that the project was "uneconomic" prior to the imposition of conditions imposed by, for example, Massachusetts DEP or MEPA as contained in the January 22, 2016 ENF Certificate.

In Avalon Cohasset, Inc. v. Cohasset, No. 05-09, slip-op at 7 (Mass. Housing Appeals Committee September 18, 2007), the Housing Appeals Committee stated, "Under the facts presented here, where the denial of a change is at issue, we rule that to sustain its burden the developer is required to establish not only the ROTC for the development as approved is uneconomic, but also that the ROTC for that development is significantly *more* uneconomic than the development it proposes to build." (Emphasis in original). Although Avalon involved an applicant's petition to the Board to modify a previously approved comprehensive permit and the Cohasset Board of Appeals denied that petition, the HAC's decision in Avalon is precisely on point as to the present matter. Since Avalon, the HAC concluded similarly in Cozy Hearth Community Corporation. v. Edgartown, No. 06-09, (Mass. Housing Appeals Committee April

14, 2008) and Autumnwood, LLC v. Sandwich, No. 05-06 (Mass. Housing Appeals Committee, March 8, 2010).

In each matter, the HAC has stated that an already uneconomic project cannot be made “significantly more uneconomic” than the developer’s submitted project. Putting aside the fact that a prohibition on making a project already deemed “uneconomic”, “significantly more uneconomic” does not exist anywhere in the statute, relevant regulations or policies of DHCD, in the present case, imposition of the most significant of the Board’s conditions, stated above and below regarding the project’s overall density (approved at 125 dwelling units), renders the resulting project less—not more—“uneconomic” than the Applicant’s original proposal.

As illustrated on the Applicant’s development budget (November 20, 2015) proposing 259 dwelling units, and using DHCD’s definition for calculating Return On Total Costs (ROTC)(see DHCD Comprehensive Permit Guidelines, December 2014), the ROTC for the development is 5.06%. As analyzed by the Board’s financial expert, a development density of 125 dwelling units, results in an ROTC of 5.57%.

Quite simply, even if the Board were to accept the HAC’s fabricated standard that a project “uneconomic” when submitted cannot be rendered “significantly more uneconomic”, the project as conditioned by the Board herein results in a “significantly *less* uneconomic” proposal. Accordingly, the Board concludes that the imposition of the conditions contained herein will not render the revised project “significantly more uneconomic”, as the phrase has been applied by the Housing Appeals Committee.

## V. REQUESTED WAIVERS AND EXEMPTIONS

1. Massachusetts General Laws c. 40B, §§20-23 empowers local Boards of Appeals to grant waivers from local rules and regulations, where the waivers would not threaten public health, safety or welfare. The Board understands that reasonable waivers from valid local regulations should be granted if, but for the waiver, the development of the housing project would be “uneconomic,” as that term is used in G. L. c. 40B, §§ 20-23.
2. The Board believes that, under existing law and regulation, the Applicant has an affirmative obligation to demonstrate the need for the requested waivers to avoid the proposed project becoming “uneconomic.”
3. The Applicant provided the Board with a revised list of waivers and exemptions sought from local rules, regulations and bylaws as identified in the “Waiver Requests”, undated and received by the Board on March 18, 2016. The undated “Waiver Requests” was without any substantive explanation for the need for each waiver and no “uneconomic” justification was provided by the Applicant within the “Wavier Requests” or at any time during the public hearing process. The Applicant’s failure to provide to provide such support is in violation of Section 18-33 (m) of Board’s Comprehensive Permit Rules, which state in relevant part, “a list, stated with particularity, of requested exceptions to Stoneham’s requirements and regulations, including by-laws, policies or regulations, including these Regulations and a written explanation of why, but for the failure to grant

the requested waiver, the Project would be rendered uneconomic pursuant to G.L. c.40B, s.20.” Section 18-33(m), Stoneham Board of Appeals Comprehensive Permit Rules.<sup>11</sup>

4. Although the Applicant has not provided information to demonstrate that the project would be rendered uneconomic but for the specifically requested waivers and exceptions, the Board has reviewed the above noted waiver requests and has granted those that are consistent with protection of the general health, safety and welfare.
5. The Board has denied requests that do not appear necessary to construct the Project. The Board finds, in the absence of any substantiation to the contrary, that the waivers not granted does not either alone or in the aggregate render the project uneconomic.
6. The Board decision as to each of the waivers and exemptions specified in the request identified as “Waiver Requests” , undated, is set forth in Attachment “B”.
7. In the event that the Applicant or the Board determines that the final design of the project necessitates further waivers, the Applicant shall submit a written request for such waiver(s) to the Board and the Board may grant or deny such additional waivers in accordance with applicable rules and regulations and the judgment of the Board.

## **VI. GRANT OF PERMIT AND CONDITIONS THERETO**

Subject to the conditions set for hereinafter, the Board grants this comprehensive permit (the “Permit”) to Weiss Farm Apartments, LLC, (the “Applicant”), for a development, located in Stoneham, Massachusetts. The development is referred to herein as “the Project.”

Without the written consent of the Board, this Permit is non-transferable and non-assignable.

The Board notes that 760 CMR 56.05(8)(d) provides that:

“The Board shall not issue any order or impose any condition that would cause the building or operation of the Project to be Uneconomic...”

In reaching this Decision, the Board has endeavored to insure that the conditions herein do not render the project uneconomic (and as discussed above, not “substantially more uneconomic”) and that the conditions are consistent with local needs.

In reaching this Decision, the Board has concluded that the requirements found at 760 CMR 56.04(1) have been as discussed below, subject to the concerns noted.

1. With respect to 760 CMR 56.04(1)(a), the Applicant has suggested that it “is” or “will become” a limited dividend corporation. The Board’s interpretation of the regulations is based upon a literal reading of the same, such that the words, “The Applicant shall be a

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<sup>11</sup> In addition to the Applicant’s failure to comport with the Board’s adopted Regulations, the Applicant has refused, in part, to pay the Board’s peer review engineering fees (see February 23, 2016 letter from Rackemann Sawyer & Brewster stating in relevant part, “Weiss Farm will not pay any invoices from peer review consultants related to either MEPA Review...”). See also, electronic correspondence to the Board dated April 25, 2016 from Steven Cicitelli, Esq. See discussion of same in the Background discussion on page 1.

...Limited Dividend Organization” when read in conjunction with the preceding paragraph (“To be eligible to submit an application to a Board for a Comprehensive Permit...the Applicant and the Project shall fulfill, at a minimum, the following project eligibility requirements...”) creates a present, not simply a future requirement, that the Applicant be a limited dividend corporation. Accordingly, the Board requires as a condition of this Decision that the Applicant execute the regulatory agreement required by this Decision within thirty (30) days following the issuance of this Decision, regardless of whether the Decision has become final.

2. With respect to 760 CMR 56.04(1)(b), the Applicant has provided a project eligibility letter from MassHousing dated June 23, 2014. By its own terms, the letter is “effective for two years from the date of this letter”. To ensure that MassHousing will continue to endorse this project, the Board requires that the Applicant demonstrate that MassHousing has provided a continuous extension of the June 23, 2014 letter within thirty (30) days of the issuance of this Decision, regardless of whether the Decision has become final.
3. With respect to compliance with the site control requirements of 760 CMR 56.04(1)(c), the Applicant has stated that the locus is the subject of a purchase and sales agreement described previously. This Decision relies upon the uninterrupted existence of this purchase and sales agreement.

#### **General**

4. The Comprehensive Permit application was based on a project eligibility letter issued to the Applicant on June 23, 2014 from MassHousing pursuant to the New England Fund program. This Permit is conditional upon receipt of Final Approval from MassHousing and the grant of subsidy funding through the New England Fund. Grant of subsidy funding by the New England Fund are condition precedents to any grading, land disturbance, construction of any structure or infrastructure, or issuance of any building permit.
5. The Applicant shall comply with the terms of a Regulatory Agreement complying with the requirements of MassHousing and/or DHCD, to which the Town of Stoneham shall be made a party and beneficiary, prior to any grading, land disturbance, construction of any structure or infrastructure, or issuance of any building permit.
6. The Decision is based on, and this Permit is issued based on, the real property identified on the Comprehensive Permit Plans, described below (hereinafter referred to as the “locus” or the “site”).
7. Except as otherwise specified in this Decision, the Project must substantially conform to the Comprehensive Permit Plans entitled “Conservation Commission [sic] Notice of Intent Submission [sic], The Commons At Weiss Farm, June 25, 2014 with a final revision date of April 4, 2016, consisting of twelve (12) sheets at varying scales.
8. Substantive revisions to the Project or the Plans, such as relocation (except relocation within the building “envelopes” as proposed) or deletion of dwellings (except as specified

in this Decision), material changes in unit architecture, style or materials, relocations of more than one property line, relocation of the right of way or other substantive changes from the approved Plans shall not be permitted without the written approval of the Board. If, between the date that this decision is filed with the Office of the Town Clerk and the completion of the Project, Applicant desires to change any details of the Project (as set forth in the Plans, or as required by the terms of this Decision) the Applicant shall promptly inform the Board in writing of the change requested. Changes will be administered or addressed pursuant to 760 CMR 56.00 et seq.

9. Except as otherwise specifically provided herein, where this Decision provides for the submission of plans or other documents to the Board, the Board shall review and provide a written response as to whether such plans or other documents are consistent with this Decision within forty-five (45) days of the Board's receipt of such plans or other documents.
10. Nothing in this Decision permits the removal of sand or gravel from the locus or waives or modifies any local by-laws, rules, regulations or requirements with respect to the removal of sand or gravel.

#### **Compliance With Federal and State Requirements and Law**

##### State and Federal Requirements

11. Development of the Project shall comply in all respects with the conditions contained in the Project Eligibility approval for the Project issued by MassHousing and dated June 23, 2014. As the Project does not comply with MassHousing's requirements as they relate to the "Commonwealth's Sustainable Development Principles", the Applicant shall submit a revised plan that conforms to the same.
12. The Project, and all construction, dwelling units, utilities, roads, drainage, earth removal or relocation of structures and all related appurtenances with respect to the Project, shall comply with all applicable state and federal regulations. The Applicant shall promptly provide the Board with copies of all permitting requests and other correspondence directed to any applicable state or federal agency and of all correspondence, approvals or disapprovals received from any such agency.
13. The Project shall comply with all rules, regulations, filing and permit requirements and certifications pertaining to regulations governing the disturbance and/or restoration/replication of wetlands on the site required by the U.S. Army Corps of Engineers, Section 404 of the Clean Water Act and, as applicable, Section 404(b)(1) guidelines that are established by the U.S. EPA to demonstrate that no less environmentally damaging, practicable alternatives exist.
14. The Project shall comply with all rules, regulations, filing and permit requirements and certifications required by the regulations governing the Massachusetts Endangered Species Act, G. L. c. 131, § 23, 321 CMR 10.00.

15. The Project shall comply with the Massachusetts Wetlands Protection Act and related regulations, G. L. c. 131, § 40-40A, 310 CMR 10.00.
16. The Project shall comply with all rules, regulations, permit and filing requirements, and certifications of the Department of Environmental Protection with respect to wastewater disposal, storm water disposal, resource protection, water supply and low impact development best management practices.
17. The Project shall comply with the rules and regulations of the Stoneham Board of Health not otherwise granted a waiver herein and dwelling floor plans shall be provided for review and approval by the Board of Health.
18. The Project shall comply with all rules, regulations, filing and permit requirements and certifications required by the regulations adopted by the Executive Office of Environmental Affairs pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, § 61-62H).
19. The Project shall comply with the Massachusetts Public Shade Tree Act (G. L. c. 87).
20. The Project shall comply with the Massachusetts Scenic Roads Act as adopted by the Town of Stoneham, G. L. c. 40, §15C.
21. The Project shall comply with all rules, regulations, filing and permit requirements and certifications required by the regulations governing the Massachusetts Historical Commission.
22. Copies of all approvals from State and Federal agencies shall be submitted to the Board prior to recording of final plans.
22. As the Project has been issued a Project Eligibility pursuant to the "New England Fund" and the Project Eligibility letter from MassHousing requires that "financing for the Project shall originate from a subsidizing lender that is member of the FHLBB [Federal Home Loan Bank of Boston], development of the Project shall comply with the requirements of the Davis-Bacon Act, 40 U.S.C. § 3142 et seq. and 29 C.F.R. §5.1. See Middleborough v. Housing Appeals Committee, 449 Mass. 514 (2007) and 12 U.S.C. § 1433.

#### Local Requirements

23. Except as expressly waived by this Decision:
  1. The development of this Project, including the construction of all dwelling units, utilities, roads, drainage structures and other appurtenances, shall comply with the Stoneham Zoning By-Law in effect at the time of this Decision and Permit.
  2. The development of this Project, including the construction of all dwelling units, utilities, roads, drainage structures, and other appurtenances, shall comply with all

other rules, regulations, bylaws and policies in effect at the time of this Decision and Permit.

24. Except as waived by this Decision or a decision of the Stoneham Board of Health, the Project shall comply, in all respects, with the rules, regulations, filing and permit requirements and certifications of the Stoneham Board of Health governing private wells, storm water disposal and wastewater disposal.

### **Density; Dwelling Units**

#### **Discussion:**

The record contains extensive testimony from the Applicant's traffic engineers and the Board's peer review traffic engineer regarding the Applicant's proposal to create a "left turn lane" on Franklin Street for motorists entering the proposed project from Stoneham center. As repeated by the Board's traffic engineer on several occasions, the requirement for the "left turn lane" is a direct consequence and only a consequence of the number of dwelling units proposed for the project. Put otherwise, but for the density proposed by the project, the "left turn lane" on Franklin Street would not be required.

The Board's traffic engineer further testified that based upon accepted engineering practice and standards, most notably those established by the Institute for Traffic Engineers, a left turn lane on Franklin Street would not be required with a development density of fewer than 125 dwelling units. As explained by the Board's traffic engineer, at a density of fewer than 125 dwelling units, the volume of traffic turning left into the project locus from Stoneham center would be insufficient to warrant, for reasons of public safety, a constructed left turn lane.

The Board heard extensive testimony from the Applicant's and the Board's traffic engineers as to the Applicant's proposals to mitigate the impacts of the traffic generated by the proposed project, including: (1) the construction on Franklin Street of a "left turn lane", (2) the synchronizing of approximately 12 traffic signals in Stoneham to ease the traffic congestion on and about Franklin Street created by the proposed project and (3) the installation of a "HAWK" traffic signal and painting of a cross walk proximate to the project locus to provide for pedestrian crossing of Franklin Street.

As confirmed by the Applicant's and the Board's traffic engineers, each of the three proposed steps to mitigate the project's traffic impacts require either a dedication of Town property, an encumbrance of Town property or an action by Stoneham Town Meeting. As confirmed by the Board's traffic engineer, each of the three proposed mitigation requirements are essential to the accommodation of the proposed project. Put otherwise, without each of the three proposed mitigation measures, the proposed project would constitute a direct, measureable and concrete threat to public health and safety.

With respect to the construction of a left turn lane on Franklin Street, the Applicant's proposal would require, for a distance of 250 linear feet, the reduction of the two travel lanes along Franklin Street and the construction of a third travel lane, that being the "left turn lane from Franklin Street into the project locus. The creation of three travel lanes where two currently exists requires the reduction of the two travel lanes, from their current paved width to eleven (11)

feet. The proposed left turn lane would be ten (10) feet in width. In order to accomplish the creation of three lanes where two currently exist, the applicant proposes to permanently alter the northerly portion of Franklin Street such that the shoulder existing along Franklin Street would be incorporated into the travel lane.

In so doing, this portion of Franklin Street would no longer safely support bicycle traffic as the combined shoulder and travel lane width would be below fourteen feet, the minimum width necessary to support vehicular and bicycle passage. Rather, bicycle traffic traveling along this portion of Franklin Street would be within the now narrowed travel lane of eleven feet. The Board's traffic engineer testified that this result—forcing bicyclists to travel within a narrowed paved way—would constitute a safety hazard as bicyclists travelling along this portion of Franklin Street would be forced into an already narrowed travel lane, thereby requiring motorists trying to pass a bicyclist into either oncoming traffic waiting in the “left turn lane” or heading eastbound on Franklin Street. The Board concurs.

The Board heard extensive testimony from residents of Stoneham and Melrose regarding the frequent use of Franklin Street for bicycle passage and the fact that the applicant's proposal would remove, permanently, safe bicycle passage along this portion of Franklin Street. The Board's own experience with travelling on Franklin Street—one of Stoneham's principal and heavily travelled ways, supports the recorded testimony: Franklin Street is used extensively by bicyclists, particularly this portion of Franklin Street, due to its immediate proximity to the Stoneham High School.

In addition to the risks to public health and safety created by removing one of the very attributes of “complete streets” required by G.L. c.90I (“Complete Streets Program”) —fostering, not inhibiting bicycle travel—the proposed “left turn” imposes a permanent servitude on the Town of Stoneham's real property and precludes the Town of Stoneham from complying with the statutory requirements found in G.L. c.90I.

If constructed as proposed by the Applicant, the Town of Stoneham will have lost—permanently and irrevocably—a real property interest in this portion of Franklin Street and will—permanently and irrevocably—be precluded from meeting the requirements of G.L. c.90I and thereafter qualifying for program funding from the Commonwealth.

The Town of Stoneham owns the fee in the road layout known as Franklin Street. This fee ownership is an interest in land. An interest in municipal property can be conveyed, restricted or otherwise transferred only pursuant to the unambiguous provisions of G.L. c.40 §§ 3 and 15.

As clearly set forth in G.L. c.40 §§ 3 and 15, in towns, an interest in real property can only be conveyed, restricted or otherwise transferred by a two-thirds vote of the town's legislative body. In this case, the Town of Stoneham's legislative body is Town Meeting. According, the Board of Appeals lacks the authority to convey, restrict or otherwise transfer an interest in Franklin Street.

Moreover, G.L. c.40B §§20-23 is intended to remove *locally imposed* “barriers” to below market rate housing, “not State law governing the disposition or transfer of land, or interests in land, owned by municipalities”. Zoning Board of Appeals of Groton v. Housing Appeals Committee,

451 Mass. 35, 41 (2008). Put otherwise, while G.L. c.40B §§20-23 allows the Board to waive provisions of the Stoneham Zoning Bylaw and other locally adopted regulations, the statute does not grant the Board with the authority to waive or otherwise ignore state (or federal) law. The conveyance of a real property interest in Franklin Street is most clearly not a locally imposed barrier to the proposed project.

Accordingly, because the Board lacks the authority to approve the Project as proposed, specifically as it relates to the conveyance of an interest in Town-owned land, the Board has conditioned approval of this Project such that a “left turn lane” will not be required.

25. The total number of dwelling units, each of which shall be dwelling units available for rent, shall not exceed one hundred and twenty-four (124).

**“Affordable Units”**

26. Not less than twenty-five (25%) percent of the total number of dwelling units constructed and rented shall be affordable to individuals and/or families earning no more than eighty (80%) percent of the median income of current residents of Stoneham. (The “affordable dwelling units” or “affordable units”). The calculation of what constitutes the median income of the current residents of Stoneham shall be based on formulas or the methodology published by the Department of Housing and Community Development (DHCD), as revised.
27. No dwelling unit identified as an “affordable unit” may be rented to anyone other than a qualified tenant as required by this Decision and consistent with the requirements of MassHousing, DHCD and other relevant state agencies governing the rental of below market rate units in a comprehensive permit project.
28. The affordable units will be evenly distributed within the locus and shall be indistinguishable in architectural style, exterior finish materials, and exterior appearance from market units.
29. Each affordable unit shall be rented pursuant to an affordable housing restriction, more fully described below, ensuring that only income eligible individuals or families may rent the dwelling unit.
30. An affordable housing restriction, enforceable by the Town of Stoneham, requiring that the affordable units remain affordable in perpetuity and in a form approved by the Board, shall be recorded senior to any liens on the Project locus to protect the requirement for the affordable units in the event of any foreclosure, bankruptcy, refinancing or sale.
31. Upon the rental of an affordable dwelling, the Applicant or its successors or assigns shall provide written notice to the tenant that the premises are subject to an affordable housing restriction and is subject to the terms and provisions of the affordable housing restriction and that any amendment purporting to alter, amend or delete the restriction shall be void and of no effect.

### **Management Documents**

32. The Applicant shall prepare documents in a form that conforms to this Decision and applicable law designed to manage the Project and ensure that the terms and conditions of this Decision are enforced.
33. The management documents shall provide that the Town of Stoneham shall not have any legal or financial responsibility for, operation or maintenance of roadways, driveways, parking areas, storm water management systems, snow plowing, landscaping, trash disposal or pick up, street lighting or other illumination, or other roadway infrastructure within the Project or the locus.

### **Profitability**

34. The Project shall be limited to the profit allowed under the Regulatory Agreement (the "allowable profit").
35. Any profit that is above the allowable profit pursuant to the Regulatory Agreement, shall be returned to the Town of Stoneham for use by the Town. The profit limitation may be enforced the Town or its agencies, boards or commissions at anytime.
36. The Applicant shall provide the Board with a copy of all financial documentation required by the Regulatory Agreement. The Board requires a full compilation and certification of total development costs and total revenues on a federal income tax basis according to generally accepted accounting standards within 30 days after the end of each tax year.

### **Marketing**

37. No construction of any dwelling under this Permit shall commence until the Applicant has submitted to the Board and any and all other relevant public agencies for review and final acknowledgment of consistency with this Decision a marketing plan for the affordable dwellings, such plan to conform to all affirmative action requirements or other requirements as imposed by federal or state regulations.

### **Conditions Precedent to Commencement of Project**

38. The conditions below are conditions precedent to site disturbance. In particular, and without limitation, no grading, land disturbance, or construction of any structure or infrastructure shall commence until:
  1. Final Review -- Prior to commencement of any construction and granting of any permits for the Project, the Applicant has submitted detailed construction drawings to the Board to ensure that said drawings are consistent with this Permit, with local requirements not waived in the Permit, and with state and federal codes and requirements of state and federal agencies and their respective decisions. Copies of the detailed, approved construction drawings (the "Final Plans") shall also be filed in hard copy (20 full-scale sets) and in digital form with the Board

and the Building Department for record keeping purposes. The Applicant must secure Board approval prior to construction and allow the Board forty-five (45) days to review the detailed construction drawings. The Final Plans shall include a Building Code review.

2. The Applicant has posted with the Town Clerk a bond or surety in the amount needed to complete the ways, utilities, drainage, shade trees in the right of way, and as-built plans of the Project as approved, plus a ten percent margin of error plus an appropriate rate of inflation over a five-year period. The performance bond or surety shall contain the following provision: "If the Principal shall fully and satisfactorily observe and perform in accordance with the qualifications and time schedule set forth herein as specified in all the covenants, agreements, terms and provisions as set forth in the Decision of the Board in this matter, as attached hereto, then this obligation shall be void, otherwise it shall remain in full force and effect, and, in the absence of completion of the above work, the aforesaid sum shall be paid to the Town of Stoneham in order to complete the construction in accordance with the plans and specifications."
3. The Final Plans, including phasing plans, way and underground utilities plans (water system, stormwater system, gas, telephone, electric and cable systems), entrance/intersection streetlights and signs, have been reviewed and have received approval consistent with this Decision by the Board, and consistent with their respective jurisdictions by the Conservation Commission and any and all relevant federal and state agencies, departments, boards or commissions for matters not otherwise approved or waived by this Decision.
4. The Applicant, the Board and DHCD have executed a Monitoring Agreement, similar in form to the Monitoring Agreement published by MassHousing but revised in content as required for consistency with this Decision. The Monitoring Agreement shall be subject to review and approval by the Board, said approval not to be unreasonably withheld.
5. A Regulatory Agreement, similar in form to that published by MassHousing or DHCD but revised in content as required for consistency with this Decision and subject to the terms and conditions of this Decision, has been executed by the Applicant and DHCD and has been recorded with this Decision. These documents shall contain, at a minimum, the following terms:
  - i. The affordable units shall be restricted as affordable in perpetuity to households with less than 80% of the applicable area median income.
  - ii. The Monitoring Agent for this Project.
  - iii. An identification of the affordable units.

The Regulatory Agreement shall be subject to review and approval by the Board as to form and consistency with this Decision, said approval to not be unreasonably withheld.

6. A NPDES Storm Water Pollution Prevention Plan, erosion control plan and stormwater management systems operations and maintenance plan has been submitted to the Stoneham Conservation Commission together with a Notice of Intent, and an Order of Conditions has been obtained from the Commission for the final design plans has been recorded.
7. The Applicant has submitted to the Board and the Stoneham Conservation Commission, and all other relevant public agencies, for review and final acknowledgement of consistency with this Decision, final and detailed stormwater management plans and improvements and consistent with DEP's Storm Water Management standards, policy and handbooks, to the detail required for use as on-site construction drawings and to obtain approval under the Massachusetts Wetlands Act and the Stoneham Wetlands Bylaw. These plans and improvements shall address the effects on abutters and assure that there will be no detrimental drainage or erosion impact on abutting properties. Additional requirements regarding required improvements to the stormwater system serving the project are presented in detail, below.
8. Final and detailed landscaping improvements and plans prepared by a Landscape Architect registered in the Commonwealth of Massachusetts to the detail required for use as on-site construction and planting drawings and/or to obtain a building permit in accordance with the State Building Code, whichever requirement is more detailed, have been submitted to the Board and all other relevant public agencies for review and approval, including acknowledgment of consistency with this Decision. Such plans shall include shade trees along roadways, and shall specify the types, number, size and location of all proposed landscaping plants, trees and shrubs at the time of planting, the location and type of fence or other screening materials, plans and profiles of all planting and screening materials and details of any and all other proposed landscape materials. Such plans indicate the specific types of active/passive recreational equipment to be installed within the open space and recreational areas located on the approved plans. Such plans shall also indicate the location of mailboxes, dumpsters and other appurtenant structures to be located within or integral to, the project.
9. Identification of all areas of the site proposed for vegetative clearing.
10. A detailed plan showing landscaping improvements, open areas, limit of construction activity, edge of clearing, sedimentation and erosion controls, a soil stockpiling area, and construction staging, refueling and storage area(s), for verification that such plan conforms with this Decision. Tree protection measures shall be stated with details for tree wells around existing trees to be protected included in the plan set. The removal of trees, shrubs, and natural ground cover on the site shall be minimized to preserve the natural environment to the highest degree possible. All trees over 8" in caliper within the limits of work shall be flagged prior to tree clearing. A representative or agent of the Board shall have the opportunity to identify trees that need to be protected and preserved during construction.

11. An Infrastructure Operations and Maintenance Plan has been submitted for review and approval by the Board. The Plan shall include, at a minimum, maintenance during and post construction as well as perpetual maintenance and monitoring of the roadway, roadway infrastructure and drainage systems (routine and seasonal). The Operation and Maintenance Plan shall bind the Applicant. The Stormwater Operation and Maintenance Plan shall include specific tasks and time lines associated with inspection and maintenance of all proposed stormwater management structural and non-structural measures, a repair and replacement plan for the system with estimated costs as well as identify the owner and party responsible for inspection, operation, maintenance, repair, and replacement including certification of acceptance of legal responsibility for the aforementioned.
12. A construction schedule identifying the sequence and approximate dates of all key stages of construction has been submitted to the Board. This submission also will include:
  - i. Identification of all contractors, field engineers, construction managers, surveyors, wetland and biology specialists, and other professionals that will be involved in the implementation of the Project;
  - ii. Staking driveways, dwelling foundations, parking areas, drainage basins and other drainage structures, and well(s) location(s);
  - iii. Placement of sediment and erosion controls and limit of construction fencing;
  - iv. Identification and approval of significant trees to be cut on the site and/or in the bordering vegetated wetland buffer zones;
  - v. Removal of vegetation and top soil;
  - vi. Drainage system construction;
  - vii. Major stages of roadway construction;
  - viii. Excavating dates for building foundations;
  - ix. Sewer line and water line installation; and
  - x. Inspection dates
13. The Applicant has provided the Town of Stoneham, in form and substance approved by counsel for the Town of Stoneham, Applicant's agreement that the Town of Stoneham shall be free of any liability for any act, omission or negligence caused by the Applicant, its employees, agents, subcontractors, beneficiaries or trustees with relation to this Project, and that Applicant on behalf of itself and its successors and assigns has consented and agreed to indemnify the

Town, its employees and officials for any harm, damage or injury caused by the Applicant, its employees, agents, subcontractors, beneficiaries or trustees with regard to this Project.

14. The Applicant has granted to the Town easements giving the Town the right to enter the locus to repair and maintain water lines as necessary to ensure the health and safety of the residents therein. The easements shall be shown on a site plan provided to the Board and shall be recorded by the Applicant.
15. Cuts and fills have been designed to preserve the existing land elevations to the extent reasonably possible based on the Final Plans as approved, and the use of retaining walls is optimized to preserve existing vegetation wherever practicable.
16. The Final Plan has addressed constructability with regard to infrastructure damage due to settlement in substantial fill areas.
17. All local zoning lines have been identified on the Final Plan for reference purposes.
18. The interior roadway layout and parking areas have been approved by the Fire Chief, to facilitate emergency access and increase fire safety.
19. Easements have been provided on the Final Plan to facilitate utility installation and slope maintenance outside the rights-of-way.
20. The Final Plans indicate that roadway construction materials and thicknesses conform to town standards as set forth in the Planning Board Rules and Regulations.
21. The Final Plans shall include limitations on lawn areas, and limitations on regrading of areas tributary to the bordering vegetated wetlands located on the locus. The Final Plans also shall include the use of bioretention areas at any down gradient lawn limits within the 100' wetland buffer, for nutrient and sediment uptake prior to discharge to wetland areas.
22. The final site plan submission has included an acceptable snow management plan protective of the resource areas. The Board rejects as unacceptable the proposed "Snow Storage Plan" submitted by the Applicant (April 4, 2016) as calling for the placement of plowed snow proximate to if not within, wetland buffer zones.
23. The Final Plans have been reviewed and accepted by the Fire Chief and the Water Department for hydrant and valve locations; hydrant locations shall provide a 10-foot minimum separation from storm drains or other approved means of protecting the water supply from storm drains.
24. The Applicant has obtained all necessary private utility permits and final designs but not limited to gas pipeline, electric, telephone and cable service required by the respective utilities prior to the commencement of construction. Documentation

of all Permits/approvals issued by private utilities pertaining to the development of the Project shall be provided to the Board prior to any construction.

25. The Applicant has submitted to the Board and all other relevant public agencies for review and final acknowledgement of consistency with this Decision, all requests for approval, and upon receipt of all approvals, has provided to the Board copies of all necessary approvals from all local, state and federal agencies, departments or commissions pertaining to this Project.
26. The Final Plans shall include the location and design (including materials to be used) of all retaining walls to be used within the project.
27. The Final Plans shall identify the location of all guard rails to be constructed within the proposed road system. All guard rails shall be constructed of timber.
28. The Final Plans shall identify the location of all street lighting fixtures. Lighting on poles shall be allowed, but poles shall not exceed fourteen (14) feet in height and light from these poles shall be downcast with cut-off shields.

### **Additional Analysis and Conditions Relating to Stormwater Management**

#### **Introduction**

The Commons at Weiss Farm borders an extensive wetland system north of Franklin Street which has a tributary area of approximately 250 acres. There are two outlets to this system which convey runoff to the south across Franklin Street. One the Franklin Street culverts is an 18 inch RCP culvert located on the east side of the Weiss Farm at 175-177 Franklin Street (Weiss Farm Culvert) and the other Franklin Street culvert is located approximately 800 feet west of Weiss Farm at 136-140 Franklin Street (West Culvert). The inverts of these two culverts are at a roughly comparable elevations and the discharge through these culverts depends on hydrology in the wetland area as well as stormwater management practices related to operation of a stormwater pump station at the Weiss Farm Culvert.

The entrance invert of the Weiss Farm Culvert is situated above the elevation of the land and drainage channels on Weiss Farm immediately upgradient of the culvert. Additionally, the culvert has a negative slope with an entrance invert of 159.8 and two inline manholes with inverts of 160.1 and 160.9. Discharge into the Weiss Farm Culvert is facilitated by a 500 gpm stormwater pump station which lifts stormwater into the culvert, which means that the pump station must lift stormwater above the entrance invert and an additional 1.1 feet above the interim high invert before it can flow by gravity.

Weiss Farm is responsible for operation of the stormwater pump station. The Board understands that the primary management objective of the pump station is to control flooding on Weiss Farm itself although it also limits the elevation of flooding on properties on Gerald Road. The stormwater pump station is operated in various modes. During the winter presumably when surface water is low, the stormwater pump is not operated. When surface water elevations increase, the stormwater pump station is operated lifting stormwater into the Weiss Farm Culvert. When surface water elevations increase above the interim high elevation of 160.9

within the culvert, the stormwater pump station is turned off and stormwater flows south by gravity through the Weiss Farm Culvert.

The West Culvert is a 36 inch diameter pipe and has less obstructed flow conditions south of Franklin Street. A 1935 plan shows Meetinghouse Brook flowing to this location and across Franklin Street in a culvert. Following construction of the drainage channel in the large wetland system in the 1950s, it is likely that the West Culvert accommodated much of the discharge from the large wetland system. However, a segment of the drainage channel was blocked by fill placed at residential properties to the west of Weiss Farm. The Board has information as to whether this filling was authorized, but under current regulations, extensive filling of bordering vegetated wetland would not be permitted. Lack of maintenance of the drainage channels is likely to further inhibit drainage flow toward the West Culvert.

The Weiss Farm Culvert conveys flows across Franklin Street flowing south and discharging between 175 and 177 Franklin Street. The flow path for drainage discharged from the Weiss Farm Culvert is extensively obstructed causing stagnant ponded water conditions and localized flooding. The Director of Public Works has informed the Board that this is a major concern for his Department.

The localized flooding affects the multifamily structure at 177 Franklin Street and reportedly other downgradient areas. A large area of ponded water was observed at the downgradient end of the Weiss Farm Culvert which was nearly at the surface of the parking lot at 177 Franklin Street which was not caused by a recent storm event. The ponded water area is eutrophic and presents a health mosquito breeding threat. The area is silted with no defined channel and no apparent gradient to convey stormwater to the south. Further downgradient and to the south there is an 18 inch diameter vitrified clay (record) culvert 450 ft. long in the Sunset Road Area. It was installed with an entrance invert elevation (160.73) higher than the exit invert of the Weiss Farm Culvert and with a flat slope (0.00038 ft. /ft.). As a result there is a lack of hydraulic gradient to convey flow to and through the culvert. The 18 inch diameter culvert connects to a 36 inch diameter culvert. The invert of the 36 inch diameter culvert is approximately 7 ft. below the invert of the 18 inch diameter culvert.

If flow constraints between the Weiss Farm Culvert and this downgradient 36 inch diameter culvert can be removed, there is the potential to solve the ponded stagnant water and localized flooding problems.

The flow path for drainage discharged from the West Culvert is reportedly less problematic and may be able to accommodate existing and increased flows without damage to property and without water ponding problems. Immediately downgradient of the West Culvert, runoff is discharged to an open channel. Further to the south runoff is conveyed through the Stoneham High School campus in a culvert. The culvert in turn discharges to an open channel which flows to Doleful Pond.

Pursuant to a 2006 DEP consent order, a 4 ft. high 20 ft. long precast concrete dam with flashboards was constructed across the drainage channel near the east edge of Weiss Farm (approximately 1,700 ft. north of Franklin St.) in an effort to force more stormwater runoff towards the West Culvert. The effectiveness of this dam is compromised because runoff can

bypass the dam on the south end of the dam and other structural deficiencies. The H. W. Moore Stormwater Pump Station and Dam Improvements report (4/28/2015 revised 6/8/2015) provides recommendations for reconstruction and repair of the precast concrete dam and the Board incorporates those recommendations as conditions of approval, herein.

29. The Applicant shall expand the stormwater runoff analysis to encompass the wetland system north of Franklin Street extending to the Weiss Farm Culvert and the West Culvert. The analysis for both pre-development and post development should recognize that the 4 ft. high 20 ft. long precast concrete dam divides the channel with flow discharged south of the dam under most hydrologic conditions flowing to the Weiss Farm Culvert and flow discharged north of the dam under most hydrologic conditions flowing to the West Culvert. The analysis shall encompass management practices such as operation of the stormwater pump station. The analysis should provide the flow through the Weiss Farm Culvert and the West Culvert including the impacts of channel improvements discussed below.
30. The Applicant shall submit an engineering feasibility report identifying deficiencies in the stormwater conveyance system downgradient of the Weiss Farm Culvert to the point of free discharge. The report shall include recommendations for necessary upgrades to eliminate ponding and localized flooding and convey existing and proposed peak flows to the point of free discharge. It should identify property ownership and preliminary construction cost.
31. The Applicant shall submit an engineering report identifying deficiencies in the stormwater conveyance system downgradient of the West Culvert to the point of free discharge. The report shall include recommendations for necessary upgrades to convey existing and proposed peak flows to the point of free discharge as well as identify property ownership and preliminary construction cost.
32. The Applicant shall revise the site Operation and Management Plan to encompass operation of existing and proposed controls to convey stormwater to the Weiss Farm Culvert and the West Culvert.
33. The Applicant shall complete final design and reconstruct and repair the low precast dam in accordance with the H. W. Moore recommendations so that the dam is capable of controlling the direction of flow in the on-site drainage channel in accordance with the DEP Consent decree. The Applicant shall revise the site Operation and Maintenance Plan to encompass the precast concrete dam.
34. The Applicant shall submit an engineering feasibility report for reconstruction of the drainage channel through the wetland north of Franklin Street reestablishing connectivity from east to west specifically to the West Culvert. The report shall identify property ownership and preliminary construction cost. If the channel

improvements are constructed, the Applicant shall expand the Operation and Maintenance Plan to encompass the reconstructed channel.

35. The Applicant shall develop a plan and upgrade the stormwater pump station.
36. The Applicant shall submit an engineering feasibility report for restoration and maintenance of the channel upgradient of the West Culvert by dredging silt and debris and removing logs, trees, and other debris. The report shall identify property ownership and preliminary cost. If the channel is restored, the Applicant shall expand the Operation and Maintenance Plan to encompass the restored channel.
37. Under Pre Development conditions, the submitted stormwater model routes runoff from the Development Footprint to the COE Channel as a single catchment. For the Post Development condition, the submitted stormwater model routes runoff from the Development Footprint to the Development Footprint at five discharge points. However, the COE Channel acts as a detention basin whose surface elevation will rise with increased runoff. The stormwater calculations show no increase in the peak rate of discharge at the discharge points. However, volumetric increases have not been modeled and will be a key factor in determining the elevation of the COE Channel during storm events. To properly model detention within the COE Channel, inflows from all tributary areas shall be quantified.
38. The outlet control device for detention in the Development Footprint is a stormwater pump station on the Project Site in close proximity to Franklin Street which is owned, operated, and maintained by Weiss Farm (Weiss Farm Stormwater Pump Station.) To properly quantify detention in the Development Footprint, the design discharge characteristics of the Weiss Farm Stormwater Pump Station the Applicant shall incorporate into the model the discharge rate, capabilities staged discharge through multiple pumps, and pump on/off elevations.
39. It is the Board's understanding that the Weiss Farm Stormwater Pump Station located on the Project Site is owned, maintained, and operated by Weiss Farm. There is no Agreement in place between Weiss Farm and the Town of Stoneham governing operation and maintenance of the stormwater pump station. Proper operation of this stormwater pump station is required to control the surface elevation of ponded water in the COE Channel and to comply with Stormwater Management Standard 2; that the post-development peak discharge rates do not exceed pre-development peak discharge rates. The stormwater management report shall be expanded to include evaluation of the age, condition, and operation of the stormwater pump station. Any outmoded or poorly operating equipment shall be replaced. Staged discharge may be required for compliance with Stormwater Management Standard 2. Each required pump shall have an alternate pump and pumps shall operate in alternating mode. The Weiss Farm Stormwater Pump Station shall be set as a design point for the overall stormwater analysis

with the peak rate post-development peak discharge rate designed to be less than the pre-development peak discharge rate for the 2-year frequency storm event and the 10-year frequency storm event and the peak rate of discharge for the 100-year frequency storm event being set to avoid increased flooding. A natural gas fired generator shall be required for standby power, unless unavailable.

40. To address mechanical failure or power loss, the Applicant shall provide detention capabilities that are modeled with no discharge for a 48 hour period.
41. The geotechnical testing conducted for the locus does not include all information required to accurately quantify seasonal high groundwater. While groundwater was recorded when observed in test pits and soil borings, the individual logging the test pits data was not a Licensed Soil Evaluator and did not record redoximorphic features such as mottles. Groundwater was monitored from one to three years at test locations; however, mottles which develop over very long time periods must also be used to confirm the elevation of seasonal high groundwater. No less than two additional test pits shall be excavated at each infiltration basin with mottles recorded by a Licensed Soil Evaluator and the results provided to the Board.
42. Low impact design shall be incorporated in the design of the proposed improvements.
43. Stormwater within the interior open space between buildings shall be disconnected from the storm drain system and recharged within the open space area. Porous walkway pavement shall be used for walkways within the interior open space area. Rain gardens located within the interior open space area shall be used for infiltration of as much roof-water as practicable.
44. At the water quality basin at southwest corner of the locus, the logs of Borings 300 and 301 show that there is a fill layer starting at elevation 160 of varying thickness of 3 to 4.3 feet. The bottom of the proposed water quality basin is at elevation 163 ft. The Applicant shall review this issue and determine if any special construction measures are required to provide long term stabilization and functioning of the basin.
45. At Infiltration/Detention System C-4 near proposed Building B, the logs of Borings 304, 305, and 306 show a layer of fill varying in thickness from 4 to 5 feet. The fill will be below the bottom of the system. The design engineer should review this issue and determine if any special construction measures are required to provide long term stabilization and functioning of the system. The Applicant shall remove fill within 5 feet horizontally and below the bottom of the system extending from the top of the fill downward to native soil and replacement with Title 5 sand.
46. At Infiltration/Detention System D-3 near proposed Building C, the logs of Borings 307, 308, and 309 show a shallow layer of fill varying in thickness from

1 to 1.5 feet. The fill will be below the bottom of the system. The design engineer should review this issue and determine if any special construction measures are required to provide long term stabilization and functioning of the system. The Applicant shall remove fill within 5 feet horizontally and below the bottom of the system extending from the top of the fill downward to native soil and replacement with Title 5 sand.

47. At Infiltration/Detention System E-3 near proposed Building C, the log of Borings 310 shows a 4.5 ft. thick layer of fill below the bottom of the system. The design engineer should review this issue and determine if any special construction measures are required to provide long term stabilization and functioning of the system. We recommend removing fill within 5 feet horizontally and below the bottom of the system extending from the top of the fill downward to native soil and replacement with Title 5 sand.
48. The Operation and Maintenance Plan should be augmented to include provisions for operation and maintenance of the Weiss Farm Stormwater Pump Station.
49. Subject to requirements of the Order of Conditions, the Operation and Maintenance Plan should provide for maintenance of the COE Channel in terms of removal of debris and obstructions that limit flow.

#### **Additional Analysis and Conditions Relating to Compliance with the Wetlands Protection Act and Stoneham Wetlands Bylaw**

##### Introduction

The Board concurs with the findings made by the Stoneham Conservation Commission with regard to the historic and existing wetland and stormwater management issues within the locus and their relevance to the proposed Project and incorporates the Conservation Commission's findings made during the Applicant's application for a Notice of Intent for the Project submitted to the Conservation Commission. In addition, as the Board acts on behalf of the Conservation Commission with regard to the Stoneham Wetlands Protection Bylaw (see, G.L. c.40B, s.20), the Board has made the following findings of fact and has conditioned this Decision accordingly and as follows:

- A. The site contains wetland resource areas, specifically Bordering Vegetated Wetlands (BVW), Land Under Water Bodies and Waterways (LUW), Bordering Land Subject to Flooding (BLSF), and Bank.
- B. The practices and activities conducted on the Weiss Farm property have resulted in changes to hydrology, alteration of wetland resource areas, and have been the subject of enforcement actions taken by the Massachusetts Department of Environmental Protection. More specifically, an Administrative Consent Order with Penalty and Notice of Noncompliance was issued in 2006 (File No.: ACOP-NE-06-6W018) ("the 2006 ACOP") and an Administrative Consent Order and Notice of Noncompliance was issued in 2010, which remains in effect (File No.: ACO-NE-10-6W002) ("the 2010 ACO").

Paragraph 5. J. of the 2010 ACO states “However, this Consent Order shall serve to supplant and replace in its entirety the 2006 ACOP except that Exhibit A of the 2006 ACOP shall remain in full force and effect and shall be incorporated as part of this ACO.” In addition, on July 9, 2015, the Stoneham Conservation Commission issued an Enforcement Order against the Weiss Farm property pursuant to G.L. c.131, s.40 and the Stoneham Wetland Bylaw alleging violations of the both the Act and the Bylaw. This Order is the subject of pending litigation in the Middlesex Superior Court (1581CV5342).

- C. Several former and ongoing activities have impacted state and local wetland resource areas. By failing to comply with the provisions of the 2006 ACOP and 2010 ACO; by failing to comply with the requirements of the Stoneham Wetlands Protection Bylaw; and by failing to restore the illegally altered wetlands to their original conditions, Weiss Farm continues to violate the Massachusetts Wetlands Protection Act and its wetlands regulations and Stoneham Wetlands Protection Bylaw.
- D. The Massachusetts Wetlands Protection Act, G.L. Chapter 131, Section 40, states, in relevant part,

“No person shall remove, fill, dredge or alter any bank, riverfront area, fresh water wetland, coastal wetland, beach, dune, flat, marsh, meadow or swamp bordering on the ocean or on any estuary, creek, river, stream, pond, or lake, or any land under said waters or any land subject to tidal action, coastal storm flowage, or flooding, other than in the course of maintaining, repairing or replacing, but not substantially changing or enlarging, an existing and lawfully located structure or facility used in the service of the public and used to provide electric, gas, sewer, water, telephone, telegraph and other telecommunication services, without filing written notice of his intention to so remove, fill, dredge or alter, including such plans as may be necessary to describe such proposed activity and its effect on the environment and without receiving and complying with an order of conditions and provided all appeal periods have elapsed.”

The Wetlands Protection Act defines several purposes, which are to determine if proposed activities are “...significant to public or private water supply, to the groundwater supply, to flood control, to storm damage prevention, to prevention of pollution, to protection of land containing shellfish, to the protection of wildlife habitat or to the protection of fisheries ...” These are referred to as the interests of the Act and are also included in the Wetlands Protection Act regulations at 310 CMR10.01 (2).

And further:

“In addition to the other duties provided for in this section, a conservation commission and its agents, officers, and employees; the commissioner, his agents and employees; environmental officers, and any officer with police powers may issue enforcement orders directing compliance with this section and may undertake any other enforcement action authorized by law. Any person who violates the provisions of this section may be ordered

to restore property to its original condition and take other actions deemed necessary to remedy such violations.

No person shall remove, fill, dredge or alter any area subject to protection under this section without the required authorization, or cause, suffer or allow such activity, or leave in place unauthorized fill, or otherwise fail to restore illegally altered land to its original condition, or fail to comply with an enforcement order issued pursuant to this section. Each day such violation continues shall constitute a separate offense except that any person who fails to remove unauthorized fill or otherwise fails to restore illegally altered land to its original condition after giving written notification of said violation to the conservation commission and the department shall not be subject to additional penalties unless said person thereafter fails to comply with an enforcement order or order of conditions.”

E. The Town of Stoneham Wetlands Protection Bylaw states, in relevant part, in Chapter 11

“A continuous strip no less than twenty-five (25) feet in width, untouched and in its natural state, shall be left undisturbed adjacent to those areas meeting the description of a “wetland” as identified in the Wetlands Protection Act, G.L. Ch 131. §40, and regulations hereunder (310 CMR 10.00). No person shall remove, fill, dredge, alter or build upon or within this strip.” (Unnumbered section)

The purpose of the Wetlands Protection Bylaw includes the following “resource area values, including but not limited to the following: public or private water supply, groundwater, flood control, erosion and sedimentation control, storm damage prevention including coastal storm flowage, water quality, water pollution control, fisheries, shellfisheries, wildlife habitat, rare species habitat including rare plant species, agriculture, aquaculture, and recreation values, deemed important to the community.” These are collectively referred to as the resource area values protected by the Bylaw.

“Except as permitted by the Conservation Commission or as provided in this bylaw, no person shall commence to remove, fill, dredge, build upon, degrade, discharge into, or otherwise alter the following resource areas: any freshwater or coastal wetlands; marshes; wet meadows; bogs; swamps; vernal pools; banks; reservoirs; lakes; ponds of any size; rivers; streams; creeks; beaches; dunes; estuaries; the ocean; lands under water bodies; lands subject to flooding or inundation by groundwater or surface water; lands subject to tidal action, coastal storm flowage, or flooding; and lands abutting any of the aforesaid resource areas as set out in Section 11.8. (collectively the “resource areas protected by this bylaw”). Said resource areas shall be protected whether or not they border surface waters.” (Section 11.2)

And further, in Section 11.12:

“No person shall remove, fill, dredge, build upon, degrade, or otherwise alter resource areas protected by this bylaw, or cause, suffer, or allow such activity, or leave in place

unauthorized fill, or otherwise fail to restore illegally altered land to its original condition, or fail to comply with a permit or an enforcement order issued pursuant to this bylaw.

The Conservation Commission, its agents, officers, and employees shall have authority to enter upon privately owned land for the purpose of performing their duties under this bylaw and may make or cause to be made such examinations, surveys, or sampling as the Commission deems necessary, subject to the constitutions and laws of the United States and the Commonwealth.

The Commission shall have authority to enforce this bylaw, its regulations, and permits issued hereunder by violation notices, non-criminal citations under G.L. Ch. 40 §21D, and civil and criminal court actions. Any person who violates provisions of this bylaw may be ordered to restore the property to its original condition and take other action deemed necessary to remedy such violations, or may be fined, or both.”

- F. The Regulations implementing the Wetlands Protection Act are located at 310 CMR 10.00 and with the regulations each wetland is defined as a resource area (e.g. Bordering Land Subject to Flooding, Bordering Vegetated Wetland). Each resource area is defined and has certain established presumptions of significance. Activities proposed within the resource areas must meet certain performance standards. The regulations specific to Bordering Vegetated Wetland are established at 310 CMR 10.55; the regulations specific to Bordering Land Subject to Flooding are established at 310 CMR 10.57; the regulations specific to Bank and Land Under Water are established at 310 CMR 10.54 and 10.56, respectively. Each is incorporated herein by reference.
- G. Weiss Farm’s unpermitted activities, as documented below, have altered, impaired and have had an adverse effect on Bordering Vegetated Wetland, Land Under Water, and Bordering Land Subject to Flooding (“Resource Areas”), and in doing so, have adversely impaired and effected the interests of the Massachusetts Wetlands Protection Act and the resource area values of the Stoneham Wetlands Protection Bylaw. By failing to restore the wetlands to their original conditions, the alteration and impairment continue to have an adverse effect on each of the Resource Areas.

In addition, those activities mandated by the 2010 Administrative Consent Order and Notice of Noncompliance (File No.: ACO-NE-10-6W002) required approval under the Stoneham Wetlands Protection Bylaw. Specifically, Section 10 states “Actions required by this Consent Order shall be taken in accordance with all applicable federal, state, and local laws, regulations and approvals. This Consent Order shall not be construed as, nor operate as, relieving Respondent or any other person of the necessity of complying with all applicable federal, state and local laws, regulations and approvals.”

- H. Work Within the Wetlands Protection Act Buffer Zone and Local Bylaw 25 foot No-Disturb Zone has been conducted without a permit and there has been a failure to restore the illegally altered land to its original condition leading to the following violations:

- 1) Two stockpiles are located within 25 feet of Wetland Flags 28 and 31.3 as shown on the Existing Conditions Plan prepared by H. W. Moore for "The Commons at Weiss Farm", and title Topographic Plan Weiss Farm, 170 Franklin Street, Stoneham, MA Scale 1" = 60', dated May 20, 2013, prepared by Feldman Professional Land Surveyors, signed and stamped by Karl A. McCarthy, PLS on June 25, 2014 ("the Feldman Plan").

The wetlands shown on the Feldman Plan extend up to the base of the stockpiles and are in an area shown on the U. S. D. A. Soil Survey Map for this site as Freetown Muck, which is defined by the National Cooperative Soil Survey, in part, as "very deep, very poorly drained organic soils formed in more than 130 centimeters of highly decomposed organic material." Given that the limit of the stockpiles is also the limit of the flagged wetlands shown on the Feldman Plan, it is probably that the stockpiles are evidence of fill within the Freetown Muck.

Placement of fill over areas of Bordering Vegetated Wetlands and Bordering Land Subject to Flooding results in adverse impact to the ability of these Resource Areas to contribute to the Interests of the Massachusetts Wetlands Protection Act and of the resource area interests of the Stoneham Wetlands Protection Bylaw. The Wetlands Protection Act regulations establish the significance and functions of Bordering Vegetated Wetland at 310 CMR 10.55, which are incorporated herein by reference and include roles such as removal or detention of sediments, nutrients, providing an exchange of groundwater and surface water, acting to slow down and reduce the passage of flood waters during periods of peak flow. Additionally, during dry periods, the water retained in Bordering Vegetated Wetlands contributes to the maintenance of base flow levels in streams and rivers. Bordering Vegetated Wetlands play a role in wildlife habitat as well.

The Wetlands Protection Act regulations establish the significance and functions of Bordering Land Subject to Flooding at 310 CMR 10.57, which are incorporated herein by reference and include such values as provision of temporary storage for flood water which may overtop a stream, and by both retaining and detaining flood waters. Certain portions of Bordering Land Subject to Flooding play a role in wildlife habitat.

Placement of fill within and on top of Bordering Vegetated Wetland and Land Subject to Flooding results in the loss of the areas to perform the documented roles performed by both of these areas.

50. The stockpiles shall be removed and once removed, soils in the location where the stockpiles were placed shall be evaluated to determine whether the wetland extended interior from that shown on the Feldman plan and whether the stockpiles

resulted in filling of Bordering Vegetated Wetland and Bordering Land Subject to Flooding. At least four (4) soil pits, distributed evenly across the area where the stockpiles were located, shall be conducted to a depth of 5 feet below existing grade and the soil profile shall be documented by a professional wetland/soil scientist. Photographs shall be taken.

I. Work with the Wetlands Protection Act and Local Bylaw Bordering Vegetated Wetland and Land Under Waterway has been conducted without a permit and there has been a failure to restore the illegally altered land to its original condition resulting in the following violations:

- 1) Concrete debris was placed within Bordering Vegetated Wetland, Land Under Waterway, and Bordering Land Subject to Flooding. Although under the MassDEP 2010 ACO the DEP does not require removal of the concrete debris, under the local bylaw, the placement of the concrete debris is in violation of the bylaw Section 11.12 which states in part: "No person shall...leave in place unauthorized fill, or otherwise fail to restore illegally altered land to its original condition..." and of the 2010 ACO which requires compliance with local law and regulation.
- 2) The concrete debris is resulting in displacement and compaction of hydric soils, and is altering the vegetative community and has been doing so for the past two (2) years, thereby resulting in the inability of the resource area to function to support wildlife habitat (Section 11.10, which states in part "Except as otherwise provided in this bylaw or in regulations of the Conservation Commission, the definitions of terms and procedures in this bylaw shall be as set forth in the Wetlands Protection Act (G.L. Ch. 131 §40) and Regulations (310 CMR10.00), which states under 310 CMR 10.56 (1): "The plant community composition and structure, hydrologic regime, topography, soil composition and water quality of land under water bodies and waterways provide important food, shelter, migratory and overwintering areas, and breeding areas for wildlife. Certain submerged, rooted vegetation is eaten by waterfowl and some mammals. Some amphibians...attach their eggs to such vegetation. Some aquatic vegetation protruding out of the water is also used for nesting, and many specie use dead vegetation resting on land under water but protruding above the surface for feeing and basking. Soil composition is also important for hibernation and for animals which begin to burrow their tunnels under water..." Additionally, 310 CMR 10.55 (1) (incorporated herein by reference) states that the Hydrologic regime, plant community composition and structure, soil composition and structure, topography, and water chemistry of Bordering Vegetated Wetlands provide important food, shelter, migratory and overwintering areas, and breeding areas of many birds, mammals, amphibians and reptiles.
- 3) The concrete debris is resulting in displacement and compaction of hydric soils, and altered the vegetative community, thereby resulting in the inability of the resource area to function to prevent pollution (Section 11.10, which states in part "Except as otherwise provided in this bylaw or in regulations of the Conservation

Commission, the definitions of terms and procedures in this bylaw shall be as set forth in the Wetlands Protection Act (G.L. Ch. 131 §40) and Regulations (310 CMR10.00), which states under 310 CMR 10.56 (1): "The plants and soils of Bordering Vegetated Wetlands remove or detain sediments, nutrients ... and toxic substances...that occur in run-off and flood waters...Some nutrients and toxic substances are detained for years in plant root system or in the soils...).

51. Concrete debris shall be hand removed or removed with small equipment to minimize disturbance to vegetation. All work shall be conducted during low-flow periods. The applicant shall prepare a work plan documenting the extent of concrete debris and presenting the mitigation methods proposed. To the extent that vegetation is growing on fill resulting from placement of the concrete debris, such vegetation shall be documented and may need to be removed in order to restore the bordering vegetated wetland and bordering land subject to flooding to original conditions.
- J. Work within Wetlands Protection Act and Local Bylaw Bordering Vegetated Wetland has been conducted without a permit and there has been a failure to restore the illegally altered land to its original condition resulting in the following violations:
- 1) Excavation of ditch in Bordering Vegetated Wetland [and BLSF]. Weiss Farm excavated a ditch adjacent to flags WF A1 through A11, as shown on as shown on the Existing Conditions Plan prepared by H. W. Moore for "The Commons at Weiss Farm", and title Topographic Plan Weiss Farm, 170 Franklin Street, Stoneham, MA Scale 1" = 60', dated May 20, 2013, prepared by Feldman Professional Land Surveyors, signed and stamped by Karl A. McCarthy, PLS on June 25, 2014.
  - 2) It is not clear that the ditch was dredged in response to the 2006 and 2010 ACOs. The ditch resulted in removal of hydric organic soils and is currently and has for the last two (2) years resulted in changes in hydrology, inability of the soils to function to address the interests of the Wetlands Protection Act and the Stoneham Wetlands Protection Bylaw, and has overall changed the condition of the wet meadow, thereby altering wetland resource areas without a permit and causing a change in area to function to contribute to the interest of the Wetlands Protection Act and the Stoneham Wetlands Protection Bylaw.
52. The 2010 ACO required the preparation of a "Drainage Study" (Paragraph G.) A Drainage Study was prepared by R. J. O'Connell dated November 2, 2009 ("the O'Connell Report"). Mr. Martin H. Wantman, an abutter, requested Benchmark Survey to review the R. J. O'Connell Report. Benchmark's report was prepared on March 8, 2010 ("the Benchmark Drainage Study"). The two studies differ in their assessment of the watershed divide on the property. Because the changes in the hydrology associated with the dredging of a new ditch in Bordering Vegetated Wetland and Bordering Land Subject to Flooding, it is required that a current

drainage study be prepared that determines where, on the property, the drainage divide is located.

K. Construction and Maintenance of Pump Station Access Road and Weir has been conducted without a local wetlands bylaw permit and there has been a failure to maintain the roadway as specified in the ACOP resulting in the following violations:

- 1) Construction of the access road to the pump station was conducted in response to the 2006 Administrative Consent Order with Penalty and Notice of Noncompliance (File No.: ACOP-NE-06-6W018).
  - 2) The 2010 ACO states “this Order does not negate the need for obtaining all other permits...No permit from the Stoneham Conservation Commission was obtained.
  - 3) The 2010 ACO specifies that the August 11, 2009 “Sedimentation Control Plan” be adhered to in order to “better manage the accumulation and treatment of stormwater runoff prior to pumping into adjacent resource areas”. The access road has not been maintained, and the Commission is unaware of the installation of a “check dam in the North/South drainage ditch that runs along the East side of the Weiss Farm property to address the accumulated stormwater to maintain a condition that does not allow flooding of the pump access road or further degrade wetland resource areas.” Paragraph E of the 2010 ACO. There is a backwater control dam (also referred to as “the weir”) in the North/South drainage ditch but it is in a state of disrepair. (See also Item 12 below.)
  - 4) Construction of the pump access road resulted in the displacement of wetland and flood storage capacity. No permit was obtained from the Stoneham Conservation Commission to conduct the work. In addition, no mitigation was provided.
53. The access roadway shall be brought to grade such that it meets the conditions specified in the ACOP. In addition, the impact to floodplain altered by the construction of the access road shall be calculated and mitigation shall be provided as specified in the regulations implementing the Wetlands Protection Act (310 CMR 10.57) and the Stoneham Wetlands Protection Bylaw (Town Code Section 11). Specifically, mitigation shall be provided on an increment by increment basis for displaced floodplain.
54. The Backwater Control Dam shall be maintained to meet the conditions specified in the ACOP. In addition, the impact to floodplain altered by the construction of the backwater control dam shall be calculated and mitigation shall be provided as specified in the regulations implementing the Wetlands Protection Act (310 CMR 10.57) and the Stoneham Wetlands Protection Bylaw. Specifically, mitigation shall be provided, if necessary, on an increment by increment basis for displaced floodplain.
55. The 2015 Enforcement Order issued by the Stoneham Conservation Commission relating to alleged violations of the Wetlands Protection Act and Stoneham

Wetland Bylaw shall have been satisfied in full as documented by the Conservation Commission.

### **Additional Analysis and Conditions Relating to Vehicular and Pedestrian Traffic and Safety**

#### Introduction

See discussion in “Density; Dwelling Units”, above, regarding the Applicant’s proposal to construct a 75-foot long left-turn lane on the Franklin Street south-eastbound approach to the Project site driveway that would maintain one (1) through travel lane in each direction, but otherwise permanently remove the Town’s ability to maintain safe and convenient bicycle travel and resulting in the less than required width for shared vehicle and bicycle travel.

56. The Applicant shall ensure that signs, landscaping and other features located within the sight triangle areas of the Project site driveway intersection with Franklin Street shall be designed, installed and maintained so as not to exceed 2.5 feet in height. The Applicant shall promptly remove snow windrows located within the sight triangle areas that exceed 2.5 feet in height or that would otherwise inhibit sight lines.
57. The Applicant shall design and implement an optimal traffic signal timing and phasing plan at the following intersections, which shall include an assessment of the yellow and “all-red” clearance intervals at each intersection and a review of pedestrian crossing times and bicycle accommodations:
  - Franklin Street/Main Street/Central Street
  - Franklin Street/Summer Street
  - Franklin Street/Franklin Place
  - Main Street/Marble Street/Summer Street
  - Franklin Street/Pine Street

The above noted improvements shall be completed prior to 60 percent occupancy of the Project and the traffic signal timings shall be re-evaluated and adjusted as may be necessary after 80 percent occupancy of the Project.

58. As offered by the Applicant, the Applicant shall contribute \$8,250 to the Town for the purpose of designing and/or constructing improvements at the Pleasant Street/Spring Street intersection.
59. The Applicant shall design and construct a pedestrian crossing of Franklin Street at an appropriate location proximate to the Project site that shall include the installation of a High-Intensity Activated Crosswalk (a.k.a. “HAWK”) pedestrian beacon to facilitate the safe conveyance of pedestrians across Franklin Street. In addition, the Applicant shall enter into an agreement with the Town to fully reimburse the Town for all energy charges associated with the HAWK beacon for the life of the beacon’s operation.

## **Additional Analysis and Conditions Relating to Building Height and Massing**

### **Introduction**

The scale, mass, and height of the proposed buildings are not compatible with the adjacent residential neighborhoods. For the portion of the site near Franklin Street, townhouses are used to create a transition presenting residential scale when viewed from Franklin Street. However, the residences at the end of Beacon Street that are elevated up to 40± ft. above the typical finished grades of the Project and the houses on Ellen Road are elevated up to 60± ft. above the typical finished grades of the Project Site and will be significantly impacted by Building B and the easterly wing of Building C which are five stories in height along the easterly edge of the Development Footprint given that the intervening land between the residences and these buildings generally slopes continuously downward.

This change in grade substantially negates the buffering effect that would otherwise arise from the intervening treed buffer. Greater building height can be considered for Building A and the westerly wing of Building C which are located along the westerly edge of the Development Footprint because they are more remote from neighboring residences.

To mitigate the impacts discussed above, revised plans shall be submitted that:

60. Restricts buildings over three stories in height to the westerly edge of Development Footprint.
61. Limits the height of the currently labeled "Building B" and the westerly wing of "Building C" should be limited to 2 to 3 stories in height.
62. Reconfigures "Building B" and the westerly wing of "Building C" to reduce their mass which could be achieved by breaking the building into smaller distinct forms.
63. Reconfigures "Building B" and the westerly wing of "Building C" to reduce their mass which could be achieved by breaking the building into smaller distinct forms.

## **Additional Analysis and Conditions Relating to Site Planning and Civil Engineering**

64. The landscaped courtyard connecting Building A, Building B, and the clubhouse and the courtyard for Building C are key elements of the site design and is a significant site amenity. The function of this space is adversely impacted by the parking bay which bisects this space. The Applicant shall submit revised plans that remove the east-west oriented parking field.
65. Separate and distinct playgrounds or other facilities should be provided to accommodate preschool and school age resident and visitor children.

66. The crushed stone path through the pedestrian bridge as shown on the Landscape Plan shall be surfaced in order to provide required handicapped access.
67. The Applicant shall provide written documentation that the Stoneham Fire Chief or his designee has approved the plans with respect to access to each of the buildings for fire fighting purposes as well as compliance with the site layout for fire truck ingress and egress.
68. Written concurrence of the Stoneham Fire Department shall be provided with respect to hydrant locations and fire lane designations. Fire lanes should be shown on the plans including pavement markings and signage.
69. Written documentation shall be submitted from the Fire Department attesting to the ability of Stoneham's current fire apparatus to reach the tallest floor of the proposed buildings.
70. Written determination shall be obtained from the Stoneham Police Department stating the Department's satisfaction with access and safety issues during construction and during operation of the Proposed Project.
71. To account for bumper overhang, sidewalks at the head of perpendicular parking spaces as shown on the plans shall be widened to 8 ft. wide minimum to maintain an accessible route.
72. Snow storage areas shall not be permitted in wetland buffers zones within the locus.
73. Retaining walls are shown but are not designed. The plans should note requirements for a building permit for certain retaining walls and shall state that final plans, sections, and elevations for all walls will be submitted to the Building Inspector prior to construction. All wall designs shall be based on site specific geotechnical investigations and their design cannot be conditioned on determination of soil conditions by others following completion of the design drawings. If unit masonry walls are used, the design shall address horizontal impact loads for guardrail posts.
74. The walkway and parking area grades shall adhere to all current Architectural Access Board regulations and in particular grades should be provided at accessible parking spaces limiting slopes to 2 percent.
75. A second site entrance off of Franklin Street shall be provided, either for regular or emergency access.
76. A parking ratio of 1.66 parking spaces per unit is provided whereas the Board has been informed that a parking ratio of 1.8+ parking spaces per unit is desirable. Of greater significance the Stoneham Zoning Bylaw requires 2.1 parking spaces per dwelling unit (§6.3.3 1). Additionally, for "Land Use 221 for suburban Low/Mid Rise Apartment," ITE shows an average peak period parking demand of 1.23

spaces per dwelling unit and an 85<sup>th</sup> percentile peak period parking demand of 1.94 vehicles per dwelling unit (Institute of Transportation Engineers (ITE), Parking Generation, 4<sup>th</sup> Edition). The ITE data also includes a range of unit types from three unit townhouses to large apartment blocks and may not accurately represent this development. Accordingly, the Board is concerned that parking demand may exceed the available supply. The applicant shall provide an outline of a Parking Plan that can be implemented if demand exceeds supply.

77. The proposed site grading will require substantial cuts and grading and shall be adjusted to the extent practicable to achieve a balanced site. The net volume of cut/fill to be imported or exported shall be estimated and provided to the Board.
78. The wooded hill in the north portion of the Development Footprint rises 30 feet above the surface of the adjacent site. Subsurface explorations in this area shows the presence of bedrock at shallow depth. For two test pits, bedrock was encountered at depths of 6.5 feet and 1 to 2.5 feet. A significant quantity of bedrock must be removed in order to construct proposed improvements in this location. The volume of rock to be removed and the duration of blasting required to achieve removal of rock shall be estimated and provided to the Board.
79. A surety in the amount to be determined by the Board following the Applicant's submission of a blasting and earth removal plan shall be required for use in repairing structural damage to abutting properties arising from blasting activities.
80. On-site rock crushing shall be permitted only if the Applicant can demonstrate that no other financially feasible option is available.
81. The submitted planting plan (Preliminary Landscape Plan) does not show species of trees and shrubs but designates the plantings in broad categories such as shade tree, ornamental tree, evergreen tree, large shrub, etc. The Plan also limits all plant materials to plants native to Massachusetts and precludes plants on the Massachusetts "Prohibited Plant List." A detailed Landscape Plan, suitable for construction and prepared by a Massachusetts Registered Landscape Architect (Final Landscape Plan) shall be submitted to the Board for the Board's review and approval.
82. A Turf Management Plan shall be provided that adequately protects the adjacent wetland areas from nitrate and phosphate loadings.
83. Final plans shall detail anticipated impacts to abutters and parties in interest from construction noise, vibration, and required blasting.
84. Due to the extent of wetlands lying along three sides of the Development Footprint, sodium chloride shall not be used for ice and snow control.
85. The Board is not in possession of sufficient details regarding the sanitary sewer pump station and force-main located north of Townhouses 10-12 and 13-15. The

sanitary sewer pump station shall have a wet well separate from the pumps, dual-alternating grinder pumps, emergency power, and odor control filters.

86. A detail shall be provided for encasement at water-sewer crossings.
87. A photometric plan shall be submitted to the Board that demonstrates compliance with the 1 foot-candle requirements for all parking facilities and no light trespass across the property line.

#### **Conditions Precedent to Making Application For Building Permit(s)**

1. All conditions precedent to commencement of Project have been fulfilled as per this Decision and to the satisfaction of the Board;
2. The Applicant shall provide proof that the Final Plans, as approved by the Board, have been recorded at the Middlesex County Registry of Deeds and three (3) copies of the Final Plan, exactly as it recorded, shall be provided to the Board.
3. Not later than the date on which the first request for a building permit is filed, and before any building permit is issued, the Applicant shall file with the Board and all other relevant public agencies for review and for consistency with this Decision:
  - A. A copy of the request for a building permit. The building permit application must include a complete set of engineering drawings, plans and specifications (hereinafter "Complete Plans") for use by contractors, inspectors, permit compliance officers and purchasers of the proposed dwelling units. These drawings, plans and specifications shall be stamped by a Registered Architect or Professional Engineer, as appropriate, licensed in the Commonwealth of Massachusetts, and contain, at a minimum, the following information: an existing conditions plan that shows and labels all easements and wetlands located on abutting property or located on the subject property. The Board shall review the Complete Plans for conformance with this Decision. The Building Department shall not issue a building permit until receipt of the Board's report that the Complete Plans conform to this Decision.
  - B. A copy of site layout plans and profiles, shown at scales considered adequate for review purposes, of all private roads and parking areas. The Board shall review the layouts and profiles for conformance with this Decision. The Building Department shall not issue a building permit until receipt of the Board's report that there is conformance with this Decision. Roadway layouts shall include properly labeled horizontal and vertical curves and stationing. The location of these facilities shall be as identified in the above-noted layout plans.
  - C. A copy of site layout plans, and final and detailed architectural drawings (including plans and elevations) shown at scales considered adequate for review purposes, of all structures containing dwelling units as approved by this Decision, including interior floor plans, current and finished elevations, construction type and exterior finishes to the detail required for use as on-site construction drawings

and/or to obtain a building permit in accordance with the State Building Code, whichever requirement is more detailed (hereinafter "Structure Plans"). The Board shall review the Structure Plans for conformance with this Decision and so notify the Building Department. The Building Department shall not issue a building permit until receipt of an affirmative report from the Board. Housing plans for dwelling units shall also be submitted to the Building Department in accordance with the State Building Code.

- D. Final and detailed utilities plans and profiles including properly labeled drainage components and all site utilities including electric, gas, water supply lines, wetland delineation, wastewater disposal connections and appurtenances and dwelling unit connections thereto indicating that all utilities servicing this Project shall be underground within the locus of the Project and to the detail required for use as on-site construction drawings and/or to obtain a building permit in accordance with the State Building Code, whichever requirement is more detailed.
- E. Submit to the Board and all other relevant public agencies for review and final acknowledgement of consistency with this Decision a long-term property management plan for the entire development.
- F. Submit to the Board plans and elevations of all proposed signs, including the entranceway sign, sufficient to determine their compliance with the Stoneham Zoning By-Law, and the design, size and location of any intersection lighting.

#### **Conditions Precedent to Building Construction**

- 4. For each phase of the Project, prior to the start of construction of any building, roads to and within that phase of the Project will have at least the first course of pavement, all hydrants in that phase of the Project will be operational, street signs will be in place and dwelling unit numbers will be provided at the building site to avoid conflict with building and lot numbers. Street names and house numbers shall be approved by the Stoneham Fire Department.
- 5. Prior to the commencement of any work at the site, an erosion control barrier (hay bales staked end to end and siltation fence firmly anchored with six (6) inches of soil on the uphill side) shall be installed in a location reasonably acceptable to the Stoneham Conservation Commission or its representative. The erosion control barrier shall be inspected by the Conservation Commission or its representative prior to work commencing on the site and shall be maintained until all disturbed areas have been stabilized to the satisfaction of the Conservation Commission or its representative.
- 6. Limit-of-work construction fencing shall be installed in accordance with the Final Plan locations for the particular building lot.

#### **Conditions Relating to Construction**

- 7. All dwelling units shall be built by the Applicant, and its agents or contractors over it will exercise supervision and control and the acts of which for which it will be responsible, in

accordance with this Permit and the Regulatory Agreement. During construction, the name and mobile telephone number of the site manager or clerk of works employed by the Applicant shall be filed with the Building Department, the Board, and the Stoneham Police Department, and such name and mobile telephone number shall be kept current.

8. At least forty-eight (48) hours prior to any initial site work, a pre-construction meeting shall be held with the Applicant, Applicant's contractor, a representative of the Board of Appeals, its consulting engineer, and representatives of the Town departments having an interest in the plan. Said meeting shall be for the purpose of familiarization with the project, the conditions of approval, and the project's construction sequence and timetable.
9. Prior to commencement of construction, the Applicant shall provide to the Board:
  - The name, address, e-mail and business telephone number of the individual(s) responsible for all activities on Site;
  - A copy of a municipal lien certificate indicating that all taxes, assessments and charges due on the Site have been paid;
  - Proof that all required federal, state and local licenses and permits have been obtained;
10. During construction, the Applicant and its agents and employees shall conform to all local, state and federal laws regarding noise, vibration, dust and use of Town roads and utilities. The Applicant shall at all times use all reasonable means to minimize inconvenience to residents in the general area. Construction shall not commence on any day Monday through Friday before 7:00 AM or on Saturday before 9:00 AM. Construction activities shall cease by 6:00 PM on all days. No construction or activity whatsoever shall take place on Sunday.
11. The Applicant shall submit to the Board, the Building Department and the Fire Chief, for review and final acknowledgement of consistency with this Decision, final and detailed scaled architectural drawings for all structures as approved by this Decision, including interior floor plans, current and finished elevations, construction type and exterior finishes to the detail required for use as on-site construction drawings and/or to obtain a building permit in accordance with the State Building Code, whichever requirement is more detailed.
12. Grading of the site shall not result in any finished slope exceeding 25 percent in fill (4:1) or 33 percent in cut (3:1). Slope stabilization methods in addition to grass shall be utilized to the extent feasible. Design of the development shall preserve existing natural features to the maximum extent possible.
13. The Applicant shall provide soil examination and testing as needed to ascertain the suitability of the parcel for development, prior to Board's approval of Final Plans.
14. Storm water management systems shall meet the design and performance requirements of the Stoneham Subdivision Rules and Regulations unless otherwise waived by this

Decision, and shall meet the requirements of the DEP Storm Water Management Policy and Handbook (Vols. 1 & 2), as revised.

15. Interior Ways - Roadway design plans and construction details (inclusive with the Final Plans) shall be provided for approval by the Board. Except as otherwise provided by this Decision, roadway design and construction standards shall conform to the requirements of the Stoneham Planning Board Subdivision Rules and Regulations. All proposed roadway and utility construction, grading and appurtenant work shall be described in complete detail to readily enable peer review and construction. A note shall be placed on each pertinent sheet of the Plans stating that the Project is the subject of a comprehensive permit under G.L. c. 40B §22-23, that the roads and ways within the Project in some cases may and in other cases may not, conform to the standards and requirements of the Stoneham Subdivision Rules and Regulations. Sidewalks shall be provided as per approved plans and shall conform to the requirements of the Stoneham Planning Board Subdivision Rules and Regulations. The roadway cross section shall include four (4) foot grassed stabilized shoulders on each side. Complete development roadway profiles shall be provided for existing centerline and sideline grades, and proposed centerline grade. The Applicant may submit plans for pedestrian paths on one side of the ways, and any such paths shall be separate from the stabilized shoulders and shall respect existing trees. Street parking shall be prohibited.
16. Utilities -All electric, cable and telephone utilities shall be underground, and shall conform to the private utility companies' requirements.
17. Proposed underground gas, electric, cable, and telephone service, shall be shown in cross-section on the way; utilities plan and construction details shall be provided.
18. Normal water service pressure within the Project shall be a minimum thirty-five (35) psi under all conditions except fireflow. Available service pressure under peak water demand and fire flow conditions, including any additional development currently anticipated in the vicinity shall be demonstrated by use of the Town's hydraulic model.
19. Water system design and construction shall meet the requirements, standards and regulations of the Stoneham Department of Public Works and the Massachusetts Department of Environmental Protection's Guidelines and Policies for Public Water Supplies.
20. All stumps, brush, and other debris resulting from any clearing or grading shall be removed from the locus. No stumps or other debris shall be buried on the locus.
21. A written submission shall be submitted to the Board describing all easements and covenants affecting the use of the subject Stoneham site, referring to such covenants and locating such easements on a site plan. The Applicant also shall submit to the Board any written or recorded instruments granting or agreeing to such easements and covenants.
22. To ensure compliance with the terms and conditions of this Decision and any approval or order by any federal or state agency, the Applicant shall, no less than thirty (30) days prior to the request for Certificate of Occupancies for any of the structures approved in

this Decision, submit to the Board a complete and detailed "As-Built" Plans of the roadway and associated infrastructure, as set forth in the Stoneham Planning Board Subdivision Rules and Regulations and approved by the Board's consulting Engineer together with a certification from a Professional Engineer or Architect registered in the Commonwealth of Massachusetts that the Project "As-Built Plan" complies in all substantive respects with this Decision and any other approval or order by any federal, state or local agency. Progress as-built plans may be submitted for the extent of roadway and associated infrastructure serving those dwellings for which certificates of occupancy are sought. Any damage to public roads and walkways shall be repaired and/or replaced to the satisfaction of the Department of Public Works.

23. Temporary certificates of occupancy will not be permitted. The Fire Department will not sign the occupancy permit until all required fire prevention and detection systems are installed and operating, carbon monoxide detectors are installed and operating, street signs and house numbers are in place and all required inspections have been completed by the Fire Department.

#### **Administrative**

24. Within fourteen (14) days of receipt of a statement of costs incurred by the Town prior to the date of this Decision in connection with reviewing the application for a Permit, the Applicant shall submit a certified check made payable to the Town of Stoneham in an amount to compensate the Town of Stoneham for such costs.
25. The Applicant shall pay the expenses incurred by the Board and Town in evaluating the plans required by this Decision and in evaluating monitoring construction for this Project. These expenses will be deducted from the special account established by the Town Treasurer for the Applicant. Prior to any clearing, grading or construction, the Applicant must pay to the Town, by certified check, \$30,000 as an advance deposit to cover at least a portion of these expenses. The Applicant will pay any additional costs to the Town as required; and if at any time the amount of the advance deposit is reduced below \$5,000 Applicant, upon request, shall within five (5) business days pay to the town an amount sufficient to increase the amount of the deposit to \$5,000, and if the Applicant fails to pay such amount within such period all work on the project shall cease until such amount has been paid. Any excess remaining at the completion of the Project will be returned to Applicant.
26. Inspections and testing during the construction of ways and installation of utilities and the stormwater management system in accordance with the schedule set forth in the Stoneham Planning Board Subdivision Rules and Regulations shall be conducted at the expense of the Applicant. The Board may appoint an agent to conduct such inspections.
27. The Applicant must post a performance guarantee for each phase of work to be undertaken, satisfactory to and reviewed by the Board to be noted on the Plan to ensure that any construction related damage to adjacent roads is repaired by the Applicant in a manner satisfactory to the Board. This performance guarantee is to be received by the Board prior to the commencement of any of the improvements approved in the Plan and

will be required until the Board decides that the Applicant has completed all of the improvements approved in the Plan. The form of the performance guarantee, adequacy and or amount may be varied from time to time by the Applicant subject to an agreement satisfactory to the Board and reviewed by the Board's counsel.

28. The following aspects of the Project shall remain private and that the Town of Stoneham shall not have any legal or financial responsibility for operation or maintenance of:
  - A. Roadways, driveways or parking areas
  - B. Stormwater management system and appurtenances
  - C. Snow plowing or removal
  - D. Landscaping
  - E. Trash disposal or pickup
  - F. Street lighting or other illumination
  - G. Maintenance requirements of easements, access and appurtenances associated with any of the above.
29. The water system shall be constructed by the Applicant, and granted to the Town of Stoneham upon the Town's acceptance of the installed watermain and appurtenances and all required testing results. Such acceptance shall not serve to constitute acceptance of the infrastructure contained in the preceding paragraph.
30. The Applicant shall be responsible for the installation, operation, and maintenance of all aspects of the Project.
31. Time limit to build: The Applicant shall complete construction within three (3) years from the date this Permit becomes final, unless such time shall be extended in writing by the Board.
32. The Applicant has provided to the Town of Stoneham, in form and substance approved by counsel for the Town of Stoneham, Applicant's agreement that the Town of Stoneham shall be free of any liability for any act, omission or negligence caused by the Applicant, its employees, agents, subcontractors, beneficiaries or trustees with relation to this Project, and that Applicant on behalf of itself and its successors and assigns has consented and agreed to indemnify the Town, its employees, agents and officials for any harm; damage or injury caused by the Applicant, its employees, agents, subcontractors, beneficiaries or trustees with regard to this Project.
33. The fees for the engineering reviews and the Town's construction oversight shall be the obligation of the Applicant. Prior to the commencement of work by a particular consultant, the Applicant shall pay the estimated fees for the required work. No site disturbance or clearing shall commence until all past and estimated future fees are paid,

including all fees owed the Board and Town of Stoneham for peer review services completed pursuant to G.L. c.44, s.53G. See also discussion in Background section above.

34. The Applicant shall keep the site and the adjoining existing roadway area clean during construction. Upon completion of all work on the Site and prior to As-Built approval, all debris and construction materials shall be removed and disposed of in accordance with state laws and regulations and the Board shall be notified in writing of the final disposition of the materials.
35. Construction, once commenced, shall progress through to completion as continuously and expeditiously as possible and in accordance with the construction sequence and timetable approved.
36. Construction equipment shall not be parked or stored within one hundred feet (100') of any drainage channel, drainage inlet, or wetland area. Maintenance of construction equipment involving transfer of fluids and fuels shall be conducted in areas away from drainage channels and inlets and wetland buffer areas. Contractor's on-site personnel shall immediately notify the Town of any hazardous material spill, regardless of size.
37. All earth stockpiles shall be established in locations greater than fifty (50') feet from the wetlands as approved by the Board or its designee. Earth material stockpiles shall not be allowed immediately adjacent to perimeter siltation barriers or drain inlets. Long term stockpiles over 30 days shall be shaped stabilized and circled by siltation fence and haybales and shall be stabilized by temporary seeding, sheeting or netting.
38. Prior to beginning construction on any phase of the Project, the Applicant will submit to the Board for its approval a plan showing the location of all construction storage and stockpiling areas for that phase, together with details of the planned use of such areas.
39. All areas to be protected from encroachment from construction shall be marked on the ground as shown on the approved construction plans and these barriers shall be maintained by the Applicant throughout the construction phase of the project.
40. Excavation dewatering shall be in a workman like manner and such water shall be free of suspended solids before being discharged into either a wetland or any storm water drainage system. This condition applies to all forms of dewatering including pumping and trenching. No direct discharge to the wetlands is allowed. Such discharge shall be consistent with the Applicant's NPDES Notice of Intent.
41. The infiltration rate for any infiltration system proposed on site shall not exceed that recommended by Schuler et al. and by the Stormwater Management Policy, based upon soil observations and permeability testing. Soil infiltration rate shall be correlated from the percolation rate from the most restrictive soil horizon in each of the stormwater disposal areas. The design of any infiltration system shall comply with DEP Stormwater Management Policy and regulations, as revised.

### **Prior To the Issuance of a Certificate of Occupancy**

42. The Applicant shall provide the Board with proof that an appropriate budget has been established and funded to maintain the systems, dwelling units, ways and improvements in the Project consistent with that required by the subsidizing agency.
43. No building shall be occupied until the improvements specified in this Decision and set forth on the plans of record are constructed and installed so as to adequately serve said building or adequate security has been provided, acceptable to the Board, to ensure such completion. Any such performance guarantee shall be approved as to the amount and form by the Board.

### **Performance Guarantees**

44. Prior to full surety release, satisfactory as-built Plans shall be provided to the Board as required under the Stoneham Planning Board Regulations.
45. All sureties shall contain the following provision:

“The Principal shall fully and satisfactorily observe and perform in accordance with the qualifications and time schedule set forth herein specified all the covenants, conditions, agreements, terms and provisions set forth in the Decision of the Stoneham Board of Appeals dated April 27, 2016.
46. No building shall be occupied until the building utilities specified in this Decision and set forth on the plans of record are constructed and installed so as to adequately serve said building or surety provided by the Applicant, in the amount and form approved by the Board.
47. In determining the amount of any surety, the Board shall be guided by the following formula in setting the sum of the security:
  - A. An estimate of the cost to complete the work that is satisfactory to the Board; plus
  - B. A ten percent margin of error; plus an appropriate rate of inflation over a five-year period.
48. This Decision shall not substitute for compliance with the Subdivision Control Law, G.L.c. 41, s. 81-L, et seq. regarding the division of land into two or more lots.

### **VII. DECISION ON WAIVERS**

The Applicant has requested certain waivers from various rules, regulations and bylaws lawfully adopted by the Town's regulatory agencies, including its Legislature (see "Waiver List", undated and received by the Board on March 18, 2016, incorporated herein). The Board has endeavored to grant waivers from those rules, regulations, and bylaws only to the extent necessary to keep the project from becoming uneconomic and so as, wherever possible, to minimize harm and disruption to the locus and real property abutting the locus.

The Board's decision as to the waivers requested is found in Appendix "B", attached hereto and incorporated herein.

**VIII. CONCLUSION**

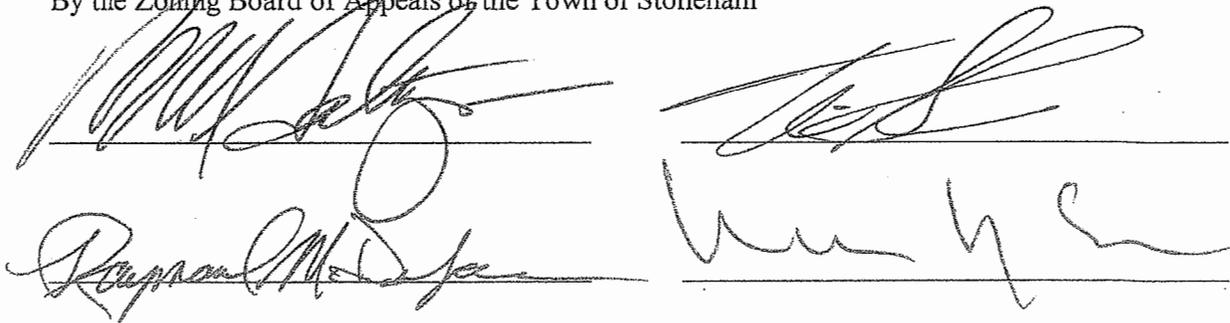
This Permit is granted with conditions. This Decision was approved by the Stoneham Board of Appeals at a meeting of the Board on April 27, 2016. This Decision must be recorded at the Middlesex County Registry of Deeds.

Any person aggrieved by this Decision may file an appeal pursuant to the provisions of General Laws, c. 40A, Section 17. Such appeal must be filed within twenty (20) days of the filing of this decision in the Office of the Town Clerk.

The Applicant has the right to appeal this Decision pursuant to the provisions of General Laws c. 40B, Section 22. Copies of this Decision and notice thereof must be recorded by the Applicant at the Middlesex County Registry of Deeds and must bear the certification of the Town Clerk that twenty (20) days have elapsed and no appeal has been filed, or that if such appeal has been filed, that it has been dismissed or denied. A certified copy of said recording must thereafter be filed with the Board of Appeals.

**THIS CONCLUDES THE DECISION OF THE BOARD OF THE APPEALS.  
SIGNATURES OF THE BOARD MEMBERS ARE FOUND IMMEDIATELY BELOW.**

By the Zoning Board of Appeals of the Town of Stoneham

Four handwritten signatures are present, each written over a horizontal line. The signatures are in cursive and appear to be of different individuals. The first two are on the top line, and the last two are on the bottom line.

DATED: April 27, 2016

--End of Decision--

**APPENDIX A: BOA Weiss Document Submission**

<b>Date</b>	<b>Document Name</b>	<b>Author</b>	<b>Company Name</b>
7/10/2014	Affadavit of Notice to Abutters	Steven Cicatelli	Cicatelli & Cicatelli
04/24/14	Letter to Mass Housing	William Solomon	Stoneham Town Counsel
6/27/2014	Comprehensive Permit Amended	Jon Witten & BoA	Board of Appeals members
6/30/2014	Application for a Comprehensive Permit	Weiss Farm Apartments, LLC	John Corcoran Co
06/30/14	Citizen comment letters	various	
07/11/14	Ethics Disclosures	Sullivan, Shulman, Juliano	Board of Appeals members
07/24/14	Department and Board comment letters	various	
07/24/14	Completeness review	John Witten	Huggins and Witten, LLC
07/24/14	Consistent with local needs To Mr Cicatelli	John Witten	Huggins and Witten, LLC
7/24/2014	Letter to BoA re Consistene wtl local needs	Jon Witten	Huggins and Witten, LLC
7/24/2014	Letter to BoA re Completeness review	Jon Witten	Huggins and Witten, LLC
08/07/14	Letter to DHCD	Richard Gallogly	Rackemann Sawyer & Brewster
08/08/14	Rackemann letter to Mr Witten re: consultants	Richard Gallogly	Rackemann Sawyer & Brewster
09/02/14	DHCD letter to Mr. Witten grounds for denial	Leverett Wing	DHCD
09/11/14	The Commons at Weiss Farm	Richard J. Gallogly	Rackemann Sawyer & Brewster
09/11/14	Rackemann letter to Mr Witten re: fee schedule	Richard Gallogly	Rackemann Sawyer & Brewster
09/11/14	Rackemann letter to Mr Witten re: incomplete ap	Richard Gallogly	Rackemann Sawyer & Brewster
09/14/14	The Commons at Weiss Farm	Jonathan D. Witten	Huggins and Witten, LLC
09/14/14	Witten letter to Mr Gallogly responses to8/8 & 9/11	Jon Witten	Huggins and Witten, LLC
9/18/14	Housing Appeals Committee Department of Housing and Community Development	Jonathan D. Witten	Huggins and Witten, LLC
9/18/14	In the Matter of Stoneham Board of Appeals and Weiss Farm Appartments, LLC	Jonathan D. Witten	Huggins and Witten, LLC
09/23/14	Email Updated Trip Distribution Summary	Heather Monticup	GPI
10/07/14	The Commons at Weiss Farm	Steven L. Cicatelli	Cicatelli & Cicatelli
10/07/14	Environmental Impact Analysis	Steven L. Cicatelli	Cicatelli & Cicatelli
10/10/14	Traffic Engineering Peer Review	Jeffrey S. Dirk	Vanasse & Associates, Inc.
10/17/2014	Public Records Request Fallon Rd & Arbors	Steven Cicatelli	Cicatelli & Cicatelli
12/03/14	Letter to Mass Housing	Jason Lewis	Mass House of Representatives

	Commonwealth of Massachusetts Housing Appeals Committee in the Matter of Stoneham Board of Appeals and Weiss Farm Apartments, LLC		
1/2/15		Jonathan D. Witten	Huggins and Witten, LLC
01/05/15	Motion in Limine	Jon Witten	Huggins and Witten, LLC
01/10/15	Hardiman vs DDS to Ellman Pearl	Jon Witten	Huggins and Witten, LLC
01/21/15	Third Amendment of Purchase & Sale	Donna Weiss & Richard High	Weiss Farm & John Corcoran Co
04/08/15	Conservation Commission Decision regarding the Notice of Intent, pursuant to the Stoneham Wetlands Bylaw, for the "Commons at Weiss Farm"	Robert Parsons	Town of Stoneham
4/8/2015	email from Bob Griffin re HW Moore response	Bob Griffin	Griffin Engineering
04/28/15	Stormwater Pump Station and Wier Dam Improvements	James White	H.W Moore Associates, Inc.
05/06/15	Weiss Farm Watershed Study	James White	
5/8/15	In the Matter of Stoneham Board of Appeals and Weiss Farm Appartments, LLC	Shelagh A. Ellman-Pearl	Department of Housing & Community Development
6/8/2015	Stormwater Pump Station & Wier Dam Improvmts	James White	HW Moore
6/9/2015	Email to Cathy Rooney re Weiss Consent Order	Ron Stelling	DEP
6/26/15	Decision on Interlocutory Appeal Regarding Applicability of Safe Harbor	Shelagh Ellman-Pearl	Commonwealth of Massachusetts Housing Appeals Committee
6/26/15	Decision on Interlocutory Appeal Regarding Applicability of Safe Harbor	Werner Lohe, Joseph P. Henefield, Constance Kruger, James G. Stockard Jr., Shelagh A. Ellman-Pearl	Commonwealth of Massachusetts Housing Appeals Committee
7/1/2015	Email to Jim White re topography of west wetland	Ingeborg Hegemann	BSC Group
7/9/2015	Operation and Maintenance Schedule	James White	HW Moore
07/31/15	Request for Superseding Order of Conditions	Richard J. Gallogly	Rackemann Sawyer & Brewster
8/13/2015	Letter to BoA Meeting schedules	Steven Cicatelli	Cicatelli & Cicatelli
08/27/15	City of Melrose comment letter to Mr Witten	John Tramontozzi	Melrose Board of Alderman
09/03/15	Traffic Engineering Peer Review	Jeffrey S. Dirk	Vanasse & Associates, Inc.
09/14/15	Email traffic peer review	Heather Monticup	GPI
09/18/15	Email traffic peer review	Jeffrey Dirk	Vanasse & Associates, Inc.
9/20/2015	Email to BoA re memory wall	Marcia Wengen	Historical Commission
09/22/15	Response to Peer Review Comments	Heather L. Monticup	Greenman-Pedersen, Inc.
09/22/15	Email traffic peer review	Jeffrey Dirk	Vanasse & Associates, Inc.
09/23/15	Email traffic peer review	Jeffrey Dirk	Vanasse & Associates, Inc.

09/23/15	Trip Distribution Journey to Work data		GPI
9/24/2015	Disc of documents sent to Mr Houston	Steven Cicatelli	Cicatelli & Cicatelli
9/26/2015	email to Jill Provencall DEO Superceding OOC	Marty Wantman	Abutter
10/01/15	Peer Review	Thomas C. Houston	Professional Services Corporation, PC
10/15/15	Traffic Engineering Peer Review	Jeffrey S. Dirk	Vanasse & Associates, Inc.
10/20/15	What is a Hawk Signal	Jeffrey Dirk	Vanasse & Associates, Inc.
10/21/15	Email traffic peer review	Jeffrey Dirk	Vanasse & Associates, Inc.
10/23/15	The Commons at Weiss Farm Response to Peer Review Memorandum Prepared by Professional Services Corporation	Richard J. Gallogly	Rackemann Sawyer & Brewster
10/27/15	Parking spaces @Lynnfield Commons	Jayne Petijean	Corcoran Management Co
10/30/15	Environmental Notification Form	Dennis J. Lowry <i>Senior Wetland Scientist</i>	AECOM
11/01/15	Opposition to State's Motion to Dismiss	Jon Witten	Huggins and Witten, LLC
11/01/15	Current ProForma	Peter Mahoney	John M Corcoran & Co
11/05/15	Response to Second Round of Peer Review Comments	Heather Monticup	Greenman-Pedersen, Inc.
11/09/15	Traffic Engineering Peer Review	Jeffrey S. Dirk	Vanasse & Associates, Inc.
11/09/15	Second Peer review comments	Susannah Theriault	GPI
11/12/2015	Stormwater Mgmt Standards	James White	HW Moore
11/16/15	Alternative Discussion to the Environmental Notification Form (ENF)	Dennis J. Lowry <i>Senior Wetland Scientist</i>	AECOM
11/25/15	Town of Stoneham Board of Appeals Re: Commons at Weiss Farm proposed development	Robert Stankus CPA, CVA, CFE	CBIZ Tofias (Accounting/Tax/Consulting)
11/28/15	Status of Responses to Comments	Thomas Houston	PSC
12/10/15	Markup by PSC of plans prepared by HWMoore	Thomas Houston	PSC
12/10/2015	Email re: MEPA Site Visit	Alexander Strysky	Comm of Mass EOEEA
12/11/15	Comprehensive Permit Application	Richard J. Gallogly	Rackemann Sawyer & Brewster
12/21/15	EEA 15444, Environmental Notification Form	Matthew A. Beaton	Huggins and Witten, LLC
12/21/2015	Letter to Mathew Beaton re ENF	Jon Witten	Huggins and Witten, LLC
12/31/2015	Email to Strysky Alexander, EOEEA	John Eaton	Citizen
1/22/2016	letter from EOEEA to Corcoran ENF Certificate	Mathew Beaton	Comm of Mass EOEEA
02/01/16	Email Bicycle Accomodations map	Heather Monticup	GPI
3/15/2016	Letter to EOEEA re: Environmental Impact report	Jon Witten	Huggins and Witten, LLC
03/16/16	Preliminary Assessment of ProForma	Robert Stankus CPA, CVA, CFE	CBIZ Tofias (Accounting/Tax/Consulting)
03/22/16	Status of Revised Plans	Thomas Houston	PSC

03/22/16	Response to Rackemann 2/1/16 letter	Thomas Houston	PSC
03/25/16	Response to R Stankus' Analysis of ProForma	Robert Engler	SEB
04/04/16	Supplemental Info to Draft & Engler's Response	Robert Stankus CPA, CVA, CFE	CBIZ Tofias (Accounting/Tax/Consulting)
04/04/16	Revised plans April 4, 2016	James White	HW Moore
04/05/16	Response to PSC Peer Review of 3/22/16	James White	HW Moore
04/06/16	Updated Snow Storage Plan	James White	HW Moore
04/07/16	Recommended Conditions of Approval	Thomas Houston	PSC
04/07/16	Conceptual Improvement Plan		GPI
04/12/16	ProFprma backup	Robert Engler	SEB
04/13/16	2nd Supplemental Information Response	Robert Stankus CPA, CVA, CFE	CBIZ Tofias (Accounting/Tax/Consulting)
04/16/16	Offsite Mitigation Commitments	John Diaz	GPI
04/18/16	Extension agreement to 5/2/16	Richard Gallogly	email
04/20/16	List of Waivers	Jon Witten	Huggins and Witten, LLC
	Consultant Resumes	various	

Documents Submitted for The Commons at Weiss Farm

Date	Document Name	Author
October 16, 1985	Drainage Study Ellen Road and Tamarock Terrace	Author Unknown (Submitted by Martin Wantman)
March 8, 1999	Letter: Possible Pollution of Stream on Weiss Farm	Dominic Ottavi, Stoneham Conservation Commission (Submitted by Martin Wantman)
July 6, 2007	Wantman V. Weiss Farm Engineering Report	Benchmark Survey (Submitted by Martin Wantman)
August 1, 2007	Certificate of Compliance	Sylvia L. Lynch, Assistant, Stoneham Conservation Commission
March 18, 2009	Compliance Inspection Summary	Martin Wantman
November 2, 2009	Letter: Weiss Farm Drainage Study Observations	RJ O'Connell and Associates
March 24, 2011	Administrative Consent Order & Notice of Noncompliance	Executive Office of Energy & Environmental Affairs
September 29, 2011	Plan of Land Weiss Farm	Hancock Associates
October 10, 2011	Plan of Land Weiss Farm (Revised)	Hancock Associates
November 18, 2011	Plan of Land Weiss Farm (Revised)	Hancock Associates
December 5, 2011	Plan of Land Weiss Farm (Revised)	Hancock Associates
December 29, 2011	ANRAD Application Weiss Farm	Hancock Associates
January 5, 2012	Plan of Land Weiss Farm (Revised)	Hancock Associates
January 11, 2012	Additional Independent Review-Abbreviated Notice of Resource Area Delineation	REC Rimmer Environmental Consulting, LLC
May 6, 2013	Letter to Steven Cicatelli: Waiver for Test Pitting	Robert Conway
May 17, 2013	Boring Report No. B-1	McPhail Associates
October 18, 2013	Letter: New England Fund Site Approval Application (Project Eligibility) for The Commons at Weiss Farm	Camille Chesnick, Resident, 2 Sparhawk Circle
November 2, 2013	Letter: The Commons at Weiss Farm Mass Housing Project #SA-13-006	Gale Spadafora, Resident, 21 Stonewood Ave.

Documents Submitted for The Commons at Weiss Farm

Date	Document Name	Author
November 5, 2013	Letter: Environmental Protection Agency to Corcoran & CO	Raymond Putnam, Environmental Scientist, EPA
November 12, 2013	Letter: The Commons at Weiss Farm/170 Franklin Street	Mayor Dolan, City of Melrose (Mayor's Office)
December 2, 2013	Letter: Development of the Weiss Farm site	Jason M. Lewis, State Senator
February 7, 2014	Letter: Commons at Weiss Farm (to Conservation Commission)	John Eaton, Resident, 18 Citation Ave.
April 27, 2014	Updated Hydrocad Calculations and Stormwater Summary Due to Minor Modifications to Infiltration/Detention System B (Updated Mounding Calculations)	H.W. Moore Associates, Inc.
June 17, 2014	Commons at Weiss Farm Comprehensive Permit Application Comments	Robert Grover, Director, Department of Public Works
June 25, 2014	Notice of Intent PLAN Submission	H.W. Moore Associates, Inc.
August 12, 2014	Letter: Water pump at Weiss Farm to John Fralick, Stoneham Health Department	Donna Weiss
August 12, 2014	Letter: DEP Site Inspection Notice to Weiss Farm Apartments, LLC	Jill Provencal, Environmental Analyst, Wetlands Program NERO
November 3, 2014	Storm Runoff Analysis & Operation and Maintenance Plan	H.W. Moore Associates, Inc.
November 12, 2014	Notice of Intent PLAN Submission (Revised)	H.W. Moore Associates, Inc.
December 1, 2014	Notice of Public Hearing, NOI	Cicatelli & Cicatelli
December 18, 2014	Notice of Intent	AECOM
December 22, 2014	NOI 11x17 sets pf plans	John M. Corcoran
December 22, 2014	Notice of Intent	John M. Corcoran
December 22, 2014	Storm Runoff Analysis & Operation and Maintenance Plan	John M. Corcoran
January 6, 2015	Certified List of Abutters	Cicatelli & Cicatelli
January 6, 2015	Letter: Department of the Army Corps of Engineers from Martin Wantman 2/3/2006	Martin Wantman

Documents Submitted for The Commons at Weiss Farm

Date	Document Name	Author
January 6, 2015	In the Matter of:Weiss Farm ACO No. ACO-NE10-6W002	Martin Wantman
January 6, 2015	John Astley memo from M. Wantman 1/05/2006	Martin Wantman
January 6, 2015	Original Certified Mail Receipts	Cicatelli & Cicatelli
January 6, 2015	Original Certified Mail Return Receipts	Cicatelli & Cicatelli
January 6, 2015	Storm Runoff Analysis	Martin Wantman
January 6, 2015	Weiss Farm Memo to Stoneham Conservation 1/12/2005	Martin Wantman
January 21, 2015	Third Amendment of Purchase and Sale Agreement	John M. Corcoran
February 16, 2015	Letter: Weiss Farm Apt. LLC's Notice of Intent Is Prematurely Filed and Should Be Rejected By the Conservation Commission In Accordance With 310 CMR	William Solomon, Esq., Counsel, Town of Stoneham
February 20, 2015	Notice of Intent and Drainage Review	Robert Griffin, P.E. Griffin Engineering Group, LLC
March 4, 2015	Notice of Intent Plan Submission (Revised)	H.W. Moore Associates, Inc.
March 6, 2015	Storm Runoff Analysis & Operation and Maintenance Plan (Revised)	H.W. Moore Associates, Inc.
March 10, 2015	Response to 2/20/15 Griffin Peer Review	H.W. Moore Associates, Inc.
April 1, 2015	Letter: Heidi Zisch, Esq., Chief Regional Counsel, MassDEP - Northeast Region Office, Re: Construction of 310 CMR 10.05 (4)e MassDEP	Huggins and Witten, LLC
April 2, 2015	DEP Notice of Intent Comments-File No. 297-0371	H.W. Moore Associates, Inc.
April 8, 2015	Conservation Commission Decision regarding the Notice of Intent, pursuant to the Stoneham Wetlands Bylaw, for the "Commons at Weiss Farm"	Robert Parsons, Chair, Stoneham Conservation Commission
April 8, 2015	Notice of Intent and Drainage Review of 3/10/15 by Griffin	Robert Griffin, P.E. Griffin Engineering Group, LLC
April 17, 2015	Proposal to Provide Peer Review Services	BSC Group

Documents Submitted for The Commons at Weiss Farm

Date	Document Name	Author
April 28, 2015	Stormwater Pump Station & Weir Dam Improvements	H.W. Moore Associates, Inc.
April 28, 2015	Stormwater Pump Station at Franklin Street	H.W. Moore Associates, Inc.
April 30, 2015	Notice of Intent Submission (Revised)	H.W. Moore Associates, Inc.
May 1, 2015	Response to Peer Review Report Dated April 8, 2015	H.W. Moore Associates, Inc.
May 5, 2015	Boring Report No. B312	McPhail Associates
May 7, 2015	Weiss Farm Watershed Study	H.W. Moore Associates, Inc.
May 7, 2015	Compliance Inspection Summary: Weiss Farm - Stoneham - ACOP-NE-06-6W018 (March 18, 2009)	Martin Wantman
June 8, 2015	Stormwater Pump Station and Weir Dam Improvements (Revised June 8, 2015)	John M. Corcoran
June 10, 2015	Weiss Farm Watershed Study (Revised)	H.W. Moore Associates, Inc.
June 10, 2015	Pump Station and Weir Dam Report (CD)	H.W. Moore Associates, Inc.
June 17, 2015	Engineering Review-Proposed Drainage Modifications	Robert Griffin, P.E. Griffin Engineering Group, LLC
June 26, 2015	Decision on Interlocutory Appeal Regarding Applicability of Safe Harbor	Commonwealth of Massachusetts Housing Appeals Committee
July 2, 2015	Additional Topography of Weiss Farm (West) PDF	H.W. Moore Associates, Inc.
July 6, 2015	Existing Conditions with Abutters	H.W. Moore Associates, Inc.
July 7, 2015	Notice of Intent and Drainage Review	Robert Griffin, P.E. Griffin Engineering Group, LLC
July 8, 2015	Copy of Newspaper Article: Joint Committee Approves Many Projects (Article references Meetinghouse Brook Drain)	Martin Wantman
July 9, 2015	Response to Peer Review Report Dated June 7, 2015	H.W. Moore Associates, Inc.
July 9, 2015	The Commons at Weiss Farm: Operation and Maintenance Schedule for Constructed Site	John M. Corcoran

Documents Submitted for The Commons at Weiss Farm

Date	Document Name	Author
July 16, 2015	Certification Pursuant to M.G.L Regarding Participation in a Session of an Adjudicatory Hearing	Robert Parsons, Chair, Stoneham Conservation Commission
July 16, 2015	Certificate Pursuant to MGL c. 39 23D Regarding Participation in a Session of an Adjudicatory Hearing	Town of Stoneham
July 22, 2015	WPA Form 5 - Order of Conditions for Weiss Farm Apartments, LLC (Denial)	Stoneham Conservation Commission
July 27, 2015	Pro Forma	Cicatelli & Cicatelli
July 29, 2015	Request to view or copy files by Steven Cicatelli, Esq. (Requested proposed draft approval/OOC and proposed draft denial/OOC with accompanying notes discussed at July 22, 2015 Conservation Commission Mtg)	Steven Cicatelli, Esq.
July 31, 2015	Request for Superceding Order of Conditions	Rackemann Sawyer & Brewster
September 18, 2015	Superseding Order Request - Infiltration System Capacity DEP File No. 297-0371	Robert Griffin, P.E. Griffin Engineering Group, LLC
September 22, 2015	Letter: DEP Information Request to Peter Mahoney c/o Weiss Farms Apartments, LLC	Jill Provencal, Envirmental Analyst, Wetlands Program NERO
October 13, 2015	Stormwater Management Standards, Revised September 21, 2015, submitted to Jill Provencal, Mass DEP -NERO	H.W. Moore Associates, Inc.
November 12, 2015	Letter: To Secretary Beaton, EOEEA, (attention MEPA Office): Alternative Discussion The Commons at Weiss Farm	Dennis Lowry, AECOM
December 14, 2015	Letter: Requesting ENF from Secretary Beaton	Robert Dolan, Mayor, City of Melrose
December 21, 2015	Letter: Requesting ENF from Secretary Beaton	Paul Brodeur, State Representative
December 21, 2015	EEA 15444 "The Commons at Weiss Farm" December 21 2015 Response from the Stoneham Board of Selectmen	Huggins and Witten, LLC
January 22, 2016	Certificate of the Secretary of Energy and Environmental Affairs on the ENF	Executive Office of Energy & Environmental Affairs
January 28, 2016	NOTICE OF INTENT SUBMISSION (REVISED) w/ Operations and Maintenance Schedule (REVISED)	H.W. Moore Associates, Inc.
December, 2015	Letter: Requesting ENF from Secretary Beaton	Michael Day, State Representative
December, 2015	Letter: Requesting ENF from Secretary Beaton	Jason M. Lewis, State Senator
January, 2015 (No specific date provided)	Letter: The Commons at Weiss Farm	John Eaton, Resident, 18 Citation Ave.
June 11, 2015	Stormwater Pump Station & Weir Dam Improvements (Revised June 8, 2015)	H.W. Moore Associates, Inc.
June 11, 2015	Weiss Farm Watershed Study (Revised June 10, 2015)	H.W. Moore Associates, Inc.
No Date	Letter: To Mr. Sweeney, Board of Selectmen	Robert Conway

Documents Submitted for The Commons at Weiss Farm

Date	Document Name	Author
No Dates	Photos Submitted by Martty Wantman	Martin Wantman
Various Dates	Various Documents(submitted by Marty Wantman)	Various Authors

**Waiver Requests and DECISION OF THE BOARD OF APPEALS AS TO EACH REQUESTED WAIVER: APPENDIX B**

Through the Comprehensive Permit, the Stoneham Board of Appeals has the authority under M.G.L. chapter 40B and its implementing regulations to waive requirements of local bylaws; further, the Board of Appeals can act on behalf of any local permitting authority through the Comprehensive Permit process. The project plans reflect an attempt to minimize the number of waivers requested and we believe reflects a plan that is contextually appropriate on several different levels. Following please find a preliminary table of the waivers necessary to permit the proposed project; the Applicant reserves the right to supplement this list will be updated as necessary as permitting proceeds.

**WAIVERS FROM ZONING**

	REQUIREMENT*	PROPOSED	SIGNIFICANCE/EXPLANATION	DECISION OF THE BOARD
1. Chapter 15; 4.2.2 -Permitted Use in Residence A	One family dwelling and accessory garage structure	Three multi-family apartment buildings, one with an integral parking garage as shown, five multi-family townhouse buildings with integral parking garages as shown, one detached parking garage structure as shown, one clubhouse/leasing/sales office building and one maintenance building.	Needed for plan as proposed	Granted for the project as conditioned and approved.
2. Chapter 15; 5.2.1 -Table One - Minimum Lot Area per Dwelling	10,000 sf/unit	4,315 sf/u	Needed for plan as proposed	Granted for the project as conditioned and approved.
3. Chapter 15; 5.2.1 -Table One- Maximum Building Height	30 feet	62 feet at larger apartment buildings, 35 feet at townhouse buildings and 30 feet at clubhouse building	Needed for plan as proposed	Granted for the project as conditioned and approved.
4. Chapter 15; 5.3.7.1 -Space Between Buildings	30 feet	22 feet between Building B and Clubhouse	Needed for plan as proposed	Granted for the project as conditioned and approved.
5. Chapter 15; 6.3.3 -Parking Requirement for Multi-Unit Development	2.1/unit	1.65/unit	Needed for plan as proposed	DENIED.
6. Chapter 15; 6.3.4.1 -Parking Space Size	9'x 18'	Generally 9'x18', but columns encroach 1' into some spaces in Garage C	Needed for plan as proposed	DENIED.
7. Chapter 15; 6.3.4.2 #10 - Parking Layout, Snow Storage	Allow for storage within parking areas	Storage will be handled onsite, not necessarily in parking areas	Needed for plan as proposed	DENIED.
8. Chapter 15; 6.3.5.2 -Parking Screening	4' w x 4' tall screening at all parking areas from adjacent lots	Sufficient screening is provided, as shown on sheet L-1	Parking areas are screened from adjacent residences by 100'+ of natural vegetation with the exception of Weiss residences, where screening is proposed as shown	DENIED.
9. Chapter 15; 6.3.5.1, 6.6.2.1, 6.8.7.1 -Parking Lighting	Minimum 1fc over entire lot, no trespass on street or abutting property	Lighting is provided as shown on sheet L-2	1 fc over entire site would be too bright, some spillover occurs at driveway entrance and Weiss abutting homes	DENIED.
10. Chapter 15; 6.3.6 - Driveway Access Permit	Permit required from DPW	Permit requested from ZBA		Granted for the project as conditioned and approved.
11. Chapter 15; 6.3.7.1 - Loading Bay	One required per 25,000 sf of building	None provided	Loading will be done through main and side building entries	Granted.
12. Chapter 15; 6.7, Table 2 - Number of Signs, Size of Signs	One sign per lot	One primary entry monument sign, one building identification monument sign, four directional monument sign and six building mounted identification signs as shown on the architectural, site and landscaping plans	Needed to identify and market community and to aid in traffic flow	DENIED.
13. Chapter 15; Sec. 6.8.10 - Alteration of Land	Suitably landscape areas of land alteration	Landscaping as shown on plans	To clarify requirement	DENIED.
14. Chapter 15; 6.10- Land Fill Permit	Permit required from Building Inspector	Permit requested from ZBA		DENIED.

**WAIVERS FROM LOCAL BY LAWS**

15. Chapter 6; Sec. 6.3-3 - Recycling	Recycling to be separated between "Paper" and "CoMingled" items	All recycling materials will be handled through "single stream" recycling where all recyclables are placed into a single container and sorted offsite	All materials are recycled results in higher recycling percentage	Granted.
16. Chapter 11, Wetland Protection By-Law	No disturbance within 25 feet of a wetland resource area	Allow for the restoration of degraded areas within 25 feet of the wetlands, and allow for pedestrian path to cross through the 25 foot strip.	The site has at least two locations where there are stockpiles of miscellaneous fill adjacent to the wetlands which should be removed. The pedestrian path is necessary to access the property on the opposite side of the wetlands at the existing pedestrian bridge	DENIED.
17. Chapter 13-1 - Streets and Sidewalks, Excavation	Permit required from Board of Selectmen	Permit requested from ZBA		Granted for the project as conditioned and approved.
18. Chapter 13-15 - Streets and Sidewalks, Street Opening	Permit required from DPW	Permit requested from ZBA		Granted for the project as conditioned and approved.
19. Chapter 13A -Earth Removal	Permit required	Permit requested		Granted for the project as conditioned and approved. No approval granted for any activities regulated pursuant to the Wetlands Protection Act or Stoneham Wetland Protection Bylaw.
20. Chapter 18; Sec 18-33(l), Comp. Permit Submittal Requirements	Utility Plan including supporting information that utility connections meet federal, state and local regulations	Utility plan provided shows nature and location of all utilities	Level of detail is not required by 760 CMR:56.05	DENIED.
21. Chapter 18; Sec 18-33(k), Comp. Permit Submittal Requirements	Pro Forma	Provided	Not required by 760 CMR:56.05	DENIED.
22. Chapter 18; Sec 18-33(n), Comp. Permit Submittal Requirements	Environmental Impact Analysis	Provided	Level of detail is not required by 760 CMR:56.05	Granted for the project as conditioned and approved. No approval granted for any activities regulated pursuant to the Wetlands Protection Act or Stoneham Wetland Protection Bylaw.
23. Chapter 18; Sec 18-33(p), Comp. Permit Submittal Requirements	Statement of Impact on Municipal Facilities and Services	Not provided	Level of detail is not required by 760 CMR:56.05	DENIED.
24. Chapter 18; Sec 18-34 - Filing Fee	\$3,000 base fee plus \$100 per unit proposed	Fee being paid, but waiver requested	In keeping with 760 CMR: 56.05, fee of this magnitude (\$29,400) is not "reasonable" for an affordable housing development.	DENIED.
25. Chapter 20; Secs. 20-28 & 32 - Location and Siting of Dumpster	Location to be submitted for approval	Location shown on Sheet C-2 and approval requested.	To clarify requirement	Granted.
26. Chapter 20; Secs 20-34 & 35, Board of Health, Dumpster Permit	Permit required from Board of Health	Permit requested from ZBA		DENIED.

\*To the extent that the plans show work requiring additional waivers not expressly set forth above, these waivers are also requested. We further request waivers from any permit requirements that may arise from conditions of approval imposed by the ZBA and recommendations of peer review consultants that have been agreed to by the Applicant. **DECISION OF THE STONEHAM BOARD OF APPEALS WITH RESPECT TO THE FOREGOING WAIVER REQUESTS: DENIED.**





# The Commons at Weiss Farm

Stoneham, MA

*Application for a Comprehensive  
Permit*

Submitted by

Devcon, Inc. and 7 Young Associates, Inc.

1997









# **The Commons at Weiss Farm**

Stoneham, Massachusetts

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

*Submitted by:*

Weiss Farm Apartments, LLC

June, 2014

## REQUEST FOR FINDINGS OF FACT

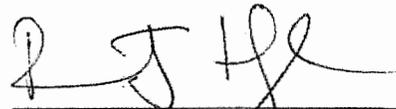
The applicant requests that the Board of Appeals make the following findings of fact in connection with the action of the Board on this application:

1. Weiss Farms Apartments LLC, a limited dividend organization within the meaning of General Laws, Chapter 40B, is eligible to receive a subsidy under a state or federal affordable housing program after a Comprehensive Permit has been granted.
2. The applicant has shown evidence of its site control to qualify it as a recipient of a Comprehensive Permit for this site.
3. Masshousing, as the Program Administrator of the New England Fund Program, will be the subsidizing agency within the meaning of the regulations of Chapter 40B (760 CMR 56.00) and within the meaning of the procedural regulations of the Housing Appeals Committee (760 CMR: 56.06).
4. The number of low or moderate income housing units in the Town of Stoneham constitutes less than ten percent (10%) as reported in the latest decennial census of the city and reported by the Department of Housing & Community Development as of April 30, 2013.
5. The development as proposed in the application is consistent with local needs within the meaning of General Laws, Chapter 40B, Section 20.

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

Weiss Farms Apartments LLC

By:



Richard J. High  
Authorized Representative  
Weiss Farms Apartments LLC

Town of Stoneham Massachusetts  
**ZONING BOARD OF APPEALS**

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Premises affected: A 25.6 acre parcel of land, at 170 Franklin Street

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

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Weiss Farm Apartments, LLC (hereinafter the "Applicant") hereby applies to the Board of Appeals of the Town of Stoneham, Massachusetts, pursuant to General Laws, Chapter 40B, Sections 20 through 23, as amended, for the issuance of a Comprehensive Permit authorizing the applicant to construct 264 garden style apartment units on land located at 170 Franklin Street in Stoneham, Massachusetts. The applicant and the development are more particularly described in the exhibits hereto annexed and submitted simultaneously herewith, all of which are incorporated herein by reference and constitute the documents required to be submitted under the regulations for filing a Chapter 40B application by the Massachusetts Department of Housing and Community Development (760 CMR 56.00).







## PROJECT DATA SUMMARY

### 1. Applicant

Weiss Farms Apartments LLC (the "Applicant") has been organized under the General Laws of the Commonwealth of Massachusetts and is qualified to undertake the planning and development of the proposed apartment community in Stoneham, MA. The Applicant proposes to develop 264 garden style apartment units on a limited dividend basis as required under all laws and regulations of the Commonwealth of Massachusetts. The firm, John M. Corcoran and Company, whose principals are the primary members of the development team, has extensive experience on a number of mixed-income housing developments over the past 35 years. The Applicant respectfully requests that all notices from the Board in connection with this Application be sent to Peter Mahoney at John M. Corcoran and Company, 100 Grandview Road, Suite 207, Braintree MA. 02184 or electronically to pmahoney@corcoranmgmt.com as well as to Geoffrey Engler at SEB LLC, 165 Chestnut Hill Ave #2, Brighton, MA 02135 or electronically to gengler@s-e-b.com.

### 2. Description of the Development

The proposed project, The Commons at Weiss Farm ("The Commons"), is located at 170 Franklin Street in Stoneham. Access to The Commons is proposed through a double wide entry from Franklin Street, just west of the existing Weiss Farm entrance. The entrance area will be heavily landscaped and bordered by townhouse buildings on either side. The two and ½ story townhouse buildings will face Franklin Street complementing the scale of the adjacent neighborhood fabric. The main entrance invites residents and visitors down a gently sloped access drive into the community, which is approximately 4' below the elevation of Franklin Street. A series of three story townhouses create a well defined streetscape edge while also allowing for a densely planted buffer from Franklin Street. Moving further north into the site, three 5-story multifamily buildings are organized around a central open green space, which is also proposed to include the clubhouse building and exterior amenities including a pool area, meandering paths, bbq areas, patios and open lawn areas for active recreation. Native shade and ornamental trees will accentuate the architecture, provide year round interest, and define the open space as attractive and useable. The two larger apartment buildings located closest to Franklin Street have been oriented to minimize their visual impact to Franklin Street. The largest "u-shaped" multifamily residential building will sit at the rear of the site and will house ground level garage parking in addition to the residences within the building. The first level of the apartment buildings will be faced in stone to integrate with the overall site character.

The composition of the site and its development responds to its specific context, taking advantage of the site characteristics to create a visually interesting sequence of buildings and spaces while limiting visual impacts to surrounding areas. The site's predominant topography is lower than surrounding land, and some of the existing interior land will be further lowered. The taller structures are located towards the center of the site. To separate the new development from surrounding areas, the buildings will be bounded by landscaped parking areas and substantial natural buffers which form most of the perimeter of the site. The buildings have varied scale, massing, orientation and architectural expression to diminish potential visual impacts from public vantage points and nearby areas. Townhouses will flank the entrance drive and continue along the site edges nearest Franklin Street. Taller buildings will be relegated to sites behind the townhouse and a small clubhouse facility, with their narrowest facades facing towards the public way.

Vehicular and emergency access, along with parking, is provided around the perimeter of the site, with a looped circulation system. The majority of parking is provided through surface parking, with additional parking located within the townhouse buildings, in a detached garage located adjacent to Building A, and within the larger "u-shaped" apartment building at the northern end of the site. The project includes a network of pedestrian friendly

sidewalks and a nature trail connecting a series of larger open spaces within the site to promote an active lifestyle.

The composition is also intended to create an excellent living environment for the residents, visually connected to its natural setting and linked to the community. The buildings are clustered around a sequence of interior open spaces that will provide a green visual amenity, complementing views towards the natural band that surrounds most of the site. A sequence of sidewalks will lead from a landscaped entrance that forms a front yard for the townhouse units and into the heart of the development. A short trail will lead across a pedestrian bridge into open land that will remain undeveloped, adding to the range of spaces and places that the resident's can enjoy.

The apartments will be built on land significantly lower in elevation to the majority of the surrounding residential neighborhoods. Therefore, many of the neighboring homes will sit at a higher elevation than the apartment buildings. There is also an existing wide, lush, vegetative buffer that will provide additional visual screening from these neighboring homes. These buffers range from 100' to 400' wide. Building setbacks from adjacent homes range from 300' to 700', except at the Weiss family properties where a dense buffer with a mix of native vegetation is proposed. On a whole, the density of the proposed development is consistent with surrounding multifamily developments, including four separate developments in the immediate vicinity which are denser than the proposed project.

The Clubhouse has been oriented and designed to be welcoming and accessible from both the main access drive and all residences within the community. The fitness area and lounge will be carefully sited for convenient use by residents, with the lounge overlooking a pool and recreation area. The architectural design is a close replica of the larger Weiss Farm barn, which combined with a complementary landscape design and state-of-the-art interior design will encourage the residents to gather in a central location reinforcing a sense of community while also reinforcing the pedestrian connections throughout the site.

The residential buildings are designed with the suburban feel of the Town of Stoneham in mind. The architecture of each residential building is articulated with changes in the exterior wall plane, a mix of materials, bays, and projecting and recessed balconies to reduce the mass and scale of the buildings. The exterior material palette includes stone at the first floor, and fiber-cement lap-siding and paneling at the upper floors in 3 colors to highlight the architectural textures and rhythms of the residential elevations, topped by a sloped, asphalt-shingled roof with multiple gables.

Within each of the larger buildings the typical floor plan provides access to homes off of a central double-loaded corridor with egress stairs at each end and an elevator lobby in the center. Typical studio, one, two, and three bedroom homes are designed with open kitchen/living areas and comfortable bedroom and bathrooms with large walk-in closets. Large windows provide abundant natural light at each home. Ground level patios with views to open spaces will be integrated into the architectural design where feasible. The townhouse buildings will each contain three 3-bedroom homes. They will have a one-car garage and master bedroom/bathroom on the ground level, a kitchen and living area on the 2<sup>nd</sup> floor and two additional bedrooms with bathrooms on the third floor.

The Commons will seek a Leadership in Energy and Environmental Design (LEED) certification from the United States Green Building Council. In addition to maintaining approximately 80% of the site as permeable, and incorporating high quality low VOC finishes and individual environmental control, each unit will contain modern energy efficient appliances, heating and cooling, in-unit laundry, and Energy Star lighting fixtures to add to an overall sense of luxury and quality at The Commons

3. Qualification as a 40B Development

The development qualifies as assisted "low or moderate income housing" within the meaning of Massachusetts General Laws Chapter 40B, section 20 and will provide 66 units (25%) which will serve households earning at or below 80% of area median income and thus will meet the definition of low and moderate income under the statute. The Applicant desires to develop this project pursuant to the guidelines of the New England Fund Program administered by Masshousing under which a site approval letter has been granted.

Preliminary architectural drawings and engineering plans are attached hereto in reduced form and under separate cover as full size drawings.

4. Local Need

According to figures compiled by the Massachusetts Department of Communities and Development (DHCD), in April 2013, Stoneham's subsidized housing inventory represented 5.3 % of its total housing stock, which is below the threshold requirements established under Chapter 40B of M.G.L.

5. Exceptions and Approvals Requested

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

CONCLUSION

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







## APPLICANT STATUS

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



## APPLICANT STATUS

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

TEL: 617.854.1000 | FAX: 617.854.1091  
VP: 866.758.1435 | [www.masshousing.com](http://www.masshousing.com)

June 23, 2014

Weiss Farm Apartments LLC  
100 Grandview Road, Suite 207, Braintree, MA 02184  
Attention: Richard J. High

VIA CERTIFIED MAIL

Re: The Commons at Weiss Farm  
Stoneham, MA (SA-13-006)  
Project Eligibility (Site Approval) Application

Dear Mr. High:

This letter is in response to your application for a determination of Project Eligibility (Site Approval) pursuant to Massachusetts General Laws Chapter 40B ("Chapter 40B"), 760 CMR 56.00 (the "Regulations") and the Comprehensive Permit Guidelines issued by the Department of Housing and Community Development ("DHCD") (the "Guidelines" and, collectively with Chapter 40B and the Regulations, the "Comprehensive Permit Rules"), under the following program (the "Program"):

- New England Fund ("NEF") Program of the Federal Home Loan Bank of Boston ("FLHBB").

Weiss Farms Apartments LLC has filed a proposal with MassHousing pursuant to Chapter 40B. The proposal is to build 264 units of rental housing (the "Project") on approximately 25.67 acres of land at 170 Franklin Street (the "Site") located in Stoneham (the "Municipality").

This letter is intended to be a written determination of Project Eligibility ("Site Approval") in accordance with the Comprehensive Permit Rules, establishing fundability by a subsidizing agency under a low or moderate-income housing subsidy program pursuant to the Guidelines which may be found at [www.mass.gov/hcd/docs/legal/comprehensivepermitguidelines.pdf](http://www.mass.gov/hcd/docs/legal/comprehensivepermitguidelines.pdf). To the extent that Project funding is provided by a non-governmental entity such as a Federal Home Loan Bank this letter is also intended to be a determination of Project Eligibility ("Site Approval") by MassHousing acting as a Subsidizing Agency (formerly, "Project Administrator") under the Guidelines, including Part V thereof, "Guidelines for Housing Programs in Which Funding Is Provided by Other Than a State Agency."

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MassHousing staff has performed an on-site inspection of the Site, which local boards and officials were invited to attend, and has reviewed the pertinent information for the Project submitted by the Applicant, the Municipality and others in accordance with the Comprehensive Permit Rules. As a result of our review, we have made the following findings as required pursuant to 760 CMR 56.04(1) and (4): (a) that the proposed Project appears generally eligible under the requirements of the housing subsidy program, subject to final approval under 760 CMR 56.04(7) ("Final Approval"); (b) that the Site of the proposed Project is generally appropriate for residential development taking into consideration the information provided by the Municipality regarding actions previously taken to meet affordable housing needs; (c) that the conceptual project design is generally appropriate for the site on which it is located; (d) that the proposed Project appears financially feasible within the housing market in which it will be situated based on comparable rentals; (e) that an initial pro forma, including a land value determination consistent with the Guidelines, has been reviewed, and the Project appears financially feasible and consistent with the Guidelines for cost examination and limitations on profits and distributions on the basis of estimated development costs, and the Project is fundable under the Program; (f) that the Applicant would be eligible to apply as a Limited Dividend Organization in connection with an application for financing under the Program; and meets the general eligibility standards of the Program; and (g) that the Applicant controls the Site. Each such finding, with supporting reasoning, is set forth in further detail on Attachment 1 hereto.

As noted, MassHousing staff has determined that the Project appears generally eligible under the requirements of the NEF Program, subject to final review of eligibility and to Final Approval. In order to maintain eligibility under the NEF Program the following requirements must be addressed as part of your Final Approval application submission:

1. Financing for the Project must originate from a subsidizing lender that is a member of the FHLBB; a minimum of 25% of the financing must be obtained from the NEF Program; the construction and permanent financing must be for a minimum term acceptable to the Subsidizing Agency; and other financing terms and conditions must be substantially similar to terms used by the Subsidizing Agency in its own lending programs or otherwise be commercially reasonable. Evidence of a firm commitment for financing for the Project must be provided during your request to MassHousing for Final Approval. The Regulatory Agreement shall provide that any transfer of all or a portion of the NEF lender's interest (including participations or sale of servicing rights) during the approved term of the construction loan or, if applicable, the first five (5) years of the permanent financing, shall be subject to the approval of the Subsidizing Agency.
2. The Applicant must offer a minimum of 25% of the units for rental to households earning no more than 80% of the area median income, adjusted for household size, as published by the U.S. Department of Housing and Urban Development (HUD). The initial maximum housing cost (rent plus applicable utility allowances) for the affordable units

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must be set at levels affordable to households earning no more than 80% of the area median income as determined by MassHousing based on the income limits published annually by HUD as adjusted for household size (based on 1.5 persons per bedroom). The most recent HUD income limits indicate that 80% of the current median income for a 4-person household in the Municipality is \$67,750.

3. The Applicant must enter into a Regulatory Agreement acceptable to MassHousing in the form for the applicable Program, ensuring compliance with the Comprehensive Permit Rules and the Program. If the Project is funded through the NEF Program, MassHousing will serve as the Subsidizing Agency under the Regulatory Agreement. The legal description of the Site attached to the Regulatory Agreement must be in recordable form.
4. The Applicant must comply with the Land Value Policy described in Section IV (B) (1) of the Guidelines and, if applicable, MassHousing's Acquisition Value Policy. *Please note that the proposed purchase price of \$7,686,200 exceeds the "As Is Market Value" of the property determined by the MassHousing commissioned independent appraisal.* The maximum permissible acquisition value that can be included, for limited dividend purposes, in the Development Budget approved at Final Approval and at the time of Cost Examination/Cost Certification, is the "As Is" value determined by the MassHousing commissioned independent appraisal of \$1,800,000 plus reasonable and verifiable carrying costs (where permitted by the Guidelines) from the October 2, 2013 date of your Site Approval application.
5. In accordance with Section 15 of the Purchase and Sale Agreement, evidence of legal site subdivision into two parcels is required prior to Final Approval.
6. The Applicant must be a Limited Dividend Organization and agree to limit the profit on, and distributions from, the Project in accordance with the Comprehensive Permit Rules.
7. The Project must comply with the Commonwealth's Sustainable Development Principles.
8. The Applicant must demonstrate that the Project will comply with EPA's Energy Star guidelines or with similar standards acceptable to MassHousing. The Applicant must make an application and submit plans to the local Energy Star administrator.
9. Final plans for the Development must show the number and location of handicapped accessible rental units in compliance with all applicable state and federal regulations.
10. The affordable rent levels must comply with the then-applicable 80% of Area Median Income (AMI) rent standard as adjusted for the required utility allowances. If any utility allowances are proposed at the time of Final Approval, appropriate supporting documentation shall be provided by the Applicant.

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11. In accordance with the Interagency Agreement Regarding Housing Opportunities for Families with Children dated January 17, 2014 (attached) at least 10% of the units in the Project must have three (3) or more bedrooms. Evidence of compliance with this requirement must be provided at Final Approval.

### **Municipal Comments**

The Municipality was given a thirty (30) day period in which to review the site approval application and submit comments to MassHousing. In response to a request from the Stoneham Board of Selectmen this review period was extended to sixty (60) days. The Chairman of the Stoneham Board of Selectmen provided an initial comment letter, received by MassHousing on December 19, 2013, identifying numerous concerns with the Project, and urging MassHousing to deny the Application for Site Approval.

On January 14, 2014, MassHousing and the Municipality received revised site plans, showing modifications made by the Applicant in response to feedback from MassHousing and the Municipality regarding the site layout and building design. The number of units and overall unit mix remained the same as in the original submittal. Revisions to the site plan included reorientation of the larger apartment buildings around a central open space, and the incorporation of five smaller townhouse structures to better integrate the Project into the surrounding neighborhood.

Following receipt of the revised Site Plan, Stoneham Selectmen asked for and were granted an additional forty-one (41) days to review the revised plans. On February 19, 2014, MassHousing received a second comment letter from the Stoneham Board of Selectmen stating that the revised Site Plan did not address their initial concerns. They stated that they remained in opposition to the Project, and affirmed that all of the comments included in the initial comment letter remained unchanged. The second letter also included a brief evaluation of the Project's compliance with the Commonwealth of Massachusetts "Sustainable Development Principles".

In response to a request from the Municipality, the Applicant agreed to a public meeting scheduled for May 19, 2014 intended to provide further opportunity for public comment. Subsequent to that public meeting the Municipality submitted additional comments in a letter dated May 29, 2014, expressing disappointment with the outcome of the presentation and restating all previous comments.

Municipal comments identified the following major areas of concern:

- Stoneham Selectmen expressed the belief that the Applicant failed to have a pre-application meeting with representatives from the Town of Stoneham prior to the

submittal of their application to MassHousing. They noted that a pre-submittal meeting was a MassHousing requirement and urged MassHousing to deny the application on this basis.

- Stoneham Selectmen questioned the Applicant's eligibility to apply for a determination of Site Approval because they fail to provide evidence that they are a "public agency, a non-profit organization, or a Limited Dividend Organization", as required by 760 CMR 56.04 (1) and 760 CMR (4) (f). MassHousing has determined that there is no reason that this requirement could not be met in the normal course prior to Final Approval. Final Approval would not be granted if at that time MassHousing could not find that the Applicant qualified as a Limited Dividend Organization.
- The Selectmen expressed concern that the Applicant fails to provide evidence of site control. MassHousing has reviewed the application and finds that the Purchase and Sale Agreement provided by the Applicant provides sufficient evidence of site control subject to final review at Final Approval.
- The Selectmen questioned the estimated land value of \$7,686,300 included in the project pro-forma. In accordance with the Section IV B.1 of the Guidelines, MassHousing has commissioned a self-contained appraisal regarding the Site, dated as of November 1, 2013, which indicates an "as-is" land valuation of \$1,800,000. In accordance with the Comprehensive Permit Rules, this is the only value that can be used in determining compliance with the limited dividend requirement.
- Stoneham Selectmen expressed the opinion that the Project was not consistent with the majority of the Commonwealth's Sustainable Development Principles, and cited evidence provided in a letter prepared by Glenn C. Gibbs, who is a municipal planner, received by MassHousing on February 19, 2014.
- Stoneham Selectmen expressed concern with the site plan, stating that it provided insufficient usable open space, too much impervious surface, and a level of density incompatible with the surrounding neighborhoods. They noted that these comments applied to both the initial and the revised site plan.
- Stoneham Selectmen noted that a significant portion of the Site is subject to the jurisdiction of the Stoneham Conservation Commission pursuant to the Wetlands Protection Act. They expressed the concern that the Project would have negative impacts on area wetlands, both on-and off site, and associated impacts on adjacent properties.
- The Stoneham Selectmen expressed concern that the Project will be located in an already congested location, and will exacerbate existing high traffic volumes on Franklin Street.

- The Selectmen expressed concern that the Project would result in the loss of agricultural land, and questioned whether the Site's use for a 40B development was permissible because they believe that "Executive Order 193 applies to the Project. MassHousing has reviewed the language of the Executive Order and determined that it does not apply to the proposed project. The Executive Order applies to projects involving state "funds" and state-owned land, neither of which are components of this proposal.

### **Community Comments**

In addition to the comments from town officials, MassHousing received a significant number of letters from area residents, all of which expressed opposition to the Project. The vast majority of letters received were copies or slight modifications of the same letter which had been individually signed and mailed to MassHousing. While letters from members of the community basically echoed the concerns identified by the Selectmen, the quantity of letters received is worth note. Community concerns can be summarized as follows:

- Community members voiced concern with existing traffic congestion on Franklin Street, and the possibility that the Project would exacerbate traffic volumes and further reduce the level of service at area intersections. Letters expressed the concern that increased traffic volume on area roadways would result in unsafe conditions for area school children in light of the proximity of the Project to several public schools.
- Area residents expressed the belief that there were sufficient amounts of affordable housing in Stoneham, and that additional affordable housing was not needed at this time.
- Area residents expressed concern about the fiscal impacts of the Project, including impacts on the quality of municipal services, specifically those that would impact schools and public works.
- Area residents expressed concern about potentially negative environmental impacts of the Project. They noted that portions of the Site have historically experienced flooding, and expressed concern that Project grading could result in erosion and flooding impacts on area wetlands and adjacent properties.

MassHousing received a separate letter from the Stoneham Historical Commission dated November 14, 2013. This letter expressed opinion that the Project was out of character with the surrounding residential neighborhood, and asked that the Developer solicit community input relative to the final design. They also urged the Developer to incorporate interpretive elements reflecting the historical use of the Site as a farm dating back to the 1700s.

MassHousing was also contacted by Representative Jason Lewis, who provided a letter dated December 2, 2013 expressing concerns about the proposed development. Representative Lewis

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reiterated constituent concerns about the potential impacts of the Project on area traffic, wetlands and natural resources. He stated that he had "serious reservations" about the Project, and expressed the opinion that "extensive deliberation and community input" was warranted prior to any sort of approval.

MassHousing has carefully considered all municipal concerns and, to the extent possible within the context of Site Approval, has offered responses in the "recommendations section" of this letter. It is anticipated that the Municipality, through the comprehensive permit process, will thoroughly review the Project proposal and identify all conditions necessary to ensure consistency with "local need" as defined in M.G.L Chapter 40B Section 20.

### **Recommendations**

Based on MassHousing's site and design review, and its review and consideration of comments received from the Municipality and others, the following issues should be addressed in your application to the local Zoning Board of Appeals ("ZBA") for a comprehensive permit and fully explored in the public hearing process prior to submission of your application for Final Approval under the Program:

1. Development of the Site will require resolution of all environmental conditions in accordance with federal and state laws, regulations and standards applicable to existing conditions and to the proposed use including, but not limited to, compliance with all applicable regulatory restrictions relating to floodplain management, the protection of wetlands (WPA), river and wildlife habitats/conservation areas as well as state environmental protection requirements relating to the protection of the public water supply, storm water runoff, wastewater treatment, and hazardous waste safety. The Applicant should expect that the Municipality will require evidence of such compliance prior to the issuance of a building permit for the Project.
2. The Applicant should provide a detailed traffic study assessing potential impacts of the Project on area roadways, including traffic volumes, crash rates, and the safety and level of service ("LOS") of area intersections, as well as identifying appropriate mitigation in compliance with all applicable state requirements. In particular, the Applicant should be prepared to provide detailed information about potential traffic impacts on Franklin Street, and to address the need for physical upgrades to Franklin Street to accommodate the projected increase in trip rates.
3. The Applicant should be prepared to discuss the adequacy of sight distances at the Site's proposed entrance on Franklin Street.
4. The Applicant should be prepared to respond to questions about the provision of alternative modes of transportation to and from the Site, and safe bike/pedestrian access on Franklin Street.

5. The traffic study or other professional peer review process should address on-site parking and circulation to ensure compliance with industry standards relative to drive-aisle widths, turning radii, hydrant locations and sufficiency of emergency access, etc.
6. The Applicant should provide a detailed Stormwater Management Plan identifying erosion control and stormwater management measures to be implemented during and after construction. This plan should describe any special measures that will be taken to address reported episodes of seasonal flooding on portions of the Site, and should include a comprehensive stormwater analysis showing no net increase in run-off on to abutting properties.
7. A Chapter 21E Phase I/II Environmental Assessment, was prepared by McPhail Associates, LLC on June 13, 2013. The purpose of the assessment was to identify the presence of Recognized Environmental Conditions (REC's) on the Site, and to assess the potential impacts to soil and groundwater from the Site's historical agricultural use. While this study did not identify any REC's, it did include recommendations relative to the removal of oil and potentially hazardous material that had been stored in the buildings, and the demolition of the buildings themselves. The Applicant should be prepared to discuss these recommendations during the Comprehensive Permit hearing process.
8. The Applicant should be prepared to discuss the implementation of appropriate noise attenuation measures through building and site design.
9. The site plan relies on the preservation of existing mature vegetation around the perimeter of the Site in order to provide effective screening from Franklin Street and adjacent neighborhoods. The Applicant should be prepared to describe, during the public hearing process, proposed measures to preserve the mature trees during and after construction, during the public hearing process.
10. A landscape plan should be provided, including a detailed planting plan as well as paving, lighting, and signage details and the location of outdoor dumpsters or other waste receptacles. The landscape plan also should include provisions for irrigation and long-term landscape maintenance.
11. Additional details should be provided to the Town about any proposed site amenities including shared community rooms, outdoor playground and seating areas, and specific information about proposed pedestrian links to nearby recreational facilities.
12. Any local preference plan required by the Municipality must conform to federal fair housing law and to the requirements outlined in the 40B Guidelines, Section III (D).

Weiss Farm Apartment LLC  
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This Site Approval is expressly limited to the development of no more than 264 rental units under the Program, subject to minimum affordability requirements (including percentage of units for low or moderate-income households, income eligibility standards and duration of restrictions requiring low or moderate-income housing) and the Developer's limited dividend status requirement, all as set forth in the Comprehensive Permit Rules for financing under the Program. It is not a commitment or a guarantee of MassHousing or NEF financing or state subsidies and does not constitute a site plan or building design approval. Should you consider, prior to obtaining a comprehensive permit, the use of any other housing subsidy programs, the construction of additional units or a reduction in the size of the Site, you will be required to submit a new site approval application for review by MassHousing. Should you consider a change in tenure type (rental/homeownership), or a change in building type or height, or a substantial change in the design of the Project, you may be required to submit a new site approval application for review by MassHousing.

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

This approval will be effective for a period of two years from the date of this letter. Should the Applicant not apply for a comprehensive permit within this period or should MassHousing not extend the effective period of this letter in writing, this letter shall be considered to have expired and no longer be in effect. In addition, the Applicant is required to notify MassHousing at the following times throughout this two year period: (1) when the Applicant applies to the local ZBA for a comprehensive permit, (2) when the ZBA issues a decision, and (3) if applicable, when any appeals are filed.

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

**Further Opportunities for Assistance from MassHousing:** Please note that MassHousing may not issue Final Approval if the comprehensive permit contains any conditions that are inconsistent with the regulatory requirements of the applicable housing subsidy program (The New England Fund Program of the FHLBB, for which MassHousing serves as Subsidizing Agency), as reflected in the applicable regulatory documents. A modification of the comprehensive permit may be required. Without limitation, we note that if the

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**comprehensive permit will contain any local preference condition, the Guidelines require that the community demonstrate that a local preference is needed and can be implemented in a way that will not have a disparate impact on protected classes. In the interest of providing for an efficient review process and in order to avoid the potential lapse of certain appeal rights, the Applicant may wish to submit a "final draft" of the comprehensive permit to MassHousing for review. Applicants who avail themselves of this opportunity may avoid significant procedural delays that can result from the need to seek modification of the comprehensive permit after its initial issuance.**

If you have any questions concerning this letter, please contact Greg Watson, Manager of the Comprehensive Permits Division, at 617-854-1880.

Sincerely,



Thomas R. Gleason  
Executive Director

cc: Mr. Aaron Gornstein, Undersecretary, DHCD  
Mr. Thomas Boussy, Chairman, Stoneham Board of Selectmen  
Mr. David Ragucci, Stoneham Town Manager

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## Attachment 1

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

### The Commons at Weiss Farm, Stoneham (SA-13-006)

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

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

The Project is eligible under the NEF housing subsidy program and at least 25% of rental units will be available to households earning at or below 80% of the Area Median Income (AMI). Proposed gross rents for the affordable units are \$1,156 for a studio apartment; \$1,323 for a one bedroom; \$1,487 for a two bedroom and \$1,652 for a three bedroom, and accurately reflect current affordable rent levels for the Boston-Cambridge-Quincy HMFA. Projected rents include estimated utility costs of \$180, \$247, \$316 and \$402, respectively.

A letter of interest was provided by Cambridge Savings Bank, a member bank of the Federal Home Loan Bank of Boston (FLHBB).

***(b) MassHousing finds that the site of the proposed Project is generally appropriate for residential development, taking into consideration information provided by the municipality or other parties regarding municipal actions previously taken to meet affordable housing needs, such as inclusionary zoning, multifamily districts adopted under c.40A, and overlay districts adopted under c.40R;***

The Site appears to be highly suitable for residential development. The Stoneham Zoning By-Law has designated this area as "Residence A", which limits by-right development to single-family homes with a minimum lot size of .23 acres (10,000 square feet) per unit. The Site's central location within the Municipality, its proximity to area services, relatively flat topography and ready availability of utilities, however, make it an acceptable location for higher-density, multi-family development such as that described by the Applicant.

According to the most recent version of DHCD's Chapter 40B Subsidized Housing Inventory (SHI), 495 of Stoneham's 9399 total housing units (5.3%) are subsidized for low or moderate income households. Stoneham does not have a DHCD certified Housing Production Plan, and MassHousing is not aware of recent or ongoing Municipal actions aimed at addressing local

need. If this Project were to be completed, however, the number of affordable units would increase by 264 to 759, or 8.1% of Stoneham's total housing stock.

*(c) MassHousing finds that the conceptual project design is generally appropriate for the site on which it is located, taking into consideration factors that may include proposed use, conceptual site plan and building massing, topography, environmental resources, and integration into existing development patterns;*

In summary, based on evaluation of the site plan using the following criteria, MassHousing finds that the proposed conceptual project design is generally appropriate for the Site. It should be noted that the proposed site plan for Weiss Farm included in the original submittal to MassHousing on October 2, 2013 was significantly re-designed by the Applicant in response to feedback that they received from the community and MassHousing during the initial review process. The following plan review findings are made in response to the modified conceptual plan, submitted to MassHousing on January 14, 2014:

#### **1. Relationship to Adjacent Building Typology:**

The 25.67-acre Site, located at 170 Franklin Street in Stoneham, is a portion of a former dairy farm that is currently operated as a loam and topsoil business. Nearby development on Franklin Street includes a fairly broad mix of building types including traditional one- and two-story single-family homes on approximately quarter-acre lots, one-story commercial uses, and multi-family housing and undeveloped land. Stoneham High School, with its associated parking and athletic facilities, is located across Franklin Street from the Site. Of note are two substantial, three- to five- story, multi-family housing developments also located on the east side of Franklin Street across from the Site.

- Buildings are designed to fit into the surrounding, mixed-use suburban context through the use of a mix of traditional siding materials, articulated facades with projecting bays and balconies, and sloped, asphalt-shingled roofs with multiple gables.
- Buildings have been sited with the goal of minimizing impacts on the surrounding streetscape, with the townhouses located closest to the Site entrance, and the larger buildings oriented vertically to Franklin Street to minimize their observable bulk.
- Landscaping, including existing and proposed plantings, will further ameliorate the impact of the Project on the surrounding area.
- A 50,562 square-foot parcel of land including a two-story house and barn will be subdivided from the larger property to create a single-family house lot with frontage on Franklin Street (the two remaining barns will be demolished). The preservation of

the existing farmhouse adjacent to the Site entrance will enhance integration the Project into the surrounding neighborhood context

## **2. Relationship to Adjacent Streets**

The Site fronts directly on Franklin Street to the east/southeast, but is separated from surrounding residential streets to the east, north, west and south by densely vegetated wetland areas. The visual impact of the Project on Franklin Street will be moderated by the following:

- Two townhouse buildings (each two stories high) will front directly on Franklin Street, reflecting the scale of adjacent single-family residential development;
- The larger, five-story apartment buildings will be located further back and at a significantly lower elevation from the road;
- The existing house and one of the barns will be preserved on a newly created lot fronting directly on Franklin Street immediately adjacent to the Site's entrance, thus protecting this portion of the streetscape and further screening views into the Site;
- The two larger buildings located closest to Franklin Street have been oriented so as to minimize their visual impact from street;
- Dense existing vegetation will be preserved on the Site's northern and western boundaries.

## **3. Density**

- Gross Project density is 10.3 units per acre of total site area and 19.3 units per buildable acre, which would not be considered significantly dense when compared to other multi-family developments of this size.
- While proposed density is higher than that of nearby single-family residences, it appears to be significantly less dense than nearby multi-family developments on Franklin Street (Brookmeadow and Grand Villa).
- Project density is mitigated by the presence of ample open space and landscaping within the developed portion of the Site and the fact that much of the perimeter area (which is primarily vegetated wetlands) has been left undeveloped.

## **4. Site Plan**

Weiss Commons includes five townhouse structures (each with two stories); three apartment buildings (each with five stories), and three garage structures (each with one story), along with associated surface parking, landscaped open areas, and site drives. Access to the Site

will be located on Franklin Street approximately 200' northwest from the existing farmhouse, which will be retained along with one barn on a newly created house lot with frontage on Franklin Street. As noted above, the Applicant revised the Site Plan significantly during the course of the project eligibility review in response to feedback from MassHousing and the Municipality. The resulting Site Plan provides an attractive setting for Project residents, while minimizing the visual impact of the Project from Franklin Street and adjacent residential neighborhoods.

- The entrance area will be heavily landscaped, and bounded by two residentially-scaled townhouse buildings, effectively screening views into the Site and complimenting the scale of nearby single-family development.
- From the entrance the site drive slopes downward, passing three two-story townhouse structures marking the Site's southern boundary, and further screening views into the Site from Franklin Street.
- The site plan largely concentrates development at the Site's central core, leaving largely vegetated open areas adjacent to Franklin Street and nearby residential neighborhoods undeveloped. The Site's central core includes three, five-story multifamily buildings organized around a central open area, with surface parking wrapped around the perimeter. The central open area will include a clubhouse, pool and lawn areas, providing an attractive outdoor area for Project residents.
- Two of the multi-family apartment buildings have been oriented so as to minimize their visual impact from Franklin Street. The largest, a "U"-shaped building will be located furthest back from Franklin Street, and will include ground-level parking under the building.
- Additional parking is provided below one of the apartment buildings and in three small garage structures, reducing the visual impact of surface parking as well as the amount of impervious surface.

## **5. Environmental Resources**

- The Site includes significant wetland resources in the north and west portion of the Site and along the easterly edge of the Site. Wetland resources include a drainage channel that was constructed around three sides of the farm operation area. The site plan envisions limited work within the 50' buffer. An Order of Conditions from the Stoneham Conservation Commission will be required under the state Wetlands Protection Act.
- The Site features a substantial existing vegetative buffer around much of the perimeter, including a large vegetated area on the northern side of the property. The site plan

envisions retention of a significant amount of existing vegetation, effectively screening views into the Site from Franklin Street and abutting properties.

- FEMA maps indicate that no portion of the Site is within the 100-year floodplain.
- The Applicant submitted a Chapter 21E Faze I/II Environmental Assessment prepared by McPhail Associates, LLC on June 13, 2013 which identified no significant soil or groundwater contamination, and no evidence of Recognized Environmental Conditions (REC's). This report indicated the presence of lead and polynuclear aromatic hydrocarbons which, while below applicable reporting thresholds, would warrant additional testing. The report also recommended the removal of existing hazardous materials stored in the barns, and management of lead-based paint and asbestos.

#### **6. Topography**

The site plan takes advantage of existing topography to the extent possible in order to minimize the Project's visual impacts.

- The Site slopes down from its entrance on Franklin Street to a level plateau at its center where the majority of the development is concentrated, and then slopes back up to the east.
- The finished floor elevations of the three larger buildings are approximately 10-12 feet lower than Franklin Street, which will have the effect of significantly reducing the visual impact of proposed building elevations when viewed from surrounding areas.
- Lower, two-story buildings similar in scale and height to surrounding residential properties are located at higher elevations closest to Franklin Street, with the larger apartment buildings sited on lower areas further back into the Site.
- An existing knoll located in the center of the Site will be leveled, allowing for a more compact site layout, and resulting in the creation of additional usable open space for Project residents close to the buildings.

#### **7. Proposed Use:**

Based on MassHousing staff's site inspection, internal discussions, and a thorough review of the application, MassHousing finds that the Site is suitable for residential use and development. This is supported by the following:

- The Site is currently served by municipal water and sanitary sewer, with ready availability to other utilities including natural gas, electricity, phone and cable.

- The Site is zoned for residential use, and is located in close proximity to two existing multi-family developments of comparable or higher density on the opposite side of Franklin Street.
- The Site is located immediately across the street from Stoneham High School, and is within walking distance to a daycare center, convenience store, laundromat, and recreational facilities. An assisted living facility is currently being constructed approximately ¼ mile from the Site. Other commercial facilities and services are located within one to two miles from the Site.
- The Site is located approximately one mile east of Route 28 and two miles east of I-93, providing good highway access, and less than one mile from an MBTA commuter rail station (Melrose Highlands).

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

The Applicant proposes 264 rental apartments to be financed under the NEF Program. There will be 198 market-rate units with proposed average rent levels of \$1,391 for studio apartments; \$1,725 for the one bedroom units; \$2,204 for the two bedroom units, and \$2,847 for the three bedroom units. MassHousing's Appraisal and Marketing Division ("A&M") conducted a preliminary market analysis and found that proposed market rent levels for all units types fall within the adjusted range of comparable unit rents and appear feasible in this market.

A&M reports that, overall, the Stoneham rental market appears to be stable, with no direct competition within Stoneham from any other newly constructed rental developments. Comparable rental developments surveyed in Stoneham, Lynnfield, Burlington, Reading and Melrose have a current average occupancy of 96%, with two of the five properties surveyed (in Lynnfield and Melrose) currently in rent-up.

Marketability of the rental units (market rate and affordable) is further supported by a review of 2010 census data for the Town of Stoneham, which shows approximately 48% of Stoneham households at under 80% of the 2013 Boston Area Median Income.

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

MassHousing has commissioned an as "As-Is" appraisal which indicates a land valuation of

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\$1,800,000. Based on a proposed equity investment of \$21,840,000 the Applicant's pro forma appears to be financially feasible and within the limitations on profits and distributions.

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

The Applicant must be organized as a Limited Dividend Organization prior to applying for Final Approval. MassHousing sees no reason this requirement could not be met given information reviewed to date. The Applicant meets the general eligibility standards of the NEF housing subsidy program.

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

The Applicant controls the entire 25.66-acre Site by virtue of a Purchase and Sale Agreement (P&S) between Weiss Farm, Inc. (seller) and John M. Corcoran & Co. LLC (buyer) dated April 10, 2013, and a subsequent Assignment of Purchase and Sale Agreement between John M Corcoran & Co. LLC ("Assignor") and Weiss Farm Apartments LLC ("Assignee") dated May 16, 2013. The Site, which is located at 170 Franklin Street in Stoneham, is shown on Stoneham Assessor's Map 8, Block 0, Lot 106. The P&S also provides for the subdivision and retention by the seller of a 50,562 square foot parcel from the larger 25.674-acre Site, to include the existing family home and adjacent rear barn. Evidence of legal site subdivision into two separate parcels is required.







## **Outline of Development Team**

### **Applicant**

Weiss Farm Apartments LLC  
C/O John M. Corcoran and Co. LLC  
100 Grandview Rd, Suite 207  
Braintree, MA 02184  
Phone: (781) 849-7111  
Fax: (781) 849-7112  
Contact: Peter Mahoney  
Email: pmahoney@corcoranmgmt.com

### **Architect**

Russell Scott Steedle & Capone Architects Inc.  
18 Brattle Street, Cambridge MA 02138  
Phone: (617) 661-5881  
Contact: Hugh Russell  
Email: harussell@rssc-architects.com  
Web: www.rssc-architects.com

### **Civil Engineering**

HW Moore Associates Inc.  
112 Shawmut Ave  
Boston, MA 02188  
Phone: (617) 357-8145  
Fax: (617) 357-9495  
Contact: Jim White  
Web: www.hwmoore.com

### **Landscape Architect**

The Cecil Group  
170 Milk Street, Suite 5  
Boston, MA 02109  
Phone: 617.426.5050  
Fax 617.426.5051  
Contact: Steve Cecil

### **Geotech/Environmental**

McPhail Associates, LLC  
2269 Massachusetts Avenue  
Cambridge, MA 02140  
Phone: (617) 868-1420  
Contact: Tom Fennick

### **Surveyor**

Harry R. Feldman, Inc.  
112 Shawmut Ave.  
Boston, MA 02118  
Phone: (617) 357-9740  
Contact: Karl McCarthy

## **Traffic Consultant**

Greenman-Pederson, Inc.  
181 Ballardvale St, Suite 202  
Wilmington, MA 01887  
Phone: (978) 570-2999  
Fax: (978) 658-3044  
Contact: Heather Monticup  
Email: [hmonticup@gpinet.com](mailto:hmonticup@gpinet.com)

## **Legal Counsel**

Rackemann, Sawyer, and Brewster  
Boston 160 Federal Street  
Floors 13, 14, 15  
Boston, MA 02110  
Phone: (617) 542-2300  
Fax: (617) 542-7437  
Web: [www.rackemann.com](http://www.rackemann.com)

Cicatelli & Cicatelli  
266 Main Street  
Stoneham, MA 02180  
Phone: (781) 438-4060  
Contact: Steven Cicatelli

## **Real Estate Consultant**

Community Resources Group, Inc  
88 Edgewater Drive  
Needham, MA 02492  
Phone: (781) 449-6260  
Contact: Margaret Murphy

## **Affordable Housing / 40B Consultant**

SEB, LLC  
165 Chestnut Hill Ave. #2  
Brighon, MA. 02135  
T: 617-782-2300  
F: 617-782-4500  
Contact: Geoff Engler  
[www.s-e-b.com](http://www.s-e-b.com)





## PURCHASE AND SALE AGREEMENT

### 1. Definitions

- Date: April 10, 2013, being the date upon which a fully executed original counterpart of this Purchase and Sale Agreement (this "Agreement") has been delivered to both Seller and Buyer.
- Seller: Weiss Farm, Inc., a Massachusetts corporation  
170 Franklin Street  
Stoneham, Massachusetts 02180  
Phone No. 781-438-0689  
Fax No. 781-438-2622
- Buyer: John M. Corcoran & Co. LLC  
c/o John M. Corcoran & Co.  
100 Grandview Road, Suite 203  
Braintree, Massachusetts 02184  
Attention: Peter Mahoney  
Phone No. 781-849-7111  
Fax No. 781-849-7112
- Escrow Agent: Chicago Title Insurance Company  
265 Franklin Street, 8<sup>th</sup> Floor  
Boston, Massachusetts  
Attention: Leslie J. Cook  
Phone No. 617-790-2126  
Fax No. 617-556-9920
- Purchase Price: Seven Million Two Hundred Thousand and No/100 Dollars (\$7,200,000.00); provided, however, that the Purchase Price shall be adjusted as follows:
- (a) If the Approvals (as defined in Section 3(d)(i), below) which are obtained pursuant to Section 3(d) permit the construction of less than 230 Units (as defined in Section 3(d)(i), below), then the Purchase Price shall be (i) Six Million Nine Hundred Thousand and No/100 Dollars (\$6,900,000.00) less (ii) Thirteen Thousand Three Hundred and No/100 Dollars (\$13,300.00) for each Unit less than 230 Units which are permitted to be constructed pursuant to the Approvals which have been obtained; provided, however, that in no event shall the Purchase Price be less than Six Million Five Hundred Thousand and No/100 Dollars (\$6,500,000.00) (the "Minimum Purchase Price"); and

(b) If the Approvals which are obtained pursuant to Section 3(d) permit the construction of more than 250 Units, then the Purchase Price shall be (i) Seven Million Five Hundred Thousand and No/100 Dollars (\$7,500,000.00) plus (ii) Thirteen Thousand Three Hundred and No/100 Dollars (\$13,300.00) for each Unit in excess of 250 Units which are permitted to be constructed pursuant to the Approvals which have been obtained.

- First Deposit: One Hundred Thousand and No/100 Dollars (\$100,000.00) (the "First Deposit") to be paid by Buyer to Escrow Agent by Federal wire transfer upon Buyer's receipt of a fully executed counterpart of this Agreement and held and disbursed by Escrow Agent in accordance with the terms of this Agreement.
- Second Deposit: One Hundred Thousand and No/100 Dollars (\$100,000.00) (the "Second Deposit") to be paid by Buyer to Escrow Agent by Federal wire transfer on or before the next business day following the termination of the Due Diligence Period and held and disbursed by Escrow Agent in accordance with the terms of this Agreement.
- Deposit: The First Deposit and the Second Deposit.
- Time of Closing: 10:00 a.m. on that date which is the sixtieth (60<sup>th</sup>) day following expiration of the Approval Period as the same may be extended in the event of an Appeal (as defined in Section 3(d)(iv), below) pursuant to the provisions of this Agreement (or, if the foregoing date is a day upon which the Middlesex South Registry of Deeds (the "Registry") is not open for business, the first day thereafter upon which the Registry is open for business). Buyer has certain rights to extend and accelerate the Time of Closing as more particularly set forth in Section 6, below.
- Premises: The parcel or parcels of land located off Franklin Street, Stoneham, Middlesex County, Massachusetts, commonly known as Weiss Farm and containing approximately 25.6 acres of land (the "Land"), together with (i) all rights, easements, and privileges appurtenant to the Land, (ii) all buildings and all other structures, facilities and improvements on the Land, (iii) all licenses, permits, approvals, warranties and guaranties which have been issued with respect to the Land, and (iv) all plans, drawings and specifications relating to the Land. There shall be excluded from the Land and the Premises the land, buildings and improvements (the "Excluded Parcel") located within the "Approximate Subdivision Line" as approximately located as shown on the sketch plan attached hereto as EXHIBIT A and made a part hereof. The exact boundary lines and area of the Excluded Parcel and the Premises shall be determined by Seller and Buyer during the Due Diligence Period

and shown on a plan to be prepared during the Due Diligence Period, at Buyer's expense, by Buyer's surveyor (the "Boundary Line Plan"). Upon preparation of the Boundary Line Plan and approval of the same by Buyer and Seller during the Due Diligence Period, the Boundary Line Plan shall be deemed to be substituted for EXHIBIT A to this Agreement for the purpose of showing the Premises and the Excluded Parcel. There shall also be excluded from the Premises all farm equipment and machinery owned by Seller and all loam piled on the Premises (provided, however, that no topsoil will be removed from the Premises prior to the Closing (as defined in Section 6, below)), composting material to be sold from the Premises and Christmas trees and other horticultural and/or agricultural crops to be harvested and sold as a part of the ongoing operation of the Premises, all of which shall be sold or otherwise removed from the Premises by Seller prior to the Closing (unless otherwise agreed to by Buyer); provided, however, that Seller shall have no obligation to cut down any remaining live Christmas trees being grown on the Premises which are not sold prior to the Closing nor to remove from the ground the root systems of any Christmas trees cut down prior to the Closing. The foregoing provision shall not obligate Seller to remove from the Premises prior to the Closing any buildings, fences or other structures.

For Seller's title to the Premises see deed dated October 13, 1950 from Samuel Weiss and Philip Weiss to Seller and recorded in the Registry in Book 7706, Page 469, as affected by confirmatory deed dated May 18, 1955 from Samuel Weiss and Philip Weiss to Seller and recorded in the Registry in Book 8474, Page 460.

**Due Diligence  
Period:**

That period commencing on the date which is the later to occur of (the "Commencement Date"): (a) the Date of this Agreement, and (b) the date Buyer receives the Reports, and ending at 5:00 PM on that date which is ninety (90) days after the Commencement Date (the "Due Diligence Expiration Date") provided this Agreement is not terminated on or before the Due Diligence Expiration Date. Buyer and Seller agree, upon request by either of them, to identify in writing the precise dates for performance or deadlines under this Agreement.

**Approval Period:**

That period commencing on the Date of this Agreement and ending at 5:00 PM on that date which is the last day of the twenty-fourth (24<sup>th</sup>) month after the Due Diligence Expiration Date. Buyer and Seller agree, upon request by either of them, to identify in writing the precise dates for performance or deadlines under this Agreement.

Reports: The reports to be provided by Seller to Buyer as set forth on EXHIBIT B attached hereto.

2. Agreement to Buy and to Sell

Seller agrees to sell and Buyer agrees to buy the Premises on the terms and conditions set forth in this Agreement.

3. Buyer's Contingencies

Buyer's obligations are contingent upon the following conditions having been satisfied or waived by Buyer on or before the date specified:

(a) Inspection of the Premises and General Due Diligence

Buyer, as Buyer deems necessary and in its sole discretion, and at Buyer's sole cost and expense, may conduct or cause to be conducted surveys, tests, inspections, studies and investigations of the Premises, including, without limitation, test borings, tests and inspections of structures, utility systems (including, without limitation, the adequacy of water, sewer, electricity, gas, telephone, and other utility services on the Premises or utility lines and/or pipes on or adjacent to the Land which are available to service the Project (as defined in Section 3(d)(i), below)), sanitary systems, wells, drainage, and storm water detention and retention facilities and access to public streets and ways, may review documentation and records pertaining to the Premises, including, without limitation, all licenses, permits, authorizations, and approvals, if any, which have been issued with respect to the Premises or the Project, may consult with any governmental agency or official with respect to the Premises or the Project, may perform feasibility studies and market analyses with respect to the Premises or the Project, may solicit investors and/or lenders for the Premises or the Project, and may perform such other due diligence with respect to the Premises, and Buyer's proposed use and development thereof, as Buyer may elect to perform in Buyer's sole discretion (all of the aforementioned activities being referred to herein as "Buyer's Due Diligence").

Seller acknowledges and agrees that Buyer requires the ability to disclose the proposed Project to public officials, including without limitation officials, agencies and boards of the Town of Stoneham (collectively, "Town Officials"), during the Due Diligence Period, and to control such communications during the Due Diligence Period and the Approval Period. Buyer acknowledges and agrees that Seller shall have the right to participate in the initial disclosure of the Project on the terms set forth in this paragraph, that Buyer's initial disclosure of the Project to Town Officials shall be conducted in accordance with the terms of this paragraph, and that Buyer shall not disclose the Project to any public officials or to the press prior to the completion of initial disclosure of the Project to Town Officials in accordance with this paragraph. In connection with the foregoing, (i) Seller shall prepare an initial statement regarding Seller's reasons for electing to

sell the Premises, which statement ("Seller's Statement") shall be provided to Buyer for Buyer's review and approval (such approval not to be unreasonably withheld) within ten (10) days after the Date of this Agreement, (ii) Seller's Statement shall be provided by Buyer to Town Officials at the time of the initial meeting or meetings by Buyer with such Town Officials, (iii) Seller shall be given the opportunity, but shall have no obligation, to attend such initial meeting or meetings with Town Officials, and (iv) after such initial meeting or meetings with Town Officials, Seller's Statement may be further distributed for the purpose of publicizing the Project on terms mutually agreed upon by Buyer and Seller. From and after the initial meeting or meetings with Town Officials as described above and the issuance and distribution of Seller's Statement, communications with public officials, including without limitation Town Officials, and other public communications shall be governed by the provisions of Section 16(l), below.

Buyer's Due Diligence shall in all events be conducted in compliance with the provisions of Section 8(h), below. No invasive testing shall be performed at the Premises until Seller or its designee has been apprised of the nature of such testing and before Seller or its designated agent has approved in writing of the same, which approval will not be unreasonably withheld or delayed; provided, however, that Seller's approval shall not be required for the invasive testing described in EXHIBIT C attached hereto.

If Buyer is not satisfied, in Buyer's sole and absolute discretion, with the results of Buyer's Due Diligence, Buyer, for any reason or for no stated reason, may terminate this Agreement by sending notice to Seller and Escrow Agent at any time on or before the expiration of the Due Diligence Period. In such event, the Deposit, with all interest accrued thereon, shall immediately be refunded to Buyer and this Agreement shall be void without recourse to the parties hereto. If Seller and Escrow Agent are not so notified, Buyer shall be deemed to have waived its rights to terminate this Agreement pursuant to this subparagraph (a).

(b) Title Insurance

Buyer shall use reasonable efforts to obtain, at its sole expense, during the Due Diligence Period (i) a commitment for owner's and, if applicable, lender's policies of title insurance issued by an American Land Title Association ("ALTA") title insurance company doing business in Massachusetts, at normal premium rates, in the ALTA form currently in use, having an effective date after the Date of this Agreement (the "Title Commitment"), and (ii) an ALTA survey of the Premises prepared by a surveyor selected by Buyer (the "Survey").

If Buyer is unable to obtain the Title Commitment and the Survey, both in form and content satisfactory to Buyer in Buyer's sole judgment, or if Buyer, in Buyer's sole judgment, is not satisfied with, or objects to, any matters appearing on the Title Commitment or Survey, Buyer may terminate this Agreement by sending notice to Seller and Escrow Agent on or before the expiration of the Due Diligence Period. In such event, the Deposit, with all interest accrued thereon,

shall immediately be refunded to Buyer and this Agreement shall be void without recourse to the parties hereto. If Seller and Escrow Agent are not notified of Buyer's election to terminate in accordance with this paragraph, Buyer shall be deemed to have waived its rights to terminate this Agreement pursuant to this subparagraph (b).

Notwithstanding the foregoing, in the event that Buyer does not elect to terminate this Agreement pursuant to this subparagraph (b) as aforesaid, Buyer shall have the right to give written notice (a "Title Defect Notice") to Seller and Escrow Agent on or before the expiration of the Due Diligence Period if the Title Commitment or the Survey discloses any title matter or encroachment or other matter to which Buyer has an objection (collectively, "Title Defects"). Any matter of record title appearing on the Title Commitment or matter appearing on the Survey, or matter of record title in existence as of the Date of this Agreement (other than any mortgage or other monetary lien(s) or UCC financing statements, or other liens voluntarily created or caused to be created by Seller including, without limitation, liens resulting from Seller's failure to pay real estate taxes, water and sewer charges or other municipal charges when due (collectively, "Voluntary Liens") appearing in the Title Commitment, which shall be discharged and terminated, respectively, by Seller at the Time of Closing without the necessity of a Title Defect Notice (provided Buyer gives Seller written notice of the existence of the same no later than the Due Diligence Expiration Date)), which is not included within a Title Defect Notice shall be conclusively deemed waived by Buyer and shall constitute a "Permitted Exception". Seller shall use reasonable efforts to cure any Title Defect which is the subject of a Title Defect Notice in accordance with the provisions of Section 13, below. In addition, in accordance with the provisions of Section 13, below, Seller shall use reasonable efforts to cure any Title Defect which first arises or encumbers the Premises after the Date of this Agreement. As set forth in Section 13, below, in no event shall Seller be required to expend in excess of \$25,000.00, including attorneys' fees, to cure any Title Defect, except for Voluntary Liens.

(c) Hazardous Materials

Buyer may obtain, at its sole expense, a written report (the "Report") from an environmental engineering firm (the "Engineer") regarding the presence of Hazardous Materials, if any, on the Premises (provided that any invasive testing shall be subject to the provisions of Section 3(a), above). "Hazardous Materials" as used in this Agreement shall mean any asbestos, urea formaldehyde foam insulation, radon, oil, hazardous material, hazardous substance, or hazardous waste as defined in the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §9601, et seq., the Resource Conservation and Recovery Act, 42 U.S.C. § 6901, et seq., and the Massachusetts Oil and Hazardous Material Release, Prevention and Response Act, M.G.L. Chapter 21E, as such acts may be amended, or in regulations adopted under such acts (collectively, "Environmental Laws").

Neither Buyer nor the Engineer shall notify any party except Seller, including any public agency, of the contents of the Report. Seller shall assume all responsibility for such notification. Seller shall give any such notification required by applicable law. Buyer shall request the Engineer not to disclose the contents of the Report to any governmental authority unless the Engineer is required by law or by professional ethical standards to disclose the same. Buyer shall, in any event, provide Seller with a copy of the Report prior to Buyer disclosing the contents of the same to any governmental authority, and, if Seller elects to have its engineer verify such findings, Buyer shall so notify the Engineer whereupon it shall become Seller's responsibility to give any required notice. In the event Seller elects to but fails or neglects to give any required notice and it is subsequently determined that such notice was required to have been given not by Seller, but by Buyer or the Engineer, and Buyer and/or the Engineer are penalized or fined for failing to give such notice, Seller shall indemnify Buyer and/or the Engineer for such fine or penalty.

If Buyer is not satisfied, in Buyer's sole and absolute discretion, with the results of the Report, Buyer, for any reason or for no stated reason, may terminate this Agreement by sending notice to Seller and Escrow Agent at any time on or before the end of the Due Diligence Period. In such event, the Deposit, with all interest accrued thereon, shall immediately be refunded to Buyer and this Agreement shall be void without recourse to the parties hereto. If Seller and Escrow Agent are not so notified, Buyer shall be deemed to have waived its rights to terminate this Agreement pursuant to this subparagraph (c).

(d) Approvals

- (i) Buyer intends to apply for approvals for and to construct on the Premises a multifamily residential complex not exceeding three hundred (300) units (the "Units") (without Seller's written approval) permitted and approved pursuant to M.G.L. c. 40B, together with related parking areas and other facilities, all according to plans and specifications satisfactory to Buyer in Buyer's sole discretion, as the same may be revised from time to time in Buyer's sole discretion (the "Project"). Buyer agrees to pursue all federal, state, regional, county, municipal, and other governmental agreements, regulatory and monitoring agreements, certificates, assurances, licenses, variances, special permits, orders, permits, authorizations and approvals necessary for the construction, operation and use of the Project in conformity with all applicable building, zoning, subdivision, land use, environmental, health, sanitary and other laws, by-laws, ordinances, rules and regulations (collectively, the "Approvals"). While Buyer may, at its election, pursue the same, the issuance of a building permit shall not be included as a condition to or as a part of the Approvals. The Approvals shall be deemed to include, without limitation, agreements with all utility providers in a form acceptable to Buyer for the connection of the Project to all utilities. Buyer's obligations under this Agreement are conditioned

upon Buyer being able to obtain all of the Approvals for the Project, which shall, in all events, comply with the following requirements:

- (A) The Approvals shall have been duly and validly issued in writing by the appropriate governmental authorities in accordance with all procedural requirements relating to the issuance thereof;
  - (B) The Approvals shall be in proper form for recording, if required under applicable law;
  - (C) The Approvals shall remain in effect until the Time of Closing and for any period thereafter as Buyer reasonably deems necessary for the construction, operation, and use of the Project;
  - (D) All appeal periods from the issuance of all Approvals shall have expired without any appeal having been taken (or, if an appeal has been taken, such appeal shall have been finally adjudicated in Buyer's favor or shall have been accepted by Buyer as a part of a settlement or agreed to by Buyer during any such appeal);
  - (E) The Approvals shall have terms and conditions reasonably satisfactory to Buyer in Buyer's sole discretion; provided, however, if Buyer agrees to conditions or modifications during the Approval process, then Buyer shall not later raise such conditions or modifications as a basis for Buyer's determination that the Approvals are not satisfactory to Buyer; and
  - (F) Buyer has neither been denied approval of its application to build housing under M.G.L. c. 40B, §21, if any, nor determined, in Buyer's reasonable judgment, that such an application is likely to be denied because the Town of Stoneham has met its 10% threshold of low and moderate income housing under said M.G.L. c. 40B.
- (ii) If Buyer is unable to obtain all of the Approvals, conforming to all of the above requirements, on or before the end of the Approval Period, Buyer may:
- (A) Close with such Approvals as then exist in accordance with the terms of this Agreement and without reduction of the Purchase Price (except as expressly set forth in this Agreement); or
  - (B) Terminate this Agreement by sending notice to Seller at any time on or before the end of the Approval Period.

In the event that this Agreement is terminated pursuant to subparagraph (B), the Deposit, with all interest accrued thereon, shall immediately be refunded to Buyer and this Agreement shall be void without recourse to

the parties hereto. In the event this Agreement is terminated by Buyer pursuant to subparagraph (B), Buyer also shall provide to Seller, at no cost to Seller, the materials developed and/or obtained by Buyer as part of the process of seeking to obtain the Approvals for the Project, and Buyer shall also cooperate with Seller, at no additional cost to Buyer, to facilitate transition of the permitting process for the Project from Buyer to Seller, if applicable.

- (iii) Seller agrees to reasonably cooperate with Buyer, at Buyer's request, in any proceedings necessary to obtain the Approvals, including, without limitation, by executing such applications and other documents as may be necessary to obtain the Approvals. Seller understands the necessity of Buyer controlling all communications with all third parties, any governmental authorities, and all other public communications with respect to the Project, and in no event shall Seller engage in any such communications without prior disclosure to and approval by Buyer. Seller also agrees that Seller shall not engage in any appeal of any Approval, nor engage in any efforts to litigate or otherwise impede the Approvals, nor join in such efforts commenced by any other party. The terms and provisions of this paragraph shall survive the Closing.
- (iv) Notwithstanding any other provisions of this Agreement to the contrary, in the event that, at end of the Approval Period, as the same may have been extended, one or more Approvals have not been obtained in accordance with the requirements set forth above but remain the subject of an appeal, litigation, or any similar proceeding (whether commenced by Buyer, by a governmental authority, or by any other party) (collectively, an "Appeal") and Buyer is using diligent efforts to contest and prevail in such Appeal, the Approval Period may, at Buyer's option, be extended to that date which is sixty (60) days after the final resolution of such Appeal, provided (a) that Buyer shall use diligent efforts to pursue resolution of such Appeal during such extended Approval Period, and (b) in the event that the Approval Period is extended beyond that date which is the last day of the forty-eighth (48<sup>th</sup>) month (four (4) years) after the Due Diligence Expiration Date (the "Approval Period Extension Date") then Buyer shall pay to Seller, on the first day of each calendar month after the Approval Period Extension Date, the applicable Approval Period Extension Payment (as defined below) which payments shall continue until the end of the Approval Period or any earlier termination of this Agreement. In the event that Buyer is not satisfied, in Buyer's sole discretion, with the results of the Appeal, Buyer shall have the options set forth in subparagraphs (ii)(A) and (ii)(B), above. In the event that this Agreement is terminated pursuant to subparagraph (ii)(B), the Deposit, with all interest accrued thereon, shall immediately be paid to Buyer and this Agreement shall be void without recourse to the parties hereto, but Seller shall be entitled to retain all Approval Period Extension Payments, if any. As used in this Agreement, the term "Approval Period Extension Payment" shall mean the following:

- (A) For the period commencing on the first day of the forty-ninth (49<sup>th</sup>) month after the Due Diligence Expiration Date and continuing until the last day of the sixtieth (60<sup>th</sup>) month after the Due Diligence Expiration Date (that is, during the fifth (5<sup>th</sup>) year of the Approval Period) the sum of Eight Thousand and No/100 Dollars (\$8,000.00) per month;
  - (B) For the period commencing on the first day of the sixty-first (61<sup>st</sup>) month after the Due Diligence Expiration Date and continuing until the last day of the seventy-second (72<sup>nd</sup>) month after the Due Diligence Expiration Date (that is, during the sixth (6<sup>th</sup>) year of the Approval Period) the sum of Nine Thousand and No/100 Dollars (\$9,000.00) per month;
  - (C) For the period commencing on the first day of the seventy-third (73<sup>rd</sup>) month after the Due Diligence Expiration Date and continuing until the last day of the eight-fourth (84<sup>th</sup>) month after the Due Diligence Expiration Date (that is, during the seventh (7<sup>th</sup>) year of the Approval Period) the sum of Ten Thousand and No/100 Dollars (\$10,000.00) per month;
  - (D) For the period commencing on the first day of the eighty-fifth (85<sup>th</sup>) month after the Due Diligence Expiration Date and continuing until the last day of the ninety-sixth (96<sup>th</sup>) month after the Due Diligence Expiration Date (that is, during the eighth (8<sup>th</sup>) year of the Approval Period) the sum of Eleven Thousand and No/100 Dollars (\$11,000.00) per month;
  - (E) For the period commencing on the first day of the ninety-seventh (97<sup>th</sup>) month after the Due Diligence Expiration Date and continuing until the last day of the one hundred eighth (108<sup>th</sup>) month after the Due Diligence Expiration Date (that is, during the ninth (9<sup>th</sup>) year of the Approval Period) the sum of Twelve Thousand and No/100 Dollars (\$12,000.00) per month; and
  - (F) From and after the first day of the one hundred ninth (109<sup>th</sup>) month after the Due Diligence Expiration Date (that is, during the tenth (10<sup>th</sup>) year of the Approval Period and thereafter) the sum of Thirty Thousand and No/100 Dollars (\$30,000.00) per month.
- (v) Notwithstanding the specific time periods set forth above in this Section 3(d) for Buyer to obtain the Approvals, Buyer may terminate this Agreement in accordance with the provisions of this Section 3(d) prior to the expiration of any such time period if Buyer has determined in Buyer's sole judgment, as of such date, that Buyer will be unable to obtain all of the Approvals, conforming to all of the requirements set forth above, prior to the expiration of the then applicable time period for obtaining the

Approvals. In the event that this Agreement is terminated pursuant to this paragraph the Deposit, with all interest accrued thereon, shall immediately be paid to Buyer and this Agreement shall be void without recourse to the parties hereto, but Seller shall be entitled to retain all Approval Period Extension Payments, if any. In the event this Agreement is terminated by Buyer pursuant to this paragraph, Buyer also shall provide to Seller, at no cost to Seller, the materials developed and/or obtained by Buyer as part of the process of seeking to obtain the Approvals for the Project, and Buyer shall also cooperate with Seller, at no additional cost to Buyer, to facilitate transition of the permitting process for the Project from Buyer to Seller, if applicable.

- (vi) Buyer shall not, however, take any actions that would (i) permanently change the condition of the Premises, including, without limitation, its zoning status, that would be binding on the Premises or Seller if Buyer does not conclude the acquisition of the Premises, or (ii) create any liability or obligation for Seller unless, after termination of this Agreement, Seller exercises its rights under the Approvals to develop the Project in which event Seller shall have the liabilities and obligations, if any, set forth in the Approvals.
- (vii) Buyer agrees that the schedule of benchmarks attached as EXHIBIT F is a reasonable estimate of the timeframes within which certain activities will be completed by Buyer as part of the Approvals process. While the benchmarks are not of the essence as to time, they are intended to set out Buyer's best estimate of the scheduling of such events during the Approvals process. Buyer agrees that it will proceed with due diligence and promptness and use efforts consistent with those used on other Chapter 40B projects of the same scope as that contemplated for the Project for which Buyer has received approval, and will pay all application fees and costs in pursuing and as required consistent with seeking and obtaining the Approvals.
- (viii) Unless this Agreement has been terminated by the Due Diligence Expiration Date, Buyer shall, no less often than monthly, commencing on the last day of the first calendar month following the Due Diligence Expiration Date, provide Seller with written reports (which may be sent by electronic mail) on the status of the Approvals. Additionally, Buyer shall, when possible, provide Seller at least two (2) business days in advance of filing the same, copies of all information, applications, submissions and/or any and all materials (collectively, the "Filings") to be furnished to any governmental or quasi-governmental agency, or, in the event such Filings are not available two (2) business days in advance, then they shall be delivered no later than the time when first available but no later than the date of their delivery to such agency, provided that all Filings may be provided by Buyer to Seller by electronic mail and/or on a computer disk in a standard and commonly available application format. Buyer shall also

promptly provide to Seller copies of all surveys, title commitments, engineering studies and/or reports and the like obtained or commissioned by Buyer as a part of Buyer's Due Diligence and during the Approval process, which materials may be provided by Buyer to Seller by electronic mail and/or on a computer disk in a standard and commonly available application format. All such materials shall be provided to Seller without charge; provided, however, Buyer makes no representation to Seller as to their truth, accuracy or completeness and Seller is not authorized to rely on the same, such materials being provided as a courtesy only.

Notwithstanding the foregoing, in no event shall the failure of Buyer to provide to Seller any report, Filings or other materials pursuant to this paragraph constitute a default under this Agreement which shall entitle Seller to terminate this Agreement.

- (ix) Notwithstanding any provisions of this Agreement to the contrary, in the event that Approvals are obtained for less than 200 Units, Buyer shall have the right to terminate this Agreement by sending notice to Seller on or before that date which is ten (10) days after the end of the Approval Period as the same may be extended pursuant to the provisions of this Agreement. In the event that this Agreement is terminated pursuant to this paragraph, the Deposit, with all interest accrued thereon, shall immediately be refunded to Buyer and this Agreement shall be void without recourse to the parties hereto, but Seller shall be entitled to retain all Approval Period Extension Payments, if any. In the event that Approvals are obtained for less than 200 Units and this Agreement is not terminated by Buyer pursuant to the provisions of this paragraph, then the Purchase Price shall be the Minimum Purchase Price regardless of the number of Units less than 200 Units for which Approvals are obtained.

#### 4. Title

Seller shall convey good and clear record and marketable title to an indefeasible estate in fee simple in and to the Premises, free from all liens, encumbrances, agreements, easements, restrictions, covenants, reservations, and encroachments from, on or against the Premises, except:

- (a) Any liens for municipal betterments assessed after the Time of Closing;
- (b) Such real estate taxes for the then current fiscal tax year as are not due and payable at the Time of Closing; and
- (c) The Permitted Exceptions (which, in accordance with the provisions of Section 3(b), above, shall include Title Defects (except for Voluntary Liens) in effect as of the Date of this Agreement which are not objected to by Buyer during the Due Diligence Period pursuant to the terms of said Section 3(b)).

It is understood and agreed by the parties that the Premises shall not be in conformity with the title provisions of this Section 4 unless title to the Premises are insurable, for the benefit of Buyer, by a title insurance company, in a fee owner's policy of title insurance at normal premium rates, in the American Land Title Association form currently in use, with no exceptions contained within such policy except as set forth above in this Section 4; provided, however, this sentence shall only pertain to Voluntary Liens, Title Defects objected to by Buyer during the Due Diligence Period, and changes in title occurring after the effective date of the Title Commitment, which date shall be no earlier than the Date of this Agreement.

5. Purchase Price

(a) Payment of Purchase Price

The Purchase Price shall be paid as follows:

- (i) The First Deposit, together with a completed I.R.S. Form W-9, shall be delivered to Escrow Agent by Federal wire transfer upon Buyer's receipt of a fully executed counterpart of this Agreement;
- (ii) Unless this Agreement has been previously terminated pursuant to the provisions of Section 3, above, the Second Deposit shall be delivered to Escrow Agent by Federal wire transfer on or before the next business day following the termination of the Due Diligence Period; and
- (iii) The balance of the Purchase Price (less the total of all Applicable Approval Period Extension Payments (as defined in Section 5(c)(i), below) and less the Closing Extension Payment (as defined in Section 6, below), if any such payments are paid prior to the Time of Closing, all of which payments are applicable to the Purchase Price as set forth below in this Section) shall be paid at the Time of Closing by Federal wire transfer to the account designated by Seller.

All Federal wire transfers shall be of immediately available U.S. Funds.

(b) Deposit and Closing Extension Payment

The Deposit and the Closing Extension Payment, if any, shall be paid to Escrow Agent by Buyer and shall be held by Escrow Agent in an interest-earning FDIC-insured account or accounts (subject, however, to the monetary limits of such insurance), subject to the terms of this Agreement, and shall be accounted for at the Time of Closing or the earlier termination of this Agreement, as follows:

- (i) If Buyer performs its obligations under this Agreement and purchases the Premises, the Deposit and the Closing Extension Payment, if any, together with all interest earned thereon, shall be paid to Seller and shall be credited in full to the Purchase Price.

- (ii) If Buyer defaults in the performance of its obligations under this Agreement and this Agreement is terminated as a result of such default in accordance with the provisions of Section 13(c), below, the Deposit and the Closing Extension Payment, if any, together with all interest earned thereon, shall be paid to Seller and the provisions of said Section 13(c) shall govern the termination of this Agreement.
- (iii) If Seller defaults in the performance of its obligations under this Agreement and this Agreement is terminated as a result of such default in accordance with the provisions of Section 13(b), below, the Deposit and the Closing Extension Payment, if any, together with all interest earned thereon, shall be paid to Buyer and the provisions of said Section 13(b) shall govern the termination of this Agreement.
- (iv) If this Agreement is terminated prior to the consummation of the Closing for any reason (other than by reason of a default by Buyer or Seller in the performance of their respective obligations under this Agreement, any such default being addressed by subparagraph (ii) or subparagraph (iii) above, as applicable), the Deposit and the Closing Extension Payment, together with all interest earned thereon, shall be paid to Buyer.

(c) Approval Period Extension Payments

The Approval Period Extension Payments, if any, shall be paid directly to Seller by Buyer, and shall be accounted for at the Time of Closing or the earlier termination of this Agreement, as follows:

- (i) If Buyer performs its obligations under this Agreement and purchases the Premises, the Approval Period Extension Payments, if any, shall be retained by Seller and fifty percent (50%) of any Approval Period Extension Payments paid with respect to the period commencing on the first day of the forty-ninth (49<sup>th</sup>) month after the Due Diligence Expiration Date and continuing until the last day of the eighty-fourth (84<sup>th</sup>) month after the Due Diligence Expiration Date (that is, the period comprising the fifth (5<sup>th</sup>), sixth (6<sup>th</sup>) and seventh (7<sup>th</sup>) years of the Approval Period) shall be credited to the Purchase Price (collectively, the "Applicable Approval Period Extension Payments"). In such event, the remaining fifty percent (50%) of any Approval Period Extension Payments paid with respect to the period commencing on the first day of the forty-ninth (49<sup>th</sup>) month after the Due Diligence Expiration Date and continuing until the last day of the eighty-fourth (84<sup>th</sup>) month after the Due Diligence Expiration Date (that is, the period comprising the fifth (5<sup>th</sup>), sixth (6<sup>th</sup>) and seventh (7<sup>th</sup>) years of the Approval Period) and one hundred percent (100%) of any Approval Period Extension Payments paid with respect to the period from and after the first day of the eighty-fifth (85<sup>th</sup>) month after the Due Diligence Expiration Date (that is, during the eighth (8<sup>th</sup>) year of the Approval Period and thereafter) shall be retained by Seller but shall be in

addition to the Purchase Price and shall not be credited to the Purchase Price.

- (ii) If Buyer defaults in the performance of its obligations under this Agreement and this Agreement is terminated as a result of such default in accordance with the provisions of Section 13(c), below, the Approval Period Extension Payments, if any, shall be retained by Seller and the provisions of said Section 13(c) shall govern the termination of this Agreement.
- (iii) If Seller defaults in the performance of its obligations under this Agreement and this Agreement is terminated as a result of such default in accordance with the provisions of Section 13(b), below, the Approval Period Extension Payments, if any, shall be refunded in full by Seller to Buyer and the provisions of said Section 13(b) shall govern the termination of this Agreement.
- (iv) If this Agreement is terminated prior to the consummation of the Closing for any reason (other than by reason of a default by Buyer or Seller in the performance of their respective obligations under this Agreement, any such default being addressed by subparagraph (ii) or subparagraph (iii) above, as applicable), the Approval Period Extension Payments, if any, shall be retained by Seller.

(d) Escrow Agent

Seller and Buyer agree:

- (i) Escrow Agent shall establish accounts and disburse the Deposit and the Closing Extension Payment paid to Escrow Agent, if any, and interest earned thereon (collectively, the "Escrow Funds") in accordance with this Agreement.
- (ii) Nothing herein contained shall be deemed to impose any duty upon Escrow Agent to exercise discretion. Buyer and Seller intend that Escrow Agent shall not be obligated to act except upon written instructions or directions signed by both Buyer and Seller. Escrow Agent shall be fully protected for any act or failure to act undertaken in good faith and shall suffer no liability for any act or failure to act taken on advice of its counsel. Escrow Agent may act and shall not incur any liability whatsoever for acting upon any notice, direction or other document purporting and believed by Escrow Agent to be genuine and signed and presented by the proper person or persons.
- (iii) Escrow Agent shall be bound only by modifications of this Agreement that are in writing and signed by Escrow Agent. Escrow Agent shall not be bound by any agreement between Buyer and Seller whether it has knowledge of the existence of such agreement or not.

- (iv) In the event of dispute concerning the Escrow Funds, Escrow Agent shall not release the Escrow Funds except by instructions mutually given by both parties in writing or a court order from the Middlesex County Superior Court (the "Court"), and, thereupon, Escrow Agent shall cease to have any obligations with respect to the Escrow Funds.
- (v) Escrow Agent shall not be required to determine the amount or validity of any claim made by Buyer or Seller against the other, Escrow Agent's sole responsibility being to deliver the Escrow Funds to Seller or Buyer or to release the Escrow Funds pursuant to an order from the Court.
- (vi) Buyer and Seller agree to jointly and severally indemnify and hold Escrow Agent harmless from and against all liability, loss, cost, damage or expense, including attorneys' fees and disbursements, in connection with any action, suit or other proceeding involving any claim which in any way relates to or arises out of this Agreement or the services of Escrow Agent hereunder, except such as result from the bad faith, willful default or gross negligence of Escrow Agent.

6. Closing

The Deed (as defined in Section 9, below), and all other instruments, documents and items required under Sections 9 and 10, below, shall be delivered at the Time of Closing at the offices of Escrow Agent. The delivery of the Deed and other documents and payment of the Purchase Price (collectively, the "Closing") shall be conducted pursuant to written customary escrow and recording instructions to be issued jointly by or on behalf of Buyer and Seller to Escrow Agent just prior to the Time of Closing instructing Escrow Agent as to distribution and recording, as applicable, of documents to be delivered to Escrow Agent and the disbursement of funds consisting of the Deposit, the Closing Extension Payment, if applicable, and the balance due at the Time of Closing, all consistent with this Agreement. Time is of the essence of this Agreement.

Buyer shall have one (1) option (the "Extension Option") to extend the Time of Closing for a period of thirty (30) days (the "Extension Period"). If Buyer elects to exercise the Extension Option, it shall do so by giving Seller notice of its intention to do so no later than the commencement date of the Extension Period (the "Notice to Extend") and paying the Closing Extension Payment set forth below. If Buyer gives the Notice to Extend and pays the Closing Extension Payment, the extension of the Time of Closing shall be automatically effected without the execution of additional documents. The Closing Extension Payment shall be paid by Buyer to Escrow Agent by personal check or Federal wire transfer in the amount of Fifty Thousand and No/100 Dollars (\$50,000.00) (the "Closing Extension Payment").

Buyer shall have the right to accelerate the Time of Closing by giving sixty (60) days advance written notice to the Seller.

7. Representations and Warranties

- (a) Seller's Representations and Warranties. Seller represents and warrants to Buyer as follows:
- (i) Seller is a corporation, validly existing and in good standing under the laws of the Commonwealth of Massachusetts, and Seller has the full right, power and authority to enter into, execute, and deliver this Agreement and to perform all duties and obligations of Seller under this Agreement.
  - (ii) Seller has obtained all necessary authorizations required in connection with Seller's execution, delivery and performance of this Agreement by Seller.
  - (iii) This Agreement has been duly and validly executed and delivered by Seller and is binding and enforceable against Seller in accordance with its terms, subject to general equitable principles and applicable provisions of law related to bankruptcy, insolvency and creditors' rights generally.
  - (iv) Except for this Agreement, Seller has not entered into any written right of first refusal, option to purchase, or other purchase right agreement with respect to the Premises or any portion thereof, nor is Seller aware of any party other than Buyer having a claim to any such rights.
  - (v) Seller has not entered into any management, service, maintenance, brokerage or other contracts (oral or written) in effect relating to the Premises which would survive the Closing.
  - (vi) Seller has neither entered into any written, nor is Seller aware of, any leases, subleases, tenancies or occupancy agreements in effect relating to the Premises, and, to the best of Seller's knowledge and belief, no person or entity other than Seller has any right to use or occupy any portion of the Premises, nor is any portion thereof so used or occupied.
  - (vii) Seller has received no written notice of and has no actual knowledge of any pending condemnation of all or any portion of the Premises, or notice of any other action or proceeding pending or threatened against or relating to a taking or condemnation of the Premises or any portion thereof.
  - (viii) Seller has received no written notice of any violation of any federal, state, or local law, ordinance or regulation relating to the Premises and, to the best of Seller's knowledge, the Premises are not in violation of any federal, state, or local law, ordinance or regulation relating to the Premises, except, in each case, as disclosed in EXHIBIT G hereto.
  - (ix) All bills and claims for labor performed and materials furnished to or for the benefit of Seller with respect to the Premises will be paid in full or properly bonded by Seller at or before the Time of Closing.

- (x) Seller has never received written notice of any violation of any Environmental Law with respect to the Premises except as disclosed in EXHIBIT G hereto.
- (xi) To the best of Seller's knowledge and belief, except for chemicals, fuel and oil used and/or stored in the operation of a farm and agricultural business at the Premises, Seller has never generated, treated, stored, released, discarded or disposed of Hazardous Materials on the Premises and Seller is not aware of the generation, treatment, storage, release, discarding or disposal of Hazardous Materials on the Premises by anyone else.
- (xii) Seller has not received any written notice of and has no actual knowledge of any threatened or pending special assessment against any part of the Premises, or of any proposed or pending proceeding to alter the zoning classification of any portion of the Premises.
- (xiii) Seller shall, within three (3) business days of receipt of any written notice covered by the foregoing sub-paragraphs (viii), (ix), (xi) and (xiii), or any other written notice from any federal, state, county, or municipal agency, board, or authority regarding the Premises, deliver to Buyer copies of any such notices received by Seller after the Date of this Agreement.
- (xiv) The execution and delivery of this Agreement by Seller and the performance by Seller of its obligations hereunder will not, to the best of Seller's knowledge, conflict with or result in a breach of any of the terms, covenants or provisions of the articles of organization or other organizational documents of Seller, any judgment, writ, injunction, regulation, ruling, directive, order or decree of any court or governmental authority, or any agreement or instrument to which Seller is a party or by which Seller is bound nor will it result in the creation or imposition of any lien, charge or encumbrance upon its property pursuant to any of the foregoing.
- (xv) Except as disclosed in EXHIBIT G hereto, to the best of Seller's knowledge and belief, there is no action, suit or other legal proceeding pending against Seller in any court or before any arbitrator or before any governmental body that affects any portion of the Premises that may materially or adversely affect the transactions contemplated by this Agreement, and, to the best of Seller's knowledge and belief, no such action, suit or other legal proceeding is being threatened against Seller.
- (xvi) Seller is not a "foreign person" within the meaning of Section 1445(f)(3) of the Internal Revenue Code of 1986.
- (xvii) Seller has not transferred any development rights with respect to the Premises.

(xviii) No "related application" as defined in 760 CMR 56.03(7) is pending with respect to the Premises nor has any such "related application" been pending with respect to the Premises during the twelve (12) months prior to the Date of this Agreement, in either case filed by or on behalf of or with the consent of Seller, and Seller covenants and agrees not to file any such application while this Agreement remains in effect (except any such application requested by Buyer to be filed on Buyer's behalf).

It shall be a condition of Buyer's obligation to close under this Agreement that all warranties and representations made by Seller hereunder shall be true (subject to exceptions thereto approved by Buyer in writing, such approval to be in Buyer's sole discretion) as of the Time of Closing, and Seller shall deliver to Buyer at the Time of Closing a certificate to that effect reasonably satisfactory in form and substance to Buyer. In the event any warranty or representation made herein shall not be true in any material adverse respect at the Time of Closing, Seller shall be deemed to be in default of its obligations under this Agreement, and Buyer shall have the rights and remedies set forth in Section 13, below, resulting from such default. The foregoing warranties and representations shall be void and of no force and effect and Seller shall be relieved therefrom unless, on or before that date which is six (6) months after the date of the Closing, Buyer shall have provided Seller with detailed written notice of any material misrepresentation knowingly made by Seller with respect thereto. No claim for a misrepresentation creating damage in an amount less than \$10,000.00 shall be deemed actionable.

(b) Buyer's Representations and Warranties. Buyer represents and warrants to Seller as follows:

- (i) Buyer is a limited liability company, validly existing and in good standing under the laws of the Commonwealth of Massachusetts, and Buyer has the full right, power and authority to enter into, execute, and deliver this Agreement and to perform all duties and obligations of Buyer under this Agreement.
- (ii) Buyer has obtained all necessary authorizations required in connection with the execution, delivery and performance of this Agreement by Buyer.
- (iii) This Agreement has been duly and validly executed and delivered by Buyer, and is binding and enforceable against Buyer in accordance with its terms, subject to general equitable principles and applicable provisions of law related to bankruptcy, insolvency and creditors' rights generally.

It shall be a condition of Seller's obligation to close under this Agreement that all warranties and representations made by Buyer hereunder shall be true (subject to exceptions thereto approved by Seller in writing, such approval to be in Seller's sole discretion) as of the Time of Closing, and Buyer shall deliver to Seller at the Time of Closing a certificate to that effect reasonably satisfactory in form and substance to Seller. In the event any warranty or representation made herein shall

not be true in any material adverse respect at the Time of Closing, Buyer shall be deemed to be in default of its obligations under this Agreement, and Seller shall have the rights and remedies set forth in Section 13, below, resulting from such default. The foregoing warranties and representations shall be void and of no force and effect and Buyer shall be relieved therefrom unless, on or before that date which is six (6) months after the date of the Closing, Seller shall have provided Buyer with detailed written notice of any material misrepresentation knowingly made by Buyer with respect thereto. No claim for a misrepresentation creating damage in an amount less than \$10,000.00 shall be deemed actionable.

(c) Disclaimers and Waivers.

(i) No Reliance. Seller makes no representation or warranty as to the truth, accuracy or completeness of any materials, data or information delivered by Seller or its agents to Buyer in connection with the transaction contemplated hereby, except as otherwise expressly stated herein. Buyer acknowledges and agrees that all materials, data and information delivered by Seller to Buyer in connection with the transaction contemplated hereby are provided to Buyer as a convenience only and that any reliance on or use of such materials, data or information by Buyer shall be at the sole risk of Buyer, except as otherwise expressly stated herein. Without limiting the generality of the foregoing provisions, Buyer acknowledges and agrees that (a) Buyer shall be responsible for conducting its own inspections and investigations of the Premises and for obtaining any reports thereon which it deems necessary, (b) any environmental, engineering or other report with respect to the Premises which is delivered by Seller to Buyer shall be for general informational purposes only, (c) Buyer shall not have any right to rely on any such report delivered by Seller to Buyer, but rather will rely on its own inspections and investigations of the Premises and reports commissioned by Buyer with respect thereto, and (d) neither Seller, any affiliate of Seller nor the person or entity which prepared any such report delivered by Seller to Buyer shall have any liability to Buyer for any inaccuracy in or omission from any such report, except as a result of Seller's or Seller's affiliates or such other person's or entity's willful or deliberate act or omission. Notwithstanding the foregoing, Buyer may, at its expense, make separate arrangements with the authors or producers of such materials to have such materials updated and for Buyer to have the right to rely thereon, and Seller agrees to authorize such authors and/or producers to make such materials available for such purpose, if so requested.

(ii) Disclaimers. EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, IT IS UNDERSTOOD AND AGREED THAT SELLER IS NOT MAKING AND HAS NOT AT ANY TIME MADE ANY WARRANTIES OR REPRESENTATIONS OF ANY KIND OR CHARACTER, EXPRESS OR IMPLIED, WITH RESPECT TO THE PREMISES, INCLUDING, BUT NOT LIMITED TO, ANY

WARRANTIES OR REPRESENTATIONS AS TO HABITABILITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, ZONING, TAX CONSEQUENCES, LATENT OR PATENT PHYSICAL OR ENVIRONMENTAL CONDITION, UTILITIES, OPERATING HISTORY OR PROJECTIONS, VALUATION, GOVERNMENTAL APPROVALS, THE COMPLIANCE OF THE PREMISES WITH LAWS, THE TRUTH, ACCURACY OR COMPLETENESS OF THE DOCUMENTS OR ANY OTHER INFORMATION PROVIDED BY OR ON BEHALF OF SELLER TO BUYER, OR ANY OTHER MATTER OR THING REGARDING THE PREMISES. BUYER ACKNOWLEDGES AND AGREES THAT AT THE CLOSING SELLER SHALL SELL AND CONVEY TO BUYER AND BUYER SHALL ACCEPT THE PREMISES "AS IS, WHERE IS, WITH ALL FAULTS", EXCEPT TO THE EXTENT EXPRESSLY PROVIDED OTHERWISE IN THIS AGREEMENT. BUYER HAS NOT RELIED AND WILL NOT RELY ON, AND SELLER IS NOT LIABLE TO BUYER FOR OR BOUND BY, ANY EXPRESS OR IMPLIED WARRANTIES, GUARANTIES, STATEMENTS, REPRESENTATIONS OR INFORMATION PERTAINING TO THE PREMISES OR RELATING THERETO (INCLUDING SPECIFICALLY, WITHOUT LIMITATION, PROPERTY INFORMATION PACKAGES DISTRIBUTED WITH RESPECT TO THE PREMISES) MADE OR FURNISHED BY SELLER, THE MANAGER OF THE PREMISES, OR ANY REAL ESTATE BROKER OR AGENT REPRESENTING OR PURPORTING TO REPRESENT SELLER, TO WHOMEVER MADE OR GIVEN, DIRECTLY OR INDIRECTLY, ORALLY OR IN WRITING, UNLESS SPECIFICALLY SET FORTH IN THIS AGREEMENT. BUYER REPRESENTS TO SELLER THAT BUYER HAS CONDUCTED, OR WILL CONDUCT PRIOR TO THE DUE DILIGENCÉ EXPIRATION DATE AND THE CLOSING, SUCH INVESTIGATIONS OF THE PREMISES, INCLUDING BUT NOT LIMITED TO THE PHYSICAL AND ENVIRONMENTAL CONDITION THEREOF, AS BUYER DEEMS NECESSARY TO SATISFY ITSELF AS TO THE CONDITION OF THE PREMISES AND THE EXISTENCE OR NONEXISTENCE OR CURATIVE ACTION TO BE TAKEN WITH RESPECT TO ANY HAZARDOUS SUBSTANCES ON, IN, UNDER OR DISCHARGED FROM THE PREMISES, AND WILL RELY SOLELY UPON SAME AND NOT UPON ANY INFORMATION PROVIDED BY OR ON BEHALF OF SELLER OR ITS AGENTS OR EMPLOYEES WITH RESPECT THERETO. AT THE CLOSING, BUYER SHALL ASSUME THE RISK THAT ADVERSE MATTERS, INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION DEFECTS AND ADVERSE PHYSICAL AND ENVIRONMENTAL CONDITIONS, MAY NOT HAVE BEEN REVEALED BY BUYER'S INVESTIGATIONS, AND BUYER, UPON CLOSING, SHALL BE DEEMED TO HAVE

WAIVED, RELINQUISHED AND RELEASED SELLER (AND SELLER'S CORPORATE OFFICERS, DIRECTORS, SHAREHOLDERS AND EMPLOYEES) FROM AND AGAINST ANY AND ALL CLAIMS, DEMANDS, CAUSES OF ACTION (INCLUDING CAUSES OF ACTION IN TORT), LOSSES, DAMAGES, LIABILITIES, COSTS AND EXPENSES (INCLUDING ATTORNEYS' FEES AND COURT COSTS) OF ANY AND EVERY KIND OR CHARACTER, KNOWN OR UNKNOWN, WHICH BUYER MIGHT HAVE ASSERTED OR ALLEGED AGAINST SELLER (AND SELLER'S CORPORATE OFFICERS, DIRECTORS, SHAREHOLDERS AND EMPLOYEES) AT ANY TIME BY REASON OF OR ARISING OUT OF ANY LATENT OR PATENT CONSTRUCTION DEFECTS OR PHYSICAL CONDITIONS, VIOLATIONS OF ANY APPLICABLE LAWS (INCLUDING, WITHOUT LIMITATION, ANY ENVIRONMENTAL LAWS) AND ANY AND ALL OTHER ACTS, OMISSIONS, EVENTS, CIRCUMSTANCES OR MATTERS BY SELLER REGARDING THE PREMISES, EXCEPT TO THE EXTENT OTHERWISE EXPRESSLY SET FORTH IN THIS AGREEMENT. NOTHING IN THIS PARAGRAPH SHALL BE DEEMED TO: (A) RELEASE OR INDEMNIFY SELLER FROM ANY LIABILITY WHICH IT MAY HAVE TO THIRD PARTIES, OR (B) RELEASE ANY PARTY OTHER THAN SELLER AND SELLER'S CORPORATE OFFICERS, DIRECTORS, SHAREHOLDERS AND EMPLOYEES.

8. Seller's Obligations Prior to Closing

Seller agrees that, until the Time of Closing, Seller shall:

- (a) Within 5 days of the Date of this Agreement, deliver to Buyer true and complete copies of the Reports;
- (b) Maintain in full force and effect the insurance policies relating to the Premises in effect on the Date of this Agreement, copies or certificates of which will be delivered to Buyer upon the Date of this Agreement;
- (c) Not grant or permit the creation of any encumbrance, easement, restriction or license on the Premises or enter into any management, service, maintenance, brokerage, or other contract which might become the obligation of Buyer after the Closing, without the prior written consent of Buyer which consent may be granted or withheld by Buyer in its sole discretion;
- (d) Not enter into any lease, sublease, tenancy or other occupancy agreement of any kind pertaining to the Premises or any portion thereof, without the prior written consent of Buyer, which may be granted or withheld by Buyer in its sole discretion;

- (e) Make available to Buyer, its agents and consultants, all permits, approvals, title insurance policies, title materials, surveys, studies, reports, plans, specifications and drawings of the Land, appraisals, books and records, and other materials in Seller's possession pertaining to the Premises or the condition thereof;
- (f) Not change the physical characteristics of the Premises other than in the ordinary operation of a horticultural, agricultural, composting or farm business without the prior written consent of Buyer, which consent may be granted or withheld in Buyer's sole discretion;
- (g) Not change the status of the Premises under any laws or regulations of any governmental authority without the prior written consent of Buyer, which consent may be granted or withheld in Buyer's sole discretion; provided, however, Seller may deal with and seek licenses and approvals as may be necessary to enable Seller to continue its horticultural, farming and agricultural operation at the Premises, provided they will not survive the Closing; and
- (h) Allow Buyer, its agents, employees, contractors, consultants and other representatives (collectively, the "Permitted Parties"), access to the Premises upon at least twenty-four (24) hours prior oral notice for each occasion, although one notice may cover a series of specific entry dates, for the purpose of conducting Buyer's Due Diligence. Buyer and the other Permitted Parties shall use reasonable efforts not to disrupt or interfere with Seller's ongoing business operations at the Premises in the performance of Buyer's Due Diligence. After performing Buyer's Due Diligence and in the event Buyer elects to terminate this Agreement pursuant to the provisions hereof, Buyer shall promptly restore the Premises to their prior condition to the extent practicable. Buyer agrees to exonerate, defend, indemnify and hold Seller harmless from all liability, loss, cost, damage or expense relating to Buyer's Due Diligence; provided, however, that this indemnity shall not apply to any liability, loss, cost, damage or expense arising solely from the discovery of existing conditions on the Premises, including, without limitation, from the discovery of Hazardous Materials on the Premises, nor to the extent any liability, loss, cost, damage or expense is caused by any act or omission of Seller or Seller's agents, employees, servants, tenants and/or independent contractors. Buyer shall maintain insurance in commercially reasonable forms and amounts covering Buyer, and naming Seller as an additional insured, against any and all claims, including, without limitation, liability for injury or death and property damage, resulting from access by Buyer and/or the Permitted Parties to the Premises. Buyer shall deliver to Seller a certificate evidencing such insurance prior to any access to the Premises by Buyer and/or the Permitted Parties. Buyer, its agents and consultants, shall have the right to inquire at any and all governmental departments, agencies, boards and authorities which may have jurisdiction over the Premises with respect to the Premises and to communicate with any of Seller's consultants with respect to the Premises; provided, however, that any communications with respect to the Project shall be subject to the prior issuance of Seller's Statement and to the related provisions of Section 3(a). The restoration and indemnification obligations of Buyer set forth

in this paragraph shall survive the Closing or any earlier termination of this Agreement.

Buyer acknowledges and agrees that Seller may, between the Date of this Agreement and the date of the Closing, continue to operate its agricultural, horticultural and farming business at the Premises, subject to the provisions of this Section 8.

9. Seller's Closing Obligations

At the Closing, Seller shall execute, as applicable, and deliver to Buyer:

- (a) A quitclaim deed of the Premises to Buyer, or to such other nominee or assignee as may be designated by Buyer, conveying title to the Premises in accordance with the terms hereof (the "Deed"), which shall include a representation to Buyer that the sale of the Premises does not constitute a sale of all or substantially all of the assets of Seller in the Commonwealth of Massachusetts and such other representations as required by Buyer's title insurance company and/or Buyer's attorney so as to allow Buyer's title insurance company to issue owners and lenders policies of title insurance without exception for any corporate excise tax lien arising from the sale, or, in the alternative, Seller shall provide Buyer with a corporate excise tax lien waiver in recordable form pursuant to M.G.L. c. 62C, § 51 for Seller and evidence acceptable to Buyer of approval from all of the shareholders of Seller of the sale of the Premises to Buyer;
- (b) An Assignment and Assumption of Licenses, Permits, Approvals, Warranties, Guaranties, and Plans and Specifications in the form of EXHIBIT D (the "General Assignment"), which shall include, without limitation, an assignment of all of Seller's interest in any Approvals which may have been issued in the name of Seller;
- (c) Such customary affidavits and indemnities as Buyer's title insurance company may reasonably require in order to issue so-called lender's and owner's title insurance policies insuring Buyer's title to the Premises without any exception for mechanics' or materialmen's liens and for parties in possession;
- (d) An affidavit of non-foreign status in the form of EXHIBIT E, and such other certifications as may be reasonably necessary for compliance with Internal Revenue Service rules and regulations;
- (e) Copies of all studies, plans, specifications, and surveys relating to the Premises in Seller's possession or control and not previously provided to Buyer;
- (f) Discharges of Voluntary Liens and other title clearing documentation required to convey title in accordance with Section 4, above;
- (g) A settlement statement, which shall include the apportionments set forth in Section 12, below (the "Settlement Statement");

- (h) A certificate to the effect that all representations and warranties made hereunder by Seller are true and correct as of the Time of Closing, as limited by the terms of this Agreement;
- (i) Such evidence of legal existence and good standing of Seller, and authority of Seller to enter into this transaction and authority and incumbency of those persons executing on behalf of Seller all documentation in connection with this transaction as may be customarily required by Buyer's title insurance company or Buyer's lender, provided the same does not impose or result in any liability to Seller (except resulting from any knowing and willful misrepresentation by Seller);
- (j) An escrow closing letter to Escrow Agent from Seller and Buyer (the "Escrow Letter") as executed by Seller or Seller's counsel; and
- (k) Such other affidavits, documents and certificates as may be reasonably and customarily required by Buyer, Buyer's attorney, Buyer's title insurance company or any mortgage lender providing financing to Buyer in connection with this transaction, provided the same does not impose or result in any liability to Seller (except resulting from any knowing and willful misrepresentation by Seller).

10. Buyer's Closing Obligations

At the Closing, Buyer shall deliver to Seller:

- (a) The balance of the Purchase Price in accordance with Section 5(a), above;
- (b) The ANR Plan (as defined in Section 15, below), as endorsed by or on behalf of the Town of Stoneham Planning Board;
- (c) The General Assignment executed by Buyer;
- (d) The Settlement Statement executed by Buyer;
- (e) A certificate to the effect that all representations and warranties made hereunder by Buyer are true and correct as of the Time of Closing, as limited by the terms of this Agreement;
- (f) Such evidence of legal existence and good standing of Buyer, and authority of Buyer to enter into this transaction and authority and incumbency of those persons executing on behalf of Buyer all documentation in connection with this transaction as may be customarily required by Seller or Seller's attorney, provided the same does not impose or result in any liability to Buyer (except resulting from any knowing and willful misrepresentation by Buyer);
- (g) The Escrow Letter as executed by Buyer or Buyer's counsel; and

- (h) Such other affidavits, documents and certificates as may be reasonably and customarily required by Seller or Seller's attorney in connection with this transaction, provided the same does not impose or result in any liability to Buyer (except resulting from any knowing and willful misrepresentation by Buyer).

11. Possession

At the Time of Closing, Seller shall deliver full possession of the Premises, free of all tenants and occupants, and in the same condition as on the Date of this Agreement, subject to the exclusion of certain property from the sale in accordance with the definition of "Premises" in Section 1 of this Agreement, and subject to the right of Seller to continue to operate its agricultural, horticultural and farming business on the Premises in accordance with Section 8 of this Agreement. Notwithstanding the foregoing or any other provision of this Agreement to the contrary, Seller shall remove from the Premises, at Seller's sole cost and expense, prior to the Time of Closing, any and all (i) fixtures, furniture, furnishings or personal property of Seller, and (ii) trash, garbage or other debris located on the Land, all of which shall be legally disposed of off-site. The foregoing provision shall not obligate Seller to remove from the Premises prior to the Closing any buildings, fences or other structures.

12. Apportionments

(a) Items Apportioned

The following apportionments shall be made between the parties at the Closing as of the close of business on the date immediately preceding the Time of Closing:

- (i) Real estate taxes, on the basis of the last fiscal year for which the same were assessed.
- (ii) All other expenses relating to the Premises, provided, however, that all expenses relating to the operation of the farm on the Premises or the Excluded Parcel shall remain with Seller.

(b) Estimated Apportionments

If any item described in subparagraph (a), above, has not been fully ascertained at the Time of Closing, then such item shall be estimated and adjusted at the Closing on the basis of the most recent utility bill, tax rate, assessment or other reasonable method available, and then adjusted retroactively as and when the same is ascertained. Any discrepancy resulting from such re-computation and any errors or omissions in computing apportionments at the Time of Closing shall be promptly corrected and paid.

(c) Use of Proceeds to Clear Title

Any unpaid taxes, assessments, water charges, and sewer charges, together with the interest and penalties thereon to the Time of Closing, and any other liens and

encumbrances which Seller is obligated to pay and discharge under the terms of this Agreement as Voluntary Liens, together with the cost of recording or filing any instruments necessary to discharge such liens and encumbrances of record, may be paid out of the proceeds of the monies payable at the Closing, provided that such instruments necessary to discharge such liens or encumbrances are recorded simultaneously with the Deed (or, in the case of mortgages held by institutional lenders, provided that arrangements reasonably satisfactory to Buyer's title insurer have been made for the recording of the discharge within a reasonable time after Closing in accordance with customary Massachusetts conveyancing practice).

(d) Expenses of Sale

Buyer and Seller shall each pay the fees of its counsel and other consultants retained in connection with the purchase and sale of the Premises. Seller shall pay all transfer taxes or deed stamps and such other closing costs as are customarily paid by a seller in Massachusetts. Buyer shall pay all title insurance premiums and such other closing costs as are customarily paid by a buyer in Massachusetts. Buyer shall pay all costs of Buyer's Due Diligence and all costs in connection with seeking and obtaining the Approvals and in connection with any Appeals thereof.

(e) Separate Tax Parcel

If the Premises are not a separately assessed parcel for real estate tax purposes, then the parties agree that the real estate taxes assessed on the larger tax parcel of which the Premises form a part shall be allocated to the Premises and the remainder of the tax parcel on an equitable basis taking into account the relative size of the Premises and the remainder of the tax parcel and the improvements located thereon.

(f) Survival

The provisions of Sections 12(b) and (e) shall survive the Closing for a period of one (1) year.

13. Default

(a) Defective Title or Condition of Premises

If Seller shall be unable to convey title or to deliver possession of the Premises as herein stipulated, or if at the Time of Closing the Premises do not conform with the provisions hereof, then, at Buyer's election, Buyer may by written notice given to Seller at or before the Closing:

- (i) Accept such title as Seller can deliver to the Premises in their then condition and to pay therefor the Purchase Price without deduction, except that:

- (A) The Purchase Price shall be reduced by an amount equal to the sum required to remove all mortgages, liens or encumbrances which secure the payment of money and are required to be removed under this Agreement; and
  - (B) If all or any portion of the Premises shall have been taken by exercise of the power of eminent domain, the following shall control: (a) if the proceeds are equal to or less than the Purchase Price, Buyer may elect to take such title as Seller can convey and Seller shall pay over and assign the proceeds to Buyer; (b) if the proceeds exceed the Purchase Price then all taking proceeds, up to the amount of the Purchase Price, shall be paid to the party who shall receive or retain title to the Premises, documented out-of-pocket costs incurred by Buyer in pursuing the purchase of the Premises, including, without limitation, the Approvals and any Appeals thereof, shall be paid to Buyer, and the excess shall be split equally between Buyer and Seller; or
- (ii) Extend the Time of Closing to a date to be determined by Buyer which is not later than sixty (60) days from the Time of Closing, during which time Seller shall use reasonable efforts to remove any defects in title (but Seller shall have no obligation to use reasonable efforts to remove any Permitted Exceptions), or to deliver possession as herein provided, or to make the Premises conform to the provisions hereof, at Seller's sole cost and expense, provided, however, that Seller shall not, in using such reasonable efforts, be required to expend more than \$25,000.00, including attorneys' fees, to cure any Title Defect, except for Voluntary Liens; or
  - (iii) Terminate this Agreement in accordance with the following subparagraph 13(b).

In the event Buyer elects to terminate this Agreement pursuant to Section 13(a)(iii), above, then Seller may extend the Time of Closing to a date to be determined by Seller which is not later than sixty (60) days from the Time of Closing, during which time Seller shall use reasonable efforts to remove any defects in title (but Seller shall have no obligation to use reasonable efforts to remove any Permitted Exceptions), or to deliver possession as herein provided, or to make the Premises conform to the provisions hereof, at Seller's sole cost and expense, provided, however, that Seller shall not, in using such reasonable efforts, be required to expend more than \$25,000.00, including attorneys' fees, to cure any Title Defect, except for Voluntary Liens.

(b) Seller's Default

If at either the original or the extended Time of Closing Seller is unable to remove all defects in title (but Seller shall have no obligation to remove any Permitted Exceptions), or to deliver possession of the Premises, or to satisfy all of the terms

and conditions precedent to Closing, or to fulfill all of Seller's obligations at or prior to the Closing, in each case, as required under this Agreement, or if on such date the Premises do not conform to the provisions of this Agreement as required at the time of delivery of the Deed by Seller, and Buyer does not elect to accept such title as herein before provided or to further extend the Time of Closing, then, at or before the Time of Closing, Buyer may notify Seller of its election to terminate this Agreement and thereupon the Deposit and the Closing Extension Payment, if any, together with all interest accrued thereon, shall be immediately returned to Buyer, and the Approval Period Extension Payments, if any, shall immediately be refunded by Seller to Buyer, and this Agreement shall be void and without further recourse to the parties hereto except as otherwise set forth in this paragraph and except for those matters which by their terms expressly survive termination of this Agreement. Return of the Deposit and the Closing Extension Payment, if any, together with all interest accrued thereon, and refund of the Approval Period Extension Payments, if any, shall be Buyer's exclusive remedy at law and in equity for any breach by Seller of any of its obligations under this Agreement, except that (A) in the event of Seller's willful breach of this Agreement, Buyer may avail itself of the remedy of specific performance, which must be exercised by filing an action for specific performance in the Middlesex Superior Court within forty-five (45) days of the original, or extended, date of the Closing or such right to seek specific performance shall be null and void and Seller shall have no further liability under this Agreement except as set forth in the following clause (B), if applicable, and except for the those matters which by their express terms survive termination of this Agreement, and (B) in the event that Seller has previously voluntarily conveyed the Premises to a third party or otherwise encumbered the Premises in a manner which prevents Buyer from being able to avail itself of the remedy of specific performance, in addition to the return of the Deposit and the Closing Extension Payment, if any, and refund of the Approval Period Extension Payments, if any, Buyer may also recover from Seller Buyer's actual damages resulting from Seller's breach of its obligations under this Agreement.

(c) Buyer's Default

The parties acknowledge that if Buyer fails to fulfill its obligations hereunder it would be impossible to compute exactly Seller's damages. Buyer and Seller have taken these facts into account in setting the amount of the Deposit, the Closing Extension Payment, and the Approval Period Extension Payments, and agree that the Deposit, the Closing Extension Payment, if any, and the Approval Period Extension Payments, if any, are the best estimate of such damages and such sums represent damages and not any penalty against Buyer. If Buyer fails to fulfill its obligations under this Agreement, this Agreement shall terminate and this Agreement shall be void and without further recourse to the parties hereto except as otherwise set forth in this paragraph and except for those matters which by their terms expressly survive termination of this Agreement, and thereupon the Deposit and the Closing Extension Payment, if any, with all interest accrued thereon, shall immediately be paid to Seller, and the Approval Period Extension

Payments, if any, shall be retained by Seller, all as liquidated damages, which shall be Seller's exclusive remedy at law and in equity for any breach by Buyer of any of its obligations under this Agreement. This provision shall not relieve Buyer from its liability under Section 8(h) of this Agreement.

14. Brokerage Fees

Seller and Buyer mutually represent and warrant that there is no broker with whom they have dealt in connection with this purchase and sale and that neither Seller nor Buyer is aware of any broker or person who has claimed or may have the right to claim a commission in connection with this purchase and sale. Seller and Buyer shall indemnify and defend each other against liability, loss, cost, damage and expense, including attorneys' fees, arising out of the breach of any representations or warranties in this Section. This Section 14 shall survive the Closing or, if the Closing does not occur, the termination of this Agreement.

15. ANR Plan; Easements.

Buyer shall also be responsible, at Buyer's expense, for producing a so-called Approval Not Required Plan (the "ANR Plan") dividing the Excluded Parcel from the Premises pursuant to the provisions of M.G.L. c. 41 §81P and the By-Laws and Regulations of the Town of Stoneham (the "ANR Process"). The ANR Plan shall be prepared in accordance with the Boundary Line Plan. The ANR Plan shall be prepared, and the ANR Process shall be commenced by Buyer, either during the Due Diligence Period or the Approval Period as may be elected by Buyer in Buyer's sole discretion. Seller and Buyer agree to cooperate with each other in connection with the ANR Process, including, in the case of Seller, by executing such applications and other documents, if any, as may be required to be executed by the owner of the Premises and the Excluded Parcel. The Closing shall in all events be conditioned upon the endorsement by or on behalf of the Town of Stoneham Planning Board of the ANR Plan and the availability of such plan for recording with the Deed.

Seller and Buyer acknowledge and agree that, in connection with the preparation of the Boundary Line Plan and the preparation and endorsement of the ANR Plan through the ANR Process, it may become apparent that easements will need to be created for access, utility or drainage purposes burdening the Excluded Parcel for the benefit of the Premises and/or burdening the Premises for the benefit of the Excluded Parcel. Seller and Buyer shall cooperate with each other in good faith in identifying and documenting such easements during the Due Diligence Period and, as applicable, during the ANR Process. All documentation required to establish such easements shall be executed and delivered at the Time of Closing as if specifically identified in Section 9 and/or Section 10, hereof, as applicable.

16. General

(a) Joint and Several Liability

If more than one party executes this Agreement, the terms Buyer and Seller shall mean all of them, and each of them shall be jointly and severally liable hereunder.

(b) Captions and Footnotes

Captions and footnotes are used for convenience of reference only and are not to be construed as part of the terms of this Agreement.

(c) Severability

The invalidity of any provision of this Agreement shall in no way affect the validity of any other provision.

(d) Successors and Assigns

This Agreement is binding upon and shall inure to the benefit of the parties hereto and their heirs, successors, personal representatives, and assigns.

Notwithstanding the foregoing, Buyer shall have no right to assign Buyer's rights and obligations under this Agreement without the prior written consent of Seller, which consent shall not be unreasonably withheld or delayed; provided, however, that Buyer shall have the right, without the consent of Seller, to assign at any time all of Buyer's rights and obligations under this Agreement to a related party in which Buyer or one or more principals of Buyer shall continue to hold an interest. In any and all events, John M. Corcoran & Co. LLC shall control the process of obtaining the Approvals and any Appeals thereof. In the event of any assignment by Buyer of its rights and obligations under this Agreement, any obligations of Buyer under this Agreement shall be the obligations of such assignee, and John M. Corcoran & Co. LLC will have no continuing obligations hereunder.

(e) Notices

All notices given hereunder shall be in writing, and shall be deemed received at the earlier of (i) when delivered in hand, or (ii) seventy two (72) hours after the same have been deposited in the United States mails, postage prepaid, certified or registered mail, return receipt requested, or (iii) twenty four (24) hours after being sent by a nationally recognized overnight delivery service which provides written receipt of delivery, or (iv) when sent by facsimile transmission provided that a copy thereof is simultaneously sent by one of the methods specified in clauses (i), (ii) or (iii), above, addressed in each case to Buyer, Seller, and Escrow Agent at their addresses appearing on the first page hereof, or to such other address or addresses as the parties may from time to time specify by notice so given, with copies sent in a similar fashion as follows:

In the event of a notice to Seller, a copy to:

Gary P. Lilienthal, Esq.  
Bernkopf Goodman LLP  
Two Seaport Lane  
Boston, Massachusetts 02210  
Phone No. (617) 790-3360  
Fax No. (617) 790-3300

In the event of a notice to Buyer, a copy to:

Daniel J. Ossoff, Esq.  
Rackemann, Sawyer & Brewster, P.C.  
160 Federal Street  
Boston, Massachusetts 02110  
Phone No. (617) 951-1121  
Fax No. (617) 542-7437

(f) Governing Law

This Agreement shall be interpreted in accordance with and governed by the laws of the Commonwealth of Massachusetts.

(g) Changes in Writing

This Agreement may not be changed, waived, or terminated except in a writing signed by the party against whom enforcement of the change, waiver, or termination is sought. Notwithstanding the foregoing, Seller and Buyer each agree that their respective attorneys may execute on their behalf extensions of dates for performance or Closing under this Agreement.

(h) No Personal Liability

In no event shall any officer, director, shareholder, member, manager, employee or agent of Seller or Buyer have any personal liability hereunder.

(i) Counterparts

This Agreement may be executed in multiple counterparts or with multiple signature pages which, when assembled as a single document or, if not so assembled, when taken together shall be deemed to be fully effective and operative as an original document.

(j) Facsimile

This Agreement may be executed and delivered by facsimile transmission, and an executed copy of this Agreement delivered by facsimile transmission shall be deemed to be an original counterpart for all purposes.

(k) Merger

The acceptance of the Deed by Buyer shall be deemed to be a full performance and discharge of every agreement and obligation of Seller herein contained or expressed, excepting only those provisions of this Agreement which expressly survive the delivery of the Deed and/or the Closing.

(l) Confidentiality and Dealings with Third Parties

Seller covenants that Seller shall keep confidential and shall not disclose to any third party any information regarding this Agreement or the transaction contemplated hereby or otherwise disclose the existence or contents of this Agreement, unless Buyer has consented thereto and to the form and substance of such disclosure; provided, however, that Seller may disclose such information as required by law, and as necessary to enforce the terms of this Agreement. In the event Buyer is required by law to disclose information regarding this Agreement or the transaction contemplated thereby and the disclosure of such information will result in the disclosure of the Project, the parties shall first proceed to disclose the Project pursuant to Seller's Statement and in accordance with the related provisions of Section 3(a) of this Agreement, or, if the Project has previously been disclosed pursuant to the provisions of Section 3(a), Buyer will give notice of the requirement of Buyer to so disclose and Seller shall have reasonable time, provided during such time Buyer does not incur additional liability for not disclosing, to appeal or take appropriate legal or other action to relieve Buyer's disclosure obligation; provided, however, that Buyer may disclose such information as necessary to enforce the terms of this Agreement and may, subject to the provisions of Section 3(a), disclose the existence of this Agreement and/or provide copies of this Agreement as necessary for the purpose of obtaining the Approvals. Seller covenants to refer all inquiries regarding this Agreement or the transaction contemplated hereby to Buyer.

Prior to the Closing, Buyer shall not issue any public statement, announcement or press release regarding this Agreement or the transactions contemplated hereby, unless Seller has consented thereto and to the form and substance of any such public statement, announcement, or press release, or unless otherwise required in connection with Buyer's efforts to obtain the Approvals. Buyer also acknowledges and agrees that the information and materials provided by Seller to Buyer, or otherwise obtained by Buyer pursuant to the terms of this Agreement, are valuable to Seller and may be of a sensitive nature, and Buyer agrees to maintain the confidentiality of all such materials and information and shall disclose the same only to Buyer's employees, attorneys, consultants and prospective lenders and investors, or as otherwise required to obtain the Approvals, as required by law, or as necessary to enforce the terms of this Agreement. In the event that this Agreement is terminated prior to the consummation of the Closing hereunder, Buyer shall immediately return all such materials to Seller upon request.

Seller agrees that, from and after the Date of this Agreement and while this Agreement remains in effect, Seller shall not solicit, entertain, or accept any offers for the purchase of the Premises, nor engage in discussions or negotiations with any other party with respect to the sale of the Premises, Seller agreeing to deal exclusively with Buyer with respect to the purchase and sale of the Premises until the Closing or the date of any earlier termination of this Agreement.

(m) Name of Project

Buyer agrees that in the name of the Project the words "Weiss Farm" shall occur, such as "The Commons at Weiss Farm". This provision shall survive the Closing.

(n) No Recording

Buyer agrees that, except in connection with Buyer's enforcement of its rights under this Agreement, neither this Agreement nor any memorandum thereof may be recorded and that any such recordation by Buyer shall, at Seller's election, relieve Seller of any obligation to convey the Premises to Buyer.

(o) Captions

The captions in this Agreement are inserted for convenience of reference only and in no way define, describe or limit the scope or intent of this Agreement or any of the provisions hereof.

(p) Drafts

This Agreement shall not be binding or effective until properly executed and delivered by both Seller and Buyer.

(q) Construction

The parties acknowledge that the parties and their counsel have reviewed and revised this Agreement and that the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement or any exhibits or amendments hereto.

(r) Dates for Performance

If the final date of any period which is set out in this Agreement falls upon a Saturday, Sunday or legal holiday under the laws of the United States or the Commonwealth of Massachusetts, then, and in such event, the time of such period shall be extended to the next business day which is not a Saturday, Sunday or legal holiday.

(s) Limitation of Liability

The obligations of Seller and/or Buyer hereunder are binding only on Seller and/or Buyer respectively and shall not be personally binding upon, nor shall any resort be had to, the private properties of any partners, officers, directors, members, managers, shareholders, beneficiaries, employees, advisors or agents of either Seller or Buyer. All documents executed by Seller and/or Buyer shall be deemed to contain (even if not expressly stated) the foregoing exculpation.

(t) Litigation; Attorneys' Fees

In the event of litigation between the parties with respect to the Premises or this Agreement, the losing party shall pay the reasonable costs and expenses incurred by the prevailing party in connection with such litigation, including reasonable attorneys' fees and costs.

**[SIGNATURES APPEAR ON NEXT PAGE.]**

EXECUTED under seal as of the date first written above.

**SELLER:  
WEISS FARM, INC.**

By: Donna Weiss  
Name: Donna Weiss  
Title: President and Treasurer

**BUYER:  
JOHN M. CORCORAN & CO. LLC**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

The undersigned Escrow Agent joins in this Agreement for the purpose of acknowledging its agreement to serve as Escrow Agent hereunder and to hold and disburse the Deposit and the Closing Extension Payment, if any, in accordance with the terms hereof.

**ESCROW AGENT:  
CHICAGO TITLE INSURANCE COMPANY**

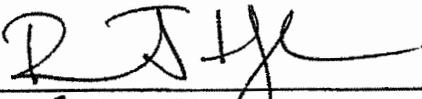
By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

EXECUTED under seal as of the date first written above.

**SELLER:**  
**WEISS FARM, INC.**

By: \_\_\_\_\_  
Name: Donna Weiss  
Title: President and Treasurer

**BUYER:**  
**JOHN M. CORCORAN & CO. LLC**

By:   
Name: RICHARD T. HIGH  
Title: PRESIDENT

The undersigned Escrow Agent joins in this Agreement for the purpose of acknowledging its agreement to serve as Escrow Agent hereunder and to hold and disburse the Deposit and the Closing Extension Payment, if any, in accordance with the terms hereof.

**ESCROW AGENT:**  
**CHICAGO TITLE INSURANCE COMPANY**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

EXECUTED under seal as of the date first written above.

**SELLER:**  
**WEISS FARM, INC.**

By: \_\_\_\_\_  
Name: Donna Weiss  
Title: President and Treasurer

**BUYER:**  
**JOHN M. CORCORAN & CO. LLC**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

The undersigned Escrow Agent joins in this Agreement for the purpose of acknowledging its agreement to serve as Escrow Agent hereunder and to hold and disburse the Deposit and the Closing Extension Payment, if any, in accordance with the terms hereof. *pursuant to §5(d) of this agreement*

**ESCROW AGENT:**  
**CHICAGO TITLE INSURANCE COMPANY**

By: Leslie Cook  
Name: Leslie J. Cook  
Title: VP/Counsel

**LIST OF EXHIBITS**  
**Purchase and Sale Agreement between**  
**Weiss Farm, Inc., Seller**  
**and**  
**John M. Corcoran & Co. LLC, Buyer**

- EXHIBIT A Plan Showing the Excluded Parcel
- EXHIBIT B List of Reports
- EXHIBIT C Scope of Invasive Testing
- EXHIBIT D Form of Assignment and Assumption of Licenses, Permits, Approvals, Warranties, Guaranties, and Plans and Specifications
- EXHIBIT E Form of Non-Foreign Status Certification
- EXHIBIT F Benchmarks for Approvals
- EXHIBIT G Qualifications to Seller Representations and Warranties

EXHIBIT A to  
Purchase and Sale Agreement between  
Weiss Farm, Inc., Seller  
and  
John M. Corcoran & Co. LLC, Buyer

Plan Showing the Excluded Parcel

**[SEE ATTACHED.]**



EXHIBIT B to  
Purchase and Sale Agreement between  
Weiss Farm, Inc., Seller  
and  
John M. Corcoran & Co. LLC, Buyer

List of Reports

1. DEP Administrative Consent Order With Penalty And Notice Of Non-Compliance, ACOP-NE-06-6W018 (DEP Consent Order principally re: wetland issues).
2. DEP Administrative Consent Order And Notice Of Non-Compliance, ACO-NE-10-6W002 (same; supersedes much of ACOP-NE-06-6W018).
3. FSL Associates Inspection Report dated November 2012 (Periodic review of Weiss Farm's compliance with above DEP consent orders).
4. FSL Associates Inspection Report dated May 2011 (Same).
5. FSL Associates Inspection Report dated August 2010 (Same).
6. FSL Associates Inspection Report dated October 2008 (Same).
7. FSL Associates Inspection Report dated October 2007 (Same).
8. FSL Associates Summary Report (Expert Report from *Wantman v. Weiss Farm, Inc.* litigation in which judgment entered for Weiss Farm).
9. FSL Associates Tennis Court – Summary Report dated March 2011 (Same).
10. March 8, 2010 Underwood LLC Appraisal (Same).
11. October 5, 2010 Harrington Letter Report (Same).
12. March 8, 2010 Benchmark Survey re: drainage review (Same).
13. July 6, 2007 Benchmark Survey Report (Same).
14. November 2009 RJ O'Connell & Associates, Inc. Letter Report re. drainage study (Same).
15. Application For Determination Of Need For Site Assignment Agriculture Composting Operation dated August 19, 2010 (DON Application To Compost Leaf And Grass On Property Pursuant To DEP Regulations).

16. Application For Determination Of Need For Site Assignment Agricultural Composting Operation dated March 2, 2011 (Revision of same).
17. August 4, 2011 Response To Notice Of Technical Deficiency, Determination Of Need, Small Operation Application, BWP SW 17 (Response To DEP comments).
18. October 19, 2011 Hancock Associates Report (Regarding ANRAD).
19. December 20, 2011 Rimmer Environmental Consulting LLC Letter (ORAD Report).
20. December 29, 2011 Hancock Associates Letter (Same).
21. January 11, 2012 Rimmer Environmental Consulting LLC Letter (Same).
22. Order Of Resource Area Delineation, WPA Form 4B Mass. DEP No. 297-0355.
23. July 4, 2000 P.J. Waterman Appraisal Co. Appraisal.

Note: Some items may relate solely to the operation of Weiss Farm, Inc. as a farm business, but not all matters relating solely to the operation of the farm business are included.

EXHIBIT C to  
Purchase and Sale Agreement between  
Weiss Farm, Inc., Seller  
and  
John M. Corcoran & Co. LLC, Buyer

Scope of Invasive Testing

The permitted scope of invasive testing for which additional Seller approval is not required is as set forth in the proposal from McPhail Associates, LLC to Buyer dated January 14, 2013, a copy of which was provided by Buyer to Seller prior to execution of the Purchase and Sale Agreement, subject to the following additional qualifications:

1. All necessary approvals shall be obtained from the Stoneham Conservation Commission prior to performance of invasive testing in wetland or buffer zone areas subject to the jurisdiction of the Conservation Commission, and such activities shall be performed in accordance with any requirements imposed by the Conservation Commission.
2. Invasive testing with respect to buildings on the site shall not include any invasive testing on the house known and numbered as 170 Franklin Street which house is located on the Excluded Parcel and will be retained by Seller.
3. Prior to providing any questionnaire to Seller to be completed as part of the due diligence activities, such questionnaire shall be provided by Buyer to Seller's counsel for review by Seller's counsel.
4. Monitoring wells will be monitored for a period of approximately four (4) weeks after installation (unless results from such monitoring warrant continued monitoring beyond such period), and such monitoring wells shall be entirely removed by Buyer at Buyer's expense in the event that the Purchase and Sale Agreement is terminated by Buyer prior to the Closing.

EXHIBIT D to  
Purchase and Sale Agreement between  
Weiss Farm, Inc., Seller  
and  
John M. Corcoran & Co. LLC, Buyer

Form of Assignment and Assumption  
of Licenses, Permits, Approvals, Warranties, Guaranties and Plans and Specifications

**ASSIGNMENT AND ASSUMPTION OF LICENSES,  
PERMITS, APPROVALS, WARRANTIES, GUARANTIES AND  
PLANS AND SPECIFICATIONS**

Reference is hereby made to a certain parcel of land located off Franklin Street, Stoneham, Middlesex County, Massachusetts and more particularly described in Exhibit A attached hereto (the "Land"), together with the buildings and improvements thereon, if any (collectively, the "Premises"), which is being conveyed pursuant to a Quitclaim Deed of even date herewith by Weiss Farm, Inc., a Massachusetts corporation, with an address at 170 Franklin Street, Stoneham, Massachusetts 02180 (the "Seller") to John M. Corcoran & Co. LLC, a Massachusetts limited liability company, with an address c/o John M. Corcoran & Co., 100 Grandview Road, Suite 203, Braintree, Massachusetts 02184 (the "Buyer").

In consideration of One Dollar (\$1.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Seller hereby assigns, conveys, transfers and sets over to the Buyer all of the Seller's right, title, and interest in and to the following (collectively, the "Assigned Property"), provided there is no cost or expense on the part of the Seller to consummate such assignment:

1. All permits, licenses, approvals, warranties and guaranties (collectively, the "Permits and Warranties") relating to the Premises which have been obtained to date by the Seller or on the Seller's behalf, to the extent only that any such assignment is allowed pursuant to the terms and conditions of the Permits and Warranties or pursuant to applicable law; and
2. All plans, drawings and specifications (the "Plans") relating to the Premises, to the extent only that such assignment is allowed pursuant to the agreement under which such materials were prepared.

This Assignment is without representation or warranty by, and without recourse, in any event, to the Seller, except that the Seller hereby represents and warrants to the Buyer that (i) the Seller has not previously conveyed or encumbered the Seller's interest in the Assigned Property, and (ii) the Seller has the full right, power and authority to convey and assign the Assigned Property.

Pursuant to this Assignment, the Buyer shall succeed to all rights of the Seller, and, by execution of this document, the Buyer agrees to assume all obligations of the Seller relating to or

arising out of the Assigned Property and arising from and after the date of this Assignment, and agrees to exonerate, indemnify and hold the Seller harmless from and against any loss, cost, damage, liability or expense (including reasonable attorneys' fees) arising out of or relating to the Buyer's failure to perform any obligations with respect to the Assigned Property first arising from and after the date hereof.

The Seller agrees to indemnify and hold the Buyer harmless from and against any loss, cost, damage, liability or expense (including reasonable attorneys' fees) arising out of or relating to the Seller's failure to perform any obligations with respect to the Assigned Property arising prior to the date hereof.

**[Signatures appear on next page.]**

EXECUTED under seal as of this \_\_\_\_ day of \_\_\_\_\_, 201\_\_.

**SELLER:**  
**WEISS FARM, INC.**

By: [EXHIBIT - DO NOT SIGN.]  
Name: Donna Weiss  
Title: President and Treasurer

**BUYER:**  
**JOHN M. CORCORAN & CO. LLC**

By: [EXHIBIT - DO NOT SIGN.]  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

**EXHIBIT A TO ASSIGNMENT AND ASSUMPTION**

**LEGAL DESCRIPTION**

**Description of Land**

[ADD LEGAL DESCRIPTION TO THE ASSIGNMENT AND ASSUMPTION WHEN IT IS  
SIGNED AT CLOSING.]

EXHIBIT E to  
Purchase and Sale Agreement between  
Weiss Farm, Inc., Seller  
and  
John M. Corcoran & Co. LLC, Buyer  
Form of Non-Foreign Status Certification

**NON-FOREIGN STATUS CERTIFICATION**

Section 1445 of the Internal Revenue Code of 1986, as amended (the "Code"), provides that a transferee of a U.S. real property interest must withhold tax if the transferor is a foreign person. For U.S. tax purposes (including Section 1445 of the Code), the owner of a disregarded entity (which has legal title to a U.S. real property interest under local law) will be the transferor of the property and not the disregarded entity. To inform the transferee that withholding of tax under Section 1445 of the Code is not required upon the disposition of a U.S. real property interest by Weiss Farm, Inc., the undersigned hereby certifies the following on behalf of Weiss Farm, Inc.:

- (1) Weiss Farm, Inc., is not a foreign corporation, foreign partnership, foreign trust, or foreign estate (as those terms are defined in the Code and the Income Tax Regulations thereunder);
- (2) Weiss Farm, Inc., is not a disregarded entity as defined in Section 1.4445-2(b)(2)(iii);
- (3) Weiss Farm, Inc.'s U.S. taxpayer identification number is 04-2088919; and
- (4) Weiss Farm, Inc.'s office address is 170 Franklin Street, Stoneham, MA 02180.

The undersigned understands that this certification may be disclosed to the Internal Revenue Service by the transferee and that any false statement contained herein could be punished by fine, imprisonment, or both.

The undersigned certifies that she is duly authorized to execute this document on behalf of Weiss Farm, Inc.

Under the penalties of perjury the undersigned declares that it has examined this certification and to the best of its knowledge and belief it is true, correct and complete.

**SELLER:**  
**WEISS FARM, INC.**

By: [EXHIBIT - DO NOT SIGN.]  
Name: Donna Weiss  
Title: President and Treasurer

Date: \_\_\_\_\_, 201\_\_

EXHIBIT F to  
Purchase and Sale Agreement between  
Weiss Farm, Inc., Seller  
and  
John M. Corcoran & Co. LLC, Buyer

Benchmarks for Approvals

1. Apply for Project Eligibility Letter – Ninety (90) days after Due Diligence Expiration Date
2. Apply for Comprehensive Permit – Sixty (60) days after issuance of Project Eligibility Letter

EXHIBIT G to  
Purchase and Sale Agreement between  
Weiss Farm, Inc., Seller  
and  
John M. Corcoran & Co. LLC, Buyer

Qualifications to Seller's Representations and Warranties  
set forth in Section 7(a) of the Purchase and Sale Agreement

- (viii) Ongoing actions with the Town of Stoneham Building Department and Zoning Board and Massachusetts Department of Environmental Protection regarding farm uses and operations.
- (x) See (viii) above and allegations made by a residential abutter to the Premises, Martin Wantman of 20 Gerald Road, Stoneham, Massachusetts, in a suit filed in July 2007, *Wantman v. Weiss Farms, Inc. & Town of Stoneham*, Civil Action No. 07-02623, which action has reached a final disposition and is no longer pending.
- (xv) Allegations made by Martin Wantman as described in (x) above.

End of qualifications to Seller's Representations and Warranties set forth in Section 7(a) of the Purchase and Sale Agreement.

**ASSIGNMENT OF PURCHASE AND SALE AGREEMENT**

This Assignment of Purchase and Sale Agreement (this "Assignment") is made as of the 16<sup>th</sup> day of May, 2013 by and between **JOHN M. CORCORAN & CO. LLC**, a Massachusetts limited liability company, having an address at 100 Grandview Road, Suite 207, Braintree, Massachusetts 02184 ("Assignor") and **WEISS FARM APARTMENTS LLC**, a Massachusetts limited liability company, having an address at 100 Grandview Road, Suite 207, Braintree, Massachusetts 02184 ("Assignee").

**WITNESSETH**

WHEREAS, Assignor, as buyer, and Weiss Farm, Inc., a Massachusetts corporation, ("Seller"), as seller, are parties to a Purchase and Sale Agreement dated April 10, 2013 (the "Contract"), for certain land off Franklin Street in Stoneham, Middlesex County, Massachusetts, as more particularly described in the Contract (the "Premises"), pursuant to which Contract Seller has agreed to sell and Assignor has agreed to purchase the Premises upon the terms and conditions contained in the Contract;

WHEREAS, pursuant to Section 16(d) of the Contract, Assignor has the right to assign all of its rights and obligations under the Contract to a related party in which Assignor or one or more principals of Assignor shall continue to hold an interest; and

WHEREAS, Assignee is a limited liability company of which Assignor is the sole member, and, as such, Assignor continues to hold an interest in Assignee; and

WHEREAS, Assignor desires to assign to Assignee, and Assignee desires to acquire, all of the right, title and interest of Assignor in, to and under the Contract.

NOW, THEREFORE, for and in consideration of the premises and the mutual covenants herein contained and other good and valuable consideration in hand paid by Assignee to Assignor, the receipt and sufficiency of which are hereby acknowledged, Assignor and Assignee hereby agree as follows:

1. Assignor hereby transfers, assigns and conveys to Assignee all of Assignor's right, title and interest in, to and under the Contract.
2. Assignee hereby accepts the foregoing assignment, and hereby assumes and covenants to perform all duties and obligations of Assignor under the Contract.
3. Notwithstanding the foregoing, Assignor and Assignee acknowledge and agree that, pursuant to Section 16(d) of the Contract, Assignor shall continue to control the process of obtaining the Approvals (as defined in the Contract) and any Appeals (as defined in the Contract) of the Approvals. Assignee shall be responsible, and shall reimburse Assignor, for any costs and expenses incurred in connection with such activities, and Assignee hereby agrees to indemnify and hold Assignor harmless

from and against any losses, liabilities, costs or expenses suffered or incurred by Assignor arising out or in connection with such activities.

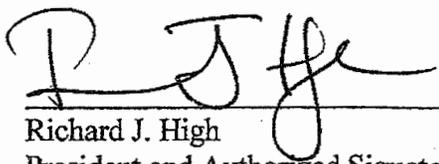
4. Assignor hereby releases all claims to the Deposit (as defined in the Contract) made by Assignor under the Contract, and assigns such claims to Assignee.
5. This Assignment shall inure to the benefit of, and be binding upon, Assignor and Assignee and their respective heirs, personal representatives, successors and assigns.
6. Assignor and Assignee agree that a copy of this Assignment shall be provided to Seller for the purpose of notifying Seller of the assignment to Assignee of all of Assignor's right, title and interest under the Contract, and Assignor and Assignee hereby agree for the benefit of Seller that Seller may rely upon this Assignment, and the recitals, agreements and undertakings of the parties as set forth in this Assignment, for the purpose of evidencing the compliance by the parties with the provisions of Section 16(d) of the Contract.
7. Each of the parties hereto represents and warrants to the other that the person executing this Assignment on behalf of such party has the full right, power and authority to enter into and execute this Assignment on such party's behalf and that no consent from any other person is necessary as a condition precedent to the legal effect of this Assignment.
8. This is the entire agreement between the parties hereto, and may not be amended or modified in any manner without the written approval of the parties hereto.
9. This Assignment may be executed in multiple counterpart copies, all of which shall be deemed originals, but which will evidence one and the same instrument.

**[SIGNATURES APPEAR ON NEXT PAGE]**

IN WITNESS WHEREOF, the parties hereto have executed this Assignment under seal as of the date first set forth above.

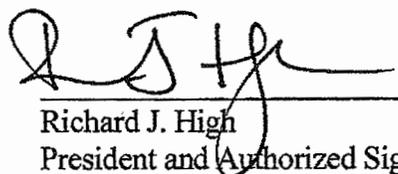
**ASSIGNOR:**

**JOHN M. CORCORAN & CO. LLC**

By:   
Richard J. High  
President and Authorized Signatory

**ASSIGNEE:**

**WEISS FARM APARTMENTS LLC**

By:   
Richard J. High  
President and Authorized Signatory

A1020638.1

## FIRST AMENDMENT OF PURCHASE AND SALE AGREEMENT

This First Amendment of Purchase and Sale Agreement (this "Amendment") is made as of the 1<sup>st</sup> day of July, 2013, between **WEISS FARM, INC.**, a Massachusetts corporation, having an address at 170 Franklin Street, Stoneham, Massachusetts 02180 ("Seller"), and **WEISS FARM APARTMENTS LLC**, a Massachusetts limited liability company, having an address c/o John M. Corcoran & Co., 100 Grandview Road, Suite 203, Braintree, Massachusetts 02184 ("Buyer").

WHEREAS, Seller and John M. Corcoran & Co. LLC ("Corcoran") are parties to a Purchase and Sale Agreement dated April 10, 2013 (the "Agreement"), for the parcel or parcels of land located off Franklin Street, Stoneham, Massachusetts commonly known as Weiss Farm, as more particularly described in the Agreement (the "Premises"). All terms not otherwise defined herein shall be defined as set forth in the Agreement; and

WHEREAS, Corcoran assigned all of its right, title and interest under the Agreement to Buyer pursuant to an Assignment of Purchase and Sale Agreement dated as of May 16, 2013; and

WHEREAS, the parties desire to amend the Agreement in the manner hereinafter set forth.

NOW THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

1. The definition of the term "Due Diligence Period" in Section 1 of the Agreement is hereby deleted and the following is substituted therefor:

"That period commencing on the Date of this Agreement (the "Commencement Date") and ending at 5:00 PM on August 9, 2013 (the "Due Diligence Expiration Date") provided this Agreement is not terminated on or before the Due Diligence Expiration Date. Buyer and Seller agree, upon request of either of them, to identify in writing the precise dates for performance or deadlines under this Agreement."

2. Except as herein provided, the Agreement and all of its terms, covenants and conditions shall remain unchanged and in full force and effect. Without limiting the foregoing, as set forth in Section 6 of the Agreement, time remains of the essence of the Agreement.
3. Each of the parties hereto represents and warrants to the other that the person executing this Amendment on behalf of such party has the full right, power and authority to enter into and execute this Amendment on such party's behalf and that no consent from any

other person or entity is necessary as a condition precedent to the legal effect of this Amendment.

4. This Amendment may be executed in multiple counterparts or with multiple signature pages which, when assembled as a single document or, if not so assembled, when taken together shall be deemed to be fully effective and operative as an original document.
5. This Amendment may be executed and delivered by facsimile transmission, and an executed copy of this Amendment delivered by facsimile transmission shall be deemed to be an original counterpart for all purposes.

**[SIGNATURES APPEAR ON NEXT PAGE]**

IN WITNESS WHEREOF, the parties have duly executed this First Amendment of Purchase and Sale Agreement under seal as of the date first written above.

**SELLER:**  
**WEISS FARM, INC.**

By: Donna Weiss  
Name: Donna Weiss  
Title: President and Treasurer

**BUYER:**  
**WEISS FARM APARTMENTS LLC**

By: RJH  
Name: Richard J. High  
Title: President and Authorized Signatory

## SECOND AMENDMENT OF PURCHASE AND SALE AGREEMENT

This Second Amendment of Purchase and Sale Agreement (this "Amendment") is made as of the 13<sup>th</sup> day of August, 2013, between **WEISS FARM, INC.**, a Massachusetts corporation, having an address at 170 Franklin Street, Stoneham, Massachusetts 02180 ("Seller"), and **WEISS FARM APARTMENTS LLC**, a Massachusetts limited liability company, having an address c/o John M. Corcoran & Co., 100 Grandview Road, Suite 203, Braintree, Massachusetts 02184 ("Buyer").

WHEREAS, Seller and John M. Corcoran & Co. LLC ("Corcoran") are parties to a Purchase and Sale Agreement dated April 10, 2013 (the "Original Agreement"), for the parcel or parcels of land located off Franklin Street, Stoneham, Massachusetts commonly known as Weiss Farm, as more particularly described in the Agreement (the "Premises"); and

WHEREAS, Corcoran assigned all of its right, title and interest under the Original Agreement to Buyer pursuant to an Assignment of Purchase and Sale Agreement dated as of May 16, 2013; and

WHEREAS, Seller and Buyer have previously amended the Original Agreement pursuant to a First Amendment of Purchase and Sale Agreement dated as of July 1, 2013 (the "First Amendment"; the Original Agreement as amended by the First Amendment is referred to herein as the "Agreement"; all terms not otherwise defined herein shall be defined as set forth in the Agreement); and

WHEREAS, Seller and Buyer desire to further amend the Agreement in the manner hereinafter set forth.

NOW THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

1. The parties acknowledge that the Due Diligence Period, as previously extended by agreement of the parties, has expired as of this date (August 13, 2013), and that, in consideration of the agreements set forth herein, Buyer has not elected to terminate the Agreement prior to the expiration of the Due Diligence Period pursuant to the provisions of Sections 4(a), 4(b) and 4(c) of the Agreement, and that Buyer shall have no further right to terminate the Agreement pursuant to those Sections.
2. As provided in the Agreement, the parties agreed upon the exact boundaries of the Excluded Parcel during the Due Diligence Period, and, accordingly, (a) EXHIBIT A as attached to the Agreement is deleted and EXHIBIT A attached hereto is substituted therefor, and (b) the Excluded Parcel shall mean the land, buildings and improvements located within the "Proposed Property Line" as shown on EXHIBIT A attached hereto.

The parties further agree that, upon preparation of the ANR Plan pursuant to Section 15 of the Agreement, and prior to the filing of the same with the Town of Stoneham Planning Board, a copy of the ANR Plan shall be provided to Seller to permit Seller to confirm that the boundary lines of the Excluded Parcel as shown on the ANR Plan conform to the boundary lines as shown on EXHIBIT A attached hereto. In addition, the parties acknowledge and agree that the final boundary line as shown on the ANR Plan will be located so that the willow tree in the approximate location shown on EXHIBIT A attached hereto will be situated on the Excluded Parcel.

3. The second paragraph of Section 15 of the Agreement is deleted, and the following is substituted therefor:

“Seller and Buyer acknowledge and agree that, in connection with the preparation and endorsement of the ANR Plan through the ANR Process, and in connection with obtaining the Approvals for the Project, it may become apparent that easements will need to be created for access, utility or drainage purposes burdening the Excluded Parcel for the benefit of the Premises and/or burdening the Premises for the benefit of the Excluded Parcel. Seller and Buyer shall cooperate with each other in good faith in identifying and documenting such easements during the ANR Process and, as applicable, during the Approval Period. All documentation required to establish such easements shall be executed and delivered at the Time of Closing as if specifically identified in Section 9 and/or Section 10, hereof, as applicable.”

4. Seller and Buyer acknowledge that, as a result of the location of the boundary lines for the Excluded Parcel as shown on EXHIBIT A attached hereto, there are two existing farm buildings which, following the Closing, will be located in part on the Premises and in part on the Excluded Parcel. Seller agrees that, in connection with Buyer's development of the Project after the Closing, Buyer shall have the obligation to remove the entirety of both such buildings, including the portions thereof located on the Excluded Parcel, and Buyer and its contractors shall be permitted to enter upon the Excluded Parcel for such purposes, provided that such work shall be done by Buyer at its sole cost and expense, and provided further that Buyer shall be responsible, at its sole cost and expense, for removal and/or disposal of all demolition debris resulting therefrom. Prior to or during such removal, Buyer will work with Seller to identify any utilities which serve the Excluded Parcel and Buyer will, at its sole cost and expense, either relocate such utilities so that they are solely on the Excluded Parcel or create satisfactory easements for the same. As a part of the demolition, Buyer will grade, and at Seller's request, either pave or loam and seed (or a combination thereof) the area from which the buildings were removed on the Excluded Parcel, at Buyer's expense.
5. Notwithstanding any provisions to the contrary in the Agreement, and without limiting other obligations of Seller as set forth in the Agreement, Seller agrees to remove from the Premises, and properly and legally dispose of off-site, at Seller's sole cost and expense, not later than sixty (60) days prior to the anticipated Time of Closing, the following:

- (a) Miscellaneous containers likely containing paint, oils and other chemicals in both marked and unmarked drums and containers within the former horse barn and the maintenance building, (the "Materials") as identified as a Recognized Environmental Condition in the report entitled "Phase I/II Environmental Site Assessment Report, 170 Franklin Street, Stoneham, Massachusetts" prepared by McPhail Associates, LLC ("McPhail") for John M. Corcoran & Co. LLC dated June 13, 2013 (the "Site Assessment Report"), and, in connection therewith, Seller shall also clean-up all standing spills, visible surface stains and other related surface residue and debris, all to the extent necessary to allow McPhail to determine, in its reasonable professional judgment, that the Materials have been removed sufficiently so that the horse barn and maintenance building may be demolished and removed without regard to such Materials (it being understood and agreed that Buyer, at its cost, shall remove stained concrete and building materials as recommended by McPhail in the Site Assessment Report); and
- (b) All stockpiled or stored materials on the Premises, including, without limitation, landscape and compost materials, mulch, sand, and soil, if and to the extent the stockpiling, storage and/or sale of such materials constitutes a violation under the zoning by-law in effect in the Town of Stoneham which would require such materials to be removed or is alleged to constitute such a violation in litigation then pending and not resolved in Seller's favor. In connection with the foregoing, the Seller shall have the right to terminate farm operations on the Premises and if such termination relieves the Premises from the litigation and eliminates any then existing zoning violations as to such materials which would require such materials to be removed, such materials may remain on the Premises (except to the extent Seller is obligated to remove such materials prior to the Closing pursuant to other provisions of the Agreement) and they shall become the property of Buyer after the Closing. In the alternative, if Seller causes the litigation relating to the presence of such materials to be dismissed as to the Premises and there are not any then existing zoning violations resulting from the presence of such materials which would require such materials to be removed, then such materials may remain on the Premises (except to the extent Seller is obligated to remove such materials prior to the Closing pursuant to other provisions of the Agreement) and they shall become the property of Buyer after the Closing.
6. The title insurance commitment obtained by Buyer during the Due Diligence Period identifies a Tax Taking by the Town of Stoneham dated April 13, 1964, recorded with the Middlesex South District Registry of Deeds in Book 10510, Page 388 (the "Tax Taking"). Seller acknowledges and agrees that the Tax Taking is not a Permitted Exception but is a Voluntary Lien identified and objected to by Buyer that Seller is required to cause to be discharged, terminated or released prior to the Closing in accordance with the terms of the Agreement.
7. Except as herein provided, the Agreement and all of its terms, covenants and conditions shall remain unchanged and in full force and effect. Without limiting the foregoing, as set forth in Section 6 of the Agreement, time remains of the essence of the Agreement.

8. Each of the parties hereto represents and warrants to the other that the person executing this Amendment on behalf of such party has the full right, power and authority to enter into and execute this Amendment on such party's behalf and that no consent from any other person or entity is necessary as a condition precedent to the legal effect of this Amendment.
9. This Amendment may be executed in multiple counterparts or with multiple signature pages which, when assembled as a single document or, if not so assembled, when taken together shall be deemed to be fully effective and operative as an original document.
10. This Amendment may be executed and delivered by facsimile transmission or electronic mail (.pdf), and an executed copy of this Amendment delivered by facsimile transmission or electronic mail (.pdf) shall be deemed to be an original counterpart for all purposes.

**[SIGNATURES APPEAR ON NEXT PAGE]**

IN WITNESS WHEREOF, the parties have duly executed this Second Amendment of Purchase and Sale Agreement under seal as of the date first written above.

**SELLER:**  
**WEISS FARM, INC.**

By: Donna Weiss  
Name: Donna Weiss  
Title: President and Treasurer

**BUYER:**  
**WEISS FARM APARTMENTS LLC**

By: \_\_\_\_\_  
Name: Richard J. High  
Title: President and Authorized Signatory

IN WITNESS WHEREOF, the parties have duly executed this Second Amendment of Purchase and Sale Agreement under seal as of the date first written above.

**SELLER:**  
**WEISS FARM, INC.**

By: \_\_\_\_\_  
Name: Donna Weiss  
Title: President and Treasurer

**BUYER:**  
**WEISS FARM APARTMENTS LLC**

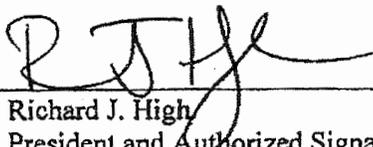
By:  \_\_\_\_\_  
Name: Richard J. High  
Title: President and Authorized Signatory

EXHIBIT A

Plan Showing the Excluded Parcel

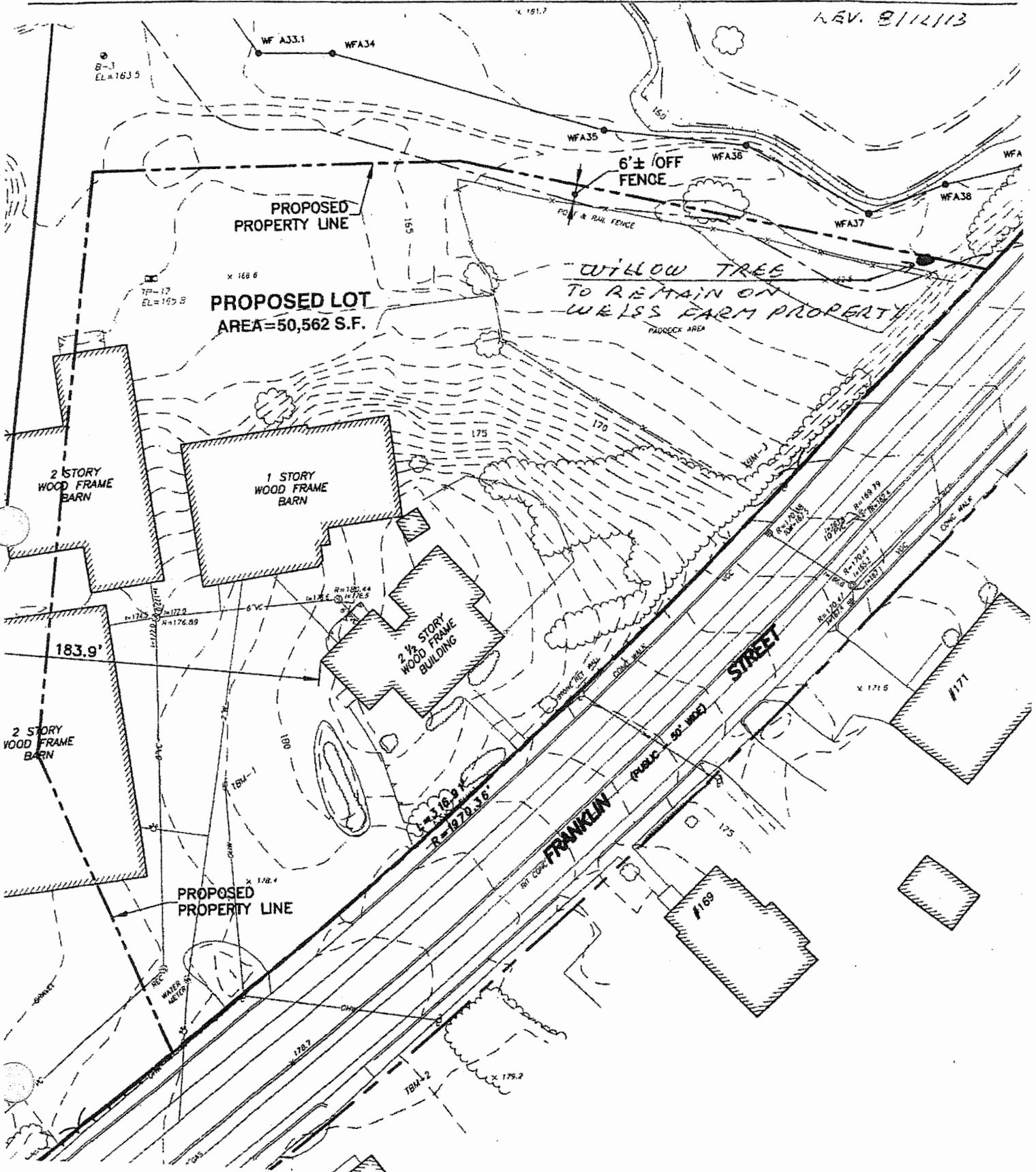
[SEE ATTACHED]

H.W. MOORE ASSOCIATES, INC.  
CONSULTING ENGINEERS  
BOSTON, MA 02118 357-8145

SUBJECT WEISS FARM  
PRELIMINARY SUBDIVISION  
SKETCH

SHEET 1 OF 1  
DATE 8/07/13  
COMP. BY JM40  
CHECK BY 1"=40'

REV. 8/14/13







Department of Housing and Community Development  
 Chapter 40B Subsidized Housing Inventory (SHI)  
 as of April 30, 2013

<b>Community</b>	<b>2010 Census Year Round Housing Units</b>	<b>Total Development Units</b>	<b>SHI Units</b>	<b>%</b>
Abington	6,364	511	478	7.5%
Acton	8,475	944	552	6.5%
Acushnet	4,097	129	99	2.4%
Adams	4,337	321	321	7.4%
Agawam	12,090	503	471	3.9%
Alford	231	0	0	0.0%
Amesbury	7,041	865	501	7.1%
Amherst	9,621	1,082	1,035	10.8%
Andover	12,324	1,431	1,148	9.3%
Aquinnah	158	41	41	25.9%
Arlington	19,881	1,323	1,118	5.6%
Ashburnham	2,272	147	32	1.4%
Ashby	1,150	0	0	0.0%
Ashfield	793	2	2	0.3%
Ashland	6,581	345	240	3.6%
Attleboro	5,148	246	246	4.8%
Attleboro	17,978	1,195	1,195	6.6%
Auburn	6,808	212	212	3.1%
Avon	1,763	74	74	4.2%
Ayer	3,440	456	290	8.4%
Barnstable	20,550	1,822	1,363	6.6%
Barre	2,164	78	78	3.6%
Becket	838	0	0	0.0%
Bedford	5,322	1,091	900	16.9%
Belchertown	5,771	394	368	6.4%
Bellingham	6,341	682	557	8.8%
Belmont	10,117	388	388	3.8%
Berkley	2,169	135	20	0.9%
Berlin	1,183	222	102	8.6%
Bernardston	930	24	24	2.6%
Beverly	16,522	1,971	1,849	11.2%
Billerica	14,442	1,472	842	5.8%
Blackstone	3,606	165	123	3.4%
Blandford	516	1	1	0.2%
Bolton	1,729	192	64	3.7%
Boston	269,482	51,554	49,971	18.5%
Bourne	8,584	1,183	563	6.6%
Boxborough	2,062	324	24	1.2%
Boxford	2,730	64	23	0.8%

Boylston	1,765	26	26	1.5%
Braintree	14,260	1,640	1,102	7.7%
Brewster	4,803	298	251	5.2%
Bridgewater	8,288	228	224	2.7%
Brimfield	1,491	80	80	5.4%
Brockton	35,514	4,479	4,479	12.6%
Brookfield	1,452	47	41	2.8%
Brookline	26,201	2,536	2,104	8.0%
Buckland	866	3	3	0.3%
Burlington	9,627	1,391	989	10.3%
Cambridge	46,690	7,181	7,091	15.2%
Canton	8,710	975	870	10.0%
Carlisle	1,740	52	46	2.6%
Carver	4,514	144	144	3.2%
Charlemont	615	3	3	0.5%
Charlton	4,774	83	83	1.7%
Chatham	3,460	168	168	4.9%
Chelmsford	13,741	1,317	990	7.2%
Chelsea	12,592	2,157	2,152	17.1%
Cheshire	1,481	0	0	0.0%
Chester	585	27	27	4.6%
Chesterfield	524	19	19	3.6%
Chicopee	25,074	2,582	2,545	10.1%
Clarksburg	706	8	8	1.1%
Clinton	6,375	551	551	8.6%
Cohasset	2,898	325	141	4.9%
Colrain	731	0	0	0.0%
Concord	6,852	762	719	10.5%
Conway	803	0	0	0.0%
Cummington	426	16	16	3.8%
Dalton	2,860	158	158	5.5%
Danvers	11,071	1,376	1,013	9.2%
Dartmouth	11,775	971	941	8.0%
Dedham	10,115	1,141	1,096	10.8%
Deerfield	2,154	33	33	1.5%
Dennis	7,653	346	332	4.3%
Dighton	2,568	412	110	4.3%
Douglas	3,147	183	140	4.4%
Dover	1,950	69	17	0.9%
Dracut	11,318	993	660	5.8%
Dudley	4,360	105	105	2.4%
Dunstable	1,085	0	0	0.0%
Duxbury	5,532	437	188	3.4%
East Bridgewater	4,897	225	168	3.4%
East Brookfield	888	0	0	0.0%
East Longmeadow	6,072	504	436	7.2%

Eastham	2,632	57	48	1.8%
Easthampton	7,567	515	459	6.1%
Easton	8,105	488	385	4.8%
Edgartown	1,962	94	89	4.5%
Egremont	596	0	0	0.0%
Erving	778	0	0	0.0%
Essex	1,477	40	40	2.7%
Everett	16,691	1,313	1,313	7.9%
Fairhaven	7,003	476	476	6.8%
Fall River	42,650	4,905	4,809	11.3%
Falmouth	14,870	1,226	794	5.3%
Fitchburg	17,058	1,660	1,659	9.7%
Florida	335	0	0	0.0%
Foxborough	6,853	600	590	8.6%
Framingham	27,443	2,875	2,875	10.5%
Franklin	11,350	1,534	1,015	8.9%
Freetown	3,263	98	80	2.5%
Gardner	9,064	1,315	1,315	14.5%
Georgetown	3,031	374	362	11.9%
Gill	591	24	24	4.1%
Gloucester	13,270	980	945	7.1%
Goshen	440	6	6	1.4%
Gosnold	41	0	0	0.0%
Granton	7,160	551	313	4.4%
Granby	2,451	64	64	2.6%
Granville	630	3	3	0.5%
Great Barrington	3,072	293	221	7.2%
Greenfield	8,325	1,170	1,153	13.8%
Groton	3,930	375	204	5.2%
Groveland	2,423	132	75	3.1%
Hadley	2,200	261	261	11.9%
Halifax	2,971	28	28	0.9%
Hamilton	2,783	124	84	3.0%
Hampden	1,941	60	60	3.1%
Hancock	326	0	0	0.0%
Hanover	4,832	441	441	9.1%
Hanson	3,572	265	143	4.0%
Hardwick	1,185	32	32	2.7%
Harvard	1,982	279	109	5.5%
Harwich	6,121	326	326	5.3%
Hatfield	1,549	47	47	3.0%
Haverhill	25,557	2,661	2,439	9.5%
Hawley	137	0	0	0.0%
Heath	334	0	0	0.0%
Hingham	8,841	2,153	557	6.3%
Hinsdale	918	0	0	0.0%
Holbrook	4,262	434	434	10.2%

Holden	6,624	498	192	2.9%
Holland	1,051	19	19	1.8%
Holliston	5,077	327	211	4.2%
Holyoke	16,320	3,416	3,373	20.7%
Hopedale	2,278	111	111	4.9%
Hopkinton	5,087	547	425	8.4%
Hubbardston	1,627	52	52	3.2%
Hudson	7,962	901	730	9.2%
Hull	4,964	101	101	2.0%
Huntington	919	47	47	5.1%
Ipswich	5,735	517	491	8.6%
Kingston	4,881	347	170	3.5%
Lakeville	3,852	570	254	6.6%
Lancaster	2,544	192	107	4.2%
Lanesborough	1,365	25	25	1.8%
Lawrence	27,092	3,851	3,832	14.1%
Lee	2,702	173	176	6.5%
Leicester	4,231	153	153	3.6%
Lenox	2,473	179	179	7.2%
Leominster	17,805	1,456	1,419	8.0%
Leverett	792	2	2	0.3%
Lexington	11,946	1,515	1,334	11.2%
Leyden	300	0	0	0.0%
Lincoln	2,153	308	236	11.0%
Littleton	3,443	447	291	8.5%
Longmeadow	5,874	265	265	4.5%
Lowell	41,308	5,255	5,220	12.6%
Ludlow	8,337	179	179	2.1%
Lunenburg	4,037	129	129	3.2%
Lynn	35,701	4,459	4,458	12.5%
Lynnfield	4,319	700	487	11.3%
Malden	25,122	2,566	2,500	10.0%
Manchester	2,275	122	110	4.8%
Mansfield	8,725	990	944	10.8%
Marblehead	8,528	399	330	3.9%
Marion	2,014	203	154	7.6%
Marlborough	16,347	1,732	1,668	10.2%
Marshfield	9,852	749	544	5.5%
Mashpee	6,473	295	277	4.3%
Mattapoisett	2,626	69	69	2.6%
Maynard	4,430	363	363	8.2%
Medfield	4,220	212	194	4.6%
Medford	23,968	1,680	1,642	6.9%
Medway	4,603	285	233	5.1%
Melrose	11,714	966	892	7.6%
Mendon	2,072	106	49	2.4%
Merrimac	2,527	403	147	5.8%

Methuen	18,268	1,932	1,643	9.0%
Middleborough	8,921	776	370	4.1%
Middlefield	230	7	7	3.0%
Middleton	3,011	149	145	4.8%
Milford	11,379	983	721	6.3%
Millbury	5,592	244	221	4.0%
Millis	3,148	183	120	3.8%
Millville	1,157	26	26	2.2%
Milton	9,641	558	426	4.4%
Monroe	64	0	0	0.0%
Monson	3,406	148	148	4.3%
Montague	3,926	422	390	9.9%
Monterey	465	0	0	0.0%
Montgomery	337	0	0	0.0%
Mount Washington	80	0	0	0.0%
Nahant	1,612	48	48	3.0%
Nantucket	4,896	180	122	2.5%
Natick	14,052	1,674	1,417	10.1%
Needham	11,047	865	839	7.6%
New Ashford	104	0	0	0.0%
New Bedford	42,816	5,095	5,064	11.8%
New Braintree	386	0	0	0.0%
New Marlborough	692	0	0	0.0%
New Salem	433	0	0	0.0%
Newbury	2,699	94	94	3.5%
Newburyport	8,015	703	610	7.6%
Newton	32,346	2,525	2,436	7.5%
Norfolk	3,112	144	111	3.6%
North Adams	6,681	891	879	13.2%
North Andover	10,902	1,196	671	6.2%
North Attleborough	11,553	309	297	2.6%
North Brookfield	2,014	142	142	7.1%
North Reading	5,597	604	533	9.5%
Northampton	12,604	1,490	1,425	11.3%
Northborough	5,297	718	605	11.4%
Northbridge	6,144	472	457	7.4%
Northfield	1,290	27	27	2.1%
Norton	6,707	715	405	6.0%
Norwell	3,652	294	139	3.8%
Norwood	12,441	717	705	5.7%
Oak Bluffs	2,138	158	146	6.8%
Oakham	702	0	0	0.0%
Orange	3,461	439	375	10.8%
Orleans	3,290	327	297	9.0%
Oris	763	0	0	0.0%
Oxford	5,520	404	404	7.3%
Palmer	5,495	316	268	4.9%

Paxton	1,590	12	12	0.8%
Peabody	22,135	2,164	2,049	9.3%
Plymouth	564	4	4	0.7%
Pembroke	6,477	773	619	9.6%
Pepperell	4,335	197	130	3.0%
Peru	354	0	0	0.0%
Petersham	525	0	0	0.0%
Phillipston	658	6	6	0.9%
Pittsfield	21,031	2,083	1,962	9.3%
Plainfield	283	0	0	0.0%
Plainville	3,459	210	176	5.1%
Plymouth	22,285	845	740	3.3%
Plympton	1,039	47	47	4.5%
Princeton	1,324	20	20	1.5%
Provincetown	2,122	230	189	8.9%
Quincy	42,547	4,089	4,089	9.6%
Randolph	11,980	1,288	1,288	10.8%
Raynham	5,052	602	487	9.6%
Reading	9,584	1,133	705	7.4%
Rehoboth	4,252	97	25	0.6%
Revere	21,956	1,818	1,808	8.2%
Richmond	706	0	0	0.0%
Rochester	1,865	8	8	0.4%
Rockland	7,030	457	411	5.8%
Rockport	3,460	135	135	3.9%
Rowe	177	0	0	0.0%
Rowley	2,226	154	92	4.1%
Royalston	523	3	3	0.6%
Russell	687	14	14	2.0%
Rutland	2,913	81	81	2.8%
Salem	18,998	2,351	2,349	12.4%
Salisbury	3,842	532	308	8.0%
Sandisfield	401	0	0	0.0%
Sandwich	8,183	555	314	3.8%
Saugus	10,754	848	759	7.1%
Savoy	318	0	0	0.0%
Scituate	7,163	354	309	4.3%
Seekonk	5,272	88	85	1.6%
Sharon	6,413	461	461	7.2%
Sheffield	1,507	30	30	2.0%
Shelburne	893	51	51	5.7%
Sherborn	1,479	41	34	2.3%
Shirley	2,417	60	60	2.5%
Shrewsbury	13,919	951	860	6.2%
Southbury	758	2	2	0.3%
Somerset	7,335	286	267	3.6%
Somerville	33,632	3,228	3,216	9.6%

South Hadley	7,091	395	396	5.6%
Southampton	2,310	44	44	1.9%
Southborough	3,433	581	257	7.5%
Southbridge	7,517	494	494	6.6%
Southwick	3,852	180	176	4.6%
Spencer	5,137	268	267	5.2%
Springfield	61,556	10,263	9,986	16.2%
Sterling	2,918	269	68	2.3%
Stockbridge	1,051	111	111	10.6%
Stoneham	9,399	501	495	5.3%
Stoughton	10,742	1,515	1,187	11.1%
Stow	2,500	301	147	5.9%
Sturbridge	3,759	258	207	5.5%
Sudbury	5,921	572	343	5.8%
Sunderland	1,718	8	8	0.5%
Sutton	3,324	176	55	1.7%
Swampscott	5,795	218	212	3.7%
Swansea	6,290	255	244	3.9%
Taunton	23,844	1,841	1,645	6.9%
Templeton	3,014	475	197	6.5%
Tewksbury	10,803	1,294	1,011	9.4%
Tisbury	1,965	123	109	5.5%
Tolland	222	0	0	0.0%
Topsfield	2,157	164	146	6.8%
Townsend	3,356	214	174	5.2%
Truro	1,090	10	10	0.9%
Tyngsborough	4,166	642	320	7.7%
Tyringham	149	0	0	0.0%
Upton	2,820	223	178	6.3%
Uxbridge	5,284	432	255	4.8%
Wakefield	10,459	1,054	757	7.2%
Wales	772	55	55	7.1%
Walpole	8,984	470	470	5.2%
Waltham	24,805	2,188	1,780	7.2%
Ware	4,539	442	442	9.7%
Wareham	9,880	887	757	7.7%
Warren	2,202	107	107	4.9%
Warwick	363	0	0	0.0%
Washington	235	0	0	0.0%
Watertown	15,521	1,229	1,010	6.5%
Wayland	4,957	281	161	3.2%
Webster	7,788	663	663	8.5%
Wellesley	9,090	592	560	6.2%
Wellfleet	1,550	34	34	2.2%
Wendell	419	0	0	0.0%
Wenham	1,404	169	116	8.3%
West Boylston	2,729	293	130	4.8%

West Bridgewater	2,658	125	63	2.4%
West Brookfield	1,578	61	61	3.9%
West Newbury	1,558	86	32	2.1%
West Springfield	12,629	434	434	3.4%
West Stockbridge	645	0	0	0.0%
West Tisbury	1,253	38	23	1.8%
Westborough	7,304	728	678	9.3%
Westfield	16,001	1,063	1,063	6.6%
Westford	7,671	984	553	7.2%
Westhampton	635	0	0	0.0%
Westminster	2,826	273	86	3.0%
Weston	3,952	252	142	3.6%
Westport	6,417	452	225	3.5%
Westwood	5,389	615	497	9.2%
Weymouth	23,337	1,925	1,901	8.1%
Whately	654	2	2	0.3%
Whitman	5,513	218	218	4.0%
Wilbraham	5,442	249	248	4.6%
Williamsburg	1,165	51	51	4.4%
Williamstown	2,805	147	147	5.2%
Wilmington	7,788	1,046	818	10.5%
Winchendon	4,088	345	345	8.4%
Winchester	7,920	199	152	1.9%
Windsor	387	0	0	0.0%
Winthrop	8,253	636	636	7.7%
Woburn	16,237	1,310	1,142	7.0%
Worcester	74,383	9,502	9,490	12.8%
Worthington	553	22	22	4.0%
Wrentham	3,821	269	165	4.3%
Yarmouth	12,037	601	494	4.1%
<b>Totals</b>	<b>2,692,186</b>	<b>276,010</b>	<b>247,059</b>	<b>9.2%</b>

\*This data is derived from Information provided to the Department of Housing and Community Development (DHCD) by individual communities and is subject to change as new information is obtained and use restrictions expire.

## **1.0 SITE DESCRIPTION NARRATIVE**

### **1.1 Existing Site Conditions**

The project site consists of 25.7 acres of land on Weiss Farm along the north side of Franklin Street in the town of Stoneham, MA. The Weiss family had operated a farm on this location for many years and in recent years has sold topsoil and mulch.

The existing property contains the Weiss Farm family home and several barn buildings. The family will keep the portion of the property that is the site of the family home and will continue to live there.

The remaining area of the farm, including the loam and mulch operation, is located to the north of the farm buildings and contains about 14 acres of upland. Much of the upland has been farmed or used for storage for many years. It also includes a rocky knoll on the north-westerly side of the composting operation area. Much of the property is wetlands and wetland buffer and therefore will remain in its natural state. There is a large wetland area on the west and north sides of the property and a wetland area on the east side adjacent to Franklin Street. Close to 80% of the property will remain as vegetative open space.

A drainage channel was excavated through the wetland area along the perimeter of the farm area. The channel flows to a wetland area in the southeast corner of the project site. A small pump station adjacent to Franklin Street pumps water to a culvert under Franklin Street. The water flows under Franklin Street and then southerly in a drainage channel.

As part of this project, the property will be subdivided into two lots. An ANR plan will be submitted to the town subdividing 1.16 acres from the remaining 25.67 acres to include the existing farmhouse, a barn and surrounding areas. The remaining land will be used for the apartment community.

Please refer to the topographic plan of land, USGS Map and the aerial photographs for further details of the site.

### **1.2 Existing Environmental Resources**

As stated above, there is a significant wetland area in the north and west portion of the site and along the easterly side of the site.

A drainage channel was excavated around three sides of the farm operation area, which is considered a wetland area. The topographic plan indicated the boundary of the vegetated wetlands along the perimeter of the proposed development area as approved by the Stoneham Conservation Commission.

FEMA mapping has been reviewed to determine if there are any flood zones located on the project site. According to the FEMA mapping, there are not any portions of the site shown as being within a 100 year flood zone.

## **1.3 EXISTING UTILITIES**

### **1.3.1 Water**

There is presently a 12-inch ductile iron water line in Franklin Street adjacent to the project site. A hydrant flow test was conducted on July 23, 2013 by the Stoneham Water Department. The test indicated a static pressure of 65 psi, a residual pressure of 62 psi and a flow of 865 gallons per day. This is adequate pressure for the proposed development. The MWRA supplies water to the Town of Stoneham.

### **1.3.2 Sewerage**

The project site is presently serviced by an 8-inch gravity sewer line which runs through a 10-foot wide sewer easement on the adjacent property and then to Franklin Street. This sewer line flows in an easterly direction under Franklin Street.

There is also a 10-inch sewer line in Franklin Street adjacent to the westerly portion of the site. This line flows in a westerly direction. It is anticipated that the proposed project will connect to this 10-inch line.

The Town of Stoneham is part of the MWRA sewer system, and the sewerage from the Town is treated at the Deer Island sewerage treatment facility.

### **1.3.3 Electric**

NSTAR provides electric service to the Town of Stoneham. Presently there is overhead electric service along the north side of Franklin Street adjacent to the site. It is anticipated that the electric service to the site will extend underground from a utility pole along Franklin Street to the project site.

### **1.3.4 Telephone, Cable and Internet**

Communication services are available on the overhead along Franklin Street. It is anticipated that the communication services to the site will extend underground from a utility pole through the project site.

### **1.3.5 Gas**

National Grid provides gas service to the Town of Stoneham. There is existing 12-inch gas main in Franklin Street adjacent to the project site.

## **1.4 Easements**

There is an existing 10 foot wide sewer easement along Franklin Street. The sewer easement is for the sewer line from the existing Weiss Farm house. It is assumed that this easement will remain in place. This easement will need to be continued to the new subdivision property line for the house. There is also a drain and ditch easement at the northwest corner of the site in the wetland area. This easement is outside of the area proposed for development and would not impact the proposed project. There are no other known easements.







# THE COMMONS AT WEISS FARM

STONEHAM, MASSACHUSETTS

WEISS FARM APARTMENTS LLC

**THE COMMONS AT WEISS FARM - STATISTICS** 5/11/14

	Studio	1BR	2BR	3BR	Total Units	Bedrooms	Footprint	Floor Area
Building A	5	26	33	0	64	97	15,331	73,661
Building B	5	26	33	0	64	97	15,331	73,661
Building C	17	53	43	3	121	175	29,593	138,135
TH 1-3	0	0	0	3	3	9	2,240	5,810
TH 4-6	0	0	0	3	3	9	2,240	5,810
TH 7-9	0	0	0	3	3	9	2,301	5,806
TH 10-12	0	0	0	3	3	9	2,301	5,802
TH 13-15	0	0	0	3	3	9	2,301	5,806
Clubhouse	0	0	0	0	0	0	4,962	4,962
Garage	0	0	0	0	0	0	1,790	0
Maintenance	0	0	0	0	0	0	449	449
<b>TOTAL</b>	<b>27</b>	<b>105</b>	<b>114</b>	<b>18</b>	<b>264</b>	<b>414</b>	<b>78,779</b>	<b>323,819</b>

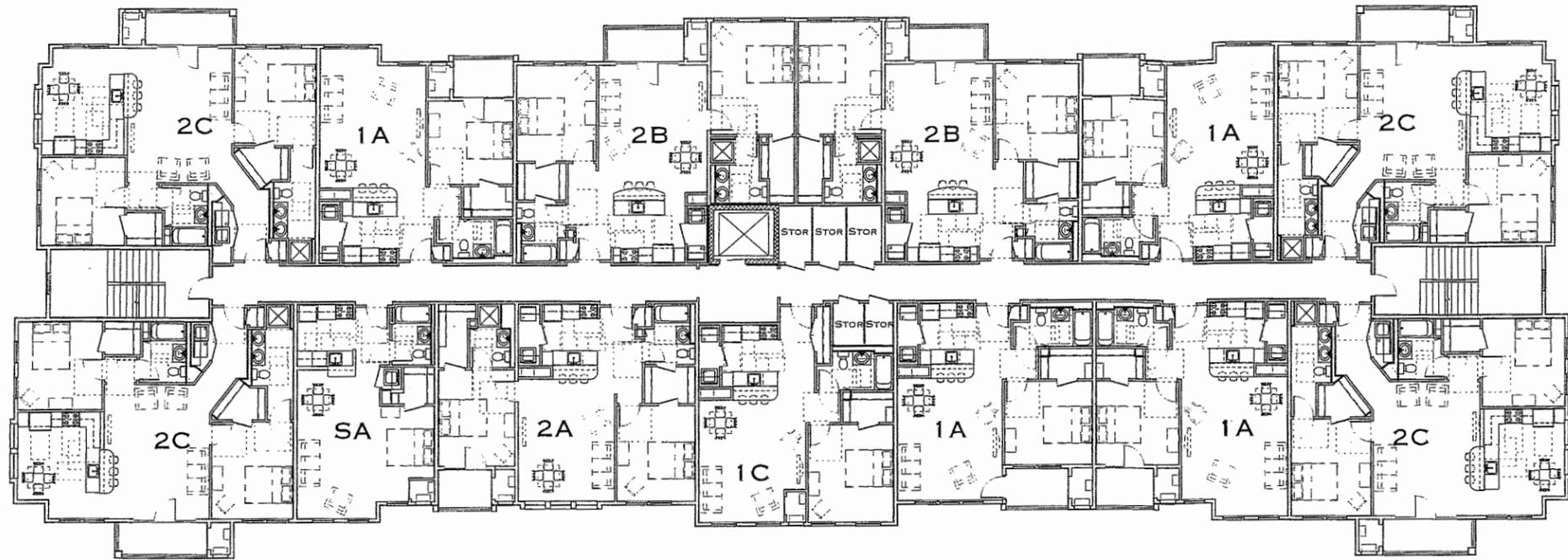
**Breakdown of Group 2 Accessible Units and Affordable Units Included in totals above**

Group 2 Acc	1	5	6	1	13	21
Affordable	7	26	29	4	66	103

**Drawing List**

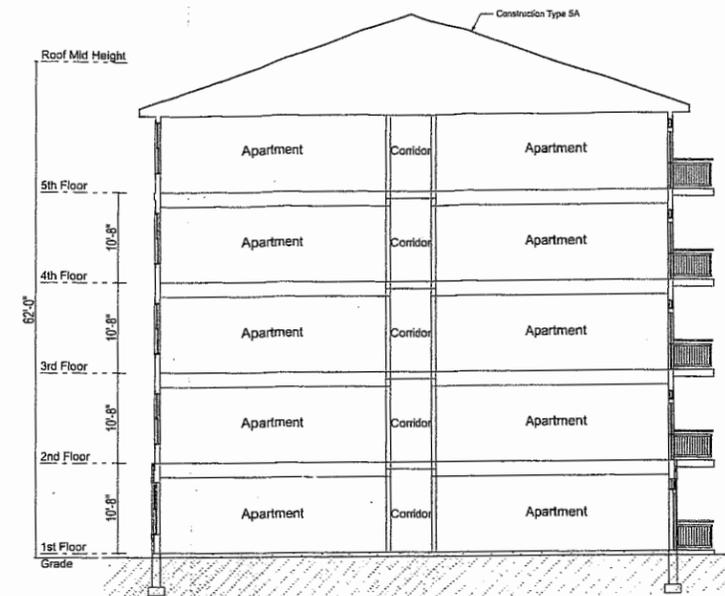
- A1 Buildings A & B Floor Plans
- A2 Buildings A & B Exterior Elevations
- A3 Buildings C First Floor Plan
- A4 Buildings C Typical Upper Floor Plan
- A5 Buildings C Exterior Elevations
- A6 Buildings C Exterior Elevations
- A7 Townhouses 1-15 Plans & Elevations
- A8 Clubhouse Plans & Elevations





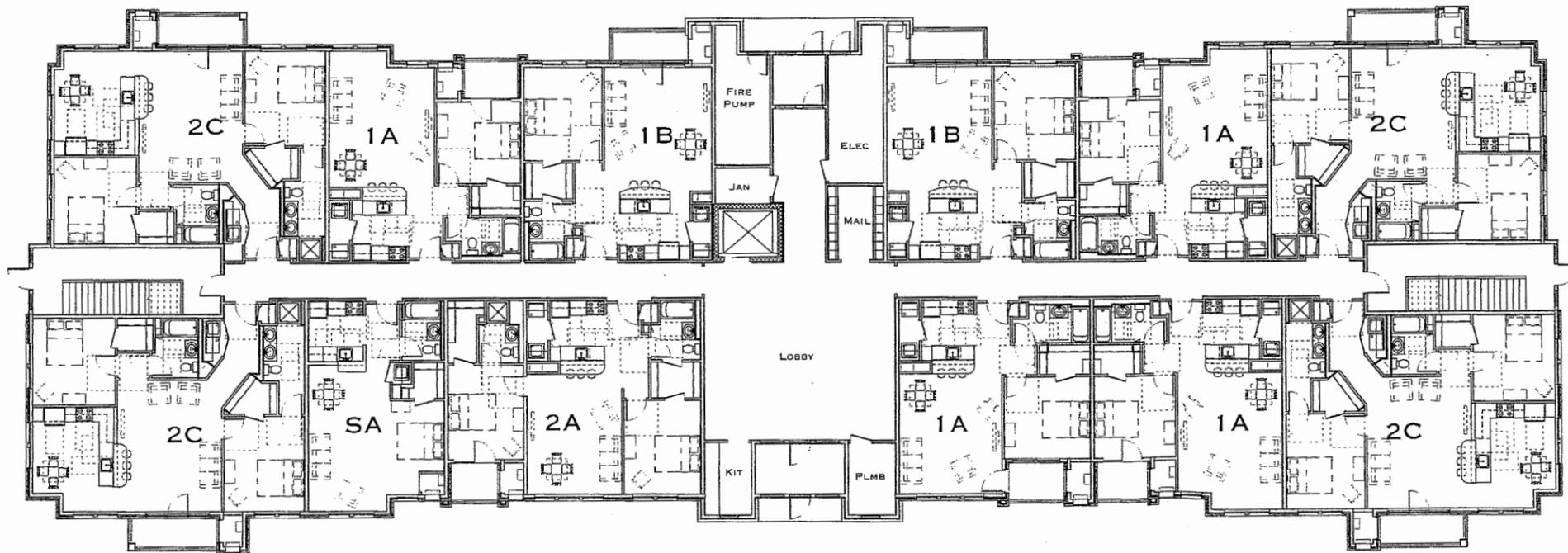
**Typical Upper Floor Plan**

Scale 1/8" = 1'-0"



**Building Section**

Scale 1/8" = 1'-0"



**1st Floor Plan**

Scale 1/8" = 1'-0"



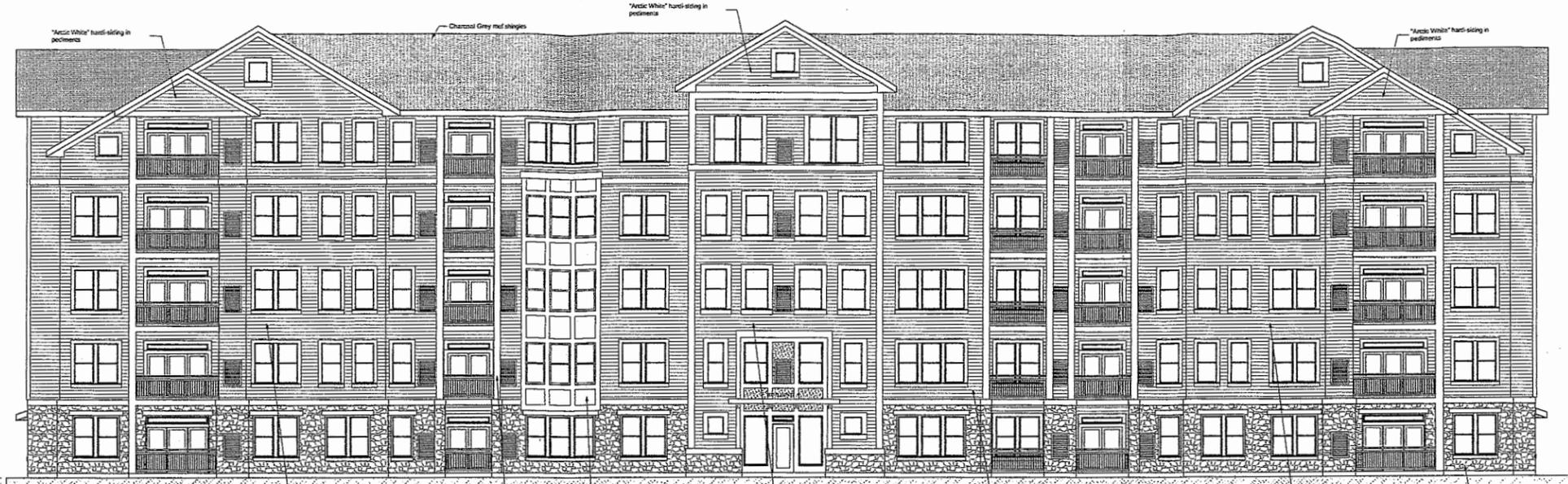
WEISS FARM APARTMENTS LLC  
THE COMMONS AT WEISS FARM  
STONEHAM, MASSACHUSETTS

**Buildings A & B  
Floor Plans**

Date: 06/25/14  
Rev: 1006



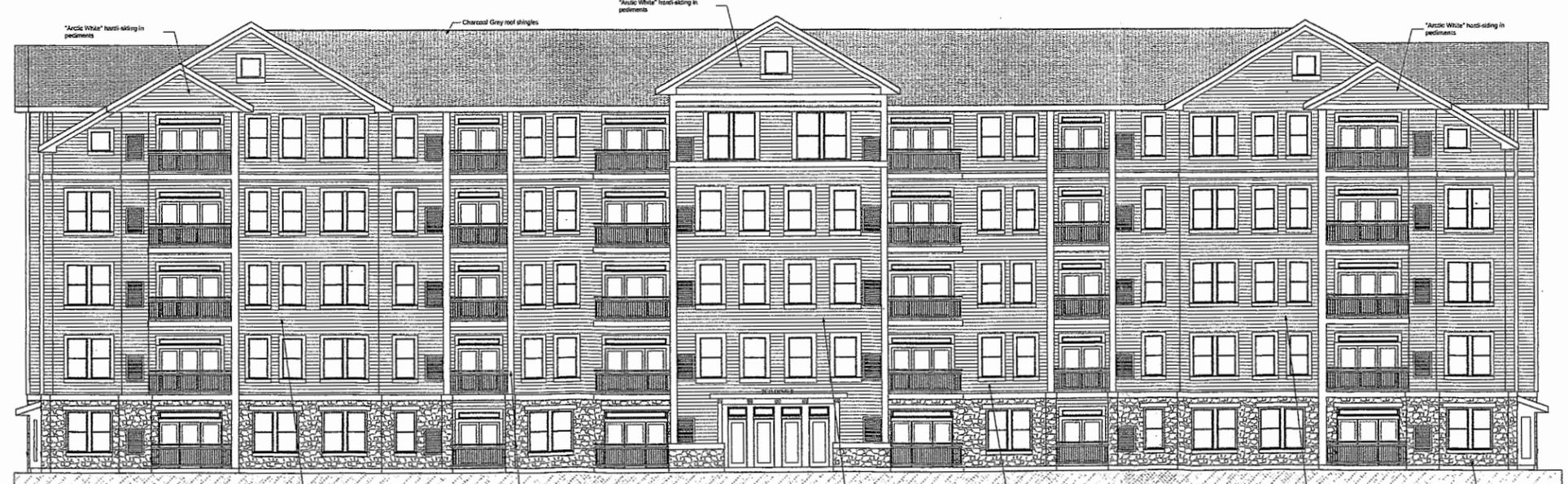
**Side Elevation**  
Scale 1/8" = 1'-0"



**Front Elevation**  
Scale 1/8" = 1'-0"



**Side Elevation**  
Scale 1/8" = 1'-0"

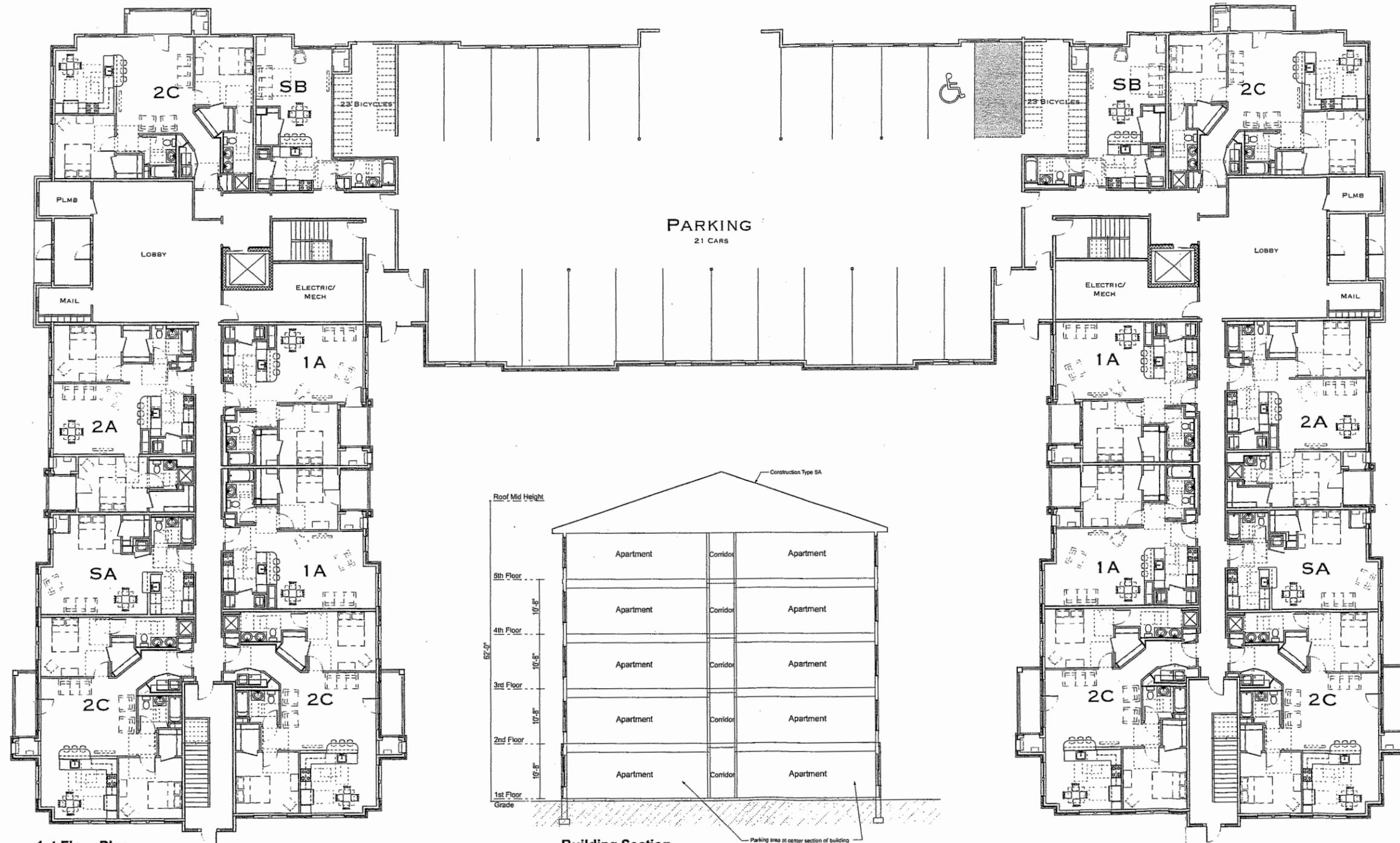


**Rear Elevation**  
Scale 1/8" = 1'-0"



WEISS FARM APARTMENTS LLC  
THE COMMONS AT WEISS FARM  
STONEHAM, MASSACHUSETTS

**Buildings A & B**  
**Exterior Elevations**  
Date: 06/25/14  
Rev: 108



**1st Floor Plan**  
Scale 1/8" = 1' - 0"

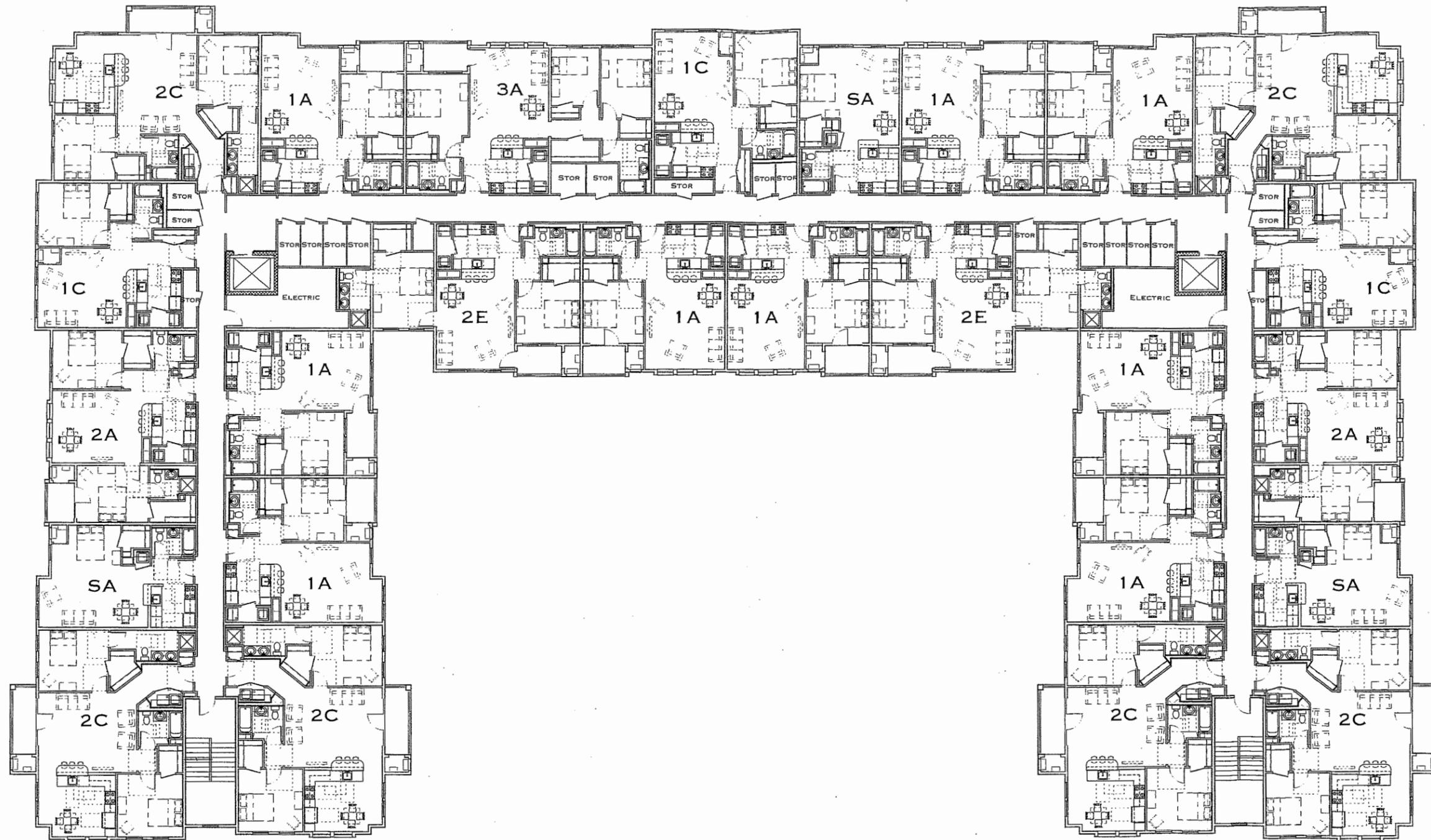
**Building Section**  
Scale 1/8" = 1' - 0"



WEISS FARM APARTMENTS LLC  
THE COMMONS AT WEISS FARM  
STONEHAM, MASSACHUSETTS

**Building C**  
**First Floor Plan**

Date: 06/25/14  
Rev: A2



**Typical Upper Floor Plan**  
 Scale 1/8" = 1'-0"



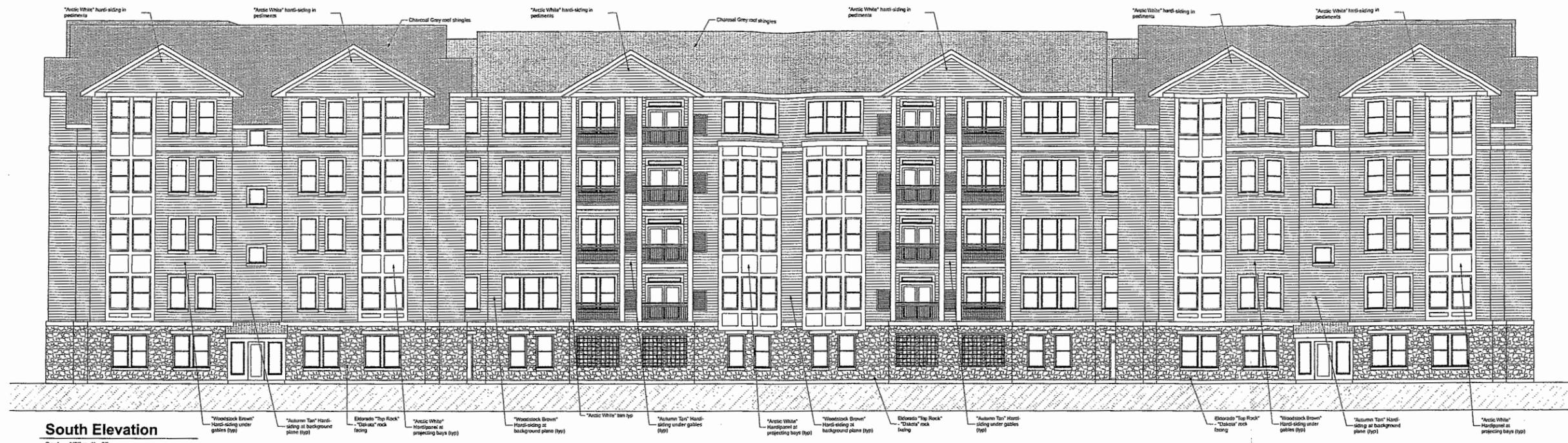
WEISS FARM APARTMENTS LLC  
 THE COMMONS AT WEISS FARM  
 STONEHAM, MASSACHUSETTS

Russell Scott Steedle & Capone Architects Inc.  
 18 South Street • Cambridge, Massachusetts 02138 • 617-861-9993 • Fax 617-861-9913

**Building C**  
**Typical Upper Floor**

Date: 06/25/14  
 Rev: \_\_\_\_\_  
 1/8" = 1'-0"

1008  
**A4**



WEISS FARM APARTMENTS LLC  
THE COMMONS AT WEISS FARM  
STONEHAM, MASSACHUSETTS

Russell Scott Steedle & Capone Architects Inc.  
18 State Street • Cambridge, Massachusetts 02142 • 617-661-6880 • Fax 617-661-6881

Building C  
Exterior Elevations

Date: 06/25/14  
Rev: \_\_\_\_\_

1308  
A5



**North Elevation**

Scale 1/8" = 1'-0"



**East Courtyard Elevation**

Scale 1/8" = 1'-0"



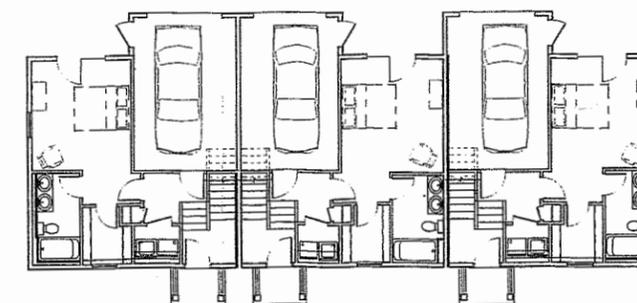
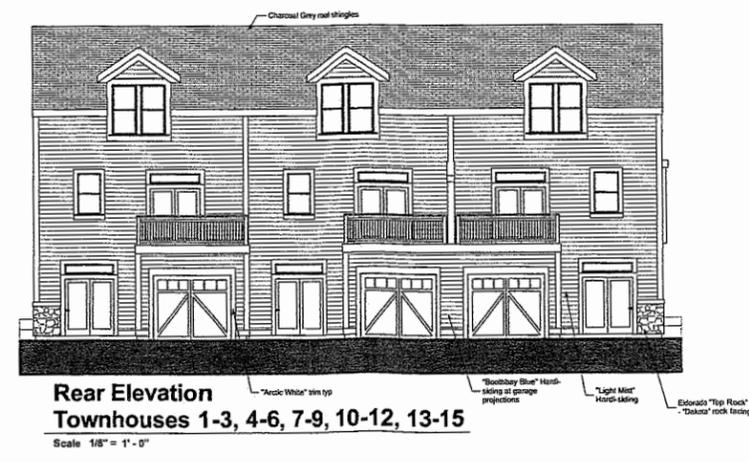
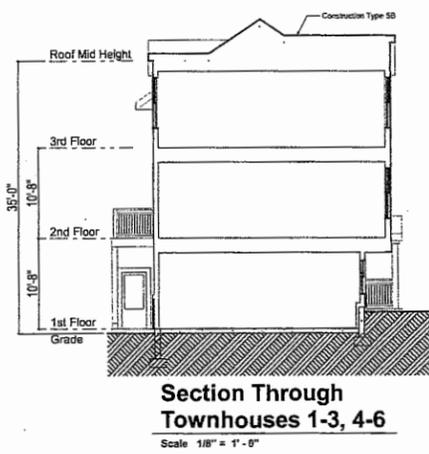
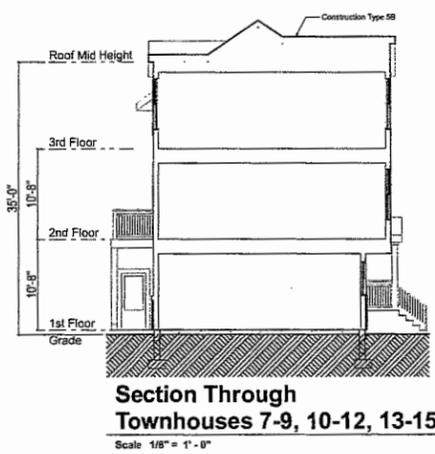
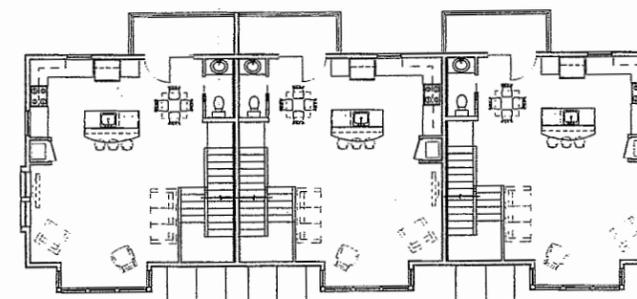
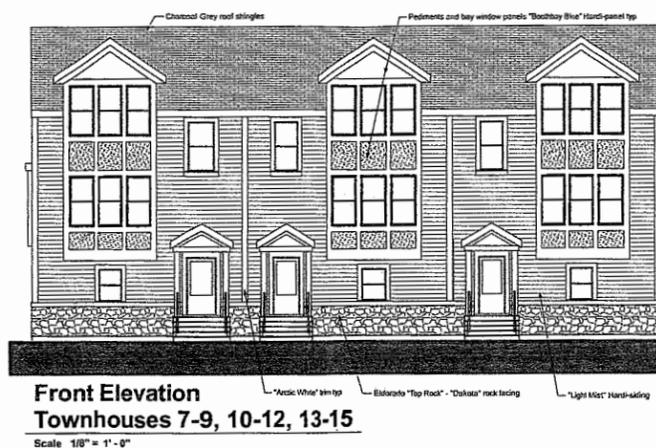
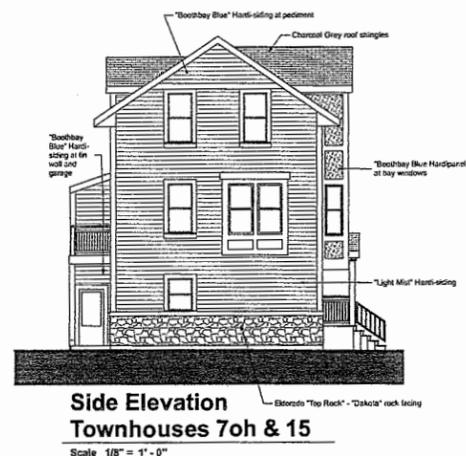
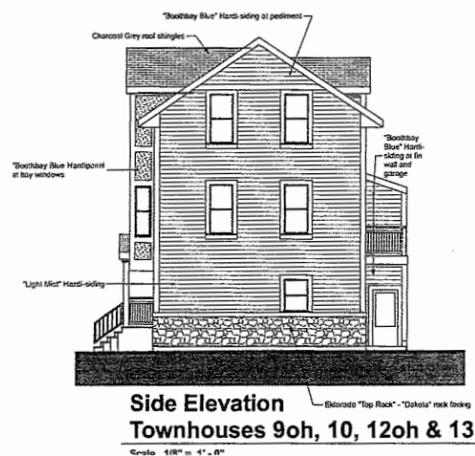
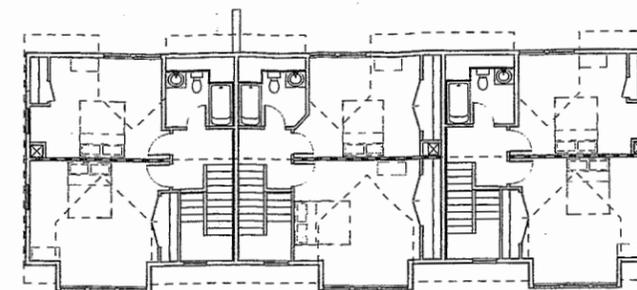
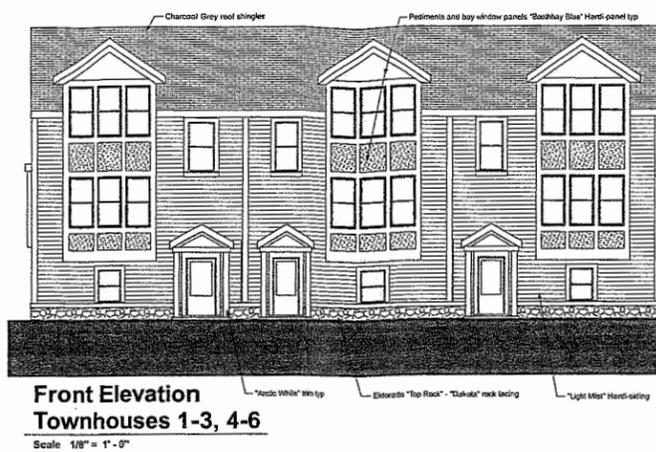
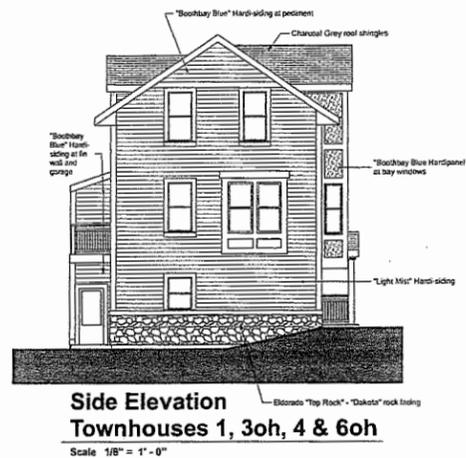
**West Elevation**

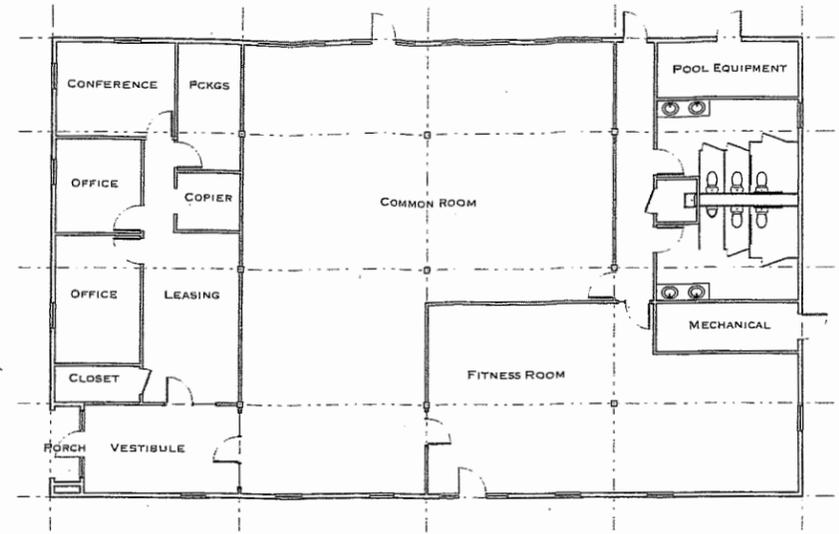
Scale 1/8" = 1'-0"



WEISS FARM APARTMENTS LLC  
 THE COMMONS AT WEISS FARM  
 STONEHAM, MASSACHUSETTS  
 Russell Scott Steadle & Capone Architects Inc.  
 18 Beale Street • Cambridge, Massachusetts • 02138 • 617-661-5622 • Fax 617-661-5623

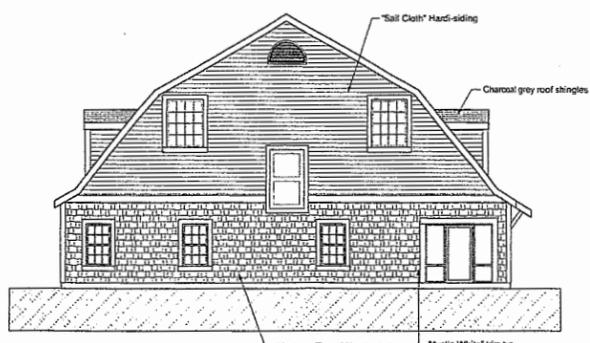
**Building C**  
**Exterior Elevations**  
 Date: 08/20/18  
 Rev: 1308  
 A6





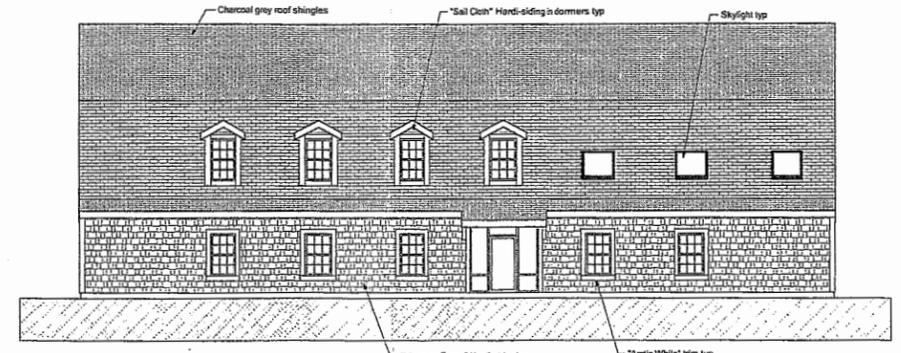
**1st Floor Plan**

Scale 1/8" = 1' - 0"



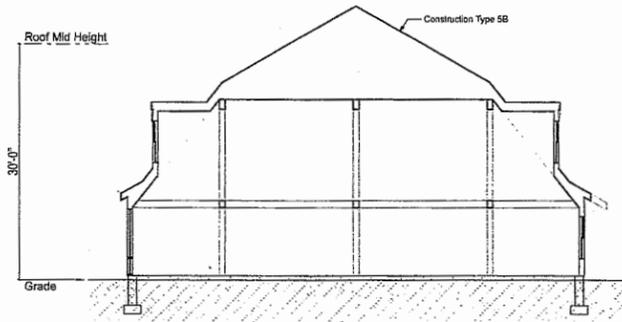
**West Elevation**

Scale 1/8" = 1' - 0"



**South Elevation**

Scale 1/8" = 1' - 0"



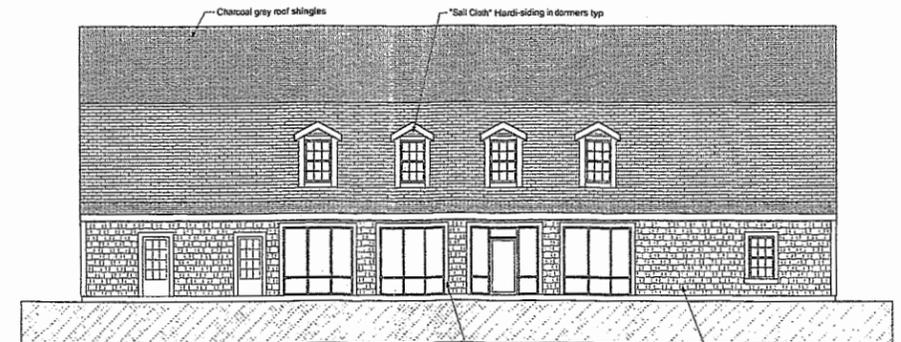
**Building Section**

Scale 1/8" = 1' - 0"



**East Elevation**

Scale 1/8" = 1' - 0"



**North Elevation**

Scale 1/8" = 1' - 0"



WEISS FARM APARTMENTS LLC  
 THE COMMONS AT WEISS FARM  
 STONEHAM, MASSACHUSETTS

Russell Scott Steedie & Capone Architects Inc.  
 18 Bottle Street - Cambridge, Massachusetts 02138 - 617-661-9990 - Fax 617-661-9614

Clubhouse  
 Plan & Elevations

Date: 06/25/14  
 1308  
 A8

# THE COMMONS AT WEISS FARM - STATISTICS

6/11/14

	Studio	1BR	2BR	3BR	Total Units	Bedrooms	Footprint	Floor Area
Building A	5	26	33	0	64	97	15,331	75,661
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TH 1-3	0	0	0	3	3	9	2,240	5,810
TH 4-6	0	0	0	3	3	9	2,240	5,810
TH 7-9	0	0	0	3	3	9	2,301	5,806
TH 10-12	0	0	0	3	3	9	2,301	5,802
TH 13-15	0	0	0	3	3	9	2,301	5,806
Clubhouse	0	0	0	0	0	0	4,982	4,982
Garage	0	0	0	0	0	0	1,750	0
Maintenance	0	0	0	0	0	0	449	449
<b>TOTAL</b>	<b>27</b>	<b>105</b>	<b>114</b>	<b>18</b>	<b>264</b>	<b>414</b>	<b>78,779</b>	<b>323,919</b>

## Breakdown of Group 2 Accessible Units and Affordable Units included in totals above

Group 2 Acc	1	5	6	1	13	21
Affordable	7	26	29	4	66	103

# COMPREHENSIVE PERMIT APPLICATION SUBMISSION

## THE COMMONS AT WEISS FARM

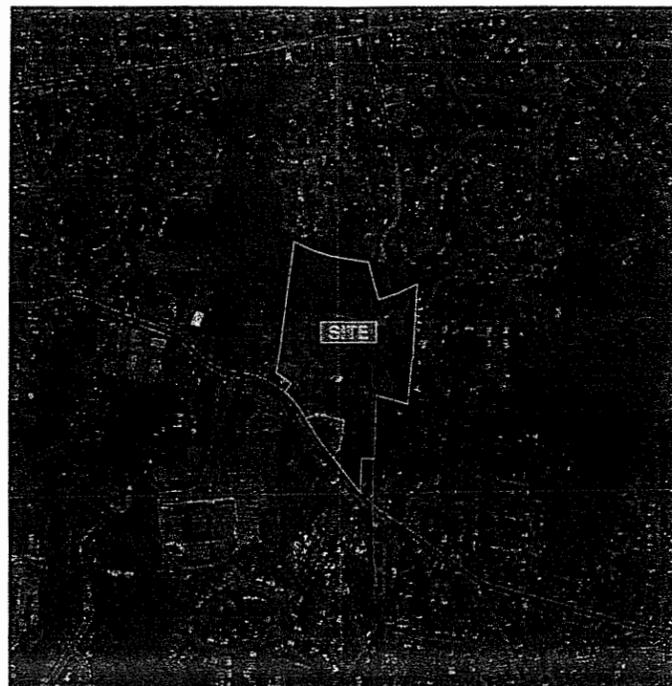
### STONEHAM, MASSACHUSETTS

### JUNE 25, 2014

**ZONING SUMMARY**  
ZONING DISTRICT: RESIDENCE A

	REQUIRED	PROVIDED
A		
MINIMUM LOT AREA	10,000 SQ. FT.	1,117,639 SQ. FT.
LOT AREA PER DWELLING	10,000 SQ. FT.	4,233 SQ. FT.
MINIMUM FRONTAGE	90 FT.	249 FT.
MIN. FRONT YARD SETBACK	20 FT.	25 FT.
MIN. SIDE YARD SETBACK	10 FT.	96 FT.
MIN. REAR YARD SETBACK	15 FT.	249 FT.
MAX. BUILDING HEIGHT	30 FT.	62 FT.
MAX. BUILDING COVERAGE	30%	7%

TOTAL PROPOSED NUMBER OF RESIDENTIAL UNITS = 264



**LOCUS MAP**

SCALE: 1" = 500'±



HORIZONTAL GRAPHIC SCALE IN FEET

Reference:  
Photo from MassGIS, Commonwealth of Massachusetts  
Executive Office of Environmental Affairs  
(http://www.mass.gov/mgis). Photo ID number is  
ceq001\_30cm\_rossic07. Photo was taken in April 2008.

### INDEX OF DRAWINGS

SHEET No.	SHEET TITLE	DATE
	COVER SHEET	6/25/2014
C-1	EXISTING CONDITIONS	6/25/2014
C-2	SITE LAYOUT AND MATERIALS PLAN	6/25/2014
C-3	SITE GRADING AND DRAINAGE PLAN	6/25/2014
C-4	SITE UTILITY PLAN	6/25/2014
C-5	SITE DETAILS PLAN	6/25/2014
C-6	SITE DETAILS PLAN	6/25/2014
C-7	SITE DETAILS PLAN	6/25/2014
C-8	SITE SIGNAGE PLAN	6/25/2014
L-1	LANDSCAPE PLAN	6/25/2014
L-2	LIGHTING PHOTOMETRIC PLAN	6/25/2014

This drawing was prepared using AutoCAD 2011. The drawing was printed on 11x17 inch paper. The drawing was printed on 6/25/2014 at 10:00 AM. The drawing was printed by James White, P.E.

**CIVIL ENGINEER**  
 H.W. MOORE ASSOCIATES, INC.  
 112 SHAWMUT AVENUE  
 BOSTON, MA 02118  
 TEL. 617-357-8145  
 CONTACT: JAMES WHITE, P.E.

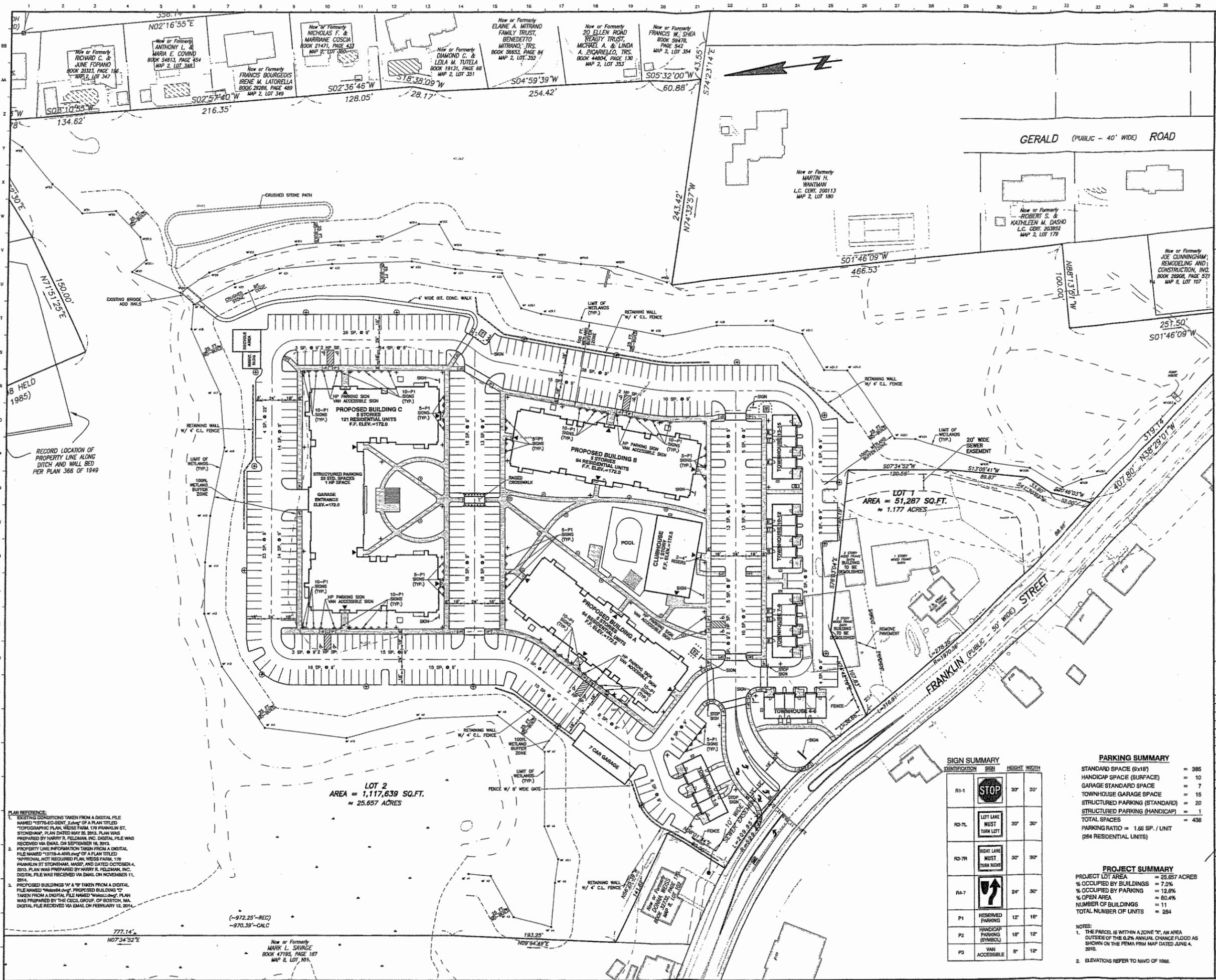
**ARCHITECT**  
 RUSSELL, SCOTT STEEDLE & CAPONE ARCHITECTS INC.  
 18 BRATTLE ST.  
 CAMBRIDGE, MA 02138  
 TEL. 617-661-5880  
 CONTACT: HUGH RUSSELL, AIA

**SURVEYOR**  
 HARRY R. FELDMAN, INC.  
 112 SHAWMUT AVE.  
 BOSTON, MA 02118  
 TEL. 617-357-9740  
 CONTACT: KARL McCARTHY, PLS

**LANDSCAPE ARCHITECT**  
 THE CECIL GROUP  
 170 MILK ST., SUITE 5  
 BOSTON, MA 02210  
 TEL. 617-426-5051  
 CONTACT: MICHAEL KLUCHMAN

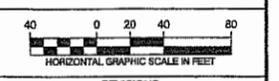
**APPLICANT**  
 WEISS FARM APARTMENTS LLC  
 100 GRANDVIEW ROAD, SUITE 207  
 BRAintree, MA 02184  
 TEL. 781-849-7111  
 CONTACT: PETER MAHONEY





**LEGEND**

- 150 INDEX CONTOUR
- 152 INTERMEDIATE CONTOUR
- 152 HALF FOOT CONTOUR
- 154.75 SPOT GRADE
- DRAIN LINE
- CATCH BASIN (CB)
- DRAIN MANHOLE (DMH)
- DRAIN INLET (DI)
- ⊙ WATER QUALITY DEVICE (WQD)
- SEWER LINE
- SEWER MANHOLE (SMH)
- WATER LINE
- ⊕ FIRE HYDRANT
- ⊕ GATE VALVE & TEE
- ELECTRIC LINE
- ⊕ ELECTRIC TRANSFORMER
- GAS LINE
- ⊕ GAS METER
- CONCRETE WALK
- RETAINING WALL
- EROSION CONTROL BARRIER
- ⊕ POLE MOUNTED LIGHT (16'-20' POLE)
- ⊕ POLE MOUNTED LIGHT (12'-16' POLE)
- PEDESTRIAN LEVEL LIGHT
- ⊕ H.P. RAMP



REVISIONS

NO.	DATE	DESCRIPTION

ISSUE DATE: JUNE 25, 2014  
 SCALE: 1" = 40'  
 SHEET: C-2

**THE COMMONS AT WEISS FARM**  
 STONEHAM, MASSACHUSETTS

**SITE LAYOUT AND MATERIALS PLAN**

**hwmooore**  
 ASSOCIATES, INC.  
 CIVIL ENGINEERING / LAND PLANNING  
 112 Shrewsbury Avenue, Boston, MA 02118-2227  
 Tel: 617-357-6145 Fax: 617-357-9455 web: hwmooore.com

**SIGN SUMMARY**

IDENTIFICATION	SIGN	HEIGHT	WIDTH
R1-1	STOP	30"	30"
R3-7L	LEFT LANE MUST TURN LEFT	30"	30"
R3-7R	RIGHT LANE MUST TURN RIGHT	30"	30"
R4-7	UPWARD ARROW	24"	30"
P1	RESERVED PARKING	12"	18"
P2	HANDICAP PARKING (SYMBOL)	18"	12"
P3	VAN ACCESSIBLE	6"	12"

**PARKING SUMMARY**

STANDARD SPACE (8x18)	= 385
HANDICAP SPACE (SURFACE)	= 10
GARAGE STANDARD SPACE	= 7
TOWNHOUSE GARAGE SPACE	= 15
STRUCTURED PARKING (STANDARD)	= 20
STRUCTURED PARKING (HANDICAP)	= 1
TOTAL SPACES	= 438
PARKING RATIO = 1.66 SP. / UNIT (264 RESIDENTIAL UNITS)	

**PROJECT SUMMARY**

PROJECT LOT AREA	= 25.657 ACRES
% OCCUPIED BY BUILDINGS	= 7.3%
% OCCUPIED BY PARKING	= 12.8%
% OPEN AREA	= 80.4%
NUMBER OF BUILDINGS	= 11
TOTAL NUMBER OF UNITS	= 264

- NOTES:**
- THE PARCEL IS WITHIN A ZONE "X" AN AREA OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD AS SHOWN ON THE FEMA FIRM MAP DATED JUNE 4, 2010.
  - ELEVATIONS REFER TO NAVD OF 1988.

**PLAN REFERENCES:**

- EXISTING CONDITIONS TAKEN FROM A DIGITAL FILE NAMED "1976-EC-SENT 2.dwg" OF A PLAN TITLED "TOPOGRAPHIC PLAN, WEISS FARM, 170 FRANKLIN ST. STONEHAM, PLAN DATED MAY 26, 2013. PLAN WAS PREPARED BY HARRY R. FELDMAN, INC. DIGITAL FILE WAS RECEIVED VIA EMAIL ON SEPTEMBER 16, 2013.
- PROPERTY LINE INFORMATION TAKEN FROM A DIGITAL FILE NAMED "13778-A-AND.dwg" OF A PLAN TITLED "APPROVAL NOT REQUIRED PLAT, WEISS FARM, 170 FRANKLIN ST STONEHAM, MASS., AND DATED OCTOBER 4, 2013. PLAN WAS PREPARED BY HARRY R. FELDMAN, INC. DIGITAL FILE WAS RECEIVED VIA EMAIL ON NOVEMBER 11, 2014.
- PROPOSED BUILDINGS "A" & "B" TAKEN FROM A DIGITAL FILE NAMED "Weiss.dwg" OF A PLAN TITLED "PROPOSED BUILDINGS "C" TAKEN FROM A DIGITAL FILE NAMED "Weiss.dwg". PLAN WAS PREPARED BY THE CECL GROUP, OF BOSTON, MA. DIGITAL FILE RECEIVED VIA EMAIL ON FEBRUARY 12, 2014.

**LOT 2**  
 AREA = 1,117,639 SQ.FT.  
 ≈ 25.657 ACRES

**LOT 1**  
 AREA = 51,287 SQ.FT.  
 ≈ 1.177 ACRES

RECORD LOCATION OF PROPERTY LINE ALONG DITCH AND WALL BED PER PLAN 366 OF 1949

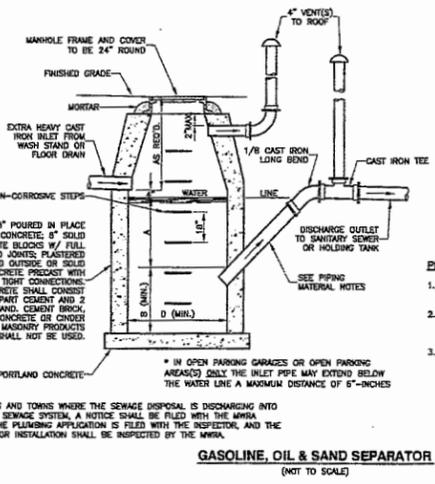
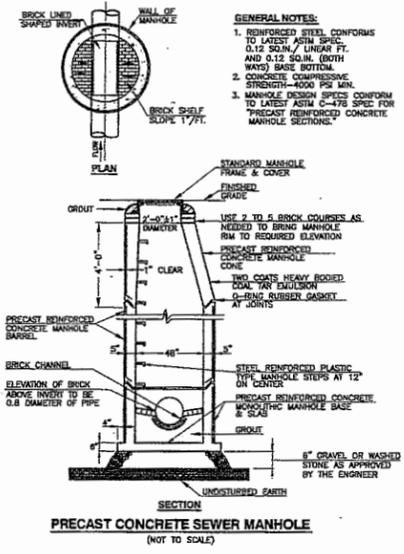
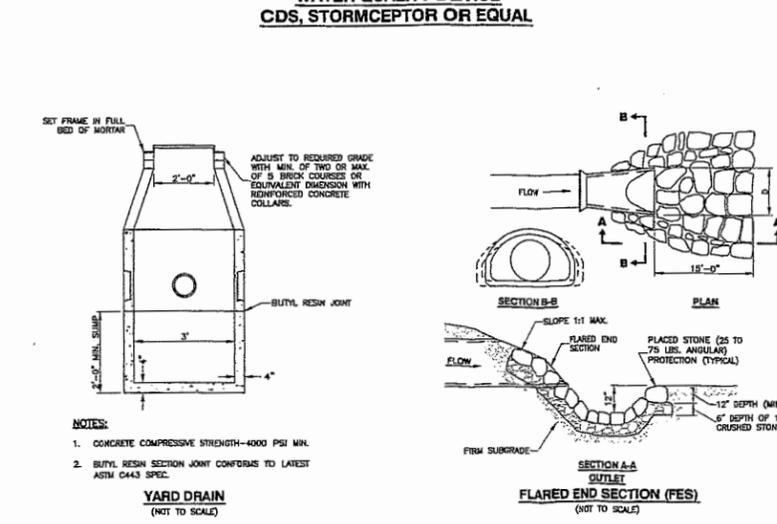
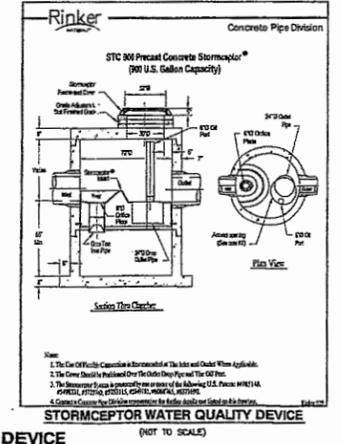
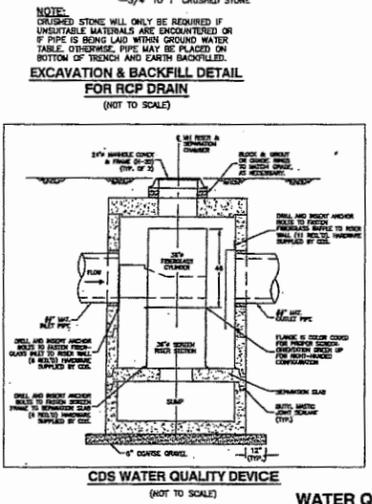
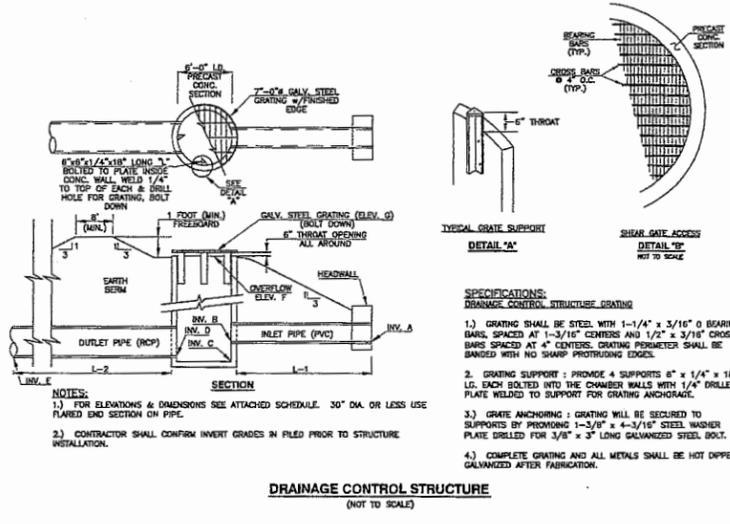
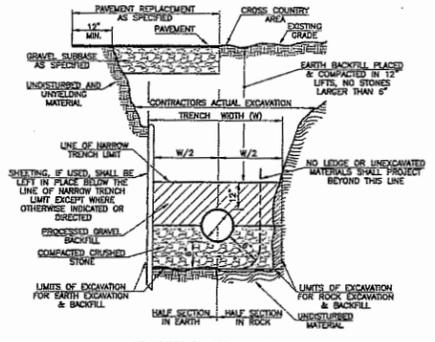
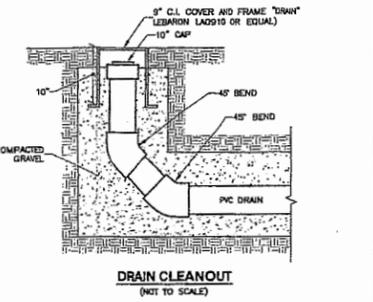
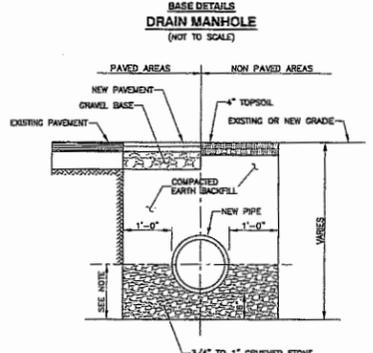
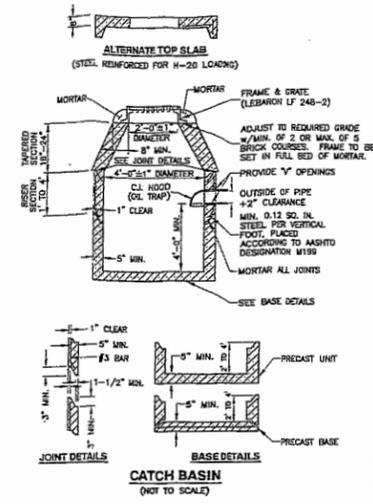
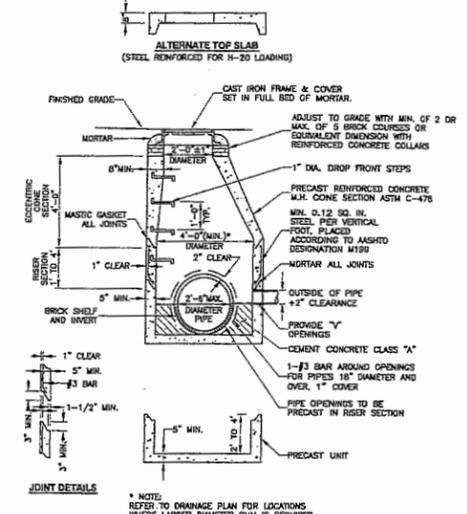
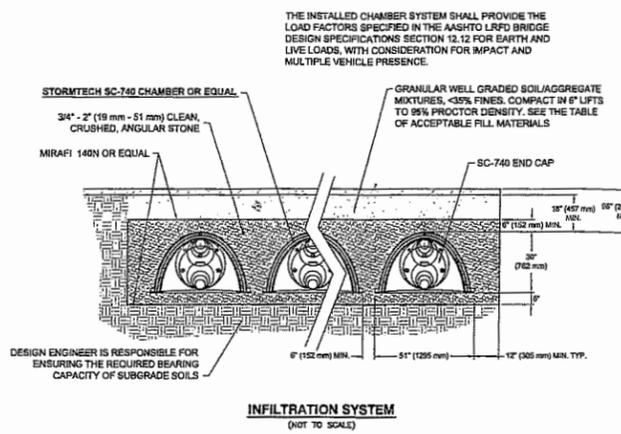
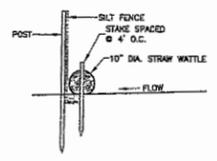
PLAN REFERENCES:

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**STRAW WATTLES & SILT FENCE  
SEDIMENTATION CONTROL**  
(NOT TO SCALE)



INLET	D	A	B
4"	3'-0"	3'-0"	2'-6"
5"	3'-0"	3'-0"	3'-0"
6"	4'-0"	4'-0"	3'-0"
8"	4'-0"	4'-0"	3'-0"
10"	4'-0"	4'-0"	3'-0"
12"	4'-0"	4'-0"	3'-0"
15"	4'-0"	4'-0"	3'-0"
18"	4'-0"	4'-0"	3'-0"
24"	4'-0"	4'-0"	3'-0"

- PIPING MATERIAL NOTES:**
- NO-HUB CAST IRON WITH PRODUCT APPROVED STAINLESS STEEL CLAMPS.
  - SERVICE WEIGHT CAST IRON WITH PRODUCT APPROVED RESILIENT GASKETS OR LEAD AND OILMAN JOINTS.
  - EXTRA HEAVY CAST IRON WITH PRODUCT APPROVED RESILIENT GASKETS OR LEAD AND OILMAN JOINTS.

REVISIONS

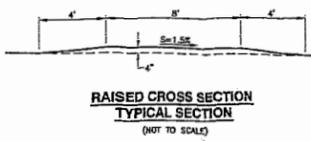
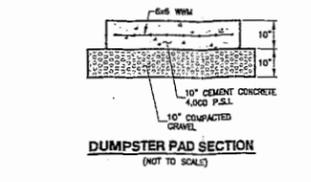
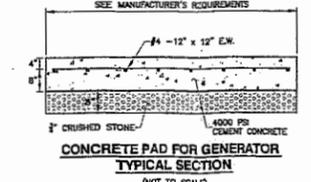
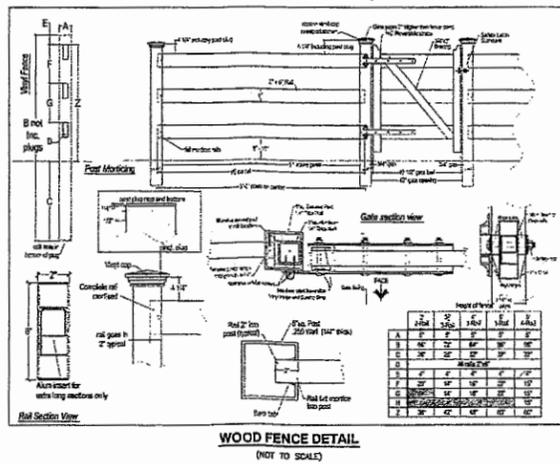
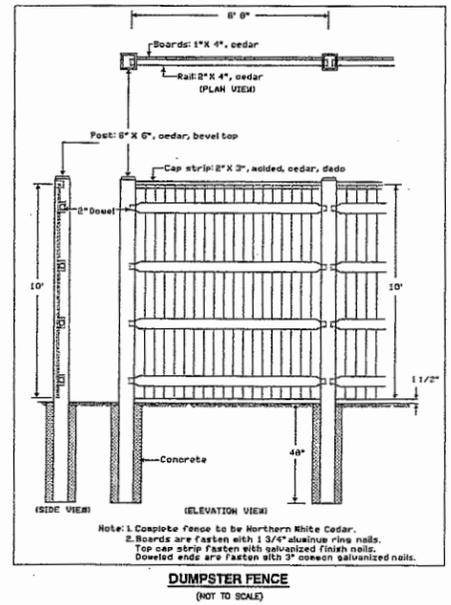
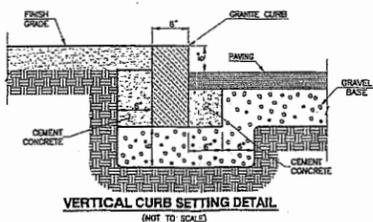
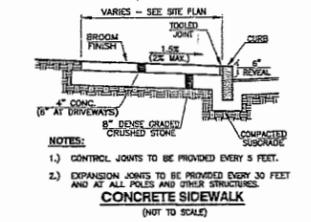
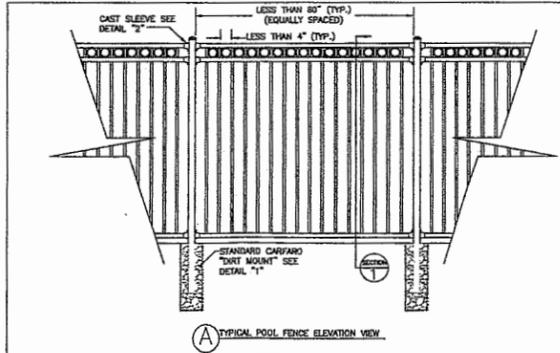
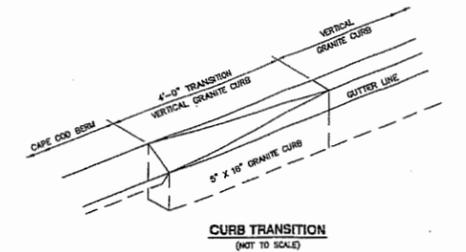
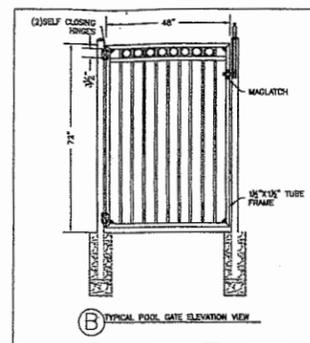
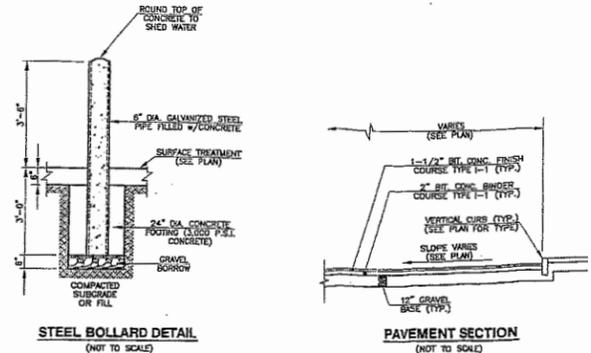
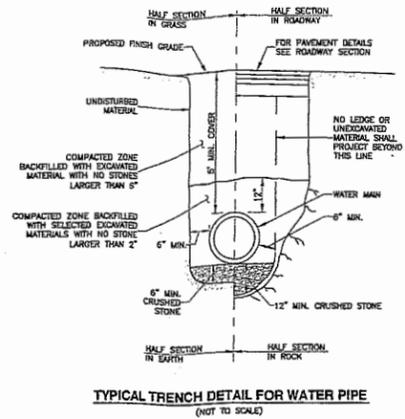
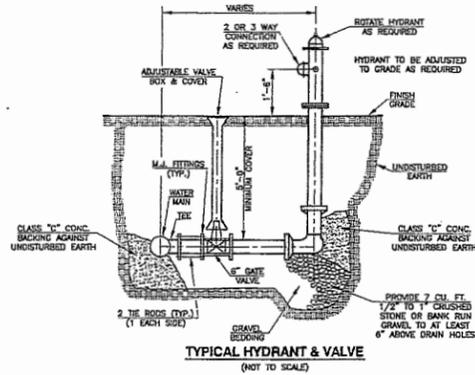
NO.	DATE	DESCRIPTION

ISSUE DATE: JUNE 25, 2014  
SCALE: AS NOTED  
SHEET C-5

**THE COMMONS AT WEISS FARM**  
STONEHAM, MASSACHUSETTS

**SITE DETAILS PLAN**

**hwmoore ASSOCIATES, INC.**  
CIVIL ENGINEERING / LAND PLANNING  
112 Glenhurst Avenue, Boston, MA 02118-2227  
Tel: 617-387-8145 Fax: 617-387-8655 www.hwmoore.com



REVISIONS	
ISSUE	DATE

ISSUE	DATE	DESCRIPTION

DATE: JUNE 25, 2014  
 SCALE: AS NOTED  
 SHEET C-6

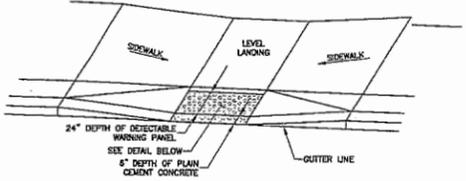
THE COMMONS AT WEISS FARM  
 STONEHAM, MASSACHUSETTS

SITE DETAILS PLAN

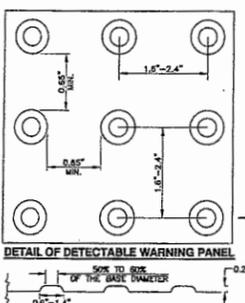
**hwmoore**  
 ASSOCIATES, INC.  
 CIVIL ENGINEERING | LAND PLANNING  
 112 Shawmut Avenue, Boston, MA 02118-2227  
 Tel: 617-557-9145 Fax: 617-557-9495 web: hwmoore.com

**DETECTABLE WARNING APPLICATION NOTES**

- TRUNCATED DOMES (SEE CURB SECTION) SHALL BE PLACED ACROSS THE ENTIRE WIDTH OF THE SIDEWALK TO A DISTANCE OF NOT LESS THAN 18 FEET ALONG THE SIDEWALK WHENEVER A PUBLIC SIDEWALK CROSSES A RAIL SYSTEM AT GRADE.
- A: AT GRADE CROSSINGS WITH A PEDESTRIAN CONTROL GATE, THE EDGE OF THE 24" DEPTH OF DETECTABLE WARNING CLOSET TO THE CONTROL GATE SHALL BE PLACED PARALLEL TO THE CONTROL GATE AT A DISTANCE OF BETWEEN 4 FEET AND 5 FEET FROM THE GATE IN A DOWN POSITION.
- B: AT GRADE CROSSINGS WITHOUT A CONTROL GATE, THE EDGE OF THE 24" DEPTH OF DETECTABLE WARNING CLOSET TO THE FIRST RAIL SHALL BE PLACED AT A DISTANCE OF 11 FEET IN ADVANCE OF THE FIRST RAIL CROSSING THE PATH OF TRAVEL.
- C: END MATERIAL SPECIFICATION TO BE WRITTEN.



**TYPICAL INSTALLATION**



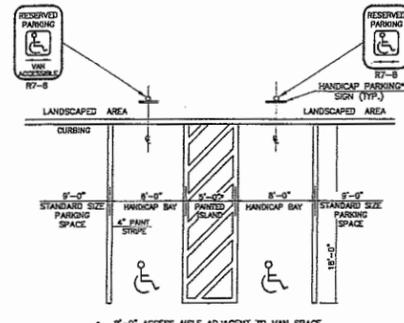
**LAYOUT PLAN TYPICAL HANDICAP PARKING**

- ADA REQUIREMENTS:**
1. WALKS SHALL NOT EXCEED 5% SLOPE.
  2. WALKS CROSS SLOPE SHALL NOT EXCEED 2%.
  3. SLOPE AT HANDICAP PARKING SPACES SHALL NOT EXCEED 2% IN ANY DIRECTION.

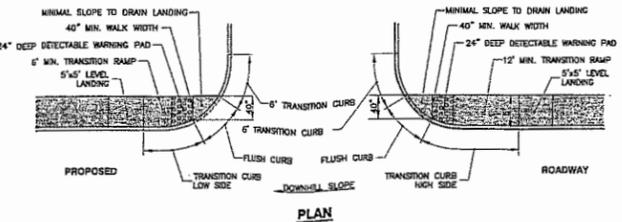


**DETAIL OF DETECTABLE WARNING PANEL FOR WHEELCHAIR RAMPS**

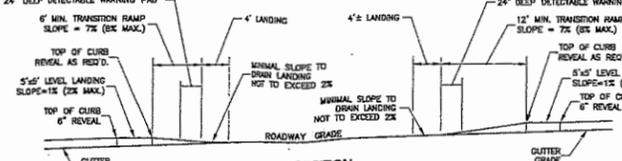
NOTE: PANELS MAY BE CONCRETE PRECAST OR CAST IN PLACE OR OTHER SUITABLE MATERIAL. PERMANENTLY APPLIED TO THE RAMPS. DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT WALKING SURFACES EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT.



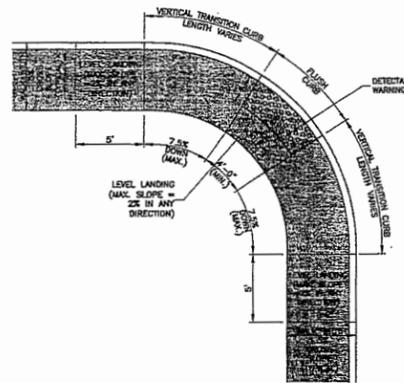
**WHEELCHAIR CURB CUT TYPE "E"**



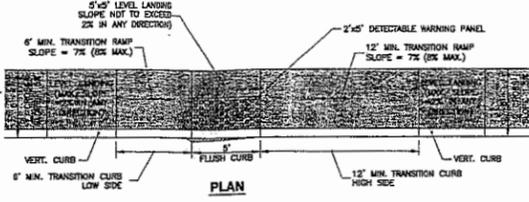
**PLAN (NOT TO SCALE)**



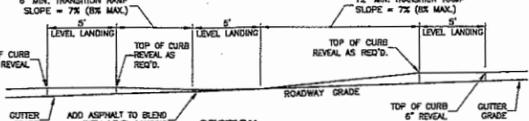
**SECTION WHEELCHAIR CURB CUT TYPE "E"**



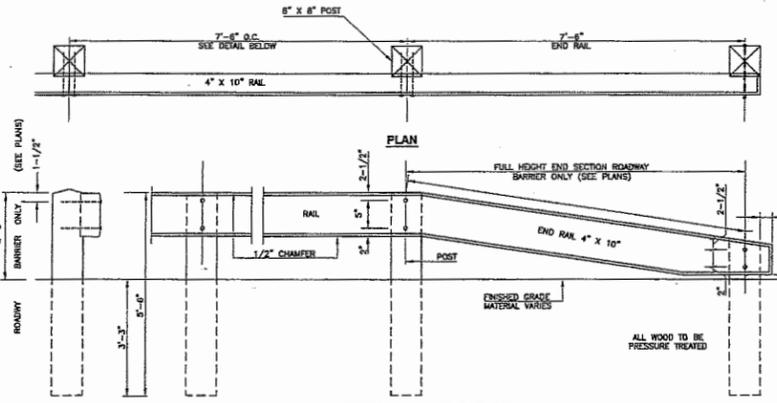
**WHEELCHAIR CURB CUT DETAIL "B"**



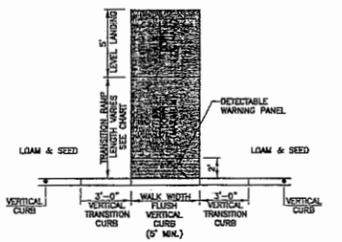
**PLAN**



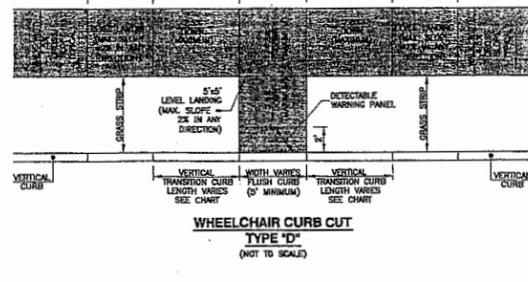
**SECTION WHEELCHAIR CURB CUT DETAIL "A"**



**SINGLE FACE WOOD GUARD RAIL DETAIL**



**WHEELCHAIR CURB CUT TYPE "C"**

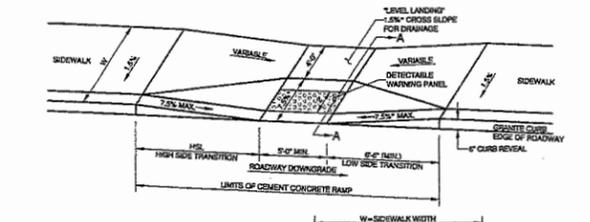


**WHEELCHAIR CURB CUT TYPE "D"**

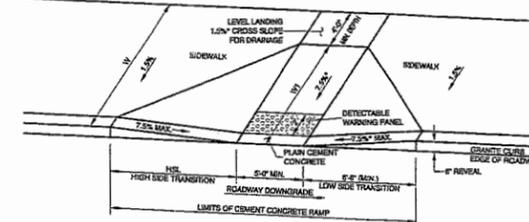
ROADWAY PROFILE GRADE	HIGH SIDE TRANSITION LENGTH ROUNDED TO THE NEAREST 4"
±	7'-0"
D	8'-0"
+0 to 1	7'-0"
+1 to 2	9'-0"
+2 to 3	11'-0"
+3 to 4	14'-0"
+4	15'-0" Max.

NOTE: BASED ON A DESIGN SLOPE OF 2.5% AND A REVEAL OF 6"

**CURB TRANSITION LENGTHS FOR WHEELCHAIR CURB CUT RAMPS**



**WHEELCHAIR CURB CUT LESS THAN 12'-0" SIDEWALK**



**WHEELCHAIR CURB CUT GREATER THAN 12'-0" SIDEWALK**

**ACCESSIBILITY NOTES**

1. SPECIAL ATTENTION SHALL BE GIVEN TO COMPLIANCE WITH THE ARCHITECTURE'S ARCHITECTURAL ACCESS BOARD RULES AND REGULATIONS AND THE AMERICANS DISABILITIES ACT STANDARDS FOR ACCESSIBLE DESIGN (ADA).
2. IT IS ESSENTIAL THAT CONTRACTORS BE AWARE OF THE SITE ACCESSIBILITY REQUIREMENTS. THESE NOTES ARE INTENDED TO ASSURE THAT CONTRACTORS ARE AWARE OF THE REQUIREMENTS AT THE TIME WHEN THEY ARE DESIGNING THE PROJECT. IF GRADES AND DIMENSIONS ARE NOT ACHIEVABLE, THE CONTRACTOR IS REQUIRED TO CONTACT THE OWNER IMMEDIATELY, BEFORE MOVING FORWARD WITH THE WORK.
3. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND CIVIL ENGINEER IMMEDIATELY OF ANY CONFLICT BETWEEN THESE NOTES AND DETAILS AND OTHER PROJECT DRAWINGS, WRITTEN BY A.M. MOORE ASSOCIATES OR OTHERS. THE CONTRACTOR SHALL NOT PROCEED WITH THE WORK FOR WHICH THE ALLEGED CONFLICT HAS BEEN DISCOVERED UNTIL SUCH ALLEGED CONFLICT HAS BEEN RESOLVED. NO CLAIM SHALL BE MADE BY THE CONTRACTOR FOR DELAY DAMAGES AS A RESULT OF RESOLUTION OF ANY SUCH CONFLICT.
4. A.M. REGULATIONS DO NOT ALLOW ANY TOLERANCE ON SLOPE REQUIREMENTS AND THE MAXIMUM SLOPES LISTED BELOW CAN NOT BE EXCEEDED.
5. IT IS RECOMMENDED THAT THE CONTRACTOR USE A 3-FOOT DIGITAL LEVEL TO VERIFY SLOPES PRIOR TO PLACING THE FINISHED SURFACE. IT IS FURTHER RECOMMENDED THAT FORMS BE CHECKED PRIOR TO PLACING CONCRETE OR ASPHALT.
6. THESE ACCESSIBILITY NOTES AND DETAILS ARE INTENDED TO DETECT AND CORRECT ACCESSIBILITY DEFICIENCIES ONLY. REFER TO SIDEWALK, CURBING, AND PAVEMENT DETAILS FOR ADDITIONAL INFORMATION.

**ACCESSIBILITY NOTES (CONT.)**

1. AT LEAST ONE ACCESSIBLE ROUTE SHALL BE PROVIDED WITHIN THE SITE FROM ACCESSIBLE PARKING SPACES AND ACCESSIBLE PASSENGER LOADING ZONES, PUBLIC STREETS OR SIDEWALKS, AND PUBLIC TRANSPORTATION STOPS TO THE ACCESSIBLE BUILDING OR FACILITY THEY SERVE.
2. AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT ACCESSIBLE BUILDINGS, ACCESSIBLE FACILITIES, AND PUBLIC TRANSPORTATION STOPS TO THE ACCESSIBLE BUILDING OR FACILITY THEY SERVE.
3. DIRECTIONAL SIGNAGE INDICATING THE ROUTE TO THE NEAREST ACCESSIBLE BUILDING ENTRANCE SHALL BE PROVIDED AT INACCESSIBLE BUILDING ENTRANCES.
4. TRANSITIONS BETWEEN RAMPS, WALKS, LANDINGS, GUTTERS OR STREETS SHALL BE FLUSH AND FREE OF ASHPY VERTICAL CHANGES (1/4" HIGH MAXIMUM) UNLESS OTHERWISE SPECIFIED.

**WALKWAYS:**

1. WIDTH OF WALKWAYS SHALL NOT BE LESS THAN 48 INCHES, EXCLUDING CURB SIDINGS.
2. WALKWAYS SHALL PROVIDE A MINIMUM OF 36 INCHES CLEAR, UNOBSTRUCTED PATH OF TRAVEL, FREE OF OBSTRUCTIONS, (I.E. UTILITY POLES, SIGNS, FIRE HYDRANTS, ETC.)
3. WALKING SURFACES SHALL HAVE A MAXIMUM RUNNING SLOPE OF 5.0% AND A MAXIMUM CROSS SLOPE OF 2.0%.
4. AT THE INTERSECTION OF TWO SIDEWALKS, THERE SHALL BE A LEVEL LANDING WITH NO SLOPE GREATER THAN 2% IN ANY DIRECTION.
5. ANY WALKING SURFACE WITH A RUNNING SLOPE GREATER THAN 5.0% IS CONSIDERED A RAMP AND SHALL COMPLY WITH THE GUIDELINES FOR RAMPS OR CURB CUT RAMPS.
6. ACCESSIBLE ROUTE SURFACES SHALL BE STABLE, FIRM AND SLIP RESISTANT.
7. IF CATCH BASINS OR OTHER GRATINGS ARE LOCATED WITHIN A ACCESSIBLE ROUTE, THEN AN ADA GRATE SHALL BE USED WITH SPACES NO GREATER THAN 1/2" INCH WIDE IN THE DIRECTION OF TRAVEL.

**RAMPS:**

1. ANY PART OF AN ACCESSIBLE ROUTE WITH A RUNNING SLOPE GREATER THAN 5% SHALL BE CONSIDERED A RAMP OR A CURB CUT RAMP.
2. THE MAXIMUM RUNNING SLOPE FOR A RAMP SHALL BE 8.33% AND THE MAXIMUM CROSS SLOPE SHALL BE 5.0%.
3. THE CLEAR WIDTH OF A RAMP SHALL BE 48 INCHES MINIMUM AS MEASURED BETWEEN THE HANDRAILS.
4. THE MAXIMUM RISE FOR ANY RAMP RUN SHALL BE 30 INCHES.
5. LANDINGS SHALL BE PROVIDED AT THE TOP AND BOTTOM OF RAMPS. LANDINGS SHALL HAVE A SLOPE NOT GREATER THAN 2% IN ANY DIRECTION. THE CLEAR WIDTH SHALL BE AT LEAST AS WIDE AS THE WIDEST RAMP RUN LEADING TO THE LANDING. THE MINIMUM CLEAR LENGTH SHALL BE SIXTY (60) INCHES. LONGER RAMPS THAT CHANGE DIRECTION BETWEEN RUNS AT LANDINGS SHALL HAVE A CLEAR LANDING OF SIXTY (60) INCHES BY SIXTY (60) INCHES MINIMUM.
6. EDGE PROTECTION COMPLYING WITH ADA AND ADAAG REQUIREMENTS SHALL BE PROVIDED ON EACH SIDE OF RAMP RUNS AND ON EACH SIDE OF RAMP LANDINGS.
7. WHERE SIDEWALKS ARE LOCATED ADJACENT TO A RAMP LANDING, MAINTAINING CLEARANCES REQUIRED BY 201 CHART FIGURES 202 AND 204 SHALL BE COMPLIED WITH.

**CURB CUT RAMPS:**

1. CURB CUT RAMPS ARE REQUIRED AT THE CORNER OF EACH INTERSECTION AND WHERE A PEDESTRIAN PATH OF TRAVEL CROSSES A ROAD, DRIVEWAY OR OTHER VEHICULAR WAY.
2. THE MAXIMUM RUNNING SLOPE OF A CURB CUT RAMP SHALL BE 8.33% AND THE MAXIMUM CROSS SLOPE SHALL BE 5.0%.
3. CURB CUT RAMPS MAY EXTEND UP TO 15 FEET IN LENGTH.
4. MAXIMUM SLOPES OF ADJACENT GUTTERS AND ROAD SURFACES IMMEDIATELY ADJACENT TO THE CURB CUT RAMP SHALL NOT BE STEEPER THAN 2%. THE ADJACENT SURFACES AT TRANSITIONS AT CURB CUT RAMPS TO WALKS, GUTTERS AND STREETS SHALL BE AT THE SAME LEVELS.
5. THE MINIMUM CLEAR WIDTH OF A CURB CUT RAMP SHALL BE 36 INCHES, EXCLUSIVE OF FLARED SIDES, IF PROVIDED.
6. LANDINGS SHALL BE PROVIDED AT THE TOP OF CURB CUT RAMPS. THE CLEAR LENGTH OF THE LANDINGS SHALL BE 48 INCHES MINIMUM. THE CLEAR WIDTH OF THE LANDINGS SHALL BE AT LEAST AS WIDE AS THE CURB CUT RAMP EXCLUDING FLARED SIDES. LANDINGS TO THE LANDINGS. LANDINGS SHALL HAVE A SLOPE NOT STEEPER THAN 2% IN ANY DIRECTION.

**ACCESSIBILITY NOTES (CONT.)**

7. IF A CURB CUT RAMP IS LOCATED WHERE PEDESTRIANS MUST WALK ACROSS THE RAMP OR WHERE IT IS NOT PROTECTED BY HANDRAILS OR GUERRALS, IT SHALL HAVE FLARED SIDES.
8. WHERE PROVIDED, CURB CUT RAMP FLARES SHALL NOT EXCEED 10%. IF THE CLEAR LENGTH OF THE LANDINGS IS LESS THAN FORTYEIGHT (48) INCHES THAN THE SLOPE OF THE FLARED SIDES SHALL NOT EXCEED 4.0%.
9. CURB CUT RAMPS AND THE FLARED SIDES OF CURB CUT RAMPS SHALL BE LOCATED SO THAT THEY DO NOT PROJECT INTO VEHICULAR TRAFFIC LANES, PARKING SPACES OR PARKING ACCESSIBLE AREAS. CURB CUT RAMPS CROSSINGS SHALL BE WHOLLY CONTAINED WITHIN THE MARKINGS, EXCLUDING ANY FLARED SIDES.
10. CURB CUT RAMPS SHALL BE LOCATED ON PROTECTED TO PREVENT THEIR OBSTRUCTION BY PARKED VEHICLES.
11. CURB CUT RAMPS SHALL HAVE A TWENTY-FOUR (24) INCH DEEP DETECTABLE WARNING PANEL COMPLYING WITH ADAAG, EXTENDING THE FULL WIDTH OF THE RAMP, REFER TO DETECTABLE WARNING DETAILS AND NOTES FOR PLACEMENT.
12. WHERE PROVIDED, STOP LINES SHALL BE LOCATED IN ADVANCE OF CURB CUT RAMPS.
13. WHERE PROVIDED, DAMAGE INLETS SHALL BE LOCATED UPSTREAM OF CURB RAMPS AND NOT IN THE RAMP AREA.
14. CURB CUT RAMP TYPES AND LOCATION ARE SHOWN ON PLAN.

**ACCESSIBLE PARKING SPACES:**

1. ACCESSIBLE PARKING SPACES SHALL BE LOCATED ON THE SHORTEST ACCESSIBLE ROUTE OF TRAVEL FROM ADJACENT PARKING TO AN ACCESSIBLE BUILDING ENTRANCE.
2. ACCESSIBLE PARKING SPACES AND ACCESSIBLE AREAS SHALL BE AT LEAST 8 FEET WIDE. WALKING SURFACES AND ACCESSIBLE AREAS SHALL BE MARKED WITH LINES. THE WIDTH MEASUREMENTS SHALL BE MADE FROM CENTERLINE OF THE MARKINGS.
3. PARKING ACCESSIBLE AREAS SHALL BE PART OF AN ACCESSIBLE ROUTE TO THE BUILDING OR FACILITY ENTRANCE AND SHALL COMPLY WITH PROVISIONS FOR ACCESSIBLE ROUTES.
4. TWO (2) ACCESSIBLE PARKING SPACES MAY SHARE A COMMON ACCESSIBLE ROUTE.
5. ACCESSIBLE AREAS SHALL EXTEND THE FULL LENGTH OF THE PARKING SPACE THEY SERVE.
6. ACCESSIBLE AREAS SHALL NOT OVERLAP THE VEHICULAR WAY. ACCESSIBLE AREAS SHALL BE PERMITTED TO BE PLACED ON EITHER SIDE OF THE PARKING SPACE EXCEPT FOR ANGLED VAN PARKING SPACES WHICH SHALL HAVE ACCESSIBLE AREAS LOCATED ON THE PASSENGER SIDE OF THE PARKING SPACES.
7. SURFACES OF PARKING SPACES AND ACCESSIBLE AREAS SERVING THEM SHALL BE STABLE, FIRM AND SLIP RESISTANT. ACCESSIBLE AREAS SHALL BE AT THE SAME LEVEL AS THE PARKING SPACES THEY SERVE.
8. PARKING SPACES AND ACCESSIBLE AREAS SHALL BE LEVEL WITH SURFACE SLOPES NOT EXCEEDING 5.0% IN ANY DIRECTION.
9. PARKED VEHICLE OVERHANGS SHALL NOT REDUCE THE REQUIRED CLEAR WIDTH OF AN ACCESSIBLE ROUTE.
10. PARKING SPACES FOR VANS AND ACCESSIBLE AREAS AND VEHICULAR ROUTES SERVING THEM SHALL PROVIDE A VERTICAL CLEARANCE OF 8 FEET 2 INCHES (8'02") MINIMUM. SIGNS SHALL BE PROVIDED AT ENTRANCES TO PARKING FACILITIES INDICATING SLOPES OF CLEARANCES AND THE LOCATION OF VAN ACCESSIBLE PARKING SPACES.
11. EACH ACCESSIBLE PARKING SPACE SHALL BE PROVIDED WITH SIGNAGE OVERLAPPING THE INTENTIONAL SYMBOL OF ACCESSIBILITY. EACH ACCESSIBLE AREAS SHALL BE CLEARLY MARKED BY MEANS OF DIRECTIONAL STRIPES. SIGNS SHALL BE INSTALLED AT A CLEAR HEIGHT OF BETWEEN 5 FEET AND 8 FEET TO THE TOP OF THE SIGN AND SHALL NOT INTERFERE WITH AN ACCESSIBLE ROUTE FROM AN ACCESSIBLE AREAS. SIGNS LOCATED WHERE THEY MAY BE HIT BY VEHICLES BEING PARKED SHALL BE INSTALLED WITH BOLLARD PROTECTION.
12. ACCESSIBLE PARKING SPACE, ACCESSIBLE AREAS, STRIPES, AND INTERNATIONAL SYMBOL OF ACCESSIBILITY SHALL BE PAINTED BLUE.

**PASSENGER LOADING ZONES:**

1. PASSENGER LOADING ZONES SHALL PROVIDE VEHICULAR PULL-UP SPACE 8 FEET WIDE MINIMUM AND 30 FEET LONG MINIMUM.
2. PASSENGER LOADING ZONES SHALL PROVIDE A CLEARLY MARKED ACCESSIBLE AREAS THAT IS 6 FEET WIDE MINIMUM AND EXTENDS THE FULL LENGTH OF THE VEHICULAR PULL-UP SPACE THEY SERVE.
3. ACCESSIBLE AREAS SHALL ADJOIN AN ACCESSIBLE ROUTE AND NOT OVERLAP THE VEHICULAR WAY.
4. VEHICLE PULL-UP SPACES AND ACCESSIBLE AREAS SERVING THEM SHALL BE LEVEL WITH SURFACE SLOPES NOT EXCEEDING 5.0% IN ANY DIRECTION. ACCESSIBLE AREAS SHALL BE AT THE SAME LEVEL AS THE VEHICLE PULL-UP SPACE THEY SERVE.
5. SURFACES OF VEHICLE PULL-UP SPACES AND ACCESSIBLE AREAS SERVING THEM SHALL BE STABLE, FIRM AND SLIP RESISTANT.
6. VEHICLE PULL-UP SPACES, ACCESSIBLE AREAS SERVING THEM AND A VEHICULAR ROUTE FROM AN ENTRANCE TO THE PASSENGER LOADING ZONE AND FROM THE PASSENGER LOADING ZONE TO A VEHICULAR EXIT SERVING THEM SHALL PROVIDE A VERTICAL CLEARANCE OF 9 FEET 6 INCHES (9'06") MINIMUM.

**SUBPANS ENTRANCES:**

1. ALL PUBLIC ENTRANCES SHALL BE ACCESSIBLE.
2. THE APPROACH TO AN ACCESSIBLE ENTRANCE SHALL BE A PAVED WALK OR RAMP WITH A SLIP RESISTANT SURFACE, UNINTERRUPTED BY STEPS.
3. THE EXTERIOR LANDING AT THE ENTRANCE DOOR SHALL HAVE A LEVEL LANDING MEASURING AT LEAST 5 FEET BY 5 FEET AND SHALL NOT SLOPE MORE THAN 2% IN ANY DIRECTION.
4. THE LEVEL LANDING SHALL EXTEND A MINIMUM OF 18 INCHES WIDER THAN THE LATCH ON THE PULL SIDE OF THE DOOR.

**REVISIONS**

NO.	DATE	DESCRIPTION

ISSUE DATE: JUNE 25, 2014  
 SCALE: AS NOTED  
 SHEET: C-7

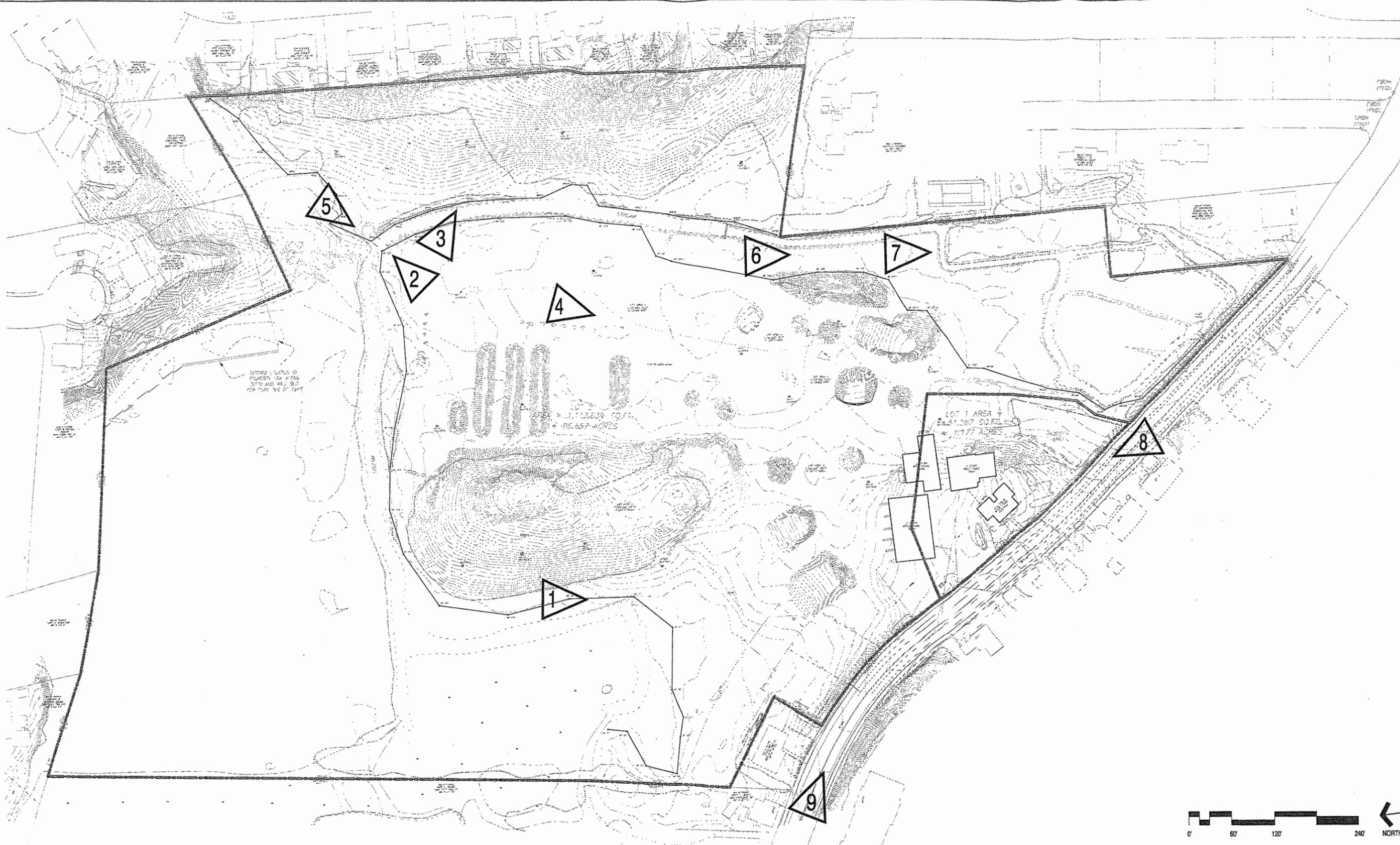
**THE COMMONS AT WEISS FARM**  
 STONEHAM, MASSACHUSETTS  
**SITE DETAILS PLAN**

**hwmoore ASSOCIATES, INC.**  
 CIVIL ENGINEERING / LAND PLANNING  
 112 Shawmut Avenue, Boston, MA 02118-2227  
 TEL: 617-557-8145 FAX: 617-557-9495 WEB: hwmoore.com



# Existing Conditions

Stoneham - Weiss Farm



# Existing Conditions

Stoneham - Weiss Farm



Southwest towards Franklin Street from wetland

1



Northeast towards bridge and potential open space

2



North towards residential buffer hill

3



South towards Franklin Street and existing business structure

4



Southwest over bridge toward knoll and Franklin Street

5



South along vegetated / constructed canal

6



South towards wetland and constructed canal

7



Northwest on Franklin Street

8



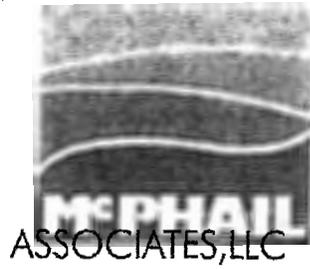
Southeast on Franklin Street

9









**PHASE I/II ENVIRONMENTAL  
SITE ASSESSMENT REPORT**

**170 FRANKLIN STREET**

**STONEHAM MASSACHUSETTS**

for

**John M. Corcoran & Company LLC**

June 13, 2013

Project No. 5561



June 13, 2013

John M. Corcoran & Company LLC  
100 Grandview Road, Suite 203  
Braintree, MA 02184

Attention: Mr. Peter Mahoney

Reference: 170 Franklin Street; Stoneham, Massachusetts  
Phase I/II Environmental Site Assessment

Ladies and Gentlemen:

Enclosed herewith is our Phase I and II Environmental Site Assessment Report prepared for the property located at 170 Franklin Street in Stoneham, Massachusetts, herein referred to as the "subject site." The general site locus is shown on the enclosed Figure 1, and the boundaries of the subject site are shown on the enclosed Figure 2. This letter provides an executive summary of our findings.

This report was prepared by McPhail Associates, LLC in accordance with our agreement with John M. Corcoran & Company LLC dated December 12, 2012, and is subject to the limitations included in Appendix A.

This environmental site assessment was conducted pursuant to the provisions contained in ASTM E 1527-05, "Standard Guide for Environmental Site Assessment: Phase I Environmental Site Assessment Process", as referred to in 40 CFR Part 312 (the All Appropriate Inquiries Rule). The objective of the environmental assessment was to identify the potential presence of Recognized Environmental Conditions (RECs), as defined by ASTM, at the subject site or on nearby property that may pose a threat to the subject site. The Massachusetts Oil and Hazardous Materials (OHM) Release Prevention and Response Act (MGL Chapter 21E) and Massachusetts Contingency Plan (MCP) 310 CMR 40.0000 were utilized in our evaluation of the potential presence of RECs as defined herein.

The objectives of the Phase I Environmental Site Assessment, as defined in the ASTM E-1527-05 Standard, are to identify the presence of RECs at the subject site or on surrounding properties that may potentially pose a threat to the subject site. The objective of the Phase II portion of this Environmental Assessment was to assess the potential impacts to soil and groundwater from the current and historical use as a farm, which was identified in the Phase I portion of our assessment as a potential REC.

Our scope of services consisted of the following: (i) a visual reconnaissance of the site and surrounding properties, (ii) an assessment of the subject site history relative to the possible presence of oil and hazardous materials (OHM) at the subject site; (iii) a search of the Town of Stoneham municipal records for permits issued for the storage and/or use of oil or hazardous materials (OHM) at the subject site; (iv) a database search of Federal and State records including the National Priorities List, the CERCLA List and the RCRIS Handlers List by EDR Inc.; (v) a search of the Massachusetts Department of Environmental Protection (DEP) online database for records of incidents involving releases of oil and/or hazardous materials at and in the vicinity of the subject site; (vi) a subsurface exploration consisting of borings and test pits and installation of groundwater monitoring wells, (vii) the screening of soil samples obtained from the borings completed as part of our subsurface exploration for the presence of total volatile organic compounds (TVOC) utilizing a photoionization detector (PID); (viii) chemical analysis of selected soil and groundwater samples obtained from the explorations; (ix) subcontracting with a hazardous building material consultant to conduct a survey of the subject site buildings for the presence of asbestos



John M. Corcoran & Co. LLC  
June 13, 2013  
Page 2

containing building materials (ACBM) and lead-based paint (LBP); and (x) assessing the above and documenting the results in a Phase I and II Environmental Site Assessment Report.

The scope of our Phase I and II Environmental Site Assessment did not include an assessment of the property for the presence of mold, radon, urea formaldehyde foam insulation (UFFI), or other naturally occurring pollutants. Further, our scope of services did not include a title or environmental lien search.

Fronting onto Franklin Street to the south, the approximate 27.2-acre subject site is bounded by residential properties to the east and west and undeveloped woodland and wetlands to the north. Currently, the subject site is occupied by an active landscaping products retailer that also imports and composts landscaping waste for resale.

A review of historical records indicated that the subject site was undeveloped prior to 1929 when it was developed for use as a dairy farm. Further research indicates that around 1978 utilization of the farm transitioned to a landscaping products retailer that included importation of landscaping materials, including yard waste, for on-site composting and resale. The current and historic usage of the subject site as a farm and an importer of landscaping materials including landscaping waste for on-site composting was taken into consideration during our environmental review.

Research of federal and state records was conducted by EDR Inc. of Milford, Connecticut, and is summarized in a database report dated May 7, 2013. The report includes a records search of federal and state database information indicating potential environmental matters within ASTM-established minimum search distances. Based on our review of the EDR report, the subject site is not a DEP-listed MCP Disposal Site. Further, a review of the information provided in the available databases searched by EDR indicated that the majority of the properties located in the immediate vicinity of the subject site did not pose a threat of impact to the subject site and therefore were not considered RECs. However, the search of the DEP online database did identify three (3) MCP release sites located within a 1/8-mile radius of the subject site that warranted further review.

According to files available on the DEP online database, response actions performed at the three above-mentioned release sites included remediation of the source of contamination and/or the released OHM from the release site. Further, records searched indicated that each of these three (3) disposal sites were reported to have achieved either a Class A-1, A-2 or A-3 RAO, indicating that a Permanent Solution was achieved. Therefore, we concluded that the three (3) MCP disposal sites are not RECs with respect to the subject site.

A hazardous materials survey was completed at the site by Smith & Wessel Associates, Inc. (SWA) on May 23, 2013. The scope of the survey was to assess the subject site buildings for the presence of asbestos-containing building materials (ACBM) and lead-based paint (LBP). The results of the survey identified both LBP and ACBM within the subject site barn structures. The SWA report has been included with this report. The findings and recommendations of the SWA hazardous materials survey has been incorporated into this assessment.

A review of records at the Stoneham Fire Department's Fire Prevention Office relating to the storage of OHM identified a permit to maintain a 500-gallon fuel oil AST at the subject site. A walk over and visual reconnaissance of the subject site was performed by a representative of McPhail Associates, LLC on May 17, 2013. We noted the presence of the permitted 500-gallon AST and observed that it was in good condition. However, during our visual reconnaissance of the interior of the subject site buildings, we



John M. Corcoran & Co. LLC  
June 13, 2013  
Page 3

observed storage of a relatively large amount of miscellaneous containers likely containing paint, oils and other chemicals in both marked and unmarked drums and containers in various conditions. Furthermore, we observed minor staining on the concrete slabs throughout the former horse barn and the maintenance building and used spill absorbent around several of the oil storage areas within the maintenance garage. The housekeeping practices concerning the storage of OHM in the former horse barn and the maintenance building is considered an REC at the subject site.

The Phase II portion of our environmental site assessment consisted of performance of a subsurface exploration program that included collection of soil and groundwater samples and laboratory analysis of the samples for the presence of contamination that would indicate if the current and historic utilization of the subject site as a farm has impacted the soil and groundwater at the subject site.

Over the period of May 16 through 17, 2013, McPhail conducted a subsurface exploration program at the subject site. The subsurface exploration program consisted of the excavation of thirteen test pits, three hand-dug test pits, and the advancement of three soil borings that were subsequently completion as groundwater monitoring wells. Soil and groundwater samples were submitted to a laboratory for analysis for the presence of a range of contaminants that included arsenic, lead, polychlorinated biphenyls, herbicides, pesticides, semivolatle organics and volatile organic compounds. The analysis of soil and groundwater samples identified the presence of each of the tested compounds at concentrations below the laboratory method detection limits and/or below the applicable RCS-1 standard for soil and the applicable RCGW-2 standard for groundwater in each of the samples analyzed.

Based on the results of the chemical testing of soil and groundwater samples, we identified no evidence that the current and historic use of the subject site as a landscaping products processing facility and dairy farm has resulted in the soil and groundwater at the subject site being significantly impacted by the constituents that were analyzed as part of this study.

We note that the presence of lead and several polynuclear aromatic hydrocarbons (PAHs) were detected at concentrations that, although below the applicable RCS-1 reporting thresholds, would warrant additional chemical testing and characterization as required per DEP soil management policies if development of the subject site results in generation of excess fill material that requires off-site reuse and/or disposal. These soils generally do not present issues if they are re-used on-site or left undisturbed.

In conclusion, we have performed an Environmental Site Assessment in conformance with the scope and limitations of ASTM E-1527-05 for the property at 170 Franklin Street in Stoneham, Massachusetts. Any exceptions to, or deletions from this practice are described in the Data Gap section of this report. This assessment has revealed no evidence of *Recognized Environmental Conditions* in connection with the subject site with the exception of the following:

*Housekeeping practices concerning the storage of OHM in the former horse barn and the maintenance building.*

A summary of our recommendations, as described in our assessment, include removal and legal off-site disposal of all oil and/or hazardous materials contained in the subject site buildings. Further, during demolition of the subject site building slabs, concrete that has been visibly impacted with petroleum should be segregated and legally disposed of off-site. Additionally, we recommend a contingency be maintained during the construction phase of the project to in order to manage the potential of unanticipated USTs or localized contamination related to the historic use of the subject site as a farm, although based upon the



John M. Corcoran & Co. LLC  
June 13, 2013  
Page 4

sampling and analytical testing performed at the site, such areas, if present, are not anticipated to be widespread.

Finally, we recommend that management or removal of asbestos containing building materials (ACBM) and lead-based paint (LBP) be performed in accordance with recommendations from Smith & Wessel Associates, Inc. as described in their report contained herein.

We trust that the above is sufficient for your present requirements. Should you have any questions concerning this report, please do not hesitate to call us.

Very truly yours,

McPHAIL ASSOCIATES, LLC

A handwritten signature in black ink, appearing to read "A. Stone", written over the printed name.

Andrew D. Stone

A handwritten signature in black ink, appearing to read "T. J. Fennick", written over the printed name.

Thomas J. Fennick, P.E., L.S.P.

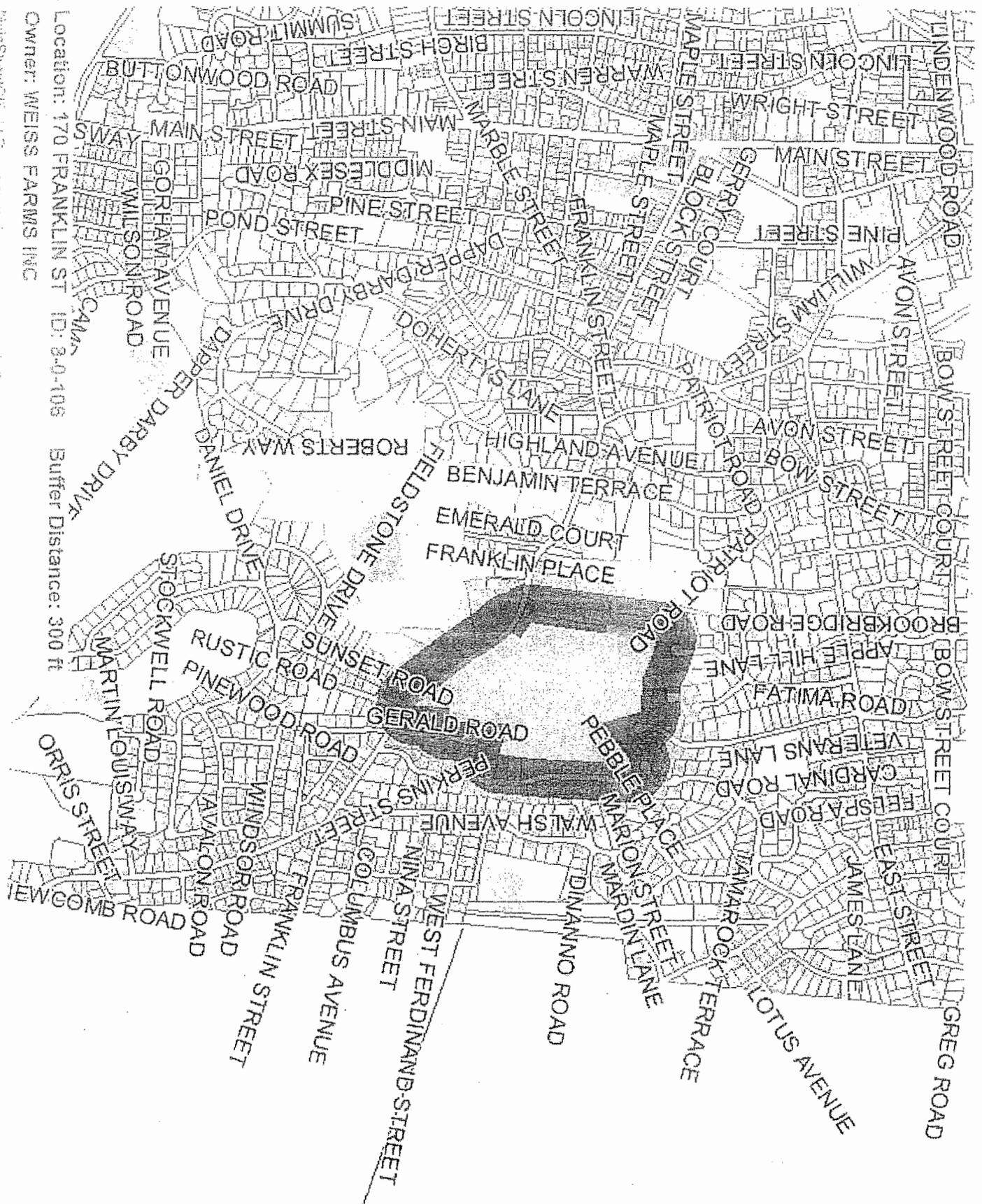
Enclosures  
COVERS\3892 ESA-PH-II Cov Letter.wpd  
ADS/tjf









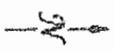


Location: 170 FRANKLIN ST ID: 3-0-106 Buffer Distance: 300 ft  
 Owner: WEISS FARMS INC

MainStreetsGIS LLC www.mainstreetsgis.com info@mainstreetsgis.com  
 User: mainstreetsgis Date: 11/11/2014 10:00:00 AM



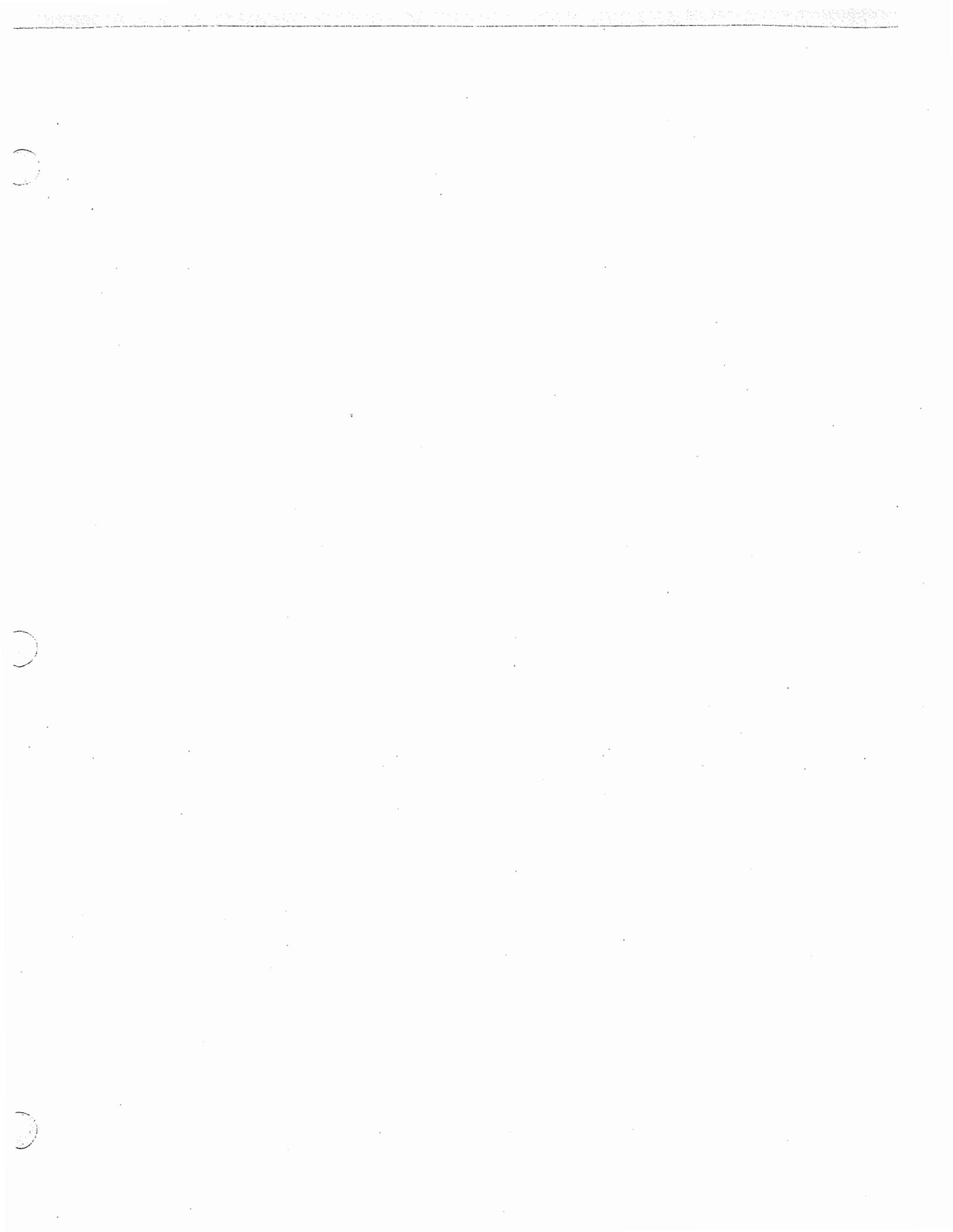
- Zoning
- streams
- Water
- wetlands
- Buildings
- Easements
- Parcels
- Roadway
- town
- towns



1 in = 1076.44 ft

Printed:  
6/24/2014

MainStreetsGIS





2-0-178  
ORPHANOS NICHOLAS  
6 GERALD ROAD  
STONEHAM, MA 02180

2-0-179  
DASHO ROBERT S.  
8 GERALD RD  
STONEHAM, MA 02180

2-0-180  
WANTMAN MARTIN H  
20 GERALD RD  
STONEHAM, MA 02180

2-0-186  
BORENSTEIN ROBERT  
9 GERALD RD  
STONEHAM, MA 02180

2-0-188  
BORENSTEIN ROBERT  
9 GERALD RD  
STONEHAM, MA 02180

2-0-189  
VON KANEL JACQUILINE M.  
7 GERALD RD  
STONEHAM, MA 02180

2-0-191  
VONKANEL JACQUILINE M.  
7 GERALD RD  
STONEHAM, MA 02180

2-0-192  
BORENSTEIN ROBERT  
9 GERALD RD  
STONEHAM, MA 02180

2-0-193  
CARPENITO GEORGE  
8 ELLEN RD  
STONEHAM, MA 02180

2-0-194  
NAZARIAN JERRY  
10 ELLEN RD  
STONEHAM, MA 02180

2-0-195  
GOSS LISA  
12 ELLEN RD  
STONEHAM, MA 02180

2-0-196  
FOTINO JOSEPHINE R.  
14 ELLEN RD  
STONEHAM, MA 02180

2-0-197  
MARECE GERTRUDE R.  
6 ELLEN RD  
STONEHAM, MA 02180

2-0-198  
BOUSSY THOMAS H. JR.  
19 ELLEN RD  
STONEHAM, MA 02180

2-0-199  
NICKERSON CAROL A.  
15 ELLEN RD  
STONEHAM, MA 02180

2-0-218  
MAGALETTA SAVINO  
6 DINANNO RD  
STONEHAM, MA 02180

2-0-219  
MORAN JAMES V., TRS. ETAL  
17 DINANNO RD  
STONEHAM, MA 02180

2-0-223A  
CUTONE MARIO V  
40 ELLEN RD  
STONEHAM, MA 02180

2-0-334  
CAMPBELL ARTHUR H.  
11 ELLEN RD  
STONEHAM, MA 02180

2-0-335  
MACKAY KEVIN C  
23 ELLEN RD  
STONEHAM, MA 02180

2-0-336  
GORDAN MARJORIE G.  
25 ELLEN RD  
STONEHAM, MA 02180

2-0-337  
COMMEM SEAN  
7 ELLEN RD  
STONEHAM, MA 02180

2-0-338  
CHI WILLIAM C  
29 ELLEN RD  
STONEHAM, MA 02180

2-0-339  
VISCONTI DENNIS J.  
31 ELLEN RD  
STONEHAM, MA 02180

2-0-340  
LIANO JAMES A  
3 ELLEN RD  
STONEHAM, MA 02180

2-0-341  
LIBBY TIMOTHY J.  
35 ELLEN RD  
STONEHAM, MA 02180

2-0-342  
LICHTMAN STEVEN A.  
37 ELLEN RD.  
STONEHAM, MA 02180

2-0-343  
DUCY FRANCOIS  
9 ELLEN RD  
STONEHAM, MA 02180

2-0-344  
DESIMONE STEPHEN A.  
38 ELLEN RD.  
STONEHAM, MA 02180

2-0-346  
PORTMAN HARRIET TRS.  
34 ELLEN RD  
STONEHAM, MA 02180

2-0-347  
FOPIANO RICHARD C.  
32 ELLEN RD  
STONEHAM, MA 02180

2-0-350  
COSCIA NICHOLAS F.  
26 ELLEN ROAD  
STONEHAM, MA 02180

2-0-353  
PICARIELLO MICHAEL A.  
20 ELLEN RD  
STONEHAM, MA 02180

2-0-356  
WANG MING L  
36 TAMAROCK TR  
STONEHAM, MA 02180

2-0-358A  
BELTRAM KENNETH A  
11 TAMAROCK TERR  
STONEHAM, MA 02180

2-0-362  
BERAGHTY KAREN J.  
4 BEACON ST  
STONEHAM, MA 02180

2-0-365  
GREENBERG BORIS  
10 BEACON ST  
STONEHAM, MA 02180

2-0-383  
JORNSON BARBARA H.  
11 ELLEN RD  
STONEHAM, MA 02180

2-0-368  
ENGO DANIEL J.  
19 FRANKLIN ST  
STONEHAM, MA 02180

2-0-6  
ENGO JOSEPH N  
1 MOUNTAIN RD  
STURLINGTON, MA 01803

2-0-348  
COVINO ANTHONY L.  
30 ELLEN RD  
STONEHAM, MA 02180

2-0-351  
TUTELA DIAMOND C  
24 ELLEN RD  
STONEHAM, MA 02180

2-0-354  
SHEA FRANCIS W  
18 ELLEN RD  
STONEHAM, MA 02180

2-0-357  
PATEL SANGITA  
38 TAMAROCK TR  
STONEHAM, MA 02180

2-0-359  
PICAZIO PETER J.  
39 TAMAROCK TR  
STONEHAM, MA 02180

2-0-363  
DAKOYANNIS STEVEN  
36 BEACON ST  
STONEHAM, MA 02180

2-0-366  
VACHON DEREK P.  
42 BEACON ST  
STONEHAM, MA 02180

3-0-1  
ALIBERTI VINCENT J.  
2 GERALD RD  
STONEHAM, MA 02180

3-0-4  
VACCARO JOSEPH A.  
5 GERALD RD  
STONEHAM, MA 02180

8-0-100  
SULLIVAN REATLY TR  
15 CHARLES STREET  
STONEHAM, MA 02180

2-0-349  
BOURGEOIS FRANCIS G.  
28 ELLEN RD  
STONEHAM, MA 02180

2-0-352  
MITRANO BENEDETTO TRTEES,  
ETAL  
22 ELLEN RD  
STONEHAM, MA 02180

2-0-355  
CUSATO PETER J. TR., ETAL  
34 TAMAROCK TERR  
STONEHAM, MA 02180

2-0-358  
O'HARA ROBERT  
40 TAMAROCK TR  
STONEHAM, MA 02180

2-0-360  
YAN YANHUA  
37 TAMAROCK TERR  
STONEHAM, MA 02180

2-0-364  
JAYASINGHE KIMBERLY  
38 BEACON ST  
STONEHAM, MA 02180

2-0-367  
CONNELY PATRICK  
31 BEACON ST  
STONEHAM, MA 02180

3-0-2  
ROBASSON DICK  
4 GERALD ROAD  
STONEHAM, MA 02180

3-0-5  
MALZONE RAYMOND V.  
3 GERALD RD  
STONEHAM, MA 02180

8-0-101  
SAVAGE MARK L.  
160 FRANKLIN ST  
STONEHAM, MA 02180

3-0-102  
WEISS DONNA, TR.  
162 FRANKLIN ST.  
STONEHAM, MA 02180

3-0-110  
WEBBER TERESA A.  
85 FRANKLIN ST  
STONEHAM, MA 02180

3-0-123  
LORD MICHAEL J.  
RUSTIC ROAD  
STONEHAM, MA 02180

3-0-127A  
BOYD MICHAEL  
75 FRANKLIN ST U# 1  
STONEHAM, MA 02180

3-0-130  
DEMETRIO ROBERT  
71 FRANKLIN ST  
STONEHAM, MA 02180

3-0-133  
WEISS MARVIN TR  
7 OLDE COACH RD  
SCOTIA, NY 12302

3-0-148  
WALTERS EDWARD J.  
55 FRANKLIN ST  
STONEHAM, MA 02180

3-0-185  
DELIKONIAN JOYCE E. TRS, ETAL  
3 BEACON ST  
STONEHAM, MA 02180

3-0-44  
TOWN OF STONEHAM  
STONEHAM TOWN HALL  
STONEHAM, MA 02180

3-0-46B  
DETTAROLI LOUIS A. JR.  
SULLIVAN CIRCLE  
STONEHAM, MA 02180

8-0-106  
WEISS FARMS INC  
170 FRANKLIN ST  
STONEHAM, MA 02180

8-0-111  
SMITH RICHARD E  
2 RUSTIC RD  
STONEHAM, MA 02180

8-0-124  
RAFFAELLO FRANK A  
181 FRANKLIN ST  
STONEHAM, MA 02180

8-0-128  
WEISS MARVIN, TR  
37 OLDE COACH RD  
SCOTIA, NY 12302

8-0-132  
DDC REALTY LLC  
100 DOVER STREET  
SOMERVILLE, MA 02144

8-0-134  
TOWN OF STONHAM  
149 FRANKLIN STREET  
STONEHAM, MA 02180

8-0-183  
ZENKOV YULIY  
39 BEACON STREET  
STONEHAM, MA 02180

8-0-42A  
LODATO RAYMOND  
12 GAVIN CR  
STONEHAM, MA 02180

8-0-45  
TOWN OF STONEHAM  
TOWN HALL  
STONEHAM, MA 02180

8-0-46C  
ANTHONY PAUL J.  
7 SULLIVAN CR.  
STONEHAM, MA 02180

8-0-107  
CUNNINGHAM, JOE REM.+ CONS  
39 PLEASANT ST STE3  
STONEHAM, MA 02180

8-0-122  
VETRANO ANTONIO  
5 SUNSET RD  
STONEHAM, MA 02180

8-0-127  
SCIOLI CHARLES E. JR.  
175 FRANKLIN ST U# 2  
STONEHAM, MA 02180

8-0-129  
MAGEE JOSSHUA  
173 FRANKLIN ST  
STONEHAM, MA 02180

8-0-132A  
THE SOUTHERN N.E. CONF.  
ASSOC  
34 SAWYER ST  
LANCASTER, MA 01561

8-0-144  
DOWNS JOHN  
42 FRANKLIN RD.  
WINCHESTER, MA 01890

8-0-184  
VAUGHAN MARK T.  
35 BEACON ST  
STONEHAM, MA 02180

8-0-42C  
CROWE THOMAS P.  
11 GAVIN CIRCLE  
STONEHAM, MA 02180

8-0-46A  
CARBO ANTHONY  
11 SULLIVAN CIRCLE  
STONEHAM, MA 02180

8-0-46E  
RUBIN ERIC T.  
5 SULLIVAN CR  
STONEHAM, MA 02180

8-0-47A  
STONEHAM, TOWN OF  
PINE STREET  
STONEHAM, MA 02180

8-0-98  
MCCARTHY TIMOTHY F.  
152 FRANKLIN ST  
STONEHAM, MA 02180

3-0-1A10  
DAKIN GEORGE P  
132 ALTAMONT AVE  
MELROSE, MA 02176

1-0-1A4  
BRIFFETT JOSEPH W. TRS  
8 CONGRESS ST  
STONEHAM, MA 02180

-0-1A8  
TYLAN RACHAEL F  
57 FRANKLIN ST  
STONEHAM, MA 02180

8-0-1B2  
MITH RUSSELL J.  
57 FRANKLIN ST U# 1B2  
STONEHAM, MA 02180

-0-1B5  
TOEV VLADIMIR  
57 FRANKLIN ST U# 1B5  
STONEHAM, MA 02180

0-1B8  
ENTURA JOSEPH  
57 FRANKLIN ST U# 1B8  
STONEHAM, MA 02180

0-1C3  
AINWRIGHT SAMUEL C  
7 FRANKLIN ST UNIT 1 C3  
STONEHAM, MA 02180

0-1C6  
TINI FLORA  
7 FRANKLIN ST U# 1C6  
STONEHAM, MA 02180

8-0-48  
MUSTONE ANTHONY J  
24 RODGERS RD  
STONEHAM, MA 02180

8-0-99  
ROTONDI CHARLES S. TRS.  
158 FRANKLIN ST  
STONEHAM, MA 02180

8-0-1A11  
RONCHINI TAMIRES  
157 FRANKLIN ST U# 1A11  
STONEHAM, MA 02180

8-0-1A6  
WILLARD JAMES C.  
157 FRANKLIN STREET #1A6  
STONEHAM, MA 02180

8-0-1A9  
KOSSIN LINDA  
3665 NE SKYLINE DR  
JENSEN BEACH, FL 34957

8-0-1B3  
FIORE JANET L.  
157 FRANKLIN ST U# 1B3  
STONEHAM, MA 02180

8-0-1B6  
ORAZIO LLC  
1 DINANNO RD  
STONEHAM, MA 02180

8-0-1C1  
HUANG HUILI  
29 GIBSON ST  
MEDFORD, MA 02155

8-0-1C4  
ALIM-MARVASTI MASIH  
157 FRANKLIN ST U# 1C4  
STONEHAM, MA 02180

8-0-1C7  
O'CONNELL PHILIP A.  
224 PARK ST UNIT B9  
STONEHAM, MA 02180

8-0-97  
DOUCET CATHERINE M.  
150 FRANKLIN ST  
STONEHAM, MA 02180

8-0-1A1  
HOGAN JOSEPH P  
7 COMMONWEALTH AVE.  
WILMINGTON, MA 01887

8-0-1A2  
MARTELL HARRY III  
157 FRANKLIN ST U# 1A2  
STONEHAM, MA 02180

8-0-1A7  
DAKIN GEORGE P  
132 ALTAMONT AVE  
MELROSE, MA 02176

8-0-1B1  
JOHNSTON CAROL D.  
157 FRANKLIN ST U# 1B1  
STONEHAM, MA 02180

8-0-1B4  
MACDONALD DONNA R  
157 FRANKLIN ST U# 1B4  
STONEHAM, MA 02180

8-0-1B7  
DALEY WALTER R.  
157 FRANKLIN ST U# 1B7  
STONEHAM, MA 02180

8-0-1C2  
MALDEN JUTTA V. TRS.  
42 BELKNAP POINT RD.  
GILFORD, NH 03249

8-0-1C5  
CESARALE FRANK P  
157 FRANKLIN ST U# 1C5  
STONEHAM, MA 02180

8-0-1C8  
DOBOS SHEILA M.  
121 HILLSIDE ROAD  
DEDHAM, MASS 02026

-0-ID1  
MC CARTHY CATHERINE A.  
57 FRANKLIN ST U# ID1  
STONEHAM, MA 02180

8-0-ID2  
CARUSO KEVIN J.  
157 FRANKLIN ST U# ID2  
STONEHAM, MA 02180

8-0-ID3  
DALY KEVIN M., TR, ETAL  
157 FRANKLIN ST U# ID3  
STONEHAM, MA 02180

-0-ID4  
MULLAN KAREN K.  
57 FRANKLIN ST U# ID4  
STONEHAM, MA 02180

8-0-ID5  
MCGREAL JACQUELINE  
157 FRANKLIN ST U# ID5  
STONEHAM, MA 02180

8-0-ID6  
JOHNSON AMY L.  
157 FRANKLIN ST U# ID6  
STONEHAM, MA 02180

-0-ID7  
WANG SHEILA S.  
57 FRANKLIN ST U# ID7  
STONEHAM, MA 02180

8-0-ID8  
VIJAYAKANTHAN ALEXIUS  
157 FRANKLIN ST U# ID8  
STONEHAM, MA 02180

8-0-IE1  
KESSARIS JOHN, III  
157 FRANKLIN ST U# IE1  
STONEHAM, MA 02180

-0-IE2  
GODDY THOMAS FRANCIS JR.  
57 FRANKLIN ST U# IE2  
STONEHAM, MA 02180

8-0-IE3  
GREENE RICHARD F.  
157 FRANKLIN ST U# IE3  
STONEHAM, MA 02180

8-0-IE4  
GREENE RICHARD  
157 FRANKLIN ST U# IE4  
STONEHAM, MA 02180

-0-IE5  
MURPHY RICHARD C.  
57 FRANKLIN ST U# IE5  
STONEHAM, MA 02180

8-0-IE6  
SCOPA LISA  
157 FRANKLIN ST U# IE6  
STONEHAM, MA 02180

8-0-IE7  
MCCAIN ROBERTA  
200 SWANTON ST. #333  
WINCHESTER, MA 01890

-0-IE8  
MATHER AMY  
57 FRANKLIN ST U# IE8  
STONEHAM, MA 02180

8-0-IIA1  
LOPRIORE ENRICA M.  
159 FRANKLIN ST U# IIA1  
STONEHAM, MA 02180

8-0-IIA2  
FUSCO ANTHONY J  
159 FRANKLIN ST U# IIA2  
STONEHAM, MA 02180

0-IIA3  
MERRILL JONATHAN S.  
14 PLACE LANE  
ROXBURY, MA 01801

8-0-IIA4  
MANISCALCO CYNTHIA A.  
159 FRANKLIN ST U# IIA4  
STONEHAM, MA 02180

8-0-IIA5  
HADSELL SUSAN E  
159 FRANKLIN ST U# IIA5  
STONEHAM, MA 02180

0-IIA6  
MCKENNA CLAIR-QUINN EILEEN M.  
9 FRANKLIN ST U# IIA6  
STONEHAM, MA 02180

8-0-IIA7  
GLOOR MATTHEW D.  
159 FRANKLIN ST U# IIA7  
STONEHAM, MA 02180

8-0-IIA8  
ROBISON DEBORAH J.  
159 FRANKLIN ST U# IIA8  
STONEHAM, MA 02180

0-IIB1  
MILLS GARY  
9 FRANKLIN ST U# IIB1  
STONEHAM, MA 02180

8-0-IIB2  
PENTA ALFRED F.  
159 FRANKLIN ST U# IIB2  
STONEHAM, MA 02180

8-0-IIB3  
HATCH SANDRA C.  
159 FRANKLIN ST U# IIB3  
STONEHAM, MA 02180

0-IIB4  
MCCOY JOSEPHINE M  
9 FRANKLIN ST U# IIB4  
STONEHAM, MA 02180

8-0-IIB5  
NUNES MARIA M.  
159 FRANKLIN ST U# IIB5  
STONEHAM, MA 02180

8-0-IIB6  
LASHLEY LEON K.  
159 FRANKLIN ST U# IIB6  
STONEHAM, MA 02180

8-0-IIB7  
MICHALAK PAUL J.  
159 FRANKLIN ST U# IIB7  
STONEHAM, MA 02180

8-0-IIB8  
ORCUTT ELENA TRSTEE  
49 COCHRANE ST  
MELROSE, MA 02176

8-0-IIC1  
JAREMA ANNE J.  
159 FRANKLIN ST U# IIC1  
STONEHAM, MA 02180

8-0-IIC2  
DAKIN GEORGE P  
132 ALTAMONT AVE  
MELROSE, MA 02176

8-0-IIC3  
WOLLHEIM ALLAN B.  
159 FRANKLIN ST U# IIC3  
STONEHAM, MA 02180

8-0-IIC4  
DESAI BHAVIK  
159 FRANKLIN ST U# IIC4  
STONEHAM, MA 02180

8-0-IIC5  
O'CONNOR JOHN T.  
159 FRANKLIN ST U# IIC5  
STONEHAM, MA 02180

8-0-IIC6  
ZHANG JIAN MIN  
159 FRANKLIN ST U# IIC6  
STONEHAM, MA 02180

8-0-IIC7  
MORELLO ROSANN  
159 FRANKLIN ST U# IIC7  
STONEHAM, MA 02180

8-0-IIC8  
MIELINSKI MARK  
59 FRANKLIN ST U# IIC8  
STONEHAM, MA 02180

8-0-IID1  
BOSSI PAULA A.  
31 DALEY TERRACE  
ORLEANS, MA 02653

8-0-IID2  
GIUSTO TAMMY  
159 FRANKLIN ST UNIT II D2  
STONEHAM, MA 02180

8-0-IID3  
ANDERSON TIM  
59 FRANKLIN ST U# IID3  
STONEHAM, MA 02180

8-0-IID4  
AKELL ALISON M.  
159 FRANKLIN ST U# IID4  
STONEHAM, MA 02180

8-0-IID5  
WARNER BAMBI  
159 FRANKLIN ST U# IID5  
STONEHAM, MA 02180

8-0-IID6  
HENRIQUEZ KAREN V.  
59 FRANKLIN ST U# IID6  
STONEHAM, MA 02180

8-0-IID7  
CONNOR STACEY M.  
47 SEERY ST  
MALDEN, MA 02148

8-0-IID8  
SIMMONS LINITA E  
159 FRANKLIN ST U# IID8  
STONEHAM, MA 02180

8-0-IIE1  
ROSE CHRISTOPHER W.  
59 FRANKLIN ST U# IIE1  
STONEHAM, MA 02180

8-0-IIE2  
SILVA JOHN  
P.O. BOX 1918  
WAKEFIELD, MA 01880

8-0-IIE3  
LOURENCO LUIZ  
159 FRANKLIN ST U# IIE3  
STONEHAM, MA 02180

8-0-IIE4  
BONO ANTHONY D  
BALDWIN PLACE  
DOSTON, MA 02113

8-0-IIE5  
LYONS EDWARD L.  
159 FRANKLIN ST U# IIE5  
STONEHAM, MA 02180

8-0-IIE6  
BALDINI NATALIE P.  
159 FRANKLIN ST U# IIE6  
STONEHAM, MA 02180

8-0-IIE7  
MAHONEY KERRY P  
59 FRANKLIN ST U# IIE7  
STONEHAM, MA 02180

8-0-IIE8  
JAQUEZ TEREZA  
159 FRANKLIN ST U# IIE8  
STONEHAM, MA 02180

8-0-126A  
HAUPT JENNIFER A.  
177 FRANKLIN ST U# 1  
STONEHAM, MA 02180

8-0-126C  
MANS PATRICK J.  
177 FRANKLIN ST U# 3  
STONEHAM, MA 02180

8-0-126D  
CHEN YUAN  
177 FRANKLIN ST U# 4  
STONEHAM, MA 02180

8-0-126E  
BARBOSA MARILENE G.  
177 FRANKLIN ST U# 5  
STONEHAM, MA 02180

8-0-125A  
MUSSELEIN JOHN  
79 FRANKLIN ST UNIT 1  
STONEHAM, MA 02180

8-0-125B  
FEIR DONNA J.  
35 CANDLEWOOD DR.  
TOLLAND, CT 06084

8-0-125C  
CORRIGAN JULIE A.  
179 FRANKLIN ST U# 3  
STONEHAM, MA 02180

8-0-125D  
HAMMARCO DOMENICO  
7-A AMARANTH AVENUE  
MEDFORD, MA 02155

8-0-125E  
MACERO JANET C.  
179 FRANKLIN ST U# 5  
STONEHAM, MA 02180

8-0-125F  
GRENIER SHAWN  
179 FRANKLIN ST U# 6  
STONEHAM, MA 02180

8-0-125G  
OHERTY RYAN A.  
79 FRANKLIN ST U# 7  
STONEHAM, MA 02180

8-0-126F  
LILJANDER GLENN  
177 FRANKLIN ST U# 6  
STONEHAM, MA 02180

8-0-148A  
DEVLIN ALBERT T.  
4 FRANKLIN PL  
STONEHAM, MA 02180

2-0-178  
ORPHANOS NICHOLAS  
6 GERALD ROAD  
STONEHAM MA 02180

2-0-179  
DASHO ROBERT S.  
8 GERALD RD  
STONEHAM MA 02180

2-0-180  
WANTMAN MARTIN H  
20 GERALD RD  
STONEHAM MA 02180

2-0-186  
BORENSTEIN ROBERT  
9 GERALD RD  
STONEHAM MA 02180

2-0-188  
BORENSTEIN ROBERT  
9 GERALD RD  
STONEHAM MA 02180

2-0-189  
VON KANEL JACQUILINE M.  
7 GERALD RD  
STONEHAM MA 02180

2-0-191  
VONKANEL JACQUILINE M.  
7 GERALD RD  
STONEHAM MA 02180

2-0-192  
BORENSTEIN ROBERT  
9 GERALD RD  
STONEHAM MA 02180

2-0-193  
CARPENITO GEORGE  
8 ELLEN RD  
STONEHAM MA 02180

2-0-194  
HAZARIAN JERRY  
0 ELLEN RD  
STONEHAM MA 02180

2-0-195  
GOSS LISA  
12 ELLEN RD  
STONEHAM MA 02180

2-0-196  
FOTINO JOSEPHINE R.  
14 ELLEN RD  
STONEHAM MA 02180

2-0-197  
ARECE GERTRUDE R.  
6 ELLEN RD  
STONEHAM MA 02180

2-0-198  
BOUSSY THOMAS H. JR.  
19 ELLEN RD  
STONEHAM MA 02180

2-0-199  
NICKERSON CAROL A.  
15 ELLEN RD  
STONEHAM MA 02180

2-0-218  
IAGALETTA SAVINO  
5 DINANNO RD  
STONEHAM MA 02180

2-0-219  
MORAN JAMES V., TRS. ETAL  
17 DINANNO RD  
STONEHAM MA 02180

2-0-223A  
CUTONE MARIO V  
40 ELLEN RD  
STONEHAM MA 02180

2-0-334  
AMPBELL ARTHUR H.  
1 ELLEN RD  
STONEHAM MA 02180

2-0-335  
MACKAY KEVIN C  
23 ELLEN RD  
STONEHAM MA 02180

2-0-336  
GORDAN MARJORIE G.  
25 ELLEN RD  
STONEHAM MA 02180

2-0-337  
MEM SEAN  
1 ELLEN RD  
STONEHAM MA 02180

2-0-338  
CHI WILLIAM C  
29 ELLEN RD  
STONEHAM MA 02180

2-0-339  
VISCONTI DENNIS J.  
31 ELLEN RD  
STONEHAM MA 02180

2-0-340  
ILIANO JAMES A  
1 ELLEN RD  
STONEHAM MA 02180

2-0-341  
LIBBY TIMOTHY J.  
35 ELLEN RD  
STONEHAM MA 02180

2-0-342  
LICHTMAN STEVEN A.  
37 ELLEN RD.  
STONEHAM MA 02180

2-0-343  
FRANCOIS  
1 ELLEN RD  
STONEHAM MA 02180

2-0-344  
DESIMONE STEPHEN A.  
38 ELLEN RD.  
STONEHAM MA 02180

2-0-346  
PORTMAN HARRIET TRS.  
34 ELLEN RD  
STONEHAM MA 02180

1-0-347  
TOPIANO RICHARD C.  
2 ELLEN RD  
STONEHAM MA 02180

2-0-348  
COVINO ANTHONY L.  
30 ELLEN RD  
STONEHAM MA 02180

2-0-349  
BOURGEOIS FRANCIS G.  
28 ELLEN RD  
STONEHAM MA 02180

1-0-350  
TOSCIA NICHOLAS F.  
6 ELLEN ROAD  
STONEHAM MA 02180

2-0-351  
TUTELA DIAMOND C  
24 ELLEN RD  
STONEHAM MA 02180

2-0-352  
MITRANO BENEDETTO TRTEES, ETAL  
22 ELLEN RD  
STONEHAM MA 02180

1-0-353  
ICARIELLO MICHAEL A.  
3 ELLEN RD  
STONEHAM MA 02180

2-0-354  
SHEA FRANCIS W  
18 ELLEN RD  
STONEHAM MA 02180

2-0-355  
CUSATO PETER J. TR., ETAL  
34 TAMAROCK TERR  
STONEHAM MA 02180

1-0-356  
WANG MING L  
3 TAMAROCK TR  
STONEHAM MA 02180

2-0-357  
PATEL SANGITA  
38 TAMAROCK TR  
STONEHAM MA 02180

2-0-358  
O'HARA ROBERT  
40 TAMAROCK TR  
STONEHAM MA 02180

1-0-358A  
DELTRAM KENNETH A  
TAMAROCK TERR  
STONEHAM MA 02180

2-0-359  
PICAZIO PETER J.  
39 TAMAROCK TR  
STONEHAM MA 02180

2-0-360  
YAN YANHUA  
37 TAMAROCK TERR  
STONEHAM MA 02180

1-0-362  
BRAGHTY KAREN J.  
BEACON ST  
STONEHAM MA 02180

2-0-363  
DAKOYANNIS STEVEN  
36 BEACON ST  
STONEHAM MA 02180

2-0-364  
JAYASINGHE KIMBERLY  
38 BEACON ST  
STONEHAM MA 02180

1-0-365  
GREENBERG BORIS  
BEACON ST  
STONEHAM MA 02180

2-0-366  
VACHON DEREK P.  
42 BEACON ST  
STONEHAM MA 02180

2-0-367  
CONNELLY PATRICK  
31 BEACON ST  
STONEHAM MA 02180

1-0-383  
ORNSON BARBARA H.  
ELLEN RD  
STONEHAM MA 02180

3-0-1  
ALIBERTI VINCENT J.  
2 GERALD RD  
STONEHAM MA 02180

3-0-2  
ROBASSON DICK  
4 GERALD ROAD  
STONEHAM MA 02180

1-0-368  
NGO DANIEL J.  
1 FRANKLIN ST  
STONEHAM MA 02180

3-0-4  
VACCARO JOSEPH A.  
5 GERALD RD  
STONEHAM MA 02180

3-0-5  
MALZONE RAYMOND V.  
3 GERALD RD  
STONEHAM MA 02180

1-0-100  
SULLIVAN JOSEPH N  
MOUNTAIN RD  
WILMINGTON MA 01803

8-0-100  
SULLIVAN REATLY TR  
15 CHARLES STREET  
STONEHAM MA 02180

8-0-101  
SAVAGE MARK L.  
160 FRANKLIN ST  
STONEHAM MA 02180

8-0-102  
WEISS DONNA, TR.  
162 FRANKLIN ST.  
STONEHAM MA 02180

8-0-106  
WEISS FARMS INC  
170 FRANKLIN ST  
STONEHAM MA 02180

8-0-107  
CUNNINGHAM, JOE REM.+ CONST.  
39 PLEASANT ST STE3  
STONEHAM MA 02180

8-0-110  
WEBBER TERESA A.  
185 FRANKLIN ST  
STONEHAM MA 02180

8-0-111  
SMITH RICHARD E  
2 RUSTIC RD  
STONEHAM MA 02180

8-0-122  
VETRANO ANTONIO  
5 SUNSET RD  
STONEHAM MA 02180

8-0-123  
LORD MICHAEL J  
1 RUSTIC ROAD  
STONEHAM MA 02180

8-0-124  
RAFFAELLO FRANK A  
181 FRANKLIN ST  
STONEHAM MA 02180

8-0-127  
SCIOLI CHARLES E. JR.  
175 FRANKLIN ST U# 2  
STONEHAM MA 02180

8-0-127A  
BOYD MICHAEL  
75 FRANKLIN ST U# 1  
STONEHAM MA 02180

8-0-128  
WEISS MARVIN, TR  
37 OLDE COACH RD  
SCOTIA NY 12302

8-0-129  
MAGEE JOSSHUA  
173 FRANKLIN ST  
STONEHAM MA 02180

8-0-130  
EMETRIO ROBERT  
71 FRANKLIN ST  
STONEHAM MA 02180

8-0-132  
DDC REALTY LLC  
100 DOVER STREET  
SOMERVILLE MA 02144

8-0-132A  
THE SOUTHERN N.E. CONF. ASSOC  
34 SAWYER ST  
LANCASTER MA 01561

8-0-133  
WEISS MARVIN TR  
7 OLDE COACH RD  
SCOTIA NY 12302

8-0-134  
TOWN OF STONHAM  
149 FRANKLIN STREET  
STONEHAM MA 02180

8-0-144  
DOWNS JOHN  
42 FRANKLIN RD.  
WINCHESTER MA 01890

8-0-148  
WALTERS EDWARD J.  
15 FRANKLIN ST  
STONEHAM MA 02180

8-0-183  
ZENKOV YULIY  
39 BEACON STREET  
STONEHAM MA 02180

8-0-184  
VAUGHAN MARK T.  
35 BEACON ST  
STONEHAM MA 02180

8-0-185  
ELKONIAN JOYCE E. TRS, ETAL  
1 BEACON ST  
STONEHAM MA 02180

8-0-42A  
LODATO RAYMOND  
12 GAVIN CR  
STONEHAM MA 02180

8-0-42C  
CROWE THOMAS P.  
11 GAVIN CIRCLE  
STONEHAM MA 02180

8-0-44  
TOWN OF STONEHAM  
STONEHAM TOWN HALL  
STONEHAM MA 02180

8-0-45  
TOWN OF STONEHAM  
TOWN HALL  
STONEHAM MA 02180

8-0-46A  
CARBO ANTHONY  
11 SULLIVAN CIRCLE  
STONEHAM MA 02180

8-0-46B  
ATTAROLI LOUIS A. JR.  
5 SULLIVAN CIRCLE  
STONEHAM MA 02180

8-0-46C  
ANTHONY PAUL J.  
7 SULLIVAN CR.  
STONEHAM MA 02180

8-0-46E  
RUBIN ERIC T.  
5 SULLIVAN CR  
STONEHAM MA 02180

0-47A  
STONEHAM, TOWN OF  
NE STREET  
STONEHAM MA 02180

8-0-48  
MUSTONE ANTHONY J  
24 RODGERS RD  
STONEHAM MA 02180

8-0-97  
DOUCET CATHERINE M.  
150 FRANKLIN ST  
STONEHAM MA 02180

0-98  
O'CARNEY TIMOTHY F.  
12 FRANKLIN ST  
STONEHAM MA 02180

8-0-99  
ROTONDI CHARLES S. TRS.  
158 FRANKLIN ST  
STONEHAM MA 02180

8-0-IA1  
HOGAN JOSEPH P  
7 COMMONWEALTH AVE.  
WILMINGTON MA 01887

0-IA10  
DAKIN GEORGE P  
2 ALTAMONT AVE  
MELROSE MA 02176

8-0-IA11  
RONCHINI TAMIRES  
157 FRANKLIN ST U# IA11  
STONEHAM MA 02180

8-0-IA2  
MARTELL HARRY III  
157 FRANKLIN ST U# IA2  
STONEHAM MA 02180

0-IA4  
RUFFETT JOSEPH W. TRS  
CONGRESS ST  
STONEHAM MA 02180

8-0-IA6  
WILLARD JAMES C.  
157 FRANKLIN STREET #IA6  
STONEHAM MA 02180

8-0-IA7  
DAKIN GEORGE P  
132 ALTAMONT AVE  
MELROSE MA 02176

0-IA8  
DAN RACHAEL F  
7 FRANKLIN ST  
UNIT #IA8  
STONEHAM MA 02180

8-0-IA9  
KOSSIN LINDA  
3665 NE SKYLINE DR  
JENSEN BEACH FL 34957

8-0-IB1  
JOHNSTON CAROL D.  
157 FRANKLIN ST U# IB1  
STONEHAM MA 02180

0-IB2  
SMITH RUSSELL J.  
7 FRANKLIN ST U# IB2  
STONEHAM MA 02180

8-0-IB3  
FIORE JANET L.  
157 FRANKLIN ST U# IB3  
STONEHAM MA 02180

8-0-IB4  
MACDONALD DONNA R  
157 FRANKLIN ST U# IB4  
STONEHAM MA 02180

0-IB5  
OEV VLADIMIR  
7 FRANKLIN ST U# IB5  
STONEHAM MA 02180

8-0-IB6  
ORAZIO LLC  
1 DINANNO RD  
STONEHAM MA 02180

8-0-IB7  
DALEY WALTER R.  
157 FRANKLIN ST U# IB7  
STONEHAM MA 02180

0-IB8  
ANTURA JOSEPH  
7 FRANKLIN ST U# IB8  
STONEHAM MA 02180

8-0-IC1  
HUANG HUILI  
29 GIBSON ST  
MEDFORD MA 02155

8-0-IC2  
MALDEN JUTTA V. TRS.  
42 BELKNAP POINT RD.  
GILFORD NH 3249

0-IC3  
WINWRIGHT SAMUEL C  
7 FRANKLIN ST UNIT IC3  
STONEHAM MA 02180

8-0-IC4  
ALIM-MARVASTI MASIH  
157 FRANKLIN ST U# IC4  
STONEHAM MA 02180

8-0-IC5  
CESARALE FRANK P  
157 FRANKLIN ST U# IC5  
STONEHAM MA 02180

0-IC6  
DANI FLORA  
7 FRANKLIN ST U# IC6  
STONEHAM MA 02180

8-0-IC7  
O'CONNELL PHILIP A.  
224 PARK ST UNIT B9  
STONEHAM MA 02180

8-0-IC8  
DOBOS SHEILA M.  
121 HILLSIDE ROAD  
DEDHAM MASS 02026

8-0-ID1  
MCCARTHY CATHERINE A.  
157 FRANKLIN ST U# ID1  
STONEHAM MA 02180

8-0-ID2  
CARUSO KEVIN J.  
157 FRANKLIN ST U# ID2  
STONEHAM MA 02180

8-0-ID3  
DALY KEVIN M., TR, ETAL  
157 FRANKLIN ST U# ID3  
STONEHAM MA 02180

8-0-ID4  
ALLAN KAREN K.  
157 FRANKLIN ST U# ID4  
STONEHAM MA 02180

8-0-ID5  
McGREAL JACQUELINE  
157 FRANKLIN ST U# ID5  
STONEHAM MA 02180

8-0-ID6  
JOHNSON AMY L.  
157 FRANKLIN ST U# ID6  
STONEHAM MA 02180

8-0-ID7  
VANG SHEILA S.  
57 FRANKLIN ST U# ID7  
STONEHAM MA 02180

8-0-ID8  
VIJAYAKANTHAN ALEXIUS  
157 FRANKLIN ST U# ID8  
STONEHAM MA 02180

8-0-IE1  
KESSARIS JOHN, III  
157 FRANKLIN ST U# IE1  
STONEHAM MA 02180

8-0-IE2  
MOODY THOMAS FRANCIS JR.  
57 FRANKLIN ST U# IE2  
STONEHAM MA 02180

8-0-IE3  
GREENE RICHARD F.  
157 FRANKLIN ST U# IE3  
STONEHAM MA 02180

8-0-IE4  
GREENE RICHARD  
157 FRANKLIN ST U# IE4  
STONEHAM MA 02180

8-0-IE5  
URRAN RICHARD C.  
37 FRANKLIN ST U# IE5  
STONEHAM MA 02180

8-0-IE6  
SCOPA LISA  
157 FRANKLIN ST U# IE6  
STONEHAM MA 02180

8-0-IE7  
McCAIN ROBERTA  
200 SWANTON ST. #333  
WINCHESTER MA 01890

8-0-IE8  
MATHER AMY  
57 FRANKLIN ST U# IE8  
STONEHAM MA 02180

8-0-IIA1  
LOPRIORE ENRICA M.  
159 FRANKLIN ST U# IIA1  
STONEHAM MA 02180

8-0-IIA2  
FUSCO ANTHONY J  
159 FRANKLIN ST U# IIA2  
STONEHAM MA 02180

8-IIA3  
ERBLE JONATHAN S.  
4 PLACE LANE  
OBURN MA 01801

8-0-IIA4  
MANISCALCO CYNTHIA A.  
159 FRANKLIN ST U# IIA4  
STONEHAM MA 02180

8-0-IIA5  
HADSELL SUSAN E  
159 FRANKLIN ST U# IIA5  
STONEHAM MA 02180

8-IIA6  
MCCLAIR-QUINN EILEEN M.  
9 FRANKLIN ST U# IIA6  
STONEHAM MA 02180

8-0-IIA7  
GLOOR MATTHEW D.  
159 FRANKLIN ST U# IIA7  
STONEHAM MA 02180

8-0-IIA8  
ROBISON DEBORAH J.  
159 FRANKLIN ST U# IIA8  
STONEHAM MA 02180

8-IIB1  
LS GARY  
9 FRANKLIN ST U# IIB1  
STONEHAM MA 02180

8-0-IIB2  
PENTA ALFRED F.  
159 FRANKLIN ST U# IIB2  
STONEHAM MA 02180

8-0-IIB3  
HATCH SANDRA C.  
159 FRANKLIN ST U# IIB3  
STONEHAM MA 02180

8-IIB4  
FUSCO JOSEPHINE M  
9 FRANKLIN ST U# IIB4  
STONEHAM MA 02180

8-0-IIB5  
NUNES MARIA M.  
159 FRANKLIN ST U# IIB5  
STONEHAM MA 02180

8-0-IIB6  
LASHLEY LEON K.  
159 FRANKLIN ST U# IIB6  
STONEHAM MA 02180

0-IIB7  
NICHALAK PAUL J.  
59 FRANKLIN ST U# IIB7  
STONEHAM MA 02180

8-0-IIB8  
ORCUTT ELENA TRSTEE  
49 COCHRANE ST  
MELROSE MA 02176

8-0-IIC1  
JAREMA ANNE J.  
159 FRANKLIN ST U# IIC1  
STONEHAM MA 02180

0-IIC2  
AKIN GEORGE P  
32 ALTAMONT AVE  
MELROSE MA 02176

8-0-IIC3  
WOLLHEIM ALLAN B.  
159 FRANKLIN ST U# IIC3  
STONEHAM MA 02180

8-0-IIC4  
DESAI BHAVIK  
159 FRANKLIN ST U# IIC4  
STONEHAM MA 02180

0-IIC5  
CONNOR JOHN T.  
59 FRANKLIN ST U# IIC5  
STONEHAM MA 02180

8-0-IIC6  
ZHANG JIAN MIN  
159 FRANKLIN ST U# IIC6  
STONEHAM MA 02180

8-0-IIC7  
MORELLO ROSANN  
159 FRANKLIN ST U# IIC7  
STONEHAM MA 02180

0-IIC8  
ELINSKI MARK  
59 FRANKLIN ST U# IIC8  
STONEHAM MA 02180

8-0-IID1  
BOSSI PAULA A.  
31 DALEY TERRACE  
ORLEANS MA 02653

8-0-IID2  
GIUSTO TAMMY  
159 FRANKLIN ST UNIT II D2  
STONEHAM MA 02180

0-IID3  
ANDERSON TIM  
59 FRANKLIN ST U# IID3  
STONEHAM MA 02180

8-0-IID4  
AKELL ALISON M.  
159 FRANKLIN ST U# IID4  
STONEHAM MA 02180

8-0-IID5  
WARNER BAMBI  
159 FRANKLIN ST U# IID5  
STONEHAM MA 02180

0-IID6  
ENRIQUEZ KAREN V.  
59 FRANKLIN ST U# IID6  
STONEHAM MA 02180

8-0-IID7  
CONNOR STACEY M.  
47 SEERY ST  
MALDEN MA 02148

8-0-IID8  
SIMMONS LINITA E  
159 FRANKLIN ST U# IID8  
STONEHAM MA 02180

0-IIE1  
JOSE CHRISTOPHER W.  
59 FRANKLIN ST U# IIE1  
STONEHAM MA 02180

8-0-IIE2  
SILVA JOHN  
P.O. BOX 1918  
WAKEFIELD MA 01880

8-0-IIE3  
LOURENCO LUIZ  
159 FRANKLIN ST U# IIE3  
STONEHAM MA 02180

0-IIE4  
BO ANTHONY D  
3 BALDWIN PLACE  
STONEHAM MA 02113

8-0-IIE5  
LYONS EDWARD L.  
159 FRANKLIN ST U# IIE5  
STONEHAM MA 02180

8-0-IIE6  
BALDINI NATALIE P.  
159 FRANKLIN ST U# IIE6  
STONEHAM MA 02180

0-IIE7  
WHONEY KERRY P  
59 FRANKLIN ST U# IIE7  
STONEHAM MA 02180

8-0-IIE8  
JAQUEZ TEREZA  
159 FRANKLIN ST U# IIE8  
STONEHAM MA 02180

8-0-126A  
HAUPT JENNIFER A.  
177 FRANKLIN ST U# 1  
STONEHAM MA 02180

0-126C  
S PATRICK J.  
57 FRANKLIN ST U# 3  
STONEHAM MA 02180

8-0-126D  
CHEN YUAN  
177 FRANKLIN ST U# 4  
STONEHAM MA 02180

8-0-126E  
BARBOSA MARILENE G.  
177 FRANKLIN ST U# 5  
STONEHAM MA 02180

8-0-125A  
NUSSLEIN JOHN  
179 FRANKLIN ST UNIT 1  
STONEHAM MA 02180

8-0-125B  
FEIR DONNA J.  
35 CANDLEWOOD DR.  
TOLLAND CT 06084

8-0-125C  
CORRIGAN JULIE A.  
179 FRANKLIN ST U# 3  
STONEHAM MA 02180

8-0-125D  
SIAMMARCO DOMENICO  
7-A AMARANTH AVENUE  
MEDFORD MA 02155

8-0-125E  
MACERO JANET C.  
179 FRANKLIN ST U# 5  
STONEHAM MA 02180

8-0-125F  
GRENIER SHAWN  
179 FRANKLIN ST U# 6  
STONEHAM MA 02180

8-0-125G  
OHERTY RYAN A.  
79 FRANKLIN ST U# 7  
STONEHAM MA 02180

8-0-126F  
LILJANDER GLENN  
177 FRANKLIN ST U# 8  
STONEHAM MA 02180

8-0-148A  
DEVLIN ALBERT T.  
4 FRANKLIN PL  
STONEHAM MA 02180





of Growth Expenses 1.04  
 1 is the first year of stabilized occupancy

JAL RENTAL INCOME	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Rental Income	5,580,720	5,748,142	5,920,586	6,098,203	6,281,150	6,469,584	6,663,672	6,863,582	7,069,489	7,281,574
Income	164,620	169,559	174,645	179,885	185,281	190,840	196,565	202,462	208,536	214,792
<b>JAL GROSS INCOME</b>	<b>5,745,340</b>	<b>5,917,700</b>	<b>6,095,231</b>	<b>6,278,088</b>	<b>6,466,431</b>	<b>6,660,424</b>	<b>6,860,236</b>	<b>7,066,044</b>	<b>7,278,025</b>	<b>7,496,366</b>
Vacancy and Bad Debt -afford units	(16,064)	(16,546)	(17,043)	(17,554)	(18,081)	(18,623)	(19,182)	(19,757)	(20,350)	(20,960)
Vacancy and Bad Debt-mrkt units	(261,701)	(269,552)	(277,638)	(285,967)	(294,546)	(303,383)	(312,484)	(321,859)	(331,514)	(341,460)
Vacancy and Bad Debt-other	(8,231)	(8,478)	(8,732)	(8,994)	(9,264)	(9,542)	(9,828)	(10,123)	(10,427)	(10,740)
<b>RENTAL INCOME</b>	<b>5,459,344</b>	<b>5,623,124</b>	<b>5,791,818</b>	<b>5,965,573</b>	<b>6,144,540</b>	<b>6,328,876</b>	<b>6,518,742</b>	<b>6,714,305</b>	<b>6,915,734</b>	<b>7,123,206</b>
<b>JAL OPERATING EXPENSES</b>										
Management Fee	172,360	179,255	186,425	193,882	201,637	209,703	218,091	226,814	235,887	245,322
Administration	400,000	416,000	432,640	449,946	467,943	486,661	506,128	526,373	547,428	569,325
Maintenance	400,000	416,000	432,640	449,946	467,943	486,661	506,128	526,373	547,428	569,325
Utilities	100,000	104,000	108,160	112,486	116,986	121,665	126,532	131,593	136,857	142,331
Estate Taxes	500,000	520,000	540,800	562,432	584,929	608,326	632,660	657,966	684,285	711,656
Insurance	122,255	127,145	132,231	137,520	143,021	148,742	154,692	160,879	167,314	174,007
Credit Monitoring Fee	15,000	15,600	16,224	16,873	17,548	18,250	18,980	19,739	20,529	21,350
Capital Reserves	80,000	83,200	86,528	89,989	93,589	97,332	101,226	105,275	109,486	113,865
<b>TOTAL OPERATING EXPENSES</b>	<b>1,864,615</b>	<b>1,939,200</b>	<b>2,016,768</b>	<b>2,097,439</b>	<b>2,181,336</b>	<b>2,268,589</b>	<b>2,359,333</b>	<b>2,453,706</b>	<b>2,551,855</b>	<b>2,653,929</b>
<b>OPERATING INCOME</b>	<b>3,594,729</b>	<b>3,683,925</b>	<b>3,775,050</b>	<b>3,868,134</b>	<b>3,963,204</b>	<b>4,060,287</b>	<b>4,159,409</b>	<b>4,260,598</b>	<b>4,363,879</b>	<b>4,469,277</b>
Service	(2,875,783)	(2,875,783)	(2,875,783)	(2,875,783)	(2,875,783)	(2,875,783)	(2,875,783)	(2,875,783)	(2,875,783)	(2,875,783)
<b>CASH FLOW</b>	<b>718,946</b>	<b>808,141</b>	<b>899,267</b>	<b>992,351</b>	<b>1,087,421</b>	<b>1,184,503</b>	<b>1,283,626</b>	<b>1,384,815</b>	<b>1,488,096</b>	<b>1,593,494</b>



Number of Units: 264

	Units	Approx. Sq. Ft.	Utility		Rent /Month
			Maximum Rent @ 70%	Allowance	
<b>TOTAL REVENUES</b>					
Studio	7	525	1,156	180	976
1 BR	26	755	1,323	247	1,076
2 BR	29	1,025	1,487	316	1,171
3 BR	4	1,300	1,652	402	1,250
Studio	20	525			1,391
1 BR	79	755			1,725
2 BR	85	1,025			2,204
3 BR	14	1,300			2,847
<b>Total Units</b>	<b>264</b>				

Monthly Rental Income	5,580,720
Income - parking	25,000
Income - Misc	139,620
Income - "OTHER"	164,620

**ANNUAL GROSS INCOME 5,745,340**

	Total	Per Unit
<b>OPERATING EXPENSES</b>		
MANAGEMENT FEE	172,360	653
MAINTENANCE	400,000	1,515
UTILITIES	400,000	1,515
INSURANCE	100,000	379
RESERVES	500,000	1,894
PROPERTY TAXES	50,000	189
CONCURRENCE	25,000	95
MONITORING FEE	122,255	463
ACCELERATION RESERVES	15,000	57
	80,000	303

**ANNUAL OPERATING EXPENSES 1,864,615 7,063**

**RATING PRO-FORMA- initial yr - stabilized occupancy**

Monthly Rental Income	5,580,720
Income (parking + miscellaneous)	164,620
Vacancy and Bad Debt -afford units	(16,064)
Vacancy and Bad Debt -mrkt units	(261,701)
Income on Other Income	(8,231)
<b>Effective Total Income</b>	<b>5,459,344</b>

**ANNUAL OPERATING EXPENSES (1,864,615)**  
**OPERATING INCOME 3,594,729**

Service Coverage Ratio	1.25
Amount available for debt service	2,875,783
<b>Maximum Available Loan</b>	<b>38,093,491</b>

Assumptions	
Vacancy & Bad Debt (Affordable Units)	2%
Vacancy & Bad Debt (Market Units)	6%
Vacancy & Bad Debt (Other Income)	5.00%
Management Fee (as a % of total effective income)	3.00%
Op. Exp. increase from original estimates based on the addition of 80 units	0
Number of Months	12
Loan	
Interest Rate	6.00%
Term	30
Debt Service Coverage Ratio	1.25

Mortgage Calculator	
Total monthly payment allowed	\$239,648.59
Estimated monthly escrow payment	\$0.00
Homeowner's Insurance, if applicable	\$0.00
Homeowner's dues and other fees, if any	\$0.00
Annual interest rate (e.g., 5.75)	5.75
Duration of loan (in years)	25
Monthly principal + interest payment	\$239,648.59
Maximum loan amount	\$38,093,491

**DEVELOPMENT BUDGET**

	<i>Per Unit</i>	<i>Total</i>
<b>Hard Costs</b>		
Acquisition value (as-is appraisal)	6,818	1,800,000
Site Preparation (any unusual site conditions which require lands crossing, blasting, etc.)	13,636	3,600,000
Construction (units)	148,106	39,100,000
Construction (parking) - included	0	0
Contingency	8,087	2,135,000
<b>Sub-Total Hard Costs</b>	<b>176,648</b>	<b>46,635,000</b>

<b>Soft Costs</b>		
Permits, Surveys,	2,084	550,150
Architecture & Engineering	6,818	1,800,000
Legal, Title & Recording	2,154	568,700
Accounting & Cost Certification	95	25,000
CI/Environmental /Geotech Engineering	1,765	465,971
Utility connections & extension	1,136	300,000
License Fees	2,095	553,020
Insurance	1,394	367,918
Construction Loan Interest	1,837	484,850
Construction Loan Interest	10,514	2,775,582
Start up & Marketing	2,333	615,869
Appraisal/Market Study/other studies/fees/due diligence	189	50,000
Security	379	100,000
Development consultant	568	150,000
Start-up deficit	0	0
Cost Contingency	1,668	440,353
Developer Overhead/Fee	16,791	4,432,793
<b>Sub-Total Soft Costs</b>	<b>51,819</b>	<b>13,680,206</b>

<b>TOTAL DEVELOPMENT COSTS</b>	<b>228,467</b>	<b>60,315,206</b>
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**DEVELOPMENT SOURCES**

Permanent Loan (2)	38,093,491
Developer Equity at permanent loan closing (3)	22,221,715

<b>TOTAL DEVELOPMENT SOURCES</b>	<b>60,315,206</b>
----------------------------------	-------------------

**Assumptions**

<b>Hard Costs</b>	
Number of Units	264
Number of below ground parking spaces	0
Total GSF	<b>293,539</b>
Construction cost per SF	\$133.20
% of Construction/Sitework for Contingency	5%
Construction Period (in years)	2
Interest during construction	0.05
<b>Soft Costs</b>	
Soft Cost Contingency (excluding Developer OH, and Fee)	5%
Finance Fee	1.0%



## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoneham COUNT DATE : Sep-13

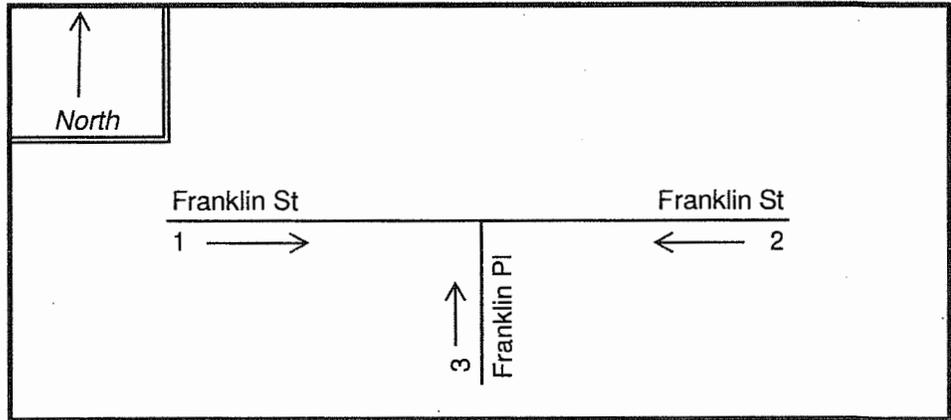
DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Franklin Street

MINOR STREET(S) : Franklin Place (Stoneham High School Access Road)

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB			
PEAK HOURLY VOLUMES (AM/PM):	1,109	743	138			

"K" FACTOR :

**0.104**

INTERSECTION ADT ( V ) = TOTAL DAILY  
 APPROACH VOLUME :

**19,135**

TOTAL # OF CRASHES :

**2**

# OF  
 YEARS :

**3**

AVERAGE # OF  
 CRASHES PER YEAR ( A ) :

**0.67**

**CRASH RATE CALCULATION :**

**0.10**

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

Project Title & Date: Proposed Residential Development

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoneham COUNT DATE : Sep-13

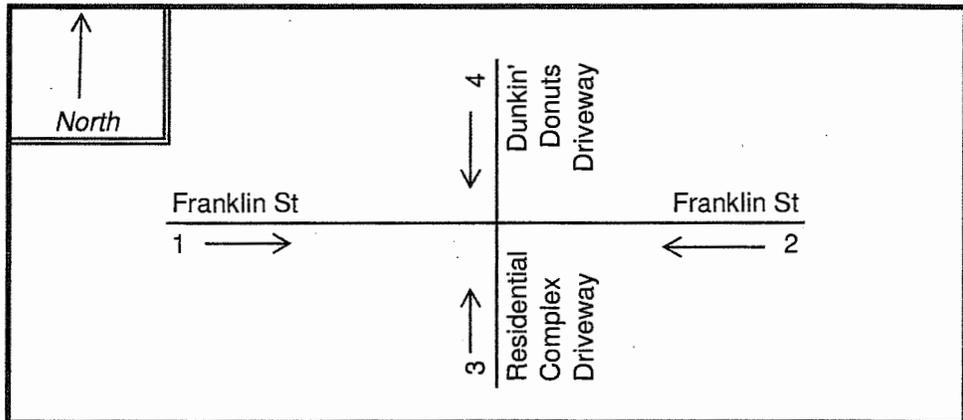
DISTRICT : 4 UNSIGNALIZED :  X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Franklin Street

MINOR STREET(S) : Dunkin Donuts Driveway (128 Franklin Street) & Residential Complex

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM):	1,127	842	9	32		2,010

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

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

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

Project Title & Date: Proposed Residential Development

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoneham                      COUNT DATE : Sep-13

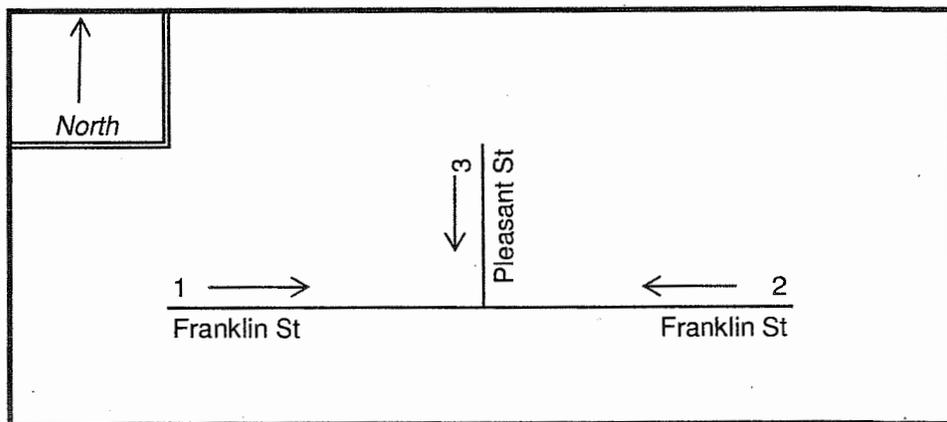
DISTRICT : 4                      UNSIGNALIZED :                       SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Franklin Street

MINOR STREET(S) : Pleasant Street

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	<b>Total Peak Hourly Approach Volume</b>
DIRECTION :	EB	WB	SB			
PEAK HOURLY VOLUMES (AM/PM):	816	711	272			

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

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

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

Project Title & Date: Proposed Residential Development













## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoneham COUNT DATE : Sep-13

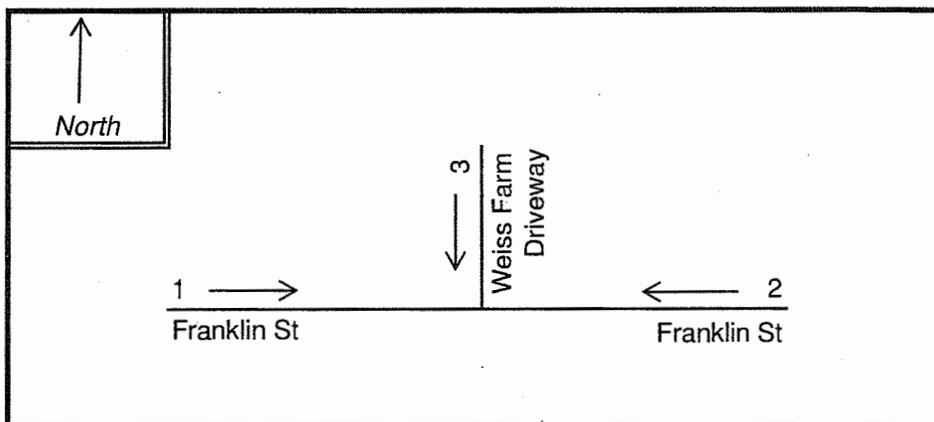
DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Franklin Street

MINOR STREET(S) : Weiss Farm Driveway (170 Franklin Street)

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	SB			
PEAK HOURLY VOLUMES (AM/PM):	1,085	743	0			

"K" FACTOR :

**0.104**

INTERSECTION ADT ( V ) = TOTAL DAILY  
 APPROACH VOLUME :

**17,577**

TOTAL # OF CRASHES :

**1**

# OF  
 YEARS :

**3**

AVERAGE # OF  
 CRASHES PER YEAR ( A ) :

**0.33**

**CRASH RATE CALCULATION :**

**0.05**

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

Project Title & Date: Proposed Residential Development



## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoneham COUNT DATE : Sep-13

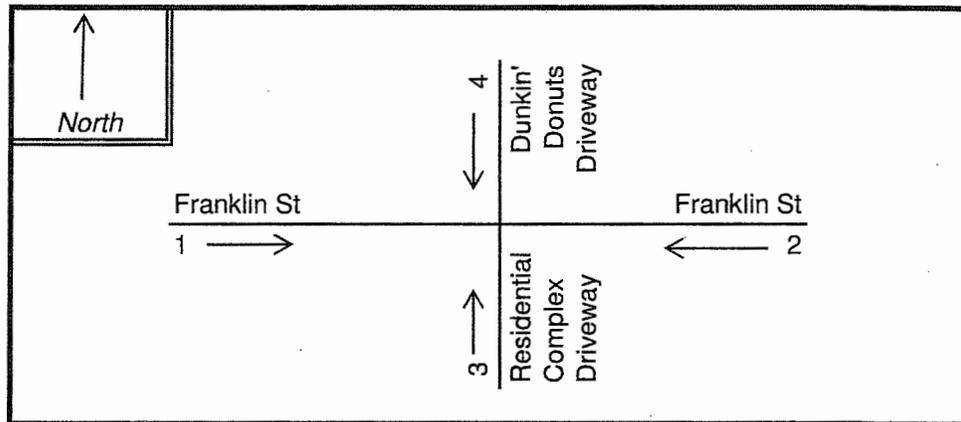
DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Franklin Street

MINOR STREET(S) : Dunkin Donuts Driveway (128 Franklin Street) & Residential Complex

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM):	1,127	842	9	32		

"K" FACTOR :

<b>0.104</b>	INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :	<b>19,327</b>
--------------	---	---------------

TOTAL # OF CRASHES :

<b>4</b>	# OF YEARS :	<b>3</b>	AVERAGE # OF CRASHES PER YEAR ( A ) :	<b>1.33</b>
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**CRASH RATE CALCULATION :**

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

Project Title & Date: Proposed Residential Development



## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoneham COUNT DATE : Sep-13

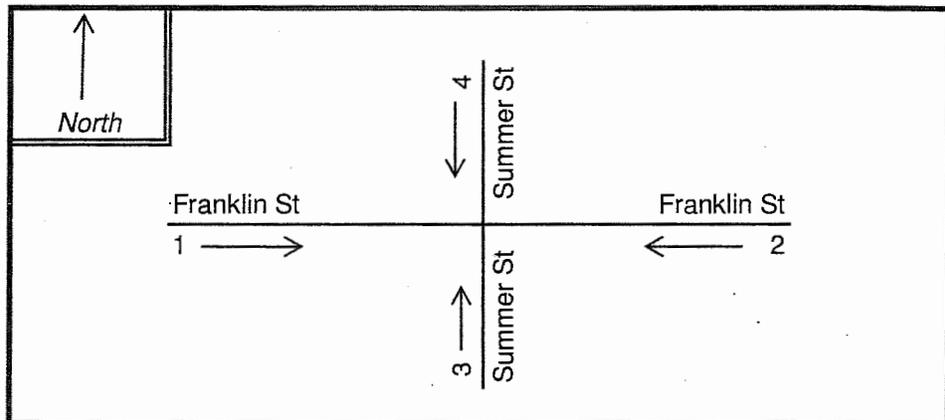
DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Franklin Street

MINOR STREET(S) : Summer Street

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	<b>Total Peak Hourly Approach Volume</b>
DIRECTION :	EB	WB	NB	SB		
PEAK HOURLY VOLUMES (AM/PM):	548	464	600	215		

" K " FACTOR : 0.104 INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME : 17,567

TOTAL # OF CRASHES : 4 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR ( A ) : 1.33

**CRASH RATE CALCULATION :** 0.21 RATE =  $\frac{(A * 1,000,000)}{(V * 365)}$

Project Title & Date: Proposed Residential Development





## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Stoneham COUNT DATE : Sep-13

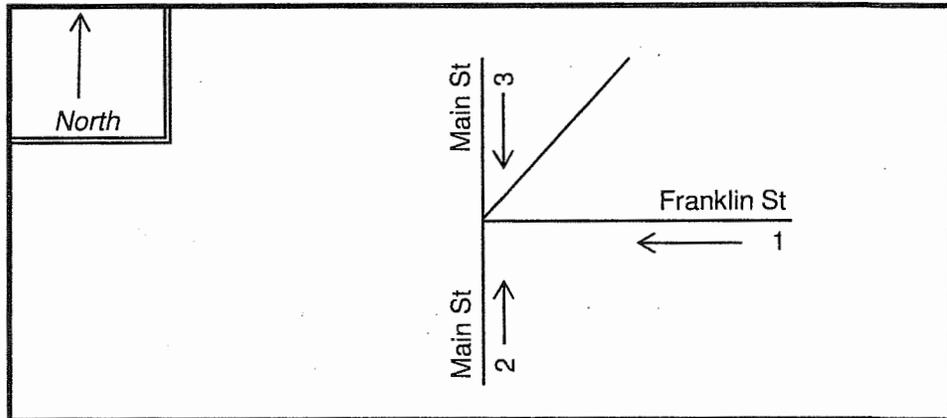
DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Main Street

MINOR STREET(S) : Franklin Street & Central Street

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	<b>Total Peak Hourly Approach Volume</b>
DIRECTION :	WB	NB	SB			
PEAK HOURLY VOLUMES (AM/PM):	278	683	458			<b>1,419</b>

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

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

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

Project Title & Date: Proposed Residential Development





**TRAFFIC IMPACT AND ACCESS STUDY**

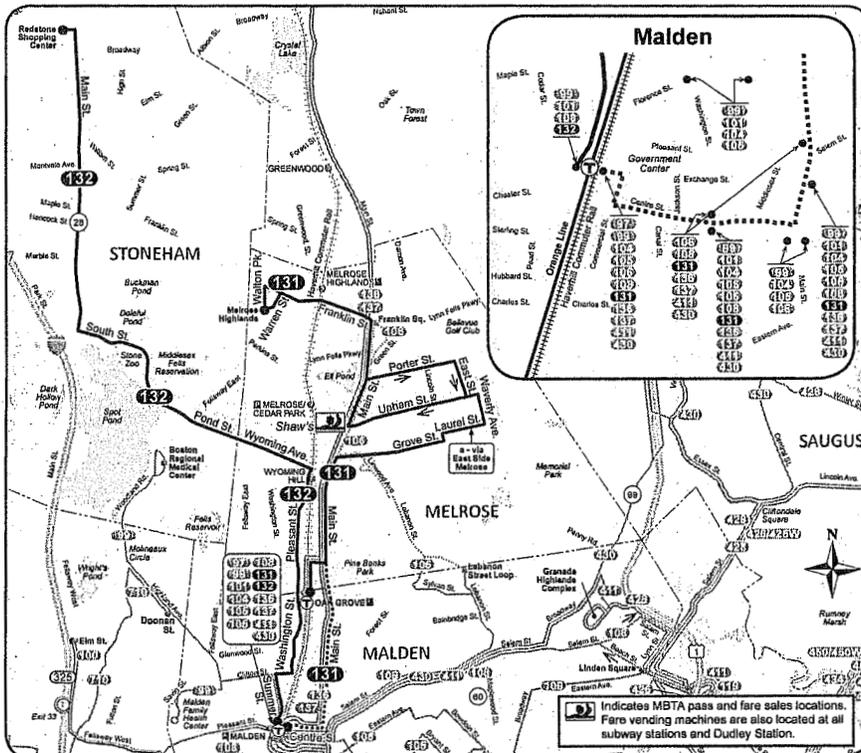
Proposed Residential Development – Stoneham, Massachusetts

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**PUBLIC TRANSPORTATION SCHEDULES**

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**Route 131 Melrose Highlands - Malden Center Station**  
**Route 132 Redstone Shopping Center - Malden Center Station**



# 131•132

Winter December 28, 2013 – March 21, 2014

**131 Melrose Highlands-Malden Station**  
**132 Redstone Shopping Center-Malden Station**

**Serving**

- Wyoming Square
- Melrose East Side
- Oak Grove Station
- Malden Square
- Orange Line
- Haverhill Commuter Rail



131 Weekday					
Inbound			Outbound		
Leave Franklin at Warren	Arrive Oak Grove Station	Arrive Malden Station	Leave Malden Station	Lv/Arrive Oak Grove Station	Arrive Franklin at Warren
a 6:25A	6:44A	.....	6:00A	.....	6:20A
a 6:45	7:04	.....	6:20	.....	6:40
a 7:05	7:25	.....	.....	6:48A	7:00
a 7:25	7:45	.....	.....	a 7:05	7:23
a 7:45	8:05	.....	.....	7:28	7:42
a 8:05	8:25	.....	.....	7:48	8:02
a 8:25	8:43	.....	.....	8:08	8:22
a 8:45	9:03	.....	.....	8:28	8:42
a 9:05	9:23	.....	.....	8:48	9:02
a 9:45	10:02	.....	.....	a 9:25	9:43
			a 11:45	11:53	12:14P
a 12:15P	.....	12:37P	a 12:45P	12:53P	1:12P
a 1:15	.....	1:36	a 1:45	1:53	2:13
a 2:15	.....	2:38	a 2:45	2:54	3:15
3:15	3:28P	.....	.....	a 3:45	4:03
4:15	4:27	.....	.....	a 4:15	4:36
4:38	4:50	.....	.....	a 4:35	4:57
4:58	5:10	.....	.....	a 4:55	5:17
5:18	5:30	.....	.....	a 5:15	5:37
5:38	5:50	.....	.....	a 5:35	5:58
5:58	6:10	.....	.....	a 5:55	6:18
6:18	6:30	.....	.....	a 6:15	6:38
6:38	6:50	.....	.....	a 6:35	6:57
6:57	.....	7:14	.....	a 6:55	7:17
7:17	.....	7:34	.....	.....	.....

a - Via East Side Melrose

**No Route 131 service on Saturday or Sunday**

**Route 131  
Melrose Highlands-Malden Ctr. Station**

132 Weekday					
Inbound			Outbound		
Leave Redstone Shopping Center	Arrive Wyoming Square	Arrive Malden Station	Leave Malden Station	Arrive Wyoming Square	Arrive Redstone Shopping Center
6:00A	6:13A	6:25A	5:30A	5:35A	5:48A
6:30	6:43	6:55	6:00	6:05	6:18
6:55	7:12	7:25	6:52	6:57	7:12
7:15	7:33	7:46	7:30	7:36	7:55
7:35	7:53	8:06	8:30	8:36	8:52
8:00	8:18	8:31	9:30	9:36	9:52
8:30	8:45	8:56	10:30	10:36	10:52
9:00	9:14	9:25	11:30	11:36	11:52
10:00	10:13	10:24			
11:00	11:13	11:24			
			12:30P	12:36P	12:52P
12:00N	12:13P	12:24P	1:30	1:36	1:52
1:00	1:15	1:26	2:30	2:36	2:55
2:00	2:15	2:26	3:15	3:21	3:37
3:00	3:15	3:26	4:00	4:07	4:25
3:45	3:58	4:09	4:45	4:52	5:10
4:30	4:45	4:54	5:20	5:27	5:44
5:15	5:30	5:39	5:50	6:00	6:16
6:05	6:20	6:29	6:20	6:27	6:43
7:00	7:12	7:19	7:00	7:07	7:23

132 Saturday					
Inbound			Outbound		
Leave Redstone Shopping Center	Arrive Wyoming Square	Arrive Malden Station	Leave Malden Station	Arrive Wyoming Square	Arrive Redstone Shopping Center
8:00A	8:05A	8:20A	8:30A	8:36A	8:55A
9:00	9:05	9:20	9:30	9:36	9:56
10:00	10:13	10:27	10:30	10:36	10:56
11:00	11:13	11:27	11:30	11:36	11:56
12:00N	12:13P	12:27P	12:30P	12:36P	12:56P
1:00	1:13	1:27	1:30	1:36	1:56
2:00	2:13	2:30	2:30	2:36	2:56
3:00	3:13	3:30	3:30	3:36	3:53
4:00	4:13	4:30	4:30	4:36	4:53
5:00	5:13	5:28	5:30	5:36	5:53
6:00	6:13	6:26	7:00	7:06	7:22
7:30	7:43	7:49			

**Route 132  
Redstone Shopping Ctr.- Malden Ctr. Station**

**No route 132 service on Sunday**

**NOTE:** All Route 132 trips travel via Oak Grove Station (West Side)

 All buses are accessible to persons with disabilities



Fare	Local Bus	Bus + Bus	Rapid Transit	Bus + Rapid Transit
CharlieCard	\$1.50	\$1.50	\$2.00	\$2.00
CharlieTicket	\$2.00	\$2.00	\$2.50	\$4.50
Cash-on-Board	\$2.00	\$4.00	\$2.50	\$4.50
Student/CharlieCard	\$0.75	\$0.75	\$1.00	\$1.00
Senior/TAP CharlieCard**	\$0.75	\$0.75	\$1.00	\$1.00

VALID PASSES: LinkPass (\$70/mo.); Monthly Local Bus (\$48/mo.); \*StudentPass (\$25/mo. M-F only or \$28 mo. 7 days); \*\*Senior/TAP Pass(\$28/mo.); and express bus, commuter rail, and boat passes.  
 FREE FARES: Children under 12 ride free when accompanied by an adult; Blind Access CharlieCard holders ride free and if using a guide, the guide rides free.  
 \* Requires Student CharlieCard, available to students through participating middle schools and high schools.  
 \*\* Requires Senior/TAP CharlieCard, available to Medicare cardholders, seniors 65+, and persons with disabilities.

**Winter 2014 Holidays**

January 1: see Sunday—January 20, February 17: see Saturday

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

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**OTHER DEVELOPMENT DATA**

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**Institute of Transportation Engineers (ITE)**  
**Land Use Code (LUC) 254 - Assisted Living**

Average Vehicle Trips Ends vs: Occupied Beds  
Independent Variable (X): 88

**AVERAGE WEEKDAY DAILY**

$T = 2.74 * (X)$   
 $T = 2.74 * 88$   
 $T = 241.12$   
 $T = 242$  vehicle trips  
with 50% ( 121 vpd) entering and 50% ( 121 vpd) exiting.

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$T = 0.18 * (X)$   
 $T = 0.18 * 88$   
 $T = 15.84$   
 $T = 16$  vehicle trips  
with 68% ( 11 vph) entering and 32% ( 5 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$T = 0.29 * (X)$   
 $T = 0.29 * 88$   
 $T = 25.52$   
 $T = 26$  vehicle trips  
with 50% ( 13 vph) entering and 48% ( 13 vph) exiting.

**SATURDAY DAILY**

$T = 2.20 * (X)$   
 $T = 2.20 * 88$   
 $T = 193.60$   
 $T = 194$  vehicle trips  
with 50% ( 97 vpd) entering and 50% ( 97 vpd) exiting.

**SATURDAY MIDDAY PEAK HOUR OF GENERATOR**

$\ln T = 0.72 \ln (X) + 0.32$   
 $\ln T = 0.72 \ln 88 + (0.32)$   
 $\ln T = 3.54$   
 $T = 34.59$   
 $T = 35$   
with 51% ( 18 vph) entering and 49% ( 17 vph) exiting.

**SUNDAY DAILY**

$T = 2.44 * (X)$   
 $T = 2.44 * 88$   
 $T = 214.72$   
 $T = 214$  vehicle trips  
with 50% ( 107 vpd) entering and 50% ( 107 vpd) exiting.

**SUNDAY PEAK HOUR OF GENERATOR**

$T = 0.39 * (X) + 3.36$   
 $T = 0.39 * 88 + 3.36$   
 $T = 37.68$   
 $T = 38$  vehicle trips  
with 43% ( 16 vph) entering and 57% ( 22 vph) exiting.

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

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**TRIP-GENERATION CALCULATIONS**

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**Institute of Transportation Engineers (ITE)**  
**Land Use Code (LUC) 220 - Apartment**

Average Vehicle Trips Ends vs: Dwelling Units  
 Independent Variable (X): 250

**AVERAGE WEEKDAY DAILY**

$$T = 6.06 * (X) + 123.56$$

$$T = 6.06 * 250 + (123.56)$$

$$T = 1638.56$$

$$T = 1,638 \text{ vehicle trips}$$

with 50% ( 819 vpd) entering and 50% ( 819 vpd) exiting.

Handwritten calculation:

$$265 = \frac{1729.46}{+44.32} = 1773.28 \quad (1,5774)$$

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 0.49 * (X) + 3.73$$

$$T = 0.49 * 250 + (3.73)$$

$$T = 126.23$$

$$T = 126 \text{ vehicle trips}$$

with 20% ( 25 vph) entering and 80% ( 101 vph) exiting.

Handwritten calculation:

$$+11 + 1 = 138$$

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 0.55 * (X) + 17.65$$

$$T = 0.55 * 250 + (17.65)$$

$$T = 155.15$$

$$T = 155 \text{ vehicle trips}$$

with 65% ( 101 vph) entering and 35% ( 54 vph) exiting.

Handwritten calculation:

$$+11 + 24 = 190$$

***Institute of Transportation Engineers (ITE)***  
**Land Use Code (LUC) 224 - Rental Townhouse**

Average Vehicle Trips Ends vs: Dwelling Units  
Independent Variable (X): 15

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

T = 0.70 (X)  
T = 0.7 15  
T = 10.50  
T = 11 vehicle trips  
with 33% ( 4 vpd) entering and 67% ( 7 vpd) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

T = 0.72 (X)  
T = 0.72 15  
T = 10.80  
T = 11 vehicle trips  
with 51% ( 6 vph) entering and 49% ( 5 vph) exiting.

**Institute of Transportation Engineers (ITE)**  
**Land Use Code (LUC) 826 - Specialty Retail Center**

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Leasable Area  
Independent Variable (X): 1.000

**AVERAGE WEEKDAY DAILY**

$$T = 44.32 * (X)$$

$$T = 44.32 * 1.000$$

$$T = 44.32$$

T = 44 vehicle trips

with 50% ( 22 vpd) entering and 50% ( 22 vpd) exiting.

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$\frac{\text{ITE LUC 820 Weekday Morning Trip Rate}}{\text{ITE LUC 820 Weekday Evening Trip Rate}} = \frac{\text{ITE LUC 826 Weekday Morning Trip Rate}}{\text{ITE LUC 826 Weekday Evening Trip Rate}}$$

$$\frac{1.00}{3.73} = \frac{(Y)}{2.71} \quad Y = 0.72654155$$

$$T = Y * 1.000$$

$$T = 0.727$$

T = 1 vehicle trips

with 61% ( 0 vph) entering and 39% ( 1 vph) exiting.

*(same distribution split as ITE LUC 820 during the weekday morning peak hour of adjacent street traffic)*

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 2.40 * (X) + 21.48$$

$$T = 2.40 * 1.000 + (21.48)$$

$$T = 23.88$$

T = 24 vehicle trips

with 44% ( 11 vph) entering and 56% ( 13 vph) exiting.

***Institute of Transportation Engineers (ITE)***  
**Land Use Code (LUC) 220 - Apartment**

Average Vehicle Trips Ends vs: Dwelling Units  
Independent Variable (X): 265

**AVERAGE WEEKDAY DAILY**

$$T = 6.06 * (X) + 123.56$$

$$T = 6.06 * 265 + (123.56)$$

$$T = 1729.46$$

T = 1,730 vehicle trips

with 50% ( 865 vpd) entering and 50% ( 865 vpd) exiting.

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

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**CAPACITY ANALYSIS METHODOLOGY**

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## **TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

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### **CAPACITY ANALYSIS METHODOLOGY**

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM).<sup>8</sup> The concept of level of service (LOS) 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 LOS A representing the best operating conditions and LOS F 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. A description of the operating condition under each level of service is provided below:

- *LOS A* describes conditions with little to no delay to motorists.
- *LOS B* represents a desirable level with relatively low delay to motorists.
- *LOS C* describes conditions with average delays to motorists.
- *LOS D* describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- *LOS E* represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- *LOS F* is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

#### **Unsignalized Intersections**

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control

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<sup>8</sup> *Highway Capacity Manual 2000*, Transportation Research Board; Washington, D.C.; 2000.

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## TRAFFIC IMPACT AND ACCESS STUDY

Proposed Residential Development – Stoneham, Massachusetts

(STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

### Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on average *control* delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Table A-1 summarizes the relationship between level of service and average control delay.

**Table A-1**  
**LEVEL-OF-SERVICE CRITERIA FOR INTERSECTIONS**

Level of Service	Unsignalized Intersection Criteria	Signalized Intersection Criteria
	Average Control Delay (Seconds per Vehicle)	Average Control Delay (Seconds per Vehicle)
A	≤10	≤10
B	>10 and ≤15	>10 and ≤20
C	>15 and ≤25	>20 and ≤35
D	>25 and ≤35	>35 and ≤55
E	>35 and ≤50	>55 and ≤80
F	>50	>80

Source: *Highway Capacity Manual 2000*, Transportation Research Board; Washington, D.C.; 2000.  
Pages 10-16 and 17-2.

For signalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups or to individual intersection approaches.

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

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**CAPACITY AND QUEUE ANALYSIS WORKSHEETS**

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1: Perkins St & Franklin St  
 HCM Unsignalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday AM

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↖	↗
Volume (veh/h)	378	193	35	584	123	23
Sign Control	Free			Free	Stop	
Grade	0%			1%	0%	
Peak Hour Factor	0.92	0.92	0.81	0.81	0.78	0.78
Hourly flow rate (vph)	411	210	43	721	158	29
Pedestrians	1				1	
Lane Width (ft)	12.0				15.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			622		1325	517
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			622		1325	517
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		4	95
cM capacity (veh/h)			968		164	562
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	621	764	187			
Volume Left	0	43	158			
Volume Right	210	0	29			
cSH	1700	968	184			
Volume to Capacity	0.37	0.04	1.02			
Queue Length 95th (ft)	0	4	214			
Control Delay (s)	0.0	1.2	122.5			
Lane LOS		A	F			
Approach Delay (s)	0.0	1.2	122.5			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			15.1			
Intersection Capacity Utilization			74.3%		ICU Level of Service	D
Analysis Period (min)			15			

2: Franklin PI & Franklin St  
Queues

2013 Existing  
Timing Plan: Weekday AM

Lane Group	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	560	700	68	967	617	121
v/c Ratio	0.68	0.49	0.20	0.91	1.06	0.16
Control Delay	22.4	1.3	8.5	29.2	86.2	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	1.3	8.5	29.2	86.2	0.4
Queue Length 50th (ft)	225	0	14	401	~353	0
Queue Length 95th (ft)	246	0	26	436	248	0
Internal Link Dist (ft)	639			672		
Turn Bay Length (ft)		135	145			
Base Capacity (vph)	1128	1438	413	1521	582	764
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	0.49	0.16	0.64	1.06	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.

2: Franklin Pl & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↘	↑		↘	↑	↗			
Volume (vph)	0	409	511	54	764	0	290	0	57	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	13	12	13	12	12	12
Grade (%)		-1%			0%			0%			0%	
Total Lost time (s)		5.0	5.0	5.0	5.0		5.0		5.0			
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Frb, ped/bikes		1.00	1.00	1.00	1.00		1.00		0.97			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		1792	1569	1768	1881		1865		1593			
Flt Permitted		1.00	1.00	0.24	1.00		0.95		1.00			
Satd. Flow (perm)		1792	1569	440	1881		1865		1593			
Peak-hour factor, PHF	0.73	0.73	0.73	0.79	0.79	0.79	0.47	0.47	0.47	0.25	0.25	0.25
Adj. Flow (vph)	0	560	700	68	967	0	617	0	121	0	0	0
RTOR Reduction (vph)	0	0	124	0	0	0	0	0	84	0	0	0
Lane Group Flow (vph)	0	560	576	68	967	0	617	0	37	0	0	0
Confl. Peds. (#/hr)			4	16			16		4			
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	3%	0%	2%	1%	0%	0%	0%	2%	0%	0%	0%
Turn Type		NA	pt+ov	pm+pt	NA		Prot		Perm			
Protected Phases		2	2 3	1	6		3	8				
Permitted Phases				6					8			
Actuated Green, G (s)		37.7	68.3	47.4	47.4		25.6		25.6			
Effective Green, g (s)		37.7	68.3	47.4	47.4		25.6		25.6			
Actuated g/C Ratio		0.45	0.82	0.57	0.57		0.31		0.31			
Clearance Time (s)		5.0		5.0	5.0		5.0		5.0			
Vehicle Extension (s)		2.0		2.0	2.0		2.0		2.0			
Lane Grp Cap (vph)		813	1291	326	1074		575		491			
v/s Ratio Prot		0.31	0.37	0.01	c0.51		c0.33					
v/s Ratio Perm				0.11					0.02			
v/c Ratio		0.69	0.45	0.21	0.90		1.07		0.08			
Uniform Delay, d1		18.0	2.1	10.7	15.7		28.7		20.3			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		2.0	0.1	0.1	10.1		58.6		0.0			
Delay (s)		19.9	2.1	10.8	25.8		87.3		20.3			
Level of Service		B	A	B	C		F		C			
Approach Delay (s)		10.1			24.9			76.4			0.0	
Approach LOS		B			C			E			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			31.2				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			83.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			64.6%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

2: Franklin Pl & Franklin St  
Timing Report, Sorted By Phase

2013 Existing  
Timing Plan: Weekday AM

					
Phase Number	1	2	3	6	8
Movement	WBL	EBT	NBL	WBTL	NBT
Lead/Lag	Lead	Lag			
Lead-Lag Optimize					
Recall Mode	None	Min	None	Min	None
Maximum Split (s)	15	55	30	70	30
Maximum Split (%)	15.0%	55.0%	30.0%	70.0%	30.0%
Minimum Split (s)	10	10	10	10	10
Yellow Time (s)	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1
Minimum Initial (s)	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)					
Flash Dont Walk (s)					
Dual Entry	No	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	15	70	0	70
End Time (s)	15	70	0	70	0
Yield/Force Off (s)	10	65	95	65	95
Yield/Force Off 170(s)	10	65	95	65	95
Local Start Time (s)	85	0	55	85	55
Local Yield (s)	95	50	80	50	80
Local Yield 170(s)	95	50	80	50	80

Intersection Summary

Cycle Length	100
Control Type	Actuated-Uncoordinated
Natural Cycle	90

Splits and Phases: 2: Franklin Pl & Franklin St

 ϕ1	 ϕ2	 ϕ3
15 s	55 s	30 s
 ϕ6		 ϕ8
70 s		30 s

3: Res Complex/Dunkins & Franklin St  
 HCM Unsignalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	26	914	0	1	941	52	6	0	10	19	1	64
Sign Control		Free			Free			Stop			Stop	
Grade		-1%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.95	0.95	0.95	0.67	0.67	0.67	0.75	0.75	0.75
Hourly flow rate (vph)	36	1269	0	1	991	55	9	0	15	25	1	85
Pedestrians		12			12			3			12	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1025			719							
pX, platoon unblocked	0.62			0.85			0.69	0.69	0.85	0.69	0.69	0.62
vC, conflicting volume	1057			1272			2463	2404	1284	2401	2377	1042
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	781			1233			2411	2326	1247	2321	2286	756
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			2	100	92	0	95	65
cM capacity (veh/h)	504			486			9	24	180	15	25	245
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1306	1046	24	112								
Volume Left	36	1	9	25								
Volume Right	0	55	15	85								
cSH	504	486	23	55								
Volume to Capacity	0.07	0.00	1.06	2.04								
Queue Length 95th (ft)	6	0	77	274								
Control Delay (s)	3.8	0.1	455.4	643.8								
Lane LOS	A	A	F	F								
Approach Delay (s)	3.8	0.1	455.4	643.8								
Approach LOS			F	F								
Intersection Summary												
Average Delay			35.4									
Intersection Capacity Utilization			84.0%		ICU Level of Service				E			
Analysis Period (min)			15									

4: Franklin St & Pleasant St  
 HCM Unsignalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	529	653	315	174	11
Sign Control		Free	Free		Stop	
Grade		4%	0%		-4%	
Peak Hour Factor	0.88	0.88	0.90	0.90	0.89	0.89
Hourly flow rate (vph)	3	601	726	350	196	12
Pedestrians			1		1	
Lane Width (ft)			13.0		14.0	
Walking Speed (ft/s)			4.0		4.0	
Percent Blockage			0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		482	1262			
pX, platoon unblocked	0.72				0.81	0.72
vC, conflicting volume	1077				1511	902
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	908				1009	664
tC, single (s)	4.8				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.8				3.5	3.3
p0 queue free %	99				8	96
cM capacity (veh/h)	384				212	332
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	3	601	1076	208		
Volume Left	3	0	0	196		
Volume Right	0	0	350	12		
cSH	384	1700	1700	216		
Volume to Capacity	0.01	0.35	0.63	0.96		
Queue Length 95th (ft)	1	0	0	208		
Control Delay (s)	14.4	0.0	0.0	98.1		
Lane LOS	B			F		
Approach Delay (s)	0.1		0.0	98.1		
Approach LOS				F		
<b>Intersection Summary</b>						
Average Delay			10.8			
Intersection Capacity Utilization			70.6%	ICU Level of Service		C
Analysis Period (min)			15			

5: Summer St & Franklin St  
Queues

2013 Existing  
Timing Plan: Weekday AM

						
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	22	392	171	592	280	459
v/c Ratio	0.07	0.74	0.41	0.73	0.40	0.76
Control Delay	10.6	30.4	13.0	24.6	10.6	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	30.4	13.0	24.6	10.6	28.3
Queue Length 50th (ft)	4	129	32	152	36	146
Queue Length 95th (ft)	15	229	90	#499	102	298
Internal Link Dist (ft)		984		402	380	774
Turn Bay Length (ft)	70		100			
Base Capacity (vph)	430	888	455	940	1155	1097
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	0.05	0.44	0.38	0.63	0.24	0.42

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

5: Summer St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	294	8	154	531	2	12	68	166	29	329	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	11	11	14	14	14	12	12	12
Grade (%)		3%			-6%			-2%			3%	
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.91			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1718	1760		1718	1836			1815			1825	
Flt Permitted	0.29	1.00		0.31	1.00			0.97			0.96	
Satd. Flow (perm)	533	1760		554	1836			1772			1758	
Peak-hour factor, PHF	0.77	0.77	0.77	0.90	0.90	0.90	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	22	382	10	171	590	2	14	77	189	33	370	56
RTOR Reduction (vph)	0	1	0	0	0	0	0	94	0	0	6	0
Lane Group Flow (vph)	22	391	0	171	592	0	0	186	0	0	453	0
Confl. Peds. (#/hr)	1		2	2		1	2		2	1		1
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	0%	6%	0%	1%	3%	0%	0%	0%	1%	0%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	24.2	22.4		34.2	28.4			21.8			21.8	
Effective Green, g (s)	24.2	22.4		34.2	28.4			21.8			21.8	
Actuated g/C Ratio	0.37	0.34		0.52	0.43			0.33			0.33	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	227	597		424	790			585			580	
v/s Ratio Prot	0.00	0.22		c0.05	c0.32							
v/s Ratio Perm	0.03			0.16				0.10			c0.26	
v/c Ratio	0.10	0.65		0.40	0.75			0.32			0.78	
Uniform Delay, d1	13.8	18.5		9.7	15.8			16.5			19.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	2.0		0.2	3.4			0.1			6.2	
Delay (s)	13.9	20.5		9.9	19.2			16.6			26.2	
Level of Service	B	C		A	B			B			C	
Approach Delay (s)		20.1			17.1			16.6			26.2	
Approach LOS		C			B			B			C	

Intersection Summary

HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

5: Summer St & Franklin St  
Timing Report, Sorted By Phase

2013 Existing  
Timing Plan: Weekday AM

						
Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	None	None	None	None	None
Maximum Split (s)	13	35	42	13	35	42
Maximum Split (%)	14.4%	38.9%	46.7%	14.4%	38.9%	46.7%
Minimum Split (s)	9	10	10	9	10	10
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	0	1	1	0	1	1
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	13	48	0	13	48
End Time (s)	13	48	0	13	48	0
Yield/Force Off (s)	9	43	85	9	43	85
Yield/Force Off 170(s)	9	43	85	9	43	85
Local Start Time (s)	77	0	35	77	0	35
Local Yield (s)	86	30	72	86	30	72
Local Yield 170(s)	86	30	72	86	30	72

Intersection Summary

Cycle Length	90
Control Type	Actuated-Uncoordinated
Natural Cycle	60

Splits and Phases: 5: Summer St & Franklin St

 φ1	 φ2	 φ4
13 s	35 s	42 s
 φ5	 φ6	 φ8
13 s	35 s	42 s

6: Pine St & Franklin St  
Queues

2013 Existing  
Timing Plan: Weekday AM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	236	751	108	514
v/c Ratio	0.31	0.84	0.14	0.79
Control Delay	11.8	24.5	14.5	31.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.8	24.5	14.5	31.1
Queue Length 50th (ft)	55	234	22	162
Queue Length 95th (ft)	76	358	51	#445
Internal Link Dist (ft)	727	984	947	646
Turn Bay Length (ft)				
Base Capacity (vph)	1318	1536	753	647
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.18	0.49	0.14	0.79

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

6: Pine St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Volume (vph)	5	171	3	36	499	141	7	54	15	208	180	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	15	15	15	15	15	15	15	15	15
Grade (%)		2%			-3%			5%			1%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.99			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.97			0.97			0.98	
Flt Protected		1.00			1.00			1.00			0.98	
Satd. Flow (prot)		1728			2014			1963			1967	
Flt Permitted		0.98			0.97			0.95			0.80	
Satd. Flow (perm)		1694			1966			1875			1617	
Peak-hour factor, PHF	0.76	0.76	0.76	0.90	0.90	0.90	0.70	0.70	0.70	0.90	0.90	0.90
Adj. Flow (vph)	7	225	4	40	554	157	10	77	21	231	200	83
RTOR Reduction (vph)	0	1	0	0	15	0	0	9	0	0	7	0
Lane Group Flow (vph)	0	235	0	0	736	0	0	99	0	0	507	0
Confl. Peds. (#/hr)	5		6	8		7	6		8	7		5
Heavy Vehicles (%)	20%	12%	0%	0%	2%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		28.5			28.5			25.5			25.5	
Effective Green, g (s)		28.5			28.5			25.5			25.5	
Actuated g/C Ratio		0.45			0.45			0.40			0.40	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		754			875			747			644	
v/s Ratio Prot												
v/s Ratio Perm		0.14			0.37			0.05			0.31	
v/c Ratio		0.31			0.84			0.13			0.79	
Uniform Delay, d1		11.4			15.7			12.2			16.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			7.1			0.0			5.8	
Delay (s)		11.5			22.8			12.3			22.7	
Level of Service		B			C			B			C	
Approach Delay (s)		11.5			22.8			12.3			22.7	
Approach LOS		B			C			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			20.4			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			64.0			Sum of lost time (s)		10.0				
Intersection Capacity Utilization			91.3%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

6: Pine St & Franklin St  
Timing Report, Sorted By Phase

2013 Existing  
Timing Plan: Weekday AM



Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	54	30	54	30
Maximum Split (%)	64.3%	35.7%	64.3%	35.7%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	54	0	54
End Time (s)	54	0	54	0
Yield/Force Off (s)	49	79	49	79
Yield/Force Off 170(s)	49	79	49	79
Local Start Time (s)	0	54	0	54
Local Yield (s)	49	79	49	79
Local Yield 170(s)	49	79	49	79

Intersection Summary

Cycle Length	84
Control Type	Actuated-Uncoordinated
Natural Cycle	60

Splits and Phases: 6: Pine St & Franklin St

φ2	φ4
54 s	30 s
φ6	φ8
54 s	30 s

7: Main St & Franklin St & Central St  
Queues

2013 Existing  
Timing Plan: Weekday AM

	↙	↑	↗	↓
Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	588	386	260	749
v/c Ratio	0.90	0.42	0.33	0.92
Control Delay	41.8	16.1	12.2	40.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.8	16.1	12.2	40.2
Queue Length 50th (ft)	276	123	60	351
Queue Length 95th (ft)	409	187	106	#662
Internal Link Dist (ft)	727	1542		692
Turn Bay Length (ft)			50	
Base Capacity (vph)	818	918	778	812
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.72	0.42	0.33	0.92

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

7: Main St & Franklin St & Central St  
 HCM Signalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday AM

											
Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL	SWR
Lane Configurations											
Volume (vph)	317	200	6	309	120	88	2	94	579	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	13	12	12	14	14	14	12	12
Grade (%)	4%			3%					1%	0%	
Total Lost time (s)	5.0			5.0	5.0				5.0		
Lane Util. Factor	1.00			1.00	1.00				1.00		
Frbp, ped/bikes	0.99			1.00	0.97				1.00		
Flpb, ped/bikes	1.00			1.00	1.00				1.00		
Fr	0.95			1.00	0.85				1.00		
Flt Protected	0.97			1.00	1.00				0.99		
Satd. Flow (prot)	1752			1824	1493				1899		
Flt Permitted	0.97			1.00	1.00				0.84		
Satd. Flow (perm)	1752			1824	1493				1614		
Peak-hour factor, PHF	0.89	0.89	0.89	0.80	0.80	0.80	0.90	0.90	0.90	0.25	0.25
Adj. Flow (vph)	356	225	7	386	150	110	2	104	643	0	0
RTOR Reduction (vph)	0	0	0	0	27	0	0	0	0	0	0
Lane Group Flow (vph)	588	0	0	386	233	0	0	0	749	0	0
Confl. Peds. (#/hr)	3	7	4		3	3	7	7			
Heavy Vehicles (%)	2%	4%	0%	6%	0%	9%	0%	20%	3%	0%	0%
Turn Type	Prot			NA	Perm		Perm	Perm	NA		
Protected Phases	6			4					8		
Permitted Phases	6			4	4		8	8			
Actuated Green, G (s)	30.7			41.3	41.3				41.3		
Effective Green, g (s)	30.7			41.3	41.3				41.3		
Actuated g/C Ratio	0.37			0.50	0.50				0.50		
Clearance Time (s)	5.0			5.0	5.0				5.0		
Vehicle Extension (s)	2.0			2.0	2.0				2.0		
Lane Grp Cap (vph)	655			918	751				812		
v/s Ratio Prot	c0.34			0.21							
v/s Ratio Perm					0.16				c0.46		
v/c Ratio	0.90			0.42	0.31				0.92		
Uniform Delay, d1	24.2			12.8	12.0				18.9		
Progression Factor	1.00			1.00	1.00				1.00		
Incremental Delay, d2	14.7			0.1	0.1				15.6		
Delay (s)	38.8			12.9	12.1				34.5		
Level of Service	D			B	B				C		
Approach Delay (s)	38.8			12.6					34.5	0.0	
Approach LOS	D			B					C	A	

Intersection Summary

HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	82.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	95.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

7: Main St & Franklin St & Central St  
Timing Report, Sorted By Phase

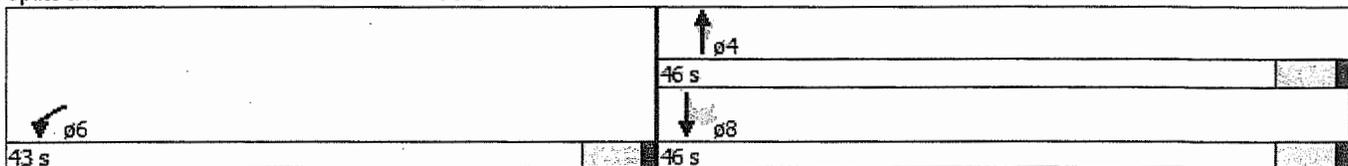
2013 Existing  
Timing Plan: Weekday AM

	↑	↙	↓
Phase Number	4	6	8
Movement	NBT	WBL	SBTL
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	None	None	None
Maximum Split (s)	46	43	46
Maximum Split (%)	51.7%	48.3%	51.7%
Minimum Split (s)	10	10	10
Yellow Time (s)	4	4	4
All-Red Time (s)	1	1	1
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	2	2	2
Minimum Gap (s)	2	2	2
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			
Flash Dont Walk (s)			
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	43	0	43
End Time (s)	0	43	0
Yield/Force Off (s)	84	38	84
Yield/Force Off 170(s)	84	38	84
Local Start Time (s)	43	0	43
Local Yield (s)	84	38	84
Local Yield 170(s)	84	38	84

Intersection Summary

Cycle Length	89
Control Type	Actuated-Uncoordinated
Natural Cycle	75

Splits and Phases: 7: Main St & Franklin St & Central St



8: Main St & Marble St/Summer St  
Queues

2013 Existing  
Timing Plan: Weekday AM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	333	322	589	971
v/c Ratio	0.80	0.81	0.68	0.81
Control Delay	47.1	51.0	25.8	28.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	47.1	51.0	25.8	28.7
Queue Length 50th (ft)	162	169	141	249
Queue Length 95th (ft)	#333	#358	194	317
Internal Link Dist (ft)	821	965	1441	57
Turn Bay Length (ft)				
Base Capacity (vph)	498	447	1242	1727
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.67	0.72	0.47	0.56

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

8: Main St & Marble St/Summer St  
 HCM Signalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday AM

Movement												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	132	107	85	199	13	62	381	76	32	697	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	12	12	12	12	12	12	11	12	13
Grade (%)		1%			2%			0%			1%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frbp, ped/bikes		0.99			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.95			0.99			0.98			0.98	
Flt Protected		0.99			0.99			0.99			1.00	
Satd. Flow (prot)		1939			1805			3414			3387	
Flt Permitted		0.99			0.99			0.65			0.91	
Satd. Flow (perm)		1939			1805			2224			3095	
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	76	142	115	92	216	14	70	433	86	36	792	143
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	314	0	0	322	0	0	589	0	0	971	0
Confl. Peds. (#/hr)	25		21	29		33	21		29	33		25
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	10%	0%	1%	2%	2%	0%	0%	2%	3%	0%	2%	7%
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)		17.0			18.4			32.5			32.5	
Effective Green, g (s)		17.0			18.4			32.5			32.5	
Actuated g/C Ratio		0.21			0.22			0.39			0.39	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		397			400			871			1213	
v/s Ratio Prot		c0.16			c0.18							
v/s Ratio Perm								0.26			c0.31	
v/c Ratio		0.79			0.81			0.68			0.80	
Uniform Delay, d1		31.3			30.6			20.8			22.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		9.6			10.6			1.6			3.7	
Delay (s)		40.9			41.2			22.5			26.0	
Level of Service		D			D			C			C	
Approach Delay (s)		40.9			41.2			22.5			26.0	
Approach LOS		D			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			29.5			HCM 2000 Level of Service					C	
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			82.9			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			75.6%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

8: Main St & Marble St/Summer St  
Timing Report, Sorted By Phase

2013 Existing  
Timing Plan: Weekday AM



Phase Number	2	4	6	8
Movement	NBTL	WBTL	SBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	50	25	50	25
Maximum Split (%)	50.0%	25.0%	50.0%	25.0%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	50	0	75
End Time (s)	50	75	50	0
Yield/Force Off (s)	45	70	45	95
Yield/Force Off 170(s)	45	70	45	95
Local Start Time (s)	0	50	0	75
Local Yield (s)	45	70	45	95
Local Yield 170(s)	45	70	45	95

Intersection Summary

Cycle Length	100
Control Type	Actuated-Uncoordinated
Natural Cycle	65

Splits and Phases: 8: Main St & Marble St/Summer St

φ2	φ4	φ8
50 s	25 s	25 s
φ6		
50 s		

9: Pond St & Summer St  
Queues

2013 Existing  
Timing Plan: Weekday AM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	306	554	420	156
v/c Ratio	0.37	0.81	0.77	0.24
Control Delay	12.7	26.4	27.6	14.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.7	26.4	27.6	14.5
Queue Length 50th (ft)	63	151	136	40
Queue Length 95th (ft)	132	#398	179	73
Internal Link Dist (ft)	965	569	871	731
Turn Bay Length (ft)				
Base Capacity (vph)	982	808	852	1023
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.31	0.69	0.49	0.15

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

9: Pond St & Summer St  
 HCM Signalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	145	103	235	285	12	106	170	47	1	129	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	15	15	15	12	12	12	12	12	12
Grade (%)		-2%			1%			-1%			0%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frb, ped/bikes		0.99			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			0.99			1.00			1.00	
Frt		0.95			1.00			0.98			0.99	
Flt Protected		1.00			0.98			0.98			1.00	
Satd. Flow (prot)		1810			1992			1798			1867	
Flt Permitted		0.99			0.72			0.85			1.00	
Satd. Flow (perm)		1790			1474			1552			1863	
Peak-hour factor, PHF	0.83	0.83	0.83	0.96	0.96	0.96	0.77	0.77	0.77	0.87	0.87	0.87
Adj. Flow (vph)	7	175	124	245	297	12	138	221	61	1	148	7
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	306	0	0	554	0	0	420	0	0	156	0
Confl. Peds. (#/hr)	12		11	18		19	11		18	19		12
Heavy Vehicles (%)	0%	3%	1%	0%	2%	8%	1%	2%	0%	0%	1%	0%
Turn Type	Perm	NA										
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		26.7			26.7			20.0			20.0	
Effective Green, g (s)		26.7			26.7			20.0			20.0	
Actuated g/C Ratio		0.47			0.47			0.35			0.35	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		842			694			547			657	
v/s Ratio Prot												
v/s Ratio Perm		0.17			0.38			0.27			0.08	
v/c Ratio		0.36			0.80			0.77			0.24	
Uniform Delay, d1		9.6			12.7			16.3			13.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			6.0			5.8			0.1	
Delay (s)		9.7			18.7			22.1			13.0	
Level of Service		A			B			C			B	
Approach Delay (s)		9.7			18.7			22.1			13.0	
Approach LOS		A			B			C			B	

Intersection Summary

HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

9: Pond St & Summer St  
Timing Report, Sorted By Phase

2013 Existing  
Timing Plan: Weekday AM



Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	35	35	35	35
Maximum Split (%)	50.0%	50.0%	50.0%	50.0%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	35	0	35
End Time (s)	35	0	35	0
Yield/Force Off (s)	30	65	30	65
Yield/Force Off 170(s)	30	65	30	65
Local Start Time (s)	0	35	0	35
Local Yield (s)	30	65	30	65
Local Yield 170(s)	30	65	30	65

Intersection Summary

Cycle Length	70
Control Type	Actuated-Uncoordinated
Natural Cycle	55

Splits and Phases: 9: Pond St & Summer St

35 s	35 s
35 s	35 s

10: Franklin St & Site Driveway  
 HCM Unsignalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	4	462	815	5	2	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	513	906	6	2	3
Pedestrians		1	1		1	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		752				
pX, platoon unblocked					0.81	
vC, conflicting volume	912				1433	910
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	912				1417	910
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	99
cM capacity (veh/h)	746				121	332
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	518	911	2	3		
Volume Left	4	0	2	0		
Volume Right	0	6	0	3		
cSH	746	1700	121	332		
Volume to Capacity	0.01	0.54	0.02	0.01		
Queue Length 95th (ft)	0	0	1	1		
Control Delay (s)	0.2	0.0	35.2	16.0		
Lane LOS	A		E	C		
Approach Delay (s)	0.2	0.0	23.7			
Approach LOS			C			
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			53.5%		ICU Level of Service	A
Analysis Period (min)			15			

1: Perkins St & Franklin St  
 HCM Unsignalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday PM

Movement	→	↘	↙	←	↖	↗
	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Volume (veh/h)	735	191	13	434	191	22
Sign Control	Free			Free	Stop	
Grade	0%			1%	0%	
Peak Hour Factor	0.94	0.94	0.96	0.96	0.86	0.86
Hourly flow rate (vph)	782	203	14	452	222	26
Pedestrians	4			1	4	
Lane Width (ft)	12.0			14.0	15.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			989		1371	889
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			989		1371	889
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		0	93
cM capacity (veh/h)			704		157	343
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	985	466	248			
Volume Left	0	14	222			
Volume Right	203	0	26			
cSH	1700	704	166			
Volume to Capacity	0.58	0.02	1.49			
Queue Length 95th (ft)	0	1	400			
Control Delay (s)	0.0	0.6	300.3			
Lane LOS		A	F			
Approach Delay (s)	0.0	0.6	300.3			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			43.9			
Intersection Capacity Utilization			69.0%	ICU Level of Service		C
Analysis Period (min)			15			

2: Franklin PI & Franklin St  
Queues

2013 Existing  
Timing Plan: Weekday PM

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1107	48	8	827	166	31
v/c Ratio	0.85	0.03	0.04	0.61	0.62	0.07
Control Delay	19.4	0.3	4.1	8.2	41.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	0.3	4.1	8.2	41.4	0.3
Queue Length 50th (ft)	285	0	1	154	71	0
Queue Length 95th (ft)	#897	4	5	314	106	0
Internal Link Dist (ft)	614			643		
Turn Bay Length (ft)		135	145			
Base Capacity (vph)	1298	1546	317	1556	593	679
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	0.85	0.03	0.03	0.53	0.28	0.05

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

2: Franklin PI & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday PM

Movement												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑		↖	↑	↗			
Volume (vph)	0	1063	46	7	736	0	116	0	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	13	12	13	12	12	12
Grade (%)		-1%			0%			0%			0%	
Total Lost time (s)		5.0	5.0	5.0	5.0		5.0		5.0			
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Frb, ped/bikes		1.00	1.00	1.00	1.00		1.00		0.98			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		1846	1569	1805	1863		1847		1630			
Flt Permitted		1.00	1.00	0.08	1.00		0.95		1.00			
Satd. Flow (perm)		1846	1569	143	1863		1847		1630			
Peak-hour factor, PHF	0.96	0.96	0.96	0.89	0.89	0.89	0.70	0.70	0.70	0.25	0.25	0.25
Adj. Flow (vph)	0	1107	48	8	827	0	166	0	31	0	0	0
RTOR Reduction (vph)	0	0	6	0	0	0	0	0	27	0	0	0
Lane Group Flow (vph)	0	1107	42	8	827	0	166	0	4	0	0	0
Confl. Peds. (#/hr)			1	17			17		1			
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Turn Type		NA	pt+ov	pm+pt	NA		Prot		Perm			
Protected Phases		2	2 3	1	6		3	8				
Permitted Phases				6					8			
Actuated Green, G (s)		55.0	71.3	60.9	60.9		11.3		11.3			
Effective Green, g (s)		55.0	71.3	60.9	60.9		11.3		11.3			
Actuated g/C Ratio		0.67	0.87	0.74	0.74		0.14		0.14			
Clearance Time (s)		5.0		5.0	5.0		5.0		5.0			
Vehicle Extension (s)		2.0		2.0	2.0		2.0		2.0			
Lane Grp Cap (vph)		1235	1360	124	1380		253		224			
v/s Ratio Prot		c0.60	0.03	0.00	c0.44		c0.09					
v/s Ratio Perm				0.05					0.00			
v/c Ratio		0.90	0.03	0.06	0.60		0.66		0.02			
Uniform Delay, d1		11.2	0.7	14.4	5.0		33.6		30.7			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		8.5	0.0	0.1	0.5		4.6		0.0			
Delay (s)		19.8	0.7	14.5	5.4		38.2		30.7			
Level of Service		B	A	B	A		D		C			
Approach Delay (s)		19.0			5.5			37.0			0.0	
Approach LOS		B			A			D			A	
Intersection Summary												
HCM 2000 Control Delay			15.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			82.2			Sum of lost time (s)				15.0		
Intersection Capacity Utilization			70.7%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

2: Franklin PI & Franklin St  
Timing Report, Sorted By Phase

2013 Existing  
Timing Plan: Weekday PM

					
Phase Number	1	2	3	6	8
Movement	WBL	EBT	NBL	WBTL	NBT
Lead/Lag	Lead	Lag			
Lead-Lag Optimize					
Recall Mode	None	Min	None	Min	None
Maximum Split (s)	15	55	30	70	30
Maximum Split (%)	15.0%	55.0%	30.0%	70.0%	30.0%
Minimum Split (s)	10	10	10	10	10
Yellow Time (s)	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1
Minimum Initial (s)	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)					
Flash Dont Walk (s)					
Dual Entry	No	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	15	70	0	70
End Time (s)	15	70	0	70	0
Yield/Force Off (s)	10	65	95	65	95
Yield/Force Off 170(s)	10	65	95	65	95
Local Start Time (s)	85	0	55	85	55
Local Yield (s)	95	50	80	50	80
Local Yield 170(s)	95	50	80	50	80

Intersection Summary

Cycle Length	100
Control Type	Actuated-Uncoordinated
Natural Cycle	80

Splits and Phases: 2: Franklin PI & Franklin St

 ϕ1	 ϕ2	 ϕ3
15 s	55 s	30 s
 ϕ6		 ϕ8
70 s		30 s

3: Res Complex/Dunkins & Franklin St  
 HCM Unsignalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday PM

Movement												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	22	1095	10	4	826	12	6	0	3	9	1	22
Sign Control		Free			Free			Stop			Stop	
Grade		-1%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.75	0.75	0.75	0.57	0.57	0.57
Hourly flow rate (vph)	24	1177	11	4	888	13	8	0	4	16	2	39
Pedestrians		9			9			8			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1051			694							
pX, platoon unblocked	0.77			0.77			0.88	0.88	0.77	0.88	0.88	0.77
vC, conflicting volume	910			1196			2190	2157	1200	2155	2156	913
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	733			1103			1694	1656	1108	1655	1655	736
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			85	100	98	75	98	88
cM capacity (veh/h)	673			487			53	82	195	64	82	315
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1212	905	12	56								
Volume Left	24	4	8	16								
Volume Right	11	13	4	39								
cSH	673	487	70	144								
Volume to Capacity	0.04	0.01	0.17	0.39								
Queue Length 95th (ft)	3	1	14	42								
Control Delay (s)	1.4	0.3	66.4	45.0								
Lane LOS	A	A	F	E								
Approach Delay (s)	1.4	0.3	66.4	45.0								
Approach LOS			F	E								
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			86.3%		ICU Level of Service				E			
Analysis Period (min)			15									

4: Franklin St & Pleasant St  
 HCM Unsignalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday PM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	811	408	303	265	7
Sign Control		Free	Free		Stop	
Grade		4%	0%		-4%	
Peak Hour Factor	0.94	0.94	0.88	0.88	0.87	0.87
Hourly flow rate (vph)	5	863	464	344	305	8
Pedestrians		4	4		4	
Lane Width (ft)		10.5	13.0		14.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		482	1263			
pX, platoon unblocked	0.87				0.82	0.87
vC, conflicting volume	812				1517	644
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	705				1153	511
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				0	98
cM capacity (veh/h)	778				178	488
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	5	863	808	313		
Volume Left	5	0	0	305		
Volume Right	0	0	344	8		
cSH	778	1700	1700	181		
Volume to Capacity	0.01	0.51	0.48	1.73		
Queue Length 95th (ft)	1	0	0	547		
Control Delay (s)	9.7	0.0	0.0	395.7		
Lane LOS	A			F		
Approach Delay (s)	0.1		0.0	395.7		
Approach LOS				F		
<b>Intersection Summary</b>						
Average Delay			62.2			
Intersection Capacity Utilization			64.5%		ICU Level of Service	C
Analysis Period (min)			15			

5: Summer St & Franklin St  
Queues

2013 Existing  
Timing Plan: Weekday PM

						
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	65	489	144	390	667	244
v/c Ratio	0.18	0.79	0.49	0.62	0.84	0.42
Control Delay	13.0	34.1	18.5	26.9	29.9	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	34.1	18.5	26.9	29.9	18.3
Queue Length 50th (ft)	16	213	38	156	253	73
Queue Length 95th (ft)	40	358	75	260	#504	147
Internal Link Dist (ft)		984		402	380	774
Turn Bay Length (ft)	70		100			
Base Capacity (vph)	388	925	306	917	1082	800
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	0.17	0.53	0.47	0.43	0.62	0.30

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

5: Summer St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	→	↘	↙	→	↘	↙	↘	↙	↘	↙	↘
Volume (vph)	64	473	11	125	332	7	6	278	316	41	113	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	11	11	14	14	14	12	12	12
Grade (%)		3%			-6%			-2%			3%	
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frft	1.00	1.00		1.00	1.00			0.93			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1718	1846		1701	1831			1876			1770	
Flt Permitted	0.36	1.00		0.22	1.00			1.00			0.79	
Satd. Flow (perm)	654	1846		393	1831			1871			1407	
Peak-hour factor, PHF	0.99	0.99	0.99	0.87	0.87	0.87	0.90	0.90	0.90	0.88	0.88	0.88
Adj. Flow (vph)	65	478	11	144	382	8	7	309	351	47	128	69
RTOR Reduction (vph)	0	1	0	0	1	0	0	44	0	0	16	0
Lane Group Flow (vph)	65	488	0	144	389	0	0	623	0	0	228	0
Confl. Peds. (#/hr)	3		3	4		4	3		4	4		3
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	1%	0%	2%	3%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	28.8	24.2		29.8	24.7			29.2			29.2	
Effective Green, g (s)	28.8	24.2		29.8	24.7			29.2			29.2	
Actuated g/C Ratio	0.40	0.33		0.41	0.34			0.40			0.40	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	327	616		253	623			753			566	
v/s Ratio Prot	0.01	c0.26		c0.04	0.21							
v/s Ratio Perm	0.07			0.19				c0.33			0.16	
v/c Ratio	0.20	0.79		0.57	0.62			0.83			0.40	
Uniform Delay, d1	14.1	21.9		15.2	20.0			19.4			15.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	6.5		1.8	1.4			7.1			0.2	
Delay (s)	14.2	28.4		17.0	21.4			26.5			15.6	
Level of Service	B	C		B	C			C			B	
Approach Delay (s)		26.7			20.2			26.5			15.6	
Approach LOS		C			C			C			B	

Intersection Summary

HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	72.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

5: Summer St & Franklin St  
Timing Report, Sorted By Phase

2013 Existing  
Timing Plan: Weekday PM

						
Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	None	None	None	None	None
Maximum Split (s)	11	38	42	11	38	42
Maximum Split (%)	12.1%	41.8%	46.2%	12.1%	41.8%	46.2%
Minimum Split (s)	9	10	10	9	10	10
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	0	1	1	0	1	1
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	11	49	0	11	49
End Time (s)	11	49	0	11	49	0
Yield/Force Off (s)	7	44	86	7	44	86
Yield/Force Off 170(s)	7	44	86	7	44	86
Local Start Time (s)	80	0	38	80	0	38
Local Yield (s)	87	33	75	87	33	75
Local Yield 170(s)	87	33	75	87	33	75

Intersection Summary

Cycle Length	91
Control Type	Actuated-Uncoordinated
Natural Cycle	60

Splits and Phases: 5: Summer St & Franklin St

 p1	 p2	 p4
11 s	38 s	42 s
 p5	 p6	 p8
11 s	38 s	42 s

6: Pine St & Franklin St  
Queues

2013 Existing  
Timing Plan: Weekday PM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	347	547	164	299
v/c Ratio	0.46	0.67	0.26	0.62
Control Delay	11.4	13.5	10.9	18.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.4	13.5	10.9	18.6
Queue Length 50th (ft)	48	73	20	49
Queue Length 95th (ft)	128	191	68	142
Internal Link Dist (ft)	727	984	947	646
Turn Bay Length (ft)				
Base Capacity (vph)	1768	1841	1271	984
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.20	0.30	0.13	0.30

Intersection Summary

6: Pine St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	15	278	9	20	268	182	7	99	44	164	61	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	15	15	15	15	15	15	15	15	15
Grade (%)		2%			-3%			5%			1%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.99			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.95			0.96			0.98	
Flt Protected		1.00			1.00			1.00			0.97	
Satd. Flow (prot)		1911			1962			1929			1955	
Flt Permitted		0.96			0.98			0.98			0.73	
Satd. Flow (perm)		1846			1919			1890			1467	
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	17	320	10	23	312	212	8	108	48	184	69	46
RTOR Reduction (vph)	0	2	0	0	38	0	0	17	0	0	7	0
Lane Group Flow (vph)	0	345	0	0	509	0	0	147	0	0	292	0
Confl. Peds. (#/hr)	10		18	13		5	18		13	5		10
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		16.6			16.6			13.2			13.2	
Effective Green, g (s)		16.6			16.6			13.2			13.2	
Actuated g/C Ratio		0.42			0.42			0.33			0.33	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		769			800			626			486	
v/s Ratio Prot												
v/s Ratio Perm		0.19			0.27			0.08			0.20	
v/c Ratio		0.45			0.64			0.23			0.60	
Uniform Delay, d1		8.3			9.2			9.6			11.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			1.2			0.1			1.4	
Delay (s)		8.5			10.4			9.7			12.5	
Level of Service		A			B			A			B	
Approach Delay (s)		8.5			10.4			9.7			12.5	
Approach LOS		A			B			A			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			10.3									B
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			39.8						10.0			
Intersection Capacity Utilization			68.6%									C
Analysis Period (min)			15									
c Critical Lane Group												

6: Pine St & Franklin St  
Timing Report, Sorted By Phase

2013 Existing  
Timing Plan: Weekday PM

	→	↓	←	↑
Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	52	30	52	30
Maximum Split (%)	63.4%	36.6%	63.4%	36.6%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	52	0	52
End Time (s)	52	0	52	0
Yield/Force Off (s)	47	77	47	77
Yield/Force Off 170(s)	47	77	47	77
Local Start Time (s)	0	52	0	52
Local Yield (s)	47	77	47	77
Local Yield 170(s)	47	77	47	77

Intersection Summary

Cycle Length	82
Control Type	Actuated-Uncoordinated
Natural Cycle	45

Splits and Phases: 6: Pine St & Franklin St

→ ρ2	↓ ρ4
52 s	30 s
← ρ6	↑ ρ8
52 s	30 s

7: Main St & Franklin St & Central St  
Queues

2013 Existing  
Timing Plan: Weekday PM

	↙	↑	↗	↓
Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	293	405	313	487
v/c Ratio	0.65	0.40	0.39	0.69
Control Delay	27.6	9.9	7.5	16.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.6	9.9	7.5	16.9
Queue Length 50th (ft)	88	76	39	113
Queue Length 95th (ft)	199	164	105	268
Internal Link Dist (ft)	727	1542		692
Turn Bay Length (ft)			50	
Base Capacity (vph)	1044	1499	1148	1033
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.27	0.27	0.47

Intersection Summary

7: Main St & Franklin St & Central St  
 HCM Signalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday PM

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL	SWR
Lane Configurations	Y			↑	↑				↑		
Volume (vph)	98	162	18	385	140	158	21	145	292	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	13	12	12	14	14	14	12	12
Grade (%)	4%			3%					1%	0%	
Total Lost time (s)	5.0			5.0	5.0				5.0		
Lane Util. Factor	1.00			1.00	1.00				1.00		
Frbp, ped/bikes	0.91			1.00	0.92				1.00		
Flpb, ped/bikes	1.00			1.00	1.00				0.99		
Frt	0.91			1.00	0.85				1.00		
Flt Protected	0.98			1.00	1.00				0.98		
Satd. Flow (prot)	1554			1934	1462				1914		
Flt Permitted	0.98			1.00	1.00				0.68		
Satd. Flow (perm)	1554			1934	1462				1334		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.94	0.94	0.94	0.25	0.25
Adj. Flow (vph)	103	171	19	405	147	166	22	154	311	0	0
RTOR Reduction (vph)	0	0	0	0	42	0	0	0	0	0	0
Lane Group Flow (vph)	293	0	0	405	271	0	0	0	487	0	0
Confl. Peds. (#/hr)	31	33	37		30	31	32	33			
Heavy Vehicles (%)	4%	5%	0%	0%	0%	1%	0%	3%	2%	0%	0%
Turn Type	Prot			NA	Perm		Perm	Perm	NA		
Protected Phases	6			4					8		
Permitted Phases	6			4	4		8	8			
Actuated Green, G (s)	16.5			30.6	30.6				30.6		
Effective Green, g (s)	16.5			30.6	30.6				30.6		
Actuated g/C Ratio	0.29			0.54	0.54				0.54		
Clearance Time (s)	5.0			5.0	5.0				5.0		
Vehicle Extension (s)	2.0			2.0	2.0				2.0		
Lane Grp Cap (vph)	449			1036	783				714		
v/s Ratio Prot	c0.19			0.21							
v/s Ratio Perm					0.19				c0.37		
v/c Ratio	0.65			0.39	0.35				0.68		
Uniform Delay, d1	17.8			7.8	7.6				9.7		
Progression Factor	1.00			1.00	1.00				1.00		
Incremental Delay, d2	2.6			0.1	0.1				2.2		
Delay (s)	20.4			7.9	7.6				11.8		
Level of Service	C			A	A				B		
Approach Delay (s)	20.4			7.8					11.8	0.0	
Approach LOS	C			A					B	A	

Intersection Summary

HCM 2000 Control Delay		11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.67		
Actuated Cycle Length (s)		57.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization		75.9%	ICU Level of Service	D
Analysis Period (min)		15		
c Critical Lane Group				

7: Main St & Franklin St & Central St  
 Timing Report, Sorted By Phase

2013 Existing  
 Timing Plan: Weekday PM

	↑ 4	↙ 6	↓ 8
Phase Number	4	6	8
Movement	NBT	WBL	SBTL
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	None	None	None
Maximum Split (s)	49	40	49
Maximum Split (%)	55.1%	44.9%	55.1%
Minimum Split (s)	10	10	10
Yellow Time (s)	4	4	4
All-Red Time (s)	1	1	1
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	2	2	2
Minimum Gap (s)	2	2	2
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			
Flash Dont Walk (s)			
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	40	0	40
End Time (s)	0	40	0
Yield/Force Off (s)	84	35	84
Yield/Force Off 170(s)	84	35	84
Local Start Time (s)	40	0	40
Local Yield (s)	84	35	84
Local Yield 170(s)	84	35	84

Intersection Summary

Cycle Length	89
Control Type	Actuated-Uncoordinated
Natural Cycle	50

Splits and Phases: 7: Main St & Franklin St & Central St

↙ ø6	↑ ø4	49 s	
	↓ ø8	49 s	
40 s		49 s	

8: Main St & Marble St/Summer St  
Queues

2013 Existing  
Timing Plan: Weekday PM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	419	263	751	364
v/c Ratio	0.77	0.73	0.76	0.38
Control Delay	39.2	42.1	28.8	21.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.2	42.1	28.8	21.1
Queue Length 50th (ft)	184	116	164	68
Queue Length 95th (ft)	#405	212	240	105
Internal Link Dist (ft)	821	965	1441	57
Turn Bay Length (ft)				
Base Capacity (vph)	544	467	1868	1821
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.77	0.56	0.40	0.20

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

8: Main St & Marble St/Summer St  
 HCM Signalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	103	258	25	92	113	26	29	448	213	18	217	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	12	12	12	12	12	12	11	12	13
Grade (%)		1%			2%			0%			1%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.98			0.95			0.96	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		2013			1732			3318			3352	
Flt Permitted		0.99			0.98			0.92			0.89	
Satd. Flow (perm)		2013			1732			3072			2998	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	112	280	27	105	128	30	32	487	232	21	249	94
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	417	0	0	263	0	0	751	0	0	364	0
Confl. Peds. (#/hr)	7		6	7		8	6		7	8		7
Heavy Vehicles (%)	4%	4%	4%	3%	5%	8%	0%	2%	4%	0%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)		20.4			15.6			24.2			24.2	
Effective Green, g (s)		20.4			15.6			24.2			24.2	
Actuated g/C Ratio		0.27			0.21			0.32			0.32	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		546			359			988			964	
v/s Ratio Prot		c0.21			c0.15							
v/s Ratio Perm								c0.24			0.12	
v/c Ratio		0.76			0.73			0.76			0.38	
Uniform Delay, d1		25.2			27.9			22.9			19.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		5.7			6.5			3.1			0.1	
Delay (s)		30.8			34.4			26.0			19.8	
Level of Service		C			C			C			B	
Approach Delay (s)		30.8			34.4			26.0			19.8	
Approach LOS		C			C			C			B	

Intersection Summary

HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	75.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

8: Main St & Marble St/Summer St  
Timing Report, Sorted By Phase

2013 Existing  
Timing Plan: Weekday PM



Phase Number	2	4	6	8
Movement	NBTL	WBTL	SBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	50	25	50	25
Maximum Split (%)	50.0%	25.0%	50.0%	25.0%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	50	0	75
End Time (s)	50	75	50	0
Yield/Force Off (s)	45	70	45	95
Yield/Force Off 170(s)	45	70	45	95
Local Start Time (s)	0	50	0	75
Local Yield (s)	45	70	45	95
Local Yield 170(s)	45	70	45	95

Intersection Summary

Cycle Length	100
Control Type	Actuated-Uncoordinated
Natural Cycle	60

Splits and Phases: 8: Main St & Marble St/Summer St

φ2	φ4	φ8
50 s	25 s	25 s
φ6		
50 s		

9: Pond St & Summer St  
Queues

2013 Existing  
Timing Plan: Weekday PM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	557	260	422	60
v/c Ratio	0.74	0.39	0.67	0.09
Control Delay	19.2	12.5	19.2	11.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	19.2	12.5	19.2	11.2
Queue Length 50th (ft)	107	42	82	9
Queue Length 95th (ft)	282	121	216	28
Internal Link Dist (ft)	965	569	871	731
Turn Bay Length (ft)				
Base Capacity (vph)	1347	1196	1237	1304
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.22	0.34	0.05
<b>Intersection Summary</b>				

9: Pond St & Summer St  
 HCM Signalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Volume (vph)	9	451	58	53	180	1	48	224	112	1	35	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	15	15	15	12	12	12	12	12	12
Grade (%)		-2%			1%			-1%			0%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			1.00			0.96			0.98	
Flt Protected		1.00			0.99			0.99			1.00	
Satd. Flow (prot)		1909			2008			1809			1849	
Flt Permitted		0.99			0.83			0.96			0.99	
Satd. Flow (perm)		1897			1683			1741			1838	
Peak-hour factor, PHF	0.93	0.93	0.93	0.90	0.90	0.90	0.91	0.91	0.91	0.72	0.72	0.72
Adj. Flow (vph)	10	485	62	59	200	1	53	246	123	1	49	10
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	557	0	0	260	0	0	422	0	0	60	0
Confl. Peds. (#/hr)	2		3	3		2	3		3	2		2
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	2%	2%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		18.1			18.1			16.4			16.4	
Effective Green, g (s)		18.1			18.1			16.4			16.4	
Actuated g/C Ratio		0.41			0.41			0.37			0.37	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		771			684			641			677	
v/s Ratio Prot												
v/s Ratio Perm		c0.29			0.15			c0.24			0.03	
v/c Ratio		0.72			0.38			0.66			0.09	
Uniform Delay, d1		11.1			9.3			11.7			9.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.9			0.1			1.9			0.0	
Delay (s)		13.9			9.4			13.6			9.2	
Level of Service		B			A			B			A	
Approach Delay (s)		13.9			9.4			13.6			9.2	
Approach LOS		B			A			B			A	

Intersection Summary

HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	44.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

9: Pond St & Summer St  
 Timing Report, Sorted By Phase

2013 Existing  
 Timing Plan: Weekday PM

				
Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	35	35	35	35
Maximum Split (%)	50.0%	50.0%	50.0%	50.0%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	35	0	35
End Time (s)	35	0	35	0
Yield/Force Off (s)	30	65	30	65
Yield/Force Off 170(s)	30	65	30	65
Local Start Time (s)	0	35	0	35
Local Yield (s)	30	65	30	65
Local Yield 170(s)	30	65	30	65

Intersection Summary

Cycle Length	70
Control Type	Actuated-Uncoordinated
Natural Cycle	45

Splits and Phases: 9: Pond St & Summer St

 02	 04
35 s	35 s
 06	 08
35 s	35 s

10: Franklin St & Site Driveway  
 HCM Unsignalized Intersection Capacity Analysis

2013 Existing  
 Timing Plan: Weekday PM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	1082	742	2	2	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	1202	824	2	2	1
Pedestrians		8	8		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		1	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		723				
pX, platoon unblocked					0.37	
vC, conflicting volume	835				2050	842
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	835				2984	842
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				60	100
cM capacity (veh/h)	793				6	360
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	1206	827	2	1		
Volume Left	3	0	2	0		
Volume Right	0	2	0	1		
cSH	793	1700	6	360		
Volume to Capacity	0.00	0.49	0.40	0.00		
Queue Length 95th (ft)	0	0	18	0		
Control Delay (s)	0.2	0.0	873.5	15.0		
Lane LOS	A		F	C		
Approach Delay (s)	0.2	0.0	587.4			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization			71.7%		ICU Level of Service	C
Analysis Period (min)			15			

1: Perkins St & Franklin St  
 HCM Unsignalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday AM

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	397	203	37	614	129	24
Sign Control	Free			Free	Stop	
Grade	0%			1%	0%	
Peak Hour Factor	0.92	0.92	0.81	0.81	0.78	0.78
Hourly flow rate (vph)	432	221	46	758	165	31
Pedestrians	1				1	
Lane Width (ft)	12.0				15.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			653		1393	543
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			653		1393	543
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		0	94
cM capacity (veh/h)			942		148	543
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	652	804	196			
Volume Left	0	46	165			
Volume Right	221	0	31			
cSH	1700	942	167			
Volume to Capacity	0.38	0.05	1.17			
Queue Length 95th (ft)	0	4	264			
Control Delay (s)	0.0	1.3	178.4			
Lane LOS		A	F			
Approach Delay (s)	0.0	1.3	178.4			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			21.8			
Intersection Capacity Utilization			77.9%	ICU Level of Service		D
Analysis Period (min)			15			

2: Franklin PI & Franklin St  
Queues

2018 No-Build  
Timing Plan: Weekday AM

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	589	736	72	1016	649	128
v/c Ratio	0.68	0.51	0.21	0.92	1.18	0.17
Control Delay	21.8	1.4	8.3	30.0	128.6	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	1.4	8.3	30.0	128.6	0.5
Queue Length 50th (ft)	243	0	15	446	~445	0
Queue Length 95th (ft)	263	0	27	481	263	0
Internal Link Dist (ft)	602			658		
Turn Bay Length (ft)		135	145			
Base Capacity (vph)	1077	1449	412	1448	552	733
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	0.55	0.51	0.17	0.70	1.18	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.

2: Franklin Pl & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑		↖	↑	↗			
Volume (vph)	0	430	537	57	803	0	305	0	60	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	13	12	13	12	12	12
Grade (%)		-1%			0%			0%			0%	
Total Lost time (s)		5.0	5.0	5.0	5.0		5.0		5.0			
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Frbp, ped/bikes		1.00	1.00	1.00	1.00		1.00		0.97			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		1792	1569	1768	1881		1865		1592			
Flt Permitted		1.00	1.00	0.23	1.00		0.95		1.00			
Satd. Flow (perm)		1792	1569	436	1881		1865		1592			
Peak-hour factor, PHF	0.73	0.73	0.73	0.79	0.79	0.79	0.47	0.47	0.47	0.25	0.25	0.25
Adj. Flow (vph)	0	589	736	72	1016	0	649	0	128	0	0	0
RTOR Reduction (vph)	0	0	125	0	0	0	0	0	90	0	0	0
Lane Group Flow (vph)	0	589	611	72	1016	0	649	0	38	0	0	0
Confl. Peds. (#/hr)			4	16			16		4			
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	3%	0%	2%	1%	0%	0%	0%	2%	0%	0%	0%
Turn Type		NA	pt+ov	pm+pt	NA		Prot		Perm			
Protected Phases		2	2 3	1	6		3	8				
Permitted Phases				6					8			
Actuated Green, G (s)		41.9	72.5	51.7	51.7		25.6		25.6			
Effective Green, g (s)		41.9	72.5	51.7	51.7		25.6		25.6			
Actuated g/C Ratio		0.48	0.83	0.59	0.59		0.29		0.29			
Clearance Time (s)		5.0		5.0	5.0		5.0		5.0			
Vehicle Extension (s)		2.0		2.0	2.0		2.0		2.0			
Lane Grp Cap (vph)		860	1303	331	1113		546		466			
v/s Ratio Prot		0.33	0.39	0.01	c0.54		c0.35					
v/s Ratio Perm				0.12					0.02			
v/c Ratio		0.68	0.47	0.22	0.91		1.19		0.08			
Uniform Delay, d1		17.6	2.1	10.6	15.8		30.8		22.3			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		1.8	0.1	0.1	11.1		102.2		0.0			
Delay (s)		19.4	2.2	10.7	26.9		133.0		22.4			
Level of Service		B	A	B	C		F		C			
Approach Delay (s)		9.8			25.8		114.8				0.0	
Approach LOS		A			C		F				A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			40.8			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			87.3			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			67.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

2: Franklin PI & Franklin St  
Timing Report, Sorted By Phase

2018 No-Build  
Timing Plan: Weekday AM

					
Phase Number	1	2	3	6	8
Movement	WBL	EBT	NBL	WBTL	NBT
Lead/Lag	Lead	Lag			
Lead-Lag Optimize					
Recall Mode	None	Min	None	Min	None
Maximum Split (s)	15	55	30	70	30
Maximum Split (%)	15.0%	55.0%	30.0%	70.0%	30.0%
Minimum Split (s)	10	10	10	10	10
Yellow Time (s)	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1
Minimum Initial (s)	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)					
Flash Dont Walk (s)					
Dual Entry	No	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	15	70	0	70
End Time (s)	15	70	0	70	0
Yield/Force Off (s)	10	65	95	65	95
Yield/Force Off 170(s)	10	65	95	65	95
Local Start Time (s)	85	0	55	85	55
Local Yield (s)	95	50	80	50	80
Local Yield 170(s)	95	50	80	50	80

Intersection Summary

Cycle Length	100
Control Type	Actuated-Uncoordinated
Natural Cycle	90

Splits and Phases: 2: Franklin PI & Franklin St

 φ1	 φ2	 φ3
15 s	55 s	30 s
 φ6		 φ8
70 s		30 s

3: Res Complex/Dunkins & Franklin St  
 HCM Unsignalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday AM

Movement												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	26	971	0	1	994	52	6	0	10	19	1	64
Sign Control		Free			Free			Stop			Stop	
Grade		-1%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.95	0.95	0.95	0.67	0.67	0.67	0.75	0.75	0.75
Hourly flow rate (vph)	36	1349	0	1	1046	55	9	0	15	25	1	85
Pedestrians		12			12			3			12	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1060			682							
pX, platoon unblocked	0.58			0.83			0.66	0.66	0.83	0.66	0.66	0.58
vC, conflicting volume	1113			1352			2598	2539	1364	2536	2512	1098
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	834			1322			2588	2500	1336	2495	2459	808
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			0	100	90	0	93	61
cM capacity (veh/h)	455			440			6	18	156	11	19	216
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1385	1102	24	112								
Volume Left	36	1	9	25								
Volume Right	0	55	15	85								
cSH	455	440	15	40								
Volume to Capacity	0.08	0.00	1.60	2.79								
Queue Length 95th (ft)	6	0	90	309								
Control Delay (s)	5.4	0.1	817.5	1019.6								
Lane LOS	A	A	F	F								
Approach Delay (s)	5.4	0.1	817.5	1019.6								
Approach LOS			F	F								

Intersection Summary

Average Delay		53.9		
Intersection Capacity Utilization		87.0%	ICU Level of Service	E
Analysis Period (min)		15		

4: Franklin St & Pleasant St  
 HCM Unsignalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	564	690	332	185	12
Sign Control		Free	Free		Stop	
Grade		4%	0%		-4%	
Peak Hour Factor	0.88	0.88	0.90	0.90	0.89	0.89
Hourly flow rate (vph)	3	641	767	369	208	13
Pedestrians			1		1	
Lane Width (ft)			13.0		14.0	
Walking Speed (ft/s)			4.0		4.0	
Percent Blockage			0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		482	1260			
pX, platoon unblocked	0.67				0.77	0.67
vC, conflicting volume	1137				1601	952
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	958				1067	684
tC, single (s)	4.8				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.8				3.5	3.3
p0 queue free %	99				0	96
cM capacity (veh/h)	343				186	304
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	3	641	1136	221		
Volume Left	3	0	0	208		
Volume Right	0	0	369	13		
cSH	343	1700	1700	190		
Volume to Capacity	0.01	0.38	0.67	1.16		
Queue Length 95th (ft)	1	0	0	281		
Control Delay (s)	15.6	0.0	0.0	166.4		
Lane LOS	C			F		
Approach Delay (s)	0.1		0.0	166.4		
Approach LOS				F		
<b>Intersection Summary</b>						
Average Delay			18.4			
Intersection Capacity Utilization			74.2%		ICU Level of Service	D
Analysis Period (min)			15			

5: Summer St & Franklin St  
Queues

2018 No-Build  
Timing Plan: Weekday AM

						
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	419	181	625	297	483
v/c Ratio	0.08	0.71	0.44	0.73	0.43	0.80
Control Delay	11.2	29.4	13.9	25.6	11.1	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	29.4	13.9	25.6	11.1	31.6
Queue Length 50th (ft)	4	150	36	177	43	166
Queue Length 95th (ft)	16	252	97	#552	111	318
Internal Link Dist (ft)		984		402	380	774
Turn Bay Length (ft)	70		100			
Base Capacity (vph)	402	799	441	860	1054	990
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	0.06	0.52	0.41	0.73	0.28	0.49

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

5: Summer St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	315	8	163	561	2	13	71	177	30	346	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	11	11	14	14	14	12	12	12
Grade (%)		3%			-6%			-2%			3%	
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.91			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1718	1761		1718	1836			1814			1824	
Flt Permitted	0.27	1.00		0.30	1.00			0.97			0.96	
Satd. Flow (perm)	481	1761		539	1836			1769			1761	
Peak-hour factor, PHF	0.77	0.77	0.77	0.90	0.90	0.90	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	23	409	10	181	623	2	15	81	201	34	389	60
RTOR Reduction (vph)	0	1	0	0	0	0	0	96	0	0	7	0
Lane Group Flow (vph)	23	418	0	181	625	0	0	201	0	0	476	0
Confl. Peds. (#/hr)	1		2	2		1	2		2	1		1
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	0%	6%	0%	1%	3%	0%	0%	0%	1%	0%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	27.8	25.9		37.8	31.9			23.2			23.2	
Effective Green, g (s)	27.8	25.9		37.8	31.9			23.2			23.2	
Actuated g/C Ratio	0.39	0.36		0.53	0.45			0.33			0.33	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	221	642		418	824			578			575	
v/s Ratio Prot	0.00	0.24		c0.05	c0.34							
v/s Ratio Perm	0.04			0.18				0.11			c0.27	
v/c Ratio	0.10	0.65		0.43	0.76			0.35			0.83	
Uniform Delay, d1	14.0	18.8		10.1	16.3			18.2			22.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	1.8		0.3	3.6			0.1			9.1	
Delay (s)	14.1	20.6		10.3	19.9			18.3			31.2	
Level of Service	B	C		B	B			B			C	
Approach Delay (s)		20.3			17.8			18.3			31.2	
Approach LOS		C			B			B			C	

Intersection Summary

HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	71.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

5: Summer St & Franklin St  
Timing Report, Sorted By Phase

2018 No-Build  
Timing Plan: Weekday AM

						
Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	None	None	None	None	None
Maximum Split (s)	13	35	42	13	35	42
Maximum Split (%)	14.4%	38.9%	46.7%	14.4%	38.9%	46.7%
Minimum Split (s)	9	10	10	9	10	10
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	0	1	1	0	1	1
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	13	48	0	13	48
End Time (s)	13	48	0	13	48	0
Yield/Force Off (s)	9	43	85	9	43	85
Yield/Force Off 170(s)	9	43	85	9	43	85
Local Start Time (s)	77	0	35	77	0	35
Local Yield (s)	86	30	72	86	30	72
Local Yield 170(s)	86	30	72	86	30	72

Intersection Summary

Cycle Length	90
Control Type	Actuated-Uncoordinated
Natural Cycle	65

Splits and Phases: 5: Summer St & Franklin St

 ø1	 ø2	 ø4
13 s	35 s	42 s
 ø5	 ø6	 ø8
13 s	35 s	42 s

6: Pine St & Franklin St  
Queues

2018 No-Build  
Timing Plan: Weekday AM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	256	792	114	541
v/c Ratio	0.33	0.86	0.16	0.86
Control Delay	11.6	24.9	15.9	38.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.6	24.9	15.9	38.2
Queue Length 50th (ft)	60	257	25	192
Queue Length 95th (ft)	81	388	57	#508
Internal Link Dist (ft)	727	984	947	646
Turn Bay Length (ft)				
Base Capacity (vph)	1273	1480	726	629
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.20	0.54	0.16	0.86

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.



6: Pine St & Franklin St  
 Timing Report, Sorted By Phase

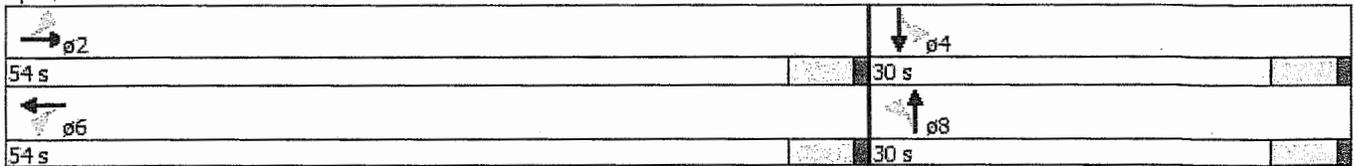
2018 No-Build  
 Timing Plan: Weekday AM

				
Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	54	30	54	30
Maximum Split (%)	64.3%	35.7%	64.3%	35.7%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	54	0	54
End Time (s)	54	0	54	0
Yield/Force Off (s)	49	79	49	79
Yield/Force Off 170(s)	49	79	49	79
Local Start Time (s)	0	54	0	54
Local Yield (s)	49	79	49	79
Local Yield 170(s)	49	79	49	79

Intersection Summary

Cycle Length	84
Control Type	Actuated-Uncoordinated
Natural Cycle	60

Splits and Phases: 6: Pine St & Franklin St



7: Main St & Franklin St & Central St  
Queues

2018 No-Build  
Timing Plan: Weekday AM

				
Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	620	406	277	792
v/c Ratio	0.91	0.45	0.36	1.06
Control Delay	43.9	17.0	13.0	75.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	43.9	17.0	13.0	75.7
Queue Length 50th (ft)	300	142	71	~493
Queue Length 95th (ft)	#484	198	114	#743
Internal Link Dist (ft)	727	1542		692
Turn Bay Length (ft)			50	
Base Capacity (vph)	802	899	763	745
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.77	0.45	0.36	1.06

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

7: Main St & Franklin St & Central St  
 HCM Signalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday AM

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL	SWR
Lane Configurations	↘	↙	↗	↑	↖	↗	↘	↙	↓	↘	↗
Volume (vph)	334	212	6	325	126	95	2	102	609	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	13	12	12	14	14	14	12	12
Grade (%)	4%			3%					1%	0%	
Total Lost time (s)	5.0			5.0	5.0				5.0		
Lane Util. Factor	1.00			1.00	1.00				1.00		
Frbp, ped/bikes	0.99			1.00	0.97				1.00		
Flpb, ped/bikes	1.00			1.00	1.00				1.00		
Frt	0.95			1.00	0.85				1.00		
Flt Protected	0.97			1.00	1.00				0.99		
Satd. Flow (prot)	1752			1824	1492				1897		
Flt Permitted	0.97			1.00	1.00				0.79		
Satd. Flow (perm)	1752			1824	1492				1512		
Peak-hour factor, PHF	0.89	0.89	0.89	0.80	0.80	0.80	0.90	0.90	0.90	0.25	0.25
Adj. Flow (vph)	375	238	7	406	158	119	2	113	677	0	0
RTOR Reduction (vph)	0	0	0	0	28	0	0	0	0	0	0
Lane Group Flow (vph)	620	0	0	406	249	0	0	0	792	0	0
Confl. Peds. (#/hr)	3	7	4		3	3	7	7			
Heavy Vehicles (%)	2%	4%	0%	6%	0%	9%	0%	20%	3%	0%	0%
Turn Type	Prot			NA	Perm		Perm	Perm	NA		
Protected Phases	6			4					8		
Permitted Phases	6			4	4		8	8			
Actuated Green, G (s)	32.3			41.2	41.2				41.2		
Effective Green, g (s)	32.3			41.2	41.2				41.2		
Actuated g/C Ratio	0.39			0.49	0.49				0.49		
Clearance Time (s)	5.0			5.0	5.0				5.0		
Vehicle Extension (s)	2.0			2.0	2.0				2.0		
Lane Grp Cap (vph)	677			899	736				746		
v/s Ratio Prot	c0.35			0.22							
v/s Ratio Perm					0.17				c0.52		
v/c Ratio	0.92			0.45	0.34				1.06		
Uniform Delay, d1	24.3			13.8	12.9				21.1		
Progression Factor	1.00			1.00	1.00				1.00		
Incremental Delay, d2	16.8			0.1	0.1				50.6		
Delay (s)	41.1			13.9	13.0				71.7		
Level of Service	D			B	B				E		
Approach Delay (s)	41.1			13.5					71.7	0.0	
Approach LOS	D			B					E	A	

Intersection Summary

HCM 2000 Control Delay	43.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	83.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

7: Main St & Franklin St & Central St  
 Timing Report, Sorted By Phase

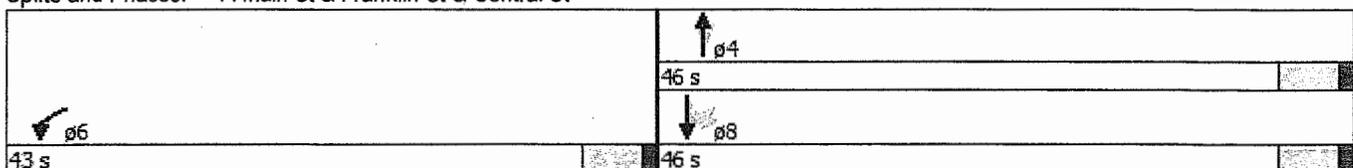
2018 No-Build  
 Timing Plan: Weekday AM

	↑	↙	↓
Phase Number	4	6	8
Movement	NBT	WBL	SBTL
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	None	None	None
Maximum Split (s)	46	43	46
Maximum Split (%)	51.7%	48.3%	51.7%
Minimum Split (s)	10	10	10
Yellow Time (s)	4	4	4
All-Red Time (s)	1	1	1
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	2	2	2
Minimum Gap (s)	2	2	2
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			
Flash Dont Walk (s)			
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	43	0	43
End Time (s)	0	43	0
Yield/Force Off (s)	84	38	84
Yield/Force Off 170(s)	84	38	84
Local Start Time (s)	43	0	43
Local Yield (s)	84	38	84
Local Yield 170(s)	84	38	84

Intersection Summary

Cycle Length	89
Control Type	Actuated-Uncoordinated
Natural Cycle	80

Splits and Phases: 7: Main St & Franklin St & Central St



8: Main St & Marble St/Summer St  
Queues

2018 No-Build  
Timing Plan: Weekday AM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	350	340	625	1023
v/c Ratio	0.84	0.85	0.73	0.83
Control Delay	52.0	56.6	28.2	30.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	52.0	56.6	28.2	30.6
Queue Length 50th (ft)	180	190	158	274
Queue Length 95th (ft)	#361	#386	214	342
Internal Link Dist (ft)	821	965	1441	57
Turn Bay Length (ft)				
Base Capacity (vph)	470	420	1122	1615
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.74	0.81	0.56	0.63

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

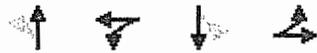
8: Main St & Marble St/Summer St  
 HCM Signalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday AM

Movement														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Volume (vph)	75	139	112	90	209	14	65	403	82	34	734	132		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	16	16	16	12	12	12	12	12	12	11	12	13		
Grade (%)		1%			2%			0%			1%			
Total Lost time (s)		5.0			5.0			5.0			5.0			
Lane Util. Factor		1.00			1.00			0.95			0.95			
Frbp, ped/bikes		0.99			1.00			0.99			0.99			
Flpb, ped/bikes		1.00			1.00			1.00			1.00			
Frt		0.95			0.99			0.98			0.98			
Flt Protected		0.99			0.99			0.99			1.00			
Satd. Flow (prot)		1939			1804			3412			3388			
Flt Permitted		0.99			0.99			0.62			0.91			
Satd. Flow (perm)		1939			1804			2134			3075			
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88		
Adj. Flow (vph)	81	149	120	98	227	15	74	458	93	39	834	150		
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	0	0	0	0		
Lane Group Flow (vph)	0	332	0	0	340	0	0	625	0	0	1023	0		
Confl. Peds. (#/hr)	25		21	29		33	21		29	33		25		
Confl. Bikes (#/hr)			1			1								
Heavy Vehicles (%)	10%	0%	1%	2%	2%	0%	0%	2%	3%	0%	2%	7%		
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA			
Protected Phases	8	8		4	4			2			6			
Permitted Phases							2			6				
Actuated Green, G (s)		18.0			19.4			34.9			34.9			
Effective Green, g (s)		18.0			19.4			34.9			34.9			
Actuated g/C Ratio		0.21			0.22			0.40			0.40			
Clearance Time (s)		5.0			5.0			5.0			5.0			
Vehicle Extension (s)		2.0			2.0			2.0			2.0			
Lane Grp Cap (vph)		399			400			853			1229			
v/s Ratio Prot		c0.17			c0.19									
v/s Ratio Perm								0.29			c0.33			
v/c Ratio		0.83			0.85			0.73			0.83			
Uniform Delay, d1		33.2			32.6			22.2			23.6			
Progression Factor		1.00			1.00			1.00			1.00			
Incremental Delay, d2		13.2			14.9			2.8			4.7			
Delay (s)		46.4			47.4			25.1			28.3			
Level of Service		D			D			C			C			
Approach Delay (s)		46.4			47.4			25.1			28.3			
Approach LOS		D			D			C			C			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			32.9									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.84											
Actuated Cycle Length (s)			87.3						15.0				Sum of lost time (s)	
Intersection Capacity Utilization			79.0%										ICU Level of Service	D
Analysis Period (min)			15											
c Critical Lane Group														

8: Main St & Marble St/Summer St  
Timing Report, Sorted By Phase

2018 No-Build  
Timing Plan: Weekday AM



Phase Number	2	4	6	8
Movement	NBTL	WBTL	SBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	50	25	50	25
Maximum Split (%)	50.0%	25.0%	50.0%	25.0%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	50	0	75
End Time (s)	50	75	50	0
Yield/Force Off (s)	45	70	45	95
Yield/Force Off 170(s)	45	70	45	95
Local Start Time (s)	0	50	0	75
Local Yield (s)	45	70	45	95
Local Yield 170(s)	45	70	45	95

Intersection Summary

Cycle Length	100
Control Type	Actuated-Uncoordinated
Natural Cycle	70

Splits and Phases: 8: Main St & Marble St/Summer St

02	04	08
50 s	25 s	25 s
06		
50 s		

9: Pond St & Summer St  
Queues

2018 No-Build  
Timing Plan: Weekday AM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	324	585	440	164
v/c Ratio	0.37	0.83	0.83	0.26
Control Delay	12.8	28.5	32.1	14.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.8	28.5	32.1	14.9
Queue Length 50th (ft)	70	174	145	42
Queue Length 95th (ft)	140	#434	190	76
Internal Link Dist (ft)	965	569	871	731
Turn Bay Length (ft)				
Base Capacity (vph)	891	719	768	927
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.81	0.57	0.18

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

9: Pond St & Summer St  
 HCM Signalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	155	108	247	301	13	111	179	49	1	136	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	15	15	15	12	12	12	12	12	12
Grade (%)		-2%			1%			-1%			0%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frb, ped/bikes		0.99			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.95			1.00			0.98			0.99	
Flt Protected		1.00			0.98			0.98			1.00	
Satd. Flow (prot)		1811			1991			1798			1868	
Flt Permitted		0.99			0.71			0.84			1.00	
Satd. Flow (perm)		1792			1447			1544			1864	
Peak-hour factor, PHF	0.83	0.83	0.83	0.96	0.96	0.96	0.77	0.77	0.77	0.87	0.87	0.87
Adj. Flow (vph)	7	187	130	257	314	14	144	232	64	1	156	7
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	324	0	0	585	0	0	440	0	0	164	0
Confl. Peds. (#/hr)	12		11	18		19	11		18	19		12
Heavy Vehicles (%)	0%	3%	1%	0%	2%	8%	1%	2%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		29.9			29.9			21.1			21.1	
Effective Green, g (s)		29.9			29.9			21.1			21.1	
Actuated g/C Ratio		0.49			0.49			0.35			0.35	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		878			709			534			644	
v/s Ratio Prot												
v/s Ratio Perm		0.18			0.40			0.29			0.09	
v/c Ratio		0.37			0.83			0.82			0.25	
Uniform Delay, d1		9.7			13.3			18.3			14.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			7.4			9.5			0.1	
Delay (s)		9.8			20.7			27.8			14.4	
Level of Service		A			C			C			B	
Approach Delay (s)		9.8			20.7			27.8			14.4	
Approach LOS		A			C			C			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			19.7									B
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			61.0						10.0			
Intersection Capacity Utilization			89.0%									E
Analysis Period (min)			15									
c Critical Lane Group												

9: Pond St & Summer St  
Timing Report, Sorted By Phase

2018 No-Build  
Timing Plan: Weekday AM



Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	35	35	35	35
Maximum Split (%)	50.0%	50.0%	50.0%	50.0%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	35	0	35
End Time (s)	35	0	35	0
Yield/Force Off (s)	30	65	30	65
Yield/Force Off 170(s)	30	65	30	65
Local Start Time (s)	0	35	0	35
Local Yield (s)	30	65	30	65
Local Yield 170(s)	30	65	30	65

Intersection Summary

Cycle Length	70
Control Type	Actuated-Uncoordinated
Natural Cycle	60

Splits and Phases: 9: Pond St & Summer St

35 s	35 s
35 s	35 s

10: Franklin St & Site Driveway  
 HCM Unsignalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	4	486	857	5	2	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	540	952	6	2	3
Pedestrians		1	1		1	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		738				
pX, platoon unblocked					0.80	
vC, conflicting volume	959				1506	957
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	959				1507	957
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	99
cM capacity (veh/h)	717				105	312
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	544	958	2	3		
Volume Left	4	0	2	0		
Volume Right	0	6	0	3		
cSH	717	1700	105	312		
Volume to Capacity	0.01	0.56	0.02	0.01		
Queue Length 95th (ft)	0	0	2	1		
Control Delay (s)	0.2	0.0	40.0	16.7		
Lane LOS	A		E	C		
Approach Delay (s)	0.2	0.0	26.0			
Approach LOS			D			
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			55.7%		ICU Level of Service	B
Analysis Period (min)			15			

1: Perkins St & Franklin St  
 HCM Unsignalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday PM

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Volume (veh/h)	773	201	14	457	201	23
Sign Control	Free			Free	Stop	
Grade	0%			1%	0%	
Peak Hour Factor	0.94	0.94	0.96	0.96	0.86	0.86
Hourly flow rate (vph)	822	214	15	476	234	27
Pedestrians	4			1	4	
Lane Width (ft)	12.0			14.0	15.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1040		1442	934
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1040		1442	934
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		0	92
cM capacity (veh/h)			673		142	323
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	1036	491	260			
Volume Left	0	15	234			
Volume Right	214	0	27			
cSH	1700	673	150			
Volume to Capacity	0.61	0.02	1.73			
Queue Length 95th (ft)	0	2	474			
Control Delay (s)	0.0	0.6	408.7			
Lane LOS		A	F			
Approach Delay (s)	0.0	0.6	408.7			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			59.7			
Intersection Capacity Utilization			72.2%		ICU Level of Service	C
Analysis Period (min)			15			

2: Franklin PI & Franklin St  
Queues

2018 No-Build  
Timing Plan: Weekday PM

Lane Group						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1166	50	8	871	174	33
v/c Ratio	0.90	0.03	0.04	0.65	0.63	0.08
Control Delay	23.9	0.4	4.3	9.2	41.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	0.4	4.3	9.2	41.3	0.3
Queue Length 50th (ft)	332	0	1	172	74	0
Queue Length 95th (ft)	#981	4	5	361	111	0
Internal Link Dist (ft)	592			653		
Turn Bay Length (ft)		135	145			
Base Capacity (vph)	1290	1543	307	1557	593	674
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	0.90	0.03	0.03	0.56	0.29	0.05

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

2: Franklin PI & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↘	↑		↘	↑	↗			
Volume (vph)	0	1119	48	7	775	0	122	0	23	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	13	12	13	12	12	12
Grade (%)		-1%			0%			0%			0%	
Total Lost time (s)		5.0	5.0	5.0	5.0		5.0		5.0			
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Frb, ped/bikes		1.00	1.00	1.00	1.00		1.00		0.98			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00		1.00			
Fr		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		1846	1569	1805	1863		1847		1630			
Flt Permitted		1.00	1.00	0.07	1.00		0.95		1.00			
Satd. Flow (perm)		1846	1569	127	1863		1847		1630			
Peak-hour factor, PHF	0.96	0.96	0.96	0.89	0.89	0.89	0.70	0.70	0.70	0.25	0.25	0.25
Adj. Flow (vph)	0	1166	50	8	871	0	174	0	33	0	0	0
RTOR Reduction (vph)	0	0	6	0	0	0	0	0	28	0	0	0
Lane Group Flow (vph)	0	1166	44	8	871	0	174	0	5	0	0	0
Confl. Peds. (#/hr)			1	17			17		1			
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Turn Type		NA	pt+ov	pm+pt	NA		Prot		Perm			
Protected Phases		2	2 3	1	6		3	8				
Permitted Phases				6					8			
Actuated Green, G (s)		54.7	71.4	60.6	60.6		11.7		11.7			
Effective Green, g (s)		54.7	71.4	60.6	60.6		11.7		11.7			
Actuated g/C Ratio		0.66	0.87	0.74	0.74		0.14		0.14			
Clearance Time (s)		5.0		5.0	5.0		5.0		5.0			
Vehicle Extension (s)		2.0		2.0	2.0		2.0		2.0			
Lane Grp Cap (vph)		1226	1361	111	1371		262		231			
v/s Ratio Prot		c0.63	0.03	0.00	c0.47		c0.09					
v/s Ratio Perm				0.05					0.00			
v/c Ratio		0.95	0.03	0.07	0.64		0.66		0.02			
Uniform Delay, d1		12.6	0.7	18.7	5.4		33.4		30.4			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		15.3	0.0	0.1	0.7		4.8		0.0			
Delay (s)		27.9	0.7	18.8	6.1		38.3		30.4			
Level of Service		C	A	B	A		D		C			
Approach Delay (s)		26.8			6.2			37.0			0.0	
Approach LOS		C			A			D			A	

Intersection Summary

HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	82.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2: Franklin PI & Franklin St  
Timing Report, Sorted By Phase

2018 No-Build  
Timing Plan: Weekday PM

Phase Number	1	2	3	6	8
Movement	WBL	EBT	NBL	WBTL	NBT
Lead/Lag	Lead	Lag			
Lead-Lag Optimize					
Recall Mode	None	Min	None	Min	None
Maximum Split (s)	15	55	30	70	30
Maximum Split (%)	15.0%	55.0%	30.0%	70.0%	30.0%
Minimum Split (s)	10	10	10	10	10
Yellow Time (s)	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1
Minimum Initial (s)	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)					
Flash Dont Walk (s)					
Dual Entry	No	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	15	70	0	70
End Time (s)	15	70	0	70	0
Yield/Force Off (s)	10	65	95	65	95
Yield/Force Off 170(s)	10	65	95	65	95
Local Start Time (s)	85	0	55	85	55
Local Yield (s)	95	50	80	50	80
Local Yield 170(s)	95	50	80	50	80

Intersection Summary

Cycle Length	100
Control Type	Actuated-Uncoordinated
Natural Cycle	90

Splits and Phases: 2: Franklin PI & Franklin St

φ1 15 s	φ2 55 s	φ3 30 s
φ6 70 s		φ8 30 s

3: Res Complex/Dunkins & Franklin St  
 HCM Unsignalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday PM

Movement												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	22	1163	10	4	880	12	6	0	3	9	1	22
Sign Control		Free			Free			Stop			Stop	
Grade		-1%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.75	0.75	0.75	0.57	0.57	0.57
Hourly flow rate (vph)	24	1251	11	4	946	13	8	0	4	16	2	39
Pedestrians		9			9			8			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1071			672							
pX, platoon unblocked	0.73			0.74			0.86	0.86	0.74	0.86	0.86	0.73
vC, conflicting volume	968			1269			2321	2288	1273	2287	2287	971
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	773			1188			1776	1737	1193	1736	1736	777
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			82	100	98	71	98	86
cM capacity (veh/h)	618			437			45	71	168	55	72	284
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1285	963	12	56								
Volume Left	24	4	8	16								
Volume Right	11	13	4	39								
cSH	618	437	59	125								
Volume to Capacity	0.04	0.01	0.20	0.45								
Queue Length 95th (ft)	3	1	17	50								
Control Delay (s)	1.8	0.4	80.7	55.2								
Lane LOS	A	A	F	F								
Approach Delay (s)	1.8	0.4	80.7	55.2								
Approach LOS			F	F								

Intersection Summary

Average Delay		2.9		
Intersection Capacity Utilization		90.0%	ICU Level of Service	E
Analysis Period (min)		15		

4: Franklin St & Pleasant St  
 HCM Unsignalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday PM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	862	439	320	280	7
Sign Control		Free	Free		Stop	
Grade		4%	0%		-4%	
Peak Hour Factor	0.94	0.94	0.88	0.88	0.87	0.87
Hourly flow rate (vph)	5	917	499	364	322	8
Pedestrians		4	4		4	
Lane Width (ft)		10.5	13.0		14.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		482	1261			
pX, platoon unblocked	0.82				0.83	0.82
vC, conflicting volume	866				1616	689
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	726				1147	509
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				0	98
cM capacity (veh/h)	723				180	462
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	5	917	862	330		
Volume Left	5	0	0	322		
Volume Right	0	0	364	8		
cSH	723	1700	1700	183		
Volume to Capacity	0.01	0.54	0.51	1.81		
Queue Length 95th (ft)	1	0	0	591		
Control Delay (s)	10.0	0.0	0.0	427.1		
Lane LOS	B			F		
Approach Delay (s)	0.1		0.0	427.1		
Approach LOS				F		
<b>Intersection Summary</b>						
Average Delay			66.6			
Intersection Capacity Utilization			68.0%		ICU Level of Service	C
Analysis Period (min)			15			

5: Summer St & Franklin St  
Queues

2018 No-Build  
Timing Plan: Weekday PM

						
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	68	521	154	417	703	257
v/c Ratio	0.19	0.85	0.58	0.61	0.90	0.48
Control Delay	13.4	39.6	22.6	26.8	36.4	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	39.6	22.6	26.8	36.4	20.1
Queue Length 50th (ft)	19	257	46	189	301	86
Queue Length 95th (ft)	42	#400	80	280	#550	159
Internal Link Dist (ft)		984		402	380	774
Turn Bay Length (ft)	70		100			
Base Capacity (vph)	387	807	273	800	954	659
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	0.18	0.65	0.56	0.52	0.74	0.39

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

5: Summer St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	504	12	134	356	7	6	292	335	43	119	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	11	11	14	14	14	12	12	12
Grade (%)		3%			-6%			-2%			3%	
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.93			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1718	1846		1701	1832			1875			1770	
Flt Permitted	0.37	1.00		0.18	1.00			1.00			0.74	
Satd. Flow (perm)	661	1846		322	1832			1870			1320	
Peak-hour factor, PHF	0.99	0.99	0.99	0.87	0.87	0.87	0.90	0.90	0.90	0.88	0.88	0.88
Adj. Flow (vph)	68	509	12	154	409	8	7	324	372	49	135	73
RTOR Reduction (vph)	0	1	0	0	1	0	0	46	0	0	16	0
Lane Group Flow (vph)	68	520	0	154	416	0	0	657	0	0	241	0
Confl. Peds. (#/hr)	3		3	4		4	3		4	4		3
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	1%	0%	2%	3%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	32.2	27.4		36.2	29.4			31.2			31.2	
Effective Green, g (s)	32.2	27.4		36.2	29.4			31.2			31.2	
Actuated g/C Ratio	0.41	0.35		0.46	0.37			0.39			0.39	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	331	637		264	678			734			518	
v/s Ratio Prot	0.01	c0.28		c0.05	0.23							
v/s Ratio Perm	0.07			0.22				c0.35			0.18	
v/c Ratio	0.21	0.82		0.58	0.61			0.90			0.47	
Uniform Delay, d1	15.1	23.7		15.5	20.4			22.6			17.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	7.6		2.1	1.2			13.2			0.2	
Delay (s)	15.2	31.3		17.6	21.5			35.8			18.1	
Level of Service	B	C		B	C			D			B	
Approach Delay (s)		29.4			20.5			35.8			18.1	
Approach LOS		C			C			D			B	

Intersection Summary

HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	79.4	Sum of lost time (s)	14.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

5: Summer St & Franklin St  
Timing Report, Sorted By Phase

2018 No-Build  
Timing Plan: Weekday PM

						
Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	None	None	None	None	None
Maximum Split (s)	11	38	42	11	38	42
Maximum Split (%)	12.1%	41.8%	46.2%	12.1%	41.8%	46.2%
Minimum Split (s)	9	10	10	9	10	10
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	0	1	1	0	1	1
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	11	49	0	11	49
End Time (s)	11	49	0	11	49	0
Yield/Force Off (s)	7	44	86	7	44	86
Yield/Force Off 170(s)	7	44	86	7	44	86
Local Start Time (s)	80	0	38	80	0	38
Local Yield (s)	87	33	75	87	33	75
Local Yield 170(s)	87	33	75	87	33	75

Intersection Summary

Cycle Length	91
Control Type	Actuated-Uncoordinated
Natural Cycle	75

Splits and Phases: 5: Summer St & Franklin St

		
11 s	38 s	42 s
		
11 s	38 s	42 s

6: Pine St & Franklin St  
Queues

2018 No-Build  
Timing Plan: Weekday PM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	372	582	171	313
v/c Ratio	0.48	0.70	0.26	0.61
Control Delay	12.3	14.9	11.3	18.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.3	14.9	11.3	18.6
Queue Length 50th (ft)	58	90	25	60
Queue Length 95th (ft)	149	225	74	155
Internal Link Dist (ft)	727	984	947	646
Turn Bay Length (ft)				
Base Capacity (vph)	1714	1791	1177	934
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.22	0.32	0.15	0.34
<b>Intersection Summary</b>				

6: Pine St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	299	9	21	289	191	7	104	46	172	64	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	15	15	15	15	15	15	15	15	15
Grade (%)		2%			-3%			5%			1%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.99			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.95			0.96			0.98	
Flt Protected		1.00			1.00			1.00			0.97	
Satd. Flow (prot)		1912			1964			1929			1946	
Flt Permitted		0.96			0.98			0.98			0.75	
Satd. Flow (perm)		1845			1921			1893			1508	
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	18	344	10	24	336	222	8	113	50	193	72	48
RTOR Reduction (vph)	0	2	0	0	36	0	0	17	0	0	7	0
Lane Group Flow (vph)	0	370	0	0	546	0	0	154	0	0	306	0
Confl. Peds. (#/hr)	10		18	13		5	18		13	5		10
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		18.4			18.4			14.9			14.9	
Effective Green, g (s)		18.4			18.4			14.9			14.9	
Actuated g/C Ratio		0.42			0.42			0.34			0.34	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		784			816			651			518	
v/s Ratio Prot												
v/s Ratio Perm		0.20			0.28			0.08			0.20	
v/c Ratio		0.47			0.67			0.24			0.59	
Uniform Delay, d1		9.0			10.0			10.1			11.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			1.6			0.1			1.2	
Delay (s)		9.1			11.6			10.2			12.9	
Level of Service		A			B			B			B	
Approach Delay (s)		9.1			11.6			10.2			12.9	
Approach LOS		A			B			B			B	

Intersection Summary

HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	43.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

6: Pine St & Franklin St  
 Timing Report, Sorted By Phase

2018 No-Build  
 Timing Plan: Weekday PM



Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	52	30	52	30
Maximum Split (%)	63.4%	36.6%	63.4%	36.6%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	52	0	52
End Time (s)	52	0	52	0
Yield/Force Off (s)	47	77	47	77
Yield/Force Off 170(s)	47	77	47	77
Local Start Time (s)	0	52	0	52
Local Yield (s)	47	77	47	77
Local Yield 170(s)	47	77	47	77

Intersection Summary

Cycle Length	82
Control Type	Actuated-Uncoordinated
Natural Cycle	40

Splits and Phases: 6: Pine St & Franklin St

ρ2	ρ4
52 s	30 s
ρ6	ρ8
52 s	30 s

7: Main St & Franklin St & Central St  
Queues

2018 No-Build  
Timing Plan: Weekday PM

				
Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	315	426	333	516
v/c Ratio	0.73	0.38	0.38	0.70
Control Delay	33.9	9.8	7.7	18.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	33.9	9.8	7.7	18.0
Queue Length 50th (ft)	128	85	45	135
Queue Length 95th (ft)	215	184	121	325
Internal Link Dist (ft)	727	1542		692
Turn Bay Length (ft)			50	
Base Capacity (vph)	865	1322	1024	876
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.32	0.33	0.59

Intersection Summary

7: Main St & Franklin St & Central St  
 HCM Signalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday PM

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL	SWR
Lane Configurations	W			↑	↑				↓		
Volume (vph)	106	174	19	405	147	169	22	156	307	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	13	12	12	14	14	14	12	12
Grade (%)	4%			3%					1%	0%	
Total Lost time (s)	5.0			5.0	5.0				5.0		
Lane Util. Factor	1.00			1.00	1.00				1.00		
Frpb, ped/bikes	0.91			1.00	0.93				1.00		
Flpb, ped/bikes	1.00			1.00	1.00				0.99		
Frt	0.91			1.00	0.85				1.00		
Flt Protected	0.98			1.00	1.00				0.98		
Satd. Flow (prot)	1547			1934	1469				1916		
Flt Permitted	0.98			1.00	1.00				0.66		
Satd. Flow (perm)	1547			1934	1469				1285		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.94	0.94	0.94	0.25	0.25
Adj. Flow (vph)	112	183	20	426	155	178	23	166	327	0	0
RTOR Reduction (vph)	0	0	0	0	39	0	0	0	0	0	0
Lane Group Flow (vph)	315	0	0	426	294	0	0	0	516	0	0
Confl. Peds. (#/hr)	31	33	37		30	31	32	33			
Heavy Vehicles (%)	4%	5%	0%	0%	0%	1%	0%	3%	2%	0%	0%
Turn Type	Prot			NA	Perm		Perm	Perm	NA		
Protected Phases	6			4					8		
Permitted Phases	6			4	4		8	8			
Actuated Green, G (s)	18.2			38.5	38.5				38.5		
Effective Green, g (s)	18.2			38.5	38.5				38.5		
Actuated g/C Ratio	0.27			0.58	0.58				0.58		
Clearance Time (s)	5.0			5.0	5.0				5.0		
Vehicle Extension (s)	2.0			2.0	2.0				2.0		
Lane Grp Cap (vph)	422			1116	847				741		
v/s Ratio Prot	c0.20			0.22							
v/s Ratio Perm					0.20				c0.40		
v/c Ratio	0.75			0.38	0.35				0.70		
Uniform Delay, d1	22.1			7.6	7.5				10.0		
Progression Factor	1.00			1.00	1.00				1.00		
Incremental Delay, d2	6.2			0.1	0.1				2.3		
Delay (s)	28.3			7.7	7.5				12.3		
Level of Service	C			A	A				B		
Approach Delay (s)	28.3			7.6					12.3	0.0	
Approach LOS	C			A					B	A	

Intersection Summary

HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	66.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

7: Main St & Franklin St & Central St  
Timing Report, Sorted By Phase

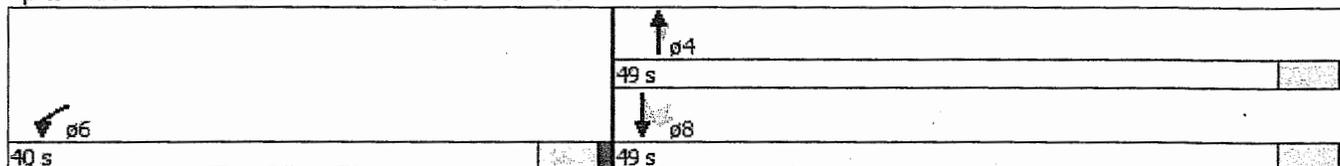
2018 No-Build  
Timing Plan: Weekday PM

	↑	↙	↓
Phase Number	4	6	8
Movement	NBT	WBL	SBTL
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	None	None	None
Maximum Split (s)	49	40	49
Maximum Split (%)	55.1%	44.9%	55.1%
Minimum Split (s)	10	10	10
Yellow Time (s)	4	4	4
All-Red Time (s)	1	1	1
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	2	2	2
Minimum Gap (s)	2	2	2
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			
Flash Dont Walk (s)			
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	40	0	40
End Time (s)	0	40	0
Yield/Force Off (s)	84	35	84
Yield/Force Off 170(s)	84	35	84
Local Start Time (s)	40	0	40
Local Yield (s)	84	35	84
Local Yield 170(s)	84	35	84

Intersection Summary

Cycle Length	89
Control Type	Actuated-Uncoordinated
Natural Cycle	55

Splits and Phases: 7: Main St & Franklin St & Central St





8: Main St & Marble St/Summer St  
Queues

2018 No-Build  
Timing Plan: Weekday PM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	441	278	794	387
v/c Ratio	0.84	0.77	0.78	0.39
Control Delay	46.0	45.2	29.2	21.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.0	45.2	29.2	21.1
Queue Length 50th (ft)	207	128	182	75
Queue Length 95th (ft)	#448	#248	256	111
Internal Link Dist (ft)	821	965	1441	57
Turn Bay Length (ft)				
Base Capacity (vph)	527	451	1804	1751
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.84	0.62	0.44	0.22

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

8: Main St & Marble St/Summer St  
 HCM Signalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	108	272	26	99	119	27	30	474	226	19	231	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	12	12	12	12	12	12	11	12	13
Grade (%)		1%			2%			0%			1%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frb, ped/bikes		1.00			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.98			0.95			0.96	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		2013			1733			3318			3354	
Flt Permitted		0.99			0.98			0.92			0.89	
Satd. Flow (perm)		2013			1733			3068			2980	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	117	296	28	112	135	31	33	515	246	22	266	99
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	439	0	0	278	0	0	794	0	0	387	0
Confl. Peds. (#/hr)	7		6	7		8	6		7	8		7
Heavy Vehicles (%)	4%	4%	4%	3%	5%	8%	0%	2%	4%	0%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)		20.3			16.4			26.0			26.0	
Effective Green, g (s)		20.3			16.4			26.0			26.0	
Actuated g/C Ratio		0.26			0.21			0.33			0.33	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		525			365			1026			997	
v/s Ratio Prot		c0.22			c0.16							
v/s Ratio Perm								c0.26			0.13	
v/c Ratio		0.84			0.76			0.77			0.39	
Uniform Delay, d1		27.1			28.8			23.2			19.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		10.6			8.2			3.4			0.1	
Delay (s)		37.7			37.0			26.6			19.9	
Level of Service		D			D			C			B	
Approach Delay (s)		37.7			37.0			26.6			19.9	
Approach LOS		D			D			C			B	

Intersection Summary

HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

8: Main St & Marble St/Summer St  
Timing Report, Sorted By Phase

2018 No-Build  
Timing Plan: Weekday PM



Phase Number	2	4	6	8
Movement	NBTL	WBTL	SBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	50	25	50	25
Maximum Split (%)	50.0%	25.0%	50.0%	25.0%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	50	0	75
End Time (s)	50	75	50	0
Yield/Force Off (s)	45	70	45	95
Yield/Force Off 170(s)	45	70	45	95
Local Start Time (s)	0	50	0	75
Local Yield (s)	45	70	45	95
Local Yield 170(s)	45	70	45	95

Intersection Summary

Cycle Length	100
Control Type	Actuated-Uncoordinated
Natural Cycle	60

Splits and Phases: 8: Main St & Marble St/Summer St

φ2	φ4	φ8
50 s	25 s	25 s
φ6		
50 s		

9: Pond St & Summer St  
Queues

2018 No-Build  
Timing Plan: Weekday PM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	589	276	443	62
v/c Ratio	0.77	0.41	0.69	0.09
Control Delay	21.0	13.4	20.2	11.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.0	13.4	20.2	11.4
Queue Length 50th (ft)	125	49	98	11
Queue Length 95th (ft)	318	135	229	28
Internal Link Dist (ft)	965	569	871	731
Turn Bay Length (ft)				
Base Capacity (vph)	1289	1123	1183	1250
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.46	0.25	0.37	0.05
Intersection Summary				

9: Pond St & Summer St  
 HCM Signalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday PM

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Volume (vph)	9	477	61	56	192	1	50	235	118	1	37	7		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	13	13	13	15	15	15	12	12	12	12	12	12		
Grade (%)		-2%			1%			-1%			0%			
Total Lost time (s)		5.0			5.0			5.0			5.0			
Lane Util. Factor		1.00			1.00			1.00			1.00			
Frbp, ped/bikes		1.00			1.00			0.99			1.00			
Flpb, ped/bikes		1.00			1.00			1.00			1.00			
Frt		0.98			1.00			0.96			0.98			
Flt Protected		1.00			0.99			0.99			1.00			
Satd. Flow (prot)		1908			2008			1808			1850			
Flt Permitted		0.99			0.81			0.96			0.99			
Satd. Flow (perm)		1897			1652			1741			1840			
Peak-hour factor, PHF	0.93	0.93	0.93	0.90	0.90	0.90	0.91	0.91	0.91	0.72	0.72	0.72		
Adj. Flow (vph)	10	513	66	62	213	1	55	258	130	1	51	10		
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0		
Lane Group Flow (vph)	0	589	0	0	276	0	0	443	0	0	62	0		
Confl. Peds. (#/hr)	2		3	3		2	3		3	2		2		
Confl. Bikes (#/hr)			1						1					
Heavy Vehicles (%)	0%	2%	2%	0%	3%	0%	0%	0%	0%	0%	0%	0%		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA			
Protected Phases		2			6			8			4			
Permitted Phases	2			6			8			4				
Actuated Green, G (s)		19.5			19.5			17.7			17.7			
Effective Green, g (s)		19.5			19.5			17.7			17.7			
Actuated g/C Ratio		0.41			0.41			0.37			0.37			
Clearance Time (s)		5.0			5.0			5.0			5.0			
Vehicle Extension (s)		2.0			2.0			2.0			2.0			
Lane Grp Cap (vph)		783			682			652			690			
v/s Ratio Prot														
v/s Ratio Perm		c0.31			0.17			c0.25			0.03			
v/c Ratio		0.75			0.40			0.68			0.09			
Uniform Delay, d1		11.8			9.8			12.4			9.5			
Progression Factor		1.00			1.00			1.00			1.00			
Incremental Delay, d2		3.6			0.1			2.2			0.0			
Delay (s)		15.4			9.9			14.6			9.6			
Level of Service		B			A			B			A			
Approach Delay (s)		15.4			9.9			14.6			9.6			
Approach LOS		B			A			B			A			
Intersection Summary														
HCM 2000 Control Delay			13.8									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.72											
Actuated Cycle Length (s)			47.2							10.0				
Intersection Capacity Utilization			82.3%										ICU Level of Service	E
Analysis Period (min)			15											
c Critical Lane Group														

9: Pond St & Summer St  
 Timing Report, Sorted By Phase

2018 No-Build  
 Timing Plan: Weekday PM

				
Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	35	35	35	35
Maximum Split (%)	50.0%	50.0%	50.0%	50.0%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	35	0	35
End Time (s)	35	0	35	0
Yield/Force Off (s)	30	65	30	65
Yield/Force Off 170(s)	30	65	30	65
Local Start Time (s)	0	35	0	35
Local Yield (s)	30	65	30	65
Local Yield 170(s)	30	65	30	65

Intersection Summary

Cycle Length	70
Control Type	Actuated-Uncoordinated
Natural Cycle	50

Splits and Phases: 9: Pond St & Summer St

 ϕ2	 ϕ4
35 s	35 s
 ϕ6	 ϕ8
35 s	35 s

10: Franklin St & Site Driveway  
 HCM Unsignalized Intersection Capacity Analysis

2018 No-Build  
 Timing Plan: Weekday PM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	1139	781	2	2	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	1266	868	2	2	1
Pedestrians		8	8		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		1	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		733				
pX, platoon unblocked					0.37	
vC, conflicting volume	878				2157	885
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	878				3291	885
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				36	100
cM capacity (veh/h)	764				3	339
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	1269	870	2	1		
Volume Left	3	0	2	0		
Volume Right	0	2	0	1		
cSH	764	1700	3	339		
Volume to Capacity	0.00	0.51	0.64	0.00		
Queue Length 95th (ft)	0	0	21	0		
Control Delay (s)	0.2	0.0	1504.7	15.6		
Lane LOS	A		F	C		
Approach Delay (s)	0.2	0.0	1008.3			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			1.7			
Intersection Capacity Utilization			74.7%		ICU Level of Service	D
Analysis Period (min)			15			

1: Perkins St & Franklin St  
 HCM Unsignalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday AM

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	T			T	T	
Volume (veh/h)	403	208	37	616	130	24
Sign Control	Free			Free	Stop	
Grade	0%			1%	0%	
Peak Hour Factor	0.92	0.92	0.81	0.81	0.78	0.78
Hourly flow rate (vph)	438	226	46	760	167	31
Pedestrians	1				1	
Lane Width (ft)	12.0				15.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			665		1405	552
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			665		1405	552
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		0	94
cM capacity (veh/h)			933		146	537
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	664	806	197			
Volume Left	0	46	167			
Volume Right	226	0	31			
cSH	1700	933	164			
Volume to Capacity	0.39	0.05	1.20			
Queue Length 95th (ft)	0	4	273			
Control Delay (s)	0.0	1.3	189.7			
Lane LOS		A	F			
Approach Delay (s)	0.0	1.3	189.7			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			23.1			
Intersection Capacity Utilization			78.0%	ICU Level of Service		D
Analysis Period (min)			15			

2: Franklin Pl & Franklin St  
Queues

2018 Build  
Timing Plan: Weekday AM

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	625	736	72	1141	649	128
v/c Ratio	0.65	0.50	0.19	0.96	1.32	0.19
Control Delay	20.0	1.4	7.7	35.8	190.5	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	1.4	7.7	35.8	190.5	0.6
Queue Length 50th (ft)	266	0	15	585	~555	0
Queue Length 95th (ft)	284	0	27	616	263	0
Internal Link Dist (ft)	574			678		
Turn Bay Length (ft)		135	145			
Base Capacity (vph)	984	1456	426	1287	491	680
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	0.64	0.51	0.17	0.89	1.32	0.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.

2: Franklin PI & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑		↖	↑	↗			
Volume (vph)	0	456	537	57	901	0	305	0	60	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	13	12	13	12	12	12
Grade (%)		-1%			0%			0%			0%	
Total Lost time (s)		5.0	5.0	5.0	5.0		5.0		5.0			
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Frb, ped/bikes		1.00	1.00	1.00	1.00		1.00		0.97			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		1792	1569	1768	1881		1865		1591			
Flt Permitted		1.00	1.00	0.25	1.00		0.95		1.00			
Satd. Flow (perm)		1792	1569	459	1881		1865		1591			
Peak-hour factor, PHF	0.73	0.73	0.73	0.79	0.79	0.79	0.47	0.47	0.47	0.25	0.25	0.25
Adj. Flow (vph)	0	625	736	72	1141	0	649	0	128	0	0	0
RTOR Reduction (vph)	0	0	113	0	0	0	0	0	95	0	0	0
Lane Group Flow (vph)	0	625	623	72	1141	0	649	0	33	0	0	0
Confl. Peds. (#/hr)			4	16			16		4			
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	3%	0%	2%	1%	0%	0%	0%	2%	0%	0%	0%
Turn Type		NA	pt+ov	pm+pt	NA		Prot		Perm			
Protected Phases		2	2 3	1	6		3	8				
Permitted Phases				6					8			
Actuated Green, G (s)		51.6	81.8	61.5	61.5		25.2		25.2			
Effective Green, g (s)		51.6	81.8	61.5	61.5		25.2		25.2			
Actuated g/C Ratio		0.53	0.85	0.64	0.64		0.26		0.26			
Clearance Time (s)		5.0		5.0	5.0		5.0		5.0			
Vehicle Extension (s)		2.0		2.0	2.0		2.0		2.0			
Lane Grp Cap (vph)		956	1327	358	1196		486		414			
v/s Ratio Prot		0.35	0.40	0.01	c0.61		c0.35					
v/s Ratio Perm				0.12					0.02			
v/c Ratio		0.65	0.47	0.20	0.95		1.34		0.08			
Uniform Delay, d1		16.2	1.9	10.0	16.3		35.8		27.0			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		1.2	0.1	0.1	16.0		164.5		0.0			
Delay (s)		17.4	2.0	10.1	32.3		200.2		27.0			
Level of Service		B	A	B	C		F		C			
Approach Delay (s)		9.1			31.0		171.7				0.0	
Approach LOS		A			C		F				A	

Intersection Summary

HCM 2000 Control Delay	54.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	96.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

2: Franklin PI & Franklin St  
Timing Report, Sorted By Phase

2018 Build  
Timing Plan: Weekday AM

					
Phase Number	1	2	3	6	8
Movement	WBL	EBT	NBL	WBTL	NBT
Lead/Lag	Lead	Lag			
Lead-Lag Optimize					
Recall Mode	None	Min	None	Min	None
Maximum Split (s)	15	55	30	70	30
Maximum Split (%)	15.0%	55.0%	30.0%	70.0%	30.0%
Minimum Split (s)	10	10	10	10	10
Yellow Time (s)	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1
Minimum Initial (s)	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)					
Flash Dont Walk (s)					
Dual Entry	No	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	15	70	0	70
End Time (s)	15	70	0	70	0
Yield/Force Off (s)	10	65	95	65	95
Yield/Force Off 170(s)	10	65	95	65	95
Local Start Time (s)	85	0	55	85	55
Local Yield (s)	95	50	80	50	80
Local Yield 170(s)	95	50	80	50	80

Intersection Summary

Cycle Length	100
Control Type	Actuated-Uncoordinated
Natural Cycle	140

Splits and Phases: 2: Franklin PI & Franklin St

 ϕ1	 ϕ2	 ϕ3
15 s	55 s	30 s
 ϕ6		 ϕ8
70 s		30 s

3: Res Complex/Dunkins & Franklin St  
 HCM Unsignalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	26	997	0	1	1092	52	6	0	10	19	1	64
Sign Control		Free			Free			Stop			Stop	
Grade		-1%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.95	0.95	0.95	0.67	0.67	0.67	0.75	0.75	0.75
Hourly flow rate (vph)	36	1385	0	1	1149	55	9	0	15	25	1	85
Pedestrians		12			12			3			12	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1084			654							
pX, platoon unblocked	0.48			0.82			0.57	0.57	0.82	0.57	0.57	0.48
vC, conflicting volume	1216			1388			2737	2678	1400	2675	2651	1201
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	906			1363			2955	2852	1377	2846	2804	874
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			100			0	100	90	0	86	48
cM capacity (veh/h)	351			417			2	9	145	5	9	163
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1421	1205	24	112								
Volume Left	36	1	9	25								
Volume Right	0	55	15	85								
cSH	351	417	5	20								
Volume to Capacity	0.10	0.00	4.57	5.69								
Queue Length 95th (ft)	9	0	Err	Err								
Control Delay (s)	9.3	0.1	Err	Err								
Lane LOS	A	A	F	F								
Approach Delay (s)	9.3	0.1	Err	Err								
Approach LOS			F	F								

Intersection Summary

Average Delay		496.8		
Intersection Capacity Utilization		88.4%	ICU Level of Service	E
Analysis Period (min)		15		

4: Franklin St & Pleasant St  
 HCM Unsignalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	3	586	772	348	189	12
Sign Control		Free	Free		Stop	
Grade		4%	0%		-4%	
Peak Hour Factor	0.88	0.88	0.90	0.90	0.89	0.89
Hourly flow rate (vph)	3	666	858	387	212	13
Pedestrians			1		1	
Lane Width (ft)			13.0		14.0	
Walking Speed (ft/s)			4.0		4.0	
Percent Blockage			0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		482	1256			
pX, platoon unblocked	0.55				0.65	0.55
vC, conflicting volume	1245				1726	1052
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1033				1135	679
tC, single (s)	4.8				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.8				3.5	3.3
p0 queue free %	99				0	95
cM capacity (veh/h)	259				143	248
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	3	666	1244	226		
Volume Left	3	0	0	212		
Volume Right	0	0	387	13		
cSH	259	1700	1700	146		
Volume to Capacity	0.01	0.39	0.73	1.54		
Queue Length 95th (ft)	1	0	0	386		
Control Delay (s)	19.1	0.0	0.0	330.4		
Lane LOS	C			F		
Approach Delay (s)	0.1		0.0	330.4		
Approach LOS				F		
<b>Intersection Summary</b>						
Average Delay			34.9			
Intersection Capacity Utilization			79.7%		ICU Level of Service	D
Analysis Period (min)			15			

5: Summer St & Franklin St  
Queues

2018 Build  
Timing Plan: Weekday AM

						
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	440	206	692	304	483
v/c Ratio	0.09	0.74	0.51	0.81	0.44	0.80
Control Delay	11.5	31.1	15.5	29.6	11.2	31.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	31.1	15.5	29.6	11.2	31.9
Queue Length 50th (ft)	4	164	43	211	46	175
Queue Length 95th (ft)	16	266	109	#639	112	318
Internal Link Dist (ft)		984		402	380	774
Turn Bay Length (ft)	70		100			
Base Capacity (vph)	356	785	426	858	1038	972
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	0.06	0.56	0.48	0.81	0.29	0.50

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

5: Summer St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday AM

Movement												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	331	8	185	621	2	13	71	183	30	346	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	11	11	14	14	14	12	12	12
Grade (%)		3%			-6%			-2%			3%	
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.91			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1719	1761		1718	1836			1812			1824	
Flt Permitted	0.20	1.00		0.28	1.00			0.97			0.96	
Satd. Flow (perm)	357	1761		503	1836			1767			1761	
Peak-hour factor, PHF	0.77	0.77	0.77	0.90	0.90	0.90	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	23	430	10	206	690	2	15	81	208	34	389	60
RTOR Reduction (vph)	0	1	0	0	0	0	0	99	0	0	7	0
Lane Group Flow (vph)	23	439	0	206	692	0	0	205	0	0	476	0
Confl. Peds. (#/hr)	1		2	2		1	2		2	1		1
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	0%	6%	0%	1%	3%	0%	0%	0%	1%	0%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	28.4	26.5		38.6	32.7			23.6			23.6	
Effective Green, g (s)	28.4	26.5		38.6	32.7			23.6			23.6	
Actuated g/C Ratio	0.39	0.37		0.53	0.45			0.33			0.33	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	176	646		405	831			577			575	
v/s Ratio Prot	0.00	0.25		c0.06	c0.38							
v/s Ratio Perm	0.05			0.21				0.12			c0.27	
v/c Ratio	0.13	0.68		0.51	0.83			0.36			0.83	
Uniform Delay, d1	14.8	19.3		10.6	17.3			18.5			22.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	2.4		0.4	6.9			0.1			9.1	
Delay (s)	14.9	21.6		10.9	24.2			18.6			31.6	
Level of Service	B	C		B	C			B			C	
Approach Delay (s)		21.3			21.2			18.6			31.6	
Approach LOS		C			C			B			C	

Intersection Summary

HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

5: Summer St & Franklin St  
Timing Report, Sorted By Phase

2018 Build  
Timing Plan: Weekday AM

						
Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	None	None	None	None	None
Maximum Split (s)	13	35	42	13	35	42
Maximum Split (%)	14.4%	38.9%	46.7%	14.4%	38.9%	46.7%
Minimum Split (s)	9	10	10	9	10	10
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	0	1	1	0	1	1
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	13	48	0	13	48
End Time (s)	13	48	0	13	48	0
Yield/Force Off (s)	9	43	85	9	43	85
Yield/Force Off 170(s)	9	43	85	9	43	85
Local Start Time (s)	77	0	35	77	0	35
Local Yield (s)	86	30	72	86	30	72
Local Yield 170(s)	86	30	72	86	30	72

Intersection Summary

Cycle Length	90
Control Type	Actuated-Uncoordinated
Natural Cycle	75

Splits and Phases: 5: Summer St & Franklin St

 φ1	 φ2	 φ4
13 s	35 s	42 s
 φ5	 φ6	 φ8
13 s	35 s	42 s

6: Pine St & Franklin St  
Queues

2018 Build  
Timing Plan: Weekday AM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	277	858	114	541
v/c Ratio	0.33	0.88	0.16	0.90
Control Delay	11.3	26.3	17.1	44.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.3	26.3	17.1	44.1
Queue Length 50th (ft)	66	296	28	211
Queue Length 95th (ft)	87	446	58	#517
Internal Link Dist (ft)	727	984	947	646
Turn Bay Length (ft)				
Base Capacity (vph)	1212	1414	691	604
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.61	0.16	0.90

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

6: Pine St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	202	3	38	587	148	7	57	16	219	189	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	15	15	15	15	15	15	15	15	15
Grade (%)		2%			-3%			5%			1%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frb, ped/bikes		1.00			0.99			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		1.00			0.97			0.97			0.98	
Flt Protected		1.00			1.00			1.00			0.98	
Satd. Flow (prot)		1729			2020			1961			1966	
Flt Permitted		0.98			0.97			0.95			0.82	
Satd. Flow (perm)		1697			1971			1871			1640	
Peak-hour factor, PHF	0.76	0.76	0.76	0.90	0.90	0.90	0.70	0.70	0.70	0.90	0.90	0.90
Adj. Flow (vph)	7	266	4	42	652	164	10	81	23	243	210	88
RTOR Reduction (vph)	0	1	0	0	12	0	0	10	0	0	8	0
Lane Group Flow (vph)	0	276	0	0	846	0	0	104	0	0	533	0
Confl. Peds. (#/hr)	5		6	8		7	6		8	7		5
Heavy Vehicles (%)	20%	12%	0%	0%	2%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		34.2			34.2			25.5			25.5	
Effective Green, g (s)		34.2			34.2			25.5			25.5	
Actuated g/C Ratio		0.49			0.49			0.37			0.37	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		832			967			684			600	
v/s Ratio Prot												
v/s Ratio Perm		0.16			c0.43			0.06			c0.33	
v/c Ratio		0.33			0.87			0.15			0.89	
Uniform Delay, d1		10.8			15.8			14.8			20.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			8.6			0.0			14.6	
Delay (s)		10.9			24.5			14.9			35.3	
Level of Service		B			C			B			D	
Approach Delay (s)		10.9			24.5			14.9			35.3	
Approach LOS		B			C			B			D	

Intersection Summary

HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	69.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

6: Pine St & Franklin St  
Timing Report, Sorted By Phase

2018 Build  
Timing Plan: Weekday AM



Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	54	30	54	30
Maximum Split (%)	64.3%	35.7%	64.3%	35.7%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	54	0	54
End Time (s)	54	0	54	0
Yield/Force Off (s)	49	79	49	79
Yield/Force Off 170(s)	49	79	49	79
Local Start Time (s)	0	54	0	54
Local Yield (s)	49	79	49	79
Local Yield 170(s)	49	79	49	79

Intersection Summary

Cycle Length	84
Control Type	Actuated-Uncoordinated
Natural Cycle	75

Splits and Phases: 6: Pine St & Franklin St

ø2	ø4
54 s	30 s
ø6	ø8
54 s	30 s

7: Main St & Franklin St & Central St  
Queues

2018 Build  
Timing Plan: Weekday AM

	↙	↑	↗	↓
Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	688	406	286	802
v/c Ratio	0.95	0.47	0.39	1.21
Control Delay	50.0	18.4	13.8	133.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	50.0	18.4	13.8	133.1
Queue Length 50th (ft)	354	152	78	~565
Queue Length 95th (ft)	#570	198	117	#785
Internal Link Dist (ft)	727	1542		692
Turn Bay Length (ft)			50	
Base Capacity (vph)	764	861	734	663
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.90	0.47	0.39	1.21

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

7: Main St & Franklin St & Central St  
 HCM Signalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday AM

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL	SWR
Lane Configurations	W			T	T				T		
Volume (vph)	361	245	6	325	126	102	2	111	609	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	13	12	12	14	14	14	12	12
Grade (%)	4%			3%					1%	0%	
Total Lost time (s)	5.0			5.0	5.0				5.0		
Lane Util. Factor	1.00			1.00	1.00				1.00		
Frbp, ped/bikes	0.99			1.00	0.97				1.00		
Flpb, ped/bikes	1.00			1.00	1.00				1.00		
Frt	0.94			1.00	0.85				1.00		
Flt Protected	0.97			1.00	1.00				0.99		
Satd. Flow (prot)	1749			1824	1489				1893		
Flt Permitted	0.97			1.00	1.00				0.74		
Satd. Flow (perm)	1749			1824	1489				1406		
Peak-hour factor, PHF	0.89	0.89	0.89	0.80	0.80	0.80	0.90	0.90	0.90	0.25	0.25
Adj. Flow (vph)	406	275	7	406	158	128	2	123	677	0	0
RTOR Reduction (vph)	0	0	0	0	32	0	0	0	0	0	0
Lane Group Flow (vph)	688	0	0	406	254	0	0	0	802	0	0
Confl. Peds. (#/hr)	3	7	4		3	3	7	7			
Heavy Vehicles (%)	2%	4%	0%	6%	0%	9%	0%	20%	3%	0%	0%
Turn Type	Prot			NA	Perm		Perm	Perm	NA		
Protected Phases	6			4					8		
Permitted Phases	6			4	4		8	8			
Actuated Green, G (s)	35.9			41.1	41.1				41.1		
Effective Green, g (s)	35.9			41.1	41.1				41.1		
Actuated g/C Ratio	0.41			0.47	0.47				0.47		
Clearance Time (s)	5.0			5.0	5.0				5.0		
Vehicle Extension (s)	2.0			2.0	2.0				2.0		
Lane Grp Cap (vph)	721			861	703				664		
v/s Ratio Prot	c0.39			0.22							
v/s Ratio Perm					0.17				c0.57		
v/c Ratio	0.95			0.47	0.36				1.21		
Uniform Delay, d1	24.8			15.6	14.6				22.9		
Progression Factor	1.00			1.00	1.00				1.00		
Incremental Delay, d2	22.6			0.1	0.1				107.3		
Delay (s)	47.3			15.7	14.7				130.2		
Level of Service	D			B	B				F		
Approach Delay (s)	47.3			15.3					130.2	0.0	
Approach LOS	D			B					F	A	
<b>Intersection Summary</b>											
HCM 2000 Control Delay			67.6		HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			1.09								
Actuated Cycle Length (s)			87.0		Sum of lost time (s)				10.0		
Intersection Capacity Utilization			103.6%		ICU Level of Service				G		
Analysis Period (min)			15								
c Critical Lane Group											

7: Main St & Franklin St & Central St  
 Timing Report, Sorted By Phase

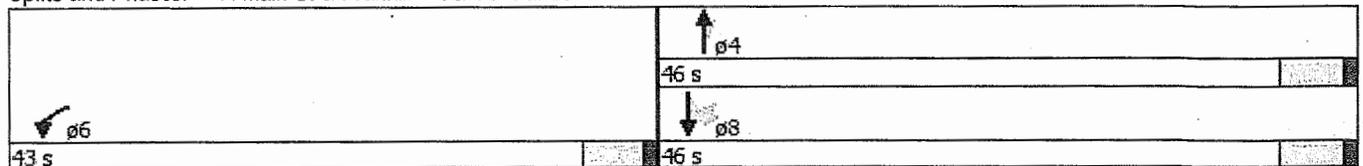
2018 Build  
 Timing Plan: Weekday AM

	↑ 4	↙ 6	↓ 8
Phase Number	4	6	8
Movement	NBT	WBL	SBTL
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	None	None	None
Maximum Split (s)	46	43	46
Maximum Split (%)	51.7%	48.3%	51.7%
Minimum Split (s)	10	10	10
Yellow Time (s)	4	4	4
All-Red Time (s)	1	1	1
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	2	2	2
Minimum Gap (s)	2	2	2
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			
Flash Dont Walk (s)			
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	43	0	43
End Time (s)	0	43	0
Yield/Force Off (s)	84	38	84
Yield/Force Off 170(s)	84	38	84
Local Start Time (s)	43	0	43
Local Yield (s)	84	38	84
Local Yield 170(s)	84	38	84

Intersection Summary

Cycle Length	89
Control Type	Actuated-Uncoordinated
Natural Cycle	90

Splits and Phases: 7: Main St & Franklin St & Central St



8: Main St & Marble St/Summer St  
Queues

2018 Build  
Timing Plan: Weekday AM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	353	364	638	1054
v/c Ratio	0.86	0.90	0.75	0.85
Control Delay	54.9	62.5	29.3	31.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	54.9	62.5	29.3	31.8
Queue Length 50th (ft)	185	210	164	286
Queue Length 95th (ft)	#364	#423	222	356
Internal Link Dist (ft)	821	965	1441	57
Turn Bay Length (ft)				
Base Capacity (vph)	455	406	1068	1565
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.78	0.90	0.60	0.67

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

8: Main St & Marble St/Summer St  
 HCM Signalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday AM

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↕			↕			↕			↕			
Volume (vph)	75	141	112	106	215	14	65	410	86	34	761	132		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	16	16	16	12	12	12	12	12	12	11	12	13		
Grade (%)		1%			2%			0%			1%			
Total Lost time (s)		5.0			5.0			5.0			5.0			
Lane Util. Factor		1.00			1.00			0.95			0.95			
Frbp, ped/bikes		0.99			1.00			0.99			0.99			
Flpb, ped/bikes		1.00			1.00			1.00			1.00			
Frt		0.95			0.99			0.98			0.98			
Flt Protected		0.99			0.98			0.99			1.00			
Satd. Flow (prot)		1940			1803			3409			3392			
Flt Permitted		0.99			0.98			0.61			0.91			
Satd. Flow (perm)		1940			1803			2102			3078			
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88		
Adj. Flow (vph)	81	152	120	115	234	15	74	466	98	39	865	150		
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	0	0	0	0		
Lane Group Flow (vph)	0	335	0	0	364	0	0	638	0	0	1054	0		
Confl. Peds. (#/hr)	25		21	29			33	21		29	33	25		
Confl. Bikes (#/hr)			1				1							
Heavy Vehicles (%)	10%	0%	1%	2%	2%	0%	0%	2%	3%	0%	2%	7%		
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA			
Protected Phases	8	8		4	4			2			6			
Permitted Phases							2			6				
Actuated Green, G (s)		18.1			20.3			36.1			36.1			
Effective Green, g (s)		18.1			20.3			36.1			36.1			
Actuated g/C Ratio		0.20			0.23			0.40			0.40			
Clearance Time (s)		5.0			5.0			5.0			5.0			
Vehicle Extension (s)		2.0			2.0			2.0			2.0			
Lane Grp Cap (vph)		392			408			847			1241			
v/s Ratio Prot		c0.17			c0.20									
v/s Ratio Perm								0.30			c0.34			
v/c Ratio		0.85			0.89			0.75			0.85			
Uniform Delay, d1		34.4			33.5			22.9			24.2			
Progression Factor		1.00			1.00			1.00			1.00			
Incremental Delay, d2		15.8			20.6			3.4			5.4			
Delay (s)		50.2			54.1			26.3			29.6			
Level of Service		D			D			C			C			
Approach Delay (s)		50.2			54.1			26.3			29.6			
Approach LOS		D			D			C			C			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			35.5									HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio			0.86											
Actuated Cycle Length (s)			89.5							15.0				
Intersection Capacity Utilization			83.0%										ICU Level of Service	E
Analysis Period (min)			15											
c Critical Lane Group														

8: Main St & Marble St/Summer St  
Timing Report, Sorted By Phase

2018 Build  
Timing Plan: Weekday AM



Phase Number	2	4	6	8
Movement	NBTL	WBTL	SBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	50	25	50	25
Maximum Split (%)	50.0%	25.0%	50.0%	25.0%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	50	0	75
End Time (s)	50	75	50	0
Yield/Force Off (s)	45	70	45	95
Yield/Force Off 170(s)	45	70	45	95
Local Start Time (s)	0	50	0	75
Local Yield (s)	45	70	45	95
Local Yield 170(s)	45	70	45	95

Intersection Summary

Cycle Length	100
Control Type	Actuated-Uncoordinated
Natural Cycle	75

Splits and Phases: 8: Main St & Marble St/Summer St

ø2	ø4	ø8
50 s	25 s	25 s
ø6		
50 s		

9: Pond St & Summer St  
Queues

2018 Build  
Timing Plan: Weekday AM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	331	606	440	164
v/c Ratio	0.37	0.85	0.83	0.26
Control Delay	12.8	30.2	32.6	14.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.8	30.2	32.6	14.9
Queue Length 50th (ft)	72	183	145	42
Queue Length 95th (ft)	143	#454	190	76
Internal Link Dist (ft)	965	569	871	731
Turn Bay Length (ft)				
Base Capacity (vph)	884	716	761	918
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.37	0.85	0.58	0.18

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

9: Pond St & Summer St  
 HCM Signalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	161	108	247	322	13	111	179	49	1	136	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	15	15	15	12	12	12	12	12	12
Grade (%)		-2%			1%			-1%			0%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.95			1.00			0.98			0.99	
Flt Protected		1.00			0.98			0.98			1.00	
Satd. Flow (prot)		1814			1993			1798			1868	
Flt Permitted		0.99			0.71			0.84			1.00	
Satd. Flow (perm)		1795			1453			1543			1864	
Peak-hour factor, PHF	0.83	0.83	0.83	0.96	0.96	0.96	0.77	0.77	0.77	0.87	0.87	0.87
Adj. Flow (vph)	7	194	130	257	335	14	144	232	64	1	156	7
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	331	0	0	606	0	0	440	0	0	164	0
Confl. Peds. (#/hr)	12		11	18		19	11		18	19		12
Heavy Vehicles (%)	0%	3%	1%	0%	2%	8%	1%	2%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		30.3			30.3			21.1			21.1	
Effective Green, g (s)		30.3			30.3			21.1			21.1	
Actuated g/C Ratio		0.49			0.49			0.34			0.34	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		885			717			530			640	
v/s Ratio Prot												
v/s Ratio Perm		0.18			0.42			0.29			0.09	
v/c Ratio		0.37			0.85			0.83			0.26	
Uniform Delay, d1		9.7			13.5			18.5			14.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			8.7			10.2			0.1	
Delay (s)		9.8			22.2			28.7			14.6	
Level of Service		A			C			C			B	
Approach Delay (s)		9.8			22.2			28.7			14.6	
Approach LOS		A			C			C			B	

Intersection Summary

HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	61.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

9: Pond St & Summer St  
Timing Report, Sorted By Phase

2018 Build  
Timing Plan: Weekday AM

				
Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	35	35	35	35
Maximum Split (%)	50.0%	50.0%	50.0%	50.0%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	35	0	35
End Time (s)	35	0	35	0
Yield/Force Off (s)	30	65	30	65
Yield/Force Off 170(s)	30	65	30	65
Local Start Time (s)	0	35	0	35
Local Yield (s)	30	65	30	65
Local Yield 170(s)	30	65	30	65

Intersection Summary

Cycle Length	70
Control Type	Actuated-Uncoordinated
Natural Cycle	55

Splits and Phases: 9: Pond St & Summer St

 p2	 p4
35 s	35 s
 p6	 p8
35 s	35 s

10: Franklin St & Site Driveway  
 HCM Unsignalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	26	490	860	3	11	98
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	29	544	956	3	12	109
Pedestrians		1	1		1	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		758				
pX, platoon unblocked					0.80	
vC, conflicting volume	960				1561	959
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	960				1577	959
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				87	65
cM capacity (veh/h)	716				92	311
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	573	959	12	109		
Volume Left	29	0	12	0		
Volume Right	0	3	0	109		
cSH	716	1700	92	311		
Volume to Capacity	0.04	0.56	0.13	0.35		
Queue Length 95th (ft)	3	0	11	38		
Control Delay (s)	1.1	0.0	50.1	22.7		
Lane LOS	A		F	C		
Approach Delay (s)	1.1	0.0	25.4			
Approach LOS			D			
<b>Intersection Summary</b>						
Average Delay			2.2			
Intersection Capacity Utilization			58.5%		ICU Level of Service	B
Analysis Period (min)			15			

1: Perkins St & Franklin St  
 HCM Unsignalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday PM

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	
Volume (veh/h)	779	205	14	465	207	23
Sign Control	Free			Free	Stop	
Grade	0%			1%	0%	
Peak Hour Factor	0.94	0.94	0.96	0.96	0.86	0.86
Hourly flow rate (vph)	829	218	15	484	241	27
Pedestrians	4			1	4	
Lane Width (ft)	12.0			14.0	15.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	0			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1051		1459	943
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1051		1459	943
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		0	92
cM capacity (veh/h)			667		138	320
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	1047	499	267			
Volume Left	0	15	241			
Volume Right	218	0	27			
cSH	1700	667	146			
Volume to Capacity	0.62	0.02	1.83			
Queue Length 95th (ft)	0	2	503			
Control Delay (s)	0.0	0.6	449.3			
Lane LOS		A	F			
Approach Delay (s)	0.0	0.6	449.3			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			66.4			
Intersection Capacity Utilization			73.1%	ICU Level of Service		D
Analysis Period (min)			15			

2: Franklin Pl & Franklin St  
Queues

2018 Build  
Timing Plan: Weekday PM

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1274	50	8	940	174	33
v/c Ratio	0.99	0.03	0.04	0.70	0.62	0.08
Control Delay	38.1	0.4	4.4	10.6	40.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	0.4	4.4	10.6	40.8	0.3
Queue Length 50th (ft)	432	0	1	199	74	0
Queue Length 95th (ft)	#1125	4	5	431	111	0
Internal Link Dist (ft)	590			660		
Turn Bay Length (ft)		135	145			
Base Capacity (vph)	1288	1541	306	1550	591	665
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	0.99	0.03	0.03	0.61	0.29	0.05

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

2: Franklin PI & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑		↖	↑	↗			
Volume (vph)	0	1223	48	7	837	0	122	0	23	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	13	12	13	12	12	12
Grade (%)		-1%			0%			0%			0%	
Total Lost time (s)		5.0	5.0	5.0	5.0		5.0		5.0			
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Frbp, ped/bikes		1.00	1.00	1.00	1.00		1.00		0.98			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		1846	1569	1805	1863		1847		1630			
Flt Permitted		1.00	1.00	0.07	1.00		0.95		1.00			
Satd. Flow (perm)		1846	1569	127	1863		1847		1630			
Peak-hour factor, PHF	0.96	0.96	0.96	0.89	0.89	0.89	0.70	0.70	0.70	0.25	0.25	0.25
Adj. Flow (vph)	0	1274	50	8	940	0	174	0	33	0	0	0
RTOR Reduction (vph)	0	0	6	0	0	0	0	0	28	0	0	0
Lane Group Flow (vph)	0	1274	44	8	940	0	174	0	5	0	0	0
Confl. Peds. (#/hr)			1	17			17		1			
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Turn Type		NA	pt+ov	pm+pt	NA		Prot		Perm			
Protected Phases		2	2 3	1	6		3	8				
Permitted Phases				6					8			
Actuated Green, G (s)		54.8	71.7	60.7	60.7		11.9		11.9			
Effective Green, g (s)		54.8	71.7	60.7	60.7		11.9		11.9			
Actuated g/C Ratio		0.66	0.87	0.73	0.73		0.14		0.14			
Clearance Time (s)		5.0		5.0	5.0		5.0		5.0			
Vehicle Extension (s)		2.0		2.0	2.0		2.0		2.0			
Lane Grp Cap (vph)		1224	1361	111	1369		266		234			
v/s Ratio Prot		c0.69	0.03	0.00	c0.50		c0.09					
v/s Ratio Perm				0.05					0.00			
v/c Ratio		1.04	0.03	0.07	0.69		0.65		0.02			
Uniform Delay, d1		13.9	0.7	21.8	5.9		33.4		30.3			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		37.0	0.0	0.1	1.2		4.4		0.0			
Delay (s)		50.9	0.7	21.9	7.0		37.8		30.4			
Level of Service		D	A	C	A		D		C			
Approach Delay (s)		49.0			7.1		36.6				0.0	
Approach LOS		D			A		D				A	

Intersection Summary

HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	82.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2: Franklin PI & Franklin St  
Timing Report, Sorted By Phase

2018 Build  
Timing Plan: Weekday PM

					
Phase Number	1	2	3	6	8
Movement	WBL	EBT	NBL	WBTL	NBT
Lead/Lag	Lead	Lag			
Lead-Lag Optimize					
Recall Mode	None	Min	None	Min	None
Maximum Split (s)	15	55	30	70	30
Maximum Split (%)	15.0%	55.0%	30.0%	70.0%	30.0%
Minimum Split (s)	10	10	10	10	10
Yellow Time (s)	4	4	4	4	4
All-Red Time (s)	1	1	1	1	1
Minimum Initial (s)	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)					
Flash Dont Walk (s)					
Dual Entry	No	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	15	70	0	70
End Time (s)	15	70	0	70	0
Yield/Force Off (s)	10	65	95	65	95
Yield/Force Off 170(s)	10	65	95	65	95
Local Start Time (s)	85	0	55	85	55
Local Yield (s)	95	50	80	50	80
Local Yield 170(s)	95	50	80	50	80

Intersection Summary

Cycle Length	100
Control Type	Actuated-Uncoordinated
Natural Cycle	90

Splits and Phases: 2: Franklin PI & Franklin St

 ϕ1	 ϕ2	 ϕ3
15 s	55 s	30 s
 ϕ6		 ϕ8
70 s		30 s

3: Res Complex/Dunkins & Franklin St  
 HCM Unsignalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday PM

Movement												
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	22	1267	10	4	942	12	6	0	3	9	1	22
Sign Control		Free			Free			Stop			Stop	
Grade		-1%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.75	0.75	0.75	0.57	0.57	0.57
Hourly flow rate (vph)	24	1362	11	4	1013	13	8	0	4	16	2	39
Pedestrians		9			9			8			9	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		1			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1071			670							
pX, platoon unblocked	0.67			0.70			0.82	0.82	0.70	0.82	0.82	0.67
vC, conflicting volume	1035			1381			2499	2466	1385	2465	2465	1037
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	808			1331			1899	1859	1336	1857	1857	812
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			76	100	97	63	97	84
cM capacity (veh/h)	551			366			34	57	131	42	57	249
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1397	1030	12	56								
Volume Left	24	4	8	16								
Volume Right	11	13	4	39								
cSH	551	366	45	101								
Volume to Capacity	0.04	0.01	0.27	0.56								
Queue Length 95th (ft)	3	1	22	65								
Control Delay (s)	2.8	0.5	112.2	78.6								
Lane LOS	A	A	F	F								
Approach Delay (s)	2.8	0.5	112.2	78.6								
Approach LOS			F	F								
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization			95.6%		ICU Level of Service				F			
Analysis Period (min)			15									

4: Franklin St & Pleasant St  
 HCM Unsignalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday PM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	949	491	330	297	7
Sign Control		Free	Free		Stop	
Grade		4%	0%		-4%	
Peak Hour Factor	0.94	0.94	0.88	0.88	0.87	0.87
Hourly flow rate (vph)	5	1010	558	375	341	8
Pedestrians		4	4		4	
Lane Width (ft)		10.5	13.0		14.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		482	1259			
pX, platoon unblocked	0.75				0.82	0.75
vC, conflicting volume	937				1774	753
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	749				1145	504
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				0	98
cM capacity (veh/h)	649				178	426
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	5	1010	933	349		
Volume Left	5	0	0	341		
Volume Right	0	0	375	8		
cSH	649	1700	1700	181		
Volume to Capacity	0.01	0.59	0.55	1.93		
Queue Length 95th (ft)	1	0	0	653		
Control Delay (s)	10.6	0.0	0.0	483.3		
Lane LOS	B			F		
Approach Delay (s)	0.1		0.0	483.3		
Approach LOS				F		
<b>Intersection Summary</b>						
Average Delay			73.5			
Intersection Capacity Utilization			73.5%	ICU Level of Service		D
Analysis Period (min)			15			

5: Summer St & Franklin St  
Queues

2018 Build  
Timing Plan: Weekday PM

						
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	68	585	171	460	730	257
v/c Ratio	0.20	0.91	0.75	0.65	0.93	0.49
Control Delay	13.7	46.3	37.8	28.1	41.8	21.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	46.3	37.8	28.1	41.8	21.3
Queue Length 50th (ft)	20	309	53	218	351	95
Queue Length 95th (ft)	42	#506	#140	317	#585	161
Internal Link Dist (ft)		984		402	380	774
Turn Bay Length (ft)	70		100			
Base Capacity (vph)	357	740	229	736	881	587
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	0.19	0.79	0.75	0.63	0.83	0.44

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

5: Summer St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	567	12	149	393	7	6	292	359	43	119	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	11	11	14	14	14	12	12	12
Grade (%)		3%			-6%			-2%			3%	
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.93			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1718	1847		1701	1832			1869			1770	
Flt Permitted	0.32	1.00		0.13	1.00			1.00			0.71	
Satd. Flow (perm)	583	1847		224	1832			1864			1277	
Peak-hour factor, PHF	0.99	0.99	0.99	0.87	0.87	0.87	0.90	0.90	0.90	0.88	0.88	0.88
Adj. Flow (vph)	68	573	12	171	452	8	7	324	399	49	135	73
RTOR Reduction (vph)	0	1	0	0	1	0	0	49	0	0	16	0
Lane Group Flow (vph)	68	584	0	171	459	0	0	681	0	0	241	0
Confl. Peds. (#/hr)	3		3	4		4	3		4	4		3
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	1%	0%	2%	3%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.3	30.4		39.7	32.6			33.3			33.3	
Effective Green, g (s)	35.3	30.4		39.7	32.6			33.3			33.3	
Actuated g/C Ratio	0.42	0.36		0.47	0.38			0.39			0.39	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	308	662		228	704			731			501	
v/s Ratio Prot	0.01	c0.32		c0.06	0.25							
v/s Ratio Perm	0.08			0.29				c0.37			0.19	
v/c Ratio	0.22	0.88		0.75	0.65			0.93			0.48	
Uniform Delay, d1	15.8	25.5		17.4	21.4			24.7			19.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	12.9		11.6	1.7			18.4			0.3	
Delay (s)	15.9	38.4		29.0	23.1			43.1			19.6	
Level of Service	B	D		C	C			D			B	
Approach Delay (s)		36.1			24.7			43.1			19.6	
Approach LOS		D			C			D			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			33.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			84.8			Sum of lost time (s)			14.0			
Intersection Capacity Utilization			92.1%			ICU Level of Service			F			
Analysis Period (min)			15									
c	Critical Lane Group											

5: Summer St & Franklin St  
Timing Report, Sorted By Phase

2018 Build  
Timing Plan: Weekday PM

Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	None	None	None	None	None
Maximum Split (s)	11	38	42	11	38	42
Maximum Split (%)	12.1%	41.8%	46.2%	12.1%	41.8%	46.2%
Minimum Split (s)	9	10	10	9	10	10
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	0	1	1	0	1	1
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	11	49	0	11	49
End Time (s)	11	49	0	11	49	0
Yield/Force Off (s)	7	44	86	7	44	86
Yield/Force Off 170(s)	7	44	86	7	44	86
Local Start Time (s)	80	0	38	80	0	38
Local Yield (s)	87	33	75	87	33	75
Local Yield 170(s)	87	33	75	87	33	75

Intersection Summary

Cycle Length	91
Control Type	Actuated-Uncoordinated
Natural Cycle	80

Splits and Phases: 5: Summer St & Franklin St

11 s	38 s	42 s
11 s	38 s	42 s

6: Pine St & Franklin St  
Queues

2018 Build  
Timing Plan: Weekday PM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	444	625	171	313
v/c Ratio	0.55	0.72	0.27	0.62
Control Delay	13.0	15.4	12.4	20.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.0	15.4	12.4	20.0
Queue Length 50th (ft)	76	106	27	64
Queue Length 95th (ft)	181	249	81	169
Internal Link Dist (ft)	727	984	947	646
Turn Bay Length (ft)				
Base Capacity (vph)	1689	1760	1125	900
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.36	0.15	0.35
Intersection Summary				

6: Pine St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday PM

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↕			↕			↕			↕			
Volume (vph)	16	362	9	21	326	191	7	104	46	172	64	43		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	13	13	13	15	15	15	15	15	15	15	15	15		
Grade (%)		2%			-3%			5%			1%			
Total Lost time (s)		5.0			5.0			5.0			5.0			
Lane Util. Factor		1.00			1.00			1.00			1.00			
Frbp, ped/bikes		1.00			0.99			0.99			0.99			
Flpb, ped/bikes		1.00			1.00			1.00			1.00			
Frt		1.00			0.95			0.96			0.98			
Flt Protected		1.00			1.00			1.00			0.97			
Satd. Flow (prot)		1914			1972			1929			1946			
Flt Permitted		0.97			0.97			0.98			0.76			
Satd. Flow (perm)		1855			1927			1893			1523			
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.92	0.92	0.92	0.89	0.89	0.89		
Adj. Flow (vph)	18	416	10	24	379	222	8	113	50	193	72	48		
RTOR Reduction (vph)	0	1	0	0	32	0	0	17	0	0	7	0		
Lane Group Flow (vph)	0	443	0	0	593	0	0	154	0	0	306	0		
Confl. Peds. (#/hr)	10		18	13		5	18		13	5		10		
Confl. Bikes (#/hr)						1								
Heavy Vehicles (%)	0%	1%	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA			
Protected Phases		2			6			8			4			
Permitted Phases	2			6			8			4				
Actuated Green, G (s)		20.3			20.3			15.3			15.3			
Effective Green, g (s)		20.3			20.3			15.3			15.3			
Actuated g/C Ratio		0.45			0.45			0.34			0.34			
Clearance Time (s)		5.0			5.0			5.0			5.0			
Vehicle Extension (s)		2.0			2.0			2.0			2.0			
Lane Grp Cap (vph)		825			857			635			511			
v/s Ratio Prot														
v/s Ratio Perm		0.24			0.31			0.08			0.20			
v/c Ratio		0.54			0.69			0.24			0.60			
Uniform Delay, d1		9.2			10.1			11.0			12.6			
Progression Factor		1.00			1.00			1.00			1.00			
Incremental Delay, d2		0.3			2.0			0.1			1.3			
Delay (s)		9.6			12.1			11.0			13.9			
Level of Service		A			B			B			B			
Approach Delay (s)		9.6			12.1			11.0			13.9			
Approach LOS		A			B			B			B			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			11.6									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.65											
Actuated Cycle Length (s)			45.6							10.0				
Intersection Capacity Utilization			74.4%										ICU Level of Service	D
Analysis Period (min)			15											
c Critical Lane Group														

6: Pine St & Franklin St  
Timing Report, Sorted By Phase

2018 Build  
Timing Plan: Weekday PM

				
Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	52	30	52	30
Maximum Split (%)	63.4%	36.6%	63.4%	36.6%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	52	0	52
End Time (s)	52	0	52	0
Yield/Force Off (s)	47	77	47	77
Yield/Force Off 170(s)	47	77	47	77
Local Start Time (s)	0	52	0	52
Local Yield (s)	47	77	47	77
Local Yield 170(s)	47	77	47	77

Intersection Summary

Cycle Length	82
Control Type	Actuated-Uncoordinated
Natural Cycle	50

Splits and Phases: 6: Pine St & Franklin St

 φ2	 φ4
52 s	30 s
 φ6	 φ8
52 s	30 s

7: Main St & Franklin St & Central St  
Queues

2018 Build  
Timing Plan: Weekday PM

	↙	↑	↗	↓
Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	353	426	363	552
v/c Ratio	0.80	0.37	0.40	0.78
Control Delay	39.6	10.5	8.3	24.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.6	10.5	8.3	24.1
Queue Length 50th (ft)	151	93	53	175
Queue Length 95th (ft)	242	201	143	#465
Internal Link Dist (ft)	727	1542		692
Turn Bay Length (ft)			50	
Base Capacity (vph)	747	1141	901	704
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.47	0.37	0.40	0.78

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

7: Main St & Franklin St & Central St  
 HCM Signalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday PM

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL	SWR
Lane Configurations	WT			↑	↑				↑		
Volume (vph)	123	194	19	405	147	198	22	190	307	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	13	12	12	14	14	14	12	12
Grade (%)	4%			3%					1%	0%	
Total Lost time (s)	5.0			5.0	5.0				5.0		
Lane Util. Factor	1.00			1.00	1.00				1.00		
Frpb, ped/bikes	0.91			1.00	0.93				1.00		
Flpb, ped/bikes	1.00			1.00	1.00				0.99		
Frt	0.91			1.00	0.85				1.00		
Flt Protected	0.98			1.00	1.00				0.98		
Satd. Flow (prot)	1553			1934	1470				1909		
Flt Permitted	0.98			1.00	1.00				0.61		
Satd. Flow (perm)	1553			1934	1470				1196		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.94	0.94	0.94	0.25	0.25
Adj. Flow (vph)	129	204	20	426	155	208	23	202	327	0	0
RTOR Reduction (vph)	0	0	0	0	44	0	0	0	0	0	0
Lane Group Flow (vph)	353	0	0	426	319	0	0	0	552	0	0
Confl. Peds. (#/hr)	31	33	37		30	31	32	33			
Heavy Vehicles (%)	4%	5%	0%	0%	0%	1%	0%	3%	2%	0%	0%
Turn Type	Prot			NA	Perm		Perm	Perm	NA		
Protected Phases	6			4					8		
Permitted Phases	6			4	4		8	8			
Actuated Green, G (s)	20.7			44.3	44.3				44.3		
Effective Green, g (s)	20.7			44.3	44.3				44.3		
Actuated g/C Ratio	0.28			0.59	0.59				0.59		
Clearance Time (s)	5.0			5.0	5.0				5.0		
Vehicle Extension (s)	2.0			2.0	2.0				2.0		
Lane Grp Cap (vph)	428			1142	868				706		
v/s Ratio Prot	c0.23			0.22							
v/s Ratio Perm					0.22				c0.46		
v/c Ratio	0.82			0.37	0.37				0.78		
Uniform Delay, d1	25.4			8.1	8.0				11.7		
Progression Factor	1.00			1.00	1.00				1.00		
Incremental Delay, d2	11.7			0.1	0.1				5.2		
Delay (s)	37.1			8.1	8.1				16.9		
Level of Service	D			A	A				B		
Approach Delay (s)	37.1			8.1					16.9	0.0	
Approach LOS	D			A					B	A	

Intersection Summary

HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

7: Main St & Franklin St & Central St  
Timing Report, Sorted By Phase

2018 Build  
Timing Plan: Weekday PM

	↑ 4	↙ 6	↓ 8
Phase Number	4	6	8
Movement	NBT	WBL	SBTL
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	None	None	None
Maximum Split (s)	49	40	49
Maximum Split (%)	55.1%	44.9%	55.1%
Minimum Split (s)	10	10	10
Yellow Time (s)	4	4	4
All-Red Time (s)	1	1	1
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	2	2	2
Minimum Gap (s)	2	2	2
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			
Flash Dont Walk (s)			
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	40	0	40
End Time (s)	0	40	0
Yield/Force Off (s)	84	35	84
Yield/Force Off 170(s)	84	35	84
Local Start Time (s)	40	0	40
Local Yield (s)	84	35	84
Local Yield 170(s)	84	35	84

Intersection Summary

Cycle Length	89
Control Type	Actuated-Uncoordinated
Natural Cycle	60

Splits and Phases: 7: Main St & Franklin St & Central St

↙ ø6	↑ ø4	49 s
	↓ ø8	49 s
40 s		

8: Main St & Marble St/Summer St  
Queues

2018 Build  
Timing Plan: Weekday PM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	448	296	844	406
v/c Ratio	0.89	0.79	0.79	0.40
Control Delay	53.9	48.0	30.0	21.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	53.9	48.0	30.0	21.2
Queue Length 50th (ft)	228	142	208	84
Queue Length 95th (ft)	#481	#288	276	116
Internal Link Dist (ft)	821	965	1441	57
Turn Bay Length (ft)				
Base Capacity (vph)	503	431	1719	1654
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.89	0.69	0.49	0.25

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

8: Main St & Marble St/Summer St  
 HCM Signalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	108	279	26	109	124	27	30	503	243	19	248	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	12	12	12	12	12	12	11	12	13
Grade (%)		1%			2%			0%			1%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frb, ped/bikes		1.00			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.99			0.95			0.96	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		2014			1734			3317			3362	
Flt Permitted		0.99			0.98			0.92			0.88	
Satd. Flow (perm)		2014			1734			3069			2952	
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	117	303	28	124	141	31	33	547	264	22	285	99
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	446	0	0	296	0	0	844	0	0	406	0
Confl. Peds. (#/hr)	7		6	7		8	6		7	8		7
Heavy Vehicles (%)	4%	4%	4%	3%	5%	8%	0%	2%	4%	0%	2%	2%
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	8	8		4	4			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)		20.3			17.7			28.3			28.3	
Effective Green, g (s)		20.3			17.7			28.3			28.3	
Actuated g/C Ratio		0.25			0.22			0.35			0.35	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		502			377			1068			1027	
v/s Ratio Prot		c0.22			c0.17							
v/s Ratio Perm								c0.28			0.14	
v/c Ratio		0.89			0.79			0.79			0.40	
Uniform Delay, d1		29.4			30.0			23.8			20.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		16.7			9.5			3.8			0.1	
Delay (s)		46.1			39.5			27.6			20.1	
Level of Service		D			D			C			C	
Approach Delay (s)		46.1			39.5			27.6			20.1	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	81.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

8: Main St & Marble St/Summer St  
Timing Report, Sorted By Phase

2018 Build  
Timing Plan: Weekday PM

				
Phase Number	2	4	6	8
Movement	NBTL	WBTL	SBTL	EBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	50	25	50	25
Maximum Split (%)	50.0%	25.0%	50.0%	25.0%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	50	0	75
End Time (s)	50	75	50	0
Yield/Force Off (s)	45	70	45	95
Yield/Force Off 170(s)	45	70	45	95
Local Start Time (s)	0	50	0	75
Local Yield (s)	45	70	45	95
Local Yield 170(s)	45	70	45	95

Intersection Summary

Cycle Length	100
Control Type	Actuated-Uncoordinated
Natural Cycle	65

Splits and Phases: 8: Main St & Marble St/Summer St

 02	 04	 08
50 s	25 s	25 s
 06		
50 s		

9: Pond St & Summer St  
Queues

2018 Build  
Timing Plan: Weekday PM

	→	←	↑	↓
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	615	293	443	62
v/c Ratio	0.78	0.43	0.70	0.09
Control Delay	21.7	13.5	20.9	11.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.7	13.5	20.9	11.8
Queue Length 50th (ft)	136	53	103	11
Queue Length 95th (ft)	#339	144	229	28
Internal Link Dist (ft)	965	569	871	731
Turn Bay Length (ft)				
Base Capacity (vph)	1264	1104	1158	1224
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.27	0.38	0.05

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

9: Pond St & Summer St  
 HCM Signalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	9	501	61	56	207	1	50	235	118	1	37	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	15	15	15	12	12	12	12	12	12
Grade (%)		-2%			1%			-1%			0%	
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.96			0.98	
Flt Protected		1.00			0.99			0.99			1.00	
Satd. Flow (prot)		1910			2009			1808			1850	
Flt Permitted		0.99			0.82			0.96			0.99	
Satd. Flow (perm)		1899			1659			1741			1840	
Peak-hour factor, PHF	0.93	0.93	0.93	0.90	0.90	0.90	0.91	0.91	0.91	0.72	0.72	0.72
Adj. Flow (vph)	10	539	66	62	230	1	55	258	130	1	51	10
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	615	0	0	293	0	0	443	0	0	62	0
Confl. Peds. (#/hr)	2		3	3		2	3		3	2		2
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	2%	2%	0%	3%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		20.4			20.4			17.9			17.9	
Effective Green, g (s)		20.4			20.4			17.9			17.9	
Actuated g/C Ratio		0.42			0.42			0.37			0.37	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		802			700			645			681	
v/s Ratio Prot												
v/s Ratio Perm		c0.32			0.18			c0.25			0.03	
v/c Ratio		0.77			0.42			0.69			0.09	
Uniform Delay, d1		11.9			9.8			12.8			9.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		4.0			0.1			2.4			0.0	
Delay (s)		15.9			9.9			15.3			9.9	
Level of Service		B			A			B			A	
Approach Delay (s)		15.9			9.9			15.3			9.9	
Approach LOS		B			A			B			A	

Intersection Summary

HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

9: Pond St & Summer St  
Timing Report, Sorted By Phase

2018 Build  
Timing Plan: Weekday PM

				
Phase Number	2	4	6	8
Movement	EBTL	SBTL	WBTL	NBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	None	None	None	None
Maximum Split (s)	35	35	35	35
Maximum Split (%)	50.0%	50.0%	50.0%	50.0%
Minimum Split (s)	10	10	10	10
Yellow Time (s)	4	4	4	4
All-Red Time (s)	1	1	1	1
Minimum Initial (s)	5	5	5	5
Vehicle Extension (s)	2	2	2	2
Minimum Gap (s)	2	2	2	2
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	35	0	35
End Time (s)	35	0	35	0
Yield/Force Off (s)	30	65	30	65
Yield/Force Off 170(s)	30	65	30	65
Local Start Time (s)	0	35	0	35
Local Yield (s)	30	65	30	65
Local Yield 170(s)	30	65	30	65

Intersection Summary

Cycle Length	70
Control Type	Actuated-Uncoordinated
Natural Cycle	55

Splits and Phases: 9: Pond St & Summer St

 ø2	 ø4
35 s	35 s
 ø6	 ø8
35 s	35 s

10: Franklin St & Site Driveway  
 HCM Unsignalized Intersection Capacity Analysis

2018 Build  
 Timing Plan: Weekday PM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	104	1142	782	14	10	62
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	116	1269	869	16	11	69
Pedestrians		8	8		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		1	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		740				
pX, platoon unblocked					0.35	
vC, conflicting volume	892				2393	893
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	892				4071	893
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				0	79
cM capacity (veh/h)	755				1	336
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	1384	884	11	69		
Volume Left	116	0	11	0		
Volume Right	0	16	0	69		
cSH	755	1700	1	336		
Volume to Capacity	0.15	0.52	13.12	0.21		
Queue Length 95th (ft)	13	0	Err	19		
Control Delay (s)	6.8	0.0	Err	18.5		
Lane LOS	A		F	C		
Approach Delay (s)	6.8	0.0	1404.6			
Approach LOS			F			
<b>Intersection Summary</b>						
Average Delay			51.8			
Intersection Capacity Utilization			123.5%		ICU Level of Service	H
Analysis Period (min)			15			

5: Summer St & Franklin St  
Queues

2018 Build w. Mitigation  
Timing Plan: Weekday AM

						
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	23	440	206	692	304	483
v/c Ratio	0.09	0.68	0.56	0.81	0.45	0.81
Control Delay	9.4	24.0	17.0	26.6	13.9	34.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	24.0	17.0	26.6	13.9	34.8
Queue Length 50th (ft)	4	151	44	218	48	162
Queue Length 95th (ft)	13	212	90	#539	140	#401
Internal Link Dist (ft)		984		402	380	774
Turn Bay Length (ft)	70		100			
Base Capacity (vph)	262	1138	371	1186	904	837
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	0.09	0.39	0.56	0.58	0.34	0.58

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

5: Summer St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 Build w. Mitigation  
 Timing Plan: Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	331	8	185	621	2	13	71	183	30	346	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	11	11	14	14	14	12	12	12
Grade (%)		3%			-6%			-2%			3%	
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.98			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.91			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1719	1761		1718	1836			1812			1824	
Flt Permitted	0.19	1.00		0.31	1.00			0.97			0.96	
Satd. Flow (perm)	335	1761		556	1836			1767			1761	
Peak-hour factor, PHF	0.77	0.77	0.77	0.90	0.90	0.90	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	23	430	10	206	690	2	15	81	208	34	389	60
RTOR Reduction (vph)	0	1	0	0	0	0	0	88	0	0	6	0
Lane Group Flow (vph)	23	439	0	206	692	0	0	216	0	0	477	0
Confl. Peds. (#/hr)	1		2	2		1	2		2	1		1
Confl. Bikes (#/hr)			1			3						
Heavy Vehicles (%)	0%	6%	0%	1%	3%	0%	0%	0%	1%	0%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	29.7	28.2		37.5	32.1			23.1			23.1	
Effective Green, g (s)	29.7	28.2		37.5	32.1			23.1			23.1	
Actuated g/C Ratio	0.42	0.40		0.53	0.45			0.33			0.33	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	170	702		383	833			577			575	
v/s Ratio Prot	0.00	0.25		c0.04	c0.38							
v/s Ratio Perm	0.05			0.24				0.12			c0.27	
v/c Ratio	0.14	0.63		0.54	0.83			0.38			0.83	
Uniform Delay, d1	13.7	17.0		10.3	16.9			18.3			22.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	1.3		0.7	6.8			0.1			9.2	
Delay (s)	13.9	18.3		11.0	23.7			18.4			31.2	
Level of Service	B	B		B	C			B			C	
Approach Delay (s)		18.1			20.8			18.4			31.2	
Approach LOS		B			C			B			C	

Intersection Summary

HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	70.7	Sum of lost time (s)	14.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

5: Summer St & Franklin St  
Timing Report, Sorted By Phase

2018 Build w. Mitigation  
Timing Plan: Weekday AM



Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	None	None	None	None	None
Maximum Split (s)	9	46	35	9	46	35
Maximum Split (%)	10.0%	51.1%	38.9%	10.0%	51.1%	38.9%
Minimum Split (s)	7	10	10	7	10	10
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	0	1	1	0	1	1
Minimum Initial (s)	3	5	5	3	5	5
Vehicle Extension (s)	2	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	9	55	0	9	55
End Time (s)	9	55	0	9	55	0
Yield/Force Off (s)	5	50	85	5	50	85
Yield/Force Off 170(s)	5	50	85	5	50	85
Local Start Time (s)	81	0	46	81	0	46
Local Yield (s)	86	41	76	86	41	76
Local Yield 170(s)	86	41	76	86	41	76

Intersection Summary

Cycle Length	90
Control Type	Actuated-Uncoordinated
Natural Cycle	65

Splits and Phases: 5: Summer St & Franklin St

φ1	φ2	φ4
9 s	46 s	35 s
φ5	φ6	φ8
9 s	46 s	35 s

7: Main St & Franklin St & Central St  
Queues

2018 Build w. Mitigation  
Timing Plan: Weekday AM

	↙	↑	↗	↓
Lane Group	WBL	NBT	NBR	SBT
Lane Group Flow (vph)	688	406	286	802
v/c Ratio	1.03	0.44	0.36	1.08
Control Delay	72.3	15.9	11.6	81.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	72.3	15.9	11.6	81.6
Queue Length 50th (ft)	~418	138	69	~509
Queue Length 95th (ft)	#617	179	103	#729
Internal Link Dist (ft)	727	1542		692
Turn Bay Length (ft)			50	
Base Capacity (vph)	667	922	786	741
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.03	0.44	0.36	1.08

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

7: Main St & Franklin St & Central St  
 HCM Signalized Intersection Capacity Analysis

2018 Build w. Mitigation  
 Timing Plan: Weekday AM

Movement	WBL	WBR	WBR2	NBT	NBR	NBR2	SBL2	SBL	SBT	SWL	SWR
Lane Configurations	↙			↑	↗				↖		
Volume (vph)	361	245	6	325	126	102	2	111	609	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	13	12	12	14	14	14	12	12
Grade (%)	4%			3%					1%	0%	
Total Lost time (s)	5.0			5.0	5.0				5.0		
Lane Util. Factor	1.00			1.00	1.00				1.00		
Frbp, ped/bikes	0.99			1.00	0.97				1.00		
Fipb, ped/bikes	1.00			1.00	1.00				1.00		
Frt	0.94			1.00	0.85				1.00		
Flt Protected	0.97			1.00	1.00				0.99		
Satd. Flow (prot)	1748			1824	1490				1893		
Flt Permitted	0.97			1.00	1.00				0.77		
Satd. Flow (perm)	1748			1824	1490				1467		
Peak-hour factor, PHF	0.89	0.89	0.89	0.80	0.80	0.80	0.90	0.90	0.90	0.25	0.25
Adj. Flow (vph)	406	275	7	406	158	128	2	123	677	0	0
RTOR Reduction (vph)	0	0	0	0	33	0	0	0	0	0	0
Lane Group Flow (vph)	688	0	0	406	253	0	0	0	802	0	0
Confl. Peds. (#/hr)	3	7	4		3	3	7	7			
Heavy Vehicles (%)	2%	4%	0%	6%	0%	9%	0%	20%	3%	0%	0%
Turn Type	Prot			NA	Perm		Perm	Perm	NA		
Protected Phases	6			4					8		
Permitted Phases	6			4	4		8	8			
Actuated Green, G (s)	34.0			45.0	45.0				45.0		
Effective Green, g (s)	34.0			45.0	45.0				45.0		
Actuated g/C Ratio	0.38			0.51	0.51				0.51		
Clearance Time (s)	5.0			5.0	5.0				5.0		
Vehicle Extension (s)	2.0			2.0	2.0				2.0		
Lane Grp Cap (vph)	667			922	753				741		
v/s Ratio Prot	c0.39			0.22							
v/s Ratio Perm					0.17				c0.55		
v/c Ratio	1.03			0.44	0.34				1.08		
Uniform Delay, d1	27.5			14.0	13.1				22.0		
Progression Factor	1.00			1.00	1.00				1.00		
Incremental Delay, d2	43.2			0.1	0.1				57.6		
Delay (s)	70.7			14.1	13.2				79.6		
Level of Service	E			B	B				E		
Approach Delay (s)	70.7			13.7					79.6	0.0	
Approach LOS	E			B					E	A	

Intersection Summary

HCM 2000 Control Delay	55.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

7: Main St & Franklin St & Central St  
Timing Report, Sorted By Phase

2018 Build w. Mitigation  
Timing Plan: Weekday AM

	↑ 4	↙ 6	↓ 8
Phase Number	4	6	8
Movement	NBT	WBL	SBTL
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	None	None	None
Maximum Split (s)	50	39	50
Maximum Split (%)	56.2%	43.8%	56.2%
Minimum Split (s)	10	10	10
Yellow Time (s)	4	4	4
All-Red Time (s)	1	1	1
Minimum Initial (s)	5	5	5
Vehicle Extension (s)	2	2	2
Minimum Gap (s)	2	2	2
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)			
Flash Dont Walk (s)			
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	39	0	39
End Time (s)	0	39	0
Yield/Force Off (s)	84	34	84
Yield/Force Off 170(s)	84	34	84
Local Start Time (s)	39	0	39
Local Yield (s)	84	34	84
Local Yield 170(s)	84	34	84

Intersection Summary

Cycle Length	89
Control Type	Actuated-Uncoordinated
Natural Cycle	90

Splits and Phases: 7: Main St & Franklin St & Central St

	↑ ø4	
	50 s	■
↙ ø6	↓ ø8	
39 s	50 s	■

10: Franklin St & Site Driveway  
 HCM Unsignalized Intersection Capacity Analysis

2018 Build w. Mitigation  
 Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	26	490	860	3	11	98
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	29	544	956	3	12	109
Pedestrians		1	1		1	
Lane Width (ft)		10.5	11.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		758				
pX, platoon unblocked					0.81	
vC, conflicting volume	960				1561	959
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	960				1576	959
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				87	65
cM capacity (veh/h)	716				94	311
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	29	544	959	12	109	
Volume Left	29	0	0	12	0	
Volume Right	0	0	3	0	109	
cSH	716	1700	1700	94	311	
Volume to Capacity	0.04	0.32	0.56	0.13	0.35	
Queue Length 95th (ft)	3	0	0	11	38	
Control Delay (s)	10.2	0.0	0.0	49.1	22.7	
Lane LOS	B			E	C	
Approach Delay (s)	0.5		0.0	25.3		
Approach LOS				D		
<b>Intersection Summary</b>						
Average Delay			2.0			
Intersection Capacity Utilization			58.5%	ICU Level of Service		B
Analysis Period (min)			15			

2: Franklin PI & Franklin St  
Queues

2018 Build w. Mitigation  
Timing Plan: Weekday PM

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1274	50	8	940	174	33
v/c Ratio	0.93	0.03	0.06	0.67	0.72	0.10
Control Delay	25.7	0.2	3.6	8.6	53.3	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	0.2	3.6	8.6	53.3	0.6
Queue Length 50th (ft)	467	0	1	216	87	0
Queue Length 95th (ft)	#1035	3	4	334	122	0
Internal Link Dist (ft)	590			660		
Turn Bay Length (ft)		135	145			
Base Capacity (vph)	1363	1503	142	1463	275	356
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	0.93	0.03	0.06	0.64	0.63	0.09

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

2: Franklin PI & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 Build w. Mitigation  
 Timing Plan: Weekday PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗	↖	↑		↖	↑	↗			
Volume (vph)	0	1223	48	7	837	0	122	0	23	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	11	12	12	12	13	12	13	12	12	12
Grade (%)		-1%			0%			0%			0%	
Total Lost time (s)		5.0	5.0	4.0	5.0		5.0		5.0			
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Frb, ped/bikes		1.00	1.00	1.00	1.00		1.00		0.98			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		1846	1569	1805	1863		1847		1629			
Flt Permitted		1.00	1.00	0.06	1.00		0.95		1.00			
Satd. Flow (perm)		1846	1569	111	1863		1847		1629			
Peak-hour factor, PHF	0.96	0.96	0.96	0.89	0.89	0.89	0.70	0.70	0.70	0.25	0.25	0.25
Adj. Flow (vph)	0	1274	50	8	940	0	174	0	33	0	0	0
RTOR Reduction (vph)	0	0	5	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	1274	45	8	940	0	174	0	4	0	0	0
Confl. Peds. (#/hr)			1	17			17		1			
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%	0%
Turn Type		NA	pt+ov	pm+pt	NA		Prot		Perm			
Protected Phases		2	23	1	6		3	8				
Permitted Phases				6					8			
Actuated Green, G (s)		64.5	80.9	69.1	69.1		11.4		11.4			
Effective Green, g (s)		64.5	80.9	69.1	69.1		11.4		11.4			
Actuated g/C Ratio		0.71	0.89	0.76	0.76		0.13		0.13			
Clearance Time (s)		5.0		4.0	5.0		5.0		5.0			
Vehicle Extension (s)		2.0		2.0	2.0		2.0		2.0			
Lane Grp Cap (vph)		1315	1402	95	1422		232		205			
v/s Ratio Prot		c0.69	0.03	0.00	c0.50		c0.09					
v/s Ratio Perm				0.06					0.00			
v/c Ratio		0.97	0.03	0.08	0.66		0.75		0.02			
Uniform Delay, d1		12.1	0.5	23.9	5.1		38.2		34.7			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		17.5	0.0	0.1	0.9		11.4		0.0			
Delay (s)		29.6	0.5	24.0	6.0		49.6		34.7			
Level of Service		C	A	C	A		D		C			
Approach Delay (s)		28.5			6.2			47.2			0.0	
Approach LOS		C			A			D			A	

Intersection Summary

HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	90.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2: Franklin PI & Franklin St  
Timing Report, Sorted By Phase

2018 Build w. Mitigation  
Timing Plan: Weekday PM

					
Phase Number	1	2	3	6	8
Movement	WBL	EBT	NBL	WBTL	NBT
Lead/Lag	Lead	Lag			
Lead-Lag Optimize					
Recall Mode	None	Min	None	Min	None
Maximum Split (s)	7	65	18	72	18
Maximum Split (%)	7.8%	72.2%	20.0%	80.0%	20.0%
Minimum Split (s)	7	10	10	10	10
Yellow Time (s)	4	4	4	4	4
All-Red Time (s)	0	1	1	1	1
Minimum Initial (s)	3	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)					
Flash Dont Walk (s)					
Dual Entry	No	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	7	72	0	72
End Time (s)	7	72	0	72	0
Yield/Force Off (s)	3	67	85	67	85
Yield/Force Off 170(s)	3	67	85	67	85
Local Start Time (s)	83	0	65	83	65
Local Yield (s)	86	60	78	60	78
Local Yield 170(s)	86	60	78	60	78

Intersection Summary

Cycle Length	90
Control Type	Actuated-Uncoordinated
Natural Cycle	90

Splits and Phases: 2: Franklin PI & Franklin St

 ø1	 ø2	 ø3
7 s	65 s	18 s
 ø6		 ø8
72 s		18 s

5: Summer St & Franklin St  
Queues

2018 Build w. Mitigation  
Timing Plan: Weekday PM

						
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	68	585	171	460	730	257
v/c Ratio	0.19	0.92	0.76	0.63	0.96	0.53
Control Delay	10.7	43.4	35.5	22.3	45.4	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	43.4	35.5	22.3	45.4	19.5
Queue Length 50th (ft)	14	231	38	166	267	73
Queue Length 95th (ft)	33	#418	#113	254	#495	137
Internal Link Dist (ft)		984		402	380	774
Turn Bay Length (ft)	70		100			
Base Capacity (vph)	355	682	226	734	775	499
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	0.19	0.86	0.76	0.63	0.94	0.52

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

5: Summer St & Franklin St  
 HCM Signalized Intersection Capacity Analysis

2018 Build w. Mitigation  
 Timing Plan: Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	567	12	149	393	7	6	292	359	43	119	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	10	11	11	14	14	14	12	12	12
Grade (%)		3%			-6%			-2%			3%	
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.93			0.96	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1718	1847		1701	1832			1869			1770	
Flt Permitted	0.35	1.00		0.15	1.00			1.00			0.70	
Satd. Flow (perm)	634	1847		262	1832			1864			1251	
Peak-hour factor, PHF	0.99	0.99	0.99	0.87	0.87	0.87	0.90	0.90	0.90	0.88	0.88	0.88
Adj. Flow (vph)	68	573	12	171	452	8	7	324	399	49	135	73
RTOR Reduction (vph)	0	1	0	0	1	0	0	63	0	0	20	0
Lane Group Flow (vph)	68	584	0	171	459	0	0	667	0	0	237	0
Confl. Peds. (#/hr)	3		3	4		4	3		4	4		3
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	1%	0%	2%	3%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	28.1	25.2		32.3	27.3			25.5			25.5	
Effective Green, g (s)	28.1	25.2		32.3	27.3			25.5			25.5	
Actuated g/C Ratio	0.40	0.36		0.46	0.39			0.37			0.37	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	300	667		224	717			681			457	
v/s Ratio Prot	0.01	c0.32		c0.05	0.25							
v/s Ratio Perm	0.08			0.30				c0.36			0.19	
v/c Ratio	0.23	0.88		0.76	0.64			0.98			0.52	
Uniform Delay, d1	13.4	20.8		14.3	17.2			21.8			17.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	11.9		12.9	1.5			29.0			0.4	
Delay (s)	13.5	32.7		27.2	18.7			50.8			17.7	
Level of Service	B	C		C	B			D			B	
Approach Delay (s)		30.7			21.0			50.8			17.7	
Approach LOS		C			C			D			B	

Intersection Summary

HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	69.7	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

5: Summer St & Franklin St  
Timing Report, Sorted By Phase

2018 Build w. Mitigation  
Timing Plan: Weekday PM

						
Phase Number	1	2	4	5	6	8
Movement	WBL	EBTL	SBTL	EBL	WBTL	NBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize						
Recall Mode	None	None	None	None	None	None
Maximum Split (s)	9	30	31	9	30	31
Maximum Split (%)	12.9%	42.9%	44.3%	12.9%	42.9%	44.3%
Minimum Split (s)	9	10	10	9	10	10
Yellow Time (s)	4	4	4	4	4	4
All-Red Time (s)	0	1	1	0	1	1
Minimum Initial (s)	5	5	5	5	5	5
Vehicle Extension (s)	2	2	2	2	2	2
Minimum Gap (s)	2	2	2	2	2	2
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)						
Flash Dont Walk (s)						
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	0	9	39	0	9	39
End Time (s)	9	39	0	9	39	0
Yield/Force Off (s)	5	34	65	5	34	65
Yield/Force Off 170(s)	5	34	65	5	34	65
Local Start Time (s)	61	0	30	61	0	30
Local Yield (s)	66	25	56	66	25	56
Local Yield 170(s)	66	25	56	66	25	56

Intersection Summary

Cycle Length	70
Control Type	Actuated-Uncoordinated
Natural Cycle	80

Splits and Phases: 5: Summer St & Franklin St

 ϕ1	 ϕ2	 ϕ4
9 s	30 s	31 s
 ϕ5	 ϕ6	 ϕ8
9 s	30 s	31 s

10: Franklin St & Site Driveway  
 HCM Unsignalized Intersection Capacity Analysis

2018 Build w. Mitigation  
 Timing Plan: Weekday PM

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	104	1142	782	14	10	62
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	116	1269	869	16	11	69
Pedestrians		8	8		8	
Lane Width (ft)		10.5	11.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		1	1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		740				
pX, platoon unblocked					0.32	
vC, conflicting volume	892				2393	893
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	892				4260	893
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				0	80
cM capacity (veh/h)	755				1	336
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	116	1269	884	11	69	
Volume Left	116	0	0	11	0	
Volume Right	0	0	16	0	69	
cSH	755	1700	1700	1	336	
Volume to Capacity	0.15	0.75	0.52	18.92	0.20	
Queue Length 95th (ft)	13	0	0	Err	19	
Control Delay (s)	10.6	0.0	0.0	Err	18.4	
Lane LOS	B			F	C	
Approach Delay (s)	0.9		0.0	1404.6		
Approach LOS				F		
<b>Intersection Summary</b>						
Average Delay			48.4			
Intersection Capacity Utilization			72.4%	ICU Level of Service		C
Analysis Period (min)			15			

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

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**LEFT-TURN LANE WARRANT ANALYSIS**

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**Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.**

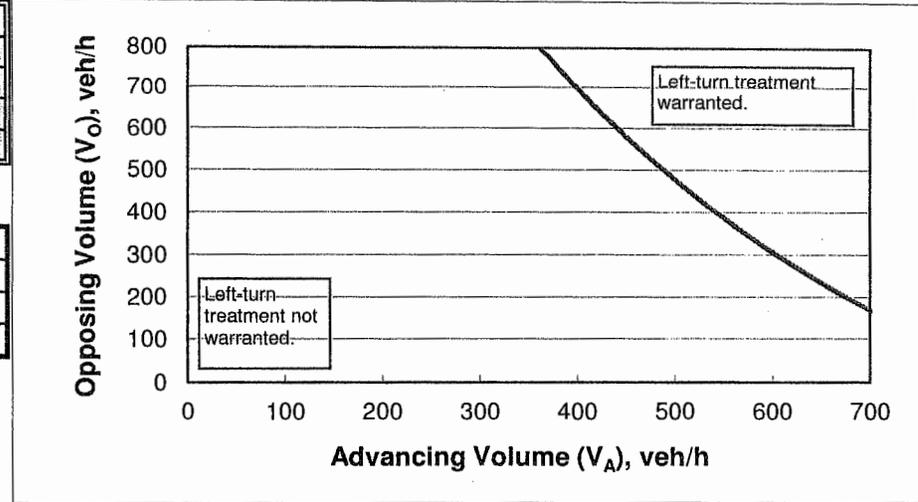
**2-lane roadway (English)**

**INPUT**

Variable	Value
85 <sup>th</sup> percentile speed, mph:	34
Percent of left-turns in advancing volume ( $V_A$ ), %:	5%
Advancing volume ( $V_A$ ), veh/h:	516
Opposing volume ( $V_O$ ), veh/h:	863

**OUTPUT**

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	340
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment warranted.</b>	



**CALIBRATION CONSTANTS**

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

**Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.**

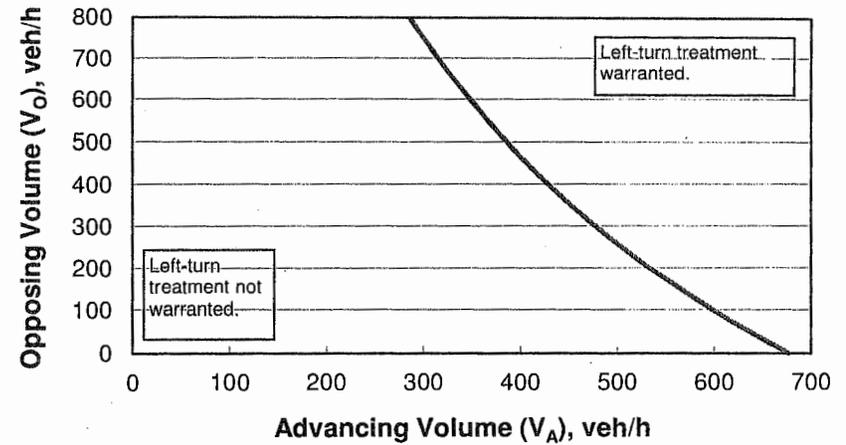
**2-lane roadway (English)**

**INPUT**

Variable	Value
85 <sup>th</sup> percentile speed, mph:	34
Percent of left-turns in advancing volume ( $V_A$ ), %:	8%
Advancing volume ( $V_A$ ), veh/h:	1246
Opposing volume ( $V_O$ ), veh/h:	796

**OUTPUT**

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	287
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
Left-turn treatment warranted.	



**CALIBRATION CONSTANTS**

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

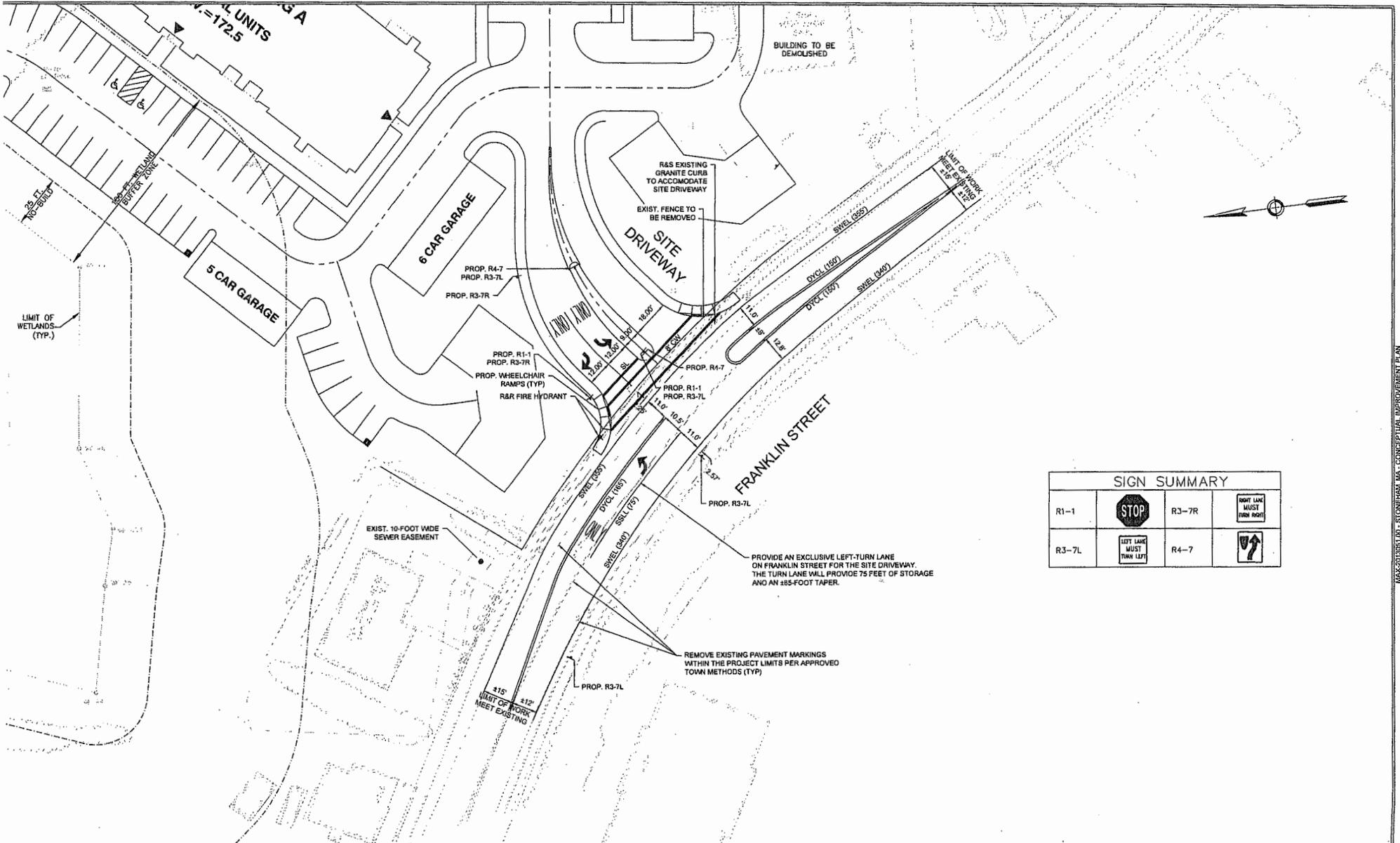
**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

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**CONCEPTUAL IMPROVEMENT PLAN**

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SIGN SUMMARY			
R1-1		R3-7R	
R3-7L		R4-7	

0 20 40  
SCALE 1" = 20'

**GPI** Greenman-Pedersen, Inc.  
Engineers, Architects, Planners, Construction Engineers & Inspectors  
181 BALLARDALE STREET, SUITE 202, WILMINGTON, MA 01807  
Tel: (978) 670-2888 Fax: (978) 688-3044  
Other Offices In: FL, MD, MI, NH, NJ, NY, OH, PA, VA, VT, WA <http://www.gpinet.com>

PROJECT: THE COMMONS AT WEISS FARM  
STONEHAM, MASSACHUSETTS

PREPARED FOR: WEISS FARM APARTMENTS LLC  
100 GRANDVIEW ROAD, SUITE 201  
BRAINTREE, MASSACHUSETTS 02184

**CONCEPTUAL IMPROVEMENT PLAN**  
**FRANKLIN STREET**  
**STONEHAM, MASSACHUSETTS**

DESIGNED BY:	HLM
CHECKED BY:	JWD
DATE:	6/20/2014
SCALE:	1" = 20'
PROJECT NO.:	MAX-2013051
FILE NAME:	LT CONCEPT
DRAWING NO.:	1 of 1

MAX-2013051.00 - STONEHAM, MA - CONCEPTUAL IMPROVEMENT PLAN

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

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**TRAFFIC CONTROL SIGNAL WARRANT ANALYSES WORKSHEET**

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# Traffic Control Signal Warrant Analyses

(Based on MUTCD-2009 Edition)

Intersection: Franklin Street at Residential Site Driveway

Pop. <10,000? (Y/N)  N

Speed (in mph): 40 mph

Count Date: 9/19/2013

Analysis Year: 2018 Build

Analysis Date: 03/24/14

Analyst: SEB

Is Major?\* (Y/N)  Y

#Lanes\* (one way) 1

Adjustment Factor: 1

Raw counts

Major Lanes: 1 Enter the higher number of lanes for the major street approach

Minor Lanes: 1 Enter the number of lanes for the minor street approach you want to analyze

EB  Y  1

WB  Y  1

NB

SB  N  1

\*Note: If intersection is a "T" intersection, leave cells blank for the non-existent approach

Time	EB LT	EB TH	EB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	SB LT	SB TH	SB R
7:00	17	432	0	0	684	2	0	0	0	0	93	0
8:00	22	536	0	0	868	3	0	0	0	0	102	0
9:00	26	447	0	0	649	3	0	0	0	0	75	0
10:00	26	436	0	0	500	3	0	0	0	0	45	0
11:00	31	505	0	0	502	4	0	0	0	0	32	0
12:00	36	520	0	0	475	4	0	0	0	0	48	0
13:00	39	532	0	0	532	5	0	0	0	0	43	0
14:00	38	546	0	0	615	4	0	0	0	0	33	0
15:00	46	701	0	0	586	5	0	0	0	0	40	0
16:00	60	851	0	0	570	7	0	0	0	0	36	0
17:00	79	963	0	0	594	9	0	0	0	0	39	0
18:00	104	828	0	0	541	12	0	0	0	0	66	0
19:00	75	639	0	0	431	9	0	0	0	0	47	0

Time	Σ EB	Σ WB	Σ NB	Σ SB	Σ Major	Σ Minor	Σ Max Minor	W1 A	W1 B	W1 combo	W2	W3
7:00	449	686	0	93	1136	93	93	N	Y	N	Y	N
8:00	558	871	0	102	1429	102	102	N	Y	N	Y	N
9:00	473	652	0	75	1125	75	75	N	Y	N	N	N
10:00	462	503	0	45	965	45	45	N	N	N	N	N
11:00	536	505	0	32	1042	32	32	N	N	N	N	N
12:00	556	479	0	48	1035	48	48	N	N	N	N	N
13:00	571	537	0	43	1108	43	43	N	N	N	N	N
14:00	584	620	0	33	1204	33	33	N	N	N	N	N
15:00	746	591	0	40	1338	40	40	N	N	N	N	N
16:00	911	577	0	36	1487	36	36	N	N	N	N	N
17:00	1042	603	0	39	1645	39	39	N	N	N	N	N
18:00	932	553	0	66	1485	66	66	N	N	N	N	N
19:00	713	440	0	47	1153	47	47	N	N	N	N	N

0 of 8    3 of 8    0 of 8    2 of 4    0 of 1

## Warrant Analyses

- Warrant 1: Condition A Minimum Vehicular Volume Warrant is Not Met
- Warrant 1: Condition B Interruption of Continuous Traffic Warrant is Not Met
- Warrant 1: Combination of Warrants 1A and 1B is Not Met
- Warrant 2: Four-Hour Warrant is Not Met
- Warrant 3: One-Hour Warrant is Not Met









**REGULATORY AND USE AGREEMENT**

[Rental]

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

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

**RECITALS**

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

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

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

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

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

amended by [amendments recorded in Book \_\_\_\_\_, Page \_\_\_ / as Document No. \_\_\_\_\_, and in Book \_\_\_\_\_, Page \_\_\_ / as Document No. \_\_\_\_\_, and by] the terms of this Agreement; and

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

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

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

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

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

## **DEFINITIONS**

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

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

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

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

Allowable Development Costs shall have the meaning given such term in Section 21 hereof.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Limited Dividend Term shall have the meaning set forth in Section 23(b) hereof.

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

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

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

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

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

Permanent Loan shall mean the Permanent Loan made or committed to be made by the Permanent Lender to the Developer after completion of construction of the Development, which will replace the Construction Loan, or any subsequent refinancing thereof in compliance with any specific terms of the Comprehensive Permit or any Housing Subsidy Program applicable to the Development.

Permanent Mortgage shall mean the mortgage from the Developer to the Permanent Lender securing the Permanent Loan.

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

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

Substantial Completion shall have the meaning given such term in Section 20 hereof.

Surety shall have the meaning given such term in Section 22 hereof.

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

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

Term shall have the meaning set forth in Section 23 hereof.

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

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

## **CONSTRUCTION OBLIGATIONS**

2. (a) The Developer agrees to construct the Development in accordance with plans and specifications approved by the Subsidizing Agency and the Municipality (the "Plans and Specifications"), in accordance with all on-site and off-site construction, design and land use conditions of the Comprehensive Permit, and in accordance with the information describing the Development presented by the Developer to the Subsidizing Agency in its application for Final Approval. All Affordable Units to be constructed as part of the Development must be similar in exterior appearance to other units in the Development and shall be evenly dispersed throughout the Development. In addition, all Affordable Units must contain complete living facilities including but not limited to a stove, kitchen cabinets, plumbing fixtures, and sanitary facilities,

all as more fully shown in the Plans and Specifications. Materials used for the interiors of the Affordable Units must be of good quality. The Development must fully comply with the State Building Code and with all applicable state and federal building, environmental, health, safety and other laws, rules, and regulations, including without limitation all applicable federal and state laws, rules and regulations relating to the operation of adaptable and accessible housing for the handicapped. Except to the extent that the Development is exempted from such compliance by the Comprehensive Permit, the Development must also comply with all applicable local codes, ordinances and by-laws.

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

### **USE RESTRICTION/RENTALS AND RENTS**

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

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

such Housing Subsidy Program, provided that the tenant's share of rent does not exceed the maximum annual rental expense as provided in this Agreement.

(c) For purposes of satisfying the requirement that the Affordable Units shall be occupied by Low or Moderate Income Tenants hereunder, no Low or Moderate Income Tenant shall be denied continued occupancy because, after admission, the Low Moderate Income Tenant's Annual Income exceeds eighty percent (80%) of Area Median Income. No Low or Moderate Income Tenant shall continue to be counted as a Low or Moderate Income Tenant as of any date upon which such tenant's Annual Income exceeds one hundred forty percent (140%) of the level at which a tenant may be qualified as a Low or Moderate Income Tenant provided, however, that the Developer shall not be in default regarding the requirements of this Agreement to maintain occupancy of the Affordable Units by Low or Moderate Income Tenants if the Developer rents the next available unit or units of comparable or smaller size to Low or Moderate Income Tenants as needed to achieve compliance with such requirements (thereupon, as rented to a Low or Moderate Income Tenant, such unit or units shall be deemed an Affordable Unit hereunder). Other than as provided above, any unit shall retain its character as an Affordable Unit occupied by a Low or Moderate Income Tenant until it is reoccupied, at which time whether or not such unit is occupied by a Low or Moderate Income Tenant shall be redetermined under the rules set forth in this Section 3, except that no reoccupancy of an Affordable Unit for a temporary period not to exceed thirty-one (31) days shall be taken into account for this purpose.

(d) If, after initial occupancy, the Annual Income of a Low or Moderate Income Tenant increases and, as a result of such increase, exceeds eighty percent (80%) of Area Median Income but is less than one hundred forty percent (140%) of Area Median Income for such a Low or Moderate Income Tenant, at the expiration of the applicable lease term, such tenant's rent may be increased to the higher of the total rental that may be required under any applicable Housing Subsidy Program (including both the tenant share and the subsidized portion) or thirty percent (30%) of such tenant's Annual Income. In the event that a Low or Moderate-Income Tenant's Annual Income increases and, as a result of such increase, exceeds one hundred forty percent (140%) of Area Median Income, the Developer may charge the formerly Low or Moderate-Income Tenant a market rate for the dwelling unit.

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

leases and shall not be implemented without at least 30 days' prior written notice by the Developer to all affected tenants.

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

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

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

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

## TENANT SELECTION AND OCCUPANCY

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

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

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

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

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

#### **EXPIRATION OF RESTRICTIONS - TENANT PROTECTIONS**

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

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

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

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

of any broker's fees and the payment of reasonable moving expenses within a thirty (30) mile radius of the Development.

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

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

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

#### **LIMITED DIVIDENDS; USE OF DEVELOPMENT REVENUES**

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

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

(b) No Limited Dividend Distributions may be made when: (i) a default or an Event of Default has occurred and is continuing under this Agreement; (ii) there has been failure to comply with the Subsidizing Agency's notice of any reasonable requirement for adequate (as

determined by the Subsidizing Agency using its reasonable discretion) maintenance of the Development in order to continue to provide decent, good quality and safe affordable housing; or (iii) prior to the expiration of the Term hereof, there is outstanding against all or any part of the Development any lien or security interest other than a lien securing the Loan or a lien expressly permitted by the Subsidizing Agency.

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

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

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

Thereafter, Developer's Equity may be adjusted not more than once in any five year period with the first five - year period commencing with the first Fiscal Year of the Development. Any adjustments shall be made only upon the written request of the Developer. Unless the Developer is otherwise directed by the Subsidizing Agency, the initial appraised market value and any adjustment thereto shall be based upon an appraisal commissioned by (and

naming as a client) the Subsidizing Agency and prepared by an independent and qualified appraiser prequalified by, and randomly assigned to the Development by, the Subsidizing Agency. The appraiser shall submit a Self-Contained Appraisal Report to the Subsidizing Agency in accordance with the Uniform Standards of Professional Appraisal Practice (USPAP). The costs of such appraisal shall be borne by the Developer. Such appraisal shall use assumptions subject to the reasonable approval of the Subsidizing Agency.

Upon completion of an appraisal as provided above, the Developer's Equity shall be adjusted to equal the appraised value of the Development as determined by the appraisal less the unpaid principal amount of the sum of secured debt on the Development plus public equity, whether structured as a grant or loan determined as of the date of the appraisal. Such new Developer's Equity shall be the Developer's Equity commencing with the first day of the Fiscal Year following the date of such appraisal and remain in effect until a subsequent adjustment.

A sale or refinancing of the Development shall not result in a new evaluation of Developer's Equity, except as provided above.

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

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

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

Agency, as applicable) may apply any amounts in the Excess Equity Account to the payment of all or any portion of the debt secured by the Mortgage.

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

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

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

In any event, cash available for distribution in any year in excess of 20% of Developer's Equity, subject to payment of a Limited Dividend Distribution pursuant to Section 7(c) hereof, shall be distributed to the Municipality within fifteen (15) business days of notice and demand given by the Subsidizing Agency as provided herein, or as otherwise directed by DHCD. Upon the expiration of the Limited Dividend Term (as defined in Section 23(b) hereof), any balance remaining in the Excess Equity Account shall (i) be contributed by the Developer to the replacement reserve held for the Development, if such contribution is deemed by the Subsidizing Agency (in its reasonable discretion) to be necessary, (ii) be distributed to the Subsidizing Agency for the purpose of developing and/or preserving affordable housing, or (iii) be distributed as otherwise directed by DHCD.

(g) All funds in the Excess Equity Account shall be considered additional security for the performance of obligations of the Developer under the Mortgage and this Agreement and the Developer hereby pledges and grants to the Lender (or the Subsidizing Agency, as applicable) a continuing security interest in said funds. Furthermore, the Developer recognizes and agrees that (i) possession of said funds by the Lender (or the Subsidizing Agency, as applicable) constitutes a bona fide pledge of said funds to the Lender (or the Subsidizing Agency, as applicable) for security purposes, (ii) to the extent required by applicable law, this Agreement, in combination, as necessary, with other documents referred to herein, constitutes a valid and binding security agreement, and (iii) the validity and effectiveness of said pledge will not be compromised if said funds are held in a bank or other financial institution. The Developer further acknowledges and agrees that, notwithstanding any nomenclature or title given to the Excess Equity Account by the bank or other financial institution at which the Excess Equity Account is held, or the fact that the Developer's tax identification number is used with respect to the Excess Equity Account, the Lender (or the Subsidizing Agency, as applicable), and not the Developer, shall be the customer of the bank or other financial institution holding the Excess Equity Account; such bank or other financial institution shall comply with instructions originated by the Lender (or the Subsidizing Agency, as applicable) directing the disposition of funds in the Excess Equity Account, without further consent of the Developer; and the Lender (or the Subsidizing Agency, as applicable), and not the Developer, shall have the exclusive right to withdraw funds from the Excess Equity Account.

(h) Payment of fees and profits from capital sources for the initial development of the Development to the Developer and/or the Developer's related party consultants, partners and legal or beneficial owners of the Development shall, unless otherwise limited by DHCD, be limited to no more than ten percent (10%) of Total Development Costs, net of (i) such fees and profits, and (ii) any working capital or reserves intended for operation of the Development and approved by the Subsidizing Agency. Such limited payment of fees and profits shall not include fees or profits paid to any other party, whether or not related to the Developer, to the extent the same are arm's length and commercially reasonable in light of the size and complexity of the Development. The Developer shall comply with the requirements of Section 21 below regarding Cost Certification. In accordance with the requirements of 760 CMR 56.04(8)(e), in the event that the Subsidizing Agency determines, following examination of the Cost Certification submitted by the Developer pursuant to Section 21 below, that amounts were paid or distributed by the Developer in excess of the above limitations (the "Excess Distributions"), the Developer

shall pay over in full such Excess Distributions to the Municipality within fifteen (15) business days of notice and demand given by the Subsidizing Agency as provided herein.

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

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

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

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

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

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

## **MANAGEMENT OF THE DEVELOPMENT**

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

## **CHANGE IN COMPOSITION OF DEVELOPER ENTITY; RESTRICTIONS ON TRANSFERS**

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

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

(b) the conveyance, assignment, transfer, or relinquishment of twenty-five percent (25%) or more of the Beneficial Interests (herein defined) in the Developer (except for such a conveyance, assignment, transfer or relinquishment among holders of Beneficial Interests as of the date of this Agreement).

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

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

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

10. The Developer shall provide the Subsidizing Agency with thirty (30) days' prior written notice of any pledge, assignment or mortgage of the Development, whether direct or indirect, and also, after Substantial Completion, of any sale, conveyance, transfer, ground lease or exchange of the Developer's interest in the Development or any part of the Development. As in Section 9 above, prior to any transfer of ownership of the Development or any portion thereof or interest therein, the Developer agrees to secure from the transferee a written agreement stating that the transferee will assume in full the Developer's obligations and duties under this Agreement.

## **BOOKS AND RECORDS**

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

### ANNUAL FINANCIAL REPORT

12. (a) Within ninety (90) days following the end of each Fiscal Year of the Development, the Developer shall furnish the Subsidizing Agency with a complete annual financial report for the Development based upon an examination of the books and records of the Developer containing a detailed, itemized statement of all income and expenditures, prepared and certified by a certified public accountant in accordance with the reasonable requirements of the Subsidizing Agency which include: (i) financial statements submitted in a format acceptable to the Subsidizing Agency; (ii) the financial report on an accrual basis and in conformity with generally accepted accounting principles applied on a consistent basis; and (iii) amounts available for distribution under Section 7 above. A duly authorized agent of the Developer must approve such submission in writing. The provisions of this paragraph may be waived or modified by the Subsidizing Agency.

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

(c) Such Audited Annual Limited Dividend Financial Report shall be accompanied by a Certificate of Developer (in the form as then reasonably required by the Subsidizing Agency) certifying to the Developer's best knowledge and belief, under the pains and penalties of perjury, as to matters such as, without limitation, the fact that (i) the Developer has made available all necessary financial records and related data to the CPA who prepared the Audited Annual Limited Dividend Financial Report, (ii) there are no material transactions related to the Development that have not been properly recorded in the accounting records underlying the Audited Annual Limited Dividend Financial Report, (iii) the Developer has no knowledge of any fraud or suspected fraud affecting the entity involving management, subcontractors, employees who have

significant roles in internal control, or others where the fraud could have a material effect on the Audited Annual Limited Dividend Financial Report and has no knowledge of any allegations of fraud or suspected fraud affecting the Developer or the Development received in communications from employees, former employees, subcontractors, regulators, or others, and (iv) the Developer has reviewed the information presented in the Audited Annual Limited Dividend Financial Report and believes that such determination is an appropriate representation of the Development.

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

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

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

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

## **FINANCIAL STATEMENTS AND OCCUPANCY REPORTS**

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

#### **NO CHANGE OF DEVELOPMENT'S USE**

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

#### **NO DISCRIMINATION**

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

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

## **DEFAULTS; REMEDIES**

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

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

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

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

## **. MONITORING AGENT; FEES; SUCCESSOR SUBSIDIZING AGENCY**

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

subject to the lien of the Mortgage and this Agreement shall constitute a security agreement with respect thereto.

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

19. The Subsidizing Agency may resign from its duties hereunder upon ninety (90) days prior written notice to DHCD, the Developer, and the Municipality. In such event, DHCD may appoint a Successor Subsidizing Agency hereunder. If DHCD fails to appoint a Successor Subsidizing Agency, the Subsidizing Agency shall identify a Successor Subsidizing Agency. The Successor Subsidizing Agency shall succeed to all the duties and rights of the Subsidizing Agency hereunder and the Subsidizing Agency shall turn over all amounts and security held by it hereunder to the Successor Subsidizing Agency.

### **CONSTRUCTION AND FINAL COST CERTIFICATION**

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

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

21. Within ninety (90) days after Substantial Completion, the Developer shall provide the Subsidizing Agency with its Cost Certification for the Development. The Subsidizing Agency

may allow additional time for submission of the Cost Certification if significant issues are determined to exist which prevent the timely submission of the Cost Certification, and may in certain circumstances (such as a halt in construction for a significant period of time) require submission of an interim Cost Certification within ninety (90) days of written notice to the Developer.

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

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

#### TERM

23. (a) This Agreement shall bind, and the benefits shall inure to, respectively, the Developer and its successors and assigns, and the Subsidizing Agency and its successors and assigns, until the date which is thirty (30) years from the date hereof (the "Term"). Upon expiration of the Term, this Agreement and the rights and obligations of the Subsidizing Agency hereunder shall automatically terminate without the need of either party executing any additional document. Notwithstanding the foregoing, this Agreement may be released by the Subsidizing Agency if the Development is financed by a state or federal agency and, in connection with such financing, a regulatory agreement acceptable to the Subsidizing Agency is recorded in the Registry. The rights and obligations of the Developer and of the Subsidizing Agency under this Agreement shall continue for the Term, regardless of whether the loan from the NEF Lender is still outstanding. Prior to the expiration of the Term, the Developer shall enter into a use agreement with the Municipality, or as otherwise required by the Comprehensive Permit Rules,

ensuring that the Development will comply with the continued affordability requirements applicable to the Development.

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

#### INDEMNIFICATION/LIMITATION ON LIABILITY

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

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

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

Nothing herein shall preclude the Subsidizing Agency from asserting such claims as it may have at law or in equity against any partner, manager or member of the Developer or any officer, director, shareholder, trustee, member, manager, agent, or employee of the Developer or of such partner, manager or member for any loss or damage the Subsidizing Agency actually suffers as a result of any of the following:

(i) a willful breach by such person of the provisions limiting payments or distributions to partners, members, managers, or affiliates as set forth in this Agreement;  
or

(ii) intentional fraud committed by such person; or

(iii) a willful breach by such person of a warranty contained in this Agreement or a false representation of a material fact made by such person with respect to itself, the Developer or the Development which was known by such person to be false when made;  
or

(iv) a false representation knowingly made by such person that it has legal capacity and is authorized to sign this Agreement on behalf of the entity on whose behalf such individual has signed.

Nothing contained in the provisions of this Section 26 or elsewhere shall limit: (i) the right of the Subsidizing Agency to obtain injunctive relief or to pursue equitable remedies under this Agreement, excluding only any injunctive relief ordering payment of obligations by any person or entity for which personal liability does not otherwise exist; or (ii) the liability of any attorney, law firm, architect, accountant or other professional who or which renders or provides any written opinion or certificate to the Subsidizing Agency in connection with the Development even though such person or entity may be an agent or employee of the Developer or of any partner, manager, or member thereof.

### **MINIMUM SUBSIDY REQUIREMENTS**

27. To ensure that the minimum subsidy requirements of the Comprehensive Permit Rules are satisfied, the Developer shall provide to the Subsidizing Agency a certification from the Lender (which certification may, in the case of the Construction Loan, be combined with the certification required pursuant to Section 2(b) hereof) that the Lender is an FHLBB member bank and shall not transfer all or any portion of its interest in the Loan (including participations or sale of servicing rights, but not including foreclosure of its mortgage) or consent to a refinancing of the Loan (which the Developer hereby agrees not to seek) during the first five (5) years of the Loan without the prior written approval of the Subsidizing Agency.

### **CASUALTY**

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

### **DEVELOPER'S REPRESENTATIONS, COVENANTS AND WARRANTIES**

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

(a) The Developer (i) is a \_\_\_\_\_ duly organized under, and is qualified to transact business under, the laws of the Commonwealth of Massa-

chusetts, (ii) has the power and authority to own its properties and assets and to carry on its business as now being conducted, and (iii) has the full legal right, power and authority to execute and deliver this Agreement.

(b) The execution and performance of this Agreement by the Developer (i) will not violate or, as applicable, has not violated any provision of law, rule or regulation, or any order of any court or other agency or governmental body, and (ii) will not violate or, as applicable, has not violated any provision of any indenture, agreement, mortgage, mortgage note, or other instrument to which the Developer is a party or by which it or the Development is bound, and (iii) will not result in the creation or imposition of any prohibited encumbrance of any nature.

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

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

(e) **[for use when the Developer is nominee trust/otherwise delete]** [(i) The undersigned Trustee(s) are the sole Trustee(s) of said Trust, duly appointed in accordance with the terms of the Trust; (ii) said Trust has not been altered, amended, revoked, or terminated, and is presently in full force and effect as recorded; (iii) pursuant to the powers granted under said Trust, the Trustee(s) have the power and authority to execute this Agreement, transfer real estate, and to execute and deliver deeds and related closing documents of any or all trust property; (iv) if under said Trust the consent of beneficiaries is required to authorize the Trustee(s) to execute this Agreement, that written consent of all beneficiaries has been obtained; and (v) no beneficiary is a minor, a corporation selling all or substantially all of its assets or a personal representative of an estate subject to estate tax liens or is now deceased or under any legal disability.]

### MISCELLANEOUS CONTRACT PROVISIONS

30. This Agreement may not be modified or amended except with the written consent of the Subsidizing Agency or its successors and assigns and Developer or its successors and assigns. The Developer hereby agrees to make such modifications to this Agreement as may be required by DHCD to implement the Comprehensive Permit Rules, as amended from time to time.

31. The Developer warrants that it has not, and will not, execute any other agreement with provisions contradictory to, or in opposition to, the provisions hereof, and that, in any event, the

requirements of this Agreement are paramount and controlling as to the rights and obligations set forth and supersede any other requirements in conflict therewith.

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

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

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

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

#### NOTICES

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

If to the Developer:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

If to the Subsidizing Agency:

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

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

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

#### **RECORDING**

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

#### **GOVERNING LAW**

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

#### **CONFLICT; PRIORITY OF AGREEMENT**

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

This Agreement is senior to the Mortgage and to any other mortgage encumbering the Development. Furthermore, the Developer understands and agrees that, in the event of foreclosure of the Mortgage and the exercise by the Lender of the power of sale therein, the

Development will be sold subject to the restrictions imposed hereby. The Developer acknowledges that any discharge or termination of this Agreement shall not affect the validity or enforceability of the Comprehensive Permit or the obligations of the Developer to comply with the provisions thereof.

**[Remainder of page intentionally left blank.]**

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

**DEVELOPER:**

By: \_\_\_\_\_  
Name:  
Title:

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

By: \_\_\_\_\_  
Gina B. Dailey, Director of  
Comprehensive Permit Programs

**Attachments:**

- Exhibit A – Legal Description
- Appendix A – Rent Schedule
- Appendix B – Subsidizing Agency Fees

Acknowledgment of Zoning Board of Appeals

COMMONWEALTH OF MASSACHUSETTS

County of Suffolk \_\_\_\_\_, 20\_\_

Then personally appeared before me, the undersigned notary public, the above-named Gina B. Dailey, the Director of Comprehensive Permit Programs of the Massachusetts Housing Finance Agency, as Subsidizing Agency as aforesaid, proved to me through satisfactory identification which was my own personal knowledge of identity of the signatory to be the person whose name is signed on the preceding document, and acknowledged to me that he/she signed it voluntarily for its stated purpose as the Director of Comprehensive Permit Programs of the Massachusetts Housing Finance Agency.

Before me,

\_\_\_\_\_  
Notary Public

My Commission Expires: \_\_\_\_\_

STATE OF \_\_\_\_\_

County of \_\_\_\_\_

\_\_\_\_\_, 20\_\_

Then personally appeared before me \_\_\_\_\_, the \_\_\_\_\_ of \_\_\_\_\_, proved to me through satisfactory evidence of identification, which was [ ] a current driver's license, [ ] a current U.S. passport, [ ] my personal knowledge, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he/she signed it voluntarily for its stated purpose as his/her free act and deed, in such capacity, before me

\_\_\_\_\_  
Notary Public

My Commission Expires:

**EXHIBIT A**

**LEGAL DESCRIPTION**

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

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

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

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

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

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

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

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

<sup>2</sup> Identify subject income limit area, i.e. Metropolitan Statistical Area (MSA)<sup>1</sup> or HUD Metro FMR Areas (HMFA) – See "Area" definition.

**APPENDIX B**

**FEES PAYABLE TO SUBSIDIZING AGENCY**

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

**ACKNOWLEDGEMENT OF ZONING BOARD OF APPEALS**

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

\_\_\_\_\_  
Name:  
Chairman, \_\_\_\_\_ Zoning Board of Appeals

\_\_\_\_\_  
Name:

\_\_\_\_\_  
Name:

\_\_\_\_\_  
Name:

\_\_\_\_\_  
Name:

**COMMONWEALTH OF MASSACHUSETTS**

\_\_\_\_\_ County, ss.

On this \_\_\_\_ day of \_\_\_\_\_, 20 \_\_, before me, the undersigned notary public, personally appeared \_\_\_\_\_, the Chairman of the \_\_\_\_\_ Zoning Board of Appeals, proved to me through satisfactory evidence of identification, which was [a current driver's license] [a current U.S. passport] [my personal knowledge], to be the person whose name is signed on the preceding instrument and acknowledged the foregoing instrument to be his or her free act and deed.

\_\_\_\_\_  
Notary Public  
My commission expires:







### Waiver Requests

Through the Comprehensive Permit, the Stoneham Board of Appeals has the authority under M.G.L. chapter 40B and its implementing regulations to waive requirements of local bylaws; further, the Board of Appeals can act on behalf of any local permitting authority through the Comprehensive Permit process. The project plans reflect an attempt to minimize the number of waivers requested and we believe reflects a plan that is contextually appropriate on several different levels. Following please find a preliminary table of the waivers necessary to permit the proposed project; the Applicant reserves the right to supplement this list will be updated as necessary as permitting proceeds.

#### WAIVERS FROM ZONING

LOCAL REGULATION	REQUIREMENT*	PROPOSED	SIGNIFICANCE/EXPLANATION
1. Chapter 15; 4.2.2 – Permitted Use in Residence A	One family dwelling and accessory garage structure	Three multi-family apartment buildings, one with an integral parking garage as shown, five multi-family townhouse buildings with integral parking garages as shown, one detached parking garage structure as shown, one clubhouse/leasing/sales office building and one maintenance building.	Needed for plan as proposed
2. Chapter 15; 5.2.1 – Table One - Minimum Lot Area per Dwelling	10,000 sf/unit	4,233 sf/u	Needed for plan as proposed
3. Chapter 15; 5.2.1 – Table One – Maximum Building Height	30 feet	62 feet at larger apartment buildings, 35 feet at townhouse buildings and 30 feet at clubhouse building	Needed for plan as proposed
4. Chapter 15; 5.3.7.1 – Space Between Buildings	30 feet	22 feet between Building B and Clubhouse	Needed for plan as proposed
5. Chapter 15; 6.3.3 – Parking Requirement for Multi-Unit Development	2.1/unit	1.65/unit	Needed for plan as proposed
6. Chapter 15; 6.3.4.1 – Parking Space Size	9'x18'	Generally 9'x18', but columns encroach 1' into some spaces in Garage C	Needed for plan as proposed

7. Chapter 15; 6.3.4.2 #10 – Parking Layout, Snow Storage	Allow for storage within parking areas	Storage will be handled onsite, not necessarily in parking areas	Needed for plan as proposed
8. Chapter 15; 6.3.5.2 – Parking Screening	4' w x 4' tall screening at all parking areas from adjacent lots	Sufficient screening is provided, as shown on sheet L-1	Parking areas are screened from adjacent residences by 100'+ of natural vegetation with the exception of Weiss residences, where screening is proposed as shown
9. Chapter 15; 6.3.5.1, 6.6.2.1, 6.8.7.1 – Parking Lighting	Minimum 1fc over entire lot, no trespass on street or abutting property	Lighting is provided as shown on sheet L-2	1fc over entire site would be too bright, some spillover occurs at driveway entrance and Weiss abutting homes
10. Chapter 15; 6.3.6 – Driveway Access Permit	Permit required	Permit requested	
11. Chapter 15; 6.3.7.1 – Loading Bay	One required per 25,000 sf of building	None provided	Loading will be done through main and side building entries
12. Chapter 15; 6.7, Table 2 – Number of Signs, Size of Signs	One sign per lot	One primary entry monument sign, one building identification monument sign, four directional monument sign and six building mounted identification signs as shown on the architectural, site and landscaping plans	Needed to identify and market community and to aid in traffic flow
13. Chapter 15; Sec. 6.8.10 – Alteration of Land	Suitably landscape areas of land alteration	Landscaping as shown on plans	To clarify requirement
14. Chapter 15; 6.10 – Land Fill Permit	Permit required	Permit requested	

\*To the extent that the plans show work requiring additional waivers not expressly set forth above, these waivers are also requested

### WAIVERS FROM LOCAL BY LAWS

15. Chapter 6; Sec. 6.3-3 – Recycling	Recycling to be separated between “Paper” and “Co-Mingled” items	All recycling materials will be handled through “single stream” recycling where all recyclables are placed into a single container and sorted offsite	All materials are recycled results in higher recycling percentage
16. Chapter 11, Wetland Protection By-Law	No disturbance within 25 feet of a wetland resource area	Allow for the restoration of degraded areas within 25 feet of the wetlands, and allow for pedestrian path to cross through the 25 foot strip.	The site has at least two locations where there are stockpiles of miscellaneous fill adjacent to the wetlands which should be removed. The pedestrian path is necessary to access the property on the opposite side of the wetlands at the existing pedestrian bridge
17. Chapter 13-1 – Streets and Sidewalks, Excavation	Permit required	Permit requested	
18. Chapter 13-15 – Streets and Sidewalks, Street Opening	Permit required	Permit requested	
19. Chapter 13A – Earth Removal	Permit required	Permit requested	
20. Chapter 18; Sec 18-33(f), Comp. Permit Submittal Requirements	Utility Plan including supporting information that utility connections meet federal, state and local regulations	Utility plan provided shows nature and location of all utilities	Level of detail is not required by 760 CMR:56.05
21. Chapter 18; Sec 18-33(k), Comp. Permit Submittal Requirements	Pro Forma	Not provided	Not required by 760 CMR:56.05
22. Chapter 18; Sec 18-33(n), Comp. Permit Submittal Requirements	Environmental Impact Analysis	Not provided	Level of detail is not required by 760 CMR:56.05
23. Chapter 18; Sec 18-33(p), Comp. Permit Submittal Requirements	Statement of Impact on Municipal Facilities and Services	Not provided	Level of detail is not required by 760 CMR:56.05

24. Chapter 18; Sec 18-34 – Filing Fee	\$3,000 base fee plus \$100 per unit proposed	Fee being paid, but waiver requested	In keeping with 760 CMR: 56.05, fee of this magnitude (\$29,400) is not “reasonable” for an affordable housing development.
25. Chapter 20; Secs. 20-28 & 32 – Location and Siting of Dumpster	Location to be submitted for approval	Location shown on Sheet C-2 and approval requested.	To clarify requirement
26. Chapter 20; Secs 20-34 & 35, Board of Health, Dumpster Permit	Permit required	Permit requested	

\*To the extent that the plans show work requiring additional waivers not expressly set forth above, these waivers are also requested





**TRAFFIC IMPACT AND ACCESS STUDY**

**PROPOSED RESIDENTIAL DEVELOPMENT  
STONEHAM, MASSACHUSETTS**

**GPI**

**181 BALLARDVALE STREET, SUITE 202  
WILMINGTON, MASSACHUSETTS 01887  
(978) 570-2999**

**PREPARED FOR:**

**WEISS FARM APARTMENTS, LLC  
C/O PETER MAHONEY  
100 GRANDVIEW ROAD, SUITE 207  
BRAintree, MASSACHUSETTS 02184**

**JUNE 2014**

**GPI**

***Traffic Impact and Access Study  
Proposed Residential Development  
Stoneham, Massachusetts***

## TECHNICAL MEMORANDUM

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**REF:** MAX-2013051

**DATE:** June 20, 2014

**TO:** Weiss Farm Apartments, LLC  
c/o Mr. Peter Mahoney  
100 Grandview Road, Suite 207  
Braintree, Massachusetts 02184

**FROM:** Ms. Heather L. Monticup, P.E., Project Manager  
Ms. Susannah E. Barnes, E.I.T., Engineer

**RE:** Traffic Impact and Access Study  
Proposed Residential Development  
Stoneham, Massachusetts

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### EXECUTIVE SUMMARY

Greenman-Pedersen, Inc. (GPI) has prepared this *Traffic Impact and Access Study* (TIAS) for a proposed residential development to be located at 170 Franklin Street in Stoneham, Massachusetts. The subject site is currently a business which sells and distributes landscape products. The proposed redevelopment consists of razing the existing 2 barns on the site, retaining the residential home and 1 story wood frame barn behind the residential home, and constructing 264 dwelling units with a  $\pm 1,000$  square foot leasing office. Access is proposed to be provided via one full access/egress driveway on Franklin Street. This TIAS evaluates the traffic impacts and access/egress requirements for the proposed residential development.

**GPI** Greenman-Pedersen, Inc.

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### **Existing Conditions**

Baseline conditions within the study area were developed by conducting traffic counts in September 2013; comparing the traffic-count data to average-month condition traffic volumes; researching collision history; inventorying roadways, intersections, and traffic controls; and assessing the availability of public transportation. The study area consists of ten intersections, four unsignalized and six signalized. Base traffic conditions within the study area were developed by conducting automatic traffic recorder (ATR) counts along Franklin Street in the vicinity of the site for a 48-hour period to obtain weekday daily data and collecting manual turning movement counts (TMCs) and vehicle classification counts during the weekday AM peak period (6:00 to 9:00 AM) and the weekday PM peak period (4:00 to 6:00 PM) at the study area locations. In addition, pedestrian and bicycle counts were conducted in April 2014 during the peak hours of each study area intersection.

### **Future Conditions**

Future conditions were derived by projecting baseline volumes to the year 2018, representing a five-year design horizon to be consistent with the state guidelines at the time that the traffic study had begun. The future No-Build peak-hour traffic volumes were developed by applying a 1.0 percent compounded annual growth rate to the existing volumes and by adding traffic associated with the assisted living facility that is currently in construction on Franklin Street.

The proposed development project consists of razing the existing two barns on the site, retaining the residential home and 1 story wood frame barn behind the residential home, and constructing 264 dwelling units with a ±1,000 square foot leasing office. Access is proposed to be provided via one full access/egress driveway on Franklin Street. The proposed project is expected to generate 1,774 vehicle trips on a weekday. During the critical peak hours, the proposed redevelopment project is expected to generate 138 vehicles trips (29 entering and 109 exiting) during the weekday AM peak hour and 190 vehicle trips (118 entering and 72 exiting) during the weekday PM peak hour.

### **Analysis**

Capacity and queue analyses were conducted at all study area locations under 2013 Existing, 2018 No-Build, and 2018 Build traffic-volume conditions. The impact of site-generated traffic can be measured by comparing 2018 No-Build conditions to 2018 Build conditions. The turning movements into and out of the site driveway shown in the No-Build condition include the existing site trips. Turning movements into and out of the site driveway shown in the Build condition represent the traffic to be generated by the proposed development project, which was

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forecast using the trip generation information provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*<sup>1</sup>.

The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM)<sup>2</sup> and is described in the Appendix. The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers.

### **Franklin Street at Perkins Street**

Under existing and future traffic-volume conditions the Franklin Street movements at the unsignalized intersection of Franklin Street at Perkins Street are expected to operate at optimal levels (LOS A). The minor street movements (Perkins Street) currently operate with long delays (LOS F) and have capacity constraints (volume-to-capacity ratio  $[v/c] > 1.00$ ). The project is expected to increase traffic on this approach by 2.7% or less and increase vehicle queue lengths by 2 vehicles or less during the peak hours.

### **Franklin Street at Franklin Place (Stoneham High School Access Road)**

Under existing and future traffic-volume conditions the signalized intersection of Franklin Street at Franklin Place is expected to operate at an overall LOS D or better during the weekday AM peak hour and LOS C or better during the weekday PM peak hour. It should be noted that the analysis results are based on an average over the entire peak hour, and the actual conditions may be better or worst at smaller intervals of time within this hour. The proposed project is expected to impact this location during the weekday PM peak hour. Accordingly, improvement measures are recommended at this location during the weekday PM peak period.

### **Franklin Street at Dunkin' Donuts Driveway and Residential Complex**

Under existing and future traffic-volume conditions the Franklin Street movements at the unsignalized intersection of Franklin Street at the Dunkin' Donuts and residential complex driveways are expected to operate at optimal levels (LOS A). This is true during times when traffic flow along Franklin Street is unrestrained, not necessarily when the Traffic Director is present at Stevens Street and at the High School. The Dunkin' Donuts and residential complex driveways currently operate at LOS F and will continue to operate at LOS F with the addition of the residential development. Queue lengths during the PM peak hour are anticipated to increase by less than one vehicle as a result of the project.

<sup>1</sup> *Trip Generation Manual*, 9<sup>th</sup> Edition; Institute of Transportation Engineers; Washington, DC; 2012.

<sup>2</sup> *HCM 2010: Highway Capacity Manual*. Washington, D.C.: Transport Research Board, 2010.

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### **Franklin Street at Pleasant Street**

Under existing and future traffic-volume conditions, the Franklin Street through movements at the unsignalized intersection of Franklin Street at Pleasant Street are expected to operate at optimal levels (LOS A) with the Franklin Street left-turn movements expected to operate at LOS C or better. The minor street movements (Pleasant Street) at this intersection currently operate with long delays (LOS F) and have capacity constraints ( $v/c > 1.00$ ). The project is expected to increase traffic on this approach by 5.9% or less and increase vehicle queue lengths by 4 vehicles or less during the peak hours.

### **Franklin Street at Summer Street**

Under existing and future traffic-volume conditions the signalized intersection of Franklin Street at Summer Street is expected to operate at an overall LOS C or better. The proposed project is expected to impact certain turning movements at this location during the peak hours studied. Accordingly, improvement measures are recommended at this location.

### **Franklin Street at Pine Street**

Under existing and future traffic-volume conditions the signalized intersection of Franklin Street at Pine Street is expected to operate with an overall LOS C during the weekday AM peak period and an overall LOS B during the weekday PM peak period. All movements are expected to operate at LOS C or better and LOS is anticipated to remain the same with the addition of the residential development. Increases in queue lengths as a result of the project are expected to be less than 3 vehicles.

### **Franklin Street at Main Street and Central Street**

The signalized intersection of Franklin Street at Main Street and Central Street is expected to drop from an overall LOS C (Existing) to LOS D (No-Build) with the addition of historical traffic growth and background developments and drop from LOS D (No-Build) to LOS E (Build) with the proposed residential development in place during the weekday AM peak hour. Under existing and future traffic-volume conditions the intersection is expected to operate with an overall LOS B during the weekday PM peak hour. As the proposed project is expected to impact this location during the weekday AM peak hour, improvement measures are recommended at this location during the weekday AM peak period.

### **Main Street at Summer Street and Marble Street**

Under existing and future traffic-volume conditions the signalized intersection of Main Street at Summer Street and Marble Street is expected to operate at an overall LOS D or better. During the weekday AM peak hour, the overall LOS drops from LOS C (No-Build) to LOS D (Build) with

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the proposed residential development in place. However, no movements drop a level of service during the weekday AM peak hour. During the weekday PM peak hour, the Main Street southbound approach is expected to drop from LOS B to LOS C as a result of the project, however, this is due to a 0.2 second increase in delay on this movement. Increases in delay for the rest of the intersection are expected to be less than 3 seconds overall and 8.4 seconds or less on any movement. In addition, increases in queue length on any movement are expected to be less than 2 vehicles.

### **Summer Street at Pond Street**

Under existing and future traffic-volume conditions the signalized intersection of Summer Street at Pond Street is expected to drop from an overall LOS B (No-Build) to LOS C (Build) during the weekday AM peak hour and operate an overall LOS B during the weekday PM peak hour. This drop in LOS during the weekday AM peak hour is due to an increase in delay of less than 1 second to the overall intersection. All movements are anticipated to operate at the same LOS with the addition of the residential development. Increases in delay of less than 2 seconds are expected on any movement and increases in queue length on any movement are expected to be less than 1 vehicle.

### **Franklin Street at Site Driveway**

Under future traffic-volume conditions the Franklin Street movements at the site driveway are expected to operate at optimal levels (LOS A). This is true during times when traffic flow along Franklin Street is unrestrained, not necessarily when the Traffic Directors are present at Stevens Street and at the High School. The site driveway southbound left-turn movement is expected to operate at with long delays (LOS F) during the weekday AM and weekday PM peak hours while the right-turn movement is expected to operate at LOS C. The queue length on the site driveway is expected to be approximately 1 vehicle for the left-turn lane and less than 2 vehicles for the right-turn lane. During the peak period prior to the start of school a longer queue could be expected, however, there is ample room on-site to queue the vehicles (up to 75 feet [3 vehicles] in each lane with an additional 50 feet [2 vehicles] prior to blocking the first internal intersection) and delays would be recognized on-site and not along Franklin Street. Improvement measures are recommended at this location.

### **Improvements**

The final phase of the transportation analysis process is to identify improvement measures necessary to minimize the impact of the project and also improve existing operating conditions on the transportation system. Improvements considered necessary to address existing and future roadway system deficiencies are discussed below as they relate to impacts as a result of background growth and to project-generated impacts.

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Due to the impacts that the proposed residential development would have at the intersection of Franklin Street at Franklin Place during the weekday commuter PM peak hour, after the school dismissal peak, improvement measures have been investigated. With the improved signal timings, the intersection is anticipated to operate at an overall LOS C during the weekday PM peak hour with all lane groups operating at LOS D or better and all v/c ratios are expected to be below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes.

Due to the impacts that the proposed residential development would have at the intersection of Franklin Street at Summer Street during the weekday AM and weekday PM peak hours, improvement measures have been investigated. With the improved signal timings, the intersection is anticipated to operate at an overall LOS C with all lane groups operating at LOS D or better and all v/c ratios are expected to be below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes.

Due to the impacts that the proposed residential development would have at the intersection of Franklin Street at Main Street and Central Street during the weekday AM peak hour, improvement measures have been investigated. With the improved signal timings, the intersection is anticipated to operate at an overall LOS D during the weekday AM peak hour with all lane groups operating at LOS E or better.

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### **INTRODUCTION**

GPI has prepared this TIAS for a proposed residential development to be located at 170 Franklin Street in Stoneham, Massachusetts. The subject site is currently a business which sells and distributes landscape products. Based on our understanding of the project, the development consists of razing the existing 2 barns on the site, retaining the residential home and 1 story wood frame barn behind the residential home, and constructing 264 dwelling units with a ±1,000 square foot leasing office. Access is proposed to be provided via one full access/egress driveway on Franklin Street.

Franklin Street is under local jurisdiction and, therefore, review and approval of the project is expected only through the Town of Stoneham. The site location in relation to the surrounding roadways is shown on the map on Figure 1. This TIAS evaluates the traffic impacts and access/egress requirements for the proposed residential development.

### **EXISTING CONDITIONS**

#### **Study Area**

Evaluation of the traffic impacts associated with the proposed project requires an evaluation of existing and projected traffic volumes on the adjacent streets, the volume of traffic expected to be generated by the project, and the impact that this traffic will have on the adjacent streets and nearby intersections. In preparing the TIAS for the proposed site, the following intersections have been analyzed and evaluated:

- Franklin Street at Perkins Street (unsignalized)
- Franklin Street at Weiss Farm Driveway - 170 Franklin Street (unsignalized)
- Franklin Street at Franklin Place (Stoneham High School Access Road) (signalized)
- Franklin Street at Dunkin' Donuts Driveway and Residential Complex (unsignalized)
- Franklin Street at Pleasant Street (unsignalized)
- Franklin Street at Summer Street (signalized)
- Franklin Street at Pine Street (signalized)
- Franklin Street at Main Street (Route 28) and Central Street (signalized)
- Main Street (Route 28) at Summer Street and Marble Street (signalized)
- Summer Street at Pond Street (signalized)

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Figure 1  
Site Location Map

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### **Franklin Street**

Within the vicinity of the site, Franklin Street is aligned in an east/west direction. Franklin Street generally provides one through lane and a shoulder in each direction with turn lanes at major intersections. Adjacent to the site, the eastbound lane is 12-feet wide with a  $\pm 3$ -foot wide shoulder and the westbound lane is 15-feet wide with a  $\pm 6.5$ -foot wide shoulder. Franklin Street has a posted speed limit that fluctuates between 30 and 35 miles per hour (mph) in the eastbound and westbound directions within the study area. Adjacent to the site, the posted speed limit is 30 mph, but changes to 35 mph in the eastbound direction just east of the site. Land uses along Franklin Street consist of residential and institutional uses.

### **Traffic Volumes**

Base traffic conditions within the study area were developed by conducting manual-turning movement counts (TMCs), vehicle classification counts, and automatic traffic recorder (ATR) counts in September 2013. The TMCs and vehicle classification counts were performed during the weekday AM peak period (6:00 to 9:00 AM) and the weekday PM peak period (4:00 to 6:00 PM). Traffic counts at the existing Weiss Farm driveway were collected during the same peak periods on April 10, 2014. In addition, pedestrian and bicycle counts were conducted on April 10, 2014 during the peak hours of each study area intersection, including the dismissal period (2:15 to 3:15 PM) at the Stoneham High School. The ATRs were used to obtain weekday daily traffic volumes along Franklin Street between Franklin Place and Rustic Road. All traffic-count data are provided in the Appendix.

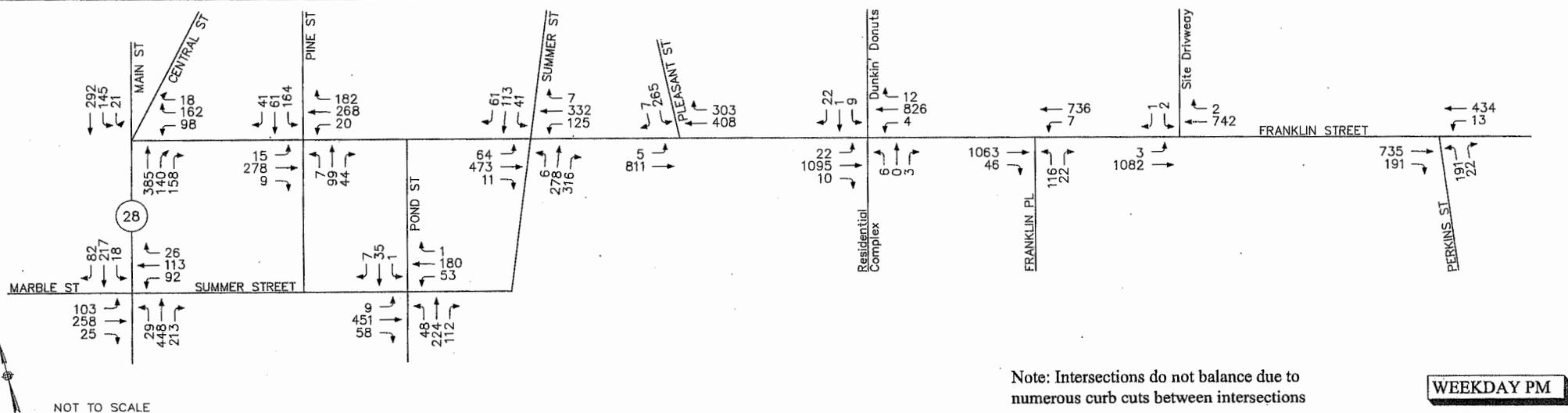
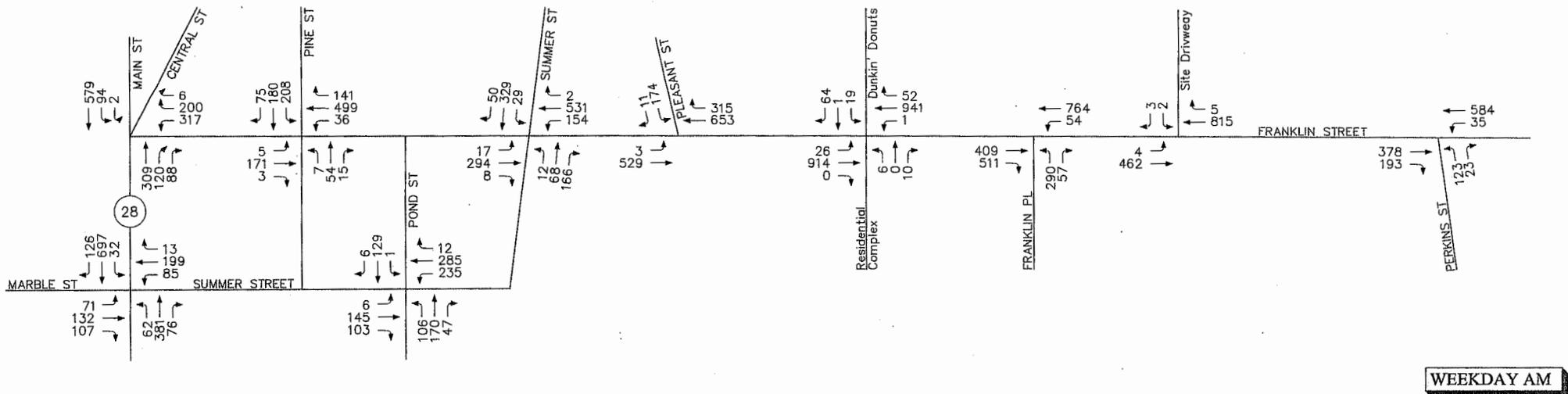
Traffic on a given roadway typically fluctuates throughout the year depending on the area and the type of roadway. To determine if the September traffic-volume data needed to be adjusted to account for this fluctuation, historical traffic-volume data were reviewed from MassDOT records.<sup>3</sup> This information revealed that September traffic volumes are 1.6 percent above average-month conditions. Therefore, to provide a conservative analytical framework (higher than average), the collected data were used as counted to reflect an above average-month analysis condition. As only the turns into and out of the Weiss Farm driveway are used in the TIAS, no seasonal adjustment for the April counts was needed. The MassDOT seasonal adjustment data are provided in the Appendix.

Table 1 summarizes the existing daily and peak-hour traffic volumes on Franklin Street between Franklin Place and Rustic Road. The 2013 Existing traffic-flow networks for the weekday AM and weekday PM peak hours are shown graphically on Figure 2.

<sup>3</sup>MassDOT 2009 Traffic Volumes; Permanent Count Station 407 – Route 28 south of the Reading Town Line (Stoneham).

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Note: Intersections do not balance due to numerous curb cuts between intersections

Figure 2  
2013 Existing  
Peak Hour Traffic Volumes

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**Table 1**  
**EXISTING TRAFFIC-VOLUME SUMMARY**

Location/Time Period	Daily Volume (vpd) <sup>a</sup>	Peak Hour Volume (vph) <sup>b</sup>	K Factor (%) <sup>c</sup>	Directional Distribution <sup>d</sup>
<b>Franklin Street adjacent to site:</b>				
Weekday Daily	17,540			
Weekday AM Peak Hour		1,284	7.3%	64% WB
Weekday PM Peak Hour		1,828	10.4%	59% EB

<sup>a</sup> In vehicles per day.

<sup>b</sup> In vehicles per hour.

<sup>c</sup> Percentage of daily traffic occurring during the peak hour.

<sup>d</sup> WB = westbound; EB = eastbound.

### Collisions

Collision data for the study area intersections were obtained from the Stoneham Police Department (2011-2013) and MassDOT (2009-2011) for the latest three years available. Summaries of the Stoneham Police Department and MassDOT crash data at the study area intersections are provided in Tables 2 and 3, respectively.

In addition to the collision summary, crash occurrence also should be compared to the volume of traffic through a particular intersection to determine any significance. Accordingly, the crash rates were calculated for each study area intersection and compared with the statewide and district-wide averages. An intersection crash rate is a measure of the frequency of collisions compared to the volume of traffic through an intersection and is presented in crashes per million entering vehicles (c/mev). For signalized intersections, the statewide average is 0.80 c/mev and the district-wide average (District 4) is 0.77 c/mev. For unsignalized intersections, the statewide average is 0.60 c/mev and the district-wide average is 0.58 c/mev. A comparison of the calculated crash rate to these averages can be used to establish the significance of collision occurrence and whether or not potential safety problems exist. It should be noted that the Stoneham Police Department summary table displays a number of police reports and a number of incident reports. Incidents are considered under \$1,000 of damage and are not technically what is reviewed for crash rates, and are therefore not included in the crash rate calculations. The number of incidents has been provided in the table merely for informational purposes. All crash rate worksheets are provided in the Appendix.

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**Table 2  
COLLISION SUMMARY – Stoneham Police Department Data**

Location	Number of Collisions					Severity <sup>a</sup>				Collision Type <sup>b</sup>						Percent During	
	Police Report	Incident Report	Total	Average per Year	Crash Rate <sup>c</sup>	PD	PI	F	U	CM	RE	HO	FO	Ped	U	Commuter Peak <sup>d</sup>	Wet/Icy Conditions <sup>e</sup>
Franklin St. at Perkins St.	4	3	7	1.33	0.24	2	1	--	1	3	1	--	--	--	--	50%	75%
Franklin St. at Weiss Farm Dwy	1	0	1	0.33	0.05	--	1	--	--	--	1	--	--	--	--	0%	100%
Franklin St. at Franklin Pl.	2	3	5	0.67	0.10	2	--	--	--	--	2	--	--	--	--	50%	0%
Franklin St. at Dunkin Donuts Dwy	5	7	12	1.67	0.24	3	2	--	--	1	4	--	--	--	--	60%	40%
Franklin St. at Pleasant St.	0	0	0	0.00	0.00	--	--	--	--	--	--	--	--	--	--	0%	0%
Franklin St. at Summer St.	4	3	7	1.33	0.21	4	--	--	--	3	1	--	--	--	--	50%	0%
Franklin St. at Pine St.	6	2	8	2.00	0.48	5	1	--	--	5	1	--	--	--	--	33%	17%
Franklin St. at Main St./Central St.	4	9	13	1.33	0.23	3	1	--	--	2	1	--	--	1	--	0%	50%
Main St at Summer St./Marble St.	2	5	7	0.67	0.10	1	1	--	--	--	2	--	--	--	--	0%	0%
Summer St. at Pond St.	2	1	3	0.67	0.14	1	1	--	--	1	1	--	--	--	--	50%	0%

Source: Stoneham Police Department Records (2011-2013).

<sup>a</sup> PD = property damage only; PI = personal injury; F = fatality.

<sup>b</sup> CM = cross movement/angle; RE = rear end; HO = head on; FO = fixed object; Ped = pedestrian; U = unknown.

<sup>c</sup> Measured in crashes per million entering vehicles.

<sup>d</sup> Percent of vehicle incidents that occurred during the weekday AM and weekday PM commuter peak periods.

<sup>e</sup> Represents the percentage of only "known" collisions occurring during inclement weather conditions.

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**Table 3  
COLLISION SUMMARY – MassDOT Data**

Location	Number of Collisions			Severity <sup>a</sup>				Collision Type <sup>b</sup>						Percent During	
	Total	Average per Year	Crash Rate <sup>c</sup>	PD	PI	F	U	CM	RE	HO	FO	Ped	U	Commuter Peak <sup>d</sup>	Wet/Icy Conditions <sup>e</sup>
Franklin Street at Perkins Street	4	1.33	0.24	2	2	--	--	3	1	--	--	--	--	50%	50%
Franklin Street at Weiss Farm Driveway	1	0.33	0.05	--	1	--	--	--	--	--	--	--	1	0%	100%
Franklin Street at Franklin Place	0	0.00	0.00	--	--	--	--	--	--	--	--	--	--	0%	0%
Franklin Street at Dunkin Donuts Driveway	4	1.33	0.19	4	--	--	--	--	3	--	--	--	1	25%	25%
Franklin Street at Pleasant Street	3	1.00	0.16	3	--	--	--	--	1	--	--	--	2	33%	33%
Franklin Street at Summer Street	4	1.33	0.21	3	1	--	--	2	--	--	1	--	1	25%	50%
Franklin Street at Pine Street	6	2.00	0.48	3	1	--	2	3	3	--	--	--	--	33%	17%
Franklin Street at Main St and Central St	19	6.33	1.10	12	6	--	1	4	6	--	6	--	3	21%	42%
Main St at Summer St and Marble St	5	1.67	0.25	4	1	--	--	3	2	--	--	--	--	0%	20%
Summer Street at Pond Street	8	2.67	0.56	5	2	--	1	6	2	--	--	--	--	25%	63%

Source: MassDOT Records (2009-2011).

<sup>a</sup> PD = property damage only; PI = personal injury; F = fatality.

<sup>b</sup> CM = cross movement/angle; RE = rear end; HO = head on; FO = fixed object; Ped = pedestrian; U = unknown.

<sup>c</sup> Measured in crashes per million entering vehicles.

<sup>d</sup> Percent of vehicle incidents that occurred during the weekday AM and weekday PM commuter peak periods.

<sup>e</sup> Represents the percentage of only “known” collisions occurring during inclement weather conditions.

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The unsignalized intersection of Franklin Street at Perkins Street experienced, on average, approximately 1.3 collisions per year over both three-year study periods. During the most recent three-year period (2011-2013), two of the four collisions resulted in property damage only, one resulted in personal injury, and one is unknown. Three of the crashes were cross movement/angle collisions and one was a rear-end collision. Fifty percent of the collisions occurred during the commuter peak, and 75 percent occurred during wet/icy conditions. Additionally, the crash rate for the intersection (0.24 c/mev) is well below the statewide and district-wide averages for unsignalized intersections, indicating a safety risk does not exist at the intersection.

The unsignalized intersection of Franklin Street at existing Weiss Farm driveway (170 Franklin Street) experienced, on average, approximately 0.3 collisions per year over both three-year study periods. The one collision was a rear-end collision in wet/icy conditions that resulted in personal injury. The crash rate for the intersection (0.05 c/mev) is well below the statewide and district-wide averages for unsignalized intersections, indicating a safety risk does not exist at the intersection.

The signalized intersection of Franklin Street at Franklin Place (Stoneham High School access road) experienced, on average, approximately 0.7 collisions per year during the most recent three-year period (2011-2013). Both collisions were rear-end collisions and resulted in property damage only. One of the crashes occurred during the commuter peak and none occurred during wet/icy conditions. The crash rate for the intersection (0.10 c/mev) is well below the statewide and district-wide averages for signalized intersections, indicating a safety risk does not exist at the intersection.

The unsignalized intersection of Franklin Street at Dunkin' Donuts driveway (128 Franklin Street) and residential complex experienced, on average, 1.7 collisions per year during the most recent three-year period (2011-2013). Three of the five collisions resulted in property damage only, and two resulted in personal injury. One of the crashes was a cross movement/angle collision and four were rear-end collisions. Three crashes occurred during the commuter peak and two crashes occurred in wet/icy conditions. The crash rate (0.24 c/mev) for the intersection is well below the statewide and district-wide averages for unsignalized intersections, indicating a safety risk does not exist at the intersection.

The unsignalized intersection of Franklin Street at Pleasant Street did not experience any collisions during the most recent three-year study period (2011-2013), but experienced on average, 1.0 collision per year over the MassDOT three-year study period (2009-2011). Of the three collisions, all resulted in property damage only and no injuries. One of the crashes was a rear-end collision and the other two were not reported. One crash occurred during the commuter peak and one crash occurred in wet/icy conditions. The crash rate for the intersection (0.16 c/mev) is well below the statewide and district-wide averages for unsignalized intersections, indicating a safety risk does not exist at the intersection.

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The signalized intersection of Franklin Street at Summer Street experienced, on average, 1.3 collisions per year over both three-year study periods. During the most recent three-year period (2011-2013), all four crashes resulted in property damage only and no injuries. Three collisions were cross movement/angle collisions and one was a rear-end collision. Two crashes occurred during the commuter peak and none occurred in wet/icy conditions. The crash rate (0.21 c/mev) for the intersection is well below the statewide and district-wide averages for signalized intersections, indicating a safety risk does not exist at the intersection.

The signalized intersection of Franklin Street at Pine Street experienced, on average, approximately 2.0 collisions per year over both three-year study periods. During the most recent three-year period (2011-2013), five crashes resulted in property damage only and one resulted in personal injury. Five of the six collisions were cross movement/angle collisions and one was a rear-end collision; both of which are typical at signalized intersections. Two crashes occurred during the commuter peak and one occurred during wet/icy conditions. The crash rate for the intersection (0.48 c/mev) is below the statewide and district-wide averages for signalized intersections, indicating a safety risk does not exist at the intersection.

The signalized intersection of Franklin Street at Main Street and Central Street experienced, on average, 6.3 collisions per year over the MassDOT three-year study period (2009-2011). Six of the 19 crashes were rear-end collisions, which are typical at signalized intersections that include permitted movements on this type of roadway with numerous developments. Six were single-vehicle collisions, involving fixed objects and are most likely due to parallel parking. The crash rate for the intersection (1.10 c/mev) is above the statewide and district-wide averages for signalized intersections, indicating a safety risk could exist at the intersection. The fixed-object collisions, mostly likely associated with parallel parking, involve vehicles colliding with objects such as curb, trees, and fences. Although, the crash rate is above statewide and district-wide averages, if the fixed-object collisions were removed from the equation, as parallel parking crashes do not occur “in” the intersection or occur with other vehicles traveling through the intersection, the crash rate reduces to 0.75 c/mev which is below the statewide and district-wide averages. The Stoneham Police Department reports include more detail regarding the crashes and provide a better source of data when locating the collisions. Based on these reports, over the most recent three-year study period (2011-2013), the signalized intersection experienced, on average, approximately 1.3 collisions per year. Three of the four crashes resulted in property damage only and one resulted in personal injury. Two collisions were cross movement/angle collisions, one was a rear-end collision, and one involved a pedestrian. None of the crashes occurred during the commuter peak and two of the crashes occurred during wet/icy conditions. The crash rate for the intersection (0.23 c/mev) based on the local data is well below the statewide and district-wide averages for signalized intersections, indicating a safety risk does not exist at the intersection.

The signalized intersection of Main Street at Summer Street and Marble Street experienced, on average, 0.7 collisions per year during the most recent three-year study period (2011-2013). Both of the crashes were rear-end collisions; one resulted in property damage only and the other resulted in personal injury. Neither collision occurred during the commuter peak, or in wet/icy

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conditions. The crash rate for the intersection (0.10 c/mev) is below the statewide and district-wide averages for signalized intersections, indicating a safety risk does not exist at the intersection.

The signalized intersection of Summer Street at Pond Street experienced, on average, 0.7 collisions per year during the most recent three-year study period (2011-2013). One crash resulted in property damage only and the other resulted in personal injury. One of the two crashes was a cross-movement/angle collision and the other was a rear-end collision; both of which are typical at signalized intersections. Of the two collisions, one occurred during the commuter peak and neither in wet/icy conditions. The crash rate for the intersection (0.14 c/mev) is below the statewide and district-wide averages for signalized intersections.

### Vehicle Speeds

Vehicle speed measurements were conducted along Franklin Street between Franklin Place and Rustic Road by measuring the elapsed time for vehicles traveling a short, pre-measured distance between two checkpoints. The travel time was recorded using ATRs and the speed was derived by dividing the elapsed time into the measured distance between checkpoints. The primary use of this information is explained in the *Sight Distance* section where the speeds are correlated to sight distance measurements taken at the location of the site driveway to assure that adequate sight distances exist at the driveway to provide safe operation. The results of the speed measurements are summarized in Table 4.

**Table 4**  
**OBSERVED TRAVEL SPEEDS <sup>a</sup>**

Location/Direction	Posted Speed Limit	Average Speed <sup>b</sup>	85 <sup>th</sup> Percentile Speed <sup>c</sup>
<b>Franklin Street between Franklin Place and Rustic Road:</b>			
<i>West of Intersection (eastbound)</i>	30	28	34
<i>East of Intersection (westbound)</i>	30	33	40

<sup>a</sup> In miles per hour (mph).

<sup>b</sup> Average speed of all observed vehicles.

<sup>c</sup> Speed at, or below which 85 percent of all observed vehicles travel.

As shown in Table 4, the average speeds on Franklin Street adjacent to the site were found to be between 28 and 33 mph with 85<sup>th</sup> percentile speeds between 34 and 40 mph. The average speeds on Franklin Street are consistent with the posted speed limit of 30 mph. Adjacent to the site the

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posted speed limit is 30 mph; however, just east of the site the speed limit changes to 35 mph in the eastbound direction and changes from 35 mph in the westbound direction. The 85<sup>th</sup> percentile speed on Franklin Street is consistent with the speed limit in the eastbound direction and is considerably higher than the posted speed limit in the westbound direction. The ATR was placed almost exactly at the speed zone change, which would explain the higher speeds recorded in the westbound direction. Therefore, the speeds adjacent to the site might actually be lower than the westbound recorded speeds.

### **Public Transportation**

Stoneham is a member of the Massachusetts Bay Transportation Authority (MBTA), which provides fixed route service to neighboring communities. Public transportation services exist in the vicinity of the project approximately 0.5 to 1.0 mile from the site, with no services that pass by the site. MBTA Bus Route 131 stops at the intersection of Franklin Street and Botolph Street which is 0.5 miles east of the site, MBTA Bus Route 132 stops at the intersection of Franklin and Main Street (Route 28) which is 0.8 miles west of the site, and the Haverhill Commuter Rail Line (Melrose Highlands Station) is located approximately one mile east of the site. MBTA Bus Route 131 provides a connection to the Oak Grove Orange Line Station via East Side Highlands Melrose & Oak Grove Malden Station via Main Street (Malden) from 6:00 AM through 7:34 PM. There is no Saturday or Sunday bus service for Route 131. MBTA Bus Route 132 provides a connection from the Malden Station to the Redstone Shopping Center from 5:30 AM through 7:23 PM. There is no Sunday bus service for Route 132. The public transportation schedules are provided in the Appendix. The MBTA also provides THE RIDE, a paratransit service for the elderly and disabled.

### **Traffic Observations**

Traffic observations were made along the Franklin Street corridor and more specifically in the vicinity of the Stoneham High School (approximately 500 feet west of the proposed site driveway), Stevens Street (adjacent to the Dunkin Donuts at 128 Franklin Street), and at the proposed site driveway during the AM peak period. The queuing along Franklin Street and Franklin Place (Stoneham High School Access Road) during the morning drop-off period at the Stoneham High School is significant from 7:30 AM until 8:00 AM. During this time period, the westbound queue backs up past the location of the proposed site driveway, which will result in long delays for vehicles exiting the site. It is expected that those vehicles entering the site from the west during this peak period will stop in the eastbound travel lane and are expected to get a courtesy gap in traffic to allow them to make a safe left-turn movement into the site.

A Traffic Director was observed at the intersection of Franklin Street at Franklin Place (Stoneham High School Access Road) in order to facilitate pedestrians crossing Franklin Street to access the High School, as well as assist drivers attempting to exit onto Franklin Street from

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the High School. Also, a Traffic Director was observed at the intersection of Franklin Street at Stevens Street (adjacent to Dunkin Donuts) in order to assist drivers attempting to exit onto Franklin Street from Stevens Street. It appeared that, due to the volume of traffic in the westbound direction, when the Traffic Director at Stevens Street stops Franklin Street traffic a westbound queue along Franklin Street develops. Observations were made during the weekday AM peak period while school was in session and again during February school vacation week in order to compare school traffic to ordinary commuter traffic. It was noted that no queuing or delay issues took place during school vacation; therefore, the traffic congestion that occurs along the corridor during the peak half hour prior to the start of school is mainly associated to the High School traffic and not necessarily the ordinary commuter traffic.

In addition, traffic observations were made during the dismissal of Stoneham High School and the weekday PM peak period. It is important to note that school dismissal is at 2:26 PM and the weekday PM peak period occurs from 4:00 to 6:00 PM, with the weekday PM peak hour (commuter peak) in front of the high school occurring from 5:00 to 6:00 PM. The queuing along Franklin Place (Stoneham High School Access Road) during the afternoon pick-up period at the Stoneham High School is significant from 2:30 PM until 2:50 PM. During this time period, the Franklin Street approaches at this signalized intersection did not have significant queuing. The queue exiting the High School to turn left onto Franklin Street extended from the traffic signal to the entrance doors of the High School. It was observed that a vehicle at the end of the queue was able to get through the traffic signal in two cycles. Within five cycles, the majority of the pick-up traffic was cleared out and the queue became less than five vehicles from then on. By the fifth cycle, traffic on Franklin Street in the westbound direction became slow, but never inhibited vehicles from exiting the High School. By 2:50 PM, operations on Franklin Street were entirely back to free flow conditions.

A Traffic Director was observed during dismissal at the intersection of Franklin Street at Franklin Place (Stoneham High School Access Road) in order to facilitate pedestrians crossing Franklin Street to leave the High School, as well as assist drivers attempting to exit onto Franklin Street from the High School. More pedestrians were observed during the dismissal compared to the AM peak period, but the traffic director was able to make operations more efficient by crossing the students during the all red time and the start of the Franklin Street eastbound and westbound green time without negatively affecting flow on Franklin Street. When the pedestrian button was pressed, the traffic director was able to 'jump start' the traffic exiting the High School once the students crossed safely, rather than waiting for the pedestrian phase to complete.

Previous studies completed along Franklin Street were reviewed including: the Vanasse Hangen Brustlin, Inc. (VHB) memorandum for the Dunkin' Donuts & Mac's Landscaping at 128 Franklin Street dated June 16, 2003 and the Nitsch Engineering report to Tappe Associates on the proposal to relocate the Stoneham Middle School to the Stoneham High School campus at 149 Franklin Street dated April 11, 2011. As noted in the Nitsch Engineering report – *"The addition of the middle school traffic on Franklin Place will pose significant issues during the pick-up/drop-off period, as there are already queuing concerns at this location. Franklin Street*

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can accommodate the additional traffic, but there is a need for a greater storage turning into and out of Franklin Place.” GPI concurs with this statement. Field observations have verified that the traffic congestion along Franklin Place and along Franklin Street is associated with the High School. To increase vehicle trips of the same land use will just intensify the traffic issues and most likely spread the congestion throughout longer weekday AM and PM peak periods since the High School and Middle School start and end at different times. The proposed residential development is not anticipated to add traffic to the turning movements in or out of Franklin Place, but rather add traffic to the through movements along Franklin Street, adjacent to Franklin Place. In order to prevent queuing for the proposed residential site from disrupting flow on Franklin Street, an eastbound left-turn lane is proposed at the site driveway. This improvement is described in the *Recommended Improvements* section of the TIAS.

## FUTURE CONDITIONS

To estimate the impact of site-generated traffic within the study area, existing traffic volumes were projected to the year 2018, representing a five-year design horizon in accordance with state guidelines. The proposed development is expected to be completed and fully operational within this time frame. Traffic volumes on the roadway network at that time will include existing traffic, new traffic due to normal traffic growth, and traffic related to any significant developments by others expected to be completed within the area by 2018. Consideration of these factors resulted in the development of 2018 No-Build traffic volumes, which assume that the proposed development is not built. The incremental impacts of the proposed project may then be determined by adding site-generated traffic volumes (Build conditions) and making comparisons to the No-Build conditions.

### Traffic Growth

To develop the 2018 No-Build forecast volumes, two components of traffic growth were considered. First, an annual growth percentage was determined. Based on historic traffic-volume counts provided by MassDOT, traffic volumes in the area have been decreasing at a rate of approximately 1.32 percent per year.<sup>4</sup> Therefore, to provide a conservative (worse than expected) analysis scenario, a 1.0 percent compounded annual growth was assumed for the project area. The MassDOT adjustment data are provided in the Appendix.

Second, any planned or approved specific developments in the area that would generate a significant volume of traffic on study area roadways within the next five years were included.

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<sup>4</sup>MassDOT 2009 Traffic Volumes; Count Station 407 located on Route 28 south of the Reading Town Line (Stoneham).

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Based on discussions with Stoneham officials, there is one project in close proximity to the proposed site that has been approved but is not currently completely constructed and occupied. The project is an Assisted Living Facility development located at 140 Franklin Street with 88 units. Trip-generation rates provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*<sup>5</sup> were used to estimate traffic volumes for the approved project and assigned to the roadway networks. All trip-generation data are provided in the Appendix.

### **Planned Roadway Improvements**

Based on discussions with the Town Engineer of Stoneham, there are no roadway improvement projects planned to be constructed within the study area during the design horizon.

### **No-Build Conditions**

The 2018 No-Build peak-hour traffic volumes were accordingly developed by applying a 1.0 percent compounded annual traffic growth rate (5.1 percent over five years) to the 2013 Existing traffic volumes and adding the traffic to be generated by the Assisted Living Facility. The 2018 No-Build traffic volumes are shown graphically on Figure 3 for the weekday AM and weekday PM peak hours.

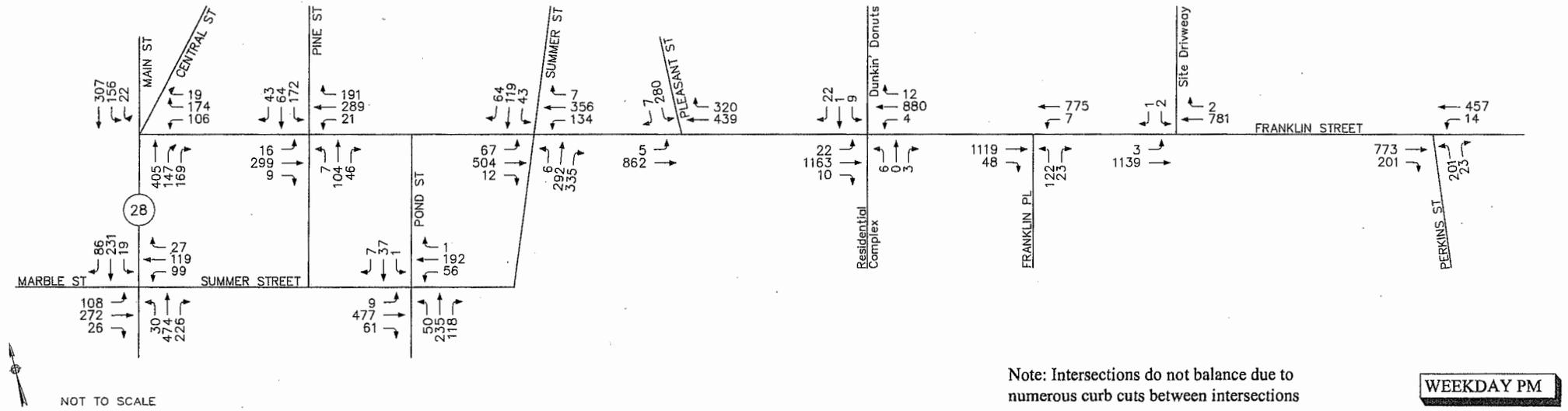
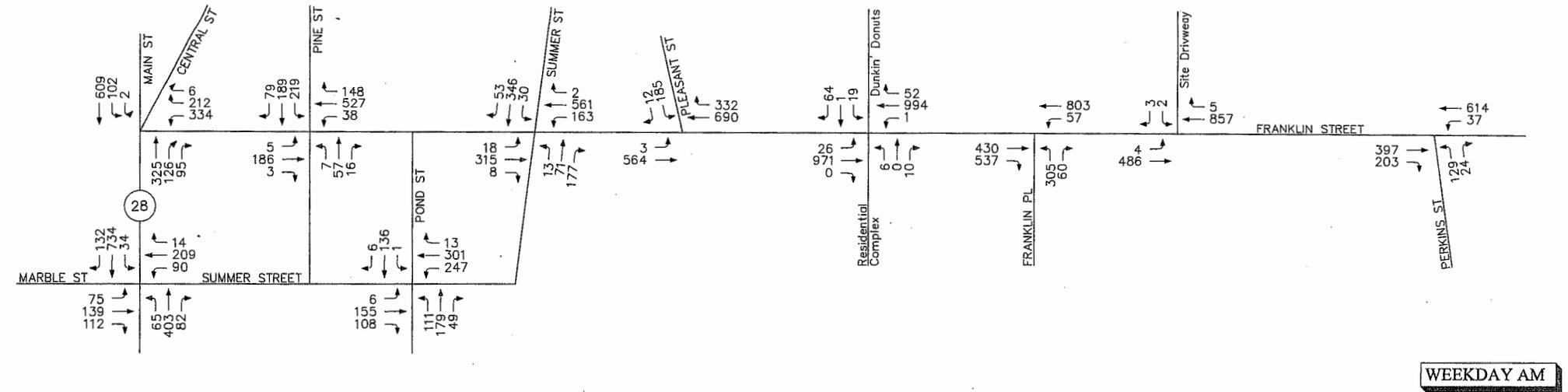
### **Trip Generation**

As proposed, the development consists of razing the existing 2 barns on the site, retaining the residential home and 1 story wood frame barn behind the residential home, and constructing 264 dwelling units with a ±1,000 square foot leasing office which will be open from 10:00 AM to 6:00 PM. It is expected that the leasing office trips will likely occur after the peak hours, particularly after the school arrival and dismissal times, but have been accounted for in the peak hours. Turning movements at the existing site driveway were counted on Thursday, April 10, 2014 and resulted in 14 vehicle trips (9 entering and 5 exiting) during the weekday AM peak hour and 8 vehicle trips (5 entering and 3 exiting) during the weekday PM peak hour. These trips as counted were utilized in the existing and no-build traffic-volume conditions. The build traffic-volume condition, however, does not take credit for the existing trips into and out of the Weiss Farm driveway. This provides a conservative (worse-case) analysis as the existing Weiss Farm trips are included within the Franklin Street adjacent street traffic and were not removed from the roadway network. The residential and office uses have been added in addition to the trips that are already on the roadway. Traffic to be generated by the proposed development project was forecast using the trip-generation information provided in the Institute of Transportation

<sup>5</sup> *Trip Generation Manual, 9<sup>th</sup> Edition*. Washington, DC: Institute of Transportation Engineers, 2012.

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Note: Intersections do not balance due to numerous curb cuts between intersections

NOT TO SCALE

Figure 3  
2018 No-Build  
Peak Hour Traffic Volumes

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Engineers (ITE) *Trip Generation Manual*<sup>6</sup> for Land Use Code (LUC) 220 (Apartment), LUC 224 (Rental Townhouse), and LUC 826 (Specialty Retail). In order to provide the most conservative trip generation for the dwelling units, apartment, high-rise apartment, and rental townhouse land uses were compared and the most conservative combination was implemented. All trip-generation data are provided in the Appendix.

**Table 5**  
**TRIP-GENERATION SUMMARY**

Time Period/Direction	Apartments <sup>a</sup>	Townhomes <sup>b</sup>	Rental Office <sup>c</sup>	Total Trips <sup>d</sup>
<b>Weekday Daily</b>	1,730	N/A	44	1,774
<b>Weekday AM Peak Hour:</b>				
<i>Enter</i>	25	4	0	29
<i>Exit</i>	101	7	1	109
<i>Total</i>	126	11	1	138
<b>Weekday PM Peak Hour:</b>				
<i>Enter</i>	101	6	11	118
<i>Exit</i>	54	5	13	72
<i>Total</i>	155	11	24	190

<sup>a</sup> ITE LUC 220 (Apartment) for 250 dwelling units (Daily trips are based on 265 apartment units).

<sup>b</sup> ITE LUC 224 (Rental Townhouse) for 15 dwelling units.

<sup>c</sup> ITE LUC 826 (Specialty Retail Center) for 1,000 square feet.

<sup>d</sup> Apartment Trips plus Rental Townhouse Trips plus Specialty Retail Trips.

N/A = Not Available

As shown in Table 5, the proposed development is expected to generate 138 vehicles trips (29 entering and 109 exiting) during the weekday AM peak hour and 190 vehicle trips (118 entering and 72 exiting) during the weekday PM peak hour. It should be noted that while the weekday AM commuter peak hour along Franklin Street coincides with the peak school arrival time period, the weekday PM commuter peak hour occurs 2 hours after the peak school dismissal time period.

<sup>6</sup> *Trip Generation Manual*, 9<sup>th</sup> Edition; Institute of Transportation Engineers; Washington, DC; 2012.

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### **Trip Distribution**

Having estimated project-generated vehicle trips, the next step is to determine the distribution of project traffic and assign these trips to the local roadway network. The distribution of proposed site traffic on the area roadways is based on United States Census Bureau Journey-to-Work information and expected travel routes to the site. Accordingly, approximately 90 percent of the *residential* site-generated traffic is expected to and from the west along Franklin Street and 10 percent is expected to and from the east along Franklin Street. Based on existing travel patterns and expected site access routes, approximately 70 percent of the *leasing office* site-generated traffic is expected to and from the west along Franklin Street and 30 percent is expected to and from the east along Franklin Street.

Of the 90 percent *residential* traffic to and from the west; 30 percent is expected to and from the north on Main Street, 40 percent is expected to and from the south on Main Street, 5 percent is expected to and from the west on Marble Street, and 15 percent is expected to and from the north on Pleasant Street. Of the 10 percent to and from the east; 5 percent is expected to and from further points east on Franklin Street and 5 percent is expected to and from the south on Perkins Street.

Of the 70 percent *leasing office* traffic to and from the west; 20 percent is expected to and from the north on Main Street, 25 percent is expected to and from the south on Main Street, 15 percent is expected to and from the west on Marble Street, and 10 percent is expected to and from the north on Pleasant Street. Of the 30 percent to and from the east; 20 percent is expected to and from further points east on Franklin Street and 10 percent is expected to and from the south on Perkins Street.

### **Site Access**

Access is proposed to be provided via one full access/egress driveway on Franklin Street. Egress will consist of a left-turn lane and a right-turn lane. In order to accommodate left-turns into the site without disrupting the flow on Franklin Street, an exclusive eastbound left-turn lane providing 75 feet of queue storage is proposed. This improvement is described in the *Recommended Improvements* section of the TIAS. The on-site sidewalks are designed to tie into the Franklin Street sidewalk system. With the close proximity to Stoneham High School, the internal on-site sidewalks and the existing sidewalks are expected to be utilized and provide students with a safe path to and from the school.

During the construction of the project site, it is expected that construction vehicles will use the existing driveway to access and egress the site until the proposed driveway location can be properly graded for use. A Traffic Management Plan will be provided within the construction documents for the new driveway and the closure of the existing driveway on Franklin Street.

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Based on discussion with the Stoneham Town Engineer and Director of the Department of Public Works, Bob Grover, the street opening permit is the only permit required by Public Works to accomplish this work, and it will cover any work done in the public right of way.

### **Parking**

As proposed, a total of 438 parking spaces are to be provided. This consists of 395 surface spaces (includes 10 handicap spaces), 7 standard garage spaces, 15 townhouse garage spaces, and 21 structured parking spaces (includes 1 handicap space).

The Town of Stoneham Zoning Bylaws contains a requirement of 2 spaces per dwelling unit for Single or two Family dwellings for the number of parking spaces to be provided by this type of land use. Based on the ITE *Parking Generation* report<sup>7</sup>, the 85<sup>th</sup> percentile parking rate for LUC 222 (High-Rise Apartments) is 1.52 spaces per dwelling unit and LUC 224 (Rental Townhouse) is 1.76 spaces per dwelling unit.

Based on the ITE data, the proposed site will require 406 parking spaces, exceeding the ITE 85<sup>th</sup> percentile *Parking Generation* rates. Therefore, the proposed 438 parking spaces are anticipated to be sufficient to accommodate the parking demand generated by the proposed residential development.

### **Sight Distance**

Access to the site will be provided via one full access/egress driveway on the northern side of Franklin Street between Franklin Place and Rustic Road. To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveway location to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO)<sup>8</sup>. AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. The Massachusetts Executive Office of Transportation (EOT) and the Executive Office of Energy and Environmental Affairs (EEA) require the use of AASHTO sight distance standards when preparing traffic impact assessments and studies, as stated in their guidelines for traffic impact assessments.

<sup>7</sup> *Parking Generation*, 4<sup>th</sup> Edition; Institute of Transportation Engineers; Washington, DC; 2010.

<sup>8</sup> *A Policy on Geometric Design of Highways and Streets*; American Association of State Highway and Transportation Officials (AASHTO); 2004.

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Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 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 above street level. The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. However, the ISD must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"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."* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

The available SSD and ISD at the proposed full access/egress site driveway location was measured and compared to minimum requirements as established by AASHTO. Based on the posted and observed speeds on Franklin Street, the SSD and ISD requirements at this intersection were calculated. The required minimum sight distances for the driveway are compared to the available distances, as shown in Table 6.

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**Table 6  
SIGHT DISTANCE SUMMARY**

Location/Direction	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)		
	Measured	Minimum Required <sup>a</sup>	Measured	Minimum Required <sup>b</sup>	Desirable <sup>c</sup>
<b>Franklin Street at Site Driveway:</b>					
<i>West of intersection (EB)</i>	380	240	400	240	335
<i>East of intersection (WB)</i>	360	305	320	305	335

<sup>a</sup> Values based on AASHTO requirements for 85<sup>th</sup> percentile speeds of 34 mph for Franklin Street eastbound travel (west of intersection) and 40 mph for Franklin Street westbound travel (east of intersection).

<sup>b</sup> Values based on AASHTO requirements for SSD.

<sup>c</sup> Values based on AASHTO requirements for posted speed limit of 30 mph on Franklin Street.

West of the intersection (eastbound travel), a horizontal curve is present. Because the driveway is located on the northern side of Franklin Street, the horizontal curve allows increased visibility between Franklin Street and the site driveway west of the intersection. East of the intersection (westbound), a vertical curve and slight s-curve is present. However, a stopped vehicle exiting the site driveway is able to see a vehicle at a distance of 320 feet on the major roadway. During sight distance measurements, there were significant snow piles present along Franklin Street; without the snow piles, the line of sight would be even greater than the measurements provided in Table 6.

As indicated in Table 6, available sight distances at the proposed site driveway exceed the minimum SSD and ISD requirements for safe operation in both directions. The desirable ISD is also met west of the intersection (eastbound travel direction). Although the desirable ISD is not available east of the site driveway, the measured ISD is adequate for speeds up to 38 mph, which is well above the posted speed limit of 30 mph. It is recommended that any proposed landscaping in the vicinity of the driveways and roadway intersections be located sufficiently back from Franklin Street or kept low to the ground so as not to impede the available sight distances.

**Build Traffic Volumes**

Based on the traffic generation and distribution estimates for this project, the traffic volumes associated with the proposed residential development were assigned to the roadway network. The site-generated traffic networks are shown on Figure 4 for the weekday AM and weekday PM peak hours. The site-generated traffic volumes were then combined with the 2018 No-Build traffic volumes to develop the 2018 Build peak-hour traffic-volume networks. The turning

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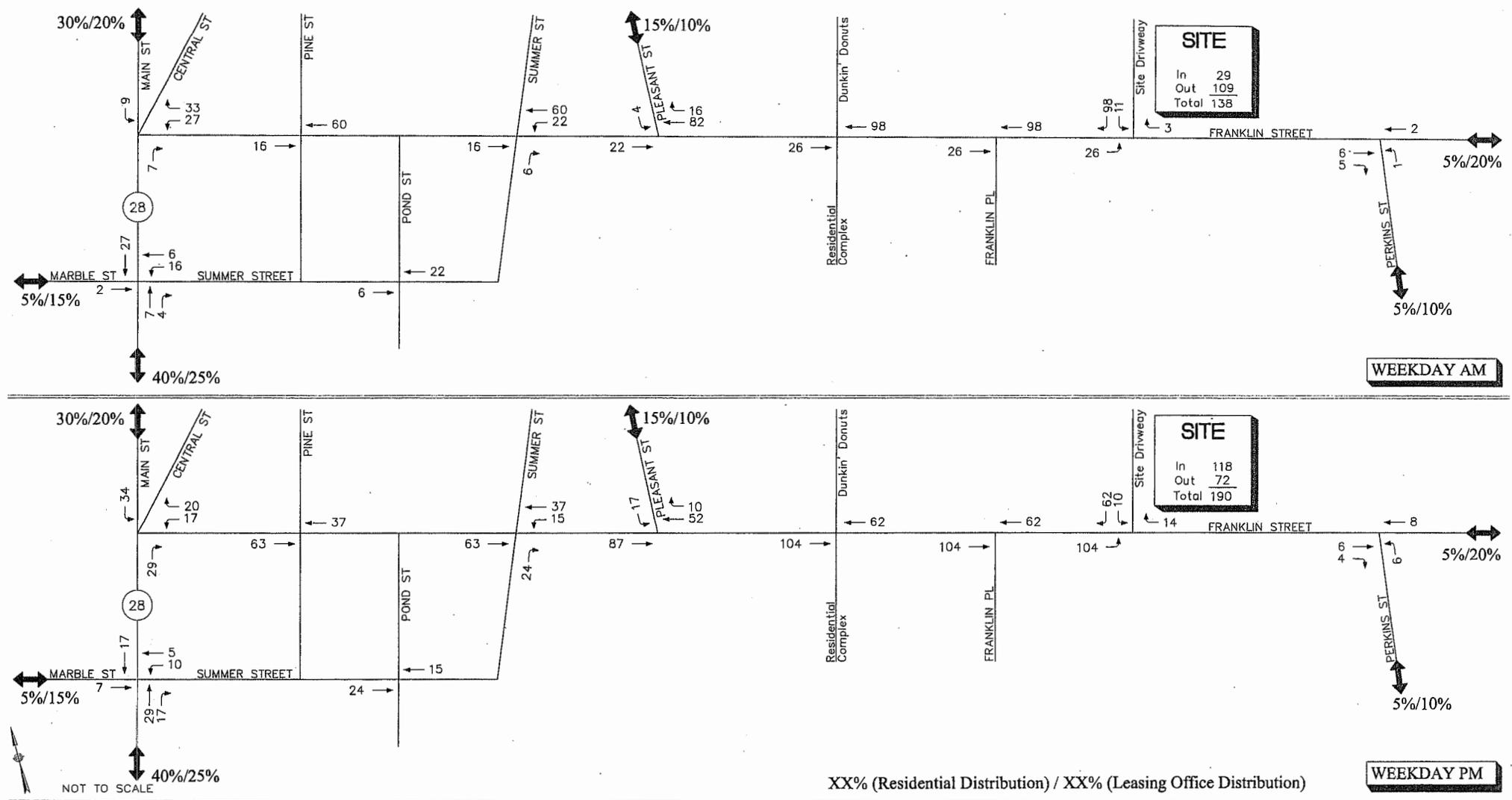


Figure 4  
Site-Generated  
Peak Hour Traffic Volumes

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movements into and out of the site driveway shown on the No-Build network include the existing site trips. Turning movements into and out of the site driveway shown on the Site-Generated and Build networks include the traffic to be generated by proposed development project, which was forecast using the trip generation information provided in the ITE *Trip Generation Manual*. The 2018 Build weekday AM and weekday PM peak hour traffic volumes are illustrated on Figure 5.

### **Traffic Increases**

The proposed development will result in increases in traffic on the study area roadways. As shown on Figure 4, traffic-volume increases beyond the study area during the peak hours are expected to be in the range of 6 to 73 vehicles. These increases represent, on average, approximately one additional vehicle every fifty seconds to ten minutes during the peak hours.

## **CAPACITY AND QUEUE ANALYSIS**

Capacity and queue analyses were conducted at all study area locations under 2013 Existing, 2018 No-Build, and 2018 Build traffic-volume conditions. The impact of site-generated traffic can be measured by comparing 2018 No-Build conditions to 2018 Build conditions. The turning movements into and out of the site driveway shown in the No-Build condition include the existing site trips. Turning movements into and out of the site driveway shown in the Build condition include the traffic to be generated by proposed development project, which was forecast using the trip generation information provided in the ITE *Trip Generation Manual*.

### **Methodology**

The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM)<sup>9</sup> and is described in the Appendix. The level-of-service results are presented and discussed below and the analysis worksheets for all conditions are provided in the Appendix.

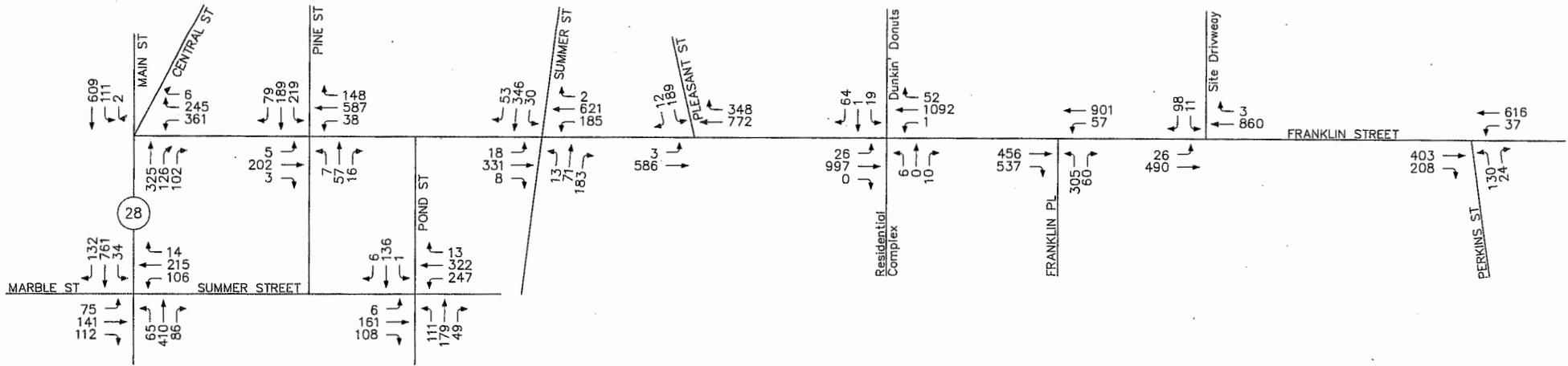
For signalized intersections, the maximum back of queue during a typical (average) signal cycle and a 95<sup>th</sup> percentile signal cycle were calculated for each lane group during the peak periods studied. The back of queue is the length of a backup of vehicles from the stop line of a signalized intersection to the last vehicle in the queue that is required to stop, regardless of the signal indication. The length of this queue depends on a number of factors including signal timing,

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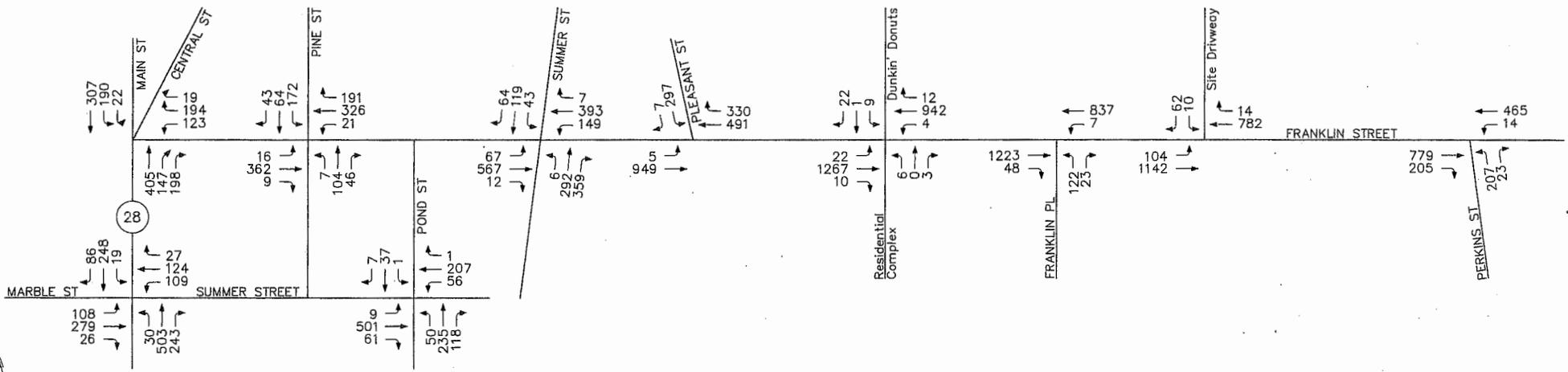
<sup>9</sup> HCM 2010: *Highway Capacity Manual*. Washington, D.C.: Transport Research Board, 2010.

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**WEEKDAY AM**



**WEEKDAY PM**

Note: Intersections do not balance due to numerous curb cuts between intersections

NOT TO SCALE

Figure 5  
2018 Build  
Peak Hour Traffic Volumes

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vehicle arrival patterns, and the saturation flow rate. For unsignalized intersections, the 95<sup>th</sup> percentile queue represents the length of queue of the critical minor-street movement that is not expected to be exceeded 95 percent of the time during the analysis period (typically one hour). In this case, the queue length is a function of the capacity of the movement and the movement's degree of saturation.

### **Analysis Results**

The results of the level-of-service (LOS) and queue analyses are shown in Table 7 and are discussed below. Capacity and queue analyses were conducted at the study area intersections utilizing *Synchro* software.<sup>10</sup>

Capacity and queue analyses were conducted at the study area intersections utilizing *Synchro* software and the default values in the program. It is expected that motorists typically accept smaller gaps in traffic at unsignalized intersections during peak periods of traffic than reflected in the analysis model and, therefore, do not wait as long to exit into the main line of traffic as shown in the analysis results. Therefore, unsignalized intersection operating results are anticipated to be better than as presented in this memorandum.

### **Franklin Street at Perkins Street**

As shown in Table 7, under existing and future traffic-volume conditions the Franklin Street movements at the unsignalized intersection of Franklin Street at Perkins Street are expected to operate at optimal levels (LOS A). The minor street movements (Perkins Street) currently operate with long delays (LOS F) and have capacity constraints (volume-to-capacity ratio [v/c] > 1.00). The project is expected to add 1 additional vehicle to the Perkins Street northbound approach during the weekday AM peak hour and 6 additional vehicles during the weekday PM peak hour. These vehicles represent a 0.7% and 2.7% increase in traffic on the northbound approach for the weekday AM and weekday PM peak hours, respectively. The proposed project is expected to add 1 additional vehicle to the queue length during the weekday AM peak hour and 2 additional vehicles during weekday PM peak hour.

### **Franklin Street at Franklin Place (Stoneham High School Access Road)**

Under existing and future traffic-volume conditions the signalized intersection of Franklin Street at Franklin Place is expected to operate at an overall LOS D or better during the weekday AM peak hour and LOS C or better during the weekday PM peak hour. During the weekday PM peak hour, the overall LOS is expected to drop from LOS B (No-Build) to LOS C (Build) with an increase in delay of 12.2 seconds, the Franklin Street eastbound through movement is expected to drop from LOS C to LOS D with an increase in delay of 23 seconds, and the Franklin Street

<sup>10</sup>*Synchro plus SimTraffic* 8; Trafficware Ltd.; Sugar Land, TX; 2011.

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westbound left-turn movement is expected to drop from LOS B to LOS C with an increase in delay of 3.1 seconds. All other movements are anticipated to remain the same LOS with the addition of the residential development. It should be noted that the analysis results are based on an average over the entire peak hour analyzed, and the actual conditions may be better or worst at smaller intervals of time within this hour. Improvement measures are recommended at this location and are described in the *Recommended Improvements* section of this study. As a result of the proposed signal timing modifications, the Franklin Street eastbound through movement is expected to improve from LOS D back to LOS C during the weekday PM peak hour.

### **Franklin Street at Dunkin' Donuts Driveway and Residential Complex**

As shown in Table 7, under existing and future traffic-volume conditions the Franklin Street movements at the unsignalized intersection of Franklin Street at the Dunkin' Donuts and residential complex driveways are expected to operate at optimal levels (LOS A). This is true during times when traffic flow along Franklin Street is unrestrained, not necessarily when the Traffic Director is present at Stevens Street and at the High School. As described in the *Traffic Observations* section of this study, during this peak period prior to the start of school the westbound traffic along Franklin Street is stopped. The Dunkin' Donuts and residential complex driveways currently operate at LOS F and will continue to operate at LOS F with the addition of the residential development. Queue lengths during the PM peak hour are anticipated to increase by less than one vehicle as a result of the project.

### **Franklin Street at Pleasant Street**

Under existing and future traffic-volume conditions, the Franklin Street through movements at the unsignalized intersection of Franklin Street at Pleasant Street are expected to operate at optimal levels (LOS A) with the Franklin Street left-turn movements expected to operate at LOS C or better. The minor street movements (Pleasant Street) at this intersection currently operate with long delays (LOS F) and have capacity constraints ( $v/c > 1.00$ ). The project is expected to add 4 additional vehicles to the Pleasant Street southbound approach during the weekday AM peak hour and 17 additional vehicles during the weekday PM peak hour. These vehicles represent a 2.0% and 5.9% increase in traffic on the southbound approach for the weekday AM and weekday PM peak hours, respectively. The proposed project is expected to add approximately 4 additional vehicles to the queue length during the weekday AM peak hour and 3 vehicles during the weekday PM peak hour.

### **Franklin Street at Summer Street**

As shown in Table 7, under existing and future traffic-volume conditions the signalized intersection of Franklin Street at Summer Street is expected to operate at an overall LOS C or better. During the weekday AM peak hour, the Franklin Street westbound shared through/right-turn movement is expected to drop from LOS B to LOS C. During the weekday PM peak hour, the Franklin Street eastbound shared through/right-turn movements is expected to drop from

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LOS C to LOS D and the westbound left-turn movement is expected to drop from LOS B to LOS C. Improvement measures are recommended at this location and are described in the *Recommended Improvements* section of this study. As a result of the proposed signal timing modifications, the Franklin Street eastbound through/right-turn is expected to improve from LOS C back to LOS B during the weekday AM peak hour, and during the weekday PM peak hour the Franklin Street eastbound through/right-turn is expected to improve from LOS D back to LOS C and the Franklin Street westbound through/right-turn is expected to improve from LOS C back to LOS B.

### **Franklin Street at Pine Street**

Under existing and future traffic-volume conditions the signalized intersection of Franklin Street at Pine Street is expected to operate with an overall LOS C during the weekday AM peak period and an overall LOS B during the weekday PM peak period. All movements are expected to operate at LOS C or better and LOS is anticipated to remain the same with the addition of the residential development. Increases in queue lengths as a result of the project are expected to be less than 3 vehicles.

### **Franklin Street at Main Street and Central Street**

As shown in Table 7, the signalized intersection of Franklin Street at Main Street and Central Street is expected to drop from an overall LOS C (Existing) to LOS D (No-Build) with the addition of historical traffic growth and background developments and drop from LOS D (No-Build) to LOS E (Build) with the proposed residential development in place during the weekday AM peak hour. Under existing and future traffic-volume conditions the intersection is expected to operate with an overall LOS B during the weekday PM peak hour. During the weekday AM peak hour, the Main Street southbound approach is expected to drop from LOS E to LOS F with an increase in queue length of less than four vehicles. All other movements are anticipated to remain the same with the addition of the residential development. Improvement measures are recommended at this location and are described in the *Recommended Improvements* section of this study. As a result of the proposed signal timing modifications, the Main Street southbound approach is expected to improve from LOS F to LOS E during the weekday AM peak hour.

### **Main Street at Summer Street and Marble Street**

Under existing and future traffic-volume conditions the signalized intersection of Main Street at Summer Street and Marble Street is expected to operate at an overall LOS D or better. During the weekday AM peak hour, the overall LOS drops from LOS C (No-Build) to LOS D (Build) with the proposed residential development in place. However, no movements drop a level of service during the weekday AM peak hour. During the weekday PM peak hour, the Main Street southbound approach is expected to drop from LOS B to LOS C as a result of the project, however, this is due to a 0.2 second increase in delay on this movement. Increases in delay for the rest of the intersection are expected to be less than 3 seconds overall and 8.4 seconds or less

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on any movement. In addition, increases in queue length on any movement are expected to be less than 2 vehicles.

### **Summer Street at Pond Street**

As shown in Table 7, under existing and future traffic-volume conditions the signalized intersection of Summer Street at Pond Street is expected to drop from an overall LOS B (No-Build) to LOS C (Build) during the weekday AM peak hour and operate an overall LOS B during the weekday PM peak hour. This drop in LOS during the weekday AM peak hour is due to an increase in delay of less than 1 second to the overall intersection. All movements are anticipated to operate at the same LOS with the addition of the residential development. Increases in delay of less than 2 seconds are expected on any movement and increases in queue length on any movement are expected to be less than 1 vehicle.

### **Franklin Street at Site Driveway**

As shown in Table 7, under future traffic-volume conditions the Franklin Street movements at the site driveway are expected to operate at optimal levels (LOS A). This is true during times when traffic flow along Franklin Street is unrestrained, not necessarily when the Traffic Directors are present at Stevens Street and at the High School. As described in the *Traffic Observations* section of this study, during this peak period prior to the start of school the westbound traffic along Franklin Street queues past the site driveway. The site driveway southbound left-turn movement is expected to operate at LOS F with 50.1 seconds of delay during the weekday AM peak hour and LOS F with more than 100.0 seconds of delay during the weekday PM peak hour while the right-turn movement is expected to operate at LOS C. Even though fewer vehicles are exiting the site during the weekday PM peak hour, the delay for the vehicles exiting is longer due to the increased traffic making a left-turn into the site as well as the increased traffic on the eastbound through movement. The queue length on the site driveway is expected to be approximately 1 vehicle for the left-turn lane and less than 2 vehicles for the right-turn lane. During the peak period prior to the start of school a longer queue could be expected, however, there is ample room on-site to queue the vehicles (up to 75 feet [3 vehicles] in each lane with an additional 50 feet [2 vehicles] prior to blocking the first internal intersection) and delays would be recognized on-site and not along Franklin Street. Improvement measures are recommended at this location and are described in the *Recommended Improvements* section of this study. As a result of the Franklin Street exclusive eastbound left-turn lane, sufficient storage is provided to accommodate a three-vehicle queue so as to not interfere with the through traffic on Franklin Street.

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**Table 7  
INTERSECTION CAPACITY ANALYSIS SUMMARY**

Intersection/Peak Hour/Lane Group	2013 Existing				2018 No-Build				2018 Build			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Franklin Street at Perkins Street</b>												
<i>Weekday AM:</i>												
Franklin Street EB through/right-turn	0.37	0.0	A	--/0	0.38	0.0	A	--/0	0.39	0.0	A	--/0
Franklin Street WB left-turn/through	0.04	1.2	A	--/4	0.05	1.3	A	--/4	0.05	1.3	A	--/4
Perkins Street NB approach	>1.0	>100.0	F	--/214	>1.0	>100.0	F	--/264	>1.0	>100.0	F	--/273
<i>Weekday PM:</i>												
Franklin Street EB through/right-turn	0.58	0.0	A	--/0	0.61	0.0	A	--/0	0.62	0.0	A	--/0
Franklin Street WB left-turn/through	0.02	0.6	A	--/1	0.02	0.6	A	--/2	0.02	0.6	A	--/2
Perkins Street NB approach	>1.0	>100.0	F	--/400	>1.0	>100.0	F	--/474	>1.0	>100.0	F	--/503

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

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**Table 7 (continued)  
INTERSECTION CAPACITY ANALYSIS SUMMARY**

Intersection/Peak Hour/Lane Group	2013 Existing				2018 No-Build				2018 Build			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Franklin Street at Franklin Place</b>												
<i>Weekday AM:</i>												
Franklin Street EB through	0.69	19.9	B	225/246	0.68	19.4	B	243/263	0.65	17.4	B	266/284
Franklin Street EB right-turn	0.45	2.1	A	0/0	0.47	2.2	A	0/0	0.47	2.0	A	0/0
Franklin Street WB left-turn	0.21	10.8	B	14/26	0.22	10.7	B	15/27	0.20	10.1	B	15/27
Franklin Street WB through	0.90	25.8	C	401/436	0.91	26.9	C	446/481	0.95	32.3	C	585/616
Franklin Place NB left-turn	>1.0	87.3	F	353/353	>1.0	>100.0	F	445/445	>1.0	>100.0	F	555/555
Franklin Place NB right-turn	0.08	20.3	C	0/0	0.08	22.4	C	0/0	0.08	27.0	C	0/0
<b>Overall Intersection</b>	<b>&gt;1.0</b>	<b>31.2</b>	<b>C</b>	<b>--/--</b>	<b>&gt;1.0</b>	<b>40.8</b>	<b>D</b>	<b>--/--</b>	<b>&gt;1.0</b>	<b>54.7</b>	<b>D</b>	<b>--/--</b>
<i>Weekday PM:</i>												
Franklin Street EB through	0.90	19.8	B	285/897	0.95	27.9	C	332/981	>1.0	50.9	D	432/1,125
Franklin Street EB right-turn	0.03	0.7	A	0/4	0.03	0.7	A	0/4	0.03	0.7	A	0/4
Franklin Street WB left-turn	0.06	14.5	B	1/5	0.07	18.8	B	1/5	0.07	21.9	C	1/5
Franklin Street WB through	0.60	5.4	A	154/314	0.64	6.1	A	172/361	0.69	7.0	A	199/431
Franklin Place NB left-turn	0.66	38.2	D	71/106	0.66	38.3	D	74/111	0.65	37.8	D	74/111
Franklin Place NB right-turn	0.02	30.7	C	0/0	0.02	30.4	C	0/0	0.02	30.4	C	0/0
<b>Overall Intersection</b>	<b>0.87</b>	<b>15.5</b>	<b>B</b>	<b>--/--</b>	<b>0.92</b>	<b>19.8</b>	<b>B</b>	<b>--/--</b>	<b>0.99</b>	<b>32.0</b>	<b>C</b>	<b>--/--</b>

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

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**Table 7 (continued)**  
**INTERSECTION CAPACITY ANALYSIS SUMMARY**

Intersection/Peak Hour/Lane Group	2013 Existing				2018 No-Build				2018 Build			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Franklin Street at Dunkin Donuts and Residential Complex</b>												
<i>Weekday AM:</i>												
Franklin Street EB approach	0.07	3.7	A	--/6	0.08	5.4	A	--/6	0.10	9.3	A	--/9
Franklin Street WB approach	0.00	0.1	A	--/0	0.00	0.1	A	--/0	0.00	0.1	A	--/0
Residential Complex NB approach	>1.0	>100.0	F	--/77	>1.0	>100.0	F	--/90	>1.0	>100.0	F	--/--
Dunkin' Donuts SB approach	>1.0	>100.0	F	--/274	>1.0	>100.0	F	--/309	>1.0	>100.0	F	--/--
<i>Weekday PM:</i>												
Franklin Street EB approach	0.04	1.4	A	--/3	0.04	1.8	A	--/3	0.04	2.8	A	--/3
Franklin Street WB approach	0.01	0.3	A	--/1	0.01	0.4	A	--/1	0.01	0.5	A	--/1
Residential Complex NB approach	0.17	66.4	F	--/14	0.20	80.7	F	--/17	0.27	112.2	F	--/22
Dunkin' Donuts SB approach	0.39	45.0	E	--/42	0.45	55.2	F	--/50	0.56	78.6	F	--/65

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

**TRAFFIC IMPACT AND ACCESS STUDY**

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**Table 7 (continued)**  
**INTERSECTION CAPACITY ANALYSIS SUMMARY**

Intersection/Peak Hour/Lane Group	2013 Existing				2018 No-Build				2018 Build			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Franklin Street at Pleasant Street</b>												
<i>Weekday AM:</i>												
Franklin Street EB left-turn	0.01	14.4	B	--/1	0.01	15.6	C	--/1	0.01	19.1	C	--/1
Franklin Street EB through	0.35	0.0	A	--/0	0.38	0.0	A	--/0	0.39	0.0	A	--/0
Franklin Street WB through/right-turn	0.63	0.0	A	--/0	0.67	0.0	A	--/0	0.73	0.0	A	--/0
Pleasant Street SB approach	0.96	98.1	F	--/208	>1.0	>100.0	F	--/281	>1.0	>100.0	F	--/386
<i>Weekday PM:</i>												
Franklin Street EB left-turn	0.01	9.7	A	--/1	0.01	10.0	A	--/1	0.01	10.6	B	--/1
Franklin Street EB through	0.51	0.0	A	--/0	0.54	0.0	A	--/0	0.59	0.0	A	--/0
Franklin Street WB through/right-turn	0.48	0.0	A	--/0	0.51	0.0	A	--/0	0.55	0.0	A	--/0
Pleasant Street SB approach	>1.0	>100.0	F	--/547	>1.0	>100.0	F	--/591	>1.0	>100.0	F	--/653

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

**Table 7 (continued)**  
**INTERSECTION CAPACITY ANALYSIS SUMMARY**

Intersection/Peak Hour/Lane Group	2013 Existing				2018 No-Build				2018 Build			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Franklin Street at Summer Street</b>												
<i>Weekday AM:</i>												
Franklin Street EB left-turn	0.10	13.9	B	4/15	0.10	14.1	B	4/16	0.13	14.9	B	4/16
Franklin Street EB through/right-turn	0.65	20.5	C	129/229	0.65	20.6	C	150/252	0.68	21.6	C	164/266
Franklin Street WB left-turn	0.40	9.9	A	32/90	0.43	10.3	B	36/97	0.51	10.9	B	43/109
Franklin Street WB through/right-turn	0.75	19.2	B	152/499	0.76	19.9	B	177/552	0.83	24.2	C	211/639
Summer Street NB approach	0.32	16.6	B	36/102	0.35	18.3	B	43/111	0.36	18.6	B	46/112
Summer Street SB approach	0.78	26.2	C	146/298	0.83	31.2	C	166/318	0.83	31.6	C	175/318
<b>Overall Intersection</b>	<b>0.76</b>	<b>19.9</b>	<b>B</b>	<b>--/--</b>	<b>0.79</b>	<b>21.6</b>	<b>C</b>	<b>--/--</b>	<b>0.83</b>	<b>23.2</b>	<b>C</b>	<b>--/--</b>
<i>Weekday PM:</i>												
Franklin Street EB left-turn	0.20	14.2	B	16/40	0.21	15.2	B	19/42	0.22	15.9	B	20/42
Franklin Street EB through/right-turn	0.79	28.4	C	213/358	0.82	31.3	C	257/400	0.88	38.4	D	309/506
Franklin Street WB left-turn	0.57	17.0	B	38/75	0.58	17.6	B	46/80	0.75	29.0	C	53/140
Franklin Street WB through/right-turn	0.62	21.4	C	156/260	0.61	21.5	C	189/280	0.65	23.1	C	218/317
Summer Street NB approach	0.83	26.5	C	253/504	0.90	35.8	D	301/550	0.93	43.1	D	351/585
Summer Street SB approach	0.40	15.6	B	73/147	0.47	18.1	B	86/159	0.48	19.6	B	95/161
<b>Overall Intersection</b>	<b>0.79</b>	<b>23.5</b>	<b>C</b>	<b>--/--</b>	<b>0.83</b>	<b>27.8</b>	<b>C</b>	<b>--/--</b>	<b>0.89</b>	<b>33.3</b>	<b>C</b>	<b>--/--</b>

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

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**Table 7 (continued)  
INTERSECTION CAPACITY ANALYSIS SUMMARY**

Intersection/Peak Hour/Lane Group	2013 Existing				2018 No-Build				2018 Build			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Franklin Street at Pine Street</b>												
<i>Weekday AM:</i>												
Franklin Street EB approach	0.31	11.5	B	55/76	0.32	11.2	B	60/81	0.33	10.9	B	66/87
Franklin Street WB approach	0.84	22.8	C	234/358	0.85	22.9	C	257/388	0.87	24.5	C	296/446
Pine Street NB approach	0.13	12.3	B	22/51	0.15	13.4	B	25/57	0.15	14.9	B	28/58
Pine Street SB approach	0.79	22.7	C	162/445	0.86	29.6	C	192/508	0.89	35.3	D	211/517
<b>Overall Intersection</b>	<b>0.82</b>	<b>20.4</b>	<b>C</b>	<b>--/--</b>	<b>0.85</b>	<b>22.6</b>	<b>C</b>	<b>--/--</b>	<b>0.88</b>	<b>25.0</b>	<b>C</b>	<b>--/--</b>
<i>Weekday PM:</i>												
Franklin Street EB approach	0.45	8.5	A	48/128	0.47	9.1	A	58/149	0.54	9.6	A	76/181
Franklin Street WB approach	0.64	10.4	B	73/191	0.67	11.6	B	90/225	0.69	12.1	B	106/249
Pine Street NB approach	0.23	9.7	A	20/68	0.24	10.2	B	25/74	0.24	11.0	B	27/81
Pine Street SB approach	0.60	12.5	B	49/142	0.59	12.9	B	60/155	0.60	13.9	B	64/169
<b>Overall Intersection</b>	<b>0.62</b>	<b>10.3</b>	<b>B</b>	<b>--/--</b>	<b>0.63</b>	<b>11.1</b>	<b>B</b>	<b>--/--</b>	<b>0.65</b>	<b>11.6</b>	<b>B</b>	<b>--/--</b>

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

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**Table 7 (continued)**  
**INTERSECTION CAPACITY ANALYSIS SUMMARY**

Intersection/Peak Hour/Lane Group	2013 Existing				2018 No-Build				2018 Build			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Franklin Street at Main St and Central St</b>												
<i>Weekday AM:</i>												
Main Street NB through	0.42	12.9	B	123/187	0.45	13.9	B	142/198	0.47	15.7	B	152/198
Main Street NB right-turn	0.31	12.1	B	60/106	0.34	13.0	B	71/114	0.36	14.7	B	78/117
Main Street SB approach	0.92	34.5	C	351/662	>1.0	71.7	E	493/743	>1.0	>100.0	F	565/785
Franklin Street WB approach	0.90	38.8	D	276/409	0.92	41.1	D	300/484	0.95	47.3	D	354/570
<b>Overall Intersection</b>	<b>0.91</b>	<b>28.6</b>	<b>C</b>	<b>--/--</b>	<b>0.99</b>	<b>43.7</b>	<b>D</b>	<b>--/--</b>	<b>&gt;1.0</b>	<b>67.6</b>	<b>E</b>	<b>--/--</b>
<i>Weekday PM:</i>												
Main Street NB through	0.39	7.9	A	76/164	0.38	7.7	A	85/184	0.37	8.1	A	93/201
Main Street NB right-turn	0.35	7.6	A	39/105	0.35	7.5	A	45/121	0.37	8.1	A	53/143
Main Street SB approach	0.68	11.8	B	113/268	0.70	12.3	B	135/325	0.78	16.9	B	175/465
Franklin Street WB approach	0.65	20.4	C	88/199	0.75	28.3	C	128/215	0.82	37.1	D	151/242
<b>Overall Intersection</b>	<b>0.67</b>	<b>11.6</b>	<b>B</b>	<b>--/--</b>	<b>0.71</b>	<b>12.1</b>	<b>B</b>	<b>--/--</b>	<b>0.79</b>	<b>17.0</b>	<b>B</b>	<b>--/--</b>

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

**Table 7 (continued)  
INTERSECTION CAPACITY ANALYSIS SUMMARY**

Intersection/Peak Hour/Lane Group	2013 Existing				2018 No-Build				2018 Build			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Main St at Summer St and Marble St</b>												
<i>Weekday AM:</i>												
Main Street NB approach	0.68	22.5	C	141/194	0.73	25.1	C	158/214	0.75	26.3	C	164/222
Main Street SB approach	0.80	26.0	C	249/317	0.83	28.3	C	274/342	0.85	29.6	C	286/356
Marble Street EB approach	0.79	40.9	D	162/333	0.83	46.4	D	180/361	0.85	50.2	D	185/364
Summer Street WB approach	0.81	41.2	D	169/358	0.85	47.4	D	190/386	0.89	54.1	D	210/423
<b>Overall Intersection</b>	<b>0.80</b>	<b>29.5</b>	<b>C</b>	<b>--/--</b>	<b>0.84</b>	<b>32.9</b>	<b>C</b>	<b>--/--</b>	<b>0.86</b>	<b>35.5</b>	<b>D</b>	<b>--/--</b>
<i>Weekday PM:</i>												
Main Street NB approach	0.76	26.0	C	164/240	0.77	26.6	C	182/256	0.79	27.6	C	208/276
Main Street SB approach	0.38	19.8	B	68/105	0.39	19.9	B	75/111	0.40	20.1	C	84/116
Marble Street EB approach	0.76	30.8	C	184/405	0.84	37.7	D	207/448	0.89	46.1	D	228/481
Summer Street WB approach	0.73	34.4	C	116/212	0.76	37.0	D	128/248	0.79	39.5	D	142/288
<b>Overall Intersection</b>	<b>0.75</b>	<b>27.1</b>	<b>C</b>	<b>--/--</b>	<b>0.79</b>	<b>29.3</b>	<b>C</b>	<b>--/--</b>	<b>0.82</b>	<b>32.0</b>	<b>C</b>	<b>--/--</b>

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

**TRAFFIC IMPACT AND ACCESS STUDY**

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**Table 7 (continued)  
INTERSECTION CAPACITY ANALYSIS SUMMARY**

Intersection/Peak Hour/Lane Group	2013 Existing				2018 No-Build				2018 Build			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Summer Street at Pond Street</b>												
<i>Weekday AM:</i>												
Summer Street EB approach	0.36	9.7	A	63/132	0.37	9.7	A	70/140	0.37	9.8	A	72/143
Summer Street WB approach	0.80	18.7	B	151/398	0.83	20.7	C	174/434	0.85	22.2	C	183/454
Pond Street NB approach	0.77	22.1	C	136/179	0.82	27.8	C	145/190	0.83	28.7	C	145/190
Pond Street SB approach	0.24	13.0	B	40/73	0.25	14.4	B	42/76	0.26	14.6	B	42/76
<b>Overall Intersection</b>	<b>0.78</b>	<b>17.1</b>	<b>B</b>	<b>--/--</b>	<b>0.82</b>	<b>19.7</b>	<b>B</b>	<b>--/--</b>	<b>0.84</b>	<b>20.6</b>	<b>C</b>	<b>--/--</b>
<i>Weekday PM:</i>												
Summer Street EB approach	0.72	13.9	B	107/282	0.75	15.4	B	125/318	0.77	15.9	B	136/339
Summer Street WB approach	0.38	9.4	A	42/121	0.40	9.9	A	49/135	0.42	9.9	A	53/144
Pond Street NB approach	0.66	13.6	B	82/216	0.68	14.6	B	98/229	0.69	15.3	B	103/229
Pond Street SB approach	0.09	9.2	A	9/28	0.09	9.6	A	11/28	0.09	9.9	A	11/28
<b>Overall Intersection</b>	<b>0.69</b>	<b>12.7</b>	<b>B</b>	<b>--/--</b>	<b>0.72</b>	<b>13.8</b>	<b>B</b>	<b>--/--</b>	<b>0.73</b>	<b>14.2</b>	<b>B</b>	<b>--/--</b>

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

**Table 7 (continued)  
INTERSECTION CAPACITY ANALYSIS SUMMARY**

Intersection/Peak Hour/Lane Group	2013 Existing				2018 No-Build				2018 Build			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Franklin Street at Site Driveway</b>												
<i>Weekday AM:</i>												
Franklin Street EB left-turn/through	0.01	0.2	A	--/0	0.01	0.2	A	--/0	0.04	1.1	A	--/3
Franklin Street WB through/right-turn	0.54	0.0	A	--/0	0.56	0.0	A	--/0	0.56	0.0	A	--/0
Site Driveway SB left-turn	0.02	35.2	E	--/1	0.02	40.0	E	--/2	0.13	50.1	F	--/11
Site Driveway SB right-turn	0.01	16.0	C	--/1	0.01	16.7	C	--/1	0.35	22.7	C	--/38
<i>Weekday PM:</i>												
Franklin Street EB left-turn/through	0.00	0.2	A	--/0	0.00	0.2	A	--/0	0.15	6.8	A	--/13
Franklin Street WB through/right-turn	0.49	0.0	A	--/0	0.51	0.0	A	--/0	0.52	0.0	A	--/0
Site Driveway SB left-turn	0.40	>100.0	F	--/18	0.64	>100.0	F	--/21	>1.0	>100.0	F	--/--
Site Driveway SB right-turn	0.00	15.0	C	--/0	0.00	15.6	C	--/0	0.21	18.5	C	--/19

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

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### **RECOMMENDED IMPROVEMENTS**

The final phase of the transportation analysis process is to identify improvement measures necessary to minimize the impact of the project and also improve existing operating conditions on the transportation system. Improvements considered necessary to address existing and future roadway system deficiencies are discussed below as they relate to impacts as a result of background growth and to project-generated impacts.

#### **Franklin Street at Franklin Place (Stoneham High School Access Road)**

Due to the impacts that the proposed residential development would have at the intersection of Franklin Street at Franklin Place during the weekday commuter PM peak hour, after the school dismissal traffic is over, improvement measures have been investigated. Accordingly, traffic signal timing modifications are recommended at this location. These modifications include lowering the cycle length from 100 seconds to 90 seconds in order to reduce delay, and increasing the green time on the Franklin Street eastbound approach from 55 seconds to 65 seconds and westbound approach from 70 seconds to 72 seconds. These modifications can be accomplished by taking time from the other approaches without impacting level-of-service. Specifically, lowering the green time for the Franklin Place northbound approach from 30 seconds to 18 seconds and lowering the green time for the leading left-turn on the Franklin Street westbound approach from 15 seconds to 7 seconds. With the improved timings, the intersection is anticipated to operate at an overall LOS C during the weekday PM peak hour with all lane groups operating at LOS D or better and all v/c ratios are expected to be below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes. The capacity analysis results are shown in Table 8.

#### **Franklin Street at Summer Street**

Due to the impacts that the proposed residential development would have at the intersection of Franklin Street at Summer Street during the weekday AM and weekday PM peak hours, improvement measures have been investigated. Accordingly, traffic signal timing modifications are recommended at this location. The weekday AM modification includes increasing the green time for through movement on Franklin Street from 35 seconds to 46 seconds. This modification can be accomplished by taking time from the other approaches without impacting level-of-service. Specifically, lowering the minimum green time for the Franklin Street left-turn movements from 13 seconds to 9 seconds and lowering the minimum green time for the Summer Street approaches from 42 seconds to 35 seconds. The weekday PM peak hour modification includes lowering the cycle length from 91 seconds to 70 seconds in order to reduce delay. With the improved timings, the intersection is anticipated to operate at an overall LOS C with all lane groups operating at LOS D or better and all v/c ratios are expected to be below 1.00, indicating

## **TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

there will be adequate capacity to accommodate the anticipated traffic volumes. The capacity analysis results are shown in Table 8.

### **Franklin Street at Main Street and Central Street**

Due to the impacts that the proposed residential development would have at the intersection of Franklin Street at Main Street and Central Street during the weekday AM peak hour, improvement measures have been investigated. Accordingly, traffic signal timing modifications are recommended at this location. These modifications include increasing the green time on Main Street from 46 seconds to 50 seconds. These modifications can be accomplished by lowering the green time for the Franklin Street approach from 43 seconds to 39 seconds. With the improved timings, the intersection is anticipated to operate at an overall LOS D during the weekday AM peak hour with all lane groups operating at LOS E or better. The capacity analysis results are shown in Table 8.

### **Franklin Street at Site Driveway**

In order to eliminate additional delays for through movements along Franklin Street in the eastbound direction at the site driveway, an exclusive left-turn lane was investigated. Based on the available information, the existing pavement width allows for a 10.5-foot wide exclusive eastbound left-turn lane, with 11-foot wide through lanes in each direction, and  $\pm 2$  foot shoulders. In addition, a storage length of 75 feet can be provided, which is sufficient length to accommodate a three-vehicle queue. The proposed traffic volumes at the site driveway intersection meets the requirements for a major-road left-turn bay and the warrant worksheet is provided in the Appendix. A *Conceptual Improvement Plan* of the proposed left-turn lane is provided in the Appendix. The capacity analysis results are shown in Table 8.

In addition to the left-turn lane warrant, it was also investigated if the traffic volumes at the site driveway location warrant the installation of a traffic signal. Based on the Build traffic volumes, none of the traffic volume warrants were met. Accordingly, traffic signal control is not proposed at this location. The Traffic Control Signal Warrant Analyses worksheet is provided in the Appendix.

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**Table 8  
INTERSECTION CAPACITY ANALYSIS SUMMARY – 2018 CONDITIONS WITH IMPROVEMENTS**

Intersection/Peak Hour/Lane Group	2018 No-Build				2018 Build				2018 Build with Improvements			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Franklin Street at Franklin Place</b>												
<i>Weekday AM:</i>												
Franklin Street EB through	0.68	19.4	B	243/263	0.65	17.4	B	266/284	--	--	--	--/--
Franklin Street EB right-turn	0.47	2.2	A	0/0	0.47	2.0	A	0/0	--	--	--	--/--
Franklin Street WB left-turn	0.22	10.7	B	15/27	0.20	10.1	B	15/27	--	--	--	--/--
Franklin Street WB through	0.91	26.9	C	446/481	0.95	32.3	C	585/616	--	--	--	--/--
Franklin Place NB left-turn	>1.0	>100.0	F	445/445	>1.0	>100.0	F	555/555	--	--	--	--/--
Franklin Place NB right-turn	0.08	22.4	C	0/0	0.08	27.0	C	0/0	--	--	--	--/--
<b>Overall Intersection</b>	<b>&gt;1.0</b>	<b>40.8</b>	<b>D</b>	<b>--/--</b>	<b>&gt;1.0</b>	<b>54.7</b>	<b>D</b>	<b>--/--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--/--</b>
<i>Weekday PM:</i>												
Franklin Street EB through	0.95	27.9	C	332/981	>1.0	50.9	D	432/1,125	0.97	29.6	C	467/1035
Franklin Street EB right-turn	0.03	0.7	A	0/4	0.03	0.7	A	0/4	0.03	0.5	A	0/3
Franklin Street WB left-turn	0.07	18.8	B	1/5	0.07	21.9	C	1/5	0.08	24.0	C	¼
Franklin Street WB through	0.64	6.1	A	172/361	0.69	7.0	A	199/431	0.66	6.0	A	216/334
Franklin Place NB left-turn	0.66	38.3	D	74/111	0.65	37.8	D	74/111	0.75	49.6	D	87/122
Franklin Place NB right-turn	0.02	30.4	C	0/0	0.02	30.4	C	0/0	0.02	34.7	C	0/0
<b>Overall Intersection</b>	<b>0.92</b>	<b>19.8</b>	<b>B</b>	<b>--/--</b>	<b>0.99</b>	<b>32.0</b>	<b>C</b>	<b>--/--</b>	<b>0.95</b>	<b>21.5</b>	<b>C</b>	<b>--/--</b>

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

**TRAFFIC IMPACT AND ACCESS STUDY**

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**Table 8 (continued)**  
**INTERSECTION CAPACITY ANALYSIS SUMMARY – 2018 CONDITIONS WITH IMPROVEMENTS**

Intersection/Peak Hour/Lane Group	2018 No-Build				2018 Build				2018 Build with Improvements			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Franklin Street at Summer Street</b>												
<i>Weekday AM:</i>												
Franklin Street EB left-turn	0.10	14.1	B	4/16	0.13	14.9	B	4/16	0.14	13.9	B	4/13
Franklin Street EB through/right-turn	0.65	20.6	C	150/252	0.68	21.6	C	164/266	0.63	18.3	B	151/212
Franklin Street WB left-turn	0.43	10.3	B	36/97	0.51	10.9	B	43/109	0.54	11.0	B	44/90
Franklin Street WB through/right-turn	0.76	19.9	B	177/552	0.83	24.2	C	211/639	0.83	23.7	C	218/539
Summer Street NB approach	0.35	18.3	B	43/111	0.36	18.6	B	46/112	0.38	18.4	B	48/140
Summer Street SB approach	0.83	31.2	C	166/318	0.83	31.6	C	175/318	0.83	31.2	C	162/401
<b>Overall Intersection</b>	<b>0.79</b>	<b>21.6</b>	<b>C</b>	<b>--/--</b>	<b>0.83</b>	<b>23.2</b>	<b>C</b>	<b>--/--</b>	<b>0.84</b>	<b>22.2</b>	<b>C</b>	<b>--/--</b>
<i>Weekday PM:</i>												
Franklin Street EB left-turn	0.21	15.2	B	19/42	0.22	15.9	B	20/42	0.23	13.5	B	14/33
Franklin Street EB through/right-turn	0.82	31.3	C	257/400	0.88	38.4	D	309/506	0.88	32.7	C	231/418
Franklin Street WB left-turn	0.58	17.6	B	46/80	0.75	29.0	C	53/140	0.76	27.2	C	38/113
Franklin Street WB through/right-turn	0.61	21.5	C	189/280	0.65	23.1	C	218/317	0.64	18.7	B	166/254
Summer Street NB approach	0.90	35.8	D	301/550	0.93	43.1	D	351/585	0.98	50.8	D	267/495
Summer Street SB approach	0.47	18.1	B	86/159	0.48	19.6	B	95/161	0.52	17.7	B	73/137
<b>Overall Intersection</b>	<b>0.83</b>	<b>27.8</b>	<b>C</b>	<b>--/--</b>	<b>0.89</b>	<b>33.3</b>	<b>C</b>	<b>--/--</b>	<b>0.91</b>	<b>33.0</b>	<b>C</b>	<b>--/--</b>

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

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**Table 8 (continued)**  
**INTERSECTION CAPACITY ANALYSIS SUMMARY – 2018 CONDITIONS WITH IMPROVEMENTS**

Intersection/Peak Hour/Lane Group	2018 No-Build				2018 Build				2018 Build with Improvements			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Franklin Street at Main St and Central St</b>												
<i>Weekday AM:</i>												
Main Street NB through	0.45	13.9	B	142/198	0.47	15.7	B	152/198	0.44	14.1	B	138/179
Main Street NB right-turn	0.34	13.0	B	71/114	0.36	14.7	B	78/117	0.34	13.2	B	69/103
Main Street SB approach	>1.0	71.7	E	493/743	>1.0	>100.0	F	565/785	>1.0	79.6	E	509/729
Franklin Street WB approach	0.92	41.1	D	300/484	0.95	47.3	D	354/570	>1.0	70.7	E	418/618
<b>Overall Intersection</b>	<b>0.99</b>	<b>43.7</b>	<b>D</b>	<b>--/--</b>	<b>&gt;1.0</b>	<b>67.6</b>	<b>E</b>	<b>--/--</b>	<b>&gt;1.0</b>	<b>55.9</b>	<b>D</b>	<b>--/--</b>
<i>Weekday PM:</i>												
Main Street NB through	0.38	7.7	A	85/184	0.37	8.1	A	93/201	--	--	--	--/--
Main Street NB right-turn	0.35	7.5	A	45/121	0.37	8.1	A	53/143	--	--	--	--/--
Main Street SB approach	0.70	12.3	B	135/325	0.78	16.9	B	175/465	--	--	--	--/--
Franklin Street WB approach	0.75	28.3	C	128/215	0.82	37.1	D	151/242	--	--	--	--/--
<b>Overall Intersection</b>	<b>0.71</b>	<b>12.1</b>	<b>B</b>	<b>--/--</b>	<b>0.79</b>	<b>17.0</b>	<b>B</b>	<b>--/--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--/--</b>

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

**TRAFFIC IMPACT AND ACCESS STUDY**

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**Table 8 (continued)**

**INTERSECTION CAPACITY ANALYSIS SUMMARY – 2018 CONDITIONS WITH IMPROVEMENTS**

Intersection/Peak Hour/Lane Group	2018 No-Build				2018 Build				2018 Build with Improvements			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Franklin Street at Site Driveway</b>												
<i>Weekday AM:</i>												
Franklin Street EB left-turn	--	--	--	--/	--	--	--	--/	0.04	10.2	B	--/3
Franklin Street EB through	--	--	--	--/	--	--	--	--/	0.32	0.0	A	--/0
Franklin Street EB left-turn/through	0.01	0.2	A	--/0	0.04	1.1	A	--/3	--	--	--	--/
Franklin Street WB through/right-turn	0.56	0.0	A	--/0	0.56	0.0	A	--/0	0.56	0.0	A	--/0
Site Driveway SB left-turn	0.02	40.0	E	--/2	0.13	50.1	F	--/11	0.13	49.1	E	--/11
Site Driveway SB right-turn	0.01	16.7	C	--/1	0.35	22.7	C	--/38	0.35	22.7	C	--/38
<i>Weekday PM:</i>												
Franklin Street EB left-turn	--	--	--	--/	--	--	--	--/	0.15	10.6	B	--/13
Franklin Street EB through	--	--	--	--/	--	--	--	--/	0.75	0.0	A	--/0
Franklin Street EB left-turn/through	0.00	0.2	A	--/0	0.15	6.8	A	--/13	--	--	--	--/
Franklin Street WB through/right-turn	0.51	0.0	A	--/0	0.52	0.0	A	--/0	0.52	0.0	A	--/0
Site Driveway SB left-turn	0.64	>100.0	F	--/21	>1.0	>100.0	F	--/	>1.0	>100.0	F	--/
Site Driveway SB right-turn	0.00	15.6	C	--/0	0.21	18.5	C	--/19	0.20	18.4	C	--/19

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

<sup>b</sup> Average control delay in seconds per vehicle.

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

<sup>d</sup> Average/95<sup>th</sup> percentile queue length in feet per lane (assuming 25 feet per vehicle).

## **TRAFFIC IMPACT AND ACCESS STUDY**

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### **CONCLUSIONS AND RECOMMENDATIONS**

Existing and future conditions in the study area have been described, analyzed, and evaluated with respect to traffic operations and the impact of the proposed residential development. Conclusions of this effort and recommendations are presented below.

- As proposed, the development consists of razing the existing 2 barns, retaining the residential home and 1 story wood frame barn behind the residential home, and constructing 264 dwelling units with a  $\pm 1,000$  square foot leasing office. Access is proposed to be provided via one full access/egress driveway on Franklin Street.
- The proposed development is expected to generate 138 vehicle trips (29 entering and 109 exiting) during the weekday AM peak hour and 190 vehicle trips (118 entering and 72 exiting) during the weekday PM peak hour. Traffic-volume increases beyond the study area during the peak hours are expected to be in the range of 6 to 73 vehicles. These increases represent, on average, approximately one additional vehicle every fifty seconds to ten minutes during the peak hours.
- Available sight distances at the proposed site driveway exceed the minimum and desirable SSD and ISD requirements for safe operation in both directions. It is recommended that any proposed landscaping in the vicinity of the driveways and roadway intersections be located sufficiently back from Franklin Street or kept low to the ground so as not to impede the available sight distances.
- Under existing and future traffic-volume conditions the Franklin Street movements at the unsignalized intersection of Franklin Street at Perkins Street are expected to operate at optimal levels (LOS A). The minor street movements (Perkins Street) currently operate with long delays (LOS F) and have capacity constraints ( $v/c > 1.00$ ). The project is expected to add 1 additional vehicle to the Perkins Street northbound approach during the weekday AM peak hour and 6 additional vehicles during the weekday PM peak hour. These vehicles represent a 0.7% and 2.7% increase in traffic on the northbound approach for the weekday AM and weekday PM peak hours, respectively. The proposed project is expected to add 1 additional vehicle to the queue length during the weekday AM peak hour and 2 additional vehicles during weekday PM peak hour.
- Under existing and future traffic-volume conditions the signalized intersection of Franklin Street at Franklin Place is expected to operate at an overall LOS D or better during the weekday AM peak hour and LOS C or better during the weekday PM peak hour. During the weekday PM peak hour, the overall LOS is expected to drop from LOS B (No-Build) to LOS C (Build) with an increase in delay of 12.2 seconds. Traffic

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Proposed Residential Development – Stoneham, Massachusetts

signal timing modifications are recommended during the weekday PM peak period at this location. With the improved timings, the intersection is anticipated to operate at an overall LOS C during the weekday PM peak hour with all lane groups operating at LOS D or better and all v/c ratios are expected to be below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes.

- Under existing and future traffic-volume conditions the Franklin Street movements at the unsignalized intersection of Franklin Street at the Dunkin' Donuts and residential complex driveways are expected to operate at optimal levels (LOS A). This is true during times when traffic flow along Franklin Street is unrestrained, not necessarily when the Traffic Director is present at Stevens Street and at the High School. As described in the *Traffic Observations* section of this study, during this peak period prior to the start of school the westbound traffic along Franklin Street is stopped. The Dunkin' Donuts and residential complex driveways currently operate at LOS F and will continue to operate at LOS F with the addition of the residential development. Queue lengths during the PM peak hour are anticipated to increase by less than one vehicle as a result of the project.
- Under existing and future traffic-volume conditions, the Franklin Street through movements at the unsignalized intersection of Franklin Street at Pleasant Street are expected to operate at optimal levels (LOS A) with the Franklin Street left-turn movements expected to operate at LOS C or better. The minor street movements (Pleasant Street) at this intersection currently operate with long delays (LOS F) and have capacity constraints ( $v/c > 1.00$ ). The project is expected to add 4 additional vehicles to the Pleasant Street southbound approach during the weekday AM peak hour and 17 additional vehicles during the weekday PM peak hour. These vehicles represent a 2.0% and 5.9% increase in traffic on the southbound approach for the weekday AM and weekday PM peak hours, respectively. The proposed project is expected to add approximately 4 additional vehicles to the queue length during the weekday AM peak hour and 3 vehicles during the weekday PM peak hour.
- Under existing and future traffic-volume conditions the signalized intersection of Franklin Street at Summer Street is expected to operate at an overall LOS C or better. As a result of the project, some movements will drop LOS; therefore, traffic signal timing modifications are recommended during the weekday AM and weekday PM peak periods at this location. With the improved timings, the intersection is anticipated to operate at an overall LOS C with all lane groups operating at LOS D or better and all v/c ratios are expected to be below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes.
- Under existing and future traffic-volume conditions the signalized intersection of Franklin Street at Pine Street is expected to operate with an overall LOS C during the

## TRAFFIC IMPACT AND ACCESS STUDY

Proposed Residential Development – Stoneham, Massachusetts

weekday AM peak period and an overall LOS B during the weekday PM peak period. All movements are expected to operate at LOS C or better and LOS is anticipated to remain the same with the addition of the residential development. Increases in queue lengths as a result of the project are expected to be less than 3 vehicles.

- The signalized intersection of Franklin Street at Main Street and Central Street is expected to drop from an overall LOS C (Existing) to LOS D (No-Build) with the addition of historical traffic growth and background developments and drop from LOS D (No-Build) to LOS E (Build) with the proposed residential development in place during the weekday AM peak hour. Under existing and future traffic-volume conditions the intersection is expected to operate with an overall LOS B during the weekday PM peak hour. Traffic signal timing modifications are recommended during the weekday AM peak period at this location. With the improved timings, the intersection is anticipated to operate at an overall LOS D during the weekday AM peak hour with all lane groups operating at LOS E or better.
- Under existing and future traffic-volume conditions the signalized intersection of Main Street at Summer Street and Marble Street is expected to operate at an overall LOS D or better. During the weekday AM peak hour, the overall LOS drops from LOS C (No-Build) to LOS D (Build) with the proposed residential development in place. During the weekday PM peak hour, the Main Street southbound approach is expected to drop from LOS B to LOS C as a result of the project, however, this is due to a 0.2 second increase in delay on this movement. Increases in delay for the rest of the intersection are expected to be less than 3 seconds overall and approximately 8.4 seconds or less on any movement. In addition, increases in queue length on any movement are expected to be less than 2 vehicles.
- Under existing and future traffic-volume conditions the signalized intersection of Summer Street at Pond Street is expected to drop from an overall LOS B (No-Build) to LOS C (Build) during the weekday AM peak hour and operate an overall LOS B during the weekday PM peak hour. This drop in LOS during the weekday AM peak hour is due to an increase in delay of less than 1 second to the overall intersection. All movements are anticipated to operate at the same LOS with the addition of the residential development. Increases in delay of less than 2 seconds are expected on any movement and increases in queue length on any movement are expected to be less than 1 vehicle.
- Under future traffic-volume conditions the Franklin Street movements at the site driveway are expected to operate at optimal levels (LOS A). This is true during times when traffic flow along Franklin Street is unrestrained, not necessarily when the Traffic Directors are present at Stevens Street and at the High School. As described in the *Traffic Observations* section of this study, during this peak period prior to the start of school the

## **TRAFFIC IMPACT AND ACCESS STUDY**

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Proposed Residential Development – Stoneham, Massachusetts

westbound traffic along Franklin Street queues past the site driveway. The site driveway southbound left-turn movement is expected to operate at LOS F with 50.1 seconds of delay during the weekday AM peak hour and LOS F with more than 100.0 seconds of delay during the weekday PM peak hour while the right-turn movement is expected to operate at LOS C. The queue length on the site driveway is expected to be approximately 1-2 vehicles for the left-turn lane and the right-turn lane. During the peak period prior to the start of school a longer queue could be expected, however, there is ample room on-site to queue the vehicles (up to 115 feet [4 vehicles] prior to blocking the first internal intersections) and delays would be recognized on-site and not along Franklin Street. As part of the proposed residential development, an exclusive eastbound left-turn lane will be provided on Franklin Street at the site driveway. As a result of the eastbound left-turn lane, sufficient storage is provided to accommodate a three-vehicle queue thereby removing these turning vehicles from the through traffic on Franklin Street.

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

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***APPENDIX***

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**TRAFFIC-COUNT DATA  
TRAFFIC-VOLUME ADJUSTMENT DATA  
MASSDOT CRASH RATE WORKSHEETS  
PUBLIC TRANSPORTATION SCHEDULES  
OTHER DEVELOPMENT DATA  
TRIP-GENERATION CALCULATIONS  
CAPACITY ANALYSIS METHODOLOGY  
CAPACITY AND QUEUE ANALYSIS WORKSHEETS  
LEFT-TURN LANE WARRANT ANALYSIS  
CONCEPTUAL IMPROVEMENT PLAN  
TRAFFIC CONTROL SIGNAL WARRANT ANALYSES WORKSHEET**

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**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

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**TRAFFIC-COUNT DATA**

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**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-301-8800  
 www.tsotraffic.com

Site Code: Stoneham  
 Station ID: Franklin Street  
 Between Franklin Place and Rustic Road

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

Eastbound

Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total
09/18/13	0	0	4	13	28	4	0	0	0	0	0	0	0	0	49
01:00	0	0	1	7	14	2	0	0	0	0	0	0	0	0	24
02:00	0	0	0	4	4	1	0	0	0	0	0	0	0	0	9
03:00	0	0	0	3	3	4	0	0	0	0	0	0	0	0	10
04:00	0	1	0	6	11	1	1	0	0	0	0	0	0	0	20
05:00	1	0	2	11	35	11	1	0	0	0	0	0	0	0	61
06:00	13	1	4	58	137	21	3	0	0	0	0	0	0	0	237
07:00	80	9	41	185	117	8	0	1	0	0	0	0	0	0	441
08:00	68	5	19	192	238	13	1	1	1	0	0	0	0	0	538
09:00	38	3	8	104	187	28	1	1	0	0	0	0	0	0	370
10:00	25	6	24	179	197	11	1	0	0	0	0	0	0	0	443
11:00	49	17	32	227	140	7	0	0	0	0	0	0	0	0	472
12 PM	30	0	17	143	238	21	2	0	0	0	0	0	0	0	451
13:00	26	4	12	184	244	13	3	0	1	0	0	0	0	0	487
14:00	42	0	35	254	214	9	3	0	2	0	0	0	0	0	559
15:00	42	7	36	300	254	15	0	1	0	0	1	0	0	0	656
16:00	62	4	33	364	311	17	1	1	0	0	0	0	0	0	793
17:00	95	8	62	481	252	9	0	1	0	0	0	0	0	0	908
18:00	53	7	49	417	294	10	1	0	1	0	0	0	0	0	832
19:00	33	2	17	278	206	11	1	0	0	0	0	0	0	0	548
20:00	17	4	4	145	202	15	0	1	0	0	0	0	0	0	388
21:00	5	0	2	95	155	13	1	0	0	0	0	0	0	0	271
22:00	2	0	1	49	99	11	1	1	0	0	0	0	0	0	164
23:00	0	0	0	30	64	10	2	0	0	0	0	0	0	0	106
<b>Total</b>	<b>681</b>	<b>78</b>	<b>403</b>	<b>3729</b>	<b>3644</b>	<b>265</b>	<b>23</b>	<b>8</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8837</b>



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-443-5686  
 F: 617-301-8800  
 www.tsetraffic.com

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

Site Code: Stoneham  
 Station ID: Franklin Street  
 Between Franklin Place and Rustic Road

Eastbound															
Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total
	15	20	25	30	35	40	45	50	55	60	65	70	75	999	
09/19/13	0	0	2	10	27	7	0	0	0	0	0	0	0	0	46
01:00	0	0	0	4	11	2	1	0	0	0	0	0	0	0	18
02:00	0	0	0	2	3	3	0	0	0	0	0	0	0	0	8
03:00	1	1	0	2	5	1	0	0	0	0	0	0	0	0	10
04:00	0	0	0	6	11	6	2	0	0	0	0	0	0	0	25
05:00	0	0	1	6	39	11	1	0	0	0	0	0	0	0	58
06:00	20	1	5	57	126	20	1	0	0	0	0	0	0	0	230
07:00	78	3	19	184	122	3	0	1	0	0	0	0	0	0	410
08:00	55	4	5	191	236	16	1	0	0	0	0	0	0	0	508
09:00	29	4	14	100	244	34	0	0	0	0	0	0	0	0	425
10:00	33	5	13	150	194	16	3	0	0	0	0	0	0	0	414
11:00	22	4	17	263	163	10	1	0	0	0	0	0	0	0	480
12 PM	36	5	14	166	252	19	1	0	1	0	0	0	0	0	494
13:00	39	3	29	217	199	17	1	1	0	0	0	0	0	0	506
14:00	54	3	41	243	165	11	0	1	1	0	0	0	0	0	519
15:00	68	3	28	319	232	16	0	0	0	0	0	0	0	0	666
16:00	70	10	39	372	295	20	0	2	1	0	0	0	0	0	809
17:00	102	25	96	482	200	11	0	0	0	0	0	0	0	0	916
18:00	51	5	61	389	264	16	0	0	0	1	0	0	0	0	787
19:00	36	5	38	333	184	10	0	1	0	0	0	0	0	0	607
20:00	15	3	7	184	174	10	0	0	0	1	0	0	0	0	394
21:00	3	0	2	123	144	12	2	1	0	0	0	0	0	0	287
22:00	2	0	1	56	89	12	1	0	0	0	0	0	0	0	161
23:00	0	0	1	31	55	13	0	0	0	0	0	0	0	0	100
<b>Total</b>	<b>714</b>	<b>84</b>	<b>433</b>	<b>3890</b>	<b>3434</b>	<b>296</b>	<b>15</b>	<b>7</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8878</b>
<b>Grand Total</b>	<b>1395</b>	<b>162</b>	<b>836</b>	<b>7619</b>	<b>7078</b>	<b>561</b>	<b>38</b>	<b>15</b>	<b>8</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17715</b>

15th Percentile : 26 MPH  
 50th Percentile : 30 MPH  
 85th Percentile : 34 MPH  
 95th Percentile : 35 MPH

Statistics  
 Mean Speed(Average) : 28 MPH  
 10 MPH Pace Speed : 26-35 MPH  
 Number in Pace : 14697  
 Percent in Pace : 83.0%  
 Number of Vehicles > 55 MPH : 3  
 Percent of Vehicles > 55 MPH : 0.0%



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

Site Code: Stoneham  
 Station ID: Franklin Street  
 Between Franklin Place and Rustic Road

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

**Westbound**

Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total
09/18/13	1	0	0	2	7	10	6	2	0	0	0	0	0	0	28
01:00	0	0	0	2	2	1	4	1	0	0	0	0	0	0	10
02:00	0	0	0	1	3	6	2	1	1	0	0	0	0	0	14
03:00	0	0	1	0	1	3	3	2	0	1	0	0	0	0	11
04:00	0	0	0	0	6	11	5	8	2	0	0	0	0	0	32
05:00	3	0	1	5	35	46	32	13	2	0	0	0	0	0	137
06:00	13	0	8	31	132	223	74	7	0	0	0	0	0	0	488
07:00	185	43	22	60	181	135	27	5	0	0	0	0	0	0	658
08:00	90	7	7	84	312	225	43	5	2	1	0	0	0	0	776
09:00	31	13	24	54	201	207	48	3	2	0	0	0	0	0	583
10:00	22	7	2	38	153	182	58	10	1	0	0	0	0	0	473
11:00	20	0	3	47	156	162	52	2	1	0	0	0	0	0	443
12 PM	20	0	0	32	190	157	53	3	0	0	0	0	0	0	455
13:00	18	1	1	36	168	217	47	8	0	0	1	0	0	0	497
14:00	34	3	6	49	186	190	45	5	0	0	0	0	0	0	518
15:00	52	1	5	27	187	220	62	9	1	0	0	0	0	0	564
16:00	52	0	2	45	183	238	61	5	1	1	0	0	0	0	588
17:00	55	0	0	41	186	219	46	5	1	0	0	0	0	0	553
18:00	58	0	0	15	166	206	63	8	0	0	0	0	0	0	516
19:00	19	0	3	33	137	173	34	3	0	0	1	0	0	0	403
20:00	9	0	1	21	104	114	38	4	0	0	0	0	0	0	291
21:00	4	0	1	15	46	100	36	4	1	0	0	0	0	0	207
22:00	3	1	0	7	37	57	19	2	2	0	0	0	0	0	128
23:00	0	0	1	5	16	27	17	6	1	0	0	0	0	0	73
<b>Total</b>	<b>689</b>	<b>76</b>	<b>88</b>	<b>650</b>	<b>2795</b>	<b>3129</b>	<b>875</b>	<b>121</b>	<b>18</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8446</b>



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 Stoneham, MA  
 Client: John DeBarros

Site Code: Stoneham  
 Station ID: Franklin Street  
 Between Franklin Place and Rustic Road

Westbound																
Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	999	Total
	15	20	25	30	35	40	45	50	55	60	65	70	75			
09/19/13	1	0	0	0	6	18	15	3	0	0	0	0	0	0	0	43
01:00	0	0	1	2	3	5	7	1	0	0	0	0	0	0	0	19
02:00	0	0	0	0	4	7	3	2	0	0	0	0	0	0	0	16
03:00	0	1	1	0	3	5	5	2	0	0	0	0	0	0	0	17
04:00	0	0	0	0	5	6	10	7	1	0	0	0	0	0	0	29
05:00	0	0	0	6	26	46	41	14	5	0	0	0	0	0	0	138
06:00	12	1	9	23	168	221	69	7	2	0	0	0	0	0	0	512
07:00	256	35	12	58	168	96	21	2	3	0	0	0	0	0	0	651
08:00	107	13	5	76	318	268	31	6	1	1	0	0	0	0	0	826
09:00	16	2	0	30	238	251	69	10	1	0	0	0	0	0	0	617
10:00	26	2	8	29	162	186	57	3	2	0	0	0	0	0	0	475
11:00	34	1	3	26	148	202	59	2	2	0	0	0	0	0	0	477
12 PM	32	3	7	25	149	175	55	4	0	0	0	0	0	0	1	451
13:00	20	0	12	49	164	208	45	4	2	0	0	0	1	0	0	505
14:00	62	15	29	53	206	182	32	5	1	0	1	0	0	0	0	586
15:00	44	3	7	44	182	213	59	5	0	0	0	0	0	0	0	557
16:00	62	0	2	27	155	221	64	10	0	0	0	0	0	0	0	541
17:00	61	1	0	41	225	181	49	4	2	0	0	0	0	0	0	564
18:00	40	2	3	19	159	222	64	4	0	0	0	0	0	0	0	513
19:00	22	1	1	25	155	152	48	4	1	0	0	0	0	0	0	409
20:00	9	1	4	21	86	125	34	5	1	0	0	0	0	0	1	287
21:00	5	0	0	10	52	93	31	4	3	0	1	0	0	0	0	199
22:00	5	0	1	8	39	36	36	7	1	1	0	0	0	0	0	134
23:00	0	0	0	7	25	34	23	3	1	0	0	0	0	0	0	93
<b>Total</b>	<b>814</b>	<b>81</b>	<b>105</b>	<b>579</b>	<b>2846</b>	<b>3153</b>	<b>927</b>	<b>118</b>	<b>29</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>2</b>		<b>8659</b>
<b>Grand Total</b>	<b>1503</b>	<b>157</b>	<b>193</b>	<b>1229</b>	<b>5641</b>	<b>6282</b>	<b>1802</b>	<b>239</b>	<b>47</b>	<b>5</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>2</b>		<b>17105</b>

15th Percentile : 28 MPH  
 50th Percentile : 35 MPH  
 85th Percentile : 40 MPH  
 95th Percentile : 44 MPH

Statistics  
 Mean Speed(Average) : 33 MPH  
 10 MPH Pace Speed : 31-40 MPH  
 Number in Pace : 11923  
 Percent in Pace : 69.7%  
 Number of Vehicles > 55 MPH : 12  
 Percent of Vehicles > 55 MPH : 0.1%



**Traffic Survey Expedition**  
 106 Sharon Road  
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Site Code: Stoneham  
 Station ID: Franklin Street  
 Between Franklin Place and Rustic Road

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

Start Time	18-Sep-13 Wed	Eastbound	Westbound	Combined Total	
12:00 AM		49	28	77	█
01:00		24	10	34	█
02:00		9	14	23	█
03:00		10	11	21	█
04:00		20	32	52	█
05:00		61	137	198	█
06:00		237	489	726	█
07:00		441	657	1098	█
08:00		539	776	1315	█
09:00		370	583	953	█
10:00		442	473	915	█
11:00		473	443	916	█
12:00 PM		450	455	905	█
01:00		487	497	984	█
02:00		559	518	1077	█
03:00		656	564	1220	█
04:00		793	588	1381	█
05:00		908	553	1461	█
06:00		832	516	1348	█
07:00		548	403	951	█
08:00		389	291	680	█
09:00		270	207	477	█
10:00		164	128	292	█
11:00		106	73	179	█
<b>Total</b>		<b>8837</b>	<b>8446</b>	<b>17283</b>	
<b>Percent</b>		<b>51.1%</b>	<b>48.9%</b>		



Traffic Survey Expedition  
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GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

Site Code: Stoneham  
 Station ID: Franklin Street  
 Between Franklin Place and Rustic Road

Start Time	19-Sep-13 Thu	Eastbound	Westbound	Combined Total	
12:00 AM		46	43	89	■
01:00		18	19	37	■
02:00		8	16	24	■
03:00		10	17	27	■
04:00		25	29	54	■
05:00		59	138	197	■
06:00		229	512	741	■
07:00		410	651	1061	■
08:00		509	826	1335	■
09:00		424	617	1041	■
10:00		414	475	889	■
11:00		480	477	957	■
12:00 PM		494	451	945	■
01:00		506	506	1012	■
02:00		519	585	1104	■
03:00		666	557	1223	■
04:00		809	541	1350	■
05:00		916	564	1480	■
06:00		787	513	1300	■
07:00		607	409	1016	■
08:00		394	287	681	■
09:00		287	199	486	■
10:00		161	134	295	■
11:00		100	93	193	■
Total		8878	8659	17537	
Percent		50.6%	49.4%		
Grand Total		17715	17105		
Percentage		50.9%	49.1%		

ADT

Not Calculated



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GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

Site Code: Stoneham  
 Station ID: Franklin Street  
 Between Franklin Place and Rustic Road

Start Time	18-Sep Wed	Eastbound		Westbound		Combined		19-Sep Thu	Eastbound		Westbound		Combined	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00		19	104	4	103	23	207		13	121	13	117	26	238
12:15		12	110	9	133	21	243		10	129	11	120	21	249
12:30		7	95	6	105	13	200		13	135	9	111	22	246
12:45		11	141	9	114	20	255		10	109	10	103	20	212
01:00		8	140	3	104	11	244		5	130	5	111	10	241
01:15		7	100	3	129	10	229		6	113	8	121	14	234
01:30		8	114	3	130	11	244		3	126	5	132	8	258
01:45		1	133	1	134	2	267		4	137	1	142	5	279
02:00		2	129	5	113	7	242		1	109	8	137	9	246
02:15		3	145	1	124	4	269		0	130	2	147	2	277
02:30		3	156	4	130	7	286		4	133	4	148	8	281
02:45		1	129	4	151	5	280		3	147	2	153	5	300
03:00		2	165	2	140	4	305		2	166	1	131	3	297
03:15		2	139	3	154	5	293		1	168	7	145	8	313
03:30		2	175	4	119	6	294		3	148	4	134	7	282
03:45		4	177	2	151	6	328		4	184	5	147	9	331
04:00		5	174	7	148	12	322		4	183	4	138	8	321
04:15		3	197	6	146	9	343		7	207	9	137	16	344
04:30		6	208	6	152	12	360		7	208	7	137	14	345
04:45		6	214	13	142	19	356		7	211	9	129	16	340
05:00		10	221	12	125	22	346		7	227	17	143	24	370
05:15		9	218	26	152	35	370		10	234	21	146	31	380
05:30		16	223	45	150	61	373		18	244	52	139	70	383
05:45		26	246	54	126	80	372		24	211	48	136	72	347
06:00		20	256	71	115	91	371		28	227	73	144	101	371
06:15		38	219	93	132	131	351		34	192	99	114	133	306
06:30		80	181	136	125	216	306		77	174	139	127	216	301
06:45		99	176	189	144	288	320		90	194	201	128	291	322
07:00		128	166	221	108	349	274		95	190	232	116	327	306
07:15		96	134	227	100	323	234		109	162	185	105	294	267
07:30		85	126	104	87	189	213		84	140	122	94	206	234
07:45		132	122	105	108	237	230		122	115	112	94	234	209
08:00		139	106	160	77	209	183		117	102	198	83	315	185
08:15		142	104	205	78	347	182		130	114	212	70	342	184
08:30		137	87	216	82	353	169		134	88	220	68	354	156
08:45		121	92	195	54	316	146		128	90	196	66	324	156
09:00		121	76	168	54	289	130		96	83	176	61	272	144
09:15		91	74	156	62	247	136		119	80	152	49	271	129
09:30		70	63	125	51	195	114		99	71	138	45	237	116
09:45		88	57	134	40	222	97		110	53	151	44	261	97
10:00		116	42	109	42	225	84		100	42	126	38	226	80
10:15		98	47	109	37	207	84		102	43	117	42	219	85
10:30		119	30	125	27	244	57		102	43	120	24	222	67
10:45		109	45	130	22	239	67		110	33	112	30	222	63
11:00		127	30	105	19	232	49		119	33	107	34	226	67
11:15		103	30	108	19	211	49		103	30	110	30	213	60
11:30		116	25	122	18	238	43		118	17	143	17	261	34
11:45		127	21	108	17	235	38		140	20	117	12	257	32
Total		2675	6162	3653	4793	6328	10955		2632	6246	3820	4839	6452	11085
Day Total		8837		8446		17283			8878		8659		17537	
% Total		15.5%	35.7%	21.1%	27.7%				15.0%	35.6%	21.8%	27.6%		
Peak		07:45	05:30	08:15	03:45	08:00	05:15		08:00	04:45	08:00	02:00	08:00	05:15
Vol.		550	944	784	597	1315	1486		509	916	826	585	1335	1481
P.H.F.		0.968	0.922	0.907	0.969	0.931	0.996		0.950	0.939	0.890	0.956	0.943	0.967

ADT Not Calculated



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-443-5686  
 F: 617-301-8800  
 www.tsetraffic.com

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

Site Code: Stoneham  
 Station ID: Franklin Street  
 Between Franklin Place and Rustic Road

Start Time	19-Sep-13 Thu	Eastbound	Westbound	Combined Total	
12:00 AM		46	43	89	█
01:00		18	19	37	█
02:00		8	16	24	█
03:00		10	17	27	█
04:00		25	29	54	█
05:00		59	138	197	█
06:00		229	512	741	█
07:00		410	651	1061	█
08:00		509	826	1335	█
09:00		424	617	1041	█
10:00		414	475	889	█
11:00		480	477	957	█
12:00 PM		494	451	945	█
01:00		506	506	1012	█
02:00		519	585	1104	█
03:00		666	557	1223	█
04:00		809	541	1350	█
05:00		916	564	1480	█
06:00		787	513	1300	█
07:00		607	409	1016	█
08:00		394	287	681	█
09:00		287	199	486	█
10:00		161	134	295	█
11:00		100	93	193	█
Total		8878	8659	17537	
Percent		50.6%	49.4%		
Grand Total		17715	17105		
Percentage		50.9%	49.1%		

ADT

Not Calculated



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

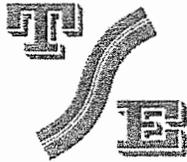
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

Site Code: Stoneham  
 Station ID: Franklin Street  
 Between Franklin Place and Rustic Road

Start Time	18-Sep Wed	Eastbound		Westbound		Combined		19-Sep Thu	Eastbound		Westbound		Combined	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00		19	104	4	103	23	207		13	121	13	117	26	238
12:15		12	110	9	133	21	243		10	129	11	120	21	249
12:30		7	95	6	105	13	200		13	135	9	111	22	246
12:45		11	141	9	114	20	255		10	109	10	103	20	212
01:00		8	140	3	104	11	244		5	130	5	111	10	241
01:15		7	100	3	129	10	229		6	113	8	121	14	234
01:30		8	114	3	130	11	244		3	126	5	132	8	258
01:45		1	133	1	134	2	267		4	137	1	142	5	279
02:00		2	129	5	113	7	242		1	109	8	137	9	246
02:15		3	145	1	124	4	269		0	130	2	147	2	277
02:30		3	156	4	130	7	286		4	133	4	148	8	281
02:45		1	129	4	151	5	280		3	147	2	153	5	300
03:00		2	165	2	140	4	305		2	166	1	131	3	297
03:15		2	139	3	154	5	293		1	168	7	145	8	313
03:30		2	175	4	119	6	294		3	148	4	134	7	282
03:45		4	177	2	151	6	328		4	184	5	147	9	331
04:00		5	174	7	148	12	322		4	183	4	138	8	321
04:15		3	197	6	146	9	343		7	207	9	137	16	344
04:30		6	208	6	152	12	360		7	208	7	137	14	345
04:45		6	214	13	142	19	356		7	211	9	129	16	340
05:00		10	221	12	125	22	346		7	227	17	143	24	370
05:15		9	218	26	152	35	370		10	234	21	146	31	380
05:30		16	223	45	150	61	373		18	244	52	139	70	383
05:45		26	246	54	126	80	372		24	211	48	136	72	347
06:00		20	256	71	115	91	371		28	227	73	144	101	371
06:15		38	219	93	132	131	351		34	192	99	114	133	306
06:30		80	181	136	125	216	306		77	174	139	127	216	301
06:45		99	176	189	144	288	320		90	194	201	128	291	322
07:00		128	166	221	108	349	274		95	190	232	116	327	306
07:15		96	134	227	100	323	234		109	162	185	105	294	267
07:30		85	126	104	87	189	213		84	140	122	94	206	234
07:45		132	122	105	108	237	230		122	115	112	94	234	209
08:00		139	106	160	77	299	183		117	102	198	83	315	185
08:15		142	104	205	78	347	182		130	114	212	70	342	184
08:30		137	87	216	82	353	169		134	88	220	68	354	156
08:45		121	92	195	54	316	146		128	90	196	66	324	156
09:00		121	76	168	54	289	130		96	83	176	61	272	144
09:15		91	74	156	62	247	136		119	80	152	49	271	129
09:30		70	63	125	51	195	114		99	71	138	45	237	116
09:45		88	57	134	40	222	97		110	53	151	44	261	97
10:00		116	42	109	42	225	84		100	42	126	38	226	80
10:15		98	47	109	37	207	84		102	43	117	42	219	85
10:30		119	30	125	27	244	57		102	43	120	24	222	67
10:45		109	45	130	22	239	67		110	33	112	30	222	63
11:00		127	30	105	19	232	49		119	33	107	34	226	67
11:15		103	30	108	19	211	49		103	30	110	30	213	60
11:30		116	25	122	18	238	43		118	17	143	17	261	34
11:45		127	21	108	17	235	38		140	20	117	12	257	32
Total Day		2675	6162	3653	4793	6328	10955		2632	6246	3820	4839	6452	11085
Day Total		8837		8446		17283			8878		8659		17537	
% Total		15.5%	35.7%	21.1%	27.7%				15.0%	35.6%	21.8%	27.6%		
Peak Vol.		07:45	05:30	08:15	03:45	08:00	05:15		08:00	04:45	08:00	02:00	08:00	05:15
P.H.F.		0.968	0.922	0.907	0.969	0.931	0.996		0.950	0.939	0.890	0.956	0.943	0.967

ADT Not Calculated

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

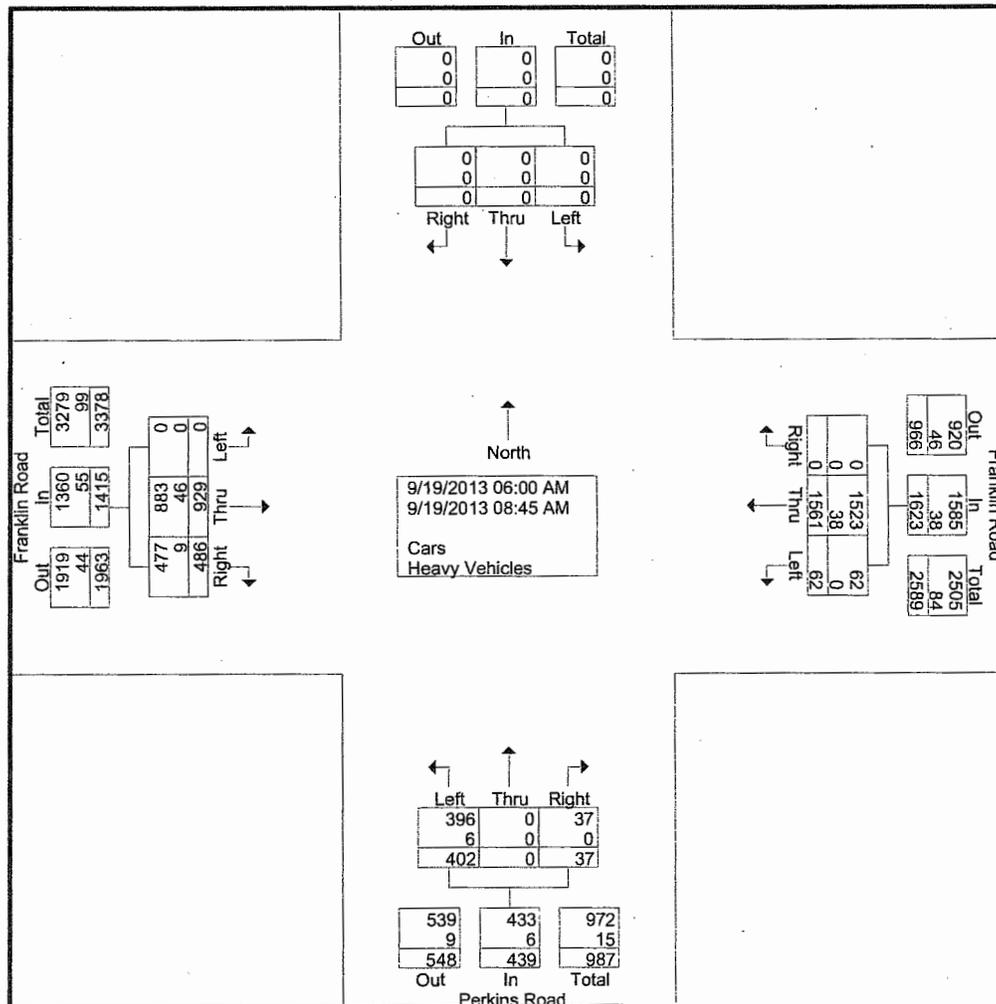


**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-443-5686  
 F: 617-891-8800  
 www.tsetraffic.com

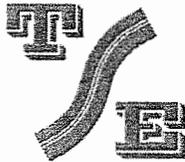
File Name : Perkins  
 Site Code : 1  
 Start Date : 9/19/20  
 Page No : 1 of 4

Groups Printed- Cars - Heavy Vehicles

Start Time	Perkins Road Northbound				Southbound				Franklin Road Eastbound				Franklin Road Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	26	0	1	27	0	0	0	0	0	53	20	73	3	94	0	97	14
06:15 AM	31	0	2	33	0	0	0	0	0	56	23	79	1	105	0	106	2
06:30 AM	26	0	1	27	0	0	0	0	0	56	51	107	4	145	0	149	28
06:45 AM	37	0	1	38	0	0	0	0	0	59	48	107	5	174	0	179	32
<b>Total</b>	<b>120</b>	<b>0</b>	<b>5</b>	<b>125</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>224</b>	<b>142</b>	<b>366</b>	<b>13</b>	<b>518</b>	<b>0</b>	<b>531</b>	<b>102</b>
07:00 AM	32	0	3	35	0	0	0	0	0	80	63	143	6	184	0	190	36
07:15 AM	36	0	6	42	0	0	0	0	0	93	48	141	5	105	0	110	29
07:30 AM	17	0	5	22	0	0	0	0	0	107	48	155	11	147	0	158	33
07:45 AM	38	0	9	47	0	0	0	0	0	98	34	132	13	148	0	161	32
<b>Total</b>	<b>123</b>	<b>0</b>	<b>23</b>	<b>146</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>378</b>	<b>193</b>	<b>571</b>	<b>35</b>	<b>584</b>	<b>0</b>	<b>619</b>	<b>133</b>
08:00 AM	49	0	1	50	0	0	0	0	0	95	47	142	9	149	0	158	35
08:15 AM	39	0	4	43	0	0	0	0	0	94	41	135	3	127	0	130	30
08:30 AM	45	0	2	47	0	0	0	0	0	82	41	123	2	109	0	111	28
08:45 AM	26	0	2	28	0	0	0	0	0	56	22	78	0	74	0	74	18
<b>Total</b>	<b>159</b>	<b>0</b>	<b>9</b>	<b>168</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>327</b>	<b>151</b>	<b>478</b>	<b>14</b>	<b>459</b>	<b>0</b>	<b>473</b>	<b>111</b>
<b>Grand Total</b>	<b>402</b>	<b>0</b>	<b>37</b>	<b>439</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>929</b>	<b>486</b>	<b>1415</b>	<b>62</b>	<b>1561</b>	<b>0</b>	<b>1623</b>	<b>347</b>
Apprch %	91.6	0	8.4		0	0	0		0	65.7	34.3		3.8	96.2	0		
Total %	11.6	0	1.1	12.6	0	0	0	0	0	26.7	14	40.7	1.8	44.9	0	46.7	
Cars	396	0	37	433	0	0	0	0	0	883	477	1360	62	1523	0	1585	675
% Cars	98.5	0	100	98.6	0	0	0	0	0	95	98.1	96.1	100	97.6	0	97.7	97
Heavy Vehicles	6	0	0	6	0	0	0	0	0	46	9	55	0	38	0	38	19
% Heavy Vehicles	1.5	0	0	1.4	0	0	0	0	0	5	1.9	3.9	0	2.4	0	2.3	2



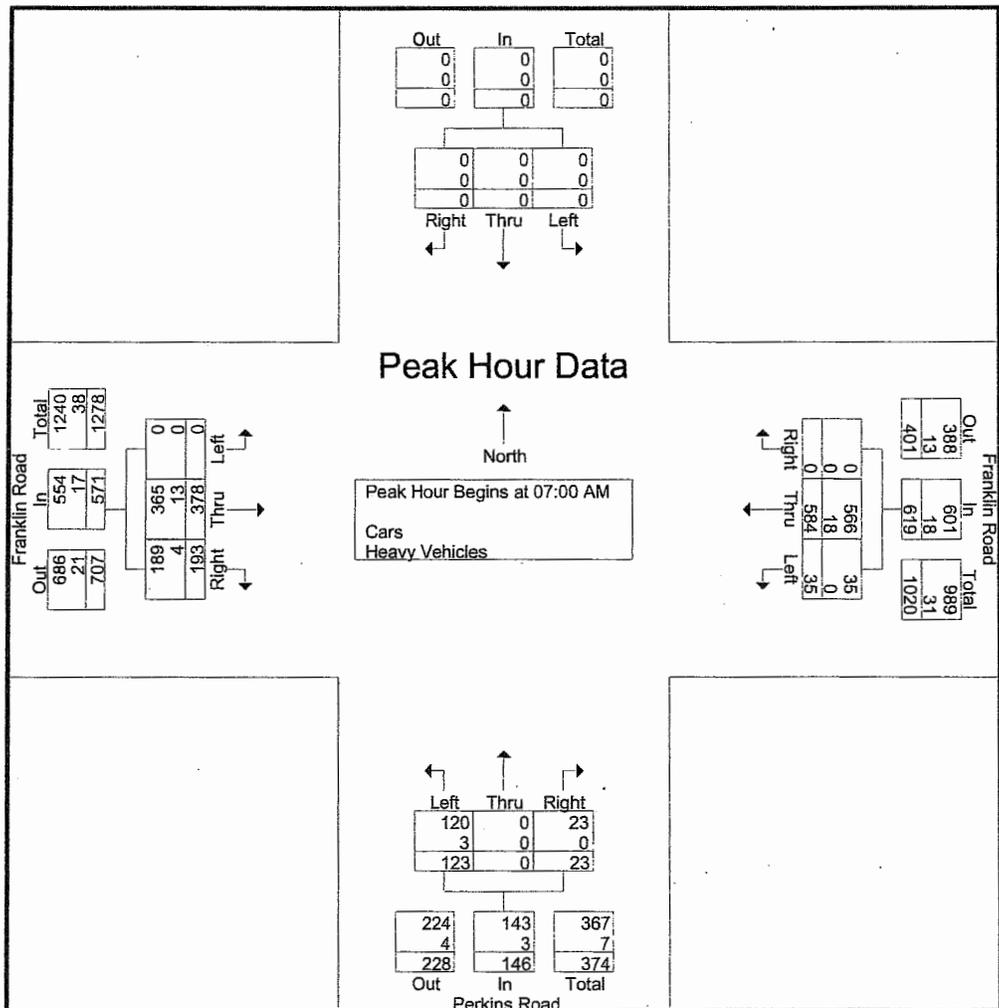
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-442-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Perkins  
 Site Code : 2  
 Start Date : 9/19/20  
 Page No : 2 of 4

Start Time	Perkins Road Northbound				Southbound				Franklin Road Eastbound				Franklin Road Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	32	0	3	35	0	0	0	0	0	80	63	143	6	184	0	190	34
07:15 AM	36	0	6	42	0	0	0	0	0	93	48	141	5	105	0	110	29
07:30 AM	17	0	5	22	0	0	0	0	0	107	48	155	11	147	0	158	33
07:45 AM	38	0	9	47	0	0	0	0	0	98	34	132	13	148	0	161	34
Total Volume	123	0	23	146	0	0	0	0	0	378	193	571	35	584	0	619	133
% App. Total	84.2	0	15.8		0	0	0			66.2	33.8		5.7	94.3	0		
PHF	.809	.000	.639	.777	.000	.000	.000	.000	.000	.883	.766	.921	.673	.793	.000	.814	.96
Cars	120	0	23	143	0	0	0	0	0	365	189	554	35	566	0	601	129
% Cars	97.6	0	100	97.9	0	0	0	0	0	96.6	97.9	97.0	100	96.9	0	97.1	97
Heavy Vehicles	3	0	0	3	0	0	0	0	0	13	4	17	0	18	0	18	3
% Heavy Vehicles	2.4	0	0	2.1	0	0	0	0	0	3.4	2.1	3.0	0	3.1	0	2.9	2



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 108 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5886  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Perkins  
 Site Code : 3  
 Start Date : 9/19/20  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Perkins Road Northbound				Southbound				Franklin Road Eastbound				Franklin Road Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	25	0	1	26	0	0	0	0	0	50	20	70	3	91	0	94	15
06:15 AM	31	0	2	33	0	0	0	0	0	51	23	74	1	100	0	101	20
06:30 AM	26	0	1	27	0	0	0	0	0	51	49	100	4	144	0	148	27
06:45 AM	36	0	1	37	0	0	0	0	0	55	46	101	5	173	0	178	31
Total	118	0	5	123	0	0	0	0	0	207	138	345	13	508	0	521	98
07:00 AM	30	0	3	33	0	0	0	0	0	78	60	138	6	183	0	189	36
07:15 AM	35	0	6	41	0	0	0	0	0	90	48	138	5	100	0	105	28
07:30 AM	17	0	5	22	0	0	0	0	0	102	48	150	11	141	0	152	32
07:45 AM	38	0	9	47	0	0	0	0	0	95	33	128	13	142	0	155	33
Total	120	0	23	143	0	0	0	0	0	365	189	554	35	566	0	601	129
08:00 AM	49	0	1	50	0	0	0	0	0	92	47	139	9	146	0	155	34
08:15 AM	38	0	4	42	0	0	0	0	0	85	40	125	3	125	0	128	29
08:30 AM	45	0	2	47	0	0	0	0	0	78	41	119	2	105	0	107	27
08:45 AM	26	0	2	28	0	0	0	0	0	56	22	78	0	73	0	73	17
Total	158	0	9	167	0	0	0	0	0	311	150	461	14	449	0	463	109
Grand Total	396	0	37	433	0	0	0	0	0	883	477	1360	62	1523	0	1585	337
Apprch %	91.5	0	8.5		0	0	0		0	64.9	35.1		3.9	96.1	0		
Total %	11.7	0	1.1	12.8	0	0	0	0	0	26.1	14.1	40.3	1.8	45.1	0	46.9	

Start Time	Perkins Road Northbound				Southbound				Franklin Road Eastbound				Franklin Road Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
1 Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	30	0	3	33	0	0	0	0	0	78	60	138	6	183	0	189	36
07:15 AM	35	0	6	41	0	0	0	0	0	90	48	138	5	100	0	105	28
07:30 AM	17	0	5	22	0	0	0	0	0	102	48	150	11	141	0	152	32
07:45 AM	38	0	9	47	0	0	0	0	0	95	33	128	13	142	0	155	33
Total Volume	120	0	23	143	0	0	0	0	0	365	189	554	35	566	0	601	129
% App. Total	83.9	0	16.1		0	0	0		0	65.9	34.1		5.8	94.2	0		
PHF	.789	.000	.639	.761	.000	.000	.000	.000	.000	.895	.788	.923	.673	.773	.000	.795	.90

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:45 AM				06:00 AM				07:15 AM				06:45 AM			
+0 mins.	38	0	9	47	0	0	0	0	0	90	48	138	5	173	0	178
+15 mins.	49	0	1	50	0	0	0	0	0	102	48	150	6	183	0	189
+30 mins.	38	0	4	42	0	0	0	0	0	95	33	128	5	100	0	105
+45 mins.	45	0	2	47	0	0	0	0	0	92	47	139	11	141	0	152
Total Volume	170	0	16	186	0	0	0	0	0	379	176	555	27	597	0	624
% App. Total	91.4	0	8.6		0	0	0		0	68.3	31.7		4.3	95.7	0	
PHF	.867	.000	.444	.930	.000	.000	.000	.000	.000	.929	.917	.925	.614	.816	.000	.825

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8900  
 www.tsetraffic.com

File Name : Perkins  
 Site Code : 4  
 Start Date : 9/19/20  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Perkins Road Northbound				Southbound				Franklin Road Eastbound				Franklin Road Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	1	0	0	1	0	0	0	0	0	3	0	3	0	3	0	3	
06:15 AM	0	0	0	0	0	0	0	0	0	5	0	5	0	5	0	5	
06:30 AM	0	0	0	0	0	0	0	0	0	5	2	7	0	1	0	1	
06:45 AM	1	0	0	1	0	0	0	0	0	4	2	6	0	1	0	1	
<b>Total</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>4</b>	<b>21</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>3</b>
07:00 AM	2	0	0	2	0	0	0	0	0	2	3	5	0	1	0	1	
07:15 AM	1	0	0	1	0	0	0	0	0	3	0	3	0	5	0	5	
07:30 AM	0	0	0	0	0	0	0	0	0	5	0	5	0	6	0	6	1
07:45 AM	0	0	0	0	0	0	0	0	0	3	1	4	0	6	0	6	1
<b>Total</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>4</b>	<b>17</b>	<b>0</b>	<b>18</b>	<b>0</b>	<b>18</b>	<b>3</b>
08:00 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	
08:15 AM	1	0	0	1	0	0	0	0	0	9	1	10	0	2	0	2	1
08:30 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	4	0	4	
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>1</b>	<b>17</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>2</b>
<b>Grand Total</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>46</b>	<b>9</b>	<b>55</b>	<b>0</b>	<b>38</b>	<b>0</b>	<b>38</b>	<b>9</b>
Apprch %	100	0	0		0	0	0		0	83.6	16.4		0	100	0		
Total %	6.1	0	0	6.1	0	0	0	0	0	46.5	9.1	55.6	0	38.4	0	38.4	

Start Time	Perkins Road Northbound				Southbound				Franklin Road Eastbound				Franklin Road Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	0	0	0	0	5	0	5	0	6	0	6	1
07:45 AM	0	0	0	0	0	0	0	0	0	3	1	4	0	6	0	6	1
08:00 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	1
08:15 AM	1	0	0	1	0	0	0	0	0	9	1	10	0	2	0	2	1
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>2</b>	<b>22</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>17</b>	<b>4</b>
% App. Total	100	0	0		0	0	0		0	90.9	9.1		0	100	0		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.556	.500	.550	.000	.708	.000	.708	.768

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	06:30 AM				06:00 AM				06:15 AM				07:15 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	5	0	5	0	5	0	5
+15 mins.	1	0	0	1	0	0	0	0	0	5	2	7	0	6	0	6
+30 mins.	2	0	0	2	0	0	0	0	0	4	2	6	0	6	0	6
+45 mins.	1	0	0	1	0	0	0	0	0	2	3	5	0	3	0	3
<b>Total Volume</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>7</b>	<b>23</b>	<b>0</b>	<b>20</b>	<b>0</b>	<b>20</b>
% App. Total	100	0	0		0	0	0		0	69.6	30.4		0	100	0	
PHF	.500	.000	.000	.500	.000	.000	.000	.000	.000	.800	.583	.821	.000	.833	.000	.833

# Accurate Counts

978-664-2565

N/S Street : Perkins Street  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16  
 Site Code : 16  
 Start Date : 4/1  
 Page No : 10

### Groups Printed- Bikes Peds

Start Time	Franklin St From East			Perkins St From South			Franklin St From West			Int.
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	
07:00 AM	0	1	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	2	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	0	3	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0
<b>Grand Total</b>	0	3	0	0	0	0	0	0	0	1
<b>Apprch %</b>	0	100	0	0	0	0	0	0	0	100
<b>Total %</b>	0	75	0	0	0	0	0	0	0	25

Start Time	Franklin St From East				Perkins St From South				Franklin St From West				Int.
	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	1	0	1	0	0	0	0	0	0	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	2	0	2	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	0	3	0	3	0	0	0	0	0	0	0	1	1
<b>% App. Total</b>	0	100	0		0	0	0		0	0	100		
<b>PHF</b>	.000	.375	.000	.375	.000	.000	.000	.000	.000	.000	.250	.250	

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

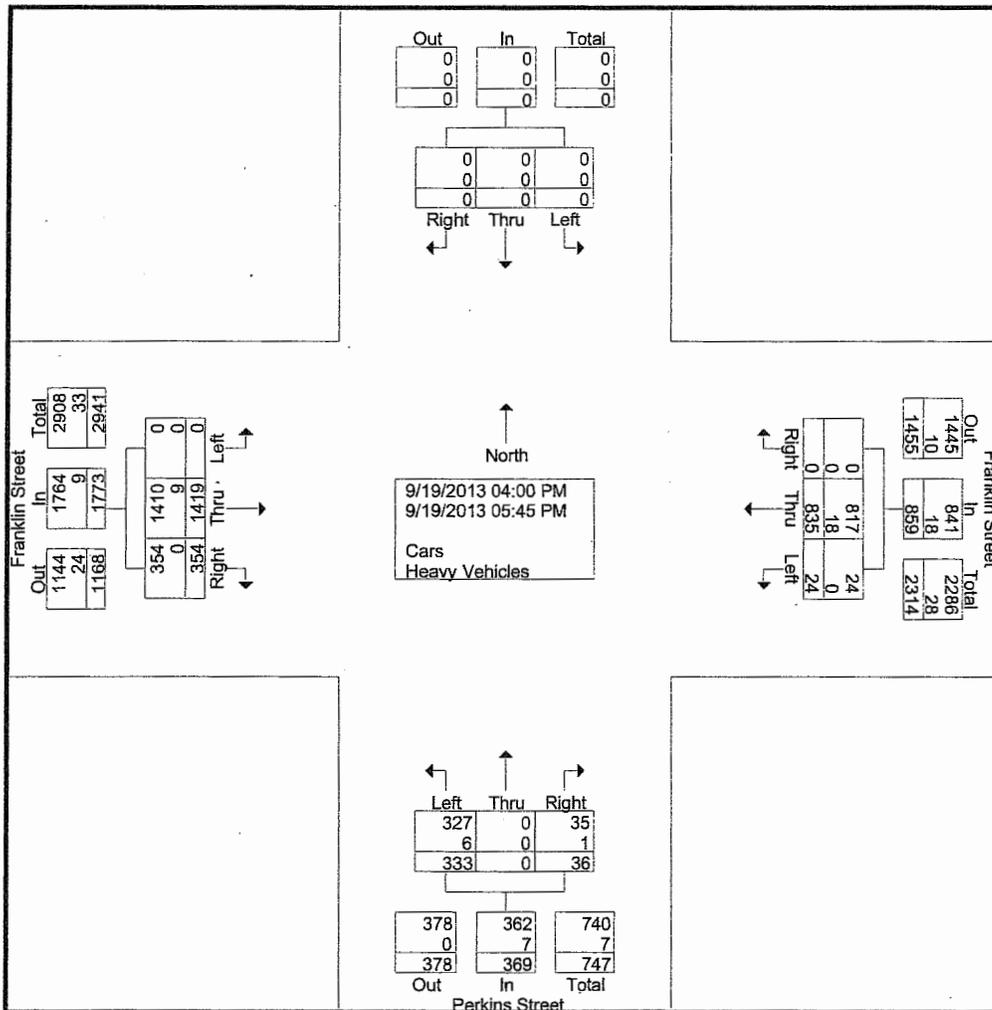


**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-3300  
 www.tsetraffic.com

File Name : Perkins  
 Site Code : 1  
 Start Date : 9/19/2013  
 Page No : 1 of 4

Groups Printed- Cars - Heavy Vehicles

Start Time	Perkins Street Northbound				Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	33	0	4	37	0	0	0	0	0	165	40	205	4	96	0	100	34
04:15 PM	38	0	4	42	0	0	0	0	0	169	42	211	4	109	0	113	36
04:30 PM	35	0	3	38	0	0	0	0	0	178	38	216	0	103	0	103	35
04:45 PM	36	0	3	39	0	0	0	0	0	172	43	215	3	93	0	96	35
<b>Total</b>	<b>142</b>	<b>0</b>	<b>14</b>	<b>156</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>684</b>	<b>163</b>	<b>847</b>	<b>11</b>	<b>401</b>	<b>0</b>	<b>412</b>	<b>147</b>
05:00 PM	48	0	2	50	0	0	0	0	0	173	43	216	4	103	0	107	37
05:15 PM	41	0	3	44	0	0	0	0	0	196	40	236	1	115	0	116	38
05:30 PM	48	0	9	57	0	0	0	0	0	190	57	247	5	106	0	111	41
05:45 PM	54	0	8	62	0	0	0	0	0	176	51	227	3	110	0	113	40
<b>Total</b>	<b>191</b>	<b>0</b>	<b>22</b>	<b>213</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>735</b>	<b>191</b>	<b>926</b>	<b>13</b>	<b>434</b>	<b>0</b>	<b>447</b>	<b>158</b>
<b>Grand Total</b>	<b>333</b>	<b>0</b>	<b>36</b>	<b>369</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1419</b>	<b>354</b>	<b>1773</b>	<b>24</b>	<b>835</b>	<b>0</b>	<b>859</b>	<b>300</b>
Apprch %	90.2	0	9.8		0	0	0		0	80	20		2.8	97.2	0		
Total %	11.1	0	1.2	12.3	0	0	0	0	0	47.3	11.8	59.1	0.8	27.8	0	28.6	
Cars	327	0	35	362	0	0	0	0	0	1410	354	1764	24	817	0	841	593
% Cars	98.2	0	97.2	98.1	0	0	0	0	0	99.4	100	99.5	100	97.8	0	97.9	98.8
Heavy Vehicles	6	0	1	7	0	0	0	0	0	9	0	9	0	18	0	18	6
% Heavy Vehicles	1.8	0	2.8	1.9	0	0	0	0	0	0.6	0	0.5	0	2.2	0	2.1	1.2



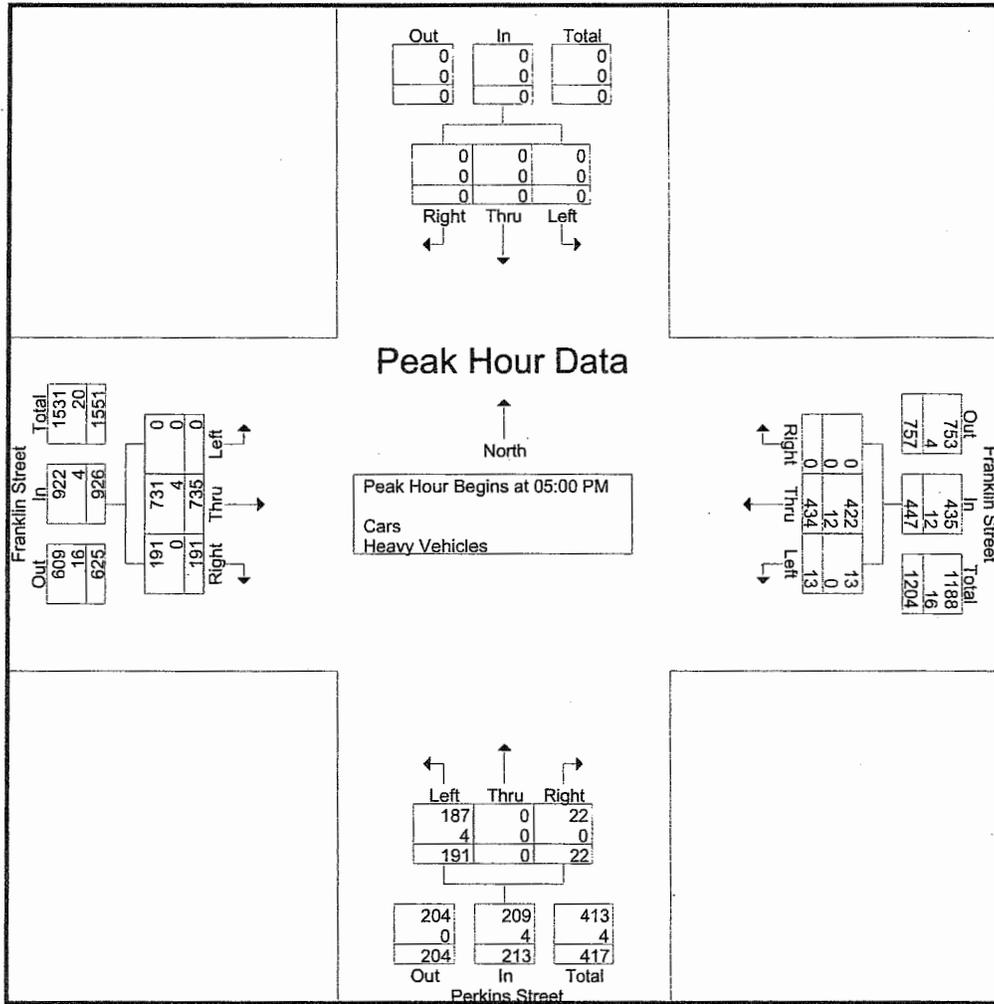
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Perkins  
 Site Code : 1  
 Start Date : 9/19/20  
 Page No : 2 of 4

Start Time	Perkins Street Northbound				Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	48	0	2	50	0	0	0	0	0	173	43	216	4	103	0	107	37
05:15 PM	41	0	3	44	0	0	0	0	0	196	40	236	1	115	0	116	38
05:30 PM	48	0	9	57	0	0	0	0	0	190	57	247	5	106	0	111	41
05:45 PM	54	0	8	62	0	0	0	0	0	176	51	227	3	110	0	113	40
Total Volume	191	0	22	213	0	0	0	0	0	735	191	926	13	434	0	447	158
% App. Total	89.7	0	10.3		0	0	0		0	79.4	20.6		2.9	97.1	0		
PHF	.884	.000	.611	.859	.000	.000	.000	.000	.000	.938	.838	.937	.650	.943	.000	.963	.95
Cars	187	0	22	209	0	0	0	0	0	731	191	922	13	422	0	435	156
% Cars	97.9	0	100	98.1	0	0	0	0	0	99.5	100	99.6	100	97.2	0	97.3	98.
Heavy Vehicles	4	0	0	4	0	0	0	0	0	4	0	4	0	12	0	12	2
% Heavy Vehicles	2.1	0	0	1.9	0	0	0	0	0	0.5	0	0.4	0	2.8	0	2.7	1.



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-443-5686  
 F: 617-801-8200  
 www.tsetraffic.com

File Name : Perkins  
 Site Code : 1  
 Start Date : 9/19/20  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Perkins Street Northbound				Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	33	0	4	37	0	0	0	0	0	164	40	204	4	95	0	99	3
04:15 PM	37	0	4	41	0	0	0	0	0	167	42	209	4	107	0	111	3
04:30 PM	35	0	2	37	0	0	0	0	0	177	38	215	0	101	0	101	3
04:45 PM	35	0	3	38	0	0	0	0	0	171	43	214	3	92	0	95	3
<b>Total</b>	140	0	13	153	0	0	0	0	0	679	163	842	11	395	0	406	14
05:00 PM	48	0	2	50	0	0	0	0	0	172	43	215	4	103	0	107	3
05:15 PM	40	0	3	43	0	0	0	0	0	195	40	235	1	109	0	110	3
05:30 PM	46	0	9	55	0	0	0	0	0	189	57	246	5	103	0	108	4
05:45 PM	53	0	8	61	0	0	0	0	0	175	51	226	3	107	0	110	3
<b>Total</b>	187	0	22	209	0	0	0	0	0	731	191	922	13	422	0	435	15
<b>Grand Total</b>	327	0	35	362	0	0	0	0	0	1410	354	1764	24	817	0	841	29
Apprch %	90.3	0	9.7		0	0	0		0	79.9	20.1		2.9	97.1	0		
Total %	11	0	1.2	12.2	0	0	0	0	0	47.5	11.9	59.5	0.8	27.5	0	28.3	

Start Time	Perkins Street Northbound				Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	48	0	2	50	0	0	0	0	0	172	43	215	4	103	0	107	37
05:15 PM	40	0	3	43	0	0	0	0	0	195	40	235	1	109	0	110	38
05:30 PM	46	0	9	55	0	0	0	0	0	189	57	246	5	103	0	108	40
05:45 PM	53	0	8	61	0	0	0	0	0	175	51	226	3	107	0	110	39
Total Volume	187	0	22	209	0	0	0	0	0	731	191	922	13	422	0	435	156
% App. Total	89.5	0	10.5		0	0	0		0	79.3	20.7		3	97	0		
PHF	.882	.000	.611	.857	.000	.000	.000	.000	.000	.937	.838	.937	.650	.968	.000	.989	.95

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

	05:00 PM				04:00 PM				05:00 PM				05:00 PM			
+0 mins.	48	0	2	50	0	0	0	0	0	172	43	215	4	103	0	107
+15 mins.	40	0	3	43	0	0	0	0	0	195	40	235	1	109	0	110
+30 mins.	46	0	9	55	0	0	0	0	0	189	57	246	5	103	0	108
+45 mins.	53	0	8	61	0	0	0	0	0	175	51	226	3	107	0	110
Total Volume	187	0	22	209	0	0	0	0	0	731	191	922	13	422	0	435
% App. Total	89.5	0	10.5		0	0	0		0	79.3	20.7		3	97	0	
PHF	.882	.000	.611	.857	.000	.000	.000	.000	.000	.937	.838	.937	.650	.968	.000	.989

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 100 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8300  
 www.tsetraffic.com

File Name : Perkins  
 Site Code : 1  
 Start Date : 9/19/20  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Perkins Street Northbound				Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1
04:15 PM	1	0	0	1	0	0	0	0	0	0	2	0	2	0	2	0	2
04:30 PM	0	0	1	1	0	0	0	0	0	0	1	0	1	0	2	0	2
04:45 PM	1	0	0	1	0	0	0	0	0	0	1	0	1	0	1	0	1
<b>Total</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>6</b>
05:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
05:15 PM	1	0	0	1	0	0	0	0	0	0	1	0	1	0	6	0	6
05:30 PM	2	0	0	2	0	0	0	0	0	0	1	0	1	0	3	0	3
05:45 PM	1	0	0	1	0	0	0	0	0	0	1	0	1	0	3	0	3
<b>Total</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>12</b>
<b>Grand Total</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>18</b>	<b>0</b>	<b>18</b>
Apprch-%	85.7	0	14.3		0	0	0		0	100	0		0	100	0		
Total %	17.6	0	2.9	20.6	0	0	0	0	0	26.5	0	26.5	0	52.9	0	52.9	

Start Time	Perkins Street Northbound				Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
05:15 PM	1	0	0	1	0	0	0	0	0	0	1	0	1	0	6	0	6
05:30 PM	2	0	0	2	0	0	0	0	0	0	1	0	1	0	3	0	3
05:45 PM	1	0	0	1	0	0	0	0	0	0	1	0	1	0	3	0	3
<b>Total Volume</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>12</b>
% App. Total	100	0	0		0	0	0		0	100	0		0	100	0		
PHF	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	1.000	.000	1.000	.000	.500	.000	.500

	04:45 PM				04:00 PM				04:00 PM				05:00 PM			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
+0 mins.	1	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	2	0	2	0	6	0
+30 mins.	1	0	0	1	0	0	0	0	0	0	1	0	1	0	3	0
+45 mins.	2	0	0	2	0	0	0	0	0	0	1	0	1	0	3	0
<b>Total Volume</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>12</b>	<b>0</b>
% App. Total	100	0	0		0	0	0		0	100	0		0	100	0	
PHF	.500	.000	.000	.500	.000	.000	.000	.000	.000	.625	.000	.625	.000	.500	.000	.500

# Accurate Counts

978-664-2565

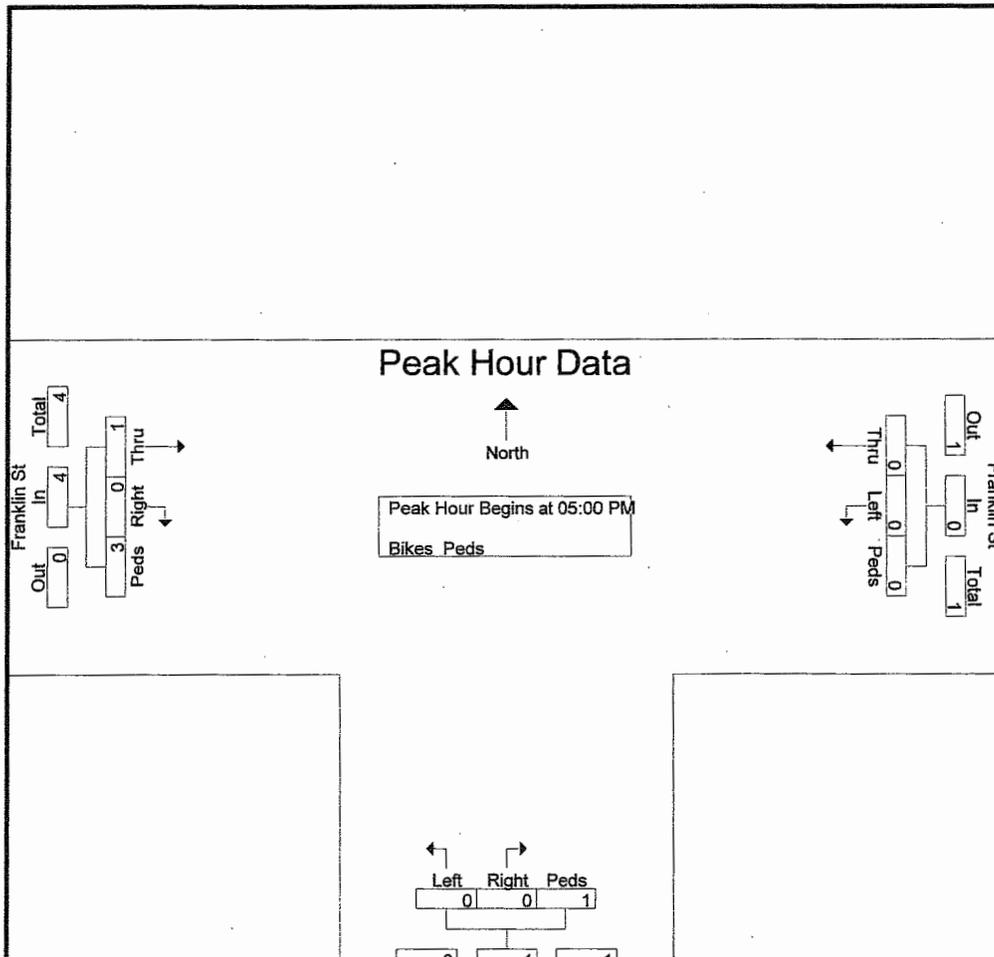
N/S Street : Perkins Street  
 East Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16  
 Site Code : 16  
 Start Date : 4/  
 Page No : 8

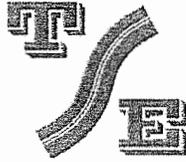
### Groups Printed- Bikes Peds

Start Time	Franklin St From East			Perkins St From South			Franklin St From West			Int.
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	
05:00 PM	0	0	0	0	0	0	0	0	1	
05:15 PM	0	0	0	0	0	0	0	0	0	
05:30 PM	0	0	0	0	0	1	0	0	1	
05:45 PM	0	0	0	0	0	0	1	0	1	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>3</b>	
Grand Total	0	0	0	0	0	1	1	0	3	
Apprch %	0	0	0	0	0	100	25	0	75	
Total %	0	0	0	0	0	20	20	0	60	

Start Time	Franklin St From East				Perkins St From South				Franklin St From West				Int.
	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	
05:30 PM	0	0	0	0	0	0	1	1	0	0	1	1	
05:45 PM	0	0	0	0	0	0	0	0	1	0	1	2	
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>4</b>	
% App. Total	0	0	0	0	0	0	100	25	25	0	75	50	
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.250	.000	.750	.500	



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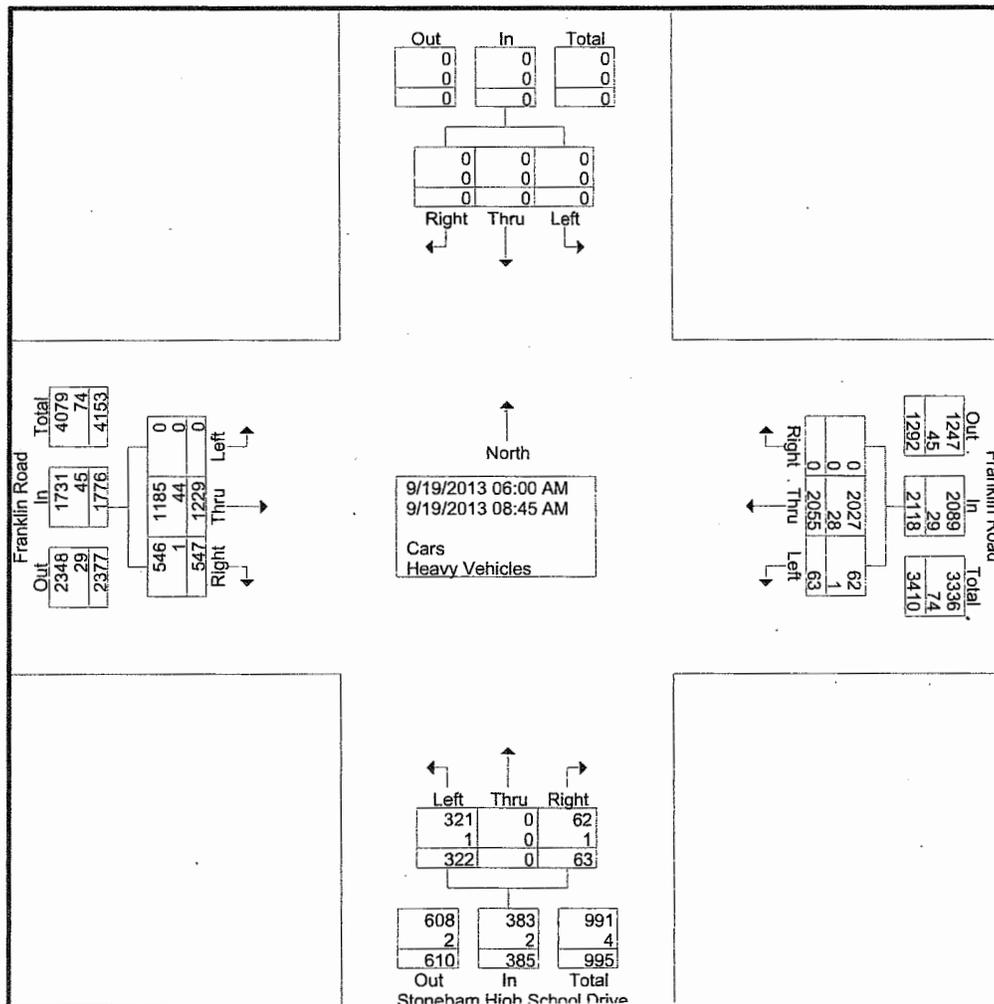


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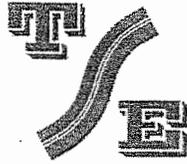
File Name : School  
 Site Code : 2  
 Start Date : 9/19/20  
 Page No : 1 of 4

Groups Printed- Cars - Heavy Vehicles

Start Time	Stoneham High School Drive Northbound				Southbound				Franklin Road Eastbound				Franklin Road Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	1	0	0	1	0	0	0	0	0	28	2	30	0	69	0	69	10
06:15 AM	0	0	1	1	0	0	0	0	0	33	1	34	0	87	0	87	12
06:30 AM	3	0	0	3	0	0	0	0	0	86	8	94	1	146	0	147	24
06:45 AM	3	0	4	7	0	0	0	0	0	109	19	128	6	217	0	223	35
Total	7	0	5	12	0	0	0	0	0	256	30	286	7	519	0	526	82
07:00 AM	32	0	4	36	0	0	0	0	0	102	66	168	16	243	0	259	46
07:15 AM	101	0	17	118	0	0	0	0	0	86	221	307	11	177	0	188	61
07:30 AM	154	0	32	186	0	0	0	0	0	112	205	317	21	127	0	148	65
07:45 AM	21	0	3	24	0	0	0	0	0	131	14	145	5	132	0	137	30
Total	308	0	56	364	0	0	0	0	0	431	506	937	53	679	0	732	203
08:00 AM	5	0	1	6	0	0	0	0	0	132	7	139	2	205	0	207	35
08:15 AM	1	0	0	1	0	0	0	0	0	129	3	132	0	223	0	223	35
08:30 AM	1	0	0	1	0	0	0	0	0	148	1	149	1	227	0	228	37
08:45 AM	0	0	1	1	0	0	0	0	0	133	0	133	0	202	0	202	33
Total	7	0	2	9	0	0	0	0	0	542	11	553	3	857	0	860	142
Grand Total	322	0	63	385	0	0	0	0	0	1229	547	1776	63	2055	0	2118	427
Apprch %	83.6	0	16.4		0	0	0		0	69.2	30.8		3	97	0		
Total %	7.5	0	1.5	9	0	0	0	0	0	28.7	12.8	41.5	1.5	48	0	49.5	
Cars	321	0	62	383	0	0	0	0	0	1185	546	1731	62	2027	0	2089	840
% Cars	99.7	0	98.4	99.5	0	0	0	0	0	96.4	99.8	97.5	98.4	98.6	0	98.6	98
Heavy Vehicles	1	0	1	2	0	0	0	0	0	44	1	45	1	28	0	29	15
% Heavy Vehicles	0.3	0	1.6	0.5	0	0	0	0	0	3.6	0.2	2.5	1.6	1.4	0	1.4	1



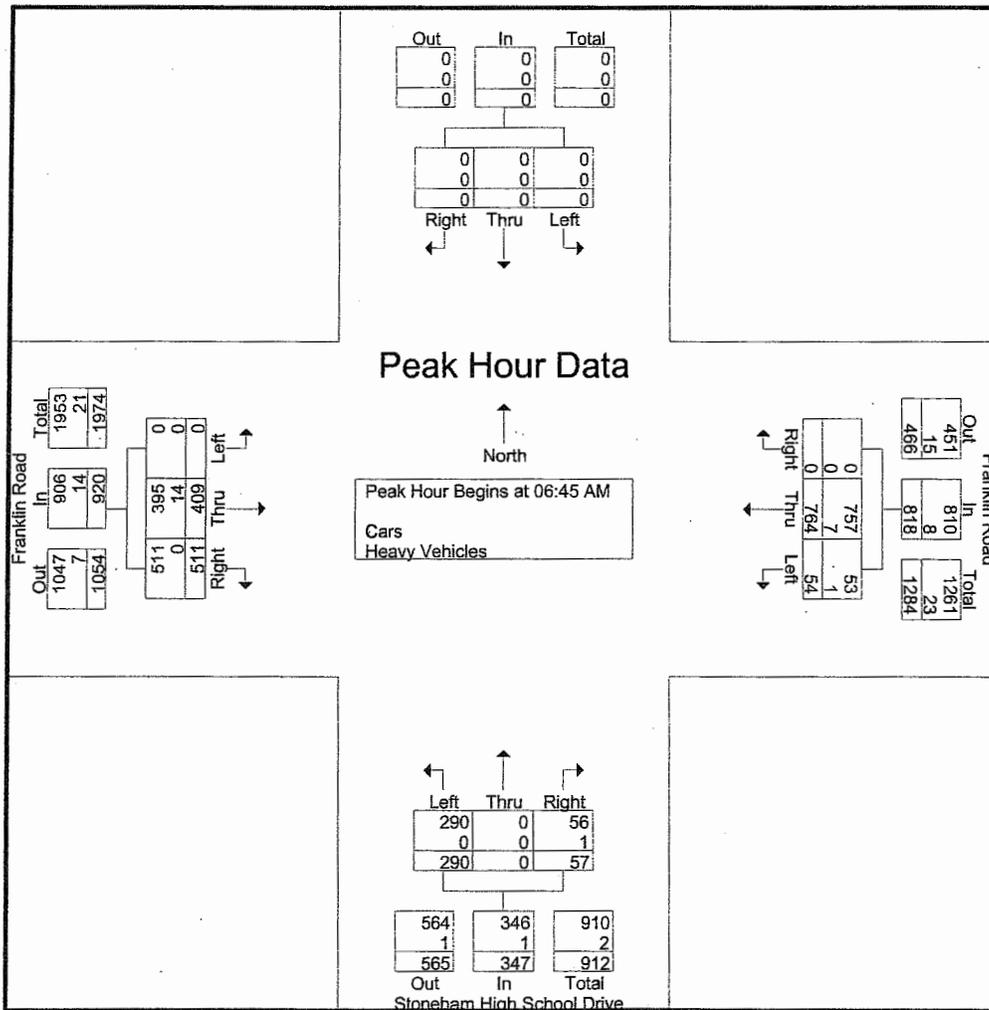
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 Client: John DeBarros



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Start Time	Stoneham High School Drive Northbound				Southbound				Franklin Road Eastbound				Franklin Road Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 06:45 AM																	
06:45 AM	3	0	4	7	0	0	0	0	0	109	19	128	6	217	0	223	38
07:00 AM	32	0	4	36	0	0	0	0	0	102	66	168	16	243	0	259	46
07:15 AM	101	0	17	118	0	0	0	0	0	86	221	307	11	177	0	188	61
07:30 AM	154	0	32	186	0	0	0	0	0	112	205	317	21	127	0	148	65
Total Volume	290	0	57	347	0	0	0	0	0	409	511	920	54	764	0	818	206
% App. Total	83.6	0	16.4		0	0	0		0	44.5	55.5		6.6	93.4	0		
PHF	.471	.000	.445	.466	.000	.000	.000	.000	.000	.913	.578	.726	.643	.786	.000	.790	.80
Cars	290	0	56	346	0	0	0	0	0	395	511	906	53	757	0	810	206
% Cars	100	0	98.2	99.7	0	0	0	0	0	96.6	100	98.5	98.1	99.1	0	99.0	98
Heavy Vehicles	0	0	1	1	0	0	0	0	0	14	0	14	1	7	0	8	2
% Heavy Vehicles	0	0	1.8	0.3	0	0	0	0	0	3.4	0	1.5	1.9	0.9	0	1.0	1.



GPI Project #:  
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File Name : School  
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Groups Printed- Cars

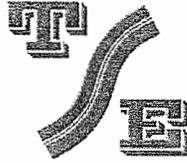
Start Time	Stoneham High School Drive Northbound				Southbound				Franklin Road Eastbound				Franklin Road Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	1	0	0	1	0	0	0	0	0	25	2	27	0	66	0	66	9
06:15 AM	0	0	1	1	0	0	0	0	0	30	1	31	0	85	0	85	11
06:30 AM	2	0	0	2	0	0	0	0	0	80	7	87	1	144	0	145	23
06:45 AM	3	0	4	7	0	0	0	0	0	103	19	122	5	215	0	220	34
Total	6	0	5	11	0	0	0	0	0	238	29	267	6	510	0	516	79
07:00 AM	32	0	3	35	0	0	0	0	0	100	66	166	16	240	0	256	45
07:15 AM	101	0	17	118	0	0	0	0	0	84	221	305	11	177	0	188	61
07:30 AM	154	0	32	186	0	0	0	0	0	108	205	313	21	125	0	146	64
07:45 AM	21	0	3	24	0	0	0	0	0	127	14	141	5	127	0	132	29
Total	308	0	55	363	0	0	0	0	0	419	506	925	53	669	0	722	201
08:00 AM	5	0	1	6	0	0	0	0	0	128	7	135	2	203	0	205	34
08:15 AM	1	0	0	1	0	0	0	0	0	125	3	128	0	219	0	219	34
08:30 AM	1	0	0	1	0	0	0	0	0	145	1	146	1	226	0	227	37
08:45 AM	0	0	1	1	0	0	0	0	0	130	0	130	0	200	0	200	33
Total	7	0	2	9	0	0	0	0	0	528	11	539	3	848	0	851	139
Grand Total	321	0	62	383	0	0	0	0	0	1185	546	1731	62	2027	0	2089	420
Apprch %	83.8	0	16.2		0	0	0	0	0	68.5	31.5		3	97	0		
Total %	7.6	0	1.5	9.1	0	0	0	0	0	28.2	13	41.2	1.5	48.2	0	49.7	

Start Time	Stoneham High School Drive Northbound				Southbound				Franklin Road Eastbound				Franklin Road Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 06:45 AM																	
06:45 AM	3	0	4	7	0	0	0	0	0	103	19	122	5	215	0	220	34
07:00 AM	32	0	3	35	0	0	0	0	0	100	66	166	16	240	0	256	45
07:15 AM	101	0	17	118	0	0	0	0	0	84	221	305	11	177	0	188	61
07:30 AM	154	0	32	186	0	0	0	0	0	108	205	313	21	125	0	146	64
Total Volume	290	0	56	346	0	0	0	0	0	395	511	906	53	757	0	810	206
% App. Total	83.8	0	16.2		0	0	0	0	0	43.6	56.4		6.5	93.5	0		
PHF	.471	.000	.438	.465	.000	.000	.000	.000	.000	.914	.578	.724	.631	.789	.000	.791	.795

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:00 AM				06:00 AM				07:00 AM				08:00 AM			
+0 mins.	32	0	3	35	0	0	0	0	0	100	66	166	2	203	0	205
+15 mins.	101	0	17	118	0	0	0	0	0	84	221	305	0	219	0	219
+30 mins.	154	0	32	186	0	0	0	0	0	108	205	313	1	226	0	227
+45 mins.	21	0	3	24	0	0	0	0	0	127	14	141	0	200	0	200
Total Volume	308	0	55	363	0	0	0	0	0	419	506	925	3	848	0	851
% App. Total	84.8	0	15.2		0	0	0	0	0	45.3	54.7		0.4	99.6	0	
PHF	.500	.000	.430	.488	.000	.000	.000	.000	.000	.825	.572	.739	.375	.938	.000	.937

GPI Project #:  
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File Name : School  
 Site Code : 2  
 Start Date : 9/19/20  
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Groups Printed- Heavy Vehicles

Start Time	Stoneham High School Drive Northbound				Southbound				Franklin Road Eastbound				Franklin Road Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	
06:15 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	
06:30 AM	1	0	0	1	0	0	0	0	0	6	1	7	0	2	0	2	1
06:45 AM	0	0	0	0	0	0	0	0	0	6	0	6	1	2	0	3	
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>1</b>	<b>19</b>	<b>1</b>	<b>9</b>	<b>0</b>	<b>10</b>	<b>3</b>
07:00 AM	0	0	1	1	0	0	0	0	0	2	0	2	0	3	0	3	
07:15 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	
07:30 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	2	0	2	
07:45 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	5	0	5	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>2</b>
08:00 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	2	0	2	
08:15 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	4	0	4	
08:30 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	1	0	1	
08:45 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>2</b>
<b>Grand Total</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>44</b>	<b>1</b>	<b>45</b>	<b>1</b>	<b>28</b>	<b>0</b>	<b>29</b>	<b>7</b>
Apprch %	50	0	50		0	0	0		0	97.8	2.2		3.4	96.6	0		
Total %	1.3	0	1.3	2.6	0	0	0	0	0	57.9	1.3	59.2	1.3	36.8	0	38.2	

Start Time	Stoneham High School Drive Northbound				Southbound				Franklin Road Eastbound				Franklin Road Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 06:00 AM																	
06:00 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	
06:15 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	
06:30 AM	1	0	0	1	0	0	0	0	0	6	1	7	0	2	0	2	1
06:45 AM	0	0	0	0	0	0	0	0	0	6	0	6	1	2	0	3	
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>1</b>	<b>19</b>	<b>1</b>	<b>9</b>	<b>0</b>	<b>10</b>	<b>3</b>
<b>% App. Total</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>94.7</b>	<b>5.3</b>	<b>0</b>	<b>10</b>	<b>90</b>	<b>0</b>	<b>0</b>	<b>0</b>
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.750	.250	.679	.250	.750	.000	.833	.750

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	06:15 AM				06:00 AM				06:00 AM				07:30 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2
+15 mins.	1	0	0	1	0	0	0	0	0	3	0	3	0	5	0	5
+30 mins.	0	0	0	0	0	0	0	0	0	6	1	7	0	2	0	2
+45 mins.	0	0	1	1	0	0	0	0	0	6	0	6	0	4	0	4
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>1</b>	<b>19</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>13</b>
<b>% App. Total</b>	<b>50</b>	<b>0</b>	<b>50</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>94.7</b>	<b>5.3</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>
PHF	.250	.000	.250	.500	.000	.000	.000	.000	.000	.750	.250	.679	.000	.650	.000	.650

# Accurate Counts

978-664-2565

N/S Street : Franklino Place  
 E/W Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16  
 Site Code : 16  
 Start Date : 4/  
 Page No : 10

### Groups Printed- Bikes Peds

Start Time	Franklin St From East			High School Dwy From South			Franklin St From West			Exclu. Total	Inclu. Total	Int.
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
06:45 AM	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
07:00 AM	0	1	0	0	0	2	0	0	1	3	1	
07:15 AM	0	0	0	0	0	2	0	0	7	9	0	
07:30 AM	0	1	0	0	0	0	0	1	4	4	2	
07:45 AM	0	1	0	0	0	0	0	0	3	3	1	
Total	0	3	0	0	0	4	0	1	15	19	4	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	
Grand Total	0	3	0	0	0	4	0	1	15	19	4	
Apprch %	0	100		0	0		0	100				
Total %	0	75		0	0		0	25		82.6	17.4	

Start Time	Franklin St From East			High School Dwy From South			Franklin St From West			Int.
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 06:45 AM to 08:30 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	1	1	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	1	1	0	0	0	0	1	1	1
07:45 AM	0	1	1	0	0	0	0	0	0	0
Total Volume	0	3	3	0	0	0	0	1	1	
% App. Total	0	100		0	0		0	100		
PHF	.000	.750	.750	.000	.000	.000	.000	.250	.250	

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

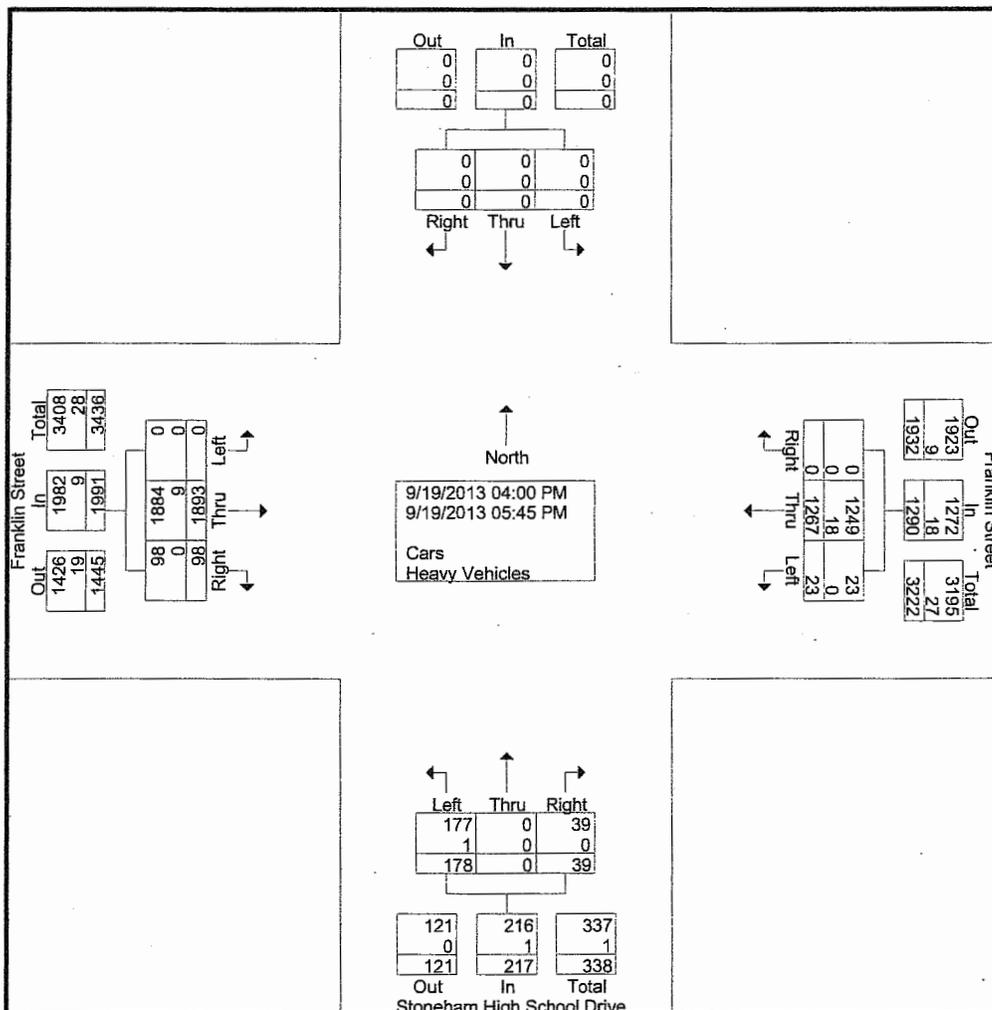


**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : School  
 Site Code : 2  
 Start Date : 9/19/20  
 Page No : 1 of 4

Groups Printed- Cars - Heavy Vehicles

Start Time	Stoneham High School Drive Northbound				Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	10	0	4	14	0	0	0	0	0	191	12	203	3	136	0	139	34
04:15 PM	18	0	5	23	0	0	0	0	0	211	10	221	3	137	0	140	34
04:30 PM	8	0	3	11	0	0	0	0	0	212	9	221	4	127	0	131	34
04:45 PM	26	0	5	31	0	0	0	0	0	216	21	237	6	131	0	137	40
<b>Total</b>	<b>62</b>	<b>0</b>	<b>17</b>	<b>79</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>830</b>	<b>52</b>	<b>882</b>	<b>16</b>	<b>531</b>	<b>0</b>	<b>547</b>	<b>150</b>
05:00 PM	40	0	9	49	0	0	0	0	0	259	10	269	0	143	0	143	46
05:15 PM	26	0	7	33	0	0	0	0	0	251	21	272	3	207	0	210	51
05:30 PM	33	0	4	37	0	0	0	0	0	272	8	280	2	184	0	186	50
05:45 PM	17	0	2	19	0	0	0	0	0	281	7	288	2	202	0	204	51
<b>Total</b>	<b>116</b>	<b>0</b>	<b>22</b>	<b>138</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1063</b>	<b>46</b>	<b>1109</b>	<b>7</b>	<b>736</b>	<b>0</b>	<b>743</b>	<b>190</b>
<b>Grand Total</b>	<b>178</b>	<b>0</b>	<b>39</b>	<b>217</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1893</b>	<b>98</b>	<b>1991</b>	<b>23</b>	<b>1267</b>	<b>0</b>	<b>1290</b>	<b>340</b>
Apprch %	82	0	18		0	0	0		0	95.1	4.9		1.8	98.2	0		
Total %	5.1	0	1.1	6.2	0	0	0	0	0	54.1	2.8	56.9	0.7	36.2	0	36.9	
Cars	177	0	39	216	0	0	0	0	0	1884	98	1982	23	1249	0	1272	694
% Cars	99.4	0	100	99.5	0	0	0	0	0	99.5	100	99.5	100	98.6	0	98.6	99
Heavy Vehicles	1	0	0	1	0	0	0	0	0	9	0	9	0	18	0	18	5
% Heavy Vehicles	0.6	0	0	0.5	0	0	0	0	0	0.5	0	0.5	0	1.4	0	1.4	0



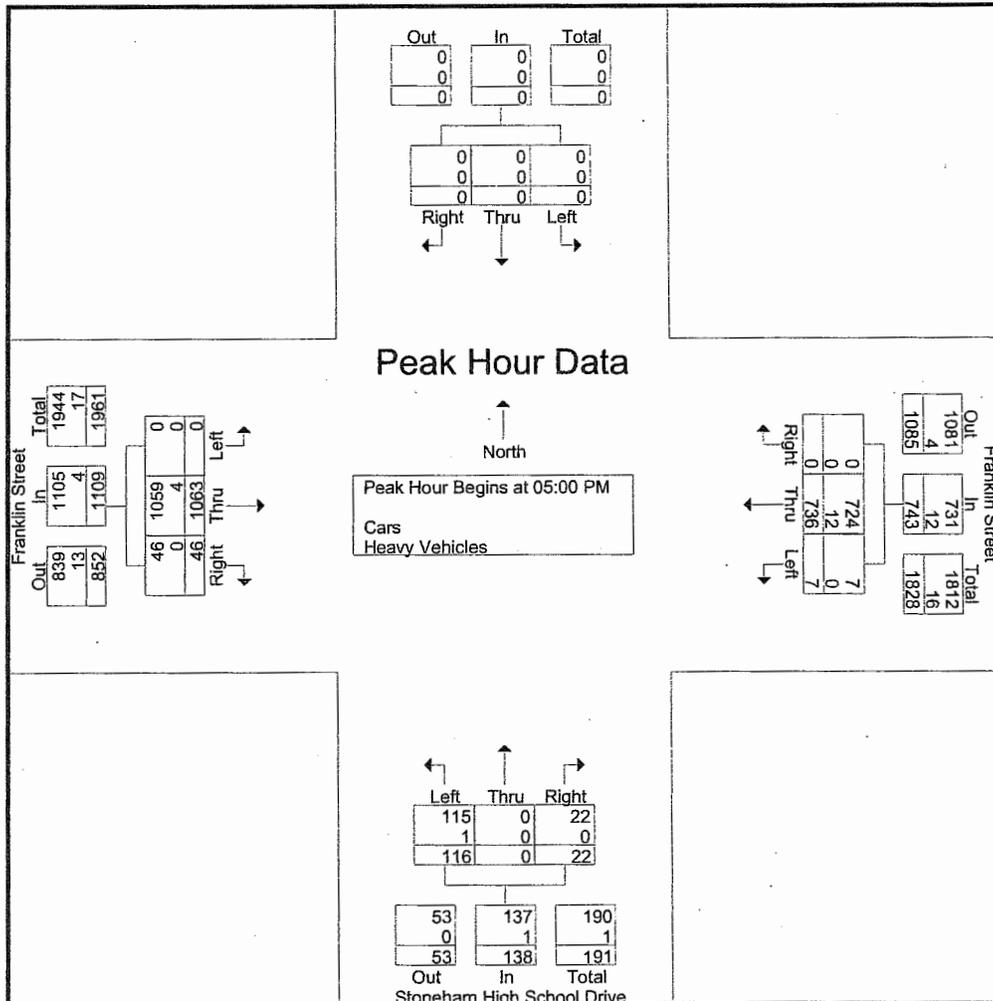
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : School  
 Site Code : 2  
 Start Date : 9/19/20  
 Page No : 2 of 4

Start Time	Stoneham High School Drive Northbound				Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	40	0	9	49	0	0	0	0	0	259	10	269	0	143	0	143	46
05:15 PM	26	0	7	33	0	0	0	0	0	251	21	272	3	207	0	210	51
05:30 PM	33	0	4	37	0	0	0	0	0	272	8	280	2	184	0	186	50
05:45 PM	17	0	2	19	0	0	0	0	0	281	7	288	2	202	0	204	57
Total Volume	116	0	22	138	0	0	0	0	0	1063	46	1109	7	736	0	743	197
% App. Total	84.1	0	15.9		0	0	0		0	95.9	4.1		0.9	99.1	0		
PHF	.725	.000	.611	.704	.000	.000	.000	.000	.000	.946	.548	.963	.583	.889	.000	.885	.96
Cars	115	0	22	137	0	0	0	0	0	1059	46	1105	7	724	0	731	197
% Cars	99.1	0	100	99.3	0	0	0	0	0	99.6	100	99.6	100	98.4	0	98.4	99
Heavy Vehicles	1	0	0	1	0	0	0	0	0	4	0	4	0	12	0	12	1
% Heavy Vehicles	0.9	0	0	0.7	0	0	0	0	0	0.4	0	0.4	0	1.6	0	1.6	0



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : School  
 Site Code : 2  
 Start Date : 9/19/20  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Stoneham High School Drive Northbound				Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	10	0	4	14	0	0	0	0	0	190	12	202	3	134	0	137	3
04:15 PM	18	0	5	23	0	0	0	0	0	209	10	219	3	135	0	138	3
04:30 PM	8	0	3	11	0	0	0	0	0	211	9	220	4	126	0	130	3
04:45 PM	26	0	5	31	0	0	0	0	0	215	21	236	6	130	0	136	4
<b>Total</b>	<b>62</b>	<b>0</b>	<b>17</b>	<b>79</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>825</b>	<b>52</b>	<b>877</b>	<b>16</b>	<b>525</b>	<b>0</b>	<b>541</b>	<b>14</b>
05:00 PM	39	0	9	48	0	0	0	0	0	258	10	268	0	142	0	142	4
05:15 PM	26	0	7	33	0	0	0	0	0	250	21	271	3	202	0	205	5
05:30 PM	33	0	4	37	0	0	0	0	0	271	8	279	2	180	0	182	4
05:45 PM	17	0	2	19	0	0	0	0	0	280	7	287	2	200	0	202	5
<b>Total</b>	<b>115</b>	<b>0</b>	<b>22</b>	<b>137</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1059</b>	<b>46</b>	<b>1105</b>	<b>7</b>	<b>724</b>	<b>0</b>	<b>731</b>	<b>19</b>
<b>Grand Total</b>	<b>177</b>	<b>0</b>	<b>39</b>	<b>216</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1884</b>	<b>98</b>	<b>1982</b>	<b>23</b>	<b>1249</b>	<b>0</b>	<b>1272</b>	<b>34</b>
Apprch %	81.9	0	18.1		0	0	0		0	95.1	4.9		1.8	98.2	0		
Total %	5.1	0	1.1	6.2	0	0	0	0	0	54.3	2.8	57.1	0.7	36	0	36.7	

Start Time	Stoneham High School Drive Northbound				Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	39	0	9	48	0	0	0	0	0	258	10	268	0	142	0	142	45
05:15 PM	26	0	7	33	0	0	0	0	0	250	21	271	3	202	0	205	50
05:30 PM	33	0	4	37	0	0	0	0	0	271	8	279	2	180	0	182	49
05:45 PM	17	0	2	19	0	0	0	0	0	280	7	287	2	200	0	202	50
<b>Total Volume</b>	<b>115</b>	<b>0</b>	<b>22</b>	<b>137</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1059</b>	<b>46</b>	<b>1105</b>	<b>7</b>	<b>724</b>	<b>0</b>	<b>731</b>	<b>197</b>
% App. Total	83.9	0	16.1		0	0	0		0	95.8	4.2		1	99	0		
PHF	.737	.000	.611	.714	.000	.000	.000	.000	.000	.946	.548	.963	.583	.896	.000	.891	.96

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

	04:45 PM				04:00 PM				05:00 PM				05:00 PM			
+0 mins.	26	0	5	31	0	0	0	0	0	258	10	268	0	142	0	142
+15 mins.	39	0	9	48	0	0	0	0	0	250	21	271	3	202	0	205
+30 mins.	26	0	7	33	0	0	0	0	0	271	8	279	2	180	0	182
+45 mins.	33	0	4	37	0	0	0	0	0	280	7	287	2	200	0	202
<b>Total Volume</b>	<b>124</b>	<b>0</b>	<b>25</b>	<b>149</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1059</b>	<b>46</b>	<b>1105</b>	<b>7</b>	<b>724</b>	<b>0</b>	<b>731</b>
% App. Total	83.2	0	16.8		0	0	0		0	95.8	4.2		1	99	0	
PHF	.795	.000	.694	.776	.000	.000	.000	.000	.000	.946	.548	.963	.583	.896	.000	.891

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : School  
 Site Code : 2  
 Start Date : 9/19/20  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Stoneham High School Drive Northbound				Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	
04:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	2	
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	
<b>Total</b>	0	0	0	0	0	0	0	0	0	5	0	5	0	6	0	6	1
05:00 PM	1	0	0	1	0	0	0	0	0	1	0	1	0	1	0	1	
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	5	0	5	
05:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	4	0	4	
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	
<b>Total</b>	1	0	0	1	0	0	0	0	0	4	0	4	0	12	0	12	1
<b>Grand Total</b>	1	0	0	1	0	0	0	0	0	9	0	9	0	18	0	18	2
Apprch %	100	0	0		0	0	0		0	100	0		0	100	0		
Total %	3.6	0	0	3.6	0	0	0	0	0	32.1	0	32.1	0	64.3	0	64.3	

Start Time	Stoneham High School Drive Northbound				Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	1	0	0	1	0	0	0	0	0	1	0	1	0	1	0	1	
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	5	0	5	
05:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	4	0	4	
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	
<b>Total Volume</b>	1	0	0	1	0	0	0	0	0	4	0	4	0	12	0	12	1
% App. Total	100	0	0		0	0	0		0	100	0		0	100	0		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	1.000	.000	1.000	.000	.600	.000	.600	.700

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

Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				04:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	2	0	2	0	5	0	5
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	4	0	4
+45 mins.	1	0	0	1	0	0	0	0	0	1	0	1	0	2	0	2
<b>Total Volume</b>	1	0	0	1	0	0	0	0	0	5	0	5	0	12	0	12
% App. Total	100	0	0		0	0	0		0	100	0		0	100	0	
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.625	.000	.625	.000	.600	.000	.600

# Accurate Counts

978-664-2565

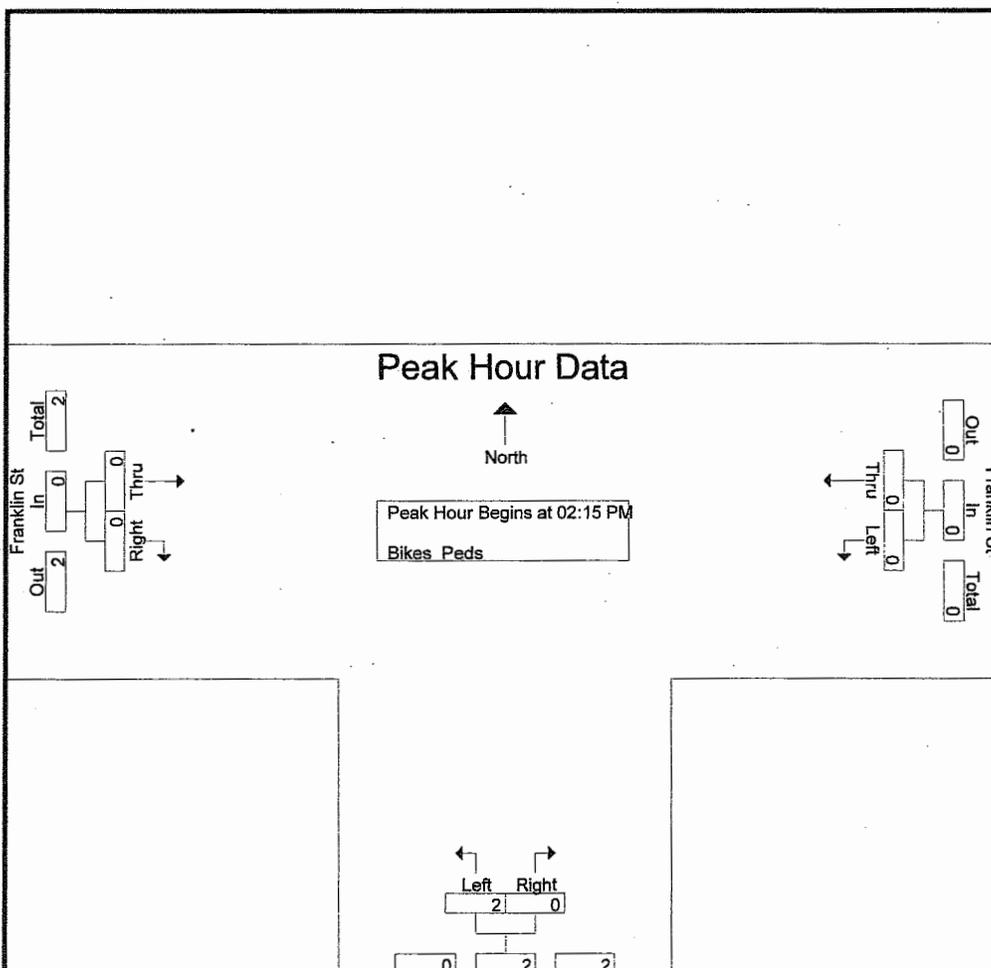
V/S Street : Franklion Place  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16  
 Site Code : 16  
 Start Date : 4/1  
 Page No : 8

### Groups Printed- Bikes Peds

Start Time	Franklin St From East			High School Dwy From South			Franklin St From West			Exclu. Total	Inclu. Total	Int.
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	
02:30 PM	0	0	0	2	0	12	0	0	84	96	2	
02:45 PM	0	0	0	0	0	3	0	0	2	5	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>86</b>	<b>101</b>	<b>2</b>	
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>86</b>	<b>101</b>	<b>2</b>	
Apprch %	0	0		100	0		0	0				
<b>Total %</b>	<b>0</b>	<b>0</b>		<b>100</b>	<b>0</b>		<b>0</b>	<b>0</b>		<b>98.1</b>	<b>1.9</b>	

Start Time	Franklin St From East			High School Dwy From South			Franklin St From West			Int.
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:15 PM to 03:00 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:15 PM										
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	2	0	2	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PHF	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000



# Accurate Counts

978-664-2565

N/S Street : Franklion Place  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

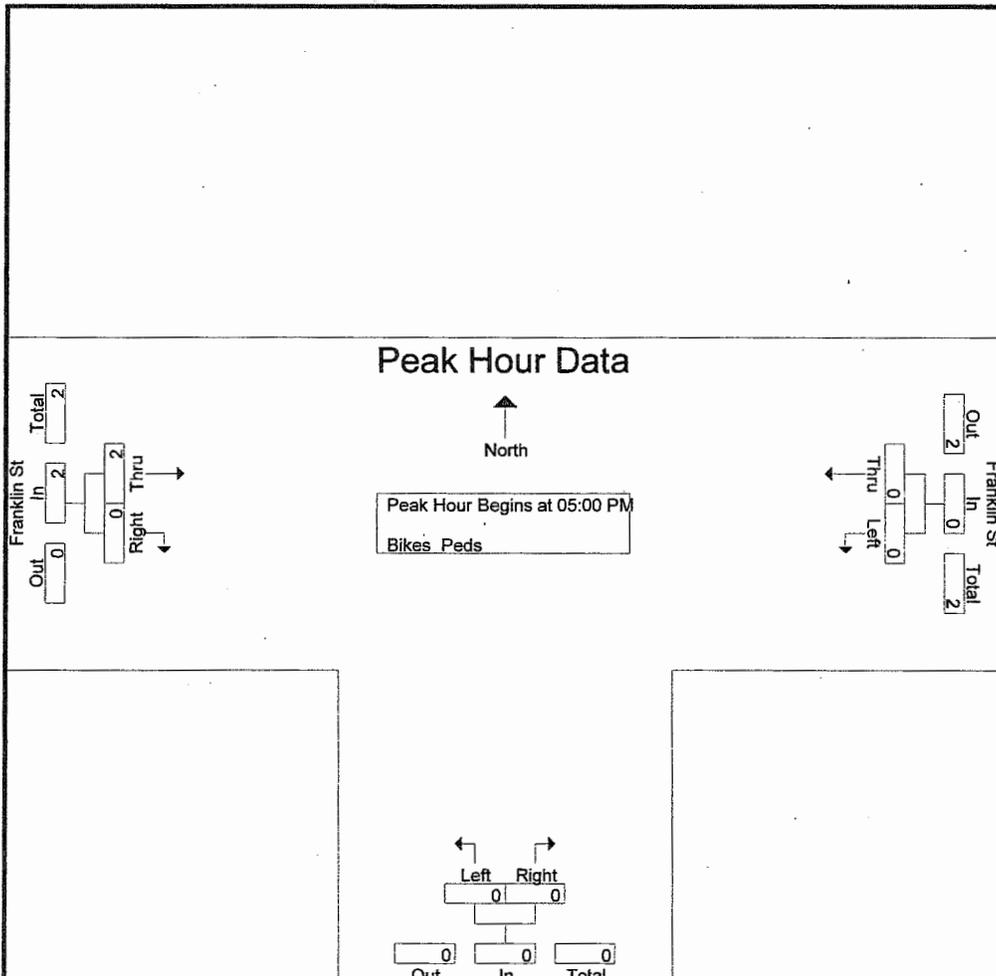
File Name : 16  
 Site Code : 16  
 Start Date : 4/  
 Page No : 8

Groups Printed- Bikes Peds

Start Time	Franklin St From East			High School Dwy From South			Franklin St From West			Exclu. Total	Inclu. Total	Int.
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
05:00 PM	0	0	0	0	0	0	1	0	5	5	1	
05:15 PM	0	0	0	0	0	0	0	0	4	4	0	
05:30 PM	0	0	0	0	0	1	0	0	1	2	0	
05:45 PM	0	0	0	0	0	0	1	0	6	6	1	
<b>Total</b>	0	0	0	0	0	1	2	0	16	17	2	
<b>Grand Total</b>	0	0	0	0	0	1	2	0	16	17	2	
Apprch %	0	0		0	0		100	0				
Total %	0	0		0	0		100	0		89.5	10.5	

Start Time	Franklin St From East			High School Dwy From South			Franklin St From West			Int.
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
05:00 PM	0	0	0	0	0	0	1	0	1	
05:15 PM	0	0	0	0	0	0	0	0	0	
05:30 PM	0	0	0	0	0	0	0	0	0	
05:45 PM	0	0	0	0	0	0	1	0	1	
<b>Total Volume</b>	0	0	0	0	0	0	2	0	2	
<b>% App. Total</b>	0	0		0	0		100	0		
<b>PHF</b>	.000	.000	.000	.000	.000	.000	.500	.000	.500	

Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 05:00 PM



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

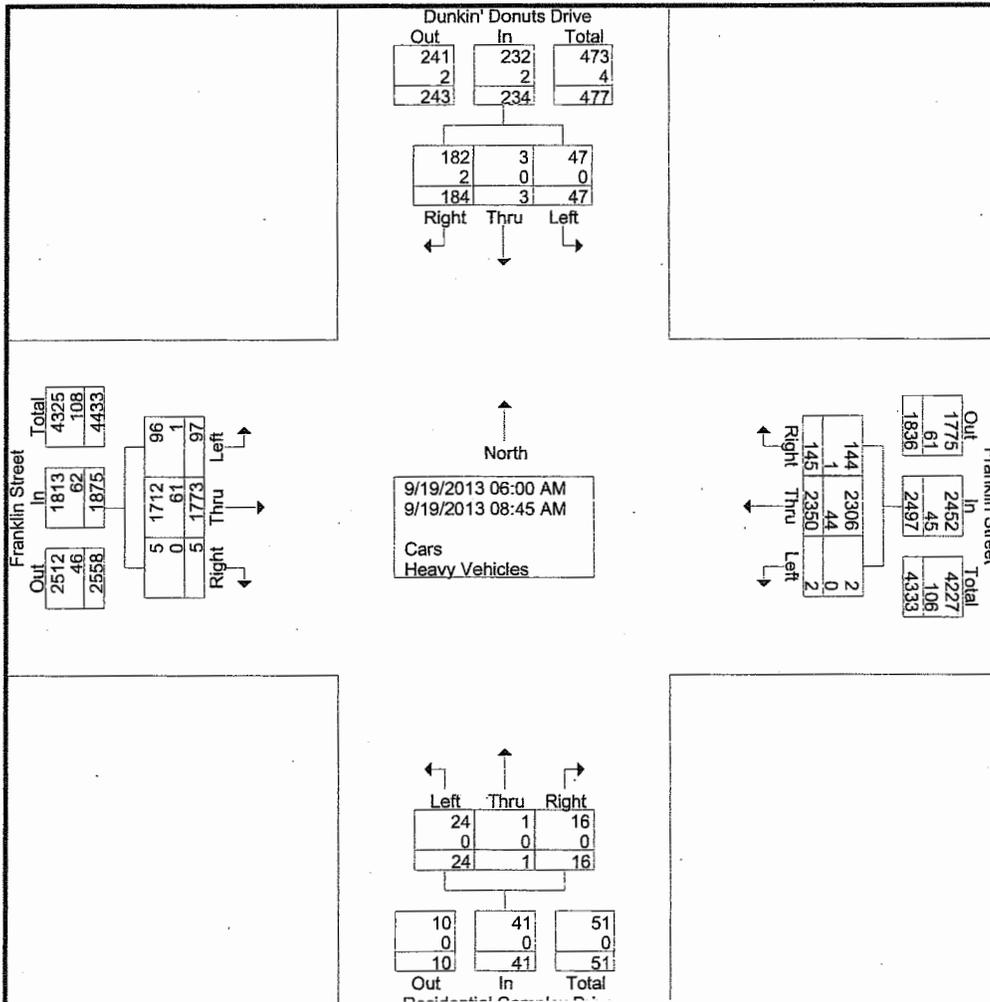


Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-301-3300  
 www.tsetraffic.com

File Name : Dunkins  
 Site Code : 9  
 Start Date : 9/19/201  
 Page No : 1 of 4

Groups Printed- Cars - Heavy Vehicles

Start Time	Residential Complex Drive Northbound				Dunkin' Donuts Drive Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	1	0	0	1	0	0	5	5	4	21	0	25	0	42	3	45	7
06:15 AM	1	1	0	2	0	0	8	8	7	52	0	59	0	118	5	123	19
06:30 AM	3	0	3	6	4	0	19	23	11	96	0	107	0	165	19	184	32
06:45 AM	3	0	1	4	4	0	17	21	11	128	1	140	0	209	10	219	36
Total	8	1	4	13	8	0	49	57	33	297	1	331	0	534	37	571	97
07:00 AM	2	0	0	2	6	0	12	18	14	165	0	179	0	245	12	257	45
07:15 AM	1	0	1	2	10	1	17	28	7	236	0	243	0	231	13	244	51
07:30 AM	0	0	2	2	6	0	14	20	3	323	0	326	0	217	11	228	57
07:45 AM	3	0	3	6	1	0	8	9	6	174	0	180	1	255	7	263	45
Total	6	0	6	12	23	1	51	75	30	898	0	928	1	948	43	992	200
08:00 AM	2	0	4	6	2	0	25	27	10	181	0	191	0	238	21	259	48
08:15 AM	2	0	0	2	4	0	21	25	11	154	0	165	0	220	19	239	43
08:30 AM	2	0	1	3	6	2	20	28	8	120	3	131	1	215	7	223	38
08:45 AM	4	0	1	5	4	0	18	22	5	123	1	129	0	195	18	213	36
Total	10	0	6	16	16	2	84	102	34	578	4	616	1	868	65	934	166
Grand Total	24	1	16	41	47	3	184	234	97	1773	5	1875	2	2350	145	2497	464
Apprch %	58.5	2.4	39		20.1	1.3	78.6		5.2	94.6	0.3		0.1	94.1	5.8		
Total %	0.5	0	0.3	0.9	1	0.1	4	5	2.1	38.2	0.1	40.3	0	50.6	3.1	53.7	
Cars	24	1	16	41	47	3	182	232	96	1712	5	1813	2	2306	144	2452	907
% Cars	100	100	100	100	100	100	98.9	99.1	99	96.6	100	96.7	100	98.1	99.3	98.2	97
Heavy Vehicles	0	0	0	0	0	0	2	2	1	61	0	62	0	44	1	45	21
% Heavy Vehicles	0	0	0	0	0	0	1.1	0.9	1	3.4	0	3.3	0	1.9	0.7	1.8	2



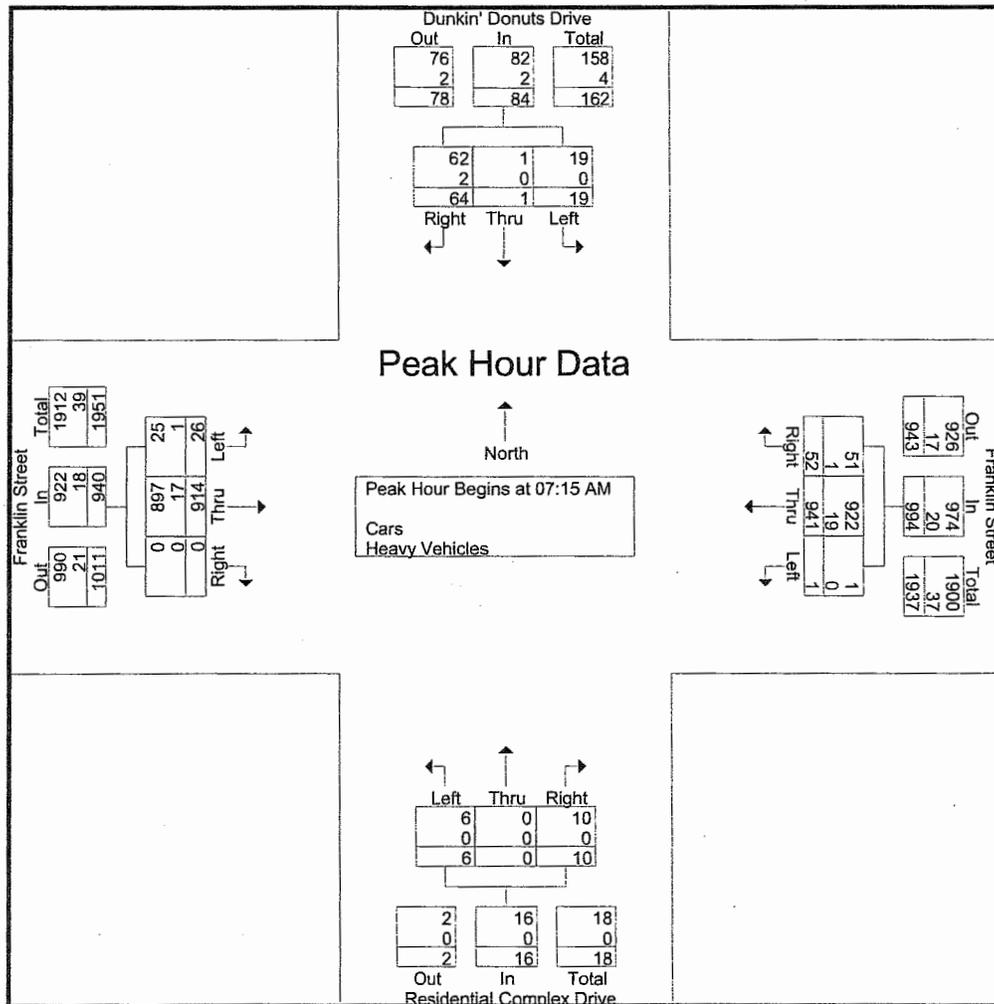
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Dunkins  
 Site Code : 9  
 Start Date : 9/19/201  
 Page No : 2 of 4

Start Time	Residential Complex Drive Northbound				Dunkin' Donuts Drive Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	0	1	2	10	1	17	28	7	236	0	243	0	231	13	244	5
07:30 AM	0	0	2	2	6	0	14	20	3	323	0	326	0	217	11	228	57
07:45 AM	3	0	3	6	1	0	8	9	6	174	0	180	1	255	7	263	4
08:00 AM	2	0	4	6	2	0	25	27	10	181	0	191	0	238	21	259	4
Total Volume	6	0	10	16	19	1	64	84	26	914	0	940	1	941	52	994	20
% App. Total	37.5	0	62.5		22.6	1.2	76.2		2.8	97.2	0		0.1	94.7	5.2		
PHF	.500	.000	.625	.667	.475	.250	.640	.750	.650	.707	.000	.721	.250	.923	.619	.945	.8
Cars	6	0	10	16	19	1	62	82	25	897	0	922	1	922	51	974	19
% Cars	100	0	100	100	100	100	96.9	97.6	96.2	98.1	0	98.1	100	98.0	98.1	98.0	98
Heavy Vehicles	0	0	0	0	0	0	2	2	1	17	0	18	0	19	1	20	4
% Heavy Vehicles	0	0	0	0	0	0	3.1	2.4	3.8	1.9	0	1.9	0	2.0	1.9	2.0	2



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Dunkin  
 Site Code : 9  
 Start Date : 9/19/20  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Residential Complex Drive Northbound				Dunkin' Donuts Drive Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	1	0	0	1	0	0	5	5	4	17	0	21	0	40	3	43	
06:15 AM	1	1	0	2	0	0	8	8	7	48	0	55	0	116	5	121	1
06:30 AM	3	0	3	6	4	0	19	23	11	92	0	103	0	164	19	183	3
06:45 AM	3	0	1	4	4	0	17	21	11	124	1	136	0	207	10	217	3
<b>Total</b>	<b>8</b>	<b>1</b>	<b>4</b>	<b>13</b>	<b>8</b>	<b>0</b>	<b>49</b>	<b>57</b>	<b>33</b>	<b>281</b>	<b>1</b>	<b>315</b>	<b>0</b>	<b>527</b>	<b>37</b>	<b>564</b>	<b>9</b>
07:00 AM	2	0	0	2	6	0	12	18	14	156	0	170	0	242	12	254	4
07:15 AM	1	0	1	2	10	1	16	27	6	233	0	239	0	227	13	240	5
07:30 AM	0	0	2	2	6	0	14	20	3	319	0	322	0	215	11	226	5
07:45 AM	3	0	3	6	1	0	8	9	6	170	0	176	1	244	7	252	4
<b>Total</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>12</b>	<b>23</b>	<b>1</b>	<b>50</b>	<b>74</b>	<b>29</b>	<b>878</b>	<b>0</b>	<b>907</b>	<b>1</b>	<b>928</b>	<b>43</b>	<b>972</b>	<b>19</b>
08:00 AM	2	0	4	6	2	0	24	26	10	175	0	185	0	236	20	256	4
08:15 AM	2	0	0	2	4	0	21	25	11	144	0	155	0	218	19	237	4
08:30 AM	2	0	1	3	6	2	20	28	8	113	3	124	1	207	7	215	3
08:45 AM	4	0	1	5	4	0	18	22	5	121	1	127	0	190	18	208	3
<b>Total</b>	<b>10</b>	<b>0</b>	<b>6</b>	<b>16</b>	<b>16</b>	<b>2</b>	<b>83</b>	<b>101</b>	<b>34</b>	<b>553</b>	<b>4</b>	<b>591</b>	<b>1</b>	<b>851</b>	<b>64</b>	<b>916</b>	<b>16</b>
<b>Grand Total</b>	<b>24</b>	<b>1</b>	<b>16</b>	<b>41</b>	<b>47</b>	<b>3</b>	<b>182</b>	<b>232</b>	<b>96</b>	<b>1712</b>	<b>5</b>	<b>1813</b>	<b>2</b>	<b>2306</b>	<b>144</b>	<b>2452</b>	<b>45</b>
Apprch %	58.5	2.4	39		20.3	1.3	78.4		5.3	94.4	0.3		0.1	94	5.9		
Total %	0.5	0	0.4	0.9	1	0.1	4	5.1	2.1	37.7	0.1	40	0	50.8	3.2	54	

Start Time	Residential Complex Drive Northbound				Dunkin' Donuts Drive Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	0	1	2	10	1	16	27	6	233	0	239	0	227	13	240	50
07:30 AM	0	0	2	2	6	0	14	20	3	319	0	322	0	215	11	226	57
07:45 AM	3	0	3	6	1	0	8	9	6	170	0	176	1	244	7	252	44
08:00 AM	2	0	4	6	2	0	24	26	10	175	0	185	0	236	20	256	47
Total Volume	6	0	10	16	19	1	62	82	25	897	0	922	1	922	51	974	199
% App. Total	37.5	0	62.5		23.2	1.2	75.6		2.7	97.3	0		0.1	94.7	5.2		
PHF	.500	.000	.625	.667	.475	.250	.646	.759	.625	.703	.000	.716	.250	.945	.638	.951	.875

	07:45 AM				08:00 AM				07:15 AM				07:15 AM			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
+0 mins.	3	0	3	6	2	0	24	26	6	233	0	239	0	227	13	240
+15 mins.	2	0	4	6	4	0	21	25	3	319	0	322	0	215	11	226
+30 mins.	2	0	0	2	6	2	20	28	6	170	0	176	1	244	7	252
+45 mins.	2	0	1	3	4	0	18	22	10	175	0	185	0	236	20	256
Total Volume	9	0	8	17	16	2	83	101	25	897	0	922	1	922	51	974
% App. Total	52.9	0	47.1		15.8	2	82.2		2.7	97.3	0		0.1	94.7	5.2	
PHF	.750	.000	.500	.708	.667	.250	.865	.902	.625	.703	.000	.716	.250	.945	.638	.951

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-301-3300  
 www.tsetraffic.com

File Name : Dunkins  
 Site Code : 9  
 Start Date : 9/19/20  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Residential Complex Drive Northbound				Dunkin' Donuts Drive Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	2	0	2	
06:15 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	2	0	2	
06:30 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	1	0	1	
06:45 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	2	0	2	
Total	0	0	0	0	0	0	0	0	0	16	0	16	0	7	0	7	
07:00 AM	0	0	0	0	0	0	0	0	0	9	0	9	0	3	0	3	
07:15 AM	0	0	0	0	0	0	1	1	1	3	0	4	0	4	0	4	
07:30 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	2	0	2	
07:45 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	11	0	11	
Total	0	0	0	0	0	0	1	1	1	20	0	21	0	20	0	20	
08:00 AM	0	0	0	0	0	0	1	1	0	6	0	6	0	2	1	3	
08:15 AM	0	0	0	0	0	0	0	0	0	10	0	10	0	2	0	2	
08:30 AM	0	0	0	0	0	0	0	0	0	7	0	7	0	8	0	8	
08:45 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	5	0	5	
Total	0	0	0	0	0	0	1	1	0	25	0	25	0	17	1	18	
Grand Total	0	0	0	0	0	0	2	2	1	61	0	62	0	44	1	45	10
Apprch %	0	0	0	0	0	0	100		1.6	98.4	0		0	97.8	2.2		
Total %	0	0	0	0	0	0	1.8	1.8	0.9	56	0	56.9	0	40.4	0.9	41.3	

Start Time	Residential Complex Drive Northbound				Dunkin' Donuts Drive Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	11	0	11	11
08:00 AM	0	0	0	0	0	0	1	1	0	6	0	6	0	2	1	3	11
08:15 AM	0	0	0	0	0	0	0	0	0	10	0	10	0	2	0	2	11
08:30 AM	0	0	0	0	0	0	0	0	0	7	0	7	0	8	0	8	11
Total Volume	0	0	0	0	0	0	1	1	0	27	0	27	0	23	1	24	55
% App. Total	0	0	0	0	0	0	100		0	100	0		0	95.8	4.2		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.675	.000	.675	.000	.523	.250	.545	.86

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	06:00 AM				07:15 AM				07:45 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	1	1	0	4	0	4	0	11	0	11
+15 mins.	0	0	0	0	0	0	0	0	0	6	0	6	0	2	1	3
+30 mins.	0	0	0	0	0	0	0	0	0	10	0	10	0	2	0	2
+45 mins.	0	0	0	0	0	0	1	1	0	7	0	7	0	8	0	8
Total Volume	0	0	0	0	0	0	2	2	0	27	0	27	0	23	1	24
% App. Total	0	0	0	0	0	0	100		0	100	0		0	95.8	4.2	
PHF	.000	.000	.000	.000	.000	.000	.500	.500	.000	.675	.000	.675	.000	.523	.250	.545

Street : Dunkin Donuts / Private Dr  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16470004  
 Site Code : 16470004  
 Start Date : 4/10/2014  
 Page No : 13

**Groups Printed- Bikes Peds**

Start Time	Dunkin Donuts From North				Franklin St From East				Private Dr From South				Franklin St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:15 AM	0	0	0	7	0	0	0	0	0	0	0	1	0	2	0	0	8	2	10
07:30 AM	0	0	0	4	0	1	0	0	0	0	0	2	0	0	0	0	6	1	7
07:45 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	2
<b>Total</b>	0	0	0	12	0	2	0	0	0	0	0	3	0	2	0	0	15	4	19
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
<b>Grand Total</b>	0	0	0	12	0	3	0	0	0	0	0	3	0	2	0	0	15	5	20
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0				
<b>Total %</b>	0	0	0		0	60	0		0	0	0		0	40	0		75	25	

Start Time	Dunkin Donuts From North				Franklin St From East				Private Dr From South				Franklin St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
07:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
<b>Total Volume</b>	0	0	0	0	0	3	0	3	0	0	0	0	0	2	0	2	5
<b>% App. Total</b>	0	0	0		0	100	0		0	0	0		0	100	0		
<b>PHF</b>	.000	.000	.000	.000	.000	.750	.000	.750	.000	.000	.000	.000	.000	.250	.000	.250	.625

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

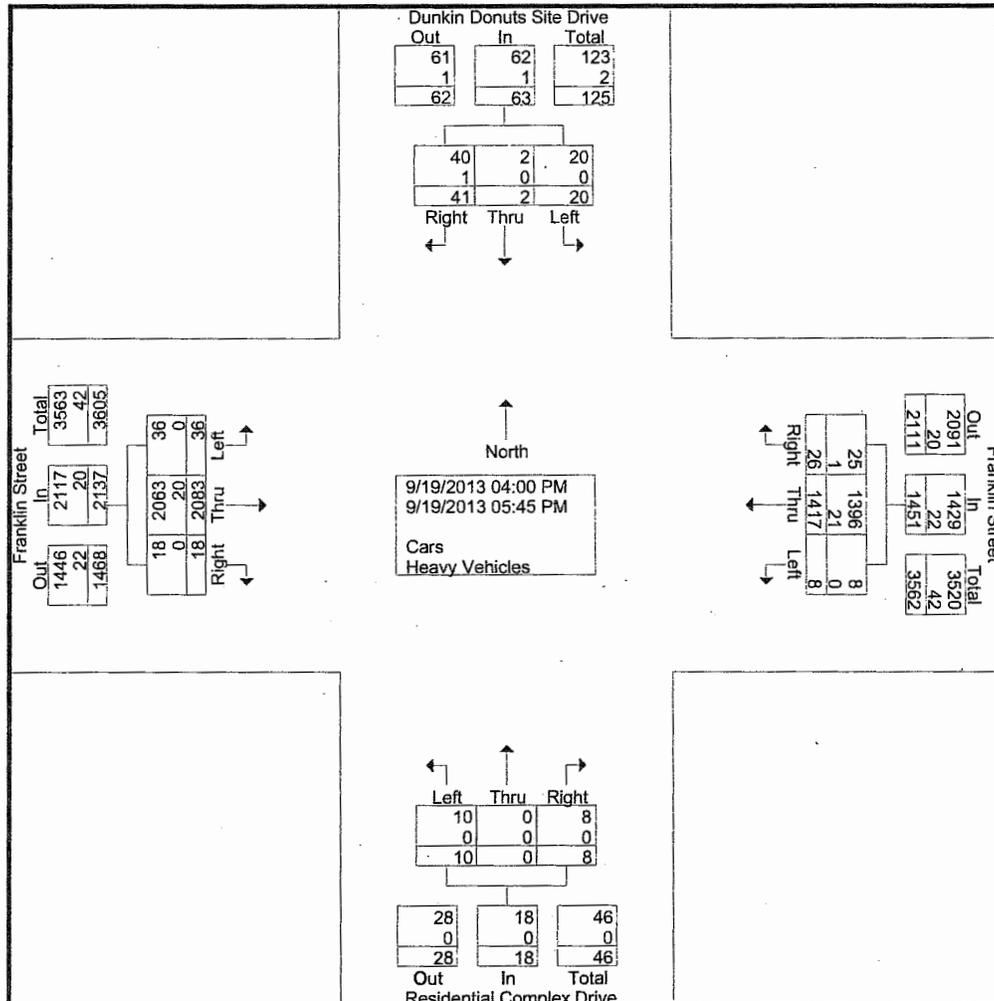


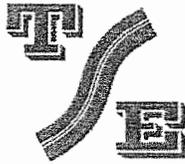
**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Dunkins  
 Site Code : 9  
 Start Date : 9/19/2013  
 Page No : 1 of 4

Groups Printed- Cars - Heavy Vehicles

Start Time	Residential Complex Drive Northbound				Dunkin Donuts Site Drive Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	1	0	0	1	3	0	4	7	3	243	2	248	1	143	3	147	4
04:15 PM	0	0	1	1	1	0	6	7	3	235	2	240	1	141	2	144	3
04:30 PM	1	0	2	3	2	0	6	8	3	243	2	248	1	144	6	151	4
04:45 PM	2	0	1	3	2	1	3	6	4	282	1	287	1	191	1	193	4
Total	4	0	4	8	8	1	19	28	13	1003	7	1023	4	619	12	635	16
05:00 PM	2	0	1	3	4	0	4	8	7	256	3	266	3	190	2	195	4
05:15 PM	1	0	1	2	2	0	2	4	3	299	2	304	0	222	5	227	5
05:30 PM	1	0	0	1	1	0	13	14	8	258	4	270	0	223	4	227	5
05:45 PM	2	0	2	4	5	1	3	9	5	267	2	274	1	163	3	167	4
Total	6	0	4	10	12	1	22	35	23	1080	11	1114	4	798	14	816	19
Grand Total	10	0	8	18	20	2	41	63	36	2083	18	2137	8	1417	26	1451	36
Apprch %	55.6	0	44.4		31.7	3.2	65.1		1.7	97.5	0.8		0.6	97.7	1.8		
Total %	0.3	0	0.2	0.5	0.5	0.1	1.1	1.7	1	56.8	0.5	58.2	0.2	38.6	0.7	39.5	
Cars	10	0	8	18	20	2	40	62	36	2063	18	2117	8	1396	25	1429	72
% Cars	100	0	100	100	100	100	97.6	98.4	100	99	100	99.1	100	98.5	96.2	98.5	98
Heavy Vehicles	0	0	0	0	0	0	1	1	0	20	0	20	0	21	1	22	8
% Heavy Vehicles	0	0	0	0	0	0	2.4	1.6	0	1	0	0.9	0	1.5	3.8	1.5	1



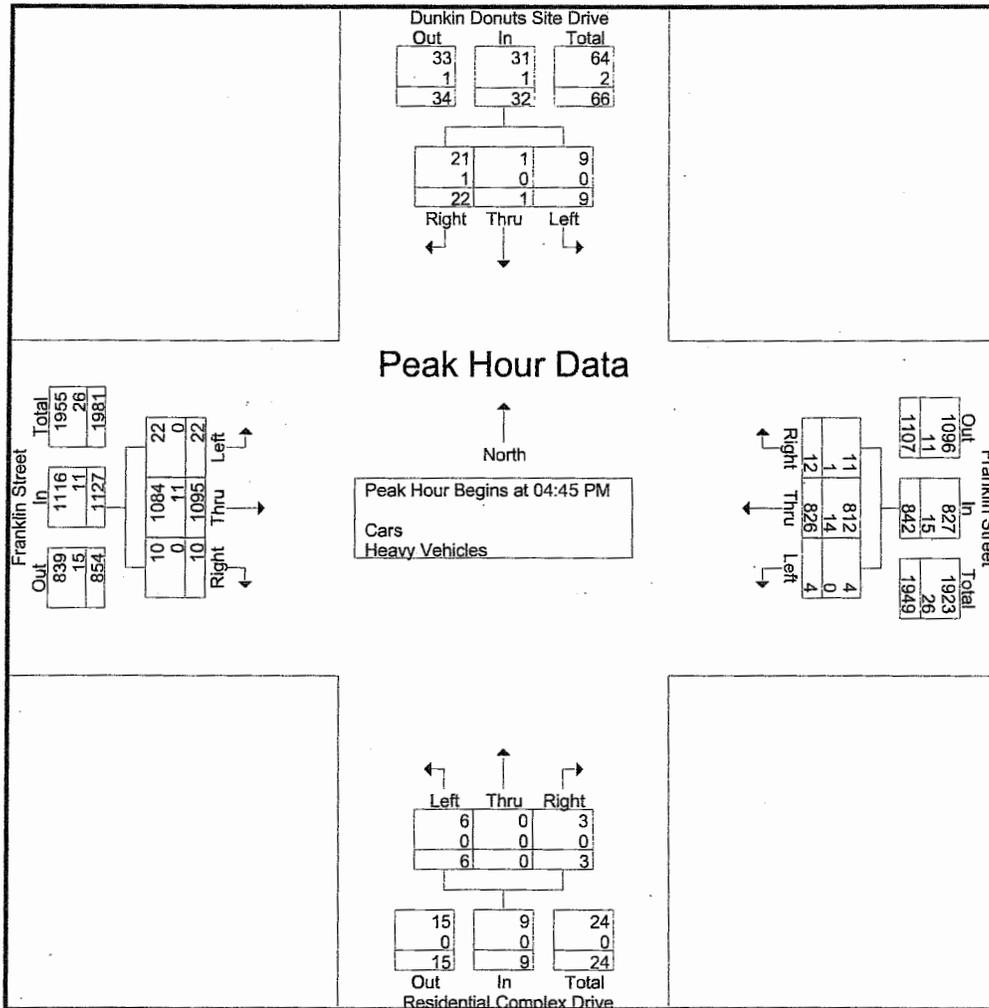


**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-3300  
 www.tsetraffic.com

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

File Name : Dunkins  
 Site Code : 9  
 Start Date : 9/19/20  
 Page No : 2 of 4

Start Time	Residential Complex Drive Northbound				Dunkin Donuts Site Drive Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	2	0	1	3	2	1	3	6	4	282	1	287	1	191	1	193	4
05:00 PM	2	0	1	3	4	0	4	8	7	256	3	266	3	190	2	195	4
05:15 PM	1	0	1	2	2	0	2	4	3	299	2	304	0	222	5	227	5
05:30 PM	1	0	0	1	1	0	13	14	8	258	4	270	0	223	4	227	5
Total Volume	6	0	3	9	9	1	22	32	22	1095	10	1127	4	826	12	842	20
% App. Total	66.7	0	33.3		28.1	3.1	68.8		2	97.2	0.9		0.5	98.1	1.4		
PHF	.750	.000	.750	.750	.563	.250	.423	.571	.688	.916	.625	.927	.333	.926	.600	.927	.9
Cars	6	0	3	9	9	1	21	31	22	1084	10	1116	4	812	11	827	19
% Cars	100	0	100	100	100	100	95.5	96.9	100	99.0	100	99.0	100	98.3	91.7	98.2	98
Heavy Vehicles	0	0	0	0	0	0	1	1	0	11	0	11	0	14	1	15	2
% Heavy Vehicles	0	0	0	0	0	0	4.5	3.1	0	1.0	0	1.0	0	1.7	8.3	1.8	1



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5636  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Dunkin:  
 Site Code : 9  
 Start Date : 9/19/20  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Residential Complex Drive Northbound				Dunkin Donuts Site Drive Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	1	0	0	1	3	0	4	7	3	241	2	246	1	142	3	146	4
04:15 PM	0	0	1	1	1	0	6	7	3	233	2	238	1	140	2	143	3
04:30 PM	1	0	2	3	2	0	6	8	3	240	2	245	1	142	6	149	4
04:45 PM	2	0	1	3	2	1	3	6	4	275	1	280	1	189	1	191	4
Total	4	0	4	8	8	1	19	28	13	989	7	1009	4	613	12	629	16
05:00 PM	2	0	1	3	4	0	4	8	7	254	3	264	3	188	1	192	4
05:15 PM	1	0	1	2	2	0	2	4	3	299	2	304	0	220	5	225	5
05:30 PM	1	0	0	1	1	0	12	13	8	256	4	268	0	215	4	219	5
05:45 PM	2	0	2	4	5	1	3	9	5	265	2	272	1	160	3	164	4
Total	6	0	4	10	12	1	21	34	23	1074	11	1108	4	783	13	800	19
Grand Total	10	0	8	18	20	2	40	62	36	2063	18	2117	8	1396	25	1429	36
Apprch %	55.6	0	44.4		32.3	3.2	64.5		1.7	97.4	0.9		0.6	97.7	1.7		
Total %	0.3	0	0.2	0.5	0.6	0.1	1.1	1.7	1	56.9	0.5	58.4	0.2	38.5	0.7	39.4	

Start Time	Residential Complex Drive Northbound				Dunkin Donuts Site Drive Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:45 PM	2	0	1	3	2	1	3	6	4	275	1	280	1	189	1	191	48
05:00 PM	2	0	1	3	4	0	4	8	7	254	3	264	3	188	1	192	46
05:15 PM	1	0	1	2	2	0	2	4	3	299	2	304	0	220	5	225	53
05:30 PM	1	0	0	1	1	0	12	13	8	256	4	268	0	215	4	219	50
Total Volume	6	0	3	9	9	1	21	31	22	1084	10	1116	4	812	11	827	198
% App. Total	66.7	0	33.3		29	3.2	67.7		2	97.1	0.9		0.5	98.2	1.3		
PHF	.750	.000	.750	.750	.563	.250	.438	.596	.688	.906	.625	.918	.333	.923	.550	.919	.92

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

Peak Hour for Entire Intersection Begins at:

	04:30 PM				05:00 PM				04:45 PM				04:45 PM			
+0 mins.	1	0	2	3	4	0	4	8	4	275	1	280	1	189	1	191
+15 mins.	2	0	1	3	2	0	2	4	7	254	3	264	3	188	1	192
+30 mins.	2	0	1	3	1	0	12	13	3	299	2	304	0	220	5	225
+45 mins.	1	0	1	2	5	1	3	9	8	256	4	268	0	215	4	219
Total Volume	6	0	5	11	12	1	21	34	22	1084	10	1116	4	812	11	827
% App. Total	54.5	0	45.5		35.3	2.9	61.8		2	97.1	0.9		0.5	98.2	1.3	
PHF	.750	.000	.625	.917	.600	.250	.438	.654	.688	.906	.625	.918	.333	.923	.550	.919

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-443-5886  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Dunkins  
 Site Code : 9  
 Start Date : 9/19/20  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Residential Complex Drive Northbound				Dunkin Donuts Site Drive Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	
04:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	
04:30 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	
04:45 PM	0	0	0	0	0	0	0	0	0	7	0	7	0	2	0	2	
Total	0	0	0	0	0	0	0	0	0	14	0	14	0	6	0	6	
05:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	2	1	3	
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	
05:30 PM	0	0	0	0	0	0	1	1	0	2	0	2	0	8	0	8	
05:45 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	
Total	0	0	0	0	0	0	1	1	0	6	0	6	0	15	1	16	
Grand Total	0	0	0	0	0	0	1	1	0	20	0	20	0	21	1	22	
Apprch %	0	0	0		0	0	100		0	100	0		0	95.5	4.5		
Total %	0	0	0		0	0	2.3	2.3	0	46.5	0	46.5	0	48.8	2.3	51.2	

Start Time	Residential Complex Drive Northbound				Dunkin Donuts Site Drive Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	7	0	7	0	2	0	2	
05:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	2	1	3	
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	
05:30 PM	0	0	0	0	0	0	1	1	0	2	0	2	0	8	0	8	1
Total Volume	0	0	0	0	0	0	1	1	0	11	0	11	0	14	1	15	2
% App. Total	0	0	0		0	0	100		0	100	0		0	93.3	6.7		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.393	.000	.393	.000	.438	.250	.469	.61

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

Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				04:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	2	0	2	0	2	1	3
+15 mins.	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	2
+30 mins.	0	0	0	0	0	0	0	0	0	3	0	3	0	8	0	8
+45 mins.	0	0	0	0	0	0	1	1	0	7	0	7	0	3	0	3
Total Volume	0	0	0	0	0	0	1	1	0	14	0	14	0	15	1	16
% App. Total	0	0	0		0	0	100		0	100	0		0	93.8	6.2	
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.500	.000	.500	.000	.469	.250	.500



Street : Dunkin Donuts / Private Dr  
V Street : Franklin Street  
y/State : Stoneham, MA  
ather : Clear

**Groups Printed- Bikes Peds**

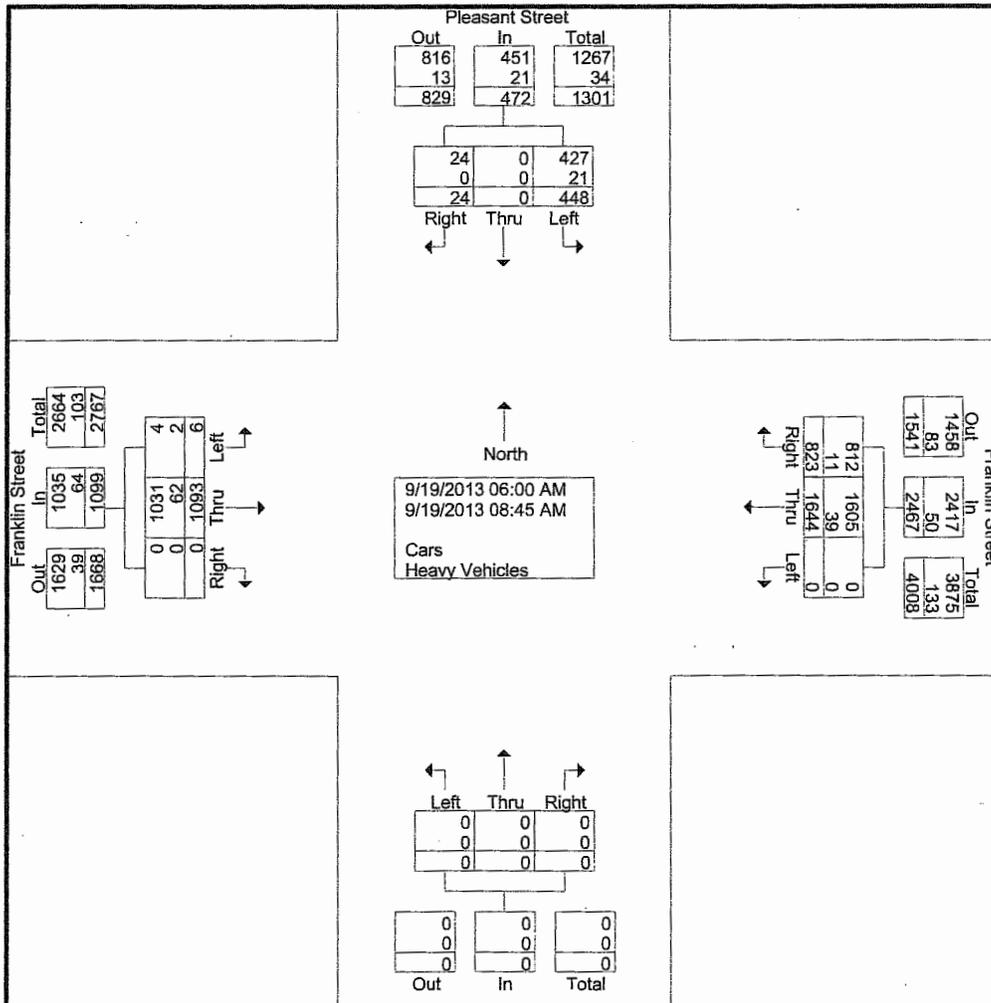
Start Time	Dunkin Donuts From North				Franklin St From East				Private Dr From South				Franklin St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:45 PM	0	0	0	2	0	0	0	0	0	0	0	2	0	1	0	0	4	1	5
Total	0	0	0	2	0	0	0	0	0	0	0	2	0	1	0	0	4	1	5
05:00 PM	0	0	0	3	0	1	0	0	0	0	0	1	0	1	0	0	4	2	6
05:15 PM	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	6	0	6
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	3	0	3
Grand Total	0	0	0	9	0	1	0	0	0	0	0	8	0	2	0	0	17	3	20
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0				
Total %	0	0	0		0	33.3	0		0	0	0		0	66.7	0		85	15	

Start Time	Dunkin Donuts From North				Franklin St From East				Private Dr From South				Franklin St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	2	0	2	3
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500	.000	.500	.375



Groups Printed- Cars - Heavy Vehicles

Start Time	Northbound				Pleasant Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tc
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	0	0	0	0	17	0	1	18	0	37	0	37	0	59	24	83	1
06:15 AM	0	0	0	0	24	0	2	26	0	44	0	44	0	89	38	127	1
06:30 AM	0	0	0	0	33	0	1	34	1	51	0	52	0	119	66	185	2
06:45 AM	0	0	0	0	44	0	2	46	0	72	0	72	0	150	87	237	3
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>118</b>	<b>0</b>	<b>6</b>	<b>124</b>	<b>1</b>	<b>204</b>	<b>0</b>	<b>205</b>	<b>0</b>	<b>417</b>	<b>215</b>	<b>632</b>	<b>9</b>
07:00 AM	0	0	0	0	44	0	0	44	0	120	0	120	0	168	87	255	4
07:15 AM	0	0	0	0	51	0	1	52	0	152	0	152	0	156	91	247	4
07:30 AM	0	0	0	0	39	0	4	43	2	146	0	148	0	150	48	198	3
07:45 AM	0	0	0	0	40	0	6	46	1	111	0	112	0	179	89	268	4
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>174</b>	<b>0</b>	<b>11</b>	<b>185</b>	<b>3</b>	<b>529</b>	<b>0</b>	<b>532</b>	<b>0</b>	<b>653</b>	<b>315</b>	<b>968</b>	<b>16</b>
08:00 AM	0	0	0	0	43	0	3	46	0	92	0	92	0	135	54	189	3
08:15 AM	0	0	0	0	43	0	3	46	0	88	0	88	0	172	83	255	3
08:30 AM	0	0	0	0	39	0	1	40	0	103	0	103	0	134	94	228	3
08:45 AM	0	0	0	0	31	0	0	31	2	77	0	79	0	133	62	195	3
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>156</b>	<b>0</b>	<b>7</b>	<b>163</b>	<b>2</b>	<b>360</b>	<b>0</b>	<b>362</b>	<b>0</b>	<b>574</b>	<b>293</b>	<b>867</b>	<b>13</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>448</b>	<b>0</b>	<b>24</b>	<b>472</b>	<b>6</b>	<b>1093</b>	<b>0</b>	<b>1099</b>	<b>0</b>	<b>1644</b>	<b>823</b>	<b>2467</b>	<b>40</b>
Approch %	0	0	0	0	94.9	0	5.1	99.5	0.5	99.5	0	27.2	0	66.6	33.4	61.1	
Total %	0	0	0	0	11.1	0	0.6	11.7	0.1	27.1	0	27.2	0	40.7	20.4	61.1	
Cars	0	0	0	0	427	0	24	451	4	1031	0	1035	0	1605	812	2417	780
% Cars	0	0	0	0	95.3	0	100	95.6	66.7	94.3	0	94.2	0	97.6	98.7	98	96
Heavy Vehicles	0	0	0	0	21	0	0	21	2	62	0	64	0	39	11	50	27
% Heavy Vehicles	0	0	0	0	4.7	0	0	4.4	33.3	5.7	0	5.8	0	2.4	1.3	2	3



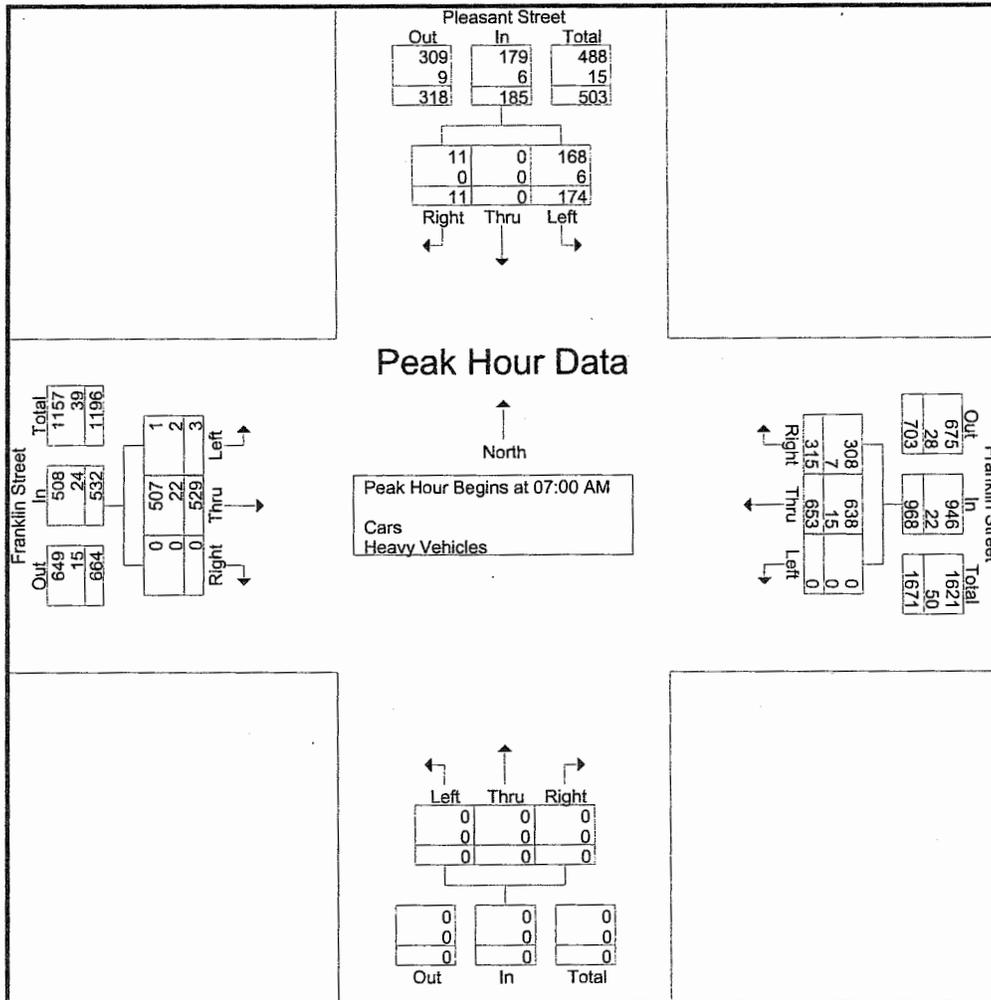
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Pleafrank  
 Site Code : 7  
 Start Date : 9/19/2011  
 Page No : 2 of 4

Start Time	Northbound				Pleasant Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tc
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	44	0	0	44	0	120	0	120	0	168	87	255	4
07:15 AM	0	0	0	0	51	0	1	52	0	152	0	152	0	156	91	247	4
07:30 AM	0	0	0	0	39	0	4	43	2	146	0	148	0	150	48	198	3
07:45 AM	0	0	0	0	40	0	6	46	1	111	0	112	0	179	89	268	4
Total Volume	0	0	0	0	174	0	11	185	3	529	0	532	0	653	315	968	16
% App. Total	0	0	0	0	94.1	0	5.9	96.8	0.6	99.4	0	95.5	0	67.5	32.5	97.7	96
PHF	.000	.000	.000	.000	.853	.000	.458	.889	.375	.870	.000	.875	.000	.912	.865	.903	.9
Cars	0	0	0	0	168	0	11	179	1	507	0	508	0	638	308	946	16
% Cars	0	0	0	0	96.6	0	100	96.8	33.3	95.8	0	95.5	0	97.7	97.8	97.7	96
Heavy Vehicles	0	0	0	0	6	0	0	6	2	22	0	24	0	15	7	22	3
% Heavy Vehicles	0	0	0	0	3.4	0	0	3.2	66.7	4.2	0	4.5	0	2.3	2.2	2.3	3



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
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 F: 617-301-8300  
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File Name : Pleafrank  
 Site Code : 7  
 Start Date : 9/19/2013  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Northbound				Pleasant Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	0	0	0	0	16	0	1	17	0	36	0	36	0	57	24	81	1:
06:15 AM	0	0	0	0	21	0	2	23	0	43	0	43	0	87	37	124	1:
06:30 AM	0	0	0	0	32	0	1	33	1	46	0	47	0	118	65	183	2:
06:45 AM	0	0	0	0	43	0	2	45	0	69	0	69	0	147	86	233	3:
<b>Total</b>	0	0	0	0	112	0	6	118	1	194	0	195	0	409	212	621	9:
07:00 AM	0	0	0	0	44	0	0	44	0	114	0	114	0	165	86	251	4:
07:15 AM	0	0	0	0	50	0	1	51	0	149	0	149	0	153	91	244	4:
07:30 AM	0	0	0	0	38	0	4	42	0	138	0	138	0	146	47	193	3:
07:45 AM	0	0	0	0	36	0	6	42	1	106	0	107	0	174	84	258	4:
<b>Total</b>	0	0	0	0	168	0	11	179	1	507	0	508	0	638	308	946	16:
08:00 AM	0	0	0	0	42	0	3	45	0	82	0	82	0	131	54	185	3:
08:15 AM	0	0	0	0	38	0	3	41	0	82	0	82	0	168	83	251	3:
08:30 AM	0	0	0	0	38	0	1	39	0	96	0	96	0	131	93	224	3:
08:45 AM	0	0	0	0	29	0	0	29	2	70	0	72	0	128	62	190	2:
<b>Total</b>	0	0	0	0	147	0	7	154	2	330	0	332	0	558	292	850	13:
<b>Grand Total</b>	0	0	0	0	427	0	24	451	4	1031	0	1035	0	1605	812	2417	39:
Apprch %	0	0	0	0	94.7	0	5.3	11.6	0.4	99.6	0	26.5	0	66.4	33.6	61.9	
Total %	0	0	0	0	10.9	0	0.6	11.6	0.1	26.4	0	26.5	0	41.1	20.8	61.9	

Start Time	Northbound				Pleasant Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	44	0	0	44	0	114	0	114	0	165	86	251	40
07:15 AM	0	0	0	0	50	0	1	51	0	149	0	149	0	153	91	244	44
07:30 AM	0	0	0	0	38	0	4	42	0	138	0	138	0	146	47	193	37
07:45 AM	0	0	0	0	36	0	6	42	1	106	0	107	0	174	84	258	40
<b>Total Volume</b>	0	0	0	0	168	0	11	179	1	507	0	508	0	638	308	946	163
<b>% App. Total</b>	0	0	0	0	93.9	0	6.1	11.6	0.2	99.8	0	26.5	0	67.4	32.6	61.9	
PHF	.000	.000	.000	.000	.840	.000	.458	.877	.250	.851	.000	.852	.000	.917	.846	.917	.91:

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	06:00 AM				06:45 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	43	0	2	45	0	114	0	114	0	165	86	251
+15 mins.	0	0	0	0	44	0	0	44	0	149	0	149	0	153	91	244
+30 mins.	0	0	0	0	50	0	1	51	0	138	0	138	0	146	47	193
+45 mins.	0	0	0	0	38	0	4	42	1	106	0	107	0	174	84	258
<b>Total Volume</b>	0	0	0	0	175	0	7	182	1	507	0	508	0	638	308	946
<b>% App. Total</b>	0	0	0	0	96.2	0	3.8	11.6	0.2	99.8	0	26.5	0	67.4	32.6	61.9
PHF	.000	.000	.000	.000	.875	.000	.438	.892	.250	.851	.000	.852	.000	.917	.846	.917

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-301-8800  
 www.tsotraffic.com

File Name : Pleafrank  
 Site Code : 7  
 Start Date : 9/19/2013  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Northbound				Pleasant Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	2	0	2	
06:15 AM	0	0	0	0	3	0	0	3	0	1	0	1	0	2	1	3	
06:30 AM	0	0	0	0	1	0	0	1	0	5	0	5	0	1	1	2	
06:45 AM	0	0	0	0	1	0	0	1	0	3	0	3	0	3	1	4	
Total	0	0	0	0	6	0	0	6	0	10	0	10	0	8	3	11	2
07:00 AM	0	0	0	0	0	0	0	0	0	6	0	6	0	3	1	4	1
07:15 AM	0	0	0	0	1	0	0	1	0	3	0	3	0	3	0	3	
07:30 AM	0	0	0	0	1	0	0	1	2	8	0	10	0	4	1	5	1
07:45 AM	0	0	0	0	4	0	0	4	0	5	0	5	0	5	5	10	1
Total	0	0	0	0	6	0	0	6	2	22	0	24	0	15	7	22	5
08:00 AM	0	0	0	0	1	0	0	1	0	10	0	10	0	4	0	4	1
08:15 AM	0	0	0	0	5	0	0	5	0	6	0	6	0	4	0	4	1
08:30 AM	0	0	0	0	1	0	0	1	0	7	0	7	0	3	1	4	1
08:45 AM	0	0	0	0	2	0	0	2	0	7	0	7	0	5	0	5	1
Total	0	0	0	0	9	0	0	9	0	30	0	30	0	16	1	17	5
Grand Total	0	0	0	0	21	0	0	21	2	62	0	64	0	39	11	50	13
Apprch %	0	0	0	0	100	0	0	100	3.1	96.9	0	100	0	78	22	100	
Total %	0	0	0	0	15.6	0	0	15.6	1.5	45.9	0	47.4	0	28.9	8.1	37	

Start Time	Northbound				Pleasant Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	1	0	0	1	2	8	0	10	0	4	1	5	1
07:45 AM	0	0	0	0	4	0	0	4	0	5	0	5	0	5	5	10	1
08:00 AM	0	0	0	0	1	0	0	1	0	10	0	10	0	4	0	4	1
08:15 AM	0	0	0	0	5	0	0	5	0	6	0	6	0	4	0	4	1
Total Volume	0	0	0	0	11	0	0	11	2	29	0	31	0	17	6	23	6
% App. Total	0	0	0	0	100	0	0	100	6.5	93.5	0	100	0	73.9	26.1	100	
PHF	.000	.000	.000	.000	.550	.000	.000	.550	.250	.725	.000	.775	.000	.850	.300	.575	.85

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	06:00 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	1	0	0	1	2	8	0	10	0	4	1	5
+15 mins.	0	0	0	0	4	0	0	4	0	5	0	5	0	5	5	10
+30 mins.	0	0	0	0	1	0	0	1	0	10	0	10	0	4	0	4
+45 mins.	0	0	0	0	5	0	0	5	0	6	0	6	0	4	0	4
Total Volume	0	0	0	0	11	0	0	11	2	29	0	31	0	17	6	23
% App. Total	0	0	0	0	100	0	0	100	6.5	93.5	0	100	0	73.9	26.1	100
PHF	.000	.000	.000	.000	.550	.000	.000	.550	.250	.725	.000	.775	.000	.850	.300	.575

# Accurate Counts

978-664-2565

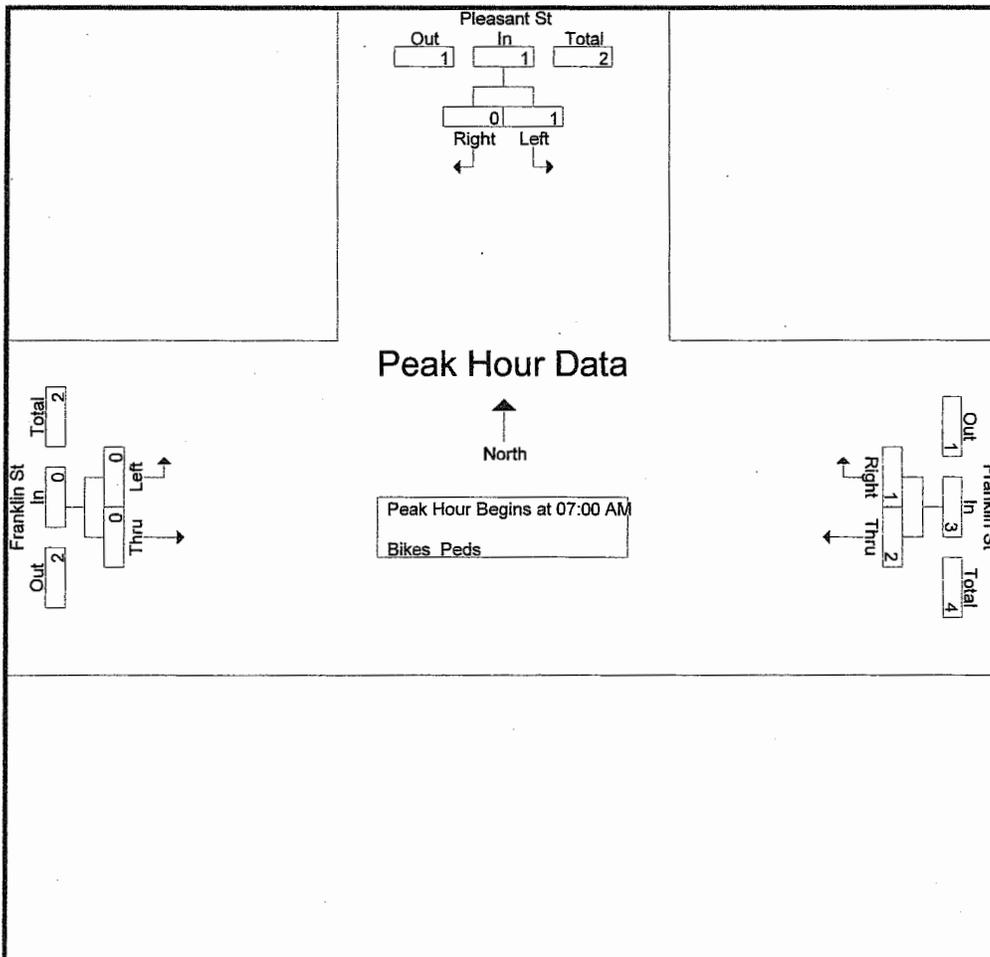
W/S Street : Pleasant Street  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16  
 Site Code : 16  
 Start Date : 4/1  
 Page No : 8

### Groups Printed- Bikes Peds

Start Time	Pleasant St From North			Franklin St From East			Franklin St From West			Exclu. Total	Inclu. Total	Int.
	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds			
07:00 AM	0	0	0	1	0	0	0	0	0	0	1	
07:15 AM	1	0	0	0	0	0	0	0	0	0	1	
07:30 AM	0	0	0	0	1	1	0	0	0	1	1	
07:45 AM	0	0	0	1	0	0	0	0	0	0	1	
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>4</b>	
Grand Total	1	0	0	2	1	1	0	0	0	1	4	
Apprch %	100	0		66.7	33.3		0	0				
Total %	25	0		50	25		0	0		20	80	

Start Time	Pleasant St From North			Franklin St From East			Franklin St From West			Int.
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	1	0	1	0	0	0	0
07:15 AM	1	0	1	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	1	1	0	0	0	0
07:45 AM	0	0	0	1	0	1	0	0	0	0
<b>Total Volume</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
% App. Total	100	0		66.7	33.3		0	0		
PHF	.250	.000	.250	.500	.250	.750	.000	.000	.000	





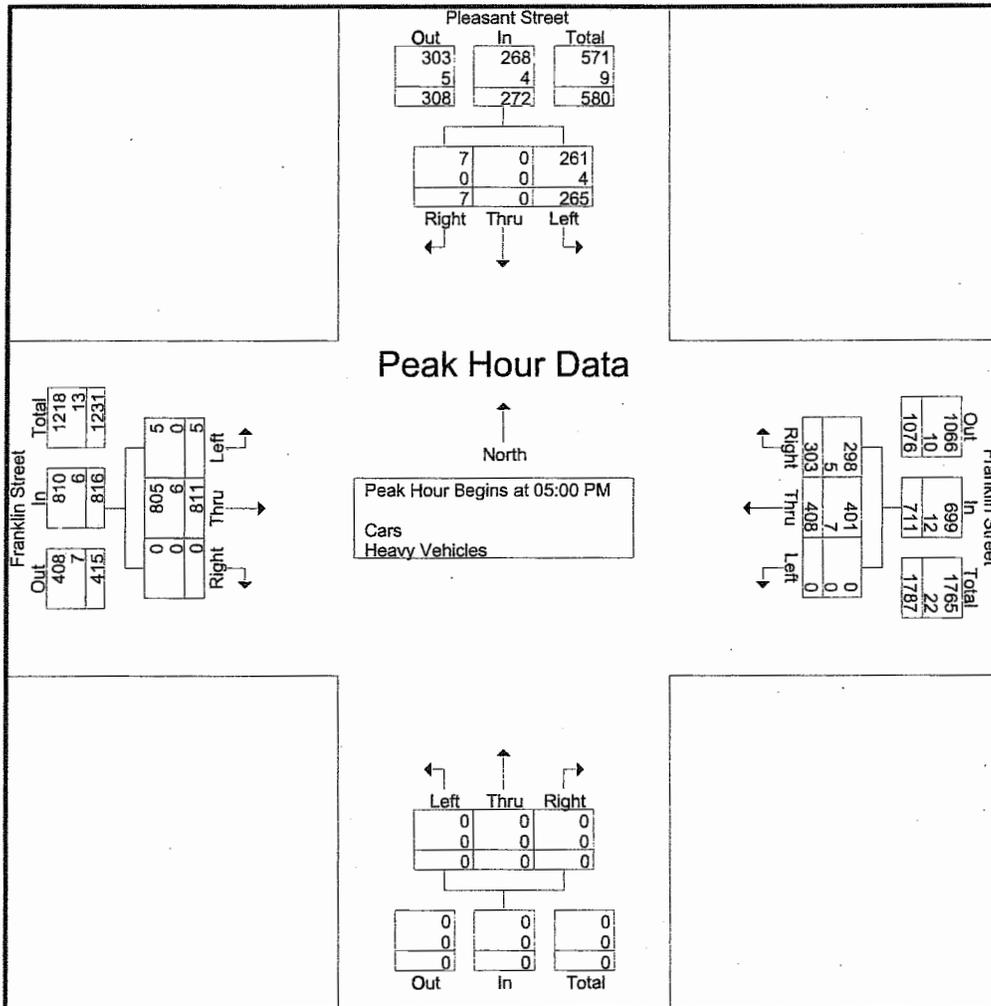
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Pleafrank  
 Site Code : 7  
 Start Date : 9/19/2013  
 Page No : 2 of 4

Start Time	Northbound				Pleasant Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Tot
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	72	0	0	72	2	196	0	198	0	92	76	168	43
05:15 PM	0	0	0	0	63	0	1	64	1	193	0	194	0	121	70	191	44
05:30 PM	0	0	0	0	54	0	4	58	2	205	0	207	0	115	86	201	46
05:45 PM	0	0	0	0	76	0	2	78	0	217	0	217	0	80	71	151	44
Total Volume	0	0	0	0	265	0	7	272	5	811	0	816	0	408	303	711	175
% App. Total	0	0	0	0	97.4	0	2.6		0.6	99.4	0		0	57.4	42.6		
PHF	.000	.000	.000	.000	.872	.000	.438	.872	.625	.934	.000	.940	.000	.843	.881	.884	.96
Cars	0	0	0	0	261	0	7	268	5	805	0	810	0	401	298	699	177
% Cars	0	0	0	0	98.5	0	100	98.5	100	99.3	0	99.3	0	98.3	98.3	98.3	98
Heavy Vehicles	0	0	0	0	4	0	0	4	0	6	0	6	0	7	5	12	2
% Heavy Vehicles	0	0	0	0	1.5	0	0	1.5	0	0.7	0	0.7	0	1.7	1.7	1.7	1



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 108 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Pleafrank  
 Site Code : 7  
 Start Date : 9/19/2013  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Northbound				Pleasant Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	52	0	2	54	2	166	0	168	0	89	58	147	31
04:15 PM	0	0	0	0	50	0	2	52	2	169	0	171	0	86	60	146	31
04:30 PM	0	0	0	0	55	0	2	57	0	189	0	189	0	88	56	144	31
04:45 PM	0	0	0	0	58	0	3	61	1	203	0	204	0	104	68	172	41
Total	0	0	0	0	215	0	9	224	5	727	0	732	0	367	242	609	151
05:00 PM	0	0	0	0	71	0	0	71	2	196	0	198	0	91	75	166	41
05:15 PM	0	0	0	0	61	0	1	62	1	190	0	191	0	119	66	185	41
05:30 PM	0	0	0	0	53	0	4	57	2	204	0	206	0	114	86	200	41
05:45 PM	0	0	0	0	76	0	2	78	0	215	0	215	0	77	71	148	41
Total	0	0	0	0	261	0	7	268	5	805	0	810	0	401	298	699	171
Grand Total	0	0	0	0	476	0	16	492	10	1532	0	1542	0	768	540	1308	334
Apprch %	0	0	0	0	96.7	0	3.3		0.6	99.4	0		0	58.7	41.3		
Total %	0	0	0	0	14.2	0	0.5	14.7	0.3	45.8	0	46.1	0	23	16.2	39.1	

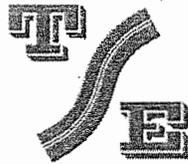
Start Time	Northbound				Pleasant Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. To
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	71	0	0	71	2	196	0	198	0	91	75	166	43
05:15 PM	0	0	0	0	61	0	1	62	1	190	0	191	0	119	66	185	43
05:30 PM	0	0	0	0	53	0	4	57	2	204	0	206	0	114	86	200	46
05:45 PM	0	0	0	0	76	0	2	78	0	215	0	215	0	77	71	148	44
Total Volume	0	0	0	0	261	0	7	268	5	805	0	810	0	401	298	699	177
% App. Total	0	0	0	0	97.4	0	2.6		0.6	99.4	0		0	57.4	42.6		
PHF	.000	.000	.000	.000	.859	.000	.438	.859	.625	.936	.000	.942	.000	.842	.866	.874	.96

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

Peak Hour for Each Approach Begins at:

	04:00 PM				05:00 PM				05:00 PM				04:45 PM			
+0 mins.	0	0	0	0	71	0	0	71	2	196	0	198	0	104	68	172
+15 mins.	0	0	0	0	61	0	1	62	1	190	0	191	0	91	75	166
+30 mins.	0	0	0	0	53	0	4	57	2	204	0	206	0	119	66	185
+45 mins.	0	0	0	0	76	0	2	78	0	215	0	215	0	114	86	200
Total Volume	0	0	0	0	261	0	7	268	5	805	0	810	0	428	295	723
% App. Total	0	0	0	0	97.4	0	2.6		0.6	99.4	0		0	59.2	40.8	
PHF	.000	.000	.000	.000	.859	.000	.438	.859	.625	.936	.000	.942	.000	.899	.858	.904

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5886  
 F: 617-801-3800  
 www.tsetraffic.com

File Name : Pleafrank PM  
 Site Code : 7  
 Start Date : 9/19/2013  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Northbound				Pleasant Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	2	3	4
04:30 PM	0	0	0	0	2	0	1	3	0	2	0	2	0	1	0	1	6
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	6	0	6	7
<b>Total</b>	0	0	0	0	2	0	1	3	0	5	0	5	0	9	2	11	19
05:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	2	3
05:15 PM	0	0	0	0	2	0	0	2	0	3	0	3	0	2	4	6	11
05:30 PM	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0	1	3
05:45 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	5
<b>Total</b>	0	0	0	0	4	0	0	4	0	6	0	6	0	7	5	12	22
<b>Grand Total</b>	0	0	0	0	6	0	1	7	0	11	0	11	0	16	7	23	41
Apprch %	0	0	0	0	85.7	0	14.3	0	0	100	0	0	0	69.6	30.4	0	0
Total %	0	0	0	0	14.6	0	2.4	17.1	0	26.8	0	26.8	0	39	17.1	56.1	0

Start Time	Northbound				Pleasant Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	2	0	1	3	0	2	0	2	0	1	0	1	6
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	6	0	6	7
05:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	2	3
05:15 PM	0	0	0	0	2	0	0	2	0	3	0	3	0	2	4	6	11
<b>Total Volume</b>	0	0	0	0	5	0	1	6	0	6	0	6	0	10	5	15	27
<b>% App. Total</b>	0	0	0	0	83.3	0	16.7	0	0	100	0	0	0	66.7	33.3	0	0
PHF	.000	.000	.000	.000	.625	.000	.250	.500	.000	.500	.000	.500	.000	.417	.313	.625	.614

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

	04:00 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	0	0	0	2	0	1	3	0	2	0	2	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	6	0	6
+30 mins.	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	2
+45 mins.	0	0	0	0	2	0	0	2	0	3	0	3	0	2	4	6
<b>Total Volume</b>	0	0	0	0	5	0	1	6	0	6	0	6	0	10	5	15
<b>% App. Total</b>	0	0	0	0	83.3	0	16.7	0	0	100	0	0	0	66.7	33.3	0
PHF	.000	.000	.000	.000	.625	.000	.250	.500	.000	.500	.000	.500	.000	.417	.313	.625

# Accurate Counts

978-664-2565

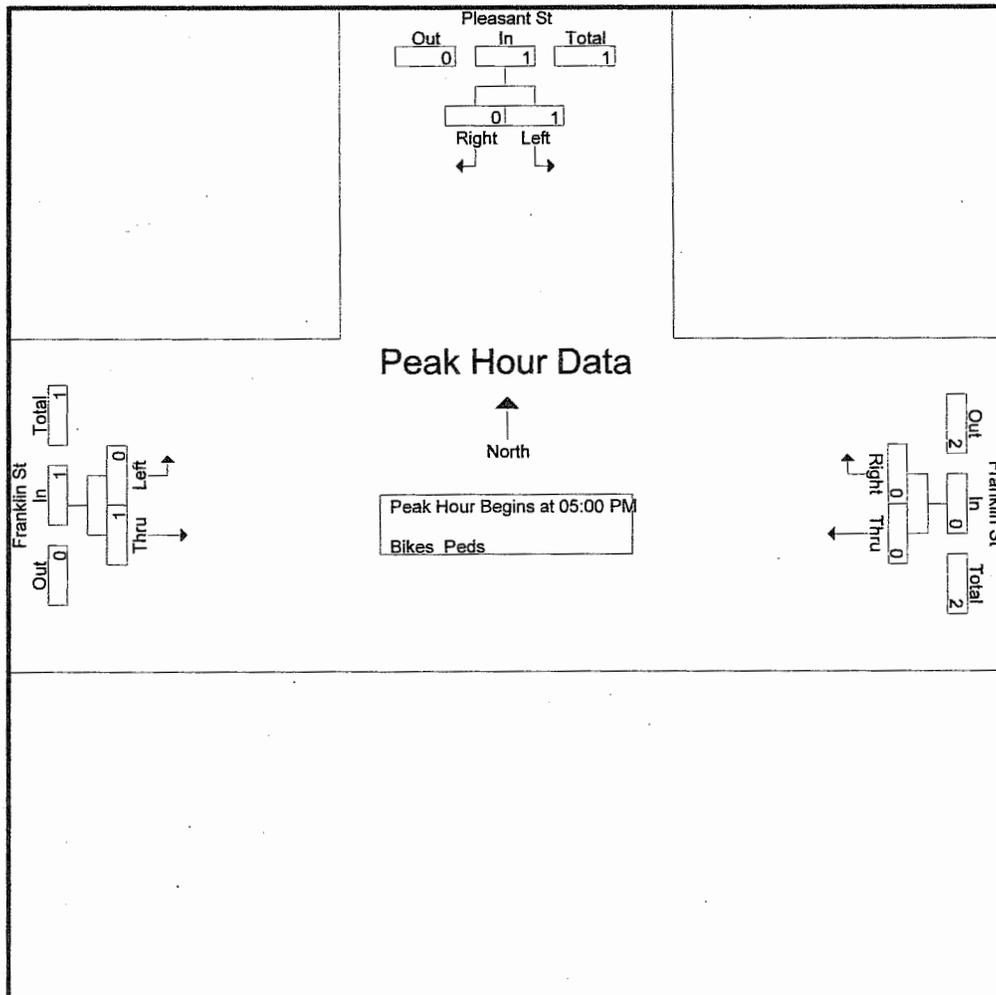
N/S Street : Pleasant Street  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

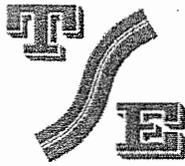
File Name : 164700  
 Site Code : 164700  
 Start Date : 4/10/20  
 Page No : 8

### Groups Printed- Bikes Peds

Start Time	Pleasant St From North			Franklin St From East			Franklin St From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds			
05:00 PM	0	0	1	0	0	0	0	0	0	1	0	
05:15 PM	0	0	2	0	0	0	0	0	0	2	0	
05:30 PM	0	0	0	0	0	0	0	0	1	1	0	
05:45 PM	1	0	0	0	0	1	0	1	0	1	2	
<b>Total</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>2</b>	
<b>Grand Total</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>2</b>	
Apprch %	100	0		0	0		0	100				
Total %	50	0		0	0		0	50		71.4	28.6	

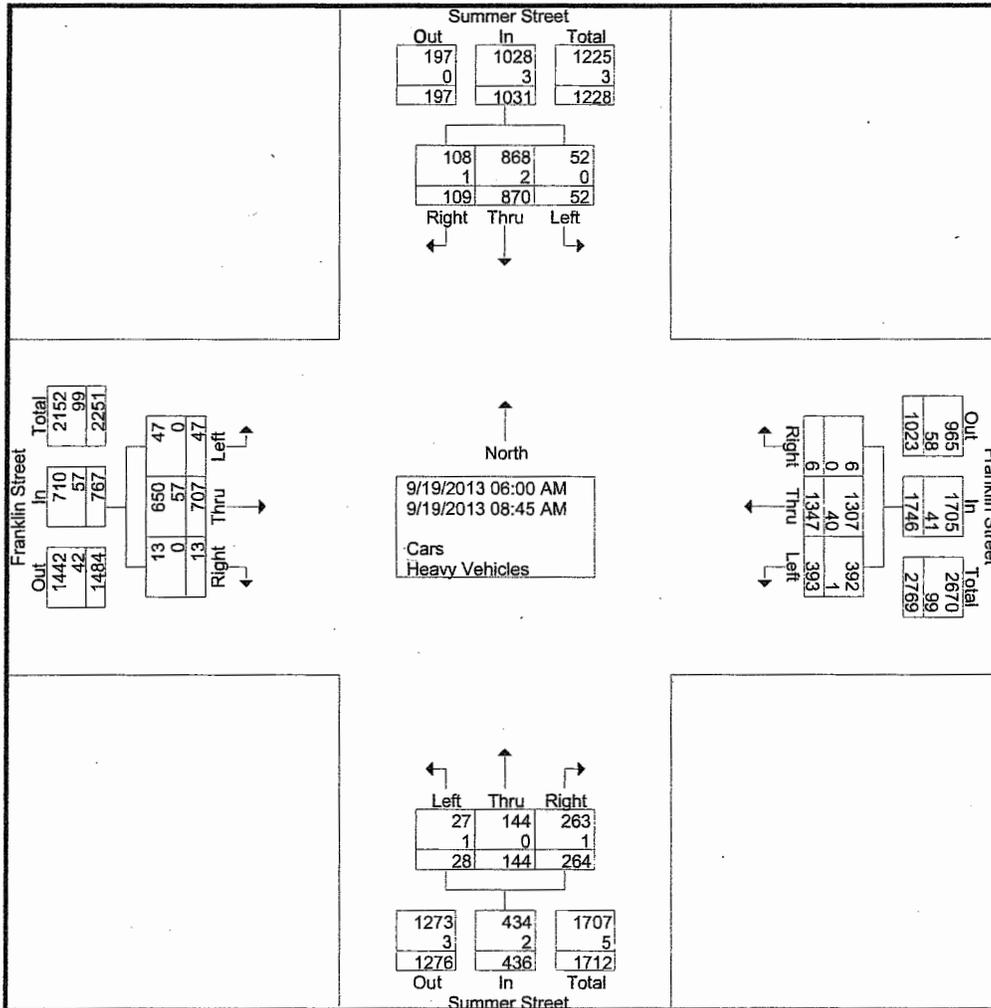
Start Time	Pleasant St From North			Franklin St From East			Franklin St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM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



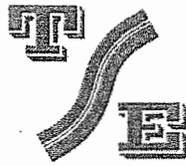


Groups Printed- Cars - Heavy Vehicles

Start Time	Summer Street Northbound				Summer Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	1	3	4	8	0	45	3	48	1	27	0	28	17	53	1	71	155
06:15 AM	3	5	4	12	1	59	6	66	0	28	1	29	25	67	0	92	199
06:30 AM	2	5	10	17	2	75	8	85	1	40	1	42	30	98	0	128	272
06:45 AM	2	10	15	27	3	79	7	89	0	39	2	41	40	130	0	170	327
<b>Total</b>	<b>8</b>	<b>23</b>	<b>33</b>	<b>64</b>	<b>6</b>	<b>258</b>	<b>24</b>	<b>288</b>	<b>2</b>	<b>134</b>	<b>4</b>	<b>140</b>	<b>112</b>	<b>348</b>	<b>1</b>	<b>461</b>	<b>953</b>
07:00 AM	3	12	37	52	9	72	7	88	6	61	3	70	40	126	0	166	376
07:15 AM	2	16	52	70	7	79	5	91	4	75	2	81	29	136	2	167	409
07:30 AM	2	19	47	68	10	93	11	114	6	95	2	103	43	121	0	164	449
07:45 AM	5	21	30	56	3	85	27	115	1	63	1	65	42	148	0	190	426
<b>Total</b>	<b>12</b>	<b>68</b>	<b>166</b>	<b>246</b>	<b>29</b>	<b>329</b>	<b>50</b>	<b>408</b>	<b>17</b>	<b>294</b>	<b>8</b>	<b>319</b>	<b>154</b>	<b>531</b>	<b>2</b>	<b>687</b>	<b>1660</b>
08:00 AM	4	18	25	47	3	86	12	101	3	66	1	70	30	110	0	140	358
08:15 AM	1	10	16	27	6	65	9	80	12	66	0	78	40	131	1	172	357
08:30 AM	1	11	13	25	5	66	7	78	5	72	0	77	26	105	1	132	312
08:45 AM	2	14	11	27	3	66	7	76	8	75	0	83	31	122	1	154	340
<b>Total</b>	<b>8</b>	<b>53</b>	<b>65</b>	<b>126</b>	<b>17</b>	<b>283</b>	<b>35</b>	<b>335</b>	<b>28</b>	<b>279</b>	<b>1</b>	<b>308</b>	<b>127</b>	<b>468</b>	<b>3</b>	<b>598</b>	<b>1367</b>
<b>Grand Total</b>	<b>28</b>	<b>144</b>	<b>264</b>	<b>436</b>	<b>52</b>	<b>870</b>	<b>109</b>	<b>1031</b>	<b>47</b>	<b>707</b>	<b>13</b>	<b>767</b>	<b>393</b>	<b>1347</b>	<b>6</b>	<b>1746</b>	<b>3980</b>
Apprch %	6.4	33	60.6		5	84.4	10.6		6.1	92.2	1.7		22.5	77.1	0.3		
Total %	0.7	3.6	6.6	11	1.3	21.9	2.7	25.9	1.2	17.8	0.3	19.3	9.9	33.8	0.2	43.9	
Cars	27	144	263	434	52	868	108	1028	47	650	13	710	392	1307	6	1705	7754
% Cars	96.4	100	99.6	99.5	100	99.8	99.1	99.7	100	91.9	100	92.6	99.7	97	100	97.7	97.4
Heavy Vehicles	1	0	1	2	0	2	1	3	0	57	0	57	1	40	0	41	206
% Heavy Vehicles	3.6	0	0.4	0.5	0	0.2	0.9	0.3	0	8.1	0	7.4	0.3	3	0	2.3	2.6



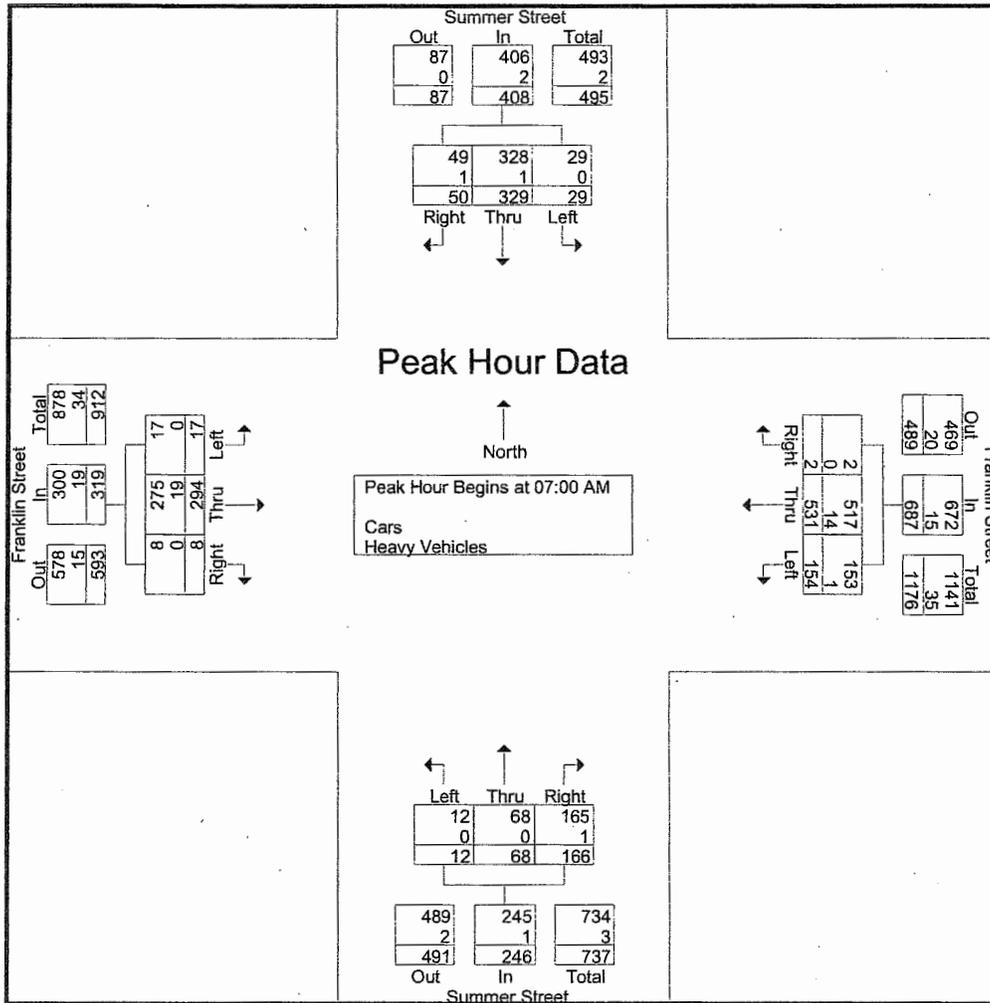
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Sumfrank AM  
 Site Code : 6  
 Start Date : 9/19/2013  
 Page No : 2 of 4

Start Time	Summer Street Northbound				Summer Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	3	12	37	52	9	72	7	88	6	61	3	70	40	126	0	166	376
07:15 AM	2	16	52	70	7	79	5	91	4	75	2	81	29	136	2	167	409
07:30 AM	2	19	47	68	10	93	11	114	6	95	2	103	43	121	0	164	449
07:45 AM	5	21	30	56	3	85	27	115	1	63	1	65	42	148	0	190	426
Total Volume	12	68	166	246	29	329	50	408	17	294	8	319	154	531	2	687	1660
% App. Total	4.9	27.6	67.5		7.1	80.6	12.3		5.3	92.2	2.5		22.4	77.3	0.3		
PHF	.600	.810	.798	.879	.725	.884	.463	.887	.708	.774	.667	.774	.895	.897	.250	.904	.924
Cars	12	68	165	245	29	328	49	406	17	275	8	300	153	517	2	672	1623
% Cars	100	100	99.4	99.6	100	99.7	98.0	99.5	100	93.5	100	94.0	99.4	97.4	100	97.8	97.8
Heavy Vehicles	0	0	1	1	0	1	1	2	0	19	0	19	1	14	0	15	37
% Heavy Vehicles	0	0	0.6	0.4	0	0.3	2.0	0.5	0	6.5	0	6.0	0.6	2.6	0	2.2	2.2



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5688  
 F: 617-801-8300  
 www.tsetraffic.com

File Name : Sumfrank AM  
 Site Code : 6  
 Start Date : 9/19/2013  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Summer Street Northbound				Summer Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	1	3	4	8	0	45	3	48	1	26	0	27	17	50	1	68	151
06:15 AM	3	5	4	12	1	59	6	66	0	26	1	27	25	66	0	91	196
06:30 AM	2	5	10	17	2	75	8	85	1	35	1	37	30	95	0	125	264
06:45 AM	2	10	15	27	3	78	7	88	0	37	2	39	40	127	0	167	321
<b>Total</b>	<b>8</b>	<b>23</b>	<b>33</b>	<b>64</b>	<b>6</b>	<b>257</b>	<b>24</b>	<b>287</b>	<b>2</b>	<b>124</b>	<b>4</b>	<b>130</b>	<b>112</b>	<b>338</b>	<b>1</b>	<b>451</b>	<b>932</b>
07:00 AM	3	12	37	52	9	72	7	88	6	57	3	66	40	123	0	163	369
07:15 AM	2	16	52	70	7	78	5	90	4	71	2	77	29	133	2	164	401
07:30 AM	2	19	47	68	10	93	11	114	6	88	2	96	43	115	0	158	436
07:45 AM	5	21	29	55	3	85	26	114	1	59	1	61	41	146	0	187	417
<b>Total</b>	<b>12</b>	<b>68</b>	<b>165</b>	<b>245</b>	<b>29</b>	<b>328</b>	<b>49</b>	<b>406</b>	<b>17</b>	<b>275</b>	<b>8</b>	<b>300</b>	<b>153</b>	<b>517</b>	<b>2</b>	<b>672</b>	<b>1623</b>
08:00 AM	3	18	25	46	3	86	12	101	3	58	1	62	30	106	0	136	345
08:15 AM	1	10	16	27	6	65	9	80	12	60	0	72	40	128	1	169	348
08:30 AM	1	11	13	25	5	66	7	78	5	66	0	71	26	101	1	128	302
08:45 AM	2	14	11	27	3	66	7	76	8	67	0	75	31	117	1	149	327
<b>Total</b>	<b>7</b>	<b>53</b>	<b>65</b>	<b>125</b>	<b>17</b>	<b>283</b>	<b>35</b>	<b>335</b>	<b>28</b>	<b>251</b>	<b>1</b>	<b>280</b>	<b>127</b>	<b>452</b>	<b>3</b>	<b>582</b>	<b>1322</b>
<b>Grand Total</b>	<b>27</b>	<b>144</b>	<b>263</b>	<b>434</b>	<b>52</b>	<b>868</b>	<b>108</b>	<b>1028</b>	<b>47</b>	<b>650</b>	<b>13</b>	<b>710</b>	<b>392</b>	<b>1307</b>	<b>6</b>	<b>1705</b>	<b>3877</b>
Apprch %	6.2	33.2	60.6		5.1	84.4	10.5		6.6	91.5	1.8		23	76.7	0.4		
Total %	0.7	3.7	6.8	11.2	1.3	22.4	2.8	26.5	1.2	16.8	0.3	18.3	10.1	33.7	0.2	44	

Start Time	Summer Street Northbound				Summer Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
1 Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	3	12	37	52	9	72	7	88	6	57	3	66	40	123	0	163	369
07:15 AM	2	16	52	70	7	78	5	90	4	71	2	77	29	133	2	164	401
07:30 AM	2	19	47	68	10	93	11	114	6	88	2	96	43	115	0	158	436
07:45 AM	5	21	29	55	3	85	26	114	1	59	1	61	41	146	0	187	417
Total Volume	12	68	165	245	29	328	49	406	17	275	8	300	153	517	2	672	1623
% App. Total	4.9	27.8	67.3		7.1	80.8	12.1		5.7	91.7	2.7		22.8	76.9	0.3		
PHF	.600	.810	.793	.875	.725	.882	.471	.890	.708	.781	.667	.781	.890	.885	.250	.898	.931

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				07:30 AM				07:45 AM			
+0 mins.	3	12	37	52	7	78	5	90	6	57	3	66	40	123	0	163
+15 mins.	2	16	52	70	10	93	11	114	4	71	2	77	29	133	2	164
+30 mins.	2	19	47	68	3	85	26	114	6	88	2	96	43	115	0	158
+45 mins.	5	21	29	55	3	86	12	101	1	59	1	61	41	146	0	187
Total Volume	12	68	165	245	23	342	54	419	17	275	8	300	153	517	2	672
% App. Total	4.9	27.8	67.3		5.5	81.6	12.9		5.7	91.7	2.7		22.8	76.9	0.3	
PHF	.600	.810	.793	.875	.575	.919	.519	.919	.708	.781	.667	.781	.890	.885	.250	.898

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-901-8300  
 www.tsetraffic.com

File Name : Sumfrank AM  
 Site Code : 6  
 Start Date : 9/19/2013  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Summer Street Northbound				Summer Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	3	0	3	4
06:15 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	3
06:30 AM	0	0	0	0	0	0	0	0	0	5	0	5	0	3	0	3	8
06:45 AM	0	0	0	0	0	1	0	1	0	2	0	2	0	3	0	3	6
<b>Total</b>	0	0	0	0	0	1	0	1	0	10	0	10	0	10	0	10	21
07:00 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	3	0	3	7
07:15 AM	0	0	0	0	0	1	0	1	0	4	0	4	0	3	0	3	8
07:30 AM	0	0	0	0	0	0	0	0	0	7	0	7	0	6	0	6	13
07:45 AM	0	0	1	1	0	0	1	1	0	4	0	4	1	2	0	3	9
<b>Total</b>	0	0	1	1	0	1	1	2	0	19	0	19	1	14	0	15	37
08:00 AM	1	0	0	1	0	0	0	0	0	8	0	8	0	4	0	4	13
08:15 AM	0	0	0	0	0	0	0	0	0	6	0	6	0	3	0	3	9
08:30 AM	0	0	0	0	0	0	0	0	0	6	0	6	0	4	0	4	10
08:45 AM	0	0	0	0	0	0	0	0	0	8	0	8	0	5	0	5	13
<b>Total</b>	1	0	0	1	0	0	0	0	0	28	0	28	0	16	0	16	45
<b>Grand Total</b>	1	0	1	2	0	2	1	3	0	57	0	57	1	40	0	41	103
Apprch %	50	0	50		0	66.7	33.3		0	100	0		2.4	97.6	0		
Total %	1	0	1	1.9	0	1.9	1	2.9	0	55.3	0	55.3	1	38.8	0	39.8	

Start Time	Summer Street Northbound				Summer Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	1	0	0	1	0	0	0	0	0	8	0	8	0	4	0	4	13
08:15 AM	0	0	0	0	0	0	0	0	0	6	0	6	0	3	0	3	9
08:30 AM	0	0	0	0	0	0	0	0	0	6	0	6	0	4	0	4	10
08:45 AM	0	0	0	0	0	0	0	0	0	8	0	8	0	5	0	5	13
<b>Total Volume</b>	1	0	0	1	0	0	0	0	0	28	0	28	0	16	0	16	45
<b>% App. Total</b>	100	0	0		0	0	0		0	100	0		0	100	0		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.875	.000	.875	.000	.800	.000	.800	.865

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

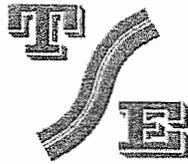
	07:15 AM				06:30 AM				08:00 AM				07:15 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	8	0	8	0	3	0	3
+15 mins.	0	0	0	0	0	1	0	1	0	6	0	6	0	6	0	6
+30 mins.	0	0	1	1	0	0	0	0	0	6	0	6	1	2	0	3
+45 mins.	1	0	0	1	0	1	0	1	0	8	0	8	0	4	0	4
<b>Total Volume</b>	1	0	1	2	0	2	0	2	0	28	0	28	1	15	0	16
<b>% App. Total</b>	50	0	50		0	100	0		0	100	0		6.2	93.8	0	
PHF	.250	.000	.250	.500	.000	.500	.000	.500	.000	.875	.000	.875	.250	.625	.000	.667

V/S Street : Summer Street  
V/W Street : Franklin Street  
City/State : Stoneham, MA  
Weather : Clear

Groups Printed- Bikes Peds

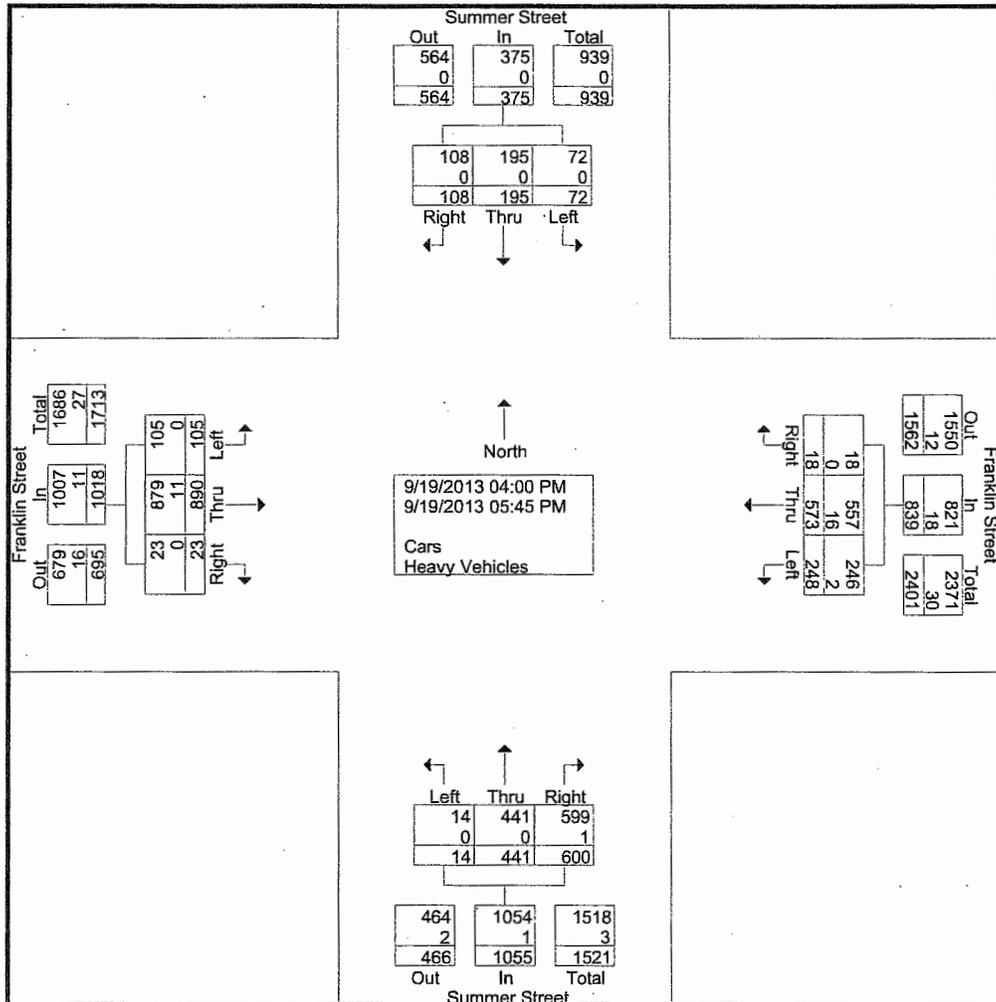
Start Time	Summer St From North				Franklin St From East				Summer St From South				Franklin St From West				Exclu. Total	Inclu. Total	Int. Total	
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds				
07:00 AM	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	1	2	3
07:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	3	0	1	0	0	0	0	1	0	1	0	1	3	4	7
Grand Total	0	0	0	0	0	3	0	1	0	0	0	1	0	1	0	1	3	4	7	
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0					
Total %	0	0	0		0	75	0		0	0	0		0	25	0		42.9	57.1		

Start Time	Summer St From North				Franklin St From East				Summer St From South				Franklin St From West				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:00 AM																		
07:00 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	3	0	3	0	0	0	0	0	0	1	0	1	4
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0			
PHF	.000	.000	.000	.000	.000	.375	.000	.375	.000	.000	.000	.000	.000	.250	.000	.250	.500	



Groups Printed- Cars - Heavy Vehicles

Start Time	Summer Street Northbound				Summer Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	2	38	63	103	8	18	10	36	11	100	2	113	26	56	3	85	337
04:15 PM	0	38	63	101	7	22	11	40	11	94	3	108	29	55	2	86	335
04:30 PM	3	43	79	125	10	20	11	41	9	102	6	117	30	64	3	97	380
04:45 PM	3	44	79	126	6	22	15	43	10	121	1	132	38	66	3	107	408
<b>Total</b>	<b>8</b>	<b>163</b>	<b>284</b>	<b>455</b>	<b>31</b>	<b>82</b>	<b>47</b>	<b>160</b>	<b>41</b>	<b>417</b>	<b>12</b>	<b>470</b>	<b>123</b>	<b>241</b>	<b>11</b>	<b>375</b>	<b>1460</b>
05:00 PM	1	53	69	123	7	31	19	57	17	114	2	133	27	59	1	87	400
05:15 PM	2	68	78	148	10	36	15	61	16	118	3	137	31	99	2	132	478
05:30 PM	1	78	87	166	13	25	15	53	17	119	3	139	37	94	2	133	491
05:45 PM	2	79	82	163	11	21	12	44	14	122	3	139	30	80	2	112	458
<b>Total</b>	<b>6</b>	<b>278</b>	<b>316</b>	<b>600</b>	<b>41</b>	<b>113</b>	<b>61</b>	<b>215</b>	<b>64</b>	<b>473</b>	<b>11</b>	<b>548</b>	<b>125</b>	<b>332</b>	<b>7</b>	<b>464</b>	<b>1827</b>
<b>Grand Total</b>	<b>14</b>	<b>441</b>	<b>600</b>	<b>1055</b>	<b>72</b>	<b>195</b>	<b>108</b>	<b>375</b>	<b>105</b>	<b>890</b>	<b>23</b>	<b>1018</b>	<b>248</b>	<b>573</b>	<b>18</b>	<b>839</b>	<b>3287</b>
Apprch %	1.3	41.8	56.9		19.2	52	28.8		10.3	87.4	2.3		29.6	68.3	2.1		
Total %	0.4	13.4	18.3	32.1	2.2	5.9	3.3	11.4	3.2	27.1	0.7	31	7.5	17.4	0.5	25.5	
<b>Cars</b>	<b>14</b>	<b>441</b>	<b>599</b>	<b>1054</b>	<b>72</b>	<b>195</b>	<b>108</b>	<b>375</b>	<b>105</b>	<b>879</b>	<b>23</b>	<b>1007</b>	<b>246</b>	<b>557</b>	<b>18</b>	<b>821</b>	<b>6514</b>
<b>% Cars</b>	<b>100</b>	<b>100</b>	<b>99.8</b>	<b>99.9</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>98.8</b>	<b>100</b>	<b>98.9</b>	<b>99.2</b>	<b>97.2</b>	<b>100</b>	<b>97.9</b>	<b>99.1</b>
Heavy Vehicles	0	0	1	1	0	0	0	0	0	11	0	11	2	16	0	18	60
% Heavy Vehicles	0	0	0.2	0.1	0	0	0	0	0	1.2	0	1.1	0.8	2.8	0	2.1	0.9



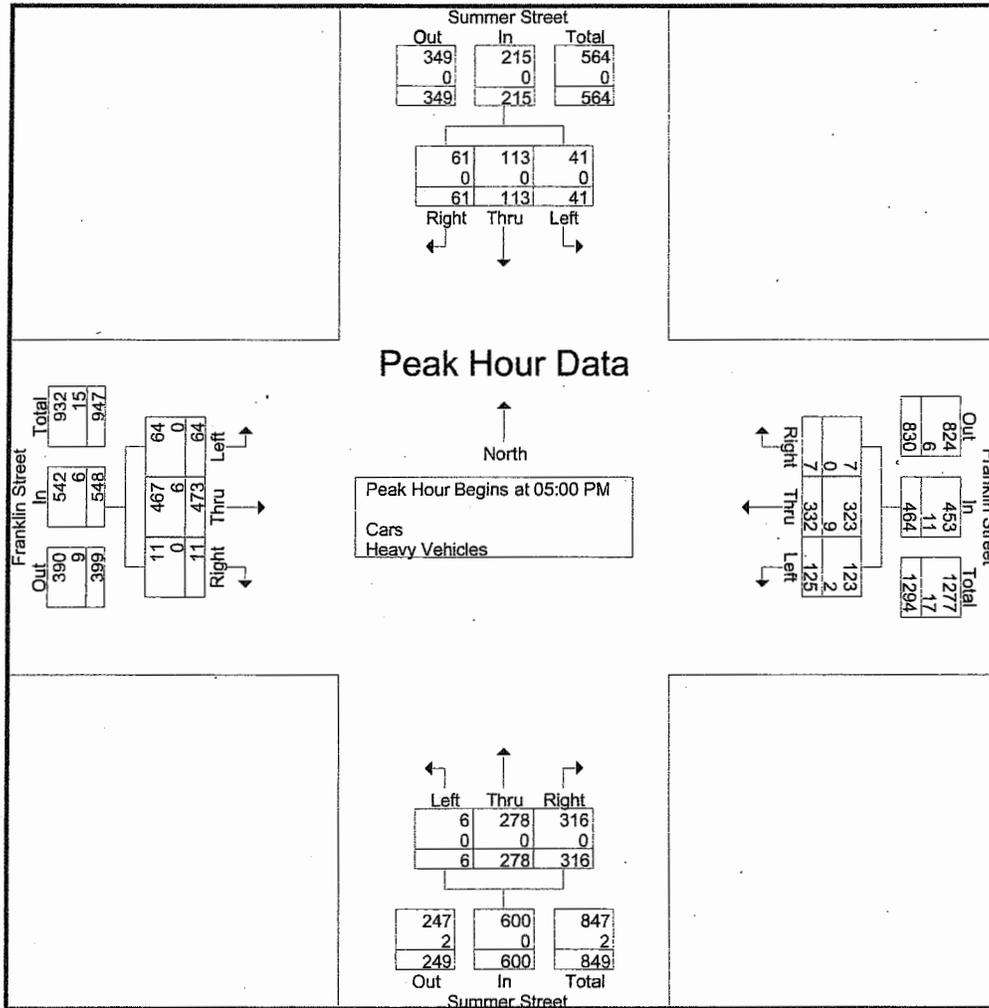
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Sumfrank PM  
 Site Code : 6  
 Start Date : 9/19/2013  
 Page No : 2 of 4

Start Time	Summer Street Northbound				Summer Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	1	53	69	123	7	31	19	57	17	114	2	133	27	59	1	87	400
05:15 PM	2	68	78	148	10	36	15	61	16	118	3	137	31	99	2	132	478
05:30 PM	1	78	87	166	13	25	15	53	17	119	3	139	37	94	2	133	491
05:45 PM	2	79	82	163	11	21	12	44	14	122	3	139	30	80	2	112	458
Total Volume	6	278	316	600	41	113	61	215	64	473	11	548	125	332	7	464	1827
% App. Total	1	46.3	52.7		19.1	52.6	28.4		11.7	86.3	2		26.9	71.6	1.5		
PHF	.750	.880	.908	.904	.788	.785	.803	.881	.941	.969	.917	.986	.845	.838	.875	.872	.930
Cars	6	278	316	600	41	113	61	215	64	467	11	542	123	323	7	453	1810
% Cars	100	100	100	100	100	100	100	100	100	98.7	100	98.9	98.4	97.3	100	97.6	99.1
Heavy Vehicles	0	0	0	0	0	0	0	0	0	6	0	6	2	9	0	11	17
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	1.3	0	1.1	1.6	2.7	0	2.4	0.9



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-301-8800  
 www.tsetraffic.com

File Name : Sumfrank PM  
 Site Code : 6  
 Start Date : 9/19/2013  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Summer Street Northbound				Summer Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	2	38	63	103	8	18	10	36	11	99	2	112	26	55	3	84	335
04:15 PM	0	38	63	101	7	22	11	40	11	93	3	107	29	54	2	85	333
04:30 PM	3	43	79	125	10	20	11	41	9	100	6	115	30	62	3	95	376
04:45 PM	3	44	78	125	6	22	15	43	10	120	1	131	38	63	3	104	403
Total	8	163	283	454	31	82	47	160	41	412	12	465	123	234	11	368	1447
05:00 PM	1	53	69	123	7	31	19	57	17	112	2	131	27	56	1	84	395
05:15 PM	2	68	78	148	10	36	15	61	16	117	3	136	31	97	2	130	475
05:30 PM	1	78	87	166	13	25	15	53	17	118	3	138	35	93	2	130	487
05:45 PM	2	79	82	163	11	21	12	44	14	120	3	137	30	77	2	109	453
Total	6	278	316	600	41	113	61	215	64	467	11	542	123	323	7	453	1810
Grand Total	14	441	599	1054	72	195	108	375	105	879	23	1007	246	557	18	821	3257
Apprch %	1.3	41.8	56.8		19.2	52	28.8		10.4	87.3	2.3		30	67.8	2.2		
Total %	0.4	13.5	18.4	32.4	2.2	6	3.3	11.5	3.2	27	0.7	30.9	7.6	17.1	0.6	25.2	

Start Time	Summer Street Northbound				Summer Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	1	53	69	123	7	31	19	57	17	112	2	131	27	56	1	84	395
05:15 PM	2	68	78	148	10	36	15	61	16	117	3	136	31	97	2	130	475
05:30 PM	1	78	87	166	13	25	15	53	17	118	3	138	35	93	2	130	487
05:45 PM	2	79	82	163	11	21	12	44	14	120	3	137	30	77	2	109	453
Total Volume	6	278	316	600	41	113	61	215	64	467	11	542	123	323	7	453	1810
% App. Total	1	46.3	52.7		19.1	52.6	28.4		11.8	86.2	2		27.2	71.3	1.5		
PHF	.750	.880	.908	.904	.788	.785	.803	.881	.941	.973	.917	.982	.879	.832	.875	.871	.929

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

Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM				
+0 mins.	1	53	69	123	7	31	19	57	17	112	2	131	27	56	1	84	395
+15 mins.	2	68	78	148	10	36	15	61	16	117	3	136	31	97	2	130	475
+30 mins.	1	78	87	166	13	25	15	53	17	118	3	138	35	93	2	130	487
+45 mins.	2	79	82	163	11	21	12	44	14	120	3	137	30	77	2	109	453
Total Volume	6	278	316	600	41	113	61	215	64	467	11	542	123	323	7	453	1810
% App. Total	1	46.3	52.7		19.1	52.6	28.4		11.8	86.2	2		27.2	71.3	1.5		
PHF	.750	.880	.908	.904	.788	.785	.803	.881	.941	.973	.917	.982	.879	.832	.875	.871	.929

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-201-8800  
 www.tsetraffic.com

File Name : Sumfrank PM  
 Site Code : 6  
 Start Date : 9/19/2013  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Summer Street Northbound				Summer Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
04:30 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	2	4
04:45 PM	0	0	1	1	0	0	0	0	0	1	0	1	0	3	0	3	5
Total	0	0	1	1	0	0	0	0	0	5	0	5	0	7	0	7	13
05:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	5
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
05:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	2	1	0	3	4
05:45 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	5
Total	0	0	0	0	0	0	0	0	0	6	0	6	2	9	0	11	17
Grand Total	0	0	1	1	0	0	0	0	0	11	0	11	2	16	0	18	30
Apprch %	0	0	100		0	0	0		0	100	0		11.1	88.9	0		
Total %	0	0	3.3	3.3	0	0	0	0	0	36.7	0	36.7	6.7	53.3	0	60	

Start Time	Summer Street Northbound				Summer Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	2	4
04:45 PM	0	0	1	1	0	0	0	0	0	1	0	1	0	3	0	3	5
05:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	5
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
Total Volume	0	0	1	1	0	0	0	0	0	6	0	6	0	10	0	10	17
% App. Total	0	0	100		0	0	0		0	100	0		0	100	0		
PHF	.000	.000	.250	.250	.000	.000	.000	.000	.000	.750	.000	.750	.000	.833	.000	.833	.850

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

	04:00 PM				04:15 PM				04:45 PM						
+0 mins.	0	0	0	0	0	0	0	0	1	0	1	0	3	0	3
+15 mins.	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3
+30 mins.	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2
+45 mins.	0	0	1	1	0	0	0	0	2	0	2	2	1	0	3
Total Volume	0	0	1	1	0	0	0	0	6	0	6	2	9	0	11
% App. Total	0	0	100		0	0	0		100	0		18.2	81.8	0	
PHF	.000	.000	.250	.250	.000	.000	.000	.000	.750	.000	.750	.250	.750	.000	.917

N/S Street : Summer Street  
E/W Street : Franklin Street  
City/State : Stoneham, MA  
Weather : Clear

**Groups Printed- Bikes Peds**

Start Time	Summer St From North				Franklin St From East				Summer St From South				Franklin St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
05:00 PM	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	2	2	4
05:15 PM	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	1	3	1	4
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
<b>Total</b>	0	0	1	2	1	0	0	2	0	0	0	2	1	1	0	1	7	4	11
<b>Grand Total</b>	0	0	1	2	1	0	0	2	0	0	0	2	1	1	0	1	7	4	11
Apprch %	0	0	100		100	0	0		0	0	0		50	50	0				
Total %	0	0	25		25	0	0		0	0	0		25	25	0		63.6	36.4	

Start Time	Summer St From North				Franklin St From East				Summer St From South				Franklin St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	2
05:15 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
<b>Total Volume</b>	0	0	1	1	1	0	0	1	0	0	0	0	1	1	0	2	4
<b>% App. Total</b>	0	0	100		100	0	0		0	0	0		50	50	0		
<b>PHF</b>	.000	.000	.250	.250	.250	.000	.000	.250	.000	.000	.000	.000	.250	.250	.000	.500	.500

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

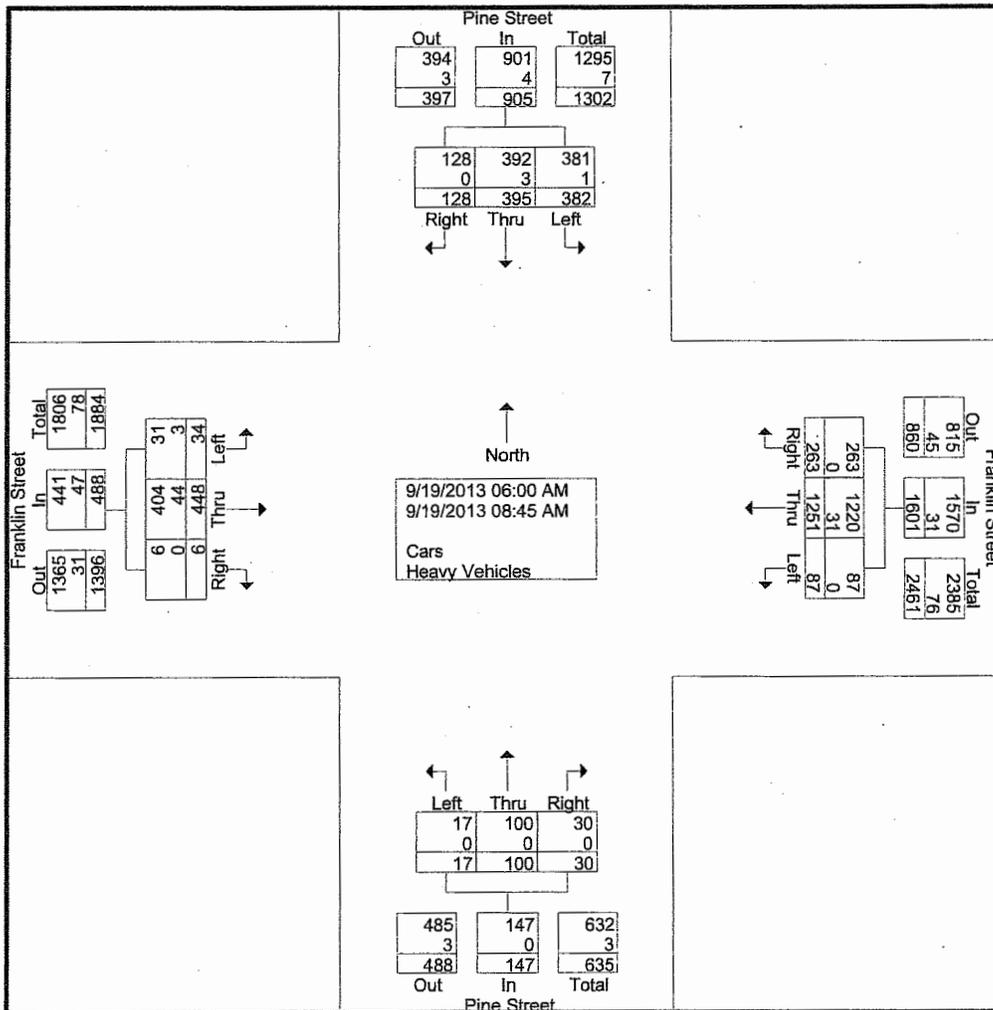


**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-443-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Pine AM  
 Site Code : 8  
 Start Date : 9/19/2013  
 Page No : 1 of 4

Groups Printed- Cars - Heavy Vehicles

Start Time	Pine Street Northbound				Pine Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	0	0	1	1	8	17	4	29	1	15	0	16	2	32	4	38	84
06:15 AM	0	4	0	4	12	21	4	37	1	18	1	20	1	45	4	50	111
06:30 AM	0	3	1	4	13	24	4	41	4	30	0	34	3	77	12	92	171
06:45 AM	1	1	0	2	26	27	10	63	2	29	0	31	3	86	21	110	206
Total	1	8	2	11	59	89	22	170	8	92	1	101	9	240	41	290	572
07:00 AM	1	1	1	3	30	32	12	74	2	39	0	41	5	104	23	132	250
07:15 AM	1	11	4	16	64	42	21	127	1	57	1	59	4	123	28	155	357
07:30 AM	2	6	3	11	49	43	18	110	0	45	0	45	5	110	31	146	312
07:45 AM	1	22	4	27	52	55	22	129	1	33	1	35	13	127	48	188	379
Total	5	40	12	57	195	172	73	440	4	174	2	180	27	464	130	621	1298
08:00 AM	3	15	4	22	43	40	14	97	3	36	1	40	14	139	34	187	346
08:15 AM	5	12	4	21	25	38	9	72	7	45	0	52	14	142	20	176	321
08:30 AM	3	10	3	16	30	33	5	68	5	44	0	49	11	136	17	164	297
08:45 AM	0	15	5	20	30	23	5	58	7	57	2	66	12	130	21	163	307
Total	11	52	16	79	128	134	33	295	22	182	3	207	51	547	92	690	1271
Grand Total	17	100	30	147	382	395	128	905	34	448	6	488	87	1251	263	1601	3141
Apprch %	11.6	68	20.4		42.2	43.6	14.1		7	91.8	1.2		5.4	78.1	16.4		
Total %	0.5	3.2	1	4.7	12.2	12.6	4.1	28.8	1.1	14.3	0.2	15.5	2.8	39.8	8.4	51	
Cars	17	100	30	147	381	392	128	901	31	404	6	441	87	1220	263	1570	6118
% Cars	100	100	100	100	99.7	99.2	100	99.6	91.2	90.2	100	90.4	100	97.5	100	98.1	97.4
Heavy Vehicles	0	0	0	0	1	3	0	4	3	44	0	47	0	31	0	31	164
% Heavy Vehicles	0	0	0	0	0.3	0.8	0	0.4	8.8	9.8	0	9.6	0	2.5	0	1.9	2.6



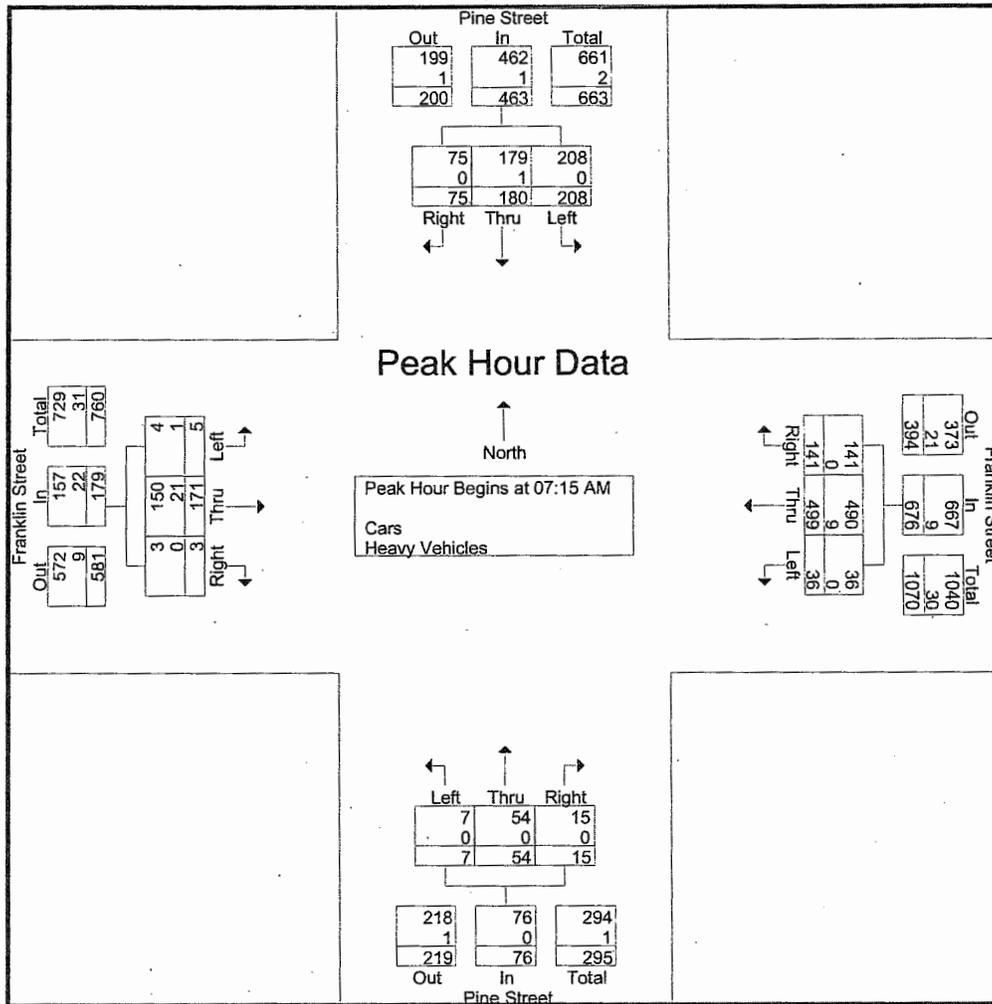
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 108 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Pine AM  
 Site Code : 8  
 Start Date : 9/19/201:  
 Page No : 2 of 4

Start Time	Pine Street Northbound				Pine Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	11	4	16	64	42	21	127	1	57	1	59	4	123	28	155	357
07:30 AM	2	6	3	11	49	43	18	110	0	45	0	45	5	110	31	146	312
07:45 AM	1	22	4	27	52	55	22	129	1	33	1	35	13	127	48	188	379
08:00 AM	3	15	4	22	43	40	14	97	3	36	1	40	14	139	34	187	346
Total Volume	7	54	15	76	208	180	75	463	5	171	3	179	36	499	141	676	1394
% App. Total	9.2	71.1	19.7		44.9	38.9	16.2		2.8	95.5	1.7		5.3	73.8	20.9		
PHF	.583	.614	.938	.704	.813	.818	.852	.897	.417	.750	.750	.758	.643	.897	.734	.899	.920
Cars	7	54	15	76	208	179	75	462	4	150	3	157	36	490	141	667	1362
% Cars	100	100	100	100	100	99.4	100	99.8	80.0	87.7	100	87.7	100	98.2	100	98.7	97.7
Heavy Vehicles	0	0	0	0	0	1	0	1	1	21	0	22	0	9	0	9	32
% Heavy Vehicles	0	0	0	0	0	0.6	0	0.2	20.0	12.3	0	12.3	0	1.8	0	1.3	2.3



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-443-5686  
 F: 617-801-8300  
 www.tsetraffic.com

File Name : Pine AM  
 Site Code : 8  
 Start Date : 9/19/2013  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Pine Street Northbound				Pine Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	0	0	1	1	8	17	4	29	1	14	0	15	2	30	4	36	81
06:15 AM	0	4	0	4	12	21	4	37	1	17	1	19	1	43	4	48	108
06:30 AM	0	3	1	4	13	24	4	41	2	27	0	29	3	76	12	91	165
06:45 AM	1	1	0	2	25	27	10	62	2	28	0	30	3	84	21	108	202
<b>Total</b>	<b>1</b>	<b>8</b>	<b>2</b>	<b>11</b>	<b>58</b>	<b>89</b>	<b>22</b>	<b>169</b>	<b>6</b>	<b>86</b>	<b>1</b>	<b>93</b>	<b>9</b>	<b>233</b>	<b>41</b>	<b>283</b>	<b>556</b>
07:00 AM	1	1	1	3	30	30	12	72	2	34	0	36	5	101	23	129	240
07:15 AM	1	11	4	16	64	42	21	127	0	52	1	53	4	120	28	152	348
07:30 AM	2	6	3	11	49	43	18	110	0	41	0	41	5	108	31	144	306
07:45 AM	1	22	4	27	52	54	22	128	1	27	1	29	13	126	48	187	371
<b>Total</b>	<b>5</b>	<b>40</b>	<b>12</b>	<b>57</b>	<b>195</b>	<b>169</b>	<b>73</b>	<b>437</b>	<b>3</b>	<b>154</b>	<b>2</b>	<b>159</b>	<b>27</b>	<b>455</b>	<b>130</b>	<b>612</b>	<b>1265</b>
08:00 AM	3	15	4	22	43	40	14	97	3	30	1	34	14	136	34	184	337
08:15 AM	5	12	4	21	25	38	9	72	7	38	0	45	14	139	20	173	311
08:30 AM	3	10	3	16	30	33	5	68	5	41	0	46	11	132	17	160	290
08:45 AM	0	15	5	20	30	23	5	58	7	55	2	64	12	125	21	158	300
<b>Total</b>	<b>11</b>	<b>52</b>	<b>16</b>	<b>79</b>	<b>128</b>	<b>134</b>	<b>33</b>	<b>295</b>	<b>22</b>	<b>164</b>	<b>3</b>	<b>189</b>	<b>51</b>	<b>532</b>	<b>92</b>	<b>675</b>	<b>1238</b>
<b>Grand Total</b>	<b>17</b>	<b>100</b>	<b>30</b>	<b>147</b>	<b>381</b>	<b>392</b>	<b>128</b>	<b>901</b>	<b>31</b>	<b>404</b>	<b>6</b>	<b>441</b>	<b>87</b>	<b>1220</b>	<b>263</b>	<b>1570</b>	<b>3059</b>
Apprch %	11.6	68	20.4		42.3	43.5	14.2		7	91.6	1.4		5.5	77.7	16.8		
Total %	0.6	3.3	1	4.8	12.5	12.8	4.2	29.5	1	13.2	0.2	14.4	2.8	39.9	8.6	51.3	

Start Time	Pine Street Northbound				Pine Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	11	4	16	<b>64</b>	42	21	127	0	<b>52</b>	<b>1</b>	<b>53</b>	4	120	28	152	348
07:30 AM	2	6	3	11	49	43	18	110	0	41	0	41	5	108	31	144	306
07:45 AM	1	<b>22</b>	4	<b>27</b>	52	<b>54</b>	<b>22</b>	<b>128</b>	1	27	1	29	13	126	<b>48</b>	<b>187</b>	<b>371</b>
08:00 AM	<b>3</b>	15	4	22	43	40	14	97	<b>3</b>	30	1	34	<b>14</b>	<b>136</b>	34	184	337
Total Volume	7	54	15	76	208	179	75	462	4	150	3	157	36	490	141	667	1362
% App. Total	9.2	71.1	19.7		45	38.7	16.2		2.5	95.5	1.9		5.4	73.5	21.1		
PHF	.583	.614	.938	.704	.813	.829	.852	.902	.333	.721	.750	.741	.643	.901	.734	.892	.918

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:45 AM				07:15 AM				08:00 AM				07:45 AM			
+0 mins.	1	<b>22</b>	4	<b>27</b>	<b>64</b>	42	21	127	3	30	1	34	13	126	<b>48</b>	<b>187</b>
+15 mins.	3	15	4	22	49	43	18	110	7	38	0	45	<b>14</b>	136	34	184
+30 mins.	<b>5</b>	12	4	21	52	<b>54</b>	<b>22</b>	<b>128</b>	5	41	0	46	14	<b>139</b>	20	173
+45 mins.	3	10	3	16	43	40	14	97	7	<b>55</b>	<b>2</b>	<b>64</b>	11	132	17	160
Total Volume	12	59	15	86	208	179	75	462	22	164	3	189	52	533	119	704
% App. Total	14	68.6	17.4		45	38.7	16.2		11.6	86.8	1.6		7.4	75.7	16.9	
PHF	.600	.670	.938	.796	.813	.829	.852	.902	.786	.745	.375	.738	.929	.959	.620	.941

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5636  
 F: 617-301-3800  
 www.tsetraffic.com

File Name : Pine AM  
 Site Code : 8  
 Start Date : 9/19/2013  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Pine Street Northbound				Pine Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
06:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
06:30 AM	0	0	0	0	0	0	0	0	2	3	0	5	0	1	0	1	6
06:45 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	2	0	2	4
Total	0	0	0	0	1	0	0	1	2	6	0	8	0	7	0	7	16
07:00 AM	0	0	0	0	0	2	0	2	0	5	0	5	0	3	0	3	10
07:15 AM	0	0	0	0	0	0	0	0	1	5	0	6	0	3	0	3	9
07:30 AM	0	0	0	0	0	0	0	0	0	4	0	4	0	2	0	2	6
07:45 AM	0	0	0	0	0	1	0	1	0	6	0	6	0	1	0	1	8
Total	0	0	0	0	0	3	0	3	1	20	0	21	0	9	0	9	33
08:00 AM	0	0	0	0	0	0	0	0	0	6	0	6	0	3	0	3	9
08:15 AM	0	0	0	0	0	0	0	0	0	7	0	7	0	3	0	3	10
08:30 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	4	0	4	7
08:45 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	5	0	5	7
Total	0	0	0	0	0	0	0	0	0	18	0	18	0	15	0	15	33
Grand Total	0	0	0	0	1	3	0	4	3	44	0	47	0	31	0	31	82
Apprch %	0	0	0	0	25	75	0	4	6.4	93.6	0	47	0	100	0	31	82
Total %	0	0	0	0	1.2	3.7	0	4.9	3.7	53.7	0	57.3	0	37.8	0	37.8	82

Start Time	Pine Street Northbound				Pine Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	1	0	1	0	6	0	6	0	1	0	1	8
08:00 AM	0	0	0	0	0	0	0	0	0	6	0	6	0	3	0	3	9
08:15 AM	0	0	0	0	0	0	0	0	0	7	0	7	0	3	0	3	10
08:30 AM	0	0	0	0	0	0	0	0	0	3	0	3	0	4	0	4	7
Total Volume	0	0	0	0	0	1	0	1	0	22	0	22	0	11	0	11	34
% App. Total	0	0	0	0	0	100	0	1	0	100	0	22	0	100	0	11	34
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.786	.000	.786	.000	.688	.000	.688	.850

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

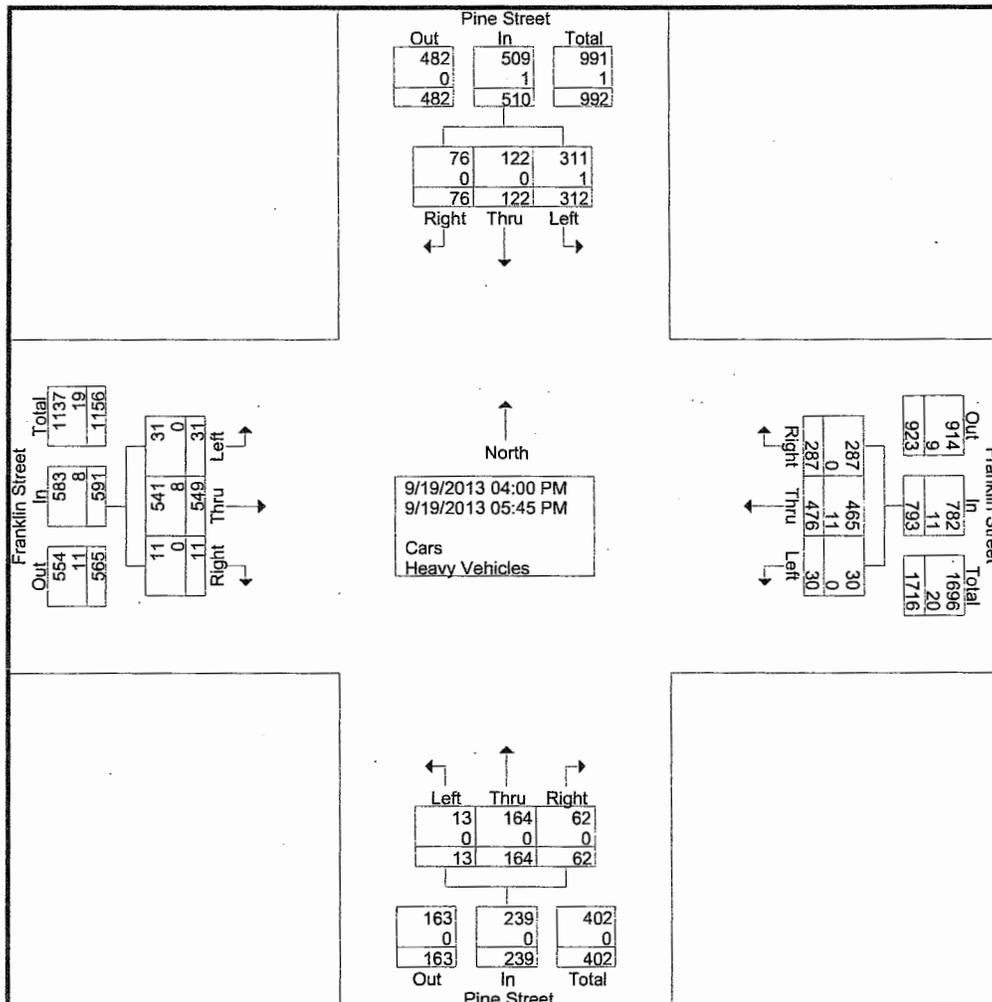
	06:00 AM				06:15 AM				07:30 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	4	0	4	0	3	0	3
+15 mins.	0	0	0	0	0	0	0	0	0	6	0	6	0	3	0	3
+30 mins.	0	0	0	0	1	0	0	1	0	6	0	6	0	4	0	4
+45 mins.	0	0	0	0	0	2	0	2	0	7	0	7	0	5	0	5
Total Volume	0	0	0	0	1	2	0	3	0	23	0	23	0	15	0	15
% App. Total	0	0	0	0	33.3	66.7	0	3	0	100	0	23	0	100	0	15
PHF	.000	.000	.000	.000	.250	.250	.000	.375	.000	.821	.000	.821	.000	.750	.000	.750





Groups Printed- Cars - Heavy Vehicles

Start Time	Pine Street Northbound				Pine Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	2	17	3	22	35	16	7	58	4	69	1	74	2	52	24	78	232
04:15 PM	0	14	3	17	37	14	9	60	4	63	0	67	3	45	27	75	219
04:30 PM	3	14	3	20	39	14	8	61	4	68	0	72	2	48	25	75	228
04:45 PM	1	20	9	30	37	17	11	65	4	71	1	76	3	63	29	95	266
Total	6	65	18	89	148	61	35	244	16	271	2	289	10	208	105	323	945
05:00 PM	1	24	8	33	36	12	10	58	3	63	1	67	6	57	37	100	258
05:15 PM	3	28	10	41	51	14	10	75	2	69	1	72	6	65	51	122	310
05:30 PM	2	22	13	37	38	21	15	74	6	76	5	87	5	88	44	137	335
05:45 PM	1	25	13	39	39	14	6	59	4	70	2	76	3	58	50	111	285
Total	7	99	44	150	164	61	41	266	15	278	9	302	20	268	182	470	1188
Grand Total	13	164	62	239	312	122	76	510	31	549	11	591	30	476	287	793	2133
Apprch %	5.4	68.6	25.9		61.2	23.9	14.9		5.2	92.9	1.9		3.8	60	36.2		
Total %	0.6	7.7	2.9	11.2	14.6	5.7	3.6	23.9	1.5	25.7	0.5	27.7	1.4	22.3	13.5	37.2	
Cars	13	164	62	239	311	122	76	509	31	541	11	583	30	465	287	782	4226
% Cars	100	100	100	100	99.7	100	100	99.8	100	98.5	100	98.6	100	97.7	100	98.6	99.1
Heavy Vehicles	0	0	0	0	1	0	0	1	0	8	0	8	0	11	0	11	40
% Heavy Vehicles	0	0	0	0	0.3	0	0	0.2	0	1.5	0	1.4	0	2.3	0	1.4	0.9



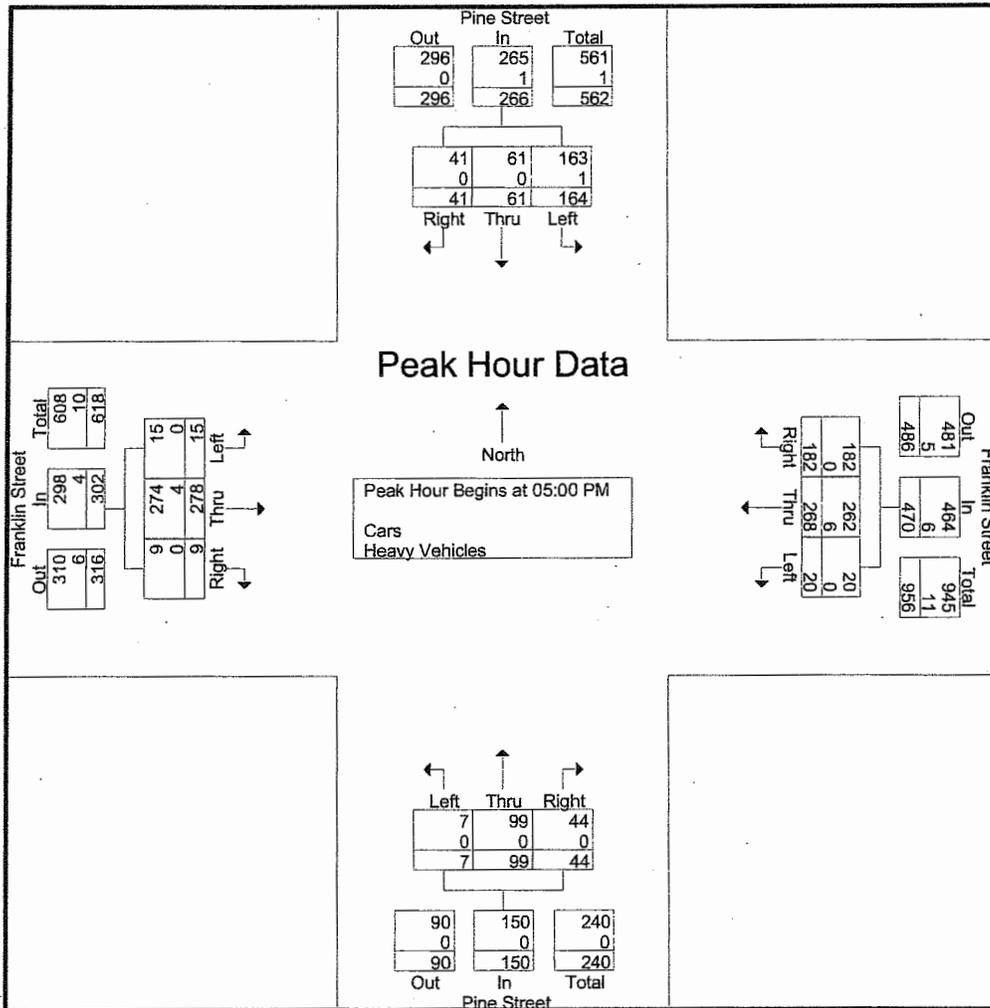
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



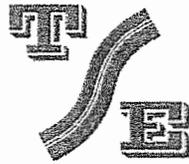
**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Pine PM  
 Site Code : 8  
 Start Date : 9/19/2013  
 Page No : 2 of 4

Start Time	Pine Street Northbound				Pine Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	1	24	8	33	36	12	10	58	3	63	1	67	6	57	37	100	258
05:15 PM	3	28	10	41	51	14	10	75	2	69	1	72	6	65	51	122	310
05:30 PM	2	22	13	37	38	21	15	74	6	76	5	87	5	88	44	137	335
05:45 PM	1	25	13	39	39	14	6	59	4	70	2	76	3	58	50	111	285
Total Volume	7	99	44	150	164	61	41	266	15	278	9	302	20	268	182	470	1188
% App. Total	4.7	66	29.3		61.7	22.9	15.4		5	92.1	3		4.3	57	38.7		
PHF	.583	.884	.846	.915	.804	.726	.683	.887	.625	.914	.450	.868	.833	.761	.892	.858	.887
Cars	7	99	44	150	163	61	41	265	15	274	9	298	20	262	182	464	1177
% Cars	100	100	100	100	99.4	100	100	99.6	100	98.6	100	98.7	100	97.8	100	98.7	99.1
Heavy Vehicles	0	0	0	0	1	0	0	1	0	4	0	4	0	6	0	6	11
% Heavy Vehicles	0	0	0	0	0.6	0	0	0.4	0	1.4	0	1.3	0	2.2	0	1.3	0.9



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 100 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.isetraffic.com

File Name : Pine PM  
 Site Code : 8  
 Start Date : 9/19/2013  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Pine Street Northbound				Pine Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	2	17	3	22	35	16	7	58	4	68	1	73	2	51	24	77	230
04:15 PM	0	14	3	17	37	14	9	60	4	62	0	66	3	44	27	74	217
04:30 PM	3	14	3	20	39	14	8	61	4	67	0	71	2	47	25	74	226
04:45 PM	1	20	9	30	37	17	11	65	4	70	1	75	3	61	29	93	263
<b>Total</b>	<b>6</b>	<b>65</b>	<b>18</b>	<b>89</b>	<b>148</b>	<b>61</b>	<b>35</b>	<b>244</b>	<b>16</b>	<b>267</b>	<b>2</b>	<b>285</b>	<b>10</b>	<b>203</b>	<b>105</b>	<b>318</b>	<b>936</b>
05:00 PM	1	24	8	33	36	12	10	58	3	62	1	66	6	56	37	99	256
05:15 PM	3	28	10	41	51	14	10	75	2	68	1	71	6	63	51	120	307
05:30 PM	2	22	13	37	37	21	15	73	6	75	5	86	5	87	44	136	332
05:45 PM	1	25	13	39	39	14	6	59	4	69	2	75	3	56	50	109	282
<b>Total</b>	<b>7</b>	<b>99</b>	<b>44</b>	<b>150</b>	<b>163</b>	<b>61</b>	<b>41</b>	<b>265</b>	<b>15</b>	<b>274</b>	<b>9</b>	<b>298</b>	<b>20</b>	<b>262</b>	<b>182</b>	<b>464</b>	<b>1177</b>
<b>Grand Total</b>	<b>13</b>	<b>164</b>	<b>62</b>	<b>239</b>	<b>311</b>	<b>122</b>	<b>76</b>	<b>509</b>	<b>31</b>	<b>541</b>	<b>11</b>	<b>583</b>	<b>30</b>	<b>465</b>	<b>287</b>	<b>782</b>	<b>2113</b>
Apprch %	5.4	68.6	25.9		61.1	24	14.9		5.3	92.8	1.9		3.8	59.5	36.7		
Total %	0.6	7.8	2.9	11.3	14.7	5.8	3.6	24.1	1.5	25.6	0.5	27.6	1.4	22	13.6	37	

Start Time	Pine Street Northbound				Pine Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	1	24	8	33	36	12	10	58	3	62	1	66	6	56	37	99	256
05:15 PM	3	28	10	41	51	14	10	75	2	68	1	71	6	63	51	120	307
05:30 PM	2	22	13	37	37	21	15	73	6	75	5	86	5	87	44	136	332
05:45 PM	1	25	13	39	39	14	6	59	4	69	2	75	3	56	50	109	282
<b>Total Volume</b>	<b>7</b>	<b>99</b>	<b>44</b>	<b>150</b>	<b>163</b>	<b>61</b>	<b>41</b>	<b>265</b>	<b>15</b>	<b>274</b>	<b>9</b>	<b>298</b>	<b>20</b>	<b>262</b>	<b>182</b>	<b>464</b>	<b>1177</b>
% App. Total	4.7	66	29.3		61.5	23	15.5		5	91.9	3		4.3	56.5	39.2		
PHF	.583	.884	.846	.915	.799	.726	.683	.883	.625	.913	.450	.866	.833	.753	.892	.853	.886

	05:00 PM				04:45 PM				04:45 PM				05:00 PM			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
+0 mins.	1	24	8	33	37	17	11	65	4	70	1	75	6	56	37	99
+15 mins.	3	28	10	41	36	12	10	58	3	62	1	66	6	63	51	120
+30 mins.	2	22	13	37	51	14	10	75	2	68	1	71	5	87	44	136
+45 mins.	1	25	13	39	37	21	15	73	6	75	5	86	3	56	50	109
<b>Total Volume</b>	<b>7</b>	<b>99</b>	<b>44</b>	<b>150</b>	<b>161</b>	<b>64</b>	<b>46</b>	<b>271</b>	<b>15</b>	<b>275</b>	<b>8</b>	<b>298</b>	<b>20</b>	<b>262</b>	<b>182</b>	<b>464</b>
% App. Total	4.7	66	29.3		59.4	23.6	17		5	92.3	2.7		4.3	56.5	39.2	
PHF	.583	.884	.846	.915	.789	.762	.767	.903	.625	.917	.400	.866	.833	.753	.892	.853

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Pine PM  
 Site Code : 8  
 Start Date : 9/19/2013  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Pine Street Northbound				Pine Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
<b>Total</b>	0	0	0	0	0	0	0	0	0	4	0	4	0	5	0	5	9
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
05:30 PM	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0	1	3
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
<b>Total</b>	0	0	0	0	1	0	0	1	0	4	0	4	0	6	0	6	11
<b>Grand Total</b>	0	0	0	0	1	0	0	1	0	8	0	8	0	11	0	11	20
Approch %	0	0	0	0	100	0	0	0	0	100	0	0	0	100	0	0	
Total %	0	0	0	0	5	0	0	5	0	40	0	40	0	55	0	55	

Start Time	Pine Street Northbound				Pine Street Southbound				Franklin Street Eastbound				Franklin Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
05:30 PM	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0	1	3
<b>Total Volume</b>	0	0	0	0	1	0	0	1	0	4	0	4	0	6	0	6	11
<b>% App. Total</b>	0	0	0	0	100	0	0	0	0	100	0	0	0	100	0	0	
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	1.000	.000	1.000	.000	.750	.000	.750	.917

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

	04:00 PM				04:45 PM				04:00 PM				04:30 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1
+45 mins.	0	0	0	0	1	0	0	1	0	1	0	1	0	2	0	2
<b>Total Volume</b>	0	0	0	0	1	0	0	1	0	4	0	4	0	6	0	6
<b>% App. Total</b>	0	0	0	0	100	0	0	0	0	100	0	0	0	100	0	0
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	1.000	.000	1.000	.000	.750	.000	.750

**ACCURA COUNTS**  
978-664-2565



N/S Street : Pine Street  
E/W Street : Franklin Street  
City/State : Stoneham, MA  
Weather : Clear

File Name : 16470007  
Site Code : 16470007  
Start Date : 4/10/2014  
Page No : 13

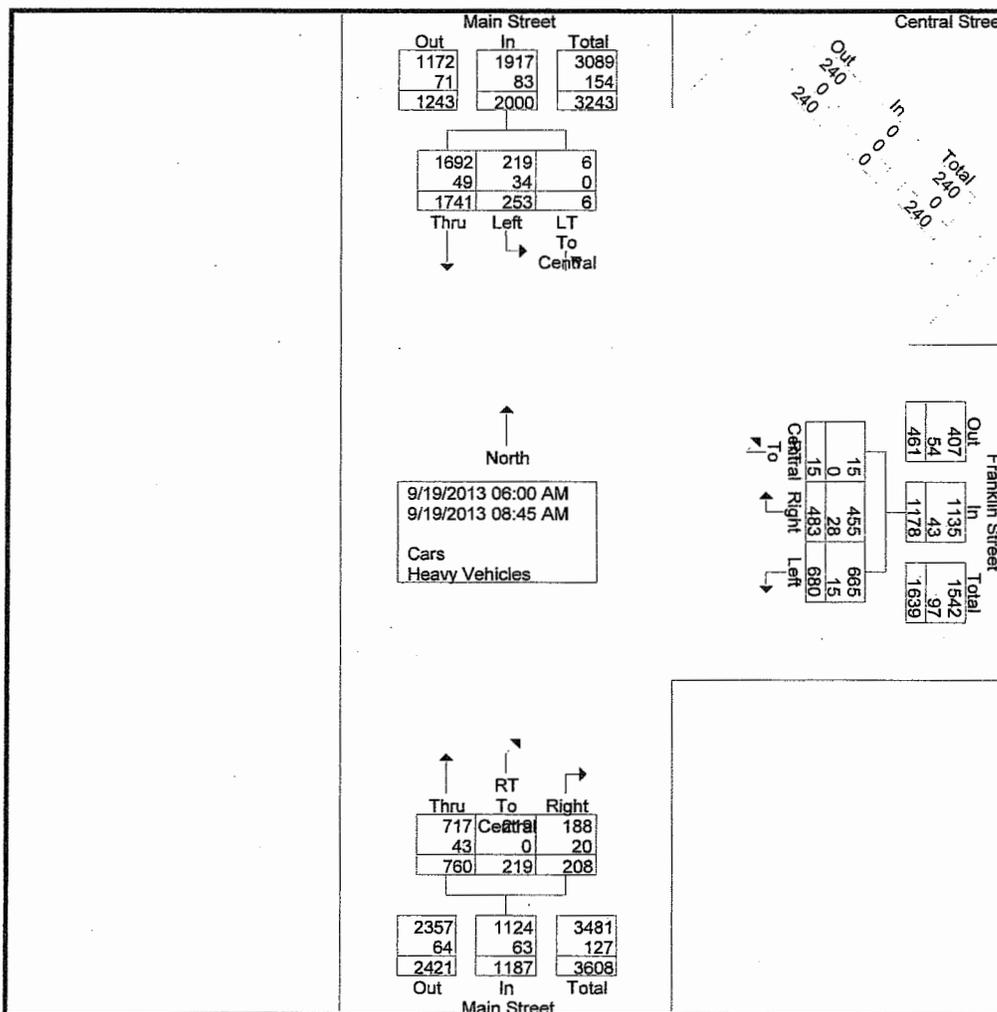
**Groups Printed- Bikes Peds**

Start Time	Pine St From North				Franklin St From East				Pine St From South				Franklin St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
05:00 PM	0	0	1	0	0	1	0	0	0	0	0	3	0	0	0	7	10	2	12
05:15 PM	0	0	0	0	0	0	0	2	0	0	0	3	0	0	0	1	6	0	6
05:30 PM	0	0	0	1	0	0	0	2	0	0	0	3	0	0	0	1	7	0	7
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
<b>Total</b>	0	0	1	1	0	1	0	4	0	0	0	9	0	0	1	9	23	3	26
<b>Grand Total</b>	0	0	1	1	0	1	0	4	0	0	0	9	0	0	1	9	23	3	26
<b>Apprch %</b>	0	0	100		0	100	0		0	0	0		0	0	100				
<b>Total %</b>	0	0	33.3		0	33.3	0		0	0	0		0	0	33.3		88.5	11.5	

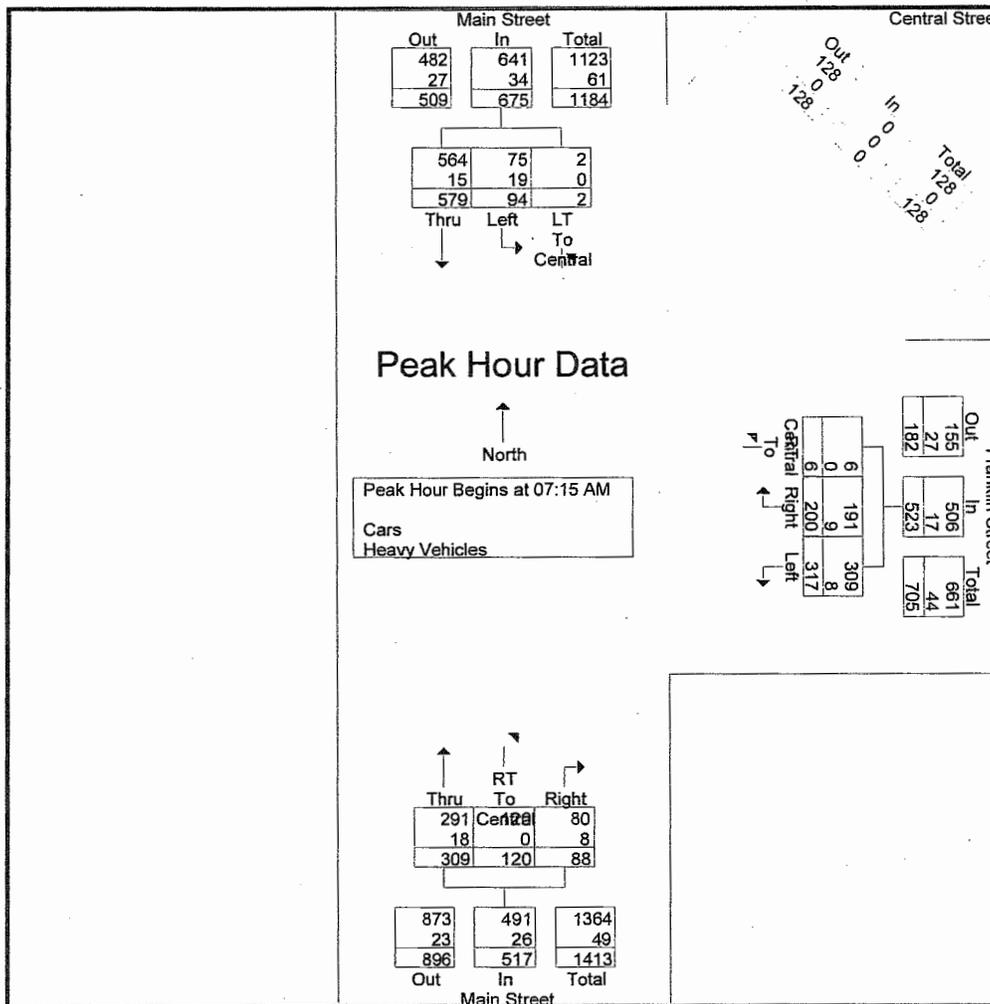
Start Time	Pine St From North				Franklin St From East				Pine St From South				Franklin St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
<b>Total Volume</b>	0	0	1	1	0	1	0	1	0	0	0	0	0	0	1	1	3
<b>% App. Total</b>	0	0	100		0	100	0		0	0	0		0	0	100		
<b>PHF</b>	.000	.000	.250	.250	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.250	.250	.375

Groups Printed- Cars - Heavy Vehicles

Start Time	Main Street Northbound				Main Street Southbound				Franklin Street Westbound				Int. Total
	Thru	RT To Central	Right	App. Total	LT To Central	Left	Thru	App. Total	Left	Right	RT To Central	App. Total	
06:00 AM	27	6	8	41	1	16	143	160	24	24	0	48	249
06:15 AM	37	6	13	56	0	17	156	173	26	22	1	49	278
06:30 AM	42	5	9	56	0	20	180	200	43	28	1	72	328
06:45 AM	40	12	17	69	1	18	167	186	63	19	2	84	339
<b>Total</b>	<b>146</b>	<b>29</b>	<b>47</b>	<b>222</b>	<b>2</b>	<b>71</b>	<b>646</b>	<b>719</b>	<b>156</b>	<b>93</b>	<b>4</b>	<b>253</b>	<b>1194</b>
07:00 AM	44	15	22	81	0	16	146	162	63	45	1	109	352
07:15 AM	42	29	21	92	1	19	167	187	81	47	1	129	408
07:30 AM	65	28	22	115	0	27	140	167	63	56	3	122	404
07:45 AM	93	36	20	149	0	18	141	159	95	52	0	147	455
<b>Total</b>	<b>244</b>	<b>108</b>	<b>85</b>	<b>437</b>	<b>1</b>	<b>80</b>	<b>594</b>	<b>675</b>	<b>302</b>	<b>200</b>	<b>5</b>	<b>507</b>	<b>1619</b>
08:00 AM	109	27	25	161	1	30	131	162	78	45	2	125	448
08:15 AM	99	20	17	136	0	20	133	153	66	49	3	118	407
08:30 AM	106	19	22	147	1	32	133	166	32	58	1	91	404
08:45 AM	56	16	12	84	1	20	104	125	46	38	0	84	293
<b>Total</b>	<b>370</b>	<b>82</b>	<b>76</b>	<b>528</b>	<b>3</b>	<b>102</b>	<b>501</b>	<b>606</b>	<b>222</b>	<b>190</b>	<b>6</b>	<b>418</b>	<b>1552</b>
<b>Grand Total</b>	<b>760</b>	<b>219</b>	<b>208</b>	<b>1187</b>	<b>6</b>	<b>253</b>	<b>1741</b>	<b>2000</b>	<b>680</b>	<b>483</b>	<b>15</b>	<b>1178</b>	<b>4365</b>
Apprch %	64	18.4	17.5		0.3	12.6	87.1		57.7	41	1.3		
Total %	17.4	5	4.8	27.2	0.1	5.8	39.9	45.8	15.6	11.1	0.3	27	
Cars	717	219	188	1124	6	219	1692	1917	665	455	15	1135	8352
% Cars	94.3	100	90.4	94.7	100	86.6	97.2	95.8	97.8	94.2	100	96.3	95.7
Heavy Vehicles	43	0	20	63	0	34	49	83	15	28	0	43	378
% Heavy Vehicles	5.7	0	9.6	5.3	0	13.4	2.8	4.2	2.2	5.8	0	3.7	4.3



Start Time	Main Street Northbound				Main Street Southbound				Franklin Street Westbound				Int. Total
	Thru	RT To Central	Right	App. Total	LT To Central	Left	Thru	App. Total	Left	Right	RT To Central	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	42	29	21	92	1	19	167	187	81	47	1	129	408
07:30 AM	65	28	22	115	0	27	140	167	63	56	3	122	404
07:45 AM	93	36	20	149	0	18	141	159	95	52	0	147	455
08:00 AM	109	27	25	161	1	30	131	162	78	45	2	125	448
Total Volume	309	120	88	517	2	94	579	675	317	200	6	523	1715
% App. Total	59.8	23.2	17		0.3	13.9	85.8		60.6	38.2	1.1		
PHF	.709	.833	.880	.803	.500	.783	.867	.902	.834	.893	.500	.889	.942
Cars	291	120	80	491	2	75	564	641	309	191	6	506	1638
% Cars	94.2	100	90.9	95.0	100	79.8	97.4	95.0	97.5	95.5	100	96.7	95.5
Heavy Vehicles	18	0	8	26	0	19	15	34	8	9	0	17	77
% Heavy Vehicles	5.8	0	9.1	5.0	0	20.2	2.6	5.0	2.5	4.5	0	3.3	4.5





**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

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**MASSDOT CRASH RATE WORKSHEETS**

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# MassHighway Traffic Volumes

## Permanent Count Station 407<sup>a</sup>

### Stoneham - Route 28 South of the Reading Town Line

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	AADT <sup>b</sup>
<b>1993</b>	26,106	25,914	26,282	28,459	29,078	30,168	29,529	30,480	29,908	29,795	28,748	30,011	28,707
	-0.60%	2.77%	9.02%	4.08%	3.19%	2.69%	3.00%	-3.28%	5.29%	0.23%	0.41%	0.85%	2.25%
<b>1994</b>	25,949	26,631	28,653	29,621	30,006	30,979	30,416	29,481	31,490	29,863	28,866	30,266	29,352
	1.45%	1.05%	-0.79%	2.30%	7.73%	7.13%	4.81%	0.16%	-3.43%	-1.29%	-0.18%	-0.93%	1.58%
<b>1996</b>	26,708	27,195	28,200	31,000	34,826	35,554	33,414	29,575	29,365	29,100	28,765	29,704	30,284
	6.65%	2.52%	-0.81%	-7.93%	-14.50%	-13.36%	-13.78%	-1.83%	-0.45%	-0.93%	-1.69%	-7.70%	-5.05%
<b>1997</b>	28,485	27,879	27,971	28,543	29,775	30,805	28,809	29,034	29,232	28,829	28,279	27,418	28,755
	-0.81%	-2.78%	-1.49%	1.08%	-1.20%	-2.58%	1.29%	-0.86%	-1.94%	0.55%	-0.87%	9.02%	-0.10%
<b>1998</b>	28,255	27,103	27,554	28,852	29,418	30,009	29,180	28,785	28,664	28,987	28,033	29,891	28,728
	-3.02%	-1.57%	-0.67%	-0.61%	-0.13%	-0.03%	-0.92%	-0.52%	0.39%	0.30%	1.12%	0.36%	-0.42%
<b>2001</b>	25,773	25,847	27,000	28,330	29,302	29,982	28,380	28,336	29,000	29,253	28,984	30,212	28,367
	1.00%	1.58%	-0.74%	0.89%	0.67%	-1.49%	5.73%	2.90%	-1.37%	-2.75%	-5.35%	-7.32%	-0.60%
<b>2002</b>	26,031	26,256	26,800	28,581	29,498	29,534	30,007	29,158	28,604	28,450	27,434	28,000	28,196
	-1.74%	-1.56%	-1.57%	-2.62%	-2.43%	-1.67%	-3.42%	-2.76%	-2.12%	-2.39%	-2.06%	-2.14%	-2.22%
<b>2005</b>	24,692	25,048	25,554	26,393	27,399	28,075	27,036	26,807	26,827	26,455	25,775	26,238	26,358
	-12.25%	-7.86%	-5.96%	-9.30%	-7.70%	-7.87%	-12.90%	-6.20%	-4.75%	-7.73%	-7.14%	-8.09%	-8.16%
<b>2006</b>	24,794	24,974	25,912	26,170	27,152	27,647	25,416	27,000	27,303	26,745	26,032	27,473	26,385
	-5.56%	-6.87%	-6.97%	-9.96%	-7.31%	-8.76%	-10.29%	-7.04%	-11.11%	-11.58%	-12.57%	-15.84%	-9.59%
<b>2007</b>	24,339	24,072	25,117	25,508	27,159	27,355	25,461	26,342	25,778	25,865	25,342	25,426	25,647
	-8.20%	-8.98%	-11.53%	-15.93%	-22.39%	-12.74%	-14.46%	-16.13%	-14.68%	-12.12%	-7.78%	-9.64%	-13.83%
<b>2008</b>	23,897	23,897	23,709	24,028	22,893	25,770	25,669	24,456	24,404	25,003	25,300	25,300	24,296
	-12.85%	-14.09%	-8.61%	-10.76%	-9.39%	-10.88%	-5.06%	-6.89%	-7.04%	-6.81%	-2.19%	-3.92%	-5.18%
<b>2009</b>	21,518	21,518	23,353	23,554	24,826	25,021	25,667	24,960	24,938	24,654	25,210	25,210	24,994

<b>Seasonal Adj. <sup>c</sup></b>	<b>7.7%</b>	<b>7.7%</b>	<b>4.4%</b>	<b>0.3%</b>	<b>-3.3%</b>	<b>-5.9%</b>	<b>-2.6%</b>	<b>-1.3%</b>	<b>-1.6%</b>	<b>-0.9%</b>	<b>1.0%</b>	<b>-1.5%</b>	<b>0.0%</b>
<b>Annual Growth <sup>d</sup></b>	<b>-0.98%</b>	<b>-1.09%</b>	<b>-0.97%</b>	<b>-1.41%</b>	<b>-1.58%</b>	<b>-1.57%</b>	<b>-1.21%</b>	<b>-1.24%</b>	<b>-1.32%</b>	<b>-1.20%</b>	<b>-0.94%</b>	<b>-1.13%</b>	<b>-1.13%</b>

<sup>a</sup> Based upon historical data. Source: MassHighway 2009 Traffic Volumes.

<sup>b</sup> Average Annual Daily Traffic.

<sup>c</sup> Seasonal adjustment to yearly average.

<sup>d</sup> Compounded Annual Growth Rate.

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Stoneham, Massachusetts

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**TRAFFIC-VOLUME ADJUSTMENT DATA**

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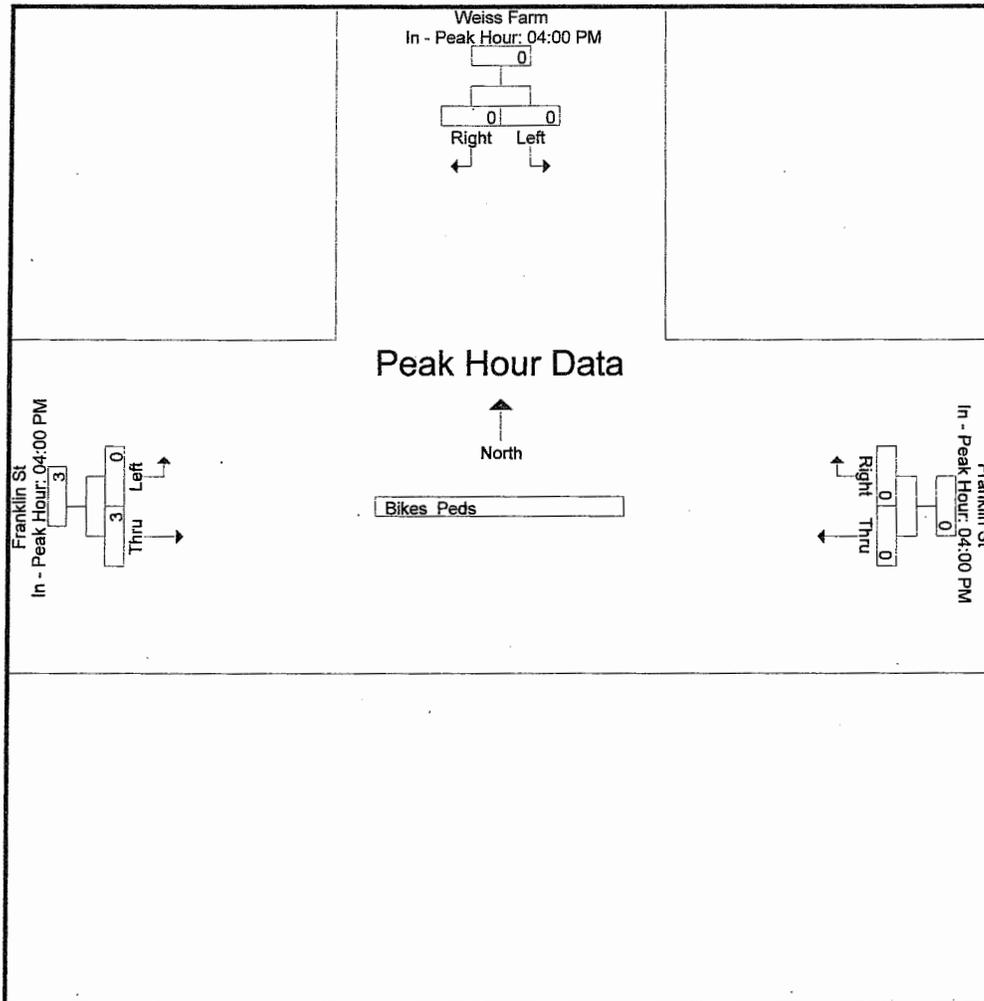
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# Accurate Counts

978-664-2565

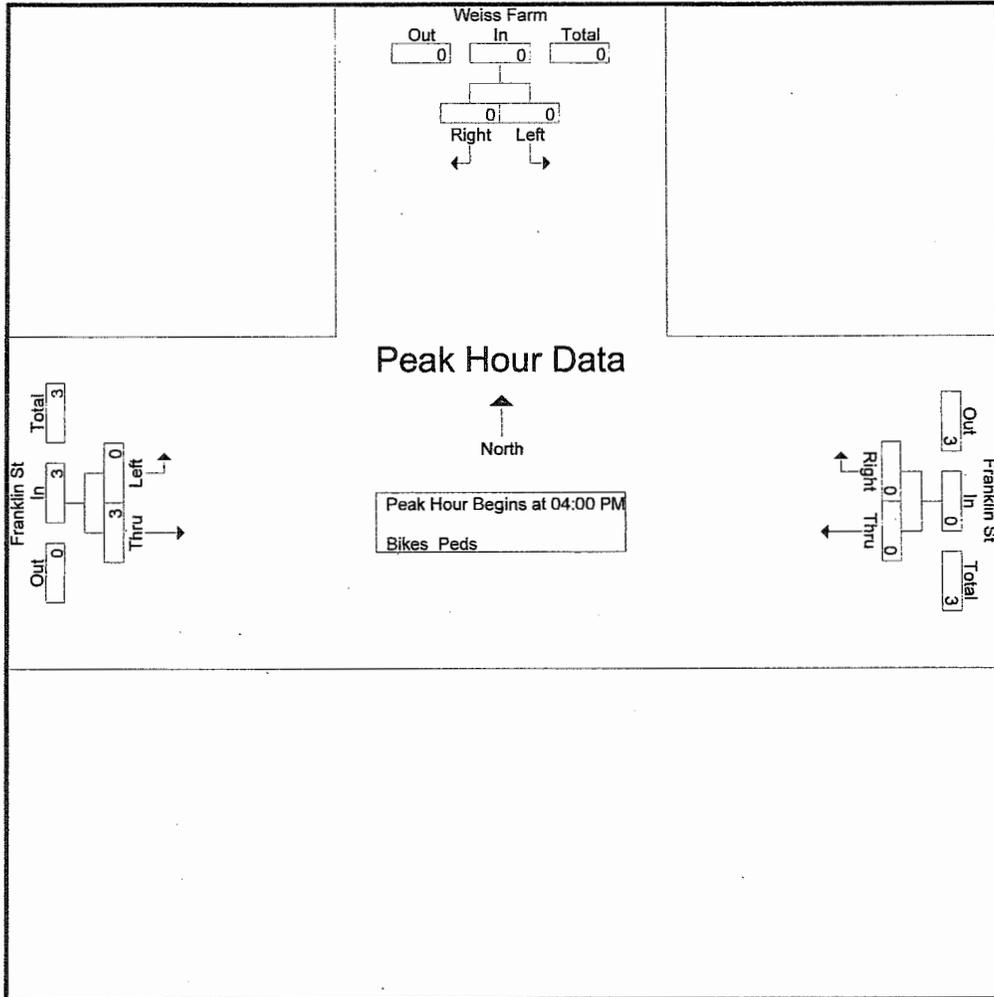
N/S Street : Weiss Farm Driveway  
E/W Street : Franklin Street  
State : Stoneham, MA  
Weather : Clear

File Name : 164700  
Site Code : 164700  
Start Date : 4/10/20  
Page No : 12



N/S Street : Weiss Farm Driveway  
 East Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16470  
 Site Code : 16470  
 Start Date : 4/10/21  
 Page No : 11



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

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	1	1
+15 mins.	0	0	0	0	0	0	0	1	1
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	1	1
Total Volume	0	0	0	0	0	0	0	3	3
% App. Total	0	0	0	0	0	0	0	100	
PHF	.000	.000	.000	.000	.000	.000	.000	.750	.750

**Accurate Counts**  
978-664-2565

File Name : 16470  
Site Code : 16470  
Start Date : 4/10/2  
Page No : 10

N/S Street : Weiss Farm Driveway  
Street : Franklin Street  
State : Stoneham, MA  
Weather : Clear

Groups Printed- Bikes Peds

Start Time	Weiss Farm From North			Franklin St From East			Franklin St From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds			
04:00 PM	0	0	2	0	0	0	0	1	0	2	1	
04:15 PM	0	0	2	0	0	0	0	1	0	2	1	
04:30 PM	0	0	1	0	0	0	0	0	0	1	0	
04:45 PM	0	0	2	0	0	0	0	1	0	2	1	
Total	0	0	7	0	0	0	0	3	0	7	3	1
05:00 PM	0	0	3	0	0	0	0	0	0	3	0	
05:15 PM	0	0	2	0	0	0	0	0	0	2	0	
05:30 PM	0	0	1	0	0	0	0	0	0	1	0	
05:45 PM	0	0	1	0	0	0	0	1	0	1	1	
Total	0	0	7	0	0	0	0	1	0	7	1	
Grand Total	0	0	14	0	0	0	0	4	0	14	4	1
Apprch %	0	0		0	0		0	100				
Total %	0	0		0	0		0	100		77.8	22.2	

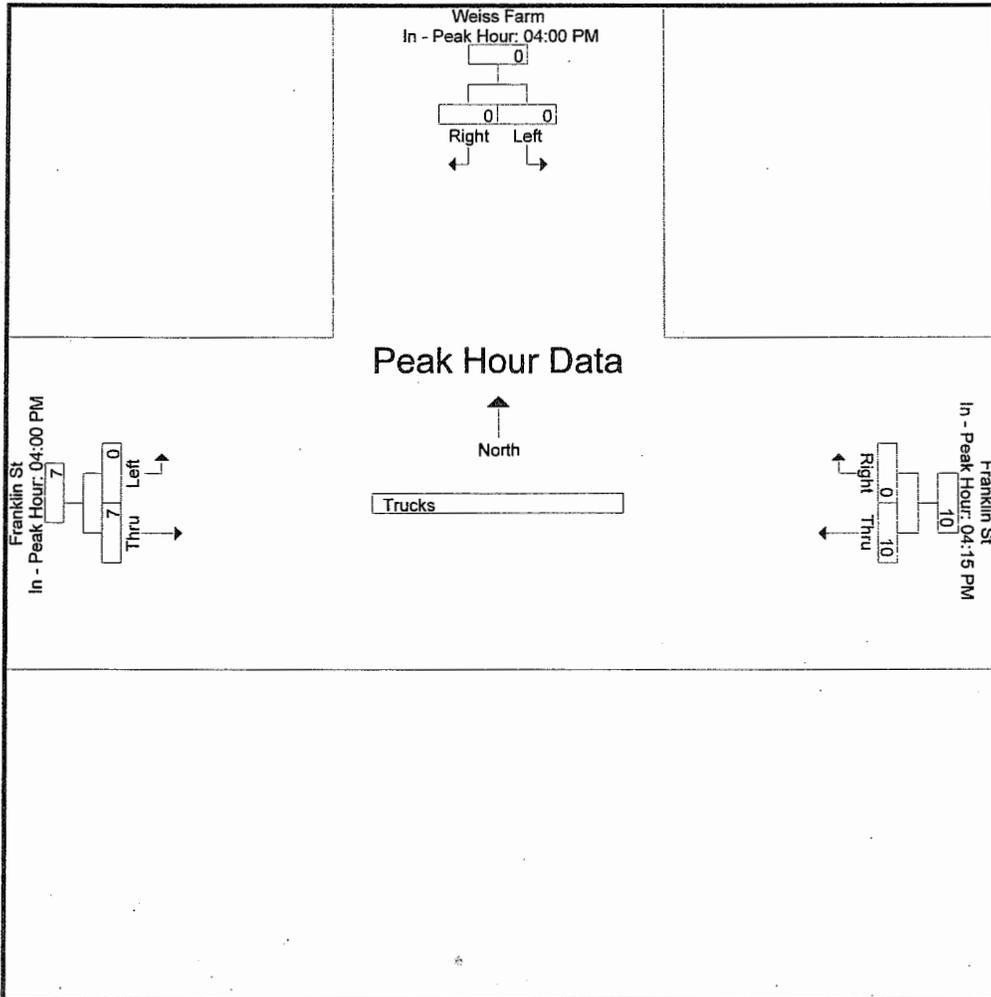
Start Time	Weiss Farm From North			Franklin St From East			Franklin St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	1	1	1
04:15 PM	0	0	0	0	0	0	0	1	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	0	0	0	0	3	3	3
%App. Total	0	0		0	0		0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.750	.750	.750

# Accurate Counts

978-664-2565

File Name : 16470  
Site Code : 16470  
Start Date : 4/10/2  
Page No : 9

N/S Street : Weiss Farm Driveway  
Street : Franklin Street  
State : Stoneham, MA  
Weather : Clear

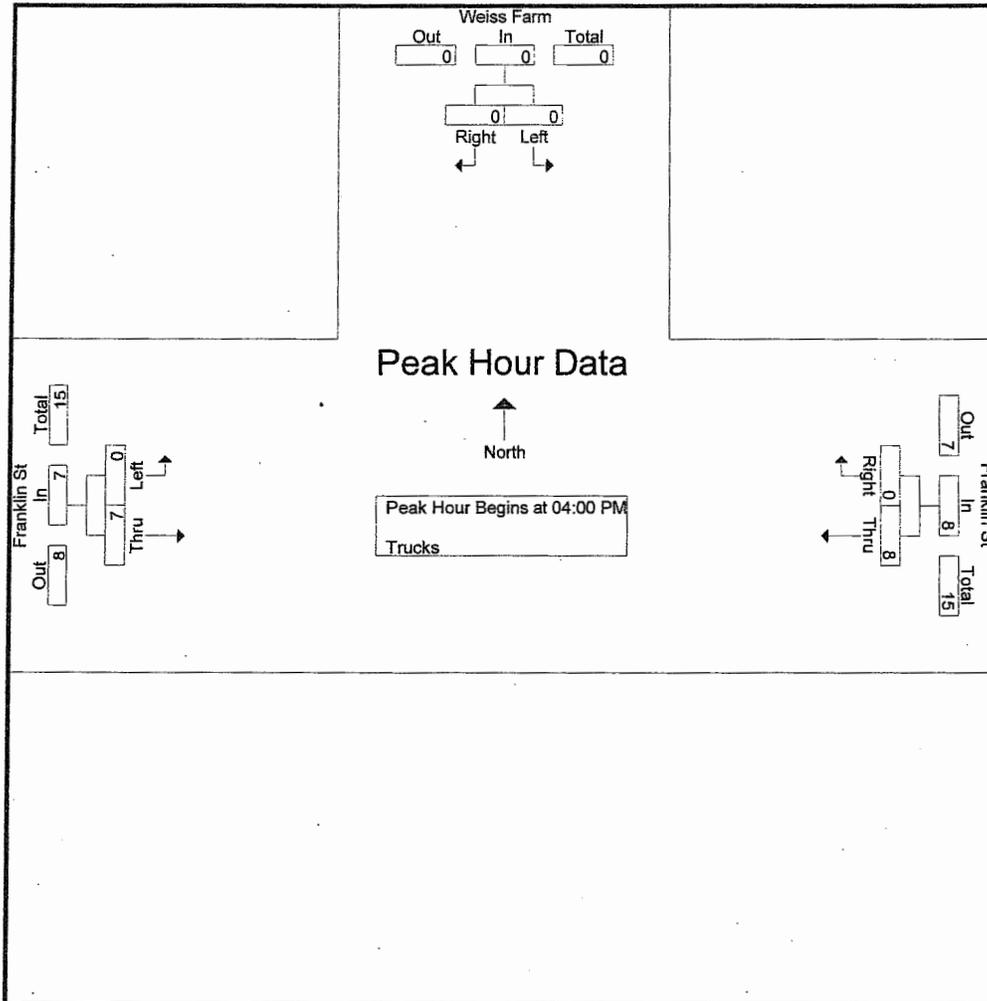


# Accurate Counts

978-664-2565

N/S Street : Weiss Farm Driveway  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16470  
 Site Code : 16470  
 Start Date : 4/10/2  
 Page No : 8



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

	04:00 PM			04:15 PM			04:30 PM		
+0 mins.	0	0	0	2	0	2	0	3	3
+15 mins.	0	0	0	1	0	1	0	1	1
+30 mins.	0	0	0	3	0	3	0	1	1
+45 mins.	0	0	0	4	0	4	0	2	2
Total Volume	0	0	0	10	0	10	0	7	7
% App. Total	0	0	0	100	0	100	0	100	100
PHF	.000	.000	.000	.625	.000	.625	.000	.583	.583

# Accurate Counts

978-664-2565

N/S Street : Weiss Farm Driveway  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16470  
 Site Code : 16470  
 Start Date : 4/10/2  
 Page No : 7

### Groups Printed- Trucks

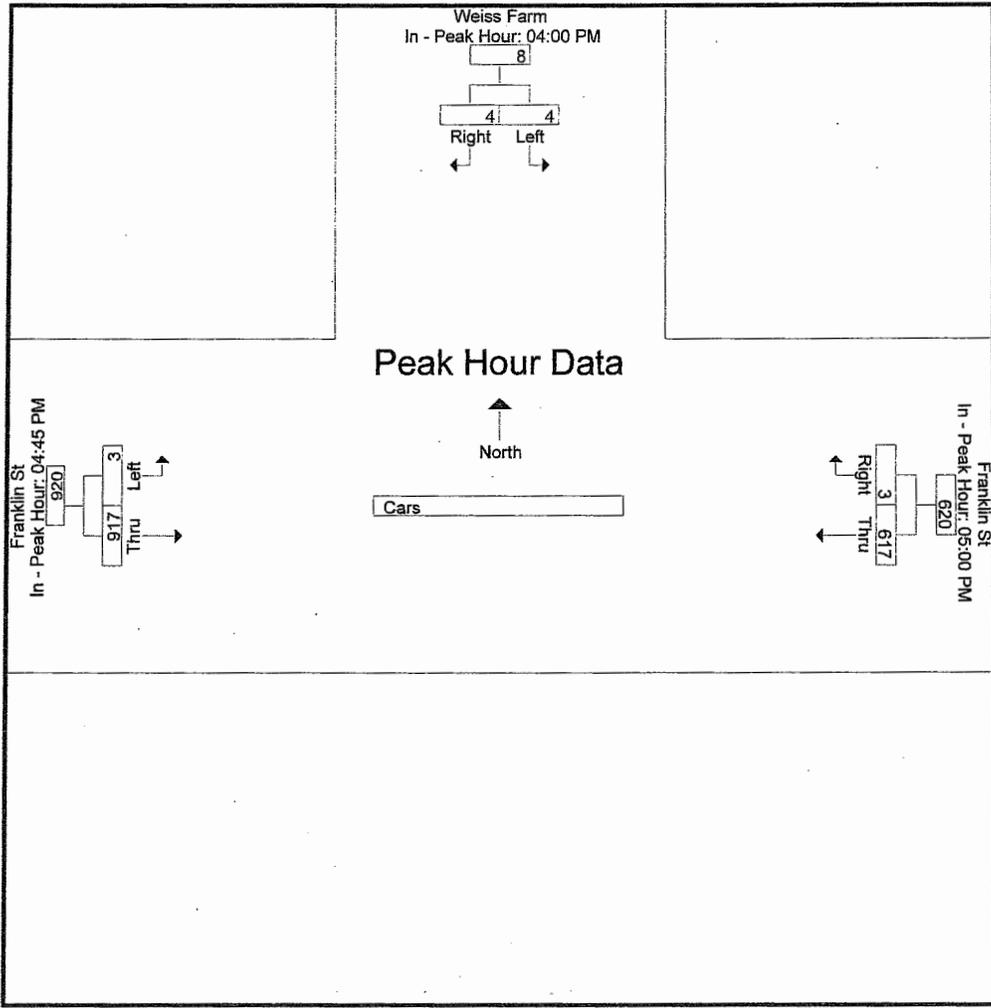
Start Time	Weiss Farm From North		Franklin St From East		Franklin St From West		Int. Tot
	Left	Right	Thru	Right	Left	Thru	
04:00 PM	0	0	2	0	0	3	
04:15 PM	0	0	2	0	0	1	
04:30 PM	0	0	1	0	0	1	
04:45 PM	0	0	3	0	0	2	
<b>Total</b>	0	0	8	0	0	7	1
05:00 PM	0	0	4	0	0	0	
05:15 PM	0	0	0	0	0	0	
05:30 PM	0	0	2	0	0	0	
05:45 PM	0	0	0	0	0	0	
<b>Total</b>	0	0	6	0	0	0	
<b>Grand Total</b>	0	0	14	0	0	7	2
Apprch %	0	0	100	0	0	100	
Total %	0	0	66.7	0	0	33.3	

Start Time	Weiss Farm From North			Franklin St From East			Franklin St From West			Int. Tot
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	2	0	2	0	3	3	!
04:15 PM	0	0	0	2	0	2	0	1	1	!
04:30 PM	0	0	0	1	0	1	0	1	1	!
04:45 PM	0	0	0	3	0	3	0	2	2	!
<b>Total Volume</b>	0	0	0	8	0	8	0	7	7	1!
<b>% App. Total</b>	0	0	0	100	0	100	0	100		
PHF	.000	.000	.000	.667	.000	.667	.000	.583	.583	.750

Accurate Counts  
978-664-2565

File Name : 164701  
Site Code : 164701  
Start Date : 4/10/21  
Page No : 6

N/S Street : Weiss Farm Driveway  
Street : Franklin Street  
State : Stoneham, MA  
Weather : Clear

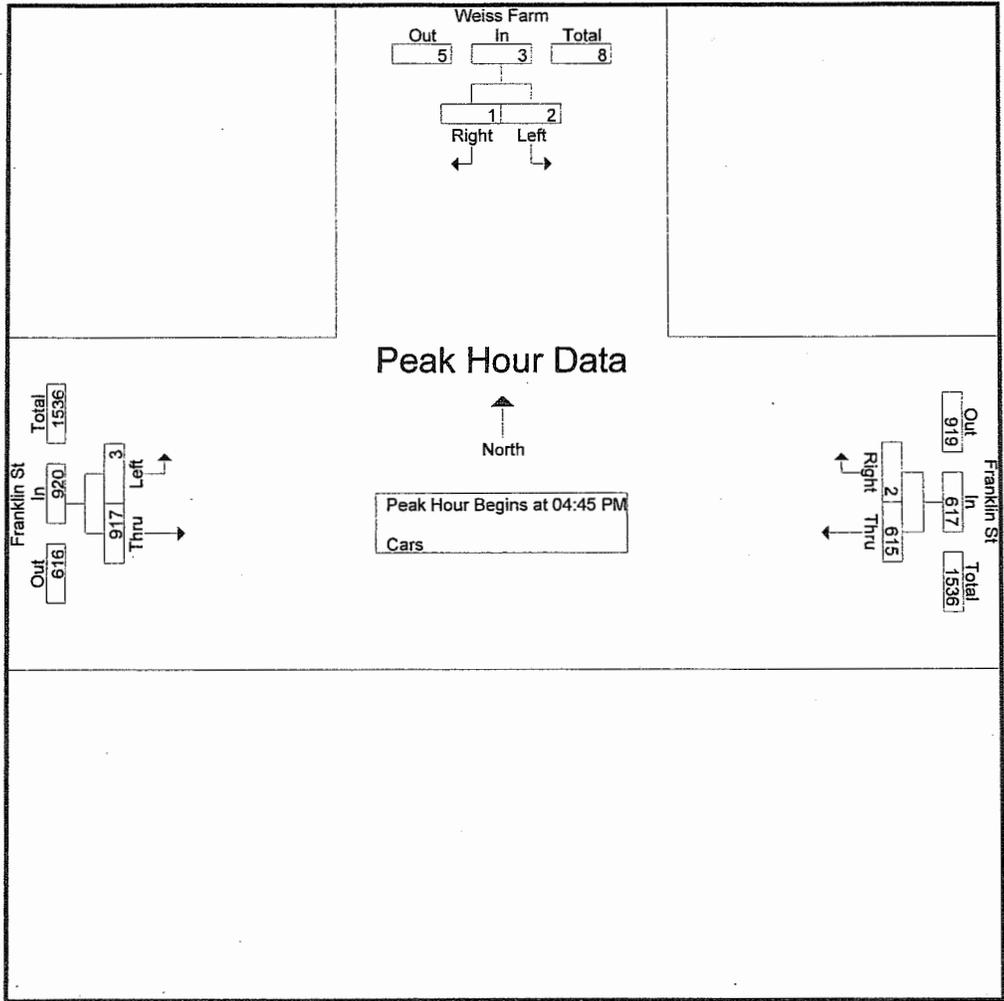


# Accurate Counts

978-664-2565

N/S Street : Weiss Farm Driveway  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 164700  
 Site Code : 164700  
 Start Date : 4/10/20  
 Page No : 5



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

	04:00 PM			05:00 PM			04:45 PM		
+0 mins.	3	2	5	140	0	140	1	230	231
+15 mins.	0	1	1	159	0	159	0	232	232
+30 mins.	0	0	0	153	2	155	1	221	222
+45 mins.	1	1	2	165	1	166	1	234	235
<b>Total Volume</b>	4	4	8	617	3	620	3	917	920
<b>% App. Total</b>	50	50		99.5	0.5		0.3	99.7	
<b>PHF</b>	.333	.500	.400	.935	.375	.934	.750	.980	.979

**Accurate Counts**  
978-664-2565

N/S Street : Weiss Farm Driveway  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 164701  
 Site Code : 164701  
 Start Date : 4/10/20  
 Page No : 4

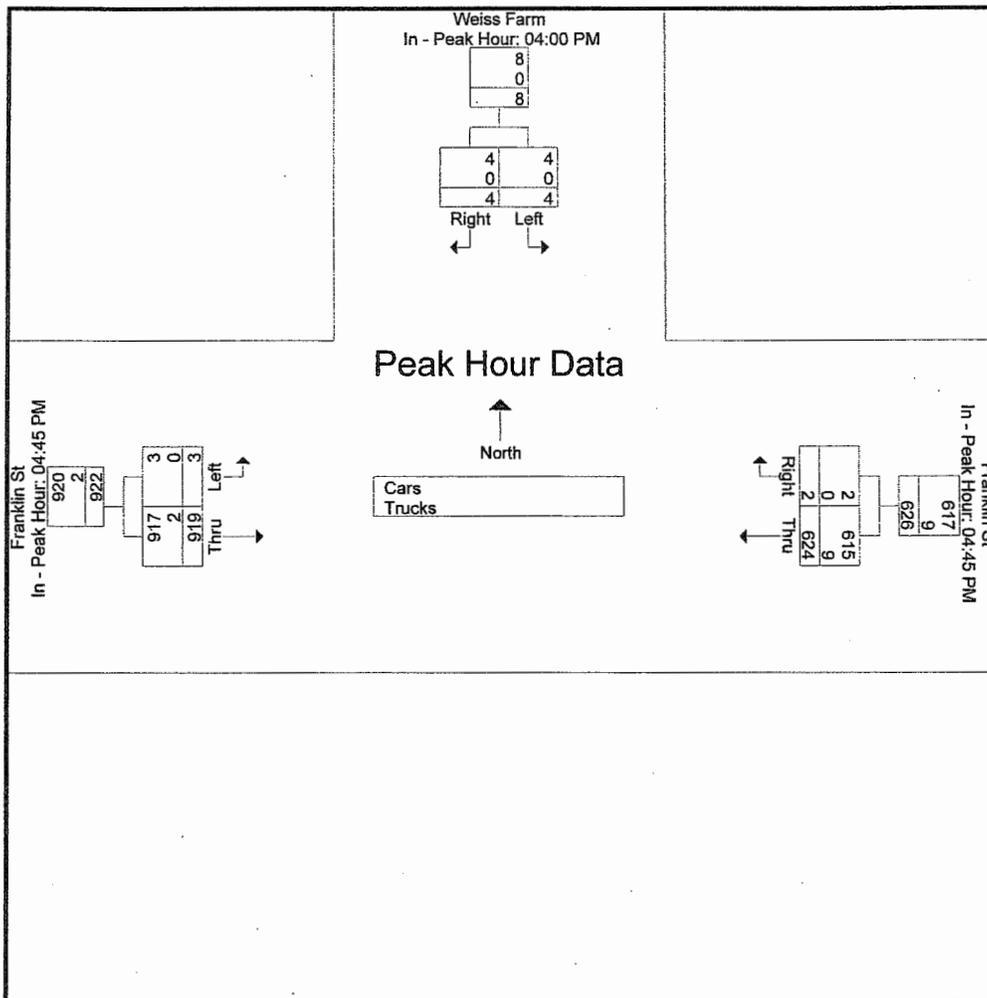
Groups Printed- Cars

Start Time	Weiss Farm From North		Franklin St From East		Franklin St From West		Int. Tot
	Left	Right	Thru	Right	Left	Thru	
04:00 PM	3	2	154	0	1	202	36
04:15 PM	0	1	131	0	0	217	34
04:30 PM	0	0	142	0	0	211	35
04:45 PM	1	1	163	0	1	230	39
Total	4	4	590	0	2	860	146
05:00 PM	0	0	140	0	0	232	37
05:15 PM	0	0	159	0	1	221	38
05:30 PM	1	0	153	2	1	234	39
05:45 PM	2	0	165	1	0	209	37
Total	3	0	617	3	2	896	152
Grand Total	7	4	1207	3	4	1756	298
Apprch %	63.6	36.4	99.8	0.2	0.2	99.8	
Total %	0.2	0.1	40.5	0.1	0.1	58.9	

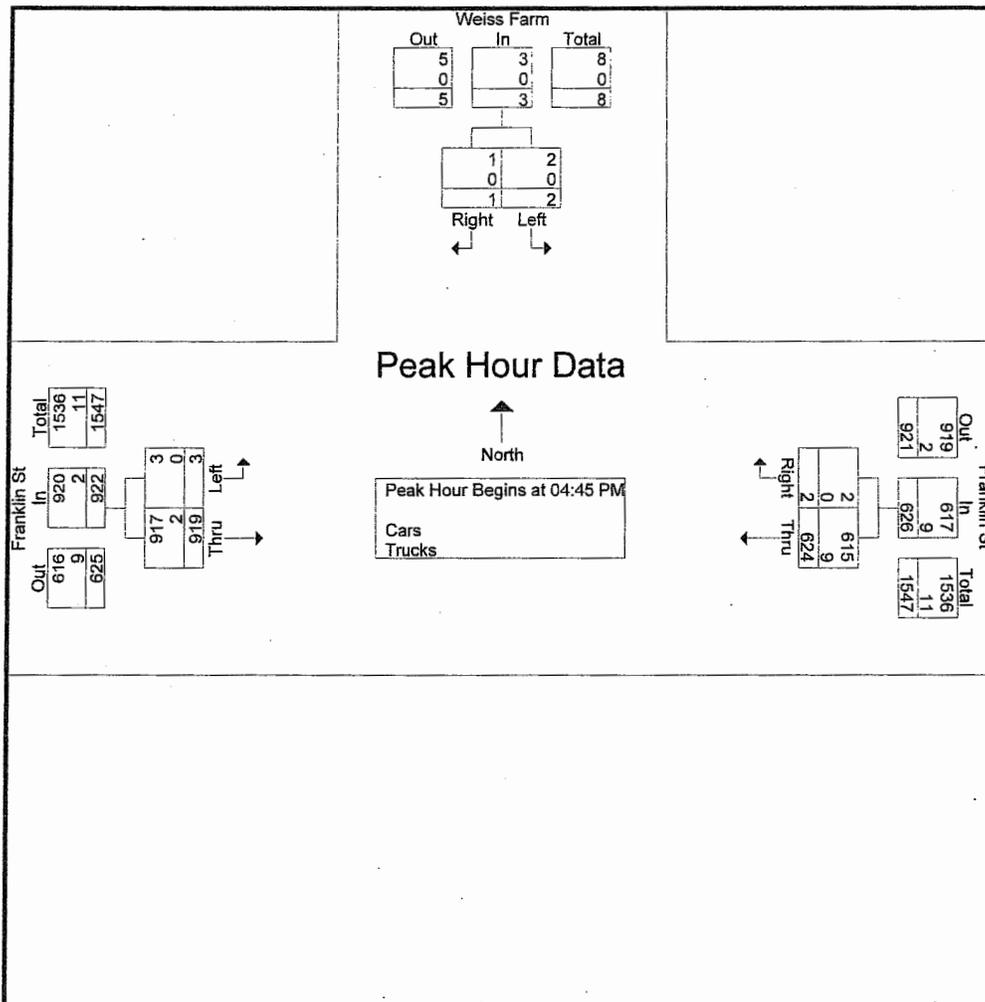
Start Time	Weiss Farm From North			Franklin St From East			Franklin St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	1	1	2	163	0	163	1	230	231	396
05:00 PM	0	0	0	140	0	140	0	232	232	372
05:15 PM	0	0	0	159	0	159	1	221	222	381
05:30 PM	1	0	1	153	2	155	1	234	235	391
Total Volume	2	1	3	615	2	617	3	917	920	1540
% App. Total	66.7	33.3		99.7	0.3		0.3	99.7		
PHF	.500	.250	.375	.943	.250	.946	.750	.980	.979	.972

N/S Street : Weiss Farm Driveway  
 E/W Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 164700  
 Site Code : 164700  
 Start Date : 4/10/21  
 Page No : 3



N/S Street : Weiss Farm Driveway  
E/S Street : Franklin Street  
State : Stoneham, MA  
Weather : Clear



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

	04:00 PM			04:45 PM			04:45 PM		
+0 mins.	3	2	5	166	0	166	1	232	233
+15 mins.	0	1	1	144	0	144	0	232	232
+30 mins.	0	0	0	159	0	159	1	221	222
+45 mins.	1	1	2	155	2	157	1	234	235
Total Volume	4	4	8	624	2	626	3	919	922
% App. Total	50	50		99.7	0.3		0.3	99.7	
PHF	.333	.500	.400	.940	.250	.943	.750	.982	.981
Cars	4	4	8	615	2	617	3	917	920
% Cars	100	100	100	98.6	100	98.6	100	99.8	99.8
Trucks	0	0	0	9	0	9	0	2	2
% Trucks	0	0	0	1.4	0	1.4	0	0.2	0.2

# Accurate Counts

978-664-2565

N/S Street : Weiss Farm Driveway  
 E/W Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16470  
 Site Code : 16470  
 Start Date : 4/10/2  
 Page No : 1

### Groups Printed- Cars - Trucks

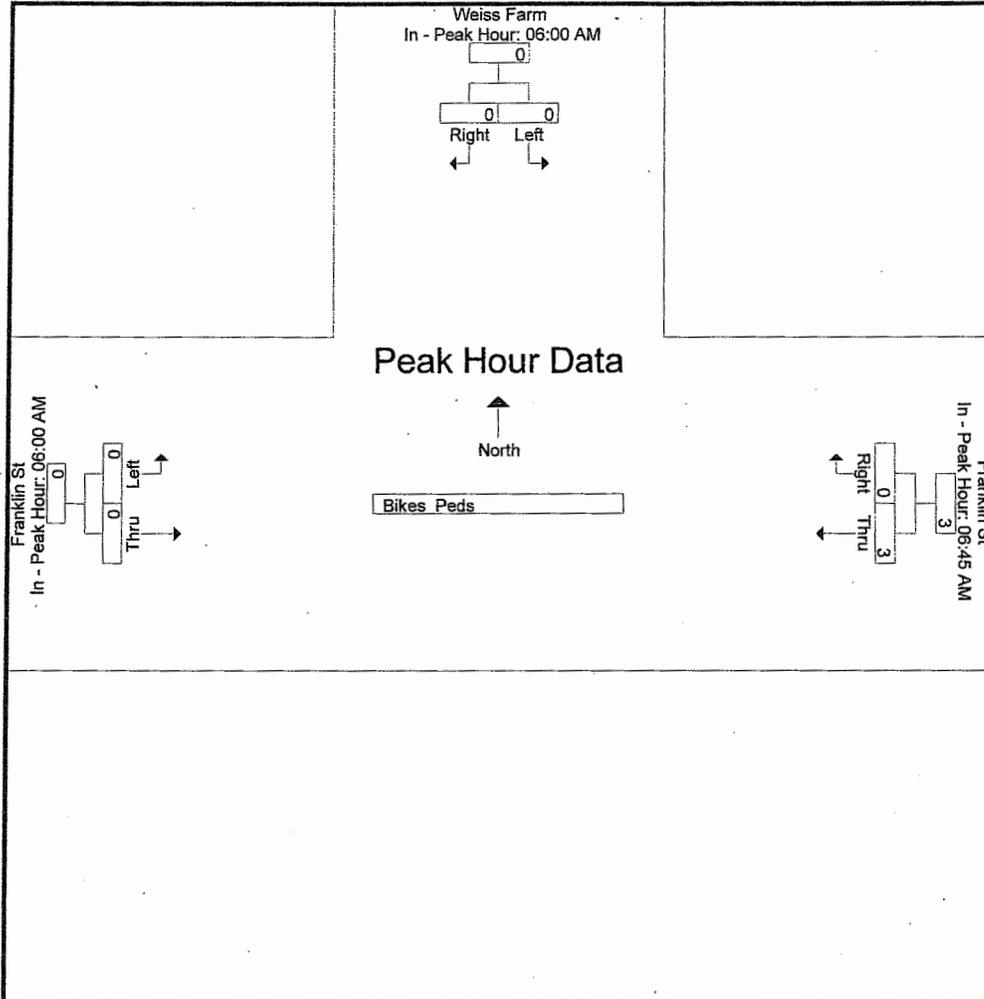
Start Time	Weiss Farm From North		Franklin St From East		Franklin St From West		Int. Tot
	Left	Right	Thru	Right	Left	Thru	
04:00 PM	3	2	156	0	1	205	36
04:15 PM	0	1	133	0	0	218	38
04:30 PM	0	0	143	0	0	212	38
04:45 PM	1	1	166	0	1	232	40
<b>Total</b>	<b>4</b>	<b>4</b>	<b>598</b>	<b>0</b>	<b>2</b>	<b>867</b>	<b>147</b>
05:00 PM	0	0	144	0	0	232	37
05:15 PM	0	0	159	0	1	221	38
05:30 PM	1	0	155	2	1	234	39
05:45 PM	2	0	165	1	0	209	37
<b>Total</b>	<b>3</b>	<b>0</b>	<b>623</b>	<b>3</b>	<b>2</b>	<b>896</b>	<b>152</b>
<b>Grand Total</b>	<b>7</b>	<b>4</b>	<b>1221</b>	<b>3</b>	<b>4</b>	<b>1763</b>	<b>300</b>
Apprch %	63.6	36.4	99.8	0.2	0.2	99.8	
Total %	0.2	0.1	40.7	0.1	0.1	58.7	
Cars	7	4	1207	3	4	1756	298
% Cars	100	100	98.9	100	100	99.6	99.6
Trucks	0	0	14	0	0	7	2
% Trucks	0	0	1.1	0	0	0.4	0.7

Start Time	Weiss Farm From North			Franklin St From East			Franklin St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
<b>Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1</b>										
<b>Peak Hour for Entire Intersection Begins at 04:45 PM</b>										
04:45 PM	1	1	2	166	0	166	1	232	233	40
05:00 PM	0	0	0	144	0	144	0	232	232	37
05:15 PM	0	0	0	159	0	159	1	221	222	38
05:30 PM	1	0	1	155	2	157	1	234	235	39
<b>Total Volume</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>624</b>	<b>2</b>	<b>626</b>	<b>3</b>	<b>919</b>	<b>922</b>	<b>155</b>
<b>% App. Total</b>	<b>66.7</b>	<b>33.3</b>		<b>99.7</b>	<b>0.3</b>		<b>0.3</b>	<b>99.7</b>		
PHF	.500	.250	.375	.940	.250	.943	.750	.982	.981	.967
Cars	2	1	3	615	2	617	3	917	920	154
% Cars	100	100	100	98.6	100	98.6	100	99.8	99.8	99.3
Trucks	0	0	0	9	0	9	0	2	2	11
% Trucks	0	0	0	1.4	0	1.4	0	0.2	0.2	0.7

Accurate Counts  
978-664-2565

File Name : 16470  
Site Code : 16470  
Start Date : 4/10/2  
Page No : 12

N/S Street : Weiss Farm Driveway  
E/W Street : Franklin Street  
State : Stoneham, MA  
Weather : Clear

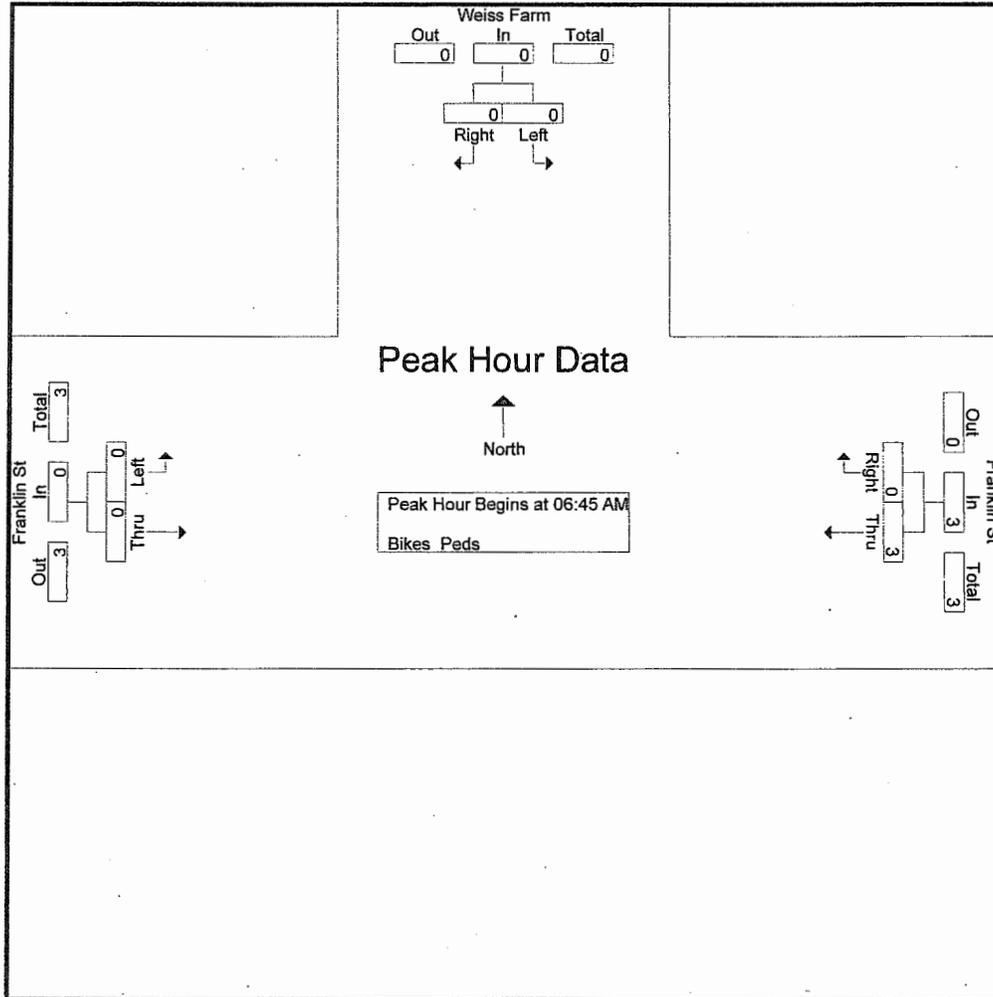


# Accurate Counts

978-664-2565

N/S Street : Weiss Farm Driveway  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16470  
 Site Code : 16470  
 Start Date : 4/10/2  
 Page No : 11



Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	06:00 AM			06:45 AM			06:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	1	0	1	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	2	0	2	0	0	0
Total Volume	0	0	0	3	0	3	0	0	0
% App. Total	0	0	0	100	0	0	0	0	0
PHF	.000	.000	.000	.375	.000	.375	.000	.000	.000

**Accurate Counts**  
978-664-2565

N/S Street : Weiss Farm Driveway  
 P Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

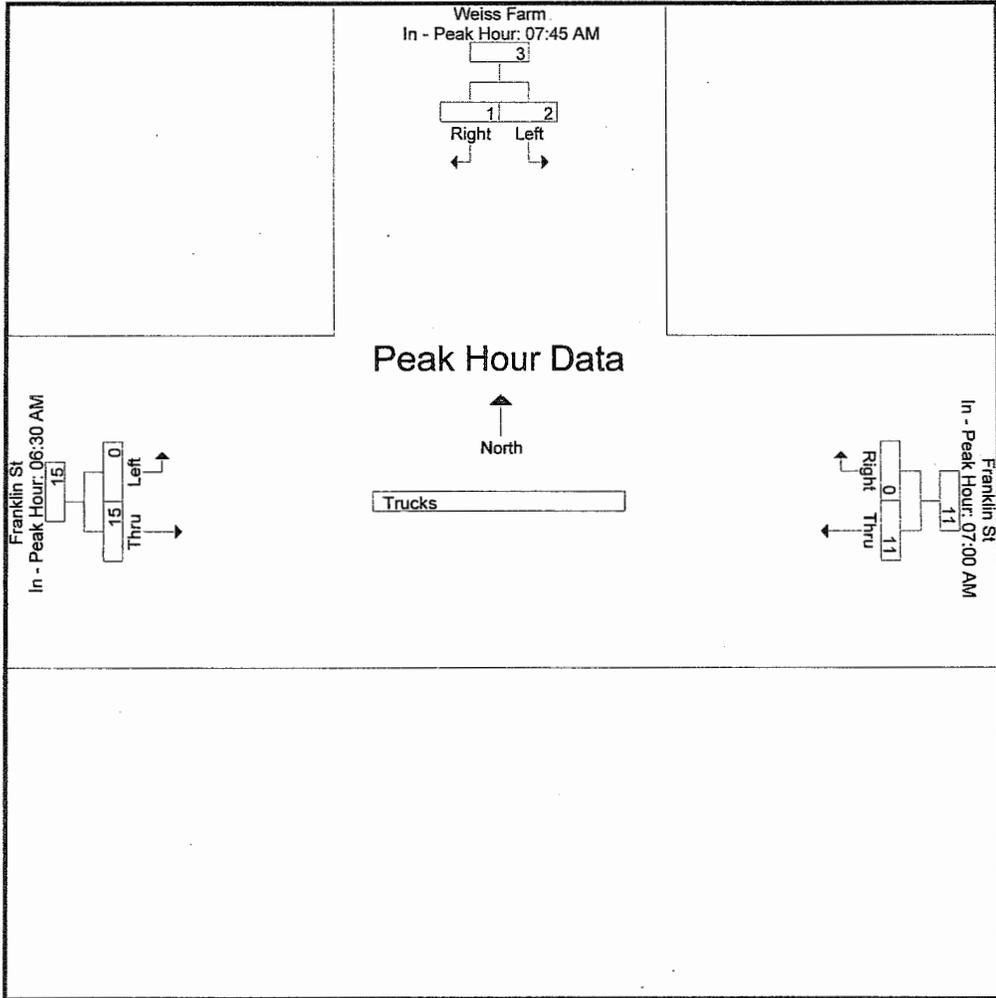
File Name : 16470  
 Site Code : 16470  
 Start Date : 4/10/2  
 Page No : 10

Groups Printed- Bikes Peds

Start Time	Weiss Farm From North			Franklin St From East			Franklin St From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds			
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	1	1	0	0	0	0	0	1	1	
06:30 AM	0	0	1	0	0	0	0	0	0	1	0	
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	2	1	0	0	0	0	0	2	1	
07:00 AM	0	0	0	1	0	0	0	0	0	0	1	
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	
07:30 AM	0	0	0	2	0	0	0	0	0	0	2	
07:45 AM	0	0	1	0	0	0	0	0	0	1	0	
Total	0	0	1	3	0	0	0	0	0	1	3	
08:00 AM	0	0	0	1	0	0	0	0	0	0	1	
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	0	1	0	0	0	0	0	0	1	
Grand Total	0	0	3	5	0	0	0	0	0	3	5	
Apprch %	0	0		100	0		0	0				
Total %	0	0		100	0		0	0		37.5	62.5	

Start Time	Weiss Farm From North			Franklin St From East			Franklin St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 06:45 AM										
06:45 AM	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	1	0	1	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	2	0	2	0	0	0	2
Total Volume	0	0	0	3	0	3	0	0	0	3
% App. Total	0	0		100	0		0	0		
PHF	.000	.000	.000	.375	.000	.375	.000	.000	.000	.375

N/S Street : Weiss Farm Driveway  
Street : Franklin Street  
State : Stoneham, MA  
Weather : Clear

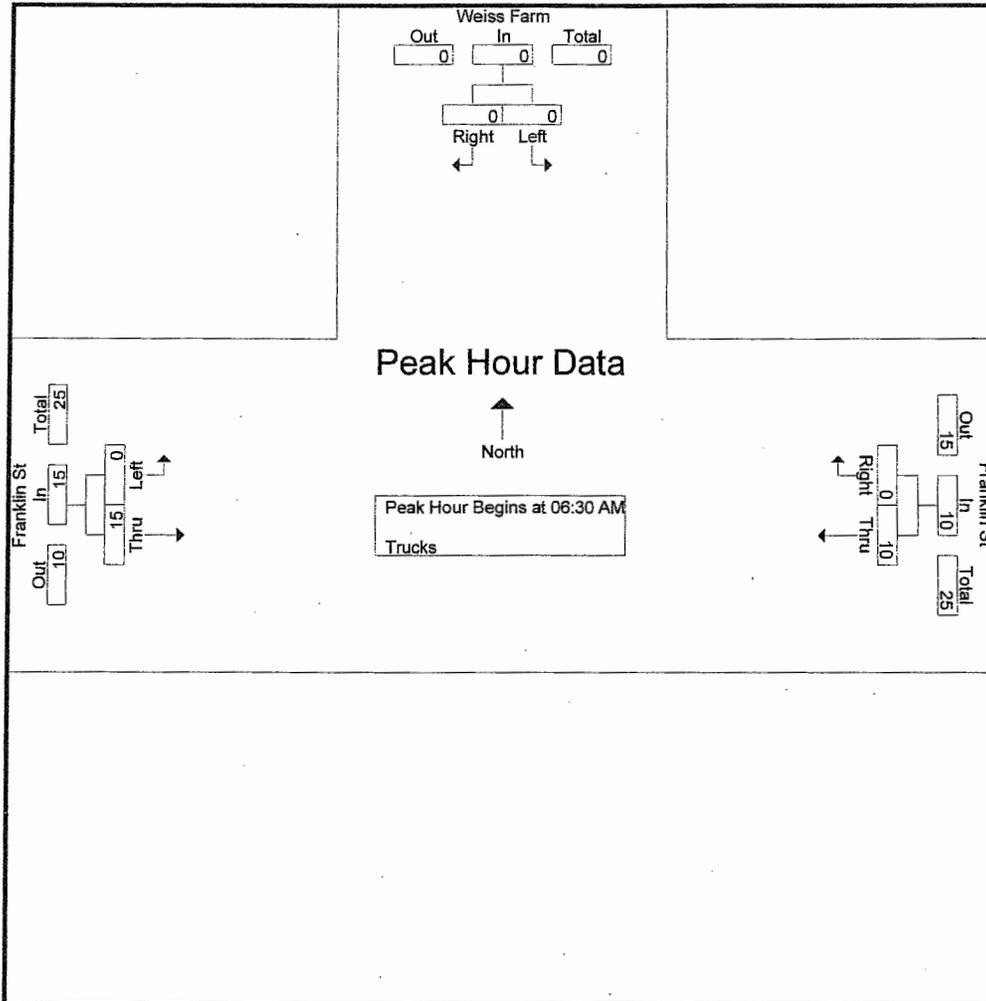


# Accurate Counts

978-664-2565

N/S Street : Weiss Farm Driveway  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 164700  
 Site Code : 164700  
 Start Date : 4/10/20  
 Page No : 8



Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:45 AM			07:00 AM			06:30 AM		
+0 mins.	1	0	1	4	0	4	0	5	5
+15 mins.	0	0	0	4	0	4	0	2	2
+30 mins.	0	1	1	1	0	1	0	5	5
+45 mins.	1	0	1	2	0	2	0	3	3
Total Volume	2	1	3	11	0	11	0	15	15
% App. Total	66.7	33.3		100	0		0	100	
PHF	.500	.250	.750	.688	.000	.688	.000	.750	.750

# Accurate Counts

978-664-2565

N/S Street : Weiss Farm Driveway  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16470  
 Site Code : 16470  
 Start Date : 4/10/21  
 Page No : 7

### Groups Printed- Trucks

Start Time	Weiss Farm From North		Franklin St From East		Franklin St From West		Int. Tot
	Left	Right	Thru	Right	Left	Thru	
06:00 AM	0	0	0	0	0	2	
06:15 AM	0	0	0	0	0	2	
06:30 AM	0	0	1	0	0	5	
06:45 AM	0	0	1	0	0	2	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>1</b>
07:00 AM	0	0	4	0	0	5	
07:15 AM	0	0	4	0	0	3	
07:30 AM	0	0	1	0	0	0	
07:45 AM	1	0	2	0	0	2	
<b>Total</b>	<b>1</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>2</b>
08:00 AM	0	0	4	0	0	2	
08:15 AM	0	1	2	0	0	2	
08:30 AM	1	0	1	1	1	4	
08:45 AM	1	0	1	1	0	3	
<b>Total</b>	<b>2</b>	<b>1</b>	<b>8</b>	<b>2</b>	<b>1</b>	<b>11</b>	<b>2</b>
<b>Grand Total</b>	<b>3</b>	<b>1</b>	<b>21</b>	<b>2</b>	<b>1</b>	<b>32</b>	<b>6</b>
Apprch %	75	25	91.3	8.7	3	97	
Total %	5	1.7	35	3.3	1.7	53.3	

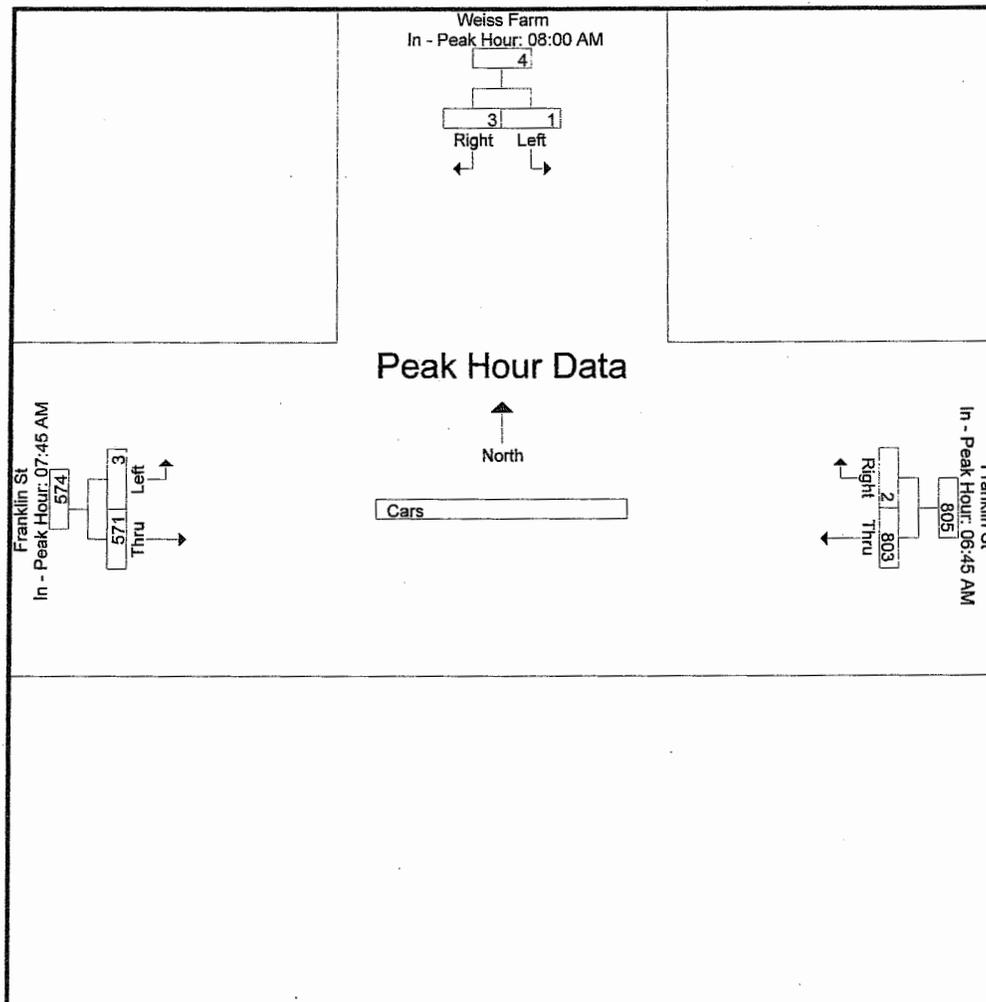
Start Time	Weiss Farm From North			Franklin St From East			Franklin St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 06:30 AM										
06:30 AM	0	0	0	1	0	1	0	5	5	6
06:45 AM	0	0	0	1	0	1	0	2	2	3
07:00 AM	0	0	0	4	0	4	0	5	5	9
07:15 AM	0	0	0	4	0	4	0	3	3	7
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>15</b>	<b>15</b>	<b>25</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>100</b>	<b>100</b>
PHF	.000	.000	.000	.625	.000	.625	.000	.750	.750	.694

# Accurate Counts

978-664-2565

N/S Street : Weiss Farm Driveway  
E/W Street : Franklin Street  
State : Stoneham, MA  
Weather : Clear

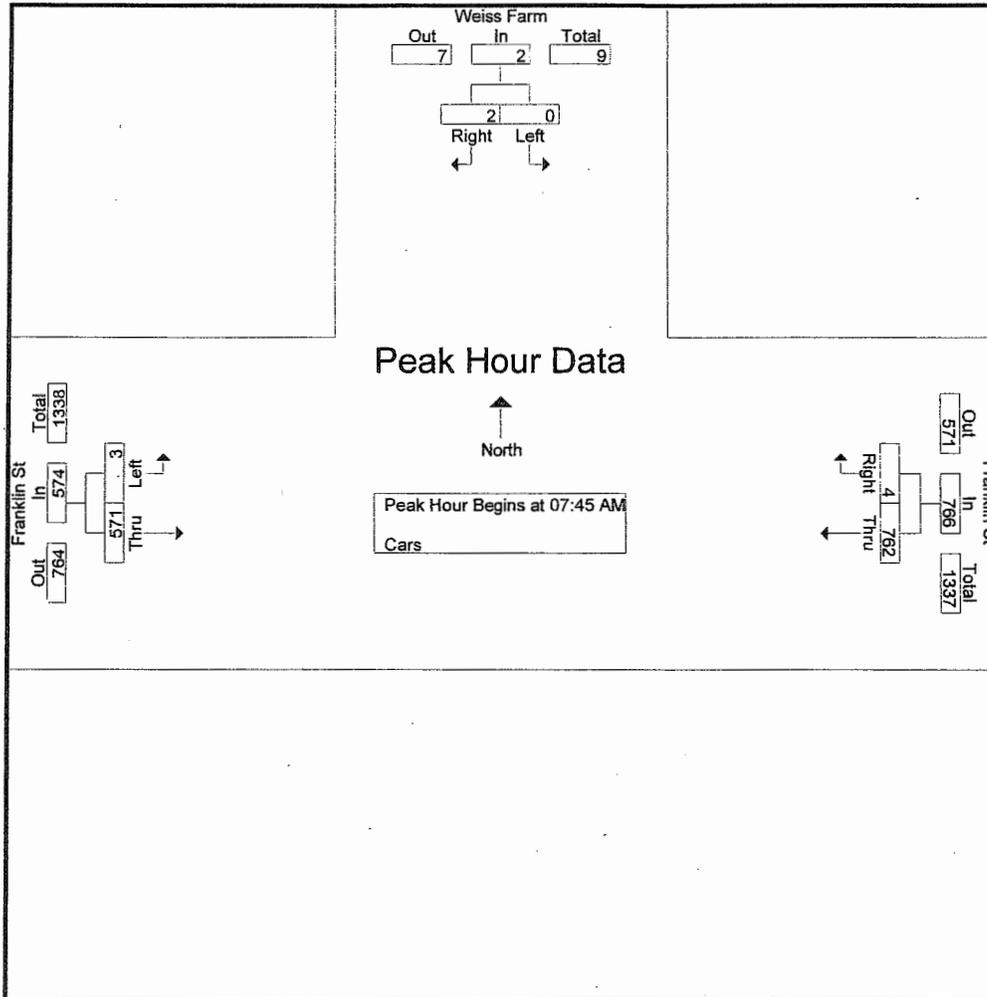
File Name : 16470  
Site Code : 16470  
Start Date : 4/10/21  
Page No : 6



**Accurate Counts**  
978-664-2565

File Name : 16470  
Site Code : 16470  
Start Date : 4/10/2  
Page No : 5

N/S Street : Weiss Farm Driveway  
Street : Franklin Street  
State : Stoneham, MA  
Weather : Clear



Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	08:00 AM			06:45 AM			07:45 AM		
+0 mins.	0	0	0	177	1	178	1	159	160
+15 mins.	0	2	2	227	0	227	0	137	137
+30 mins.	0	0	0	221	1	222	2	155	157
+45 mins.	1	1	2	178	0	178	0	120	120
<b>Total Volume</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>803</b>	<b>2</b>	<b>805</b>	<b>3</b>	<b>571</b>	<b>574</b>
<b>% App. Total</b>	<b>25</b>	<b>75</b>		<b>99.8</b>	<b>0.2</b>		<b>0.5</b>	<b>99.5</b>	
<b>PHF</b>	<b>.250</b>	<b>.375</b>	<b>.500</b>	<b>.884</b>	<b>.500</b>	<b>.887</b>	<b>.375</b>	<b>.898</b>	<b>.897</b>

# Accurate Counts

978-664-2565

N/S Street : Weiss Farm Driveway  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16470  
 Site Code : 16470  
 Start Date : 4/10/2  
 Page No : 4

Groups Printed- Cars

Start Time	Weiss Farm From North		Franklin St From East		Franklin St From West		Int. Tot
	Left	Right	Thru	Right	Left	Thru	
06:00 AM	0	0	88	0	0	35	12
06:15 AM	0	0	95	0	0	49	14
06:30 AM	0	0	154	0	0	74	22
06:45 AM	0	0	177	1	1	89	26
<b>Total</b>	0	0	514	1	1	247	76
07:00 AM	0	1	227	0	0	109	33
07:15 AM	0	0	221	1	0	132	35
07:30 AM	0	0	178	0	0	97	27
07:45 AM	0	0	159	0	1	159	31
<b>Total</b>	0	1	785	1	1	497	128
08:00 AM	0	0	196	0	0	137	33
08:15 AM	0	2	235	3	2	155	39
08:30 AM	0	0	172	1	0	120	29
08:45 AM	1	1	187	1	2	124	31
<b>Total</b>	1	3	790	5	4	536	133
<b>Grand Total</b>	1	4	2089	7	6	1280	338
Apprch %	20	80	99.7	0.3	0.5	99.5	
Total %	0	0.1	61.7	0.2	0.2	37.8	

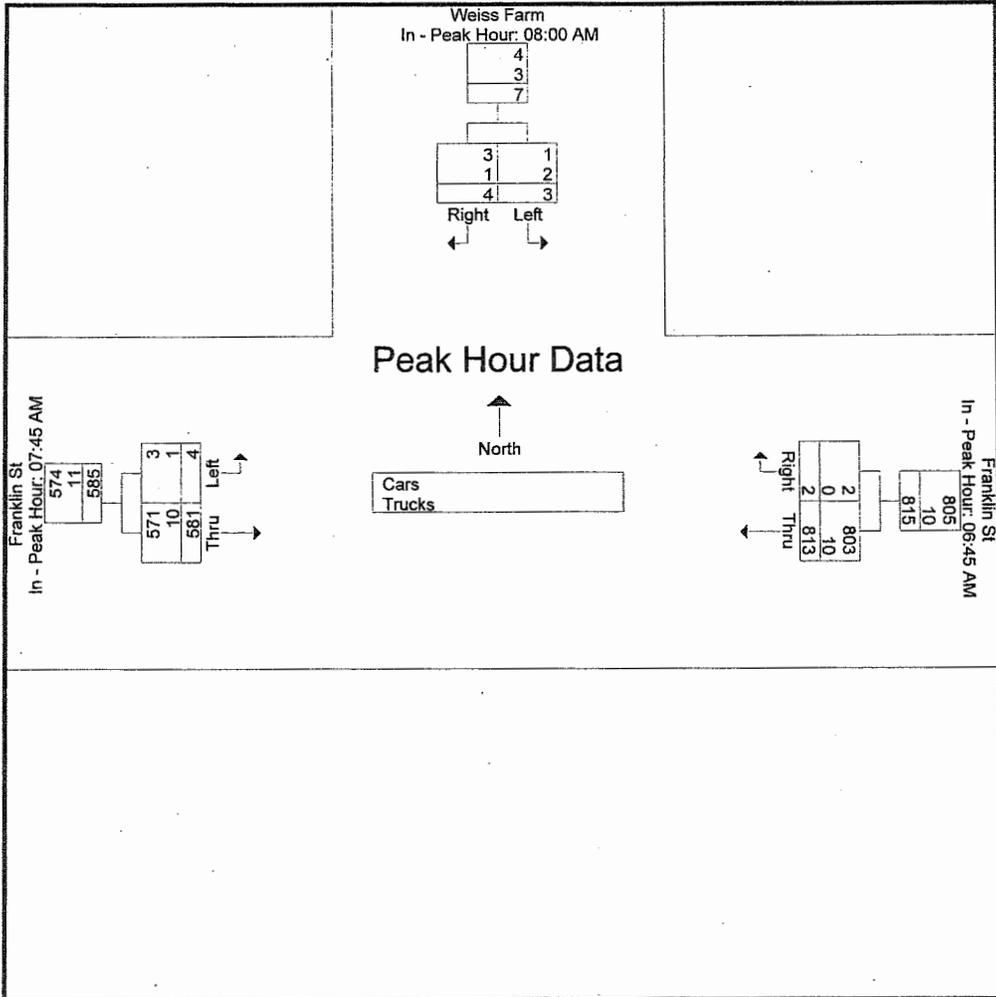
Start Time	Weiss Farm From North			Franklin St From East			Franklin St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	0	0	0	159	0	159	1	159	160	319
08:00 AM	0	0	0	196	0	196	0	137	137	333
08:15 AM	0	2	2	235	3	238	2	155	157	397
08:30 AM	0	0	0	172	1	173	0	120	120	293
<b>Total Volume</b>	0	2	2	762	4	766	3	571	574	1342
<b>% App. Total</b>	0	100		99.5	0.5		0.5	99.5		
PHF	.000	.250	.250	.811	.333	.805	.375	.898	.897	.845

# Accurate Counts

978-664-2565

File Name : 16470  
 Site Code : 16470  
 Start Date : 4/10/2  
 Page No : 3

N/S Street : Weiss Farm Driveway  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

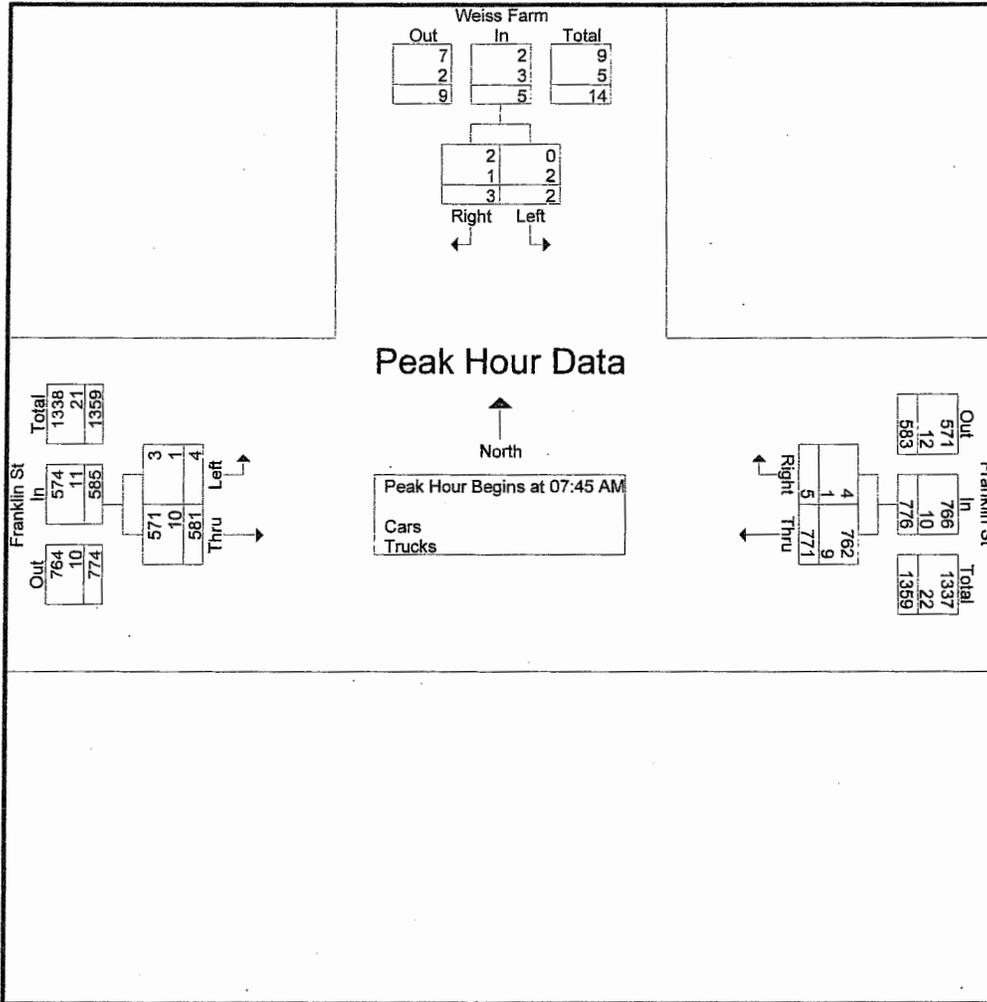


# Accurate Counts

978-664-2565

File Name : 16470  
 Site Code : 16470  
 Start Date : 4/10/2  
 Page No : 2

N/S Street : Weiss Farm Driveway  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear



Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	08:00 AM			06:45 AM			07:45 AM		
+0 mins.	0	0	0	178	1	179	1	161	162
+15 mins.	0	3	3	231	0	231	0	139	139
+30 mins.	1	0	1	225	1	226	2	157	159
+45 mins.	2	1	3	179	0	179	1	124	125
Total Volume	3	4	7	813	2	815	4	581	585
% App. Total	42.9	57.1		99.8	0.2		0.7	99.3	
PHF	.375	.333	.583	.880	.500	.882	.500	.902	.903
Cars	1	3	4	803	2	805	3	571	574
% Cars	33.3	75	57.1	98.8	100	98.8	75	98.3	98.1
Trucks	2	1	3	10	0	10	1	10	11
% Trucks	66.7	25	42.9	1.2	0	1.2	25	1.7	1.9

**Accurate Counts**  
978-664-2565

N/S Street : Weiss Farm Driveway  
 Street : Franklin Street  
 State : Stoneham, MA  
 Weather : Clear

File Name : 16470  
 Site Code : 16470  
 Start Date : 4/10/2  
 Page No : 1

Groups Printed- Cars - Trucks

Start Time	Weiss Farm From North		Franklin St From East		Franklin St From West		Int. Tot
	Left	Right	Thru	Right	Left	Thru	
06:00 AM	0	0	88	0	0	37	12
06:15 AM	0	0	95	0	0	51	14
06:30 AM	0	0	155	0	0	79	23
06:45 AM	0	0	178	1	1	91	27
<b>Total</b>	<b>0</b>	<b>0</b>	<b>516</b>	<b>1</b>	<b>1</b>	<b>258</b>	<b>77</b>
07:00 AM	0	1	231	0	0	114	34
07:15 AM	0	0	225	1	0	135	36
07:30 AM	0	0	179	0	0	97	27
07:45 AM	1	0	161	0	1	161	32
<b>Total</b>	<b>1</b>	<b>1</b>	<b>796</b>	<b>1</b>	<b>1</b>	<b>507</b>	<b>130</b>
08:00 AM	0	0	200	0	0	139	33
08:15 AM	0	3	237	3	2	157	40
08:30 AM	1	0	173	2	1	124	30
08:45 AM	2	1	188	2	2	127	32
<b>Total</b>	<b>3</b>	<b>4</b>	<b>798</b>	<b>7</b>	<b>5</b>	<b>547</b>	<b>136</b>
<b>Grand Total</b>	<b>4</b>	<b>5</b>	<b>2110</b>	<b>9</b>	<b>7</b>	<b>1312</b>	<b>344</b>
Apprch %	44.4	55.6	99.6	0.4	0.5	99.5	
Total %	0.1	0.1	61.2	0.3	0.2	38.1	
Cars	1	4	2089	7	6	1280	338
% Cars	25	80	99	77.8	85.7	97.6	98.1
Trucks	3	1	21	2	1	32	6
% Trucks	75	20	1	22.2	14.3	2.4	1.9

Start Time	Weiss Farm From North			Franklin St From East			Franklin St From West			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
<b>Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1</b>										
<b>Peak Hour for Entire Intersection Begins at 07:45 AM</b>										
07:45 AM	1	0	1	161	0	161	1	161	162	324
08:00 AM	0	0	0	200	0	200	0	139	139	339
08:15 AM	0	3	3	237	3	240	2	157	159	402
08:30 AM	1	0	1	173	2	175	1	124	125	301
<b>Total Volume</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>771</b>	<b>5</b>	<b>776</b>	<b>4</b>	<b>581</b>	<b>585</b>	<b>1366</b>
<b>% App. Total</b>	<b>40</b>	<b>60</b>		<b>99.4</b>	<b>0.6</b>		<b>0.7</b>	<b>99.3</b>		
PHF	.500	.250	.417	.813	.417	.808	.500	.902	.903	.850
Cars	0	2	2	762	4	766	3	571	574	1342
% Cars	0	66.7	40.0	98.8	80.0	98.7	75.0	98.3	98.1	98.2
Trucks	2	1	3	9	1	10	1	10	11	24
% Trucks	100	33.3	60.0	1.2	20.0	1.3	25.0	1.7	1.9	1.8

# Accura Counts

978-664-2565

File Name : 1647001  
 Site Code : 1647001  
 Start Date : 4/10/201  
 Page No : 13.

N/S Street : Pond Street  
 E/W Street : Summer Street  
 City/State : Stoneham, MA  
 Weather : Clear

### Groups Printed- Bikes Peds

Start Time	Pond St From North				Summer St From East				Pond St From South				Summer St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	1	2	3
Total	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	1	2	3
05:00 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	2	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	1	0	0	0	1	0	1	0	2	0	1	0	1	5	2	7
Apprch %	0	0	0		0	0	0		0	100	0		0	100	0				
Total %	0	0	0		0	0	0		0	50	0		0	50	0		71.4	28.6	

Start Time	Pond St From North				Summer St From East				Pond St From South				Summer St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
% App. Total	0	0	0		0	0	0		0	100	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.250	.000	.250	.250

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Sumpnd PM  
 Site Code : 3  
 Start Date : 9/19/2013  
 Page No. : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Pond Street Northbound				Pond Street Southbound				Summer Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
04:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	3
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
Total	0	0	0	0	0	0	0	0	0	5	0	5	0	4	0	4	9
05:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	3
05:15 PM	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	5
05:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	5
Total	0	0	0	0	0	0	0	0	0	9	1	10	0	5	0	5	15
Grand Total	0	0	0	0	0	0	0	0	0	14	1	15	0	9	0	9	24
Apprch %	0	0	0	0	0	0	0	0	0	93.3	6.7		0	100	0		
Total %	0	0	0	0	0	0	0	0	0	58.3	4.2	62.5	0	37.5	0	37.5	

Start Time	Pond Street Northbound				Pond Street Southbound				Summer Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	3
05:15 PM	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	5
05:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2	5
Total Volume	0	0	0	0	0	0	0	0	0	9	1	10	0	5	0	5	15
% App. Total	0	0	0	0	0	0	0	0	0	90	10		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750	.250	.833	.000	.625	.000	.625	.750

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

	04:00 PM				04:00 PM				05:00 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	2
+15 mins.	0	0	0	0	0	0	0	0	0	1	1	2	0	1	0	1
+30 mins.	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	3	0	3	0	2	0	2
Total Volume	0	0	0	0	0	0	0	0	0	9	1	10	0	5	0	5
% App. Total	0	0	0	0	0	0	0	0	0	90	10		0	100	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750	.250	.833	.000	.625	.000	.625

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-901-8300  
 www.tsetraffic.com

File Name : Sumpond PM  
 Site Code : 3  
 Start Date : 9/19/2013  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Pond Street Northbound				Pond Street Southbound				Summer Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	6	39	30	75	1	3	0	4	3	90	12	105	14	35	2	51	235
04:15 PM	10	44	33	87	0	1	1	2	1	103	10	114	11	31	1	43	246
04:30 PM	9	50	28	87	2	6	1	9	2	118	10	130	13	40	0	53	279
04:45 PM	12	56	26	94	0	6	2	8	3	125	11	139	14	48	1	63	304
Total	37	189	117	343	3	16	4	23	9	436	43	488	52	154	4	210	1064
05:00 PM	7	54	26	87	1	5	3	9	4	105	13	122	12	45	0	57	275
05:15 PM	16	52	30	98	0	14	1	15	1	105	21	127	12	47	0	59	299
05:30 PM	13	62	30	105	0	10	1	11	1	109	12	122	15	35	0	50	288
05:45 PM	16	42	33	91	1	11	0	12	4	99	9	112	16	35	3	54	269
Total	52	210	119	381	2	40	5	47	10	418	55	483	55	162	3	220	1131
Grand Total	89	399	236	724	5	56	9	70	19	854	98	971	107	316	7	430	2195
Apprch %	12.3	55.1	32.6		7.1	80	12.9		2	88	10.1		24.9	73.5	1.6		
Total %	4.1	18.2	10.8	33	0.2	2.6	0.4	3.2	0.9	38.9	4.5	44.2	4.9	14.4	0.3	19.6	

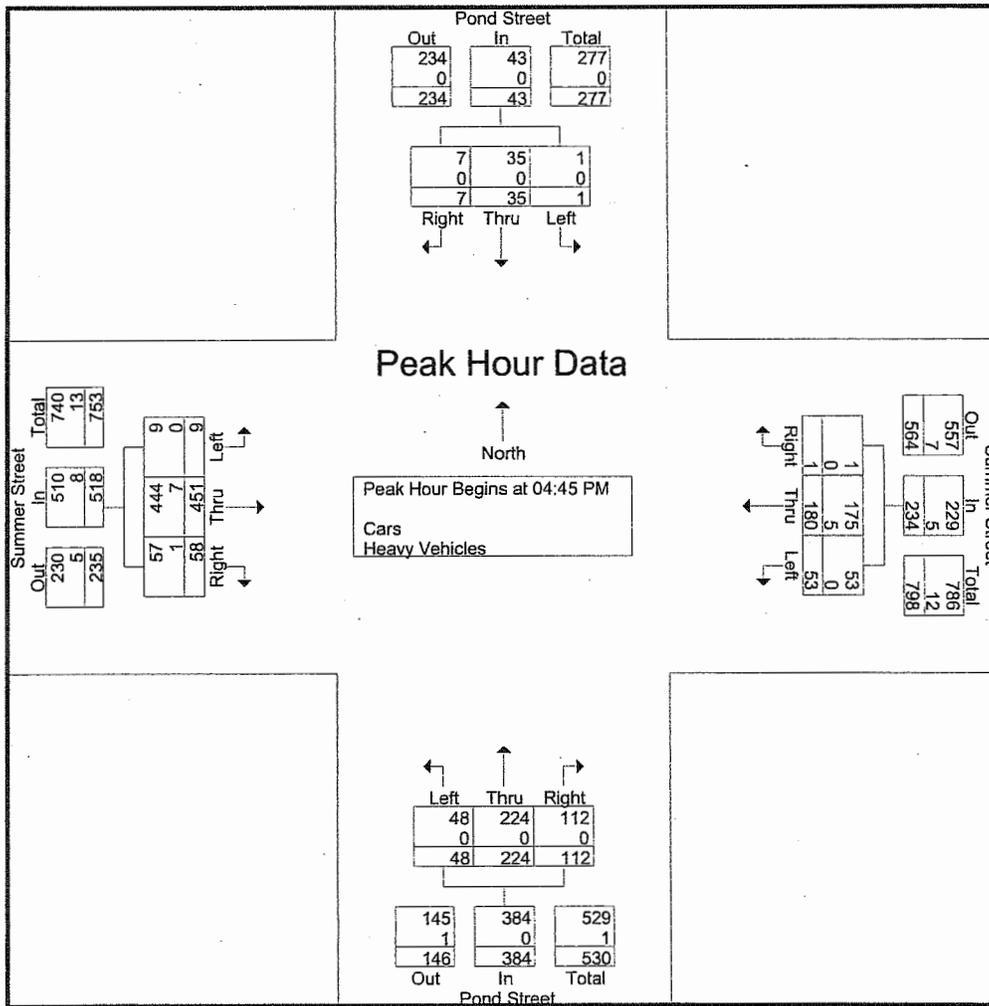
Start Time	Pond Street Northbound				Pond Street Southbound				Summer Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	12	56	26	94	0	6	2	8	3	125	11	139	14	48	1	63	304
05:00 PM	7	54	26	87	1	5	3	9	4	105	13	122	12	45	0	57	275
05:15 PM	16	52	30	98	0	14	1	15	1	105	21	127	12	47	0	59	299
05:30 PM	13	62	30	105	0	10	1	11	1	109	12	122	15	35	0	50	288
Total Volume	48	224	112	384	1	35	7	43	9	444	57	510	53	175	1	229	1166
% App. Total	12.5	58.3	29.2		2.3	81.4	16.3		1.8	87.1	11.2		23.1	76.4	0.4		
PHF	.750	.903	.933	.914	.250	.625	.583	.717	.563	.888	.679	.917	.883	.911	.250	.909	.959

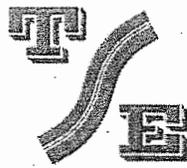
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	04:45 PM				05:00 PM				04:30 PM				04:30 PM			
+0 mins.	12	56	26	94	1	5	3	9	2	118	10	130	13	40	0	53
+15 mins.	7	54	26	87	0	14	1	15	3	125	11	139	14	48	1	63
+30 mins.	16	52	30	98	0	10	1	11	4	105	13	122	12	45	0	57
+45 mins.	13	62	30	105	1	11	0	12	1	105	21	127	12	47	0	59
Total Volume	48	224	112	384	2	40	5	47	10	453	55	518	51	180	1	232
% App. Total	12.5	58.3	29.2		4.3	85.1	10.6		1.9	87.5	10.6		22	77.6	0.4	
PHF	.750	.903	.933	.914	.500	.714	.417	.783	.625	.906	.655	.932	.911	.938	.250	.921



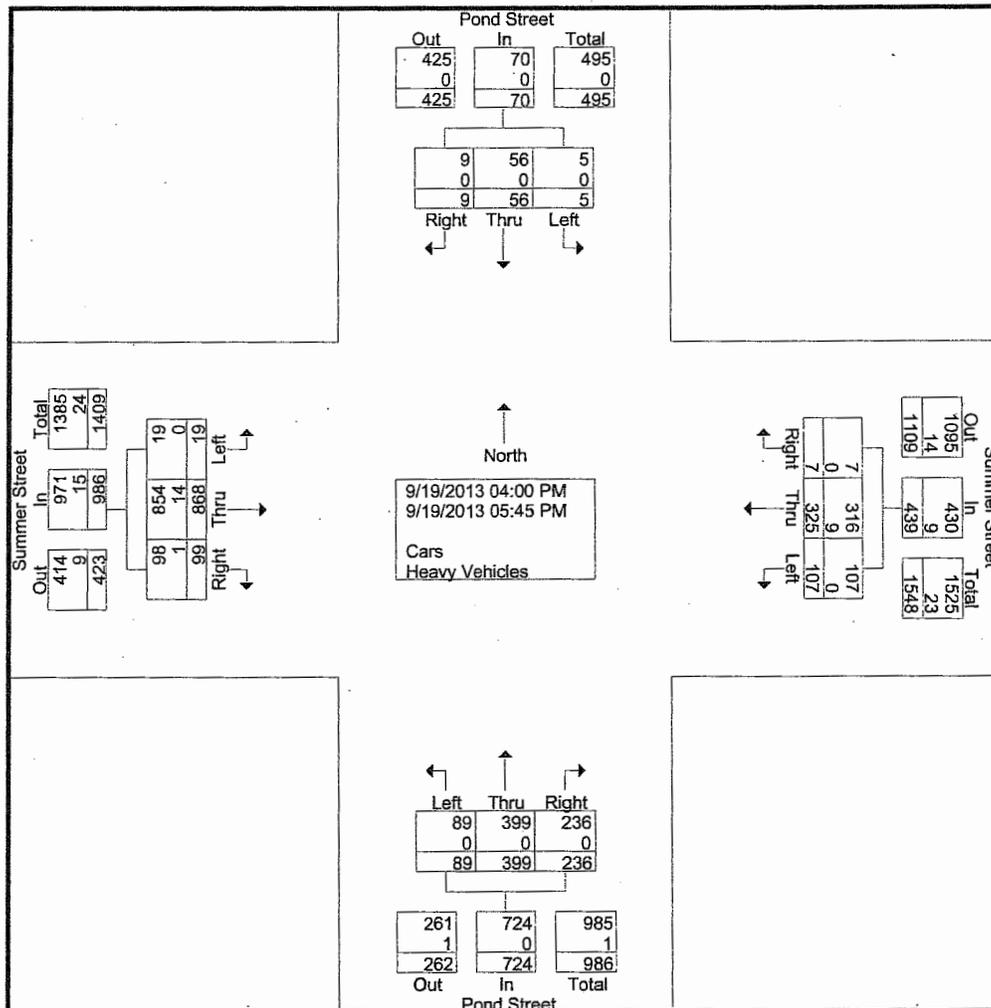
Start Time	Pond Street Northbound				Pond Street Southbound				Summer Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	12	56	26	94	0	6	2	8	3	126	11	140	14	50	1	65	307
05:00 PM	7	54	26	87	1	5	3	9	4	107	13	124	12	46	0	58	278
05:15 PM	16	52	30	98	0	14	1	15	1	106	22	129	12	47	0	59	301
05:30 PM	13	62	30	105	0	10	1	11	1	112	12	125	15	37	0	52	293
Total Volume	48	224	112	384	1	35	7	43	9	444	57	510	53	180	1	234	1179
% App. Total	12.5	58.3	29.2		2.3	81.4	16.3		1.7	87.1	11.2		22.6	76.9	0.4		
PHF	.750	.903	.933	.914	.250	.625	.583	.717	.563	.895	.659	.925	.883	.900	.250	.900	.960
Cars	48	224	112	384	1	35	7	43	9	444	57	510	53	175	1	229	1166
% Cars	100	100	100	100	100	100	100	100	100	98.4	98.3	98.5	100	97.2	100	97.9	98.9
Heavy Vehicles	0	0	0	0	0	0	0	0	0	7	1	8	0	5	0	5	13
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	1.6	1.7	1.5	0	2.8	0	2.1	1.1





Groups Printed- Cars - Heavy Vehicles

Start Time	Pond Street Northbound				Pond Street Southbound				Summer Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	6	39	30	75	1	3	0	4	3	91	12	106	14	36	2	52	237
04:15 PM	10	44	33	87	0	1	1	2	1	105	10	116	11	32	1	44	249
04:30 PM	9	50	28	87	2	6	1	9	2	119	10	131	13	40	0	53	280
04:45 PM	12	56	26	94	0	6	2	8	3	126	11	140	14	50	1	65	307
Total	37	189	117	343	3	16	4	23	9	441	43	493	52	158	4	214	1073
05:00 PM	7	54	26	87	1	5	3	9	4	107	13	124	12	46	0	58	278
05:15 PM	16	52	30	98	0	14	1	15	1	106	22	129	12	47	0	59	301
05:30 PM	13	62	30	105	0	10	1	11	1	112	12	125	15	37	0	52	293
05:45 PM	16	42	33	91	1	11	0	12	4	102	9	115	16	37	3	56	274
Total	52	210	119	381	2	40	5	47	10	427	56	493	55	167	3	225	1146
Grand Total	89	399	236	724	5	56	9	70	19	868	99	986	107	325	7	439	2219
Apprch %	12.3	55.1	32.6		7.1	80	12.9		1.9	88	10		24.4	74	1.6		
Total %	4	18	10.6	32.6	0.2	2.5	0.4	3.2	0.9	39.1	4.5	44.4	4.8	14.6	0.3	19.8	
Cars	89	399	236	724	5	56	9	70	19	854	98	971	107	316	7	430	4390
% Cars	100	100	100	100	100	100	100	100	100	98.4	99	98.5	100	97.2	100	97.9	98.9
Heavy Vehicles	0	0	0	0	0	0	0	0	0	14	1	15	0	9	0	9	48
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	1.6	1	1.5	0	2.8	0	2.1	1.1



N/S Street : Pond Street  
E/W Street : Summer Street  
City/State : Stoneham, MA  
Weather : Clear

File Name : 1647001  
Site Code : 1647001  
Start Date : 4/10/20  
Page No : 13

Groups Printed- Bikes Peds

Start Time	Pond St From North				Summer St From East				Pond St From South				Summer St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:15 AM	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0	1	6	0	6
07:30 AM	0	1	0	2	0	0	0	1	0	0	0	0	0	0	0	0	3	1	4
07:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	3	1	4
Total	0	1	0	2	0	0	0	5	0	1	0	1	0	0	0	4	12	2	14
08:00 AM	0	0	0	2	0	0	0	10	0	0	0	2	0	0	0	4	18	0	18
Grand Total	0	1	0	4	0	0	0	15	0	1	0	3	0	0	0	8	30	2	32
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0				
Total %	0	50	0		0	0	0		0	50	0		0	0	0		93.8	6.2	

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

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Sumpond AM  
 Site Code : 3  
 Start Date : 9/19/2013  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Pond Street Northbound				Pond Street Southbound				Summer Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2
07:00 AM	0	0	0	0	0	0	0	0	0	2	0	2	2	1	0	3	5
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
07:30 AM	0	1	0	1	0	0	0	0	0	2	1	3	1	2	0	3	7
07:45 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	2	1	3	6
Total	0	2	0	2	0	1	0	1	0	6	1	7	3	5	1	9	19
08:00 AM	1	1	0	2	0	0	0	0	0	0	0	0	0	2	0	2	4
08:15 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
08:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
Total	2	1	0	3	0	0	0	0	0	2	0	2	0	5	0	5	10
Grand Total	2	3	0	5	0	1	0	1	0	8	1	9	4	11	1	16	31
Apprch %	40	60	0		0	100	0		0	88.9	11.1		25	68.8	6.2		
Total %	6.5	9.7	0	16.1	0	3.2	0	3.2	0	25.8	3.2	29	12.9	35.5	3.2	51.6	

Start Time	Pond Street Northbound				Pond Street Southbound				Summer Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	2	0	2	2	1	0	3	5
07:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
07:30 AM	0	1	0	1	0	0	0	0	0	2	1	3	1	2	0	3	7
07:45 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	2	1	3	6
Total Volume	0	2	0	2	0	1	0	1	0	6	1	7	3	5	1	9	19
% App. Total	0	100	0		0	100	0		0	85.7	14.3		33.3	55.6	11.1		
PHF	.000	.500	.000	.500	.000	.250	.000	.250	.000	.750	.250	.583	.375	.625	.250	.750	.679

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				06:30 AM				07:00 AM				07:00 AM			
+0 mins.	0	1	0	1	0	0	0	0	0	2	0	2	2	1	0	3
+15 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	1	1	0	2	0	0	0	0	0	2	1	3	1	2	0	3
+45 mins.	1	0	0	1	0	1	0	1	0	2	0	2	0	2	1	3
Total Volume	2	3	0	5	0	1	0	1	0	6	1	7	3	5	1	9
% App. Total	40	60	0		0	100	0		0	85.7	14.3		33.3	55.6	11.1	
PHF	.500	.750	.000	.625	.000	.250	.000	.250	.000	.750	.250	.583	.375	.625	.250	.750

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Sumpod AM  
 Site Code : 3  
 Start Date : 9/19/2013  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Pond Street Northbound				Pond Street Southbound				Summer Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	3	8	2	13	2	12	1	15	2	10	4	16	33	40	2	75	119
06:15 AM	5	7	2	14	0	10	1	11	0	9	7	16	44	59	2	105	146
06:30 AM	7	9	2	18	1	12	0	13	0	7	10	17	59	72	0	131	179
06:45 AM	9	16	4	29	0	13	1	14	0	21	8	29	57	77	2	136	208
<b>Total</b>	<b>24</b>	<b>40</b>	<b>10</b>	<b>74</b>	<b>3</b>	<b>47</b>	<b>3</b>	<b>53</b>	<b>2</b>	<b>47</b>	<b>29</b>	<b>78</b>	<b>193</b>	<b>248</b>	<b>6</b>	<b>447</b>	<b>652</b>
07:00 AM	4	18	8	30	0	18	1	19	2	30	17	49	64	103	1	168	266
07:15 AM	20	27	7	54	1	26	0	27	1	41	16	58	57	80	1	138	277
07:30 AM	28	48	21	97	0	33	4	37	2	41	31	74	56	63	2	121	329
07:45 AM	36	55	13	104	0	32	0	32	1	27	28	56	56	73	4	133	325
<b>Total</b>	<b>88</b>	<b>148</b>	<b>49</b>	<b>285</b>	<b>1</b>	<b>109</b>	<b>5</b>	<b>115</b>	<b>6</b>	<b>139</b>	<b>92</b>	<b>237</b>	<b>233</b>	<b>319</b>	<b>8</b>	<b>560</b>	<b>1197</b>
08:00 AM	21	37	6	64	0	37	2	39	2	32	27	61	65	63	4	132	296
08:15 AM	15	29	8	52	1	17	0	18	5	41	26	72	53	57	3	113	255
08:30 AM	14	25	13	52	0	17	2	19	1	44	14	59	30	55	2	87	217
08:45 AM	8	20	8	36	0	21	1	22	0	36	10	46	50	62	0	112	216
<b>Total</b>	<b>58</b>	<b>111</b>	<b>35</b>	<b>204</b>	<b>1</b>	<b>92</b>	<b>5</b>	<b>98</b>	<b>8</b>	<b>153</b>	<b>77</b>	<b>238</b>	<b>198</b>	<b>237</b>	<b>9</b>	<b>444</b>	<b>984</b>
<b>Grand Total</b>	<b>170</b>	<b>299</b>	<b>94</b>	<b>563</b>	<b>5</b>	<b>248</b>	<b>13</b>	<b>266</b>	<b>16</b>	<b>339</b>	<b>198</b>	<b>553</b>	<b>624</b>	<b>804</b>	<b>23</b>	<b>1451</b>	<b>2833</b>
Apprch %	30.2	53.1	16.7		1.9	93.2	4.9		2.9	61.3	35.8		43	55.4	1.6		
Total %	6	10.6	3.3	19.9	0.2	8.8	0.5	9.4	0.6	12	7	19.5	22	28.4	0.8	51.2	

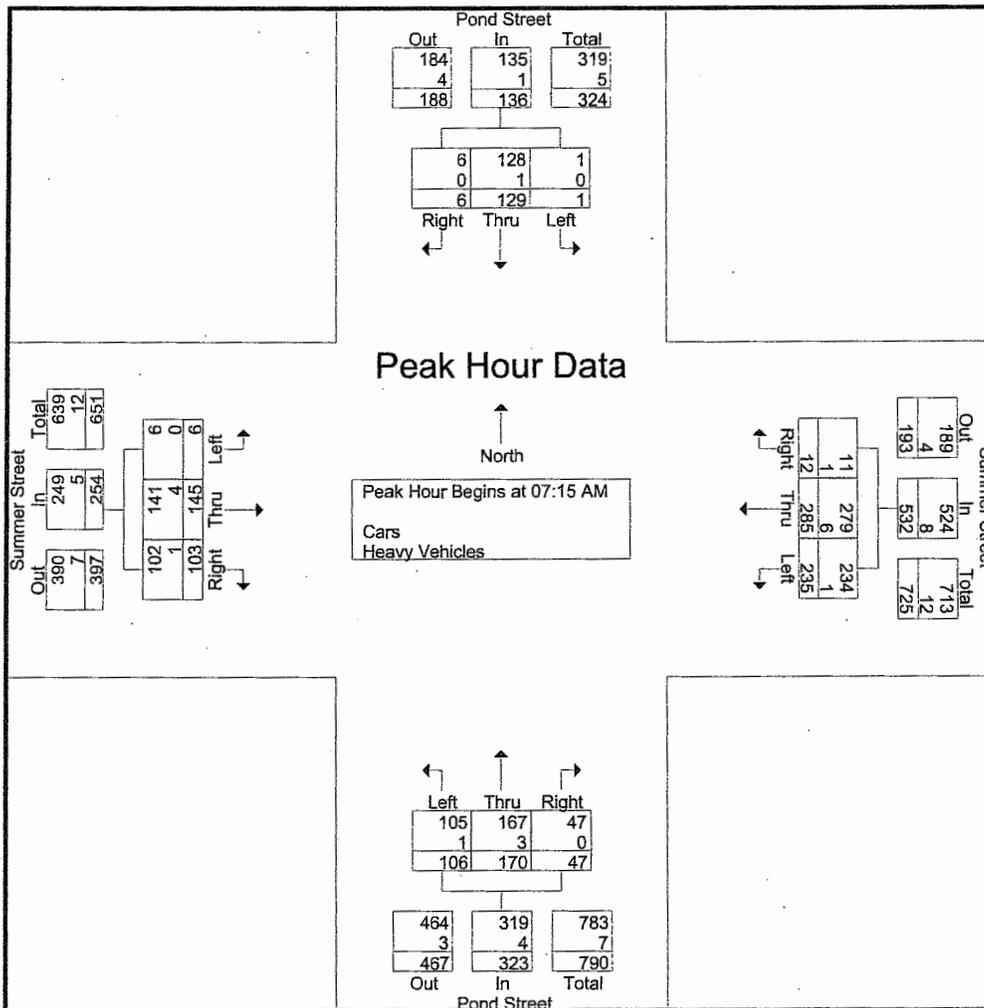
Start Time	Pond Street Northbound				Pond Street Southbound				Summer Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	20	27	7	54	1	26	0	27	1	41	16	58	57	80	1	138	277
07:30 AM	28	48	21	97	0	33	4	37	2	41	31	74	56	63	2	121	329
07:45 AM	36	55	13	104	0	32	0	32	1	27	28	56	56	73	4	133	325
08:00 AM	21	37	6	64	0	37	2	39	2	32	27	61	65	63	4	132	296
Total Volume	105	167	47	319	1	128	6	135	6	141	102	249	234	279	11	524	1227
% App. Total	32.9	52.4	14.7		0.7	94.8	4.4		2.4	56.6	41		44.7	53.2	2.1		
PHF	.729	.759	.560	.767	.250	.865	.375	.865	.750	.860	.823	.841	.900	.872	.688	.949	.932

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:30 AM				06:30 AM			
+0 mins.	20	27	7	54	1	26	0	27	2	41	31	74	59	72	0	131
+15 mins.	28	48	21	97	0	33	4	37	1	27	28	56	57	77	2	136
+30 mins.	36	55	13	104	0	32	0	32	2	32	27	61	64	103	1	168
+45 mins.	21	37	6	64	0	37	2	39	5	41	26	72	57	80	1	138
Total Volume	105	167	47	319	1	128	6	135	10	141	112	263	237	332	4	573
% App. Total	32.9	52.4	14.7		0.7	94.8	4.4		3.8	53.6	42.6		41.4	57.9	0.7	
PHF	.729	.759	.560	.767	.250	.865	.375	.865	.500	.860	.903	.889	.926	.806	.500	.853



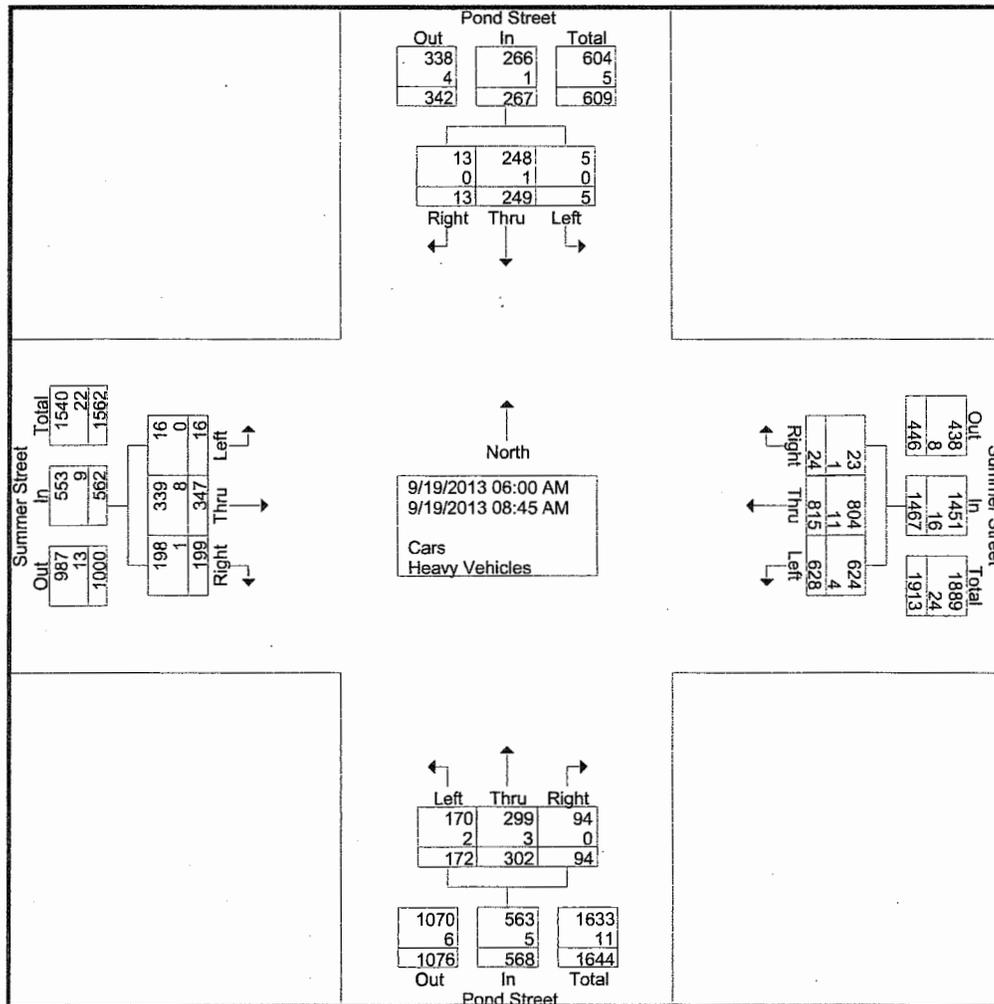
Start Time	Pond Street Northbound				Pond Street Southbound				Summer Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	20	27	7	54	1	27	0	28	1	41	16	58	57	80	1	138	278
07:30 AM	28	49	21	98	0	33	4	37	2	43	32	77	57	65	2	124	336
07:45 AM	36	56	13	105	0	32	0	32	1	29	28	58	56	75	5	136	331
08:00 AM	22	38	6	66	0	37	2	39	2	32	27	61	65	65	4	134	300
Total Volume	106	170	47	323	1	129	6	136	6	145	103	254	235	285	12	532	1245
% App. Total	32.8	52.6	14.6		0.7	94.9	4.4		2.4	57.1	40.6		44.2	53.6	2.3		
PHF	.736	.759	.560	.769	.250	.872	.375	.872	.750	.843	.805	.825	.904	.891	.600	.964	.926
Cars	105	167	47	319	1	128	6	135	6	141	102	249	234	279	11	524	1227
% Cars	99.1	98.2	100	98.8	100	99.2	100	99.3	100	97.2	99.0	98.0	99.6	97.9	91.7	98.5	98.6
Heavy Vehicles	1	3	0	4	0	1	0	1	0	4	1	5	1	6	1	8	18
% Heavy Vehicles	0.9	1.8	0	1.2	0	0.8	0	0.7	0	2.8	1.0	2.0	0.4	2.1	8.3	1.5	1.4





Groups Printed- Cars - Heavy Vehicles

Start Time	Pond Street Northbound				Pond Street Southbound				Summer Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	3	8	2	13	2	12	1	15	2	10	4	16	33	40	2	75	119
06:15 AM	5	7	2	14	0	10	1	11	0	9	7	16	44	60	2	106	147
06:30 AM	7	9	2	18	1	12	0	13	0	7	10	17	59	72	0	131	179
06:45 AM	9	16	4	29	0	13	1	14	0	21	8	29	58	77	2	137	209
Total	24	40	10	74	3	47	3	53	2	47	29	78	194	249	6	449	654
07:00 AM	4	18	8	30	0	18	1	19	2	32	17	51	66	104	1	171	271
07:15 AM	20	27	7	54	1	27	0	28	1	41	16	58	57	80	1	138	278
07:30 AM	28	49	21	98	0	33	4	37	2	43	32	77	57	65	2	124	336
07:45 AM	36	56	13	105	0	32	0	32	1	29	28	58	56	75	5	136	331
Total	88	150	49	287	1	110	5	116	6	145	93	244	236	324	9	569	1216
08:00 AM	22	38	6	66	0	37	2	39	2	32	27	61	65	65	4	134	300
08:15 AM	16	29	8	53	1	17	0	18	5	41	26	72	53	58	3	114	257
08:30 AM	14	25	13	52	0	17	2	19	1	45	14	60	30	56	2	88	219
08:45 AM	8	20	8	36	0	21	1	22	0	37	10	47	50	63	0	113	218
Total	60	112	35	207	1	92	5	98	8	155	77	240	198	242	9	449	994
Grand Total	172	302	94	568	5	249	13	267	16	347	199	562	628	815	24	1467	2864
Apprch %	30.3	53.2	16.5		1.9	93.3	4.9		2.8	61.7	35.4		42.8	55.6	1.6		
Total %	6	10.5	3.3	19.8	0.2	8.7	0.5	9.3	0.6	12.1	6.9	19.6	21.9	28.5	0.8	51.2	
Cars	170	299	94	563	5	248	13	266	16	339	198	553	624	804	23	1451	5666
% Cars	98.8	99	100	99.1	100	99.6	100	99.6	100	97.7	99.5	98.4	99.4	98.7	95.8	98.9	
Heavy Vehicles	2	3	0	5	0	1	0	1	0	8	1	9	4	11	1	16	62
% Heavy Vehicles	1.2	1	0	0.9	0	0.4	0	0.4	0	2.3	0.5	1.6	0.6	1.3	4.2	1.1	



N/S Street : Main Street  
E/W Street : Summer St / Marble St  
City/State : Stoneham, MA  
Weather : Clear

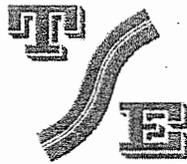
**Groups Printed- Bikes Peds**

Start Time	Main St From North				Summer St From East				Main St From South				Marble St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
05:00 PM	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	1	5	0	5
05:15 PM	0	0	0	2	0	0	0	2	0	0	0	1	0	0	0	2	7	0	7
05:30 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1
<b>Total</b>	0	0	1	4	0	0	0	4	0	0	0	3	0	0	0	3	14	1	15
<b>Grand Total</b>	0	0	1	4	0	0	0	4	0	0	0	3	0	0	0	3	14	1	15
Apprch %	0	0	100		0	0	0		0	0	0		0	0	0				
Total %	0	0	100		0	0	0		0	0	0		0	0	0		93.3	6.7	

Start Time	Main St From North				Summer St From East				Main St From South				Marble St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:45 AM				07:45 AM				07:45 AM				07:45 AM				
+0 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	1
% App. Total	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	0
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	

Start Time	Main St From North				Summer St From East				Main St From South				Marble St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	0	100		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5888  
 F: 617-301-8800  
 www.tsetraffic.com

File Name : Mainsum PM  
 Site Code : 4  
 Start Date : 9/19/2013  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

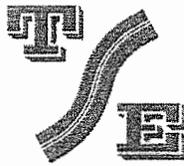
Start Time	Main Street Northbound				Main Street Southbound				Marble Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	3	0	3	0	1	0	1	0	1	0	1	2	0	0	2	7
04:15 PM	0	2	0	2	0	3	0	3	0	1	0	1	0	1	0	1	7
04:30 PM	0	2	0	2	0	1	0	1	0	0	0	0	1	0	0	1	4
04:45 PM	0	1	1	2	0	1	1	2	0	1	0	1	2	1	0	3	8
Total	0	8	1	9	0	6	1	7	0	3	0	3	5	2	0	7	26
05:00 PM	0	5	1	6	0	0	0	0	0	3	0	3	1	2	1	4	13
05:15 PM	0	3	6	9	0	1	1	2	1	3	0	4	1	0	0	1	16
05:30 PM	0	0	2	2	0	1	0	1	3	0	1	4	0	3	0	3	10
05:45 PM	0	1	0	1	0	2	1	3	0	5	0	5	1	1	1	3	12
Total	0	9	9	18	0	4	2	6	4	11	1	16	3	6	2	11	51
Grand Total	0	17	10	27	0	10	3	13	4	14	1	19	8	8	2	18	77
Apprch %	0	63	37		0	76.9	23.1		21.1	73.7	5.3		44.4	44.4	11.1		
Total %	0	22.1	13	35.1	0	13	3.9	16.9	5.2	18.2	1.3	24.7	10.4	10.4	2.6	23.4	

Start Time	Main Street Northbound				Main Street Southbound				Marble Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	5	1	6	0	0	0	0	0	3	0	3	1	2	1	4	13
05:15 PM	0	3	6	9	0	1	1	2	1	3	0	4	1	0	0	1	16
05:30 PM	0	0	2	2	0	1	0	1	3	0	1	4	0	3	0	3	10
05:45 PM	0	1	0	1	0	2	1	3	0	5	0	5	1	1	1	3	12
Total Volume	0	9	9	18	0	4	2	6	4	11	1	16	3	6	2	11	51
% App. Total	0	50	50		0	66.7	33.3		25	68.8	6.2		27.3	54.5	18.2		
PHF	.000	.450	.375	.500	.000	.500	.500	.500	.333	.550	.250	.800	.750	.500	.500	.688	.797

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

	04:30 PM				04:00 PM				05:00 PM				04:45 PM			
+0 mins.	0	2	0	2	0	1	0	1	0	3	0	3	2	1	0	3
+15 mins.	0	1	1	2	0	3	0	3	1	3	0	4	1	2	1	4
+30 mins.	0	5	1	6	0	1	0	1	3	0	1	4	1	0	0	1
+45 mins.	0	3	6	9	0	1	1	2	0	5	0	5	0	3	0	3
Total Volume	0	11	8	19	0	6	1	7	4	11	1	16	4	6	1	11
% App. Total	0	57.9	42.1		0	85.7	14.3		25	68.8	6.2		36.4	54.5	9.1	
PHF	.000	.550	.333	.528	.000	.500	.250	.583	.333	.550	.250	.800	.500	.500	.250	.688

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Mainsum PM  
 Site Code : 4  
 Start Date : 9/19/2013  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Main Street Northbound				Main Street Southbound				Marble Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	4	67	44	115	4	44	7	55	23	65	5	93	20	11	4	35	298
04:15 PM	9	88	48	145	4	36	11	51	17	67	2	86	16	15	2	33	315
04:30 PM	6	91	48	145	3	48	9	60	22	64	4	90	16	14	2	32	327
04:45 PM	8	112	50	170	6	50	15	71	26	56	2	84	19	15	3	37	362
<b>Total</b>	<b>27</b>	<b>358</b>	<b>190</b>	<b>575</b>	<b>17</b>	<b>178</b>	<b>42</b>	<b>237</b>	<b>88</b>	<b>252</b>	<b>13</b>	<b>353</b>	<b>71</b>	<b>55</b>	<b>11</b>	<b>137</b>	<b>1302</b>
05:00 PM	5	129	47	181	4	44	19	67	29	65	4	98	27	28	6	61	407
05:15 PM	7	116	50	173	7	57	25	89	26	54	3	83	28	31	6	65	410
05:30 PM	10	98	63	171	1	67	22	90	22	61	6	89	15	24	3	42	392
05:45 PM	7	96	44	147	6	45	14	65	22	67	11	100	19	24	9	52	364
<b>Total</b>	<b>29</b>	<b>439</b>	<b>204</b>	<b>672</b>	<b>18</b>	<b>213</b>	<b>80</b>	<b>311</b>	<b>99</b>	<b>247</b>	<b>24</b>	<b>370</b>	<b>89</b>	<b>107</b>	<b>24</b>	<b>220</b>	<b>1573</b>
<b>Grand Total</b>	<b>56</b>	<b>797</b>	<b>394</b>	<b>1247</b>	<b>35</b>	<b>391</b>	<b>122</b>	<b>548</b>	<b>187</b>	<b>499</b>	<b>37</b>	<b>723</b>	<b>160</b>	<b>162</b>	<b>35</b>	<b>357</b>	<b>2875</b>
Apprch %	4.5	63.9	31.6		6.4	71.4	22.3		25.9	69	5.1		44.8	45.4	9.8		
Total %	1.9	27.7	13.7	43.4	1.2	13.6	4.2	19.1	6.5	17.4	1.3	25.1	5.6	5.6	1.2	12.4	

Start Time	Main Street Northbound				Main Street Southbound				Marble Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	5	129	47	181	4	44	19	67	29	65	4	98	27	28	6	61	407
05:15 PM	7	116	50	173	7	57	25	89	26	54	3	83	28	31	6	65	410
05:30 PM	10	98	63	171	1	67	22	90	22	61	6	89	15	24	3	42	392
05:45 PM	7	96	44	147	6	45	14	65	22	67	11	100	19	24	9	52	364
<b>Total Volume</b>	<b>29</b>	<b>439</b>	<b>204</b>	<b>672</b>	<b>18</b>	<b>213</b>	<b>80</b>	<b>311</b>	<b>99</b>	<b>247</b>	<b>24</b>	<b>370</b>	<b>89</b>	<b>107</b>	<b>24</b>	<b>220</b>	<b>1573</b>
<b>% App. Total</b>	<b>4.3</b>	<b>65.3</b>	<b>30.4</b>		<b>5.8</b>	<b>68.5</b>	<b>25.7</b>		<b>26.8</b>	<b>66.8</b>	<b>6.5</b>		<b>40.5</b>	<b>48.6</b>	<b>10.9</b>		
<b>PHF</b>	<b>.725</b>	<b>.851</b>	<b>.810</b>	<b>.928</b>	<b>.643</b>	<b>.795</b>	<b>.800</b>	<b>.864</b>	<b>.853</b>	<b>.922</b>	<b>.545</b>	<b>.925</b>	<b>.795</b>	<b>.863</b>	<b>.667</b>	<b>.846</b>	<b>.959</b>

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

	04:45 PM				04:45 PM				05:00 PM				05:00 PM			
+0 mins.	8	112	50	170	6	50	15	71	29	65	4	98	27	28	6	61
+15 mins.	5	129	47	181	4	44	19	67	26	54	3	83	28	31	6	65
+30 mins.	7	116	50	173	7	57	25	89	22	61	6	89	15	24	3	42
+45 mins.	10	98	63	171	1	67	22	90	22	67	11	100	19	24	9	52
<b>Total Volume</b>	<b>30</b>	<b>455</b>	<b>210</b>	<b>695</b>	<b>18</b>	<b>218</b>	<b>81</b>	<b>317</b>	<b>99</b>	<b>247</b>	<b>24</b>	<b>370</b>	<b>89</b>	<b>107</b>	<b>24</b>	<b>220</b>
<b>% App. Total</b>	<b>4.3</b>	<b>65.5</b>	<b>30.2</b>		<b>5.7</b>	<b>68.8</b>	<b>25.6</b>		<b>26.8</b>	<b>66.8</b>	<b>6.5</b>		<b>40.5</b>	<b>48.6</b>	<b>10.9</b>	
<b>PHF</b>	<b>.750</b>	<b>.882</b>	<b>.833</b>	<b>.960</b>	<b>.643</b>	<b>.813</b>	<b>.810</b>	<b>.881</b>	<b>.853</b>	<b>.922</b>	<b>.545</b>	<b>.925</b>	<b>.795</b>	<b>.863</b>	<b>.667</b>	<b>.846</b>

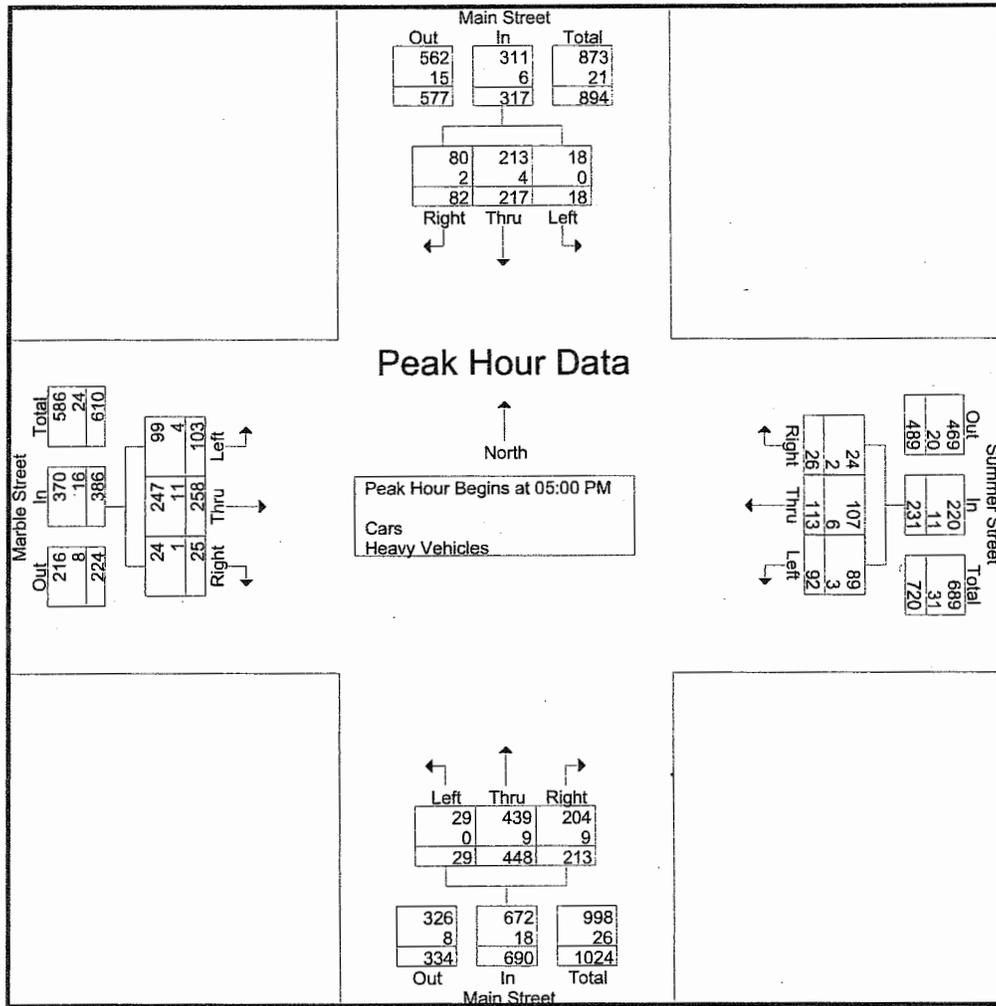
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5636  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Mainsum PM  
 Site Code : 4  
 Start Date : 9/19/2013  
 Page No : 2 of 4

Start Time	Main Street Northbound				Main Street Southbound				Marble Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	5	134	48	187	4	44	19	67	29	68	4	101	28	30	7	65	420
05:15 PM	7	119	56	182	7	58	26	91	27	57	3	87	29	31	6	66	426
05:30 PM	10	98	65	173	1	68	22	91	25	61	7	93	15	27	3	45	402
05:45 PM	7	97	44	148	6	47	15	68	22	72	11	105	20	25	10	55	376
Total Volume	29	448	213	690	18	217	82	317	103	258	25	386	92	113	26	231	1624
% App. Total	4.2	64.9	30.9		5.7	68.5	25.9		26.7	66.8	6.5		39.8	48.9	11.3		
PHF	.725	.836	.819	.922	.643	.798	.788	.871	.888	.896	.568	.919	.793	.911	.650	.875	.953
Cars	29	439	204	672	18	213	80	311	99	247	24	370	89	107	24	220	1573
% Cars	100	98.0	95.8	97.4	100	98.2	97.6	98.1	96.1	95.7	96.0	95.9	96.7	94.7	92.3	95.2	96.9
Heavy Vehicles	0	9	9	18	0	4	2	6	4	11	1	16	3	6	2	11	51
% Heavy Vehicles	0	2.0	4.2	2.6	0	1.8	2.4	1.9	3.9	4.3	4.0	4.1	3.3	5.3	7.7	4.8	3.1



GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros

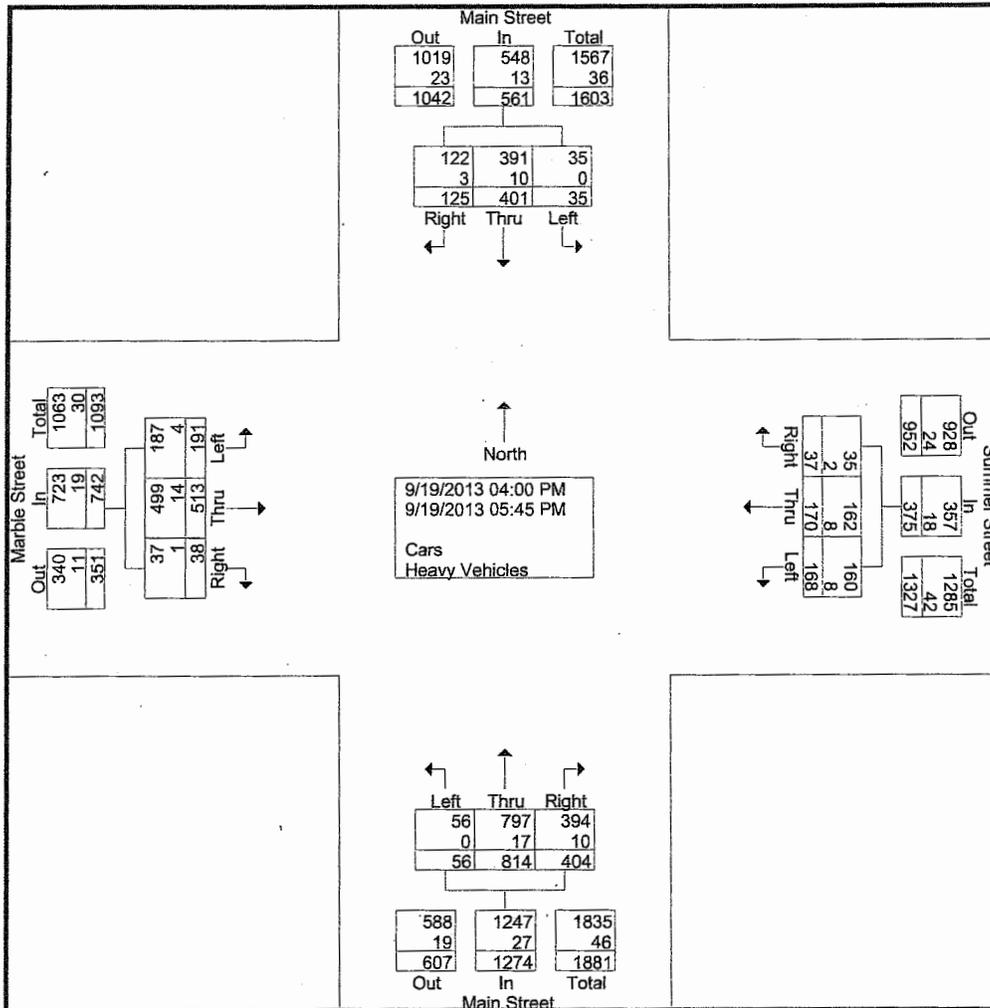


Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-443-5686  
 F: 617-801-8300  
 www.tsetraffic.com

File Name : Mainsum PM  
 Site Code : 4  
 Start Date : 9/19/2013  
 Page No : 1 of 4

Groups Printed- Cars - Heavy Vehicles

Start Time	Main Street Northbound				Main Street Southbound				Marble Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	4	70	44	118	4	45	7	56	23	66	5	94	22	11	4	37	305
04:15 PM	9	90	48	147	4	39	11	54	17	68	2	87	16	16	2	34	322
04:30 PM	6	93	48	147	3	49	9	61	22	64	4	90	17	14	2	33	331
04:45 PM	8	113	51	172	6	51	16	73	26	57	2	85	21	16	3	40	370
Total	27	366	191	584	17	184	43	244	88	255	13	356	76	57	11	144	1328
05:00 PM	5	134	48	187	4	44	19	67	29	68	4	101	28	30	7	65	420
05:15 PM	7	119	56	182	7	58	26	91	27	57	3	87	29	31	6	66	426
05:30 PM	10	98	65	173	1	68	22	91	25	61	7	93	15	27	3	45	402
05:45 PM	7	97	44	148	6	47	15	68	22	72	11	105	20	25	10	55	376
Total	29	448	213	690	18	217	82	317	103	258	25	386	92	113	26	231	1624
Grand Total	56	814	404	1274	35	401	125	561	191	513	38	742	168	170	37	375	2952
Apprch %	4.4	63.9	31.7		6.2	71.5	22.3		25.7	69.1	5.1		44.8	45.3	9.9		
Total %	1.9	27.6	13.7	43.2	1.2	13.6	4.2	19	6.5	17.4	1.3	25.1	5.7	5.8	1.3	12.7	
Cars	56	797	394	1247	35	391	122	548	187	499	37	723	160	162	35	357	5750
% Cars	100	97.9	97.5	97.9	100	97.5	97.6	97.7	97.9	97.3	97.4	97.4	95.2	95.3	94.6	95.2	97.4
Heavy Vehicles	0	17	10	27	0	10	3	13	4	14	1	19	8	8	2	18	154
% Heavy Vehicles	0	2.1	2.5	2.1	0	2.5	2.4	2.3	2.1	2.7	2.6	2.6	4.8	4.7	5.4	4.8	2.6



**ACCURA COUNTS**  
978-664-2565

File Name : 16470009  
Site Code : 16470009  
Start Date : 4/10/2014  
Page No : 13

N/S Street : Main Street  
E/W Street : Summer St / Marble St  
City/State : Stoneham, MA  
Weather : Clear

**Groups Printed- Bikes Peds**

Start Time	Main St From North				Summer St From East				Main St From South				Marble St From West				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:45 AM	0	0	0	6	0	1	0	3	0	0	0	0	0	0	0	0	9	1	10
Total	0	0	0	6	0	1	0	3	0	0	0	0	0	0	0	0	9	1	10
08:00 AM	0	0	0	11	0	0	0	2	0	0	0	11	0	1	0	0	24	1	25
08:15 AM	0	0	0	6	0	0	0	4	0	0	0	8	0	0	0	0	18	0	18
08:30 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	3	0	3
Grand Total	0	0	0	24	0	1	0	9	0	0	0	20	0	1	0	1	54	2	56
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0				
Total %	0	0	0		0	50	0		0	0	0		0	50	0		96.4	3.6	

Start Time	Main St From North				Summer St From East				Main St From South				Marble St From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.500

Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5888  
 F: 617-801-3800  
 www.tsetraffic.com

File Name : Mainsum AV  
 Site Code : 4  
 Start Date : 9/19/2013  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Main Street Northbound				Main Street Southbound				Marble Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0
06:15 AM	0	2	0	2	0	2	0	2	0	0	0	0	1	0	0	1	5
06:30 AM	0	2	0	2	0	3	0	3	0	0	0	0	0	0	0	0	5
06:45 AM	0	1	0	1	0	2	0	2	1	0	0	1	0	0	0	0	4
<b>Total</b>	0	7	0	7	0	9	0	9	1	0	0	1	1	0	0	1	18
07:00 AM	0	1	0	1	0	2	1	3	0	1	0	1	0	0	0	0	5
07:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
07:30 AM	0	2	0	2	0	2	0	2	0	0	1	1	0	0	1	1	6
07:45 AM	0	2	1	3	0	2	0	2	0	0	0	0	0	1	0	1	6
<b>Total</b>	0	5	1	6	0	8	1	9	0	1	1	2	0	1	1	2	19
08:00 AM	0	1	0	1	0	3	3	6	2	0	0	2	2	1	0	3	12
08:15 AM	0	2	0	2	0	4	6	10	3	0	0	3	0	1	0	1	16
08:30 AM	0	2	1	3	0	3	0	3	2	0	1	3	0	0	0	0	9
08:45 AM	0	2	0	2	0	2	0	2	0	1	0	1	0	1	0	1	6
<b>Total</b>	0	7	1	8	0	12	9	21	7	1	1	9	2	3	0	5	43
<b>Grand Total</b>	0	19	2	21	0	29	10	39	8	2	2	12	3	4	1	8	80
Apprch %	0	90.5	9.5		0	74.4	25.6		66.7	16.7	16.7		37.5	50	12.5		
Total %	0	23.8	2.5	26.2	0	36.2	12.5	48.8	10	2.5	2.5	15	3.8	5	1.2	10	

Start Time	Main Street Northbound				Main Street Southbound				Marble Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	2	1	3	0	2	0	2	0	0	0	0	0	1	0	1	6
08:00 AM	0	1	0	1	0	3	3	6	2	0	0	2	2	1	0	3	12
08:15 AM	0	2	0	2	0	4	6	10	3	0	0	3	0	1	0	1	16
08:30 AM	0	2	1	3	0	3	0	3	2	0	1	3	0	0	0	0	9
<b>Total Volume</b>	0	7	2	9	0	12	9	21	7	0	1	8	2	3	0	5	43
<b>% App. Total</b>	0	77.8	22.2		0	57.1	42.9		87.5	0	12.5		40	60	0		
PHF	.000	.875	.500	.750	.000	.750	.375	.525	.583	.000	.250	.667	.250	.750	.000	.417	.672

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				08:00 AM				07:30 AM			
+0 mins.	0	2	1	3	0	2	0	2	2	0	0	2	0	0	1	1
+15 mins.	0	1	0	1	0	3	3	6	3	0	0	3	0	1	0	1
+30 mins.	0	2	0	2	0	4	6	10	2	0	1	3	2	1	0	3
+45 mins.	0	2	1	3	0	3	0	3	0	1	0	1	0	1	0	1
<b>Total Volume</b>	0	7	2	9	0	12	9	21	7	1	1	9	2	3	1	6
<b>% App. Total</b>	0	77.8	22.2		0	57.1	42.9		77.8	11.1	11.1		33.3	50	16.7	
PHF	.000	.875	.500	.750	.000	.750	.375	.525	.583	.250	.250	.750	.250	.750	.250	.500

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-3800  
 www.tsetraffic.com

File Name : Mainsum AM  
 Site Code : 4  
 Start Date : 9/19/2013  
 Page No : 3 of 4

Groups Printed- Cars

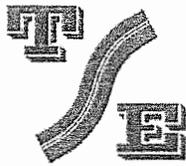
Start Time	Main Street Northbound				Main Street Southbound				Marble Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	3	20	3	26	2	144	10	156	5	7	12	24	30	27	2	59	265
06:15 AM	2	28	4	34	3	186	14	203	5	5	16	26	41	33	1	75	338
06:30 AM	1	34	4	39	1	205	17	223	7	5	13	25	27	37	1	65	352
06:45 AM	8	41	12	61	2	226	22	250	7	18	18	43	32	61	1	94	448
<b>Total</b>	<b>14</b>	<b>123</b>	<b>23</b>	<b>160</b>	<b>8</b>	<b>761</b>	<b>63</b>	<b>832</b>	<b>24</b>	<b>35</b>	<b>59</b>	<b>118</b>	<b>130</b>	<b>158</b>	<b>5</b>	<b>293</b>	<b>1403</b>
07:00 AM	4	41	10	55	1	199	26	226	10	28	35	73	32	57	7	96	450
07:15 AM	10	54	25	89	0	210	31	241	15	26	35	76	30	41	2	73	479
07:30 AM	16	47	18	81	5	202	25	232	8	40	27	75	34	52	3	89	477
07:45 AM	19	62	11	92	8	202	32	242	17	22	30	69	25	52	3	80	483
<b>Total</b>	<b>49</b>	<b>204</b>	<b>64</b>	<b>317</b>	<b>14</b>	<b>813</b>	<b>114</b>	<b>941</b>	<b>50</b>	<b>116</b>	<b>127</b>	<b>293</b>	<b>121</b>	<b>202</b>	<b>15</b>	<b>338</b>	<b>1889</b>
08:00 AM	17	97	25	139	12	164	32	208	10	36	35	81	14	48	2	64	492
08:15 AM	12	103	19	134	9	152	27	188	14	38	26	78	19	46	3	68	468
08:30 AM	14	112	19	145	3	167	26	196	23	36	15	74	25	50	5	80	495
08:45 AM	12	107	21	140	2	156	20	178	18	14	14	46	15	25	2	42	406
<b>Total</b>	<b>55</b>	<b>419</b>	<b>84</b>	<b>558</b>	<b>26</b>	<b>639</b>	<b>105</b>	<b>770</b>	<b>65</b>	<b>124</b>	<b>90</b>	<b>279</b>	<b>73</b>	<b>169</b>	<b>12</b>	<b>254</b>	<b>1861</b>
<b>Grand Total</b>	<b>118</b>	<b>746</b>	<b>171</b>	<b>1035</b>	<b>48</b>	<b>2213</b>	<b>282</b>	<b>2543</b>	<b>139</b>	<b>275</b>	<b>276</b>	<b>690</b>	<b>324</b>	<b>529</b>	<b>32</b>	<b>885</b>	<b>5153</b>
Apprch %	11.4	72.1	16.5		1.9	87	11.1		20.1	39.9	40		36.6	59.8	3.6		
Total %	2.3	14.5	3.3	20.1	0.9	42.9	5.5	49.3	2.7	5.3	5.4	13.4	6.3	10.3	0.6	17.2	

Start Time	Main Street Northbound				Main Street Southbound				Marble Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	19	62	11	92	8	202	32	242	17	22	30	69	25	52	3	80	483
08:00 AM	17	97	25	139	12	164	32	208	10	36	35	81	14	48	2	64	492
08:15 AM	12	103	19	134	9	152	27	188	14	38	26	78	19	46	3	68	468
08:30 AM	14	112	19	145	3	167	26	196	23	36	15	74	25	50	5	80	495
<b>Total Volume</b>	<b>62</b>	<b>374</b>	<b>74</b>	<b>510</b>	<b>32</b>	<b>685</b>	<b>117</b>	<b>834</b>	<b>64</b>	<b>132</b>	<b>106</b>	<b>302</b>	<b>83</b>	<b>196</b>	<b>13</b>	<b>292</b>	<b>1938</b>
% App. Total	12.2	73.3	14.5		3.8	82.1	14		21.2	43.7	35.1		28.4	67.1	4.5		
PHF	.816	.835	.740	.879	.667	.848	.914	.862	.696	.868	.757	.932	.830	.942	.650	.913	.979

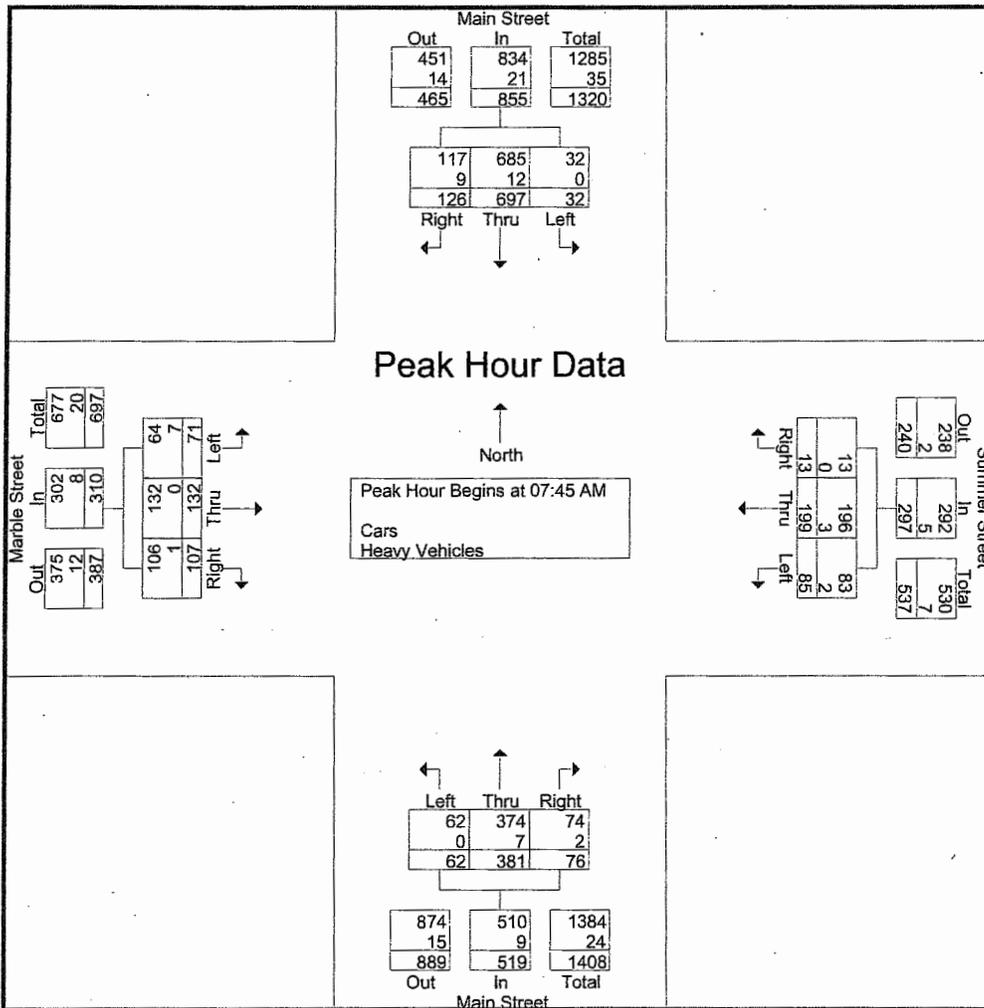
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				06:45 AM				07:30 AM				06:45 AM			
+0 mins.	17	97	25	139	2	226	22	250	8	40	27	75	32	61	1	94
+15 mins.	12	103	19	134	1	199	26	226	17	22	30	69	32	57	7	96
+30 mins.	14	112	19	145	0	210	31	241	10	36	35	81	30	41	2	73
+45 mins.	12	107	21	140	5	202	25	232	14	38	26	78	34	52	3	89
<b>Total Volume</b>	<b>55</b>	<b>419</b>	<b>84</b>	<b>558</b>	<b>8</b>	<b>837</b>	<b>104</b>	<b>949</b>	<b>49</b>	<b>136</b>	<b>118</b>	<b>303</b>	<b>128</b>	<b>211</b>	<b>13</b>	<b>352</b>
% App. Total	9.9	75.1	15.1		0.8	88.2	11		16.2	44.9	38.9		36.4	59.9	3.7	
PHF	.809	.935	.840	.962	.400	.926	.839	.949	.721	.850	.843	.935	.941	.865	.464	.917



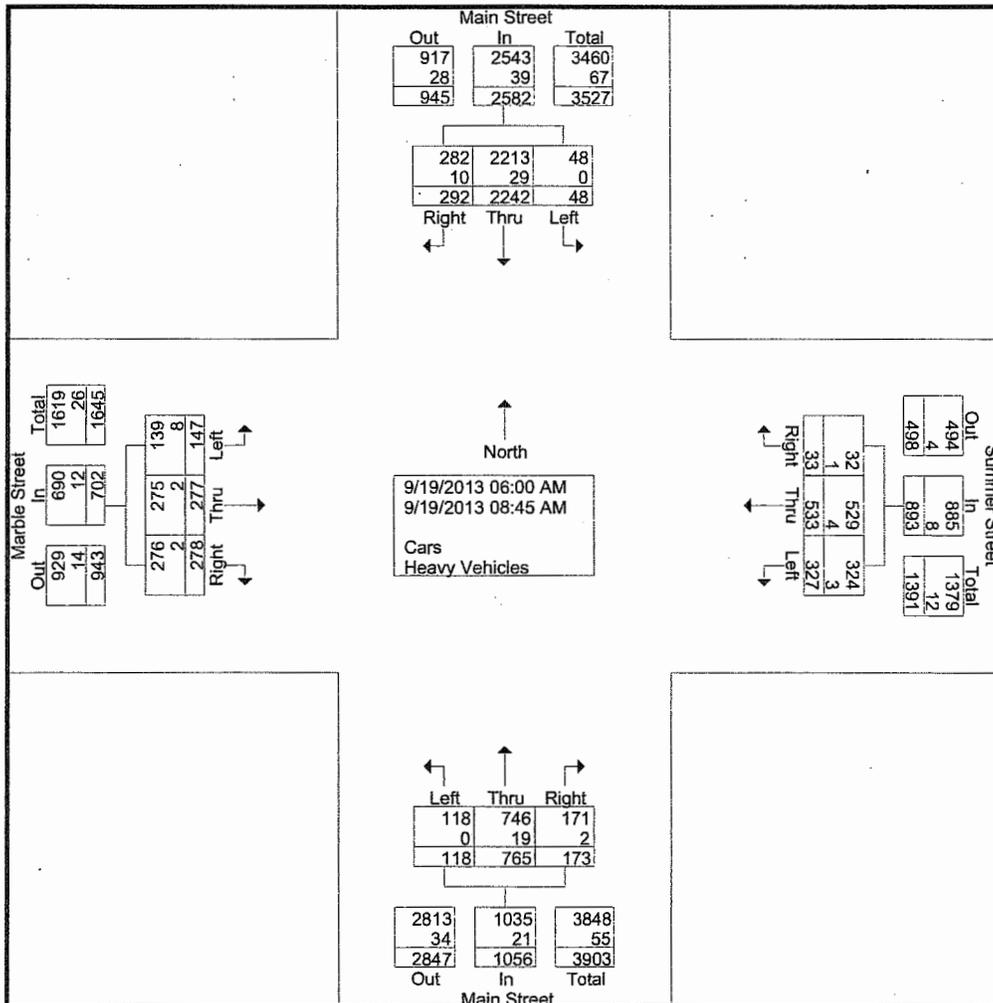
Start Time	Main Street Northbound				Main Street Southbound				Marble Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	19	64	12	95	8	204	32	244	17	22	30	69	25	53	3	81	489
08:00 AM	17	98	25	140	12	167	35	214	12	36	35	83	16	49	2	67	504
08:15 AM	12	105	19	136	9	156	33	198	17	38	26	81	19	47	3	69	484
08:30 AM	14	114	20	148	3	170	26	199	25	36	16	77	25	50	5	80	504
Total Volume	62	381	76	519	32	697	126	855	71	132	107	310	85	199	13	297	1981
% App. Total	11.9	73.4	14.6		3.7	81.5	14.7		22.9	42.6	34.5		28.6	67	4.4		
PHF	.816	.836	.760	.877	.667	.854	.900	.876	.710	.868	.764	.934	.850	.939	.650	.917	.983
Cars	62	374	74	510	32	685	117	834	64	132	106	302	83	196	13	292	1938
% Cars	100	98.2	97.4	98.3	100	98.3	92.9	97.5	90.1	100	99.1	97.4	97.6	98.5	100	98.3	97.8
Heavy Vehicles	0	7	2	9	0	12	9	21	7	0	1	8	2	3	0	5	43
% Heavy Vehicles	0	1.8	2.6	1.7	0	1.7	7.1	2.5	9.9	0	0.9	2.6	2.4	1.5	0	1.7	2.2





Groups Printed- Cars - Heavy Vehicles

Start Time	Main Street Northbound				Main Street Southbound				Marble Street Eastbound				Summer Street Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
06:00 AM	3	22	3	28	2	146	10	158	5	7	12	24	30	27	2	59	269
06:15 AM	2	30	4	36	3	188	14	205	5	5	16	26	42	33	1	76	343
06:30 AM	1	36	4	41	1	208	17	226	7	5	13	25	27	37	1	65	357
06:45 AM	8	42	12	62	2	228	22	252	8	18	18	44	32	61	1	94	452
Total	14	130	23	167	8	770	63	841	25	35	59	119	131	158	5	294	1421
07:00 AM	4	42	10	56	1	201	27	229	10	29	35	74	32	57	7	96	455
07:15 AM	10	54	25	89	0	212	31	243	15	26	35	76	30	41	2	73	481
07:30 AM	16	49	18	83	5	204	25	234	8	40	28	76	34	52	4	90	483
07:45 AM	19	64	12	95	8	204	32	244	17	22	30	69	25	53	3	81	489
Total	49	209	65	323	14	821	115	950	50	117	128	295	121	203	16	340	1908
08:00 AM	17	98	25	140	12	167	35	214	12	36	35	83	16	49	2	67	504
08:15 AM	12	105	19	136	9	156	33	198	17	38	26	81	19	47	3	69	484
08:30 AM	14	114	20	148	3	170	26	199	25	36	16	77	25	50	5	80	504
08:45 AM	12	109	21	142	2	158	20	180	18	15	14	47	15	26	2	43	412
Total	55	426	85	566	26	651	114	791	72	125	91	288	75	172	12	259	1904
Grand Total	118	765	173	1056	48	2242	292	2582	147	277	278	702	327	533	33	893	5233
Apprch %	11.2	72.4	16.4		1.9	86.8	11.3		20.9	39.5	39.6		36.6	59.7	3.7		
Total %	2.3	14.6	3.3	20.2	0.9	42.8	5.6	49.3	2.8	5.3	5.3	13.4	6.2	10.2	0.6	17.1	
Cars	118	746	171	1035	48	2213	282	2543	139	275	276	690	324	529	32	885	10306
% Cars	100	97.5	98.8	98	100	98.7	96.6	98.5	94.6	99.3	99.3	98.3	99.1	99.2	97	99.1	98.5
Heavy Vehicles	0	19	2	21	0	29	10	39	8	2	2	12	3	4	1	8	160
% Heavy Vehicles	0	2.5	1.2	2	0	1.3	3.4	1.5	5.4	0.7	0.7	1.7	0.9	0.8	3	0.9	1.5



**Accura Counts**  
978-664-2565

File Name : 16470008  
Site Code : 16470008  
Start Date : 4/10/2014  
Page No : 13

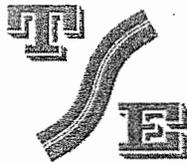
N/S Street : Main Street / Central St  
E/W Street : Franklin Street  
City/State : Stoneham, MA  
Weather : Clear

Groups Printed- Bikes Peds

Start Time	Main St From North				Central St From Northeast				Franklin St From East				Main St From South				Exclu. Total	Inclu. Total	Int. Total
	HdLt	Left	Thru	Peds	HdLt	BrLt	HdRt	Peds	Left	Right	HdRt	Peds	Thru	BrRt	Right	Peds			
04:15 PM	0	0	0	3	0	0	0	4	0	0	0	1	0	0	0	1	9	0	9
04:30 PM	0	0	0	4	0	0	0	1	0	0	0	4	0	0	1	4	13	1	14
04:45 PM	0	0	0	6	0	0	0	8	0	0	0	9	0	0	0	0	23	0	23
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>45</b>	<b>1</b>	<b>46</b>
05:00 PM	0	0	0	1	0	0	0	5	0	0	0	5	0	0	0	7	18	0	18
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>12</b>	<b>63</b>	<b>1</b>	<b>64</b>
Apprch %	0	0	0		0	0	0		0	0	0		0	0	100				
<b>Total %</b>	<b>0</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>0</b>	<b>100</b>		<b>98.4</b>	<b>1.6</b>	

Start Time	Main St From North				Central St From Northeast				Franklin St From East				Main St From South				Int. Total
	HdLt	Left	Thru	App. Total	HdLt	BrLt	HdRt	App. Total	Left	Right	HdRt	App. Total	Thru	BrRt	Right	App. Total	
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Volume</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>% App. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>100</b>		
<b>PHF</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.250</b>	<b>.250</b>	<b>.250</b>

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5886  
 F: 617-801-8300  
 www.tsetraffic.com

File Name : Mainfrank PM  
 Site Code : 5  
 Start Date : 9/19/2013  
 Page No : 4 of 4

Groups Printed- Heavy Vehicles

Start Time	Main Street Northbound				Main Street Southbound				Franklin Street Westbound				Int. Total
	Thru	RT To Central	Right	App. Total	LT To Central	Left	Thru	App. Total	Left	Right	RT To Central	App. Total	
04:00 PM	1	0	0	1	0	0	2	2	1	2	0	3	6
04:15 PM	0	0	0	0	0	0	2	2	0	4	0	4	6
04:30 PM	1	0	0	1	0	0	2	2	2	1	0	3	6
04:45 PM	1	0	0	1	0	0	0	0	1	3	0	4	5
Total	3	0	0	3	0	0	6	6	4	10	0	14	23
05:00 PM	0	0	1	1	0	4	3	7	1	0	0	1	9
05:15 PM	0	0	1	1	0	0	2	2	1	1	0	2	5
05:30 PM	5	0	0	5	0	2	1	3	2	4	0	6	14
05:45 PM	0	0	1	1	0	0	1	1	0	1	0	1	3
Total	5	0	3	8	0	6	7	13	4	6	0	10	31
Grand Total	8	0	3	11	0	6	13	19	8	16	0	24	54
Apprch %	72.7	0	27.3		0	31.6	68.4		33.3	66.7	0		
Total %	14.8	0	5.6	20.4	0	11.1	24.1	35.2	14.8	29.6	0	44.4	

Start Time	Main Street Northbound				Main Street Southbound				Franklin Street Westbound				Int. Total
	Thru	RT To Central	Right	App. Total	LT To Central	Left	Thru	App. Total	Left	Right	RT To Central	App. Total	
04:45 PM	1	0	0	1	0	0	0	0	1	3	0	4	5
05:00 PM	0	0	1	1	0	4	3	7	1	0	0	1	9
05:15 PM	0	0	1	1	0	0	2	2	1	1	0	2	5
05:30 PM	5	0	0	5	0	2	1	3	2	4	0	6	14
Total Volume	6	0	2	8	0	6	6	12	5	8	0	13	33
% App. Total	75	0	25		0	50	50		38.5	61.5	0		
PHF	.300	.000	.500	.400	.000	.375	.500	.429	.625	.500	.000	.542	.589

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

	04:45 PM				05:00 PM				04:00 PM			
+0 mins.	1	0	0	1	0	4	3	7	1	2	0	3
+15 mins.	0	0	1	1	0	0	2	2	0	4	0	4
+30 mins.	0	0	1	1	0	2	1	3	2	1	0	3
+45 mins.	5	0	0	5	0	0	1	1	1	3	0	4
Total Volume	6	0	2	8	0	6	7	13	4	10	0	14
% App. Total	75	0	25		0	46.2	53.8		28.6	71.4	0	
PHF	.300	.000	.500	.400	.000	.375	.583	.464	.500	.625	.000	.875

GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



**Traffic Survey Expedition**  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-8800  
 www.tsetraffic.com

File Name : Mainfrank PM  
 Site Code : 5  
 Start Date : 9/19/2013  
 Page No : 3 of 4

Groups Printed- Cars

Start Time	Main Street Northbound				Main Street Southbound				Franklin Street Westbound				Int. Total
	Thru	RT To Central	Right	App. Total	LT To Central	Left	Thru	App. Total	Left	Right	RT To Central	App. Total	
04:00 PM	94	24	38	156	4	36	44	84	28	40	3	71	311
04:15 PM	101	27	35	163	3	30	85	118	25	35	4	64	345
04:30 PM	101	36	38	175	6	31	69	106	24	40	6	70	351
04:45 PM	96	39	43	178	3	43	76	122	26	36	6	68	368
Total	392	126	154	672	16	140	274	430	103	151	19	273	1375
05:00 PM	85	38	41	164	9	37	55	101	19	43	2	64	329
05:15 PM	56	37	32	125	5	29	50	84	29	42	2	73	282
05:30 PM	101	47	37	185	6	41	62	109	32	40	5	77	371
05:45 PM	73	24	25	122	7	21	48	76	28	32	4	64	262
Total	315	146	135	596	27	128	215	370	108	157	13	278	1244
Grand Total	707	272	289	1268	43	268	489	800	211	308	32	551	2619
Apprch %	55.8	21.5	22.8		5.4	33.5	61.1		38.3	55.9	5.8		
Total %	27	10.4	11	48.4	1.6	10.2	18.7	30.5	8.1	11.8	1.2	21	

Start Time	Main Street Northbound				Main Street Southbound				Franklin Street Westbound				Int. Total
	Thru	RT To Central	Right	App. Total	LT To Central	Left	Thru	App. Total	Left	Right	RT To Central	App. Total	
04:15 PM	101	27	35	163	3	30	85	118	25	35	4	64	345
04:30 PM	101	36	38	175	6	31	69	106	24	40	6	70	351
04:45 PM	96	39	43	178	3	43	76	122	26	36	6	68	368
05:00 PM	85	38	41	164	9	37	55	101	19	43	2	64	329
Total Volume	383	140	157	680	21	141	285	447	94	154	18	266	1393
% App. Total	56.3	20.6	23.1		4.7	31.5	63.8		35.3	57.9	6.8		
PHF	.948	.897	.913	.955	.583	.820	.838	.916	.904	.895	.750	.950	.946

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Entire Intersection Begins at 04:15 PM

	04:15 PM				04:15 PM				04:45 PM			
+0 mins.	101	27	35	163	3	30	85	118	26	36	6	68
+15 mins.	101	36	38	175	6	31	69	106	19	43	2	64
+30 mins.	96	39	43	178	3	43	76	122	29	42	2	73
+45 mins.	85	38	41	164	9	37	55	101	32	40	5	77
Total Volume	383	140	157	680	21	141	285	447	106	161	15	282
% App. Total	56.3	20.6	23.1		4.7	31.5	63.8		37.6	57.1	5.3	
PHF	.948	.897	.913	.955	.583	.820	.838	.916	.828	.936	.625	.916

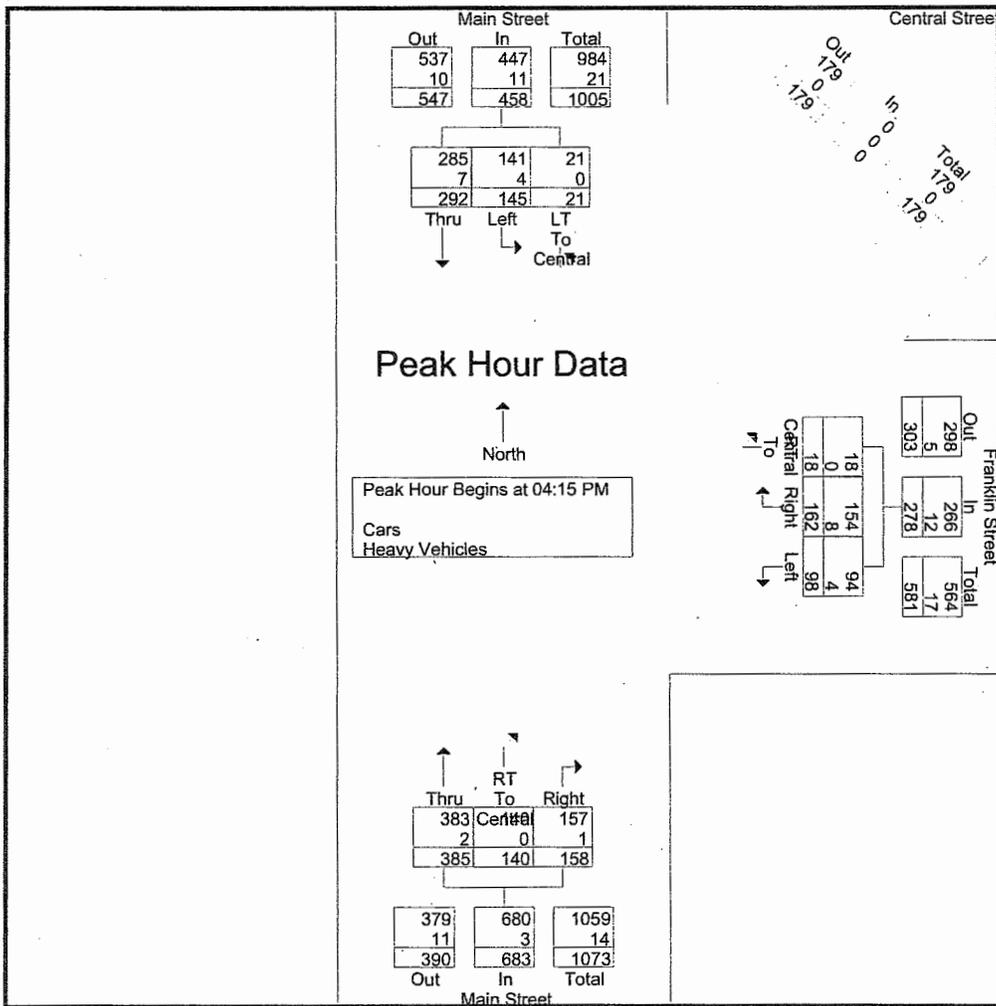
GPI Project #:  
 Stoneham, MA  
 Client: John DeBarros



Traffic Survey Expedition  
 106 Sharon Road  
 N. Quincy, MA 02171  
 P: 617-448-5686  
 F: 617-801-3800  
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File Name : Mainfrank PM  
 Site Code : 5  
 Start Date : 9/19/2013  
 Page No : 2 of 4

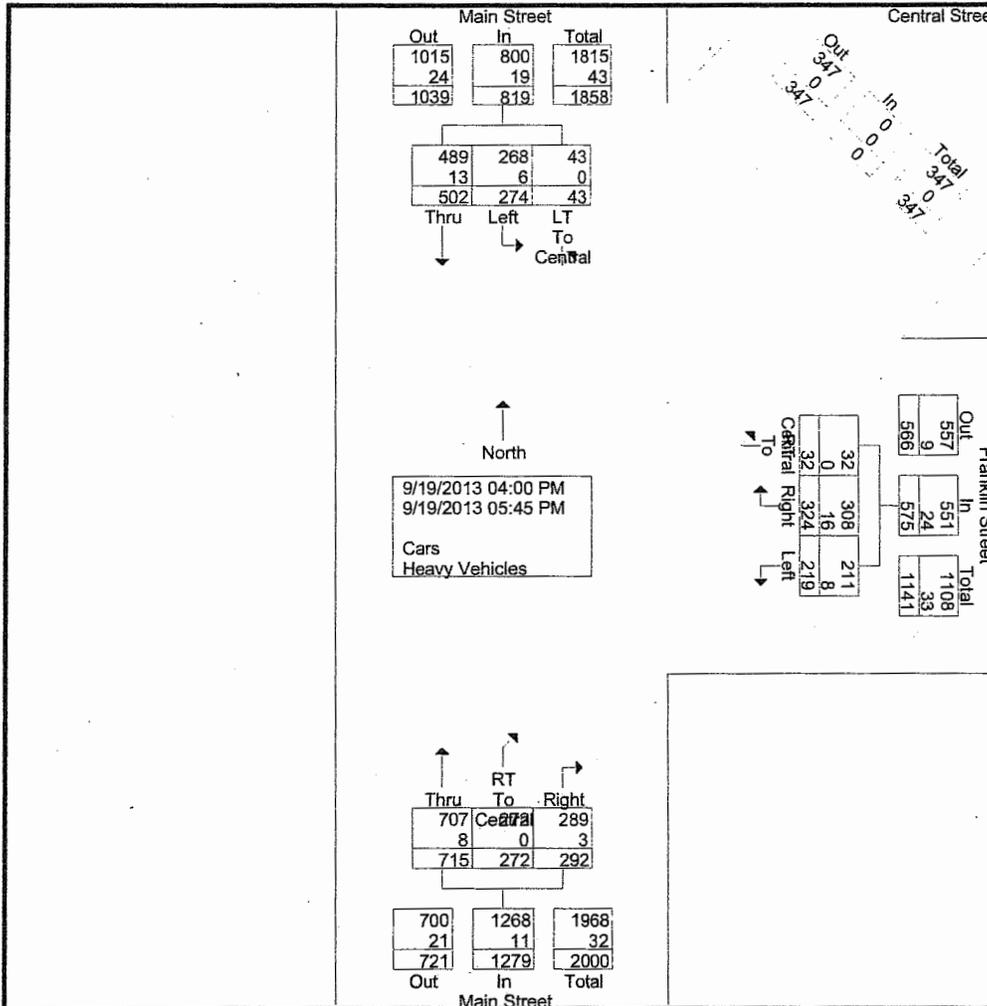
Start Time	Main Street Northbound				Main Street Southbound				Franklin Street Westbound				Int. Total
	Thru	RT To Central	Right	App. Total	LT To Central	Left	Thru	App. Total	Left	Right	RT To Central	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	101	27	35	163	3	30	87	120	25	39	4	68	351
04:30 PM	102	36	38	176	6	31	71	108	26	41	6	73	357
04:45 PM	97	39	43	179	3	43	76	122	27	39	6	72	373
05:00 PM	85	38	42	165	9	41	58	108	20	43	2	65	338
Total Volume	385	140	158	683	21	145	292	458	98	162	18	278	1419
% App. Total	56.4	20.5	23.1		4.6	31.7	63.8		35.3	58.3	6.5		
PHF	.944	.897	.919	.954	.583	.843	.839	.939	.907	.942	.750	.952	.951
Cars	383	140	157	680	21	141	285	447	94	154	18	266	1393
% Cars	99.5	100	99.4	99.6	100	97.2	97.6	97.6	95.9	95.1	100	95.7	98.2
Heavy Vehicles	2	0	1	3	0	4	7	11	4	8	0	12	26
% Heavy Vehicles	0.5	0	0.6	0.4	0	2.8	2.4	2.4	4.1	4.9	0	4.3	1.8





Groups Printed- Cars - Heavy Vehicles

Start Time	Main Street Northbound				Main Street Southbound				Franklin Street Westbound				Int. Total
	Thru	RT To Central	Right	App. Total	LT To Central	Left	Thru	App. Total	Left	Right	RT To Central	App. Total	
04:00 PM	95	24	38	157	4	36	46	86	29	42	3	74	317
04:15 PM	101	27	35	163	3	30	87	120	25	39	4	68	351
04:30 PM	102	36	38	176	6	31	71	108	26	41	6	73	357
04:45 PM	97	39	43	179	3	43	76	122	27	39	6	72	373
Total	395	126	154	675	16	140	280	436	107	161	19	287	1398
05:00 PM	85	38	42	165	9	41	58	108	20	43	2	65	338
05:15 PM	56	37	33	126	5	29	52	86	30	43	2	75	287
05:30 PM	106	47	37	190	6	43	63	112	34	44	5	83	385
05:45 PM	73	24	26	123	7	21	49	77	28	33	4	65	265
Total	320	146	138	604	27	134	222	383	112	163	13	288	1275
Grand Total	715	272	292	1279	43	274	502	819	219	324	32	575	2673
Apprch %	55.9	21.3	22.8		5.3	33.5	61.3		38.1	56.3	5.6		
Total %	26.7	10.2	10.9	47.8	1.6	10.3	18.8	30.6	8.2	12.1	1.2	21.5	
Cars	707	272	289	1268	43	268	489	800	211	308	32	551	5238
% Cars	98.9	100	99	99.1	100	97.8	97.4	97.7	96.3	95.1	100	95.8	98
Heavy Vehicles	8	0	3	11	0	6	13	19	8	16	0	24	108
% Heavy Vehicles	1.1	0	1	0.9	0	2.2	2.6	2.3	3.7	4.9	0	4.2	2





Groups Printed- Cars

Start Time	Main Street Northbound				Main Street Southbound				Franklin Street Westbound				Int. Total
	Thru	RT To Central	Right	App. Total	LT To Central	Left	Thru	App. Total	Left	Right	RT To Central	App. Total	
06:00 AM	26	6	8	40	1	16	137	154	24	23	0	47	241
06:15 AM	35	6	11	52	0	16	154	170	26	18	1	45	267
06:30 AM	40	5	6	51	0	19	175	194	43	27	1	71	316
06:45 AM	38	12	15	65	1	17	163	181	62	16	2	80	326
<b>Total</b>	<b>139</b>	<b>29</b>	<b>40</b>	<b>208</b>	<b>2</b>	<b>68</b>	<b>629</b>	<b>699</b>	<b>155</b>	<b>84</b>	<b>4</b>	<b>243</b>	<b>1150</b>
07:00 AM	39	15	20	74	0	15	140	155	62	43	1	106	335
07:15 AM	42	29	20	91	1	15	163	179	78	44	1	123	393
07:30 AM	61	28	22	111	0	16	136	152	62	52	3	117	380
07:45 AM	86	36	19	141	0	16	138	154	92	52	0	144	439
<b>Total</b>	<b>228</b>	<b>108</b>	<b>81</b>	<b>417</b>	<b>1</b>	<b>62</b>	<b>577</b>	<b>640</b>	<b>294</b>	<b>191</b>	<b>5</b>	<b>490</b>	<b>1547</b>
08:00 AM	102	27	19	148	1	28	127	156	77	43	2	122	426
08:15 AM	94	20	17	131	0	16	130	146	64	48	3	115	392
08:30 AM	103	19	20	142	1	29	128	158	32	54	1	87	387
08:45 AM	51	16	11	78	1	16	101	118	43	35	0	78	274
<b>Total</b>	<b>350</b>	<b>82</b>	<b>67</b>	<b>499</b>	<b>3</b>	<b>89</b>	<b>486</b>	<b>578</b>	<b>216</b>	<b>180</b>	<b>6</b>	<b>402</b>	<b>1479</b>
<b>Grand Total</b>	<b>717</b>	<b>219</b>	<b>188</b>	<b>1124</b>	<b>6</b>	<b>219</b>	<b>1692</b>	<b>1917</b>	<b>665</b>	<b>455</b>	<b>15</b>	<b>1135</b>	<b>4176</b>
Apprch %	63.8	19.5	16.7		0.3	11.4	88.3		58.6	40.1	1.3		
Total %	17.2	5.2	4.5	26.9	0.1	5.2	40.5	45.9	15.9	10.9	0.4	27.2	

Start Time	Main Street Northbound				Main Street Southbound				Franklin Street Westbound				Int. Total
	Thru	RT To Central	Right	App. Total	LT To Central	Left	Thru	App. Total	Left	Right	RT To Central	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	86	36	19	141	0	16	138	154	92	52	0	144	439
08:00 AM	102	27	19	148	1	28	127	156	77	43	2	122	426
08:15 AM	94	20	17	131	0	16	130	146	64	48	3	115	392
08:30 AM	103	19	20	142	1	29	128	158	32	54	1	87	387
<b>Total Volume</b>	<b>385</b>	<b>102</b>	<b>75</b>	<b>562</b>	<b>2</b>	<b>89</b>	<b>523</b>	<b>614</b>	<b>265</b>	<b>197</b>	<b>6</b>	<b>468</b>	<b>1644</b>
% App. Total	68.5	18.1	13.3		0.3	14.5	85.2		56.6	42.1	1.3		
PHF	.934	.708	.938	.949	.500	.767	.947	.972	.720	.912	.500	.813	.936

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				06:30 AM				07:15 AM			
+0 mins.	86	36	19	141	0	19	175	194	78	44	1	123
+15 mins.	102	27	19	148	1	17	163	181	62	52	3	117
+30 mins.	94	20	17	131	0	15	140	155	92	52	0	144
+45 mins.	103	19	20	142	1	15	163	179	77	43	2	122
<b>Total Volume</b>	<b>385</b>	<b>102</b>	<b>75</b>	<b>562</b>	<b>2</b>	<b>66</b>	<b>641</b>	<b>709</b>	<b>309</b>	<b>191</b>	<b>6</b>	<b>506</b>
% App. Total	68.5	18.1	13.3		0.3	9.3	90.4		61.1	37.7	1.2	
PHF	.934	.708	.938	.949	.500	.868	.916	.914	.840	.918	.500	.878

Groups Printed- Heavy Vehicles

Start Time	Main Street Northbound				Main Street Southbound				Franklin Street Westbound				Int. Total
	Thru	RT To Central	Right	App. Total	LT To Central	Left	Thru	App. Total	Left	Right	RT To Central	App. Total	
06:00 AM	1	0	0	1	0	0	6	6	0	1	0	1	8
06:15 AM	2	0	2	4	0	1	2	3	0	4	0	4	11
06:30 AM	2	0	3	5	0	1	5	6	0	1	0	1	12
06:45 AM	2	0	2	4	0	1	4	5	1	3	0	4	13
Total	7	0	7	14	0	3	17	20	1	9	0	10	44
07:00 AM	5	0	2	7	0	1	6	7	1	2	0	3	17
07:15 AM	0	0	1	1	0	4	4	8	3	3	0	6	15
07:30 AM	4	0	0	4	0	11	4	15	1	4	0	5	24
07:45 AM	7	0	1	8	0	2	3	5	3	0	0	3	16
Total	16	0	4	20	0	18	17	35	8	9	0	17	72
08:00 AM	7	0	6	13	0	2	4	6	1	2	0	3	22
08:15 AM	5	0	0	5	0	4	3	7	2	1	0	3	15
08:30 AM	3	0	2	5	0	3	5	8	0	4	0	4	17
08:45 AM	5	0	1	6	0	4	3	7	3	3	0	6	19
Total	20	0	9	29	0	13	15	28	6	10	0	16	73
Grand Total	43	0	20	63	0	34	49	83	15	28	0	43	189
Approch %	68.3	0	31.7		0	41	59		34.9	65.1	0		
Total %	22.8	0	10.6	33.3	0	18	25.9	43.9	7.9	14.8	0	22.8	

Start Time	Main Street Northbound				Main Street Southbound				Franklin Street Westbound				Int. Total
	Thru	RT To Central	Right	App. Total	LT To Central	Left	Thru	App. Total	Left	Right	RT To Central	App. Total	
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	0	0	1	1	0	4	4	8	3	3	0	6	15
07:30 AM	4	0	0	4	0	11	4	15	1	4	0	5	24
07:45 AM	7	0	1	8	0	2	3	5	3	0	0	3	16
08:00 AM	7	0	6	13	0	2	4	6	1	2	0	3	22
Total Volume	18	0	8	26	0	19	15	34	8	9	0	17	77
% App. Total	69.2	0	30.8		0	55.9	44.1		47.1	52.9	0		
PHF	.643	.000	.333	.500	.000	.432	.938	.567	.667	.563	.000	.708	.802

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:45 AM				06:45 AM				06:45 AM			
+0 mins.	7	0	1	8	0	1	4	5	1	3	0	4
+15 mins.	7	0	6	13	0	1	6	7	1	2	0	3
+30 mins.	5	0	0	5	0	4	4	8	3	3	0	6
+45 mins.	3	0	2	5	0	11	4	15	1	4	0	5
Total Volume	22	0	9	31	0	17	18	35	6	12	0	18
% App. Total	71	0	29		0	48.6	51.4		33.3	66.7	0	
PHF	.786	.000	.375	.596	.000	.386	.750	.583	.500	.750	.000	.750