Appendix A Draft Scope, MEPA Certificate, and Responses to Comments

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Request For Qualifications

Environmental Permitting Services Related to the Preparation of the 2012 L.G. Hanscom Field Environmental Status & Planning Report Bedford, Massachusetts

EOEEA Number: 5484/8696

Massachusetts Port Authority

March 1, 2012

Request for Qualifications (RFQ)
For Environmental Permitting and Planning Services
Related to the Preparation of the 2012 Hanscom Field Environmental Status and Planning Report

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The MASSACHUSETTS PORT AUTHORITY (Massport) is soliciting proposals from qualified aviation planning and environmental permitting consultants to assist the Authority with preparing and filing the Hanscom Field 2012 Environmental Status and Planning Report (ESPR).

Background Information

Hanscom Field is owned and operated by the Authority and is Massachusetts's premier general aviation airport. Hanscom's role is as a general aviation reliever to Logan International Airport. The Massachusetts Secretary of the Executive Office of Energy and Environmental Affairs (Secretary) currently requires that the Authority prepare an ESPR every five years to evaluate the cumulative effect of growth and change at Hanscom Field and provide data and analyses on noise, ground transportation, air quality, and water quality. The last ESPR was completed in 2005. The ESPR was deferred until analysis year 2012 due to the economic downturn and the number of aviation operations, which have remained below the 2005 and future analysis years.

In 1985, Massport initiated a series of environmental studies at Hanscom that started with the Generic Environmental Impact Report (GEIR) and was followed by the 1995 GEIR, the 2000 ESPR, and the 2005 ESPR. The ESPR includes a retrospective analysis of Hanscom Field impacts and analyses for future operating and environmental conditions. The ESPR has become an effective planning tool from which the Authority's policy and program developments are derived. The ESPR also provides long-range projections of cumulative environmental conditions against which the effects of individual projects can be compared. The ESPR allows the reader to see historical environmental information, current information, and future analysis of environmental effects and planning scenarios while providing a foundation for future project planning and analyses at Hanscom Field. The ESPR will also describe Massport's vision for the coordinated use of its three airports: Logan, Hanscom, and Worcester.

The Authority filed its 2005 ESPR with the Executive Office of Energy and Environmental Affairs (formerly the Executive Office of Environmental Affairs) in November 2006. That comprehensive document contains, among other things, an extensive discussion on aircraft and ground transportation, and detailed information on such technical issues as noise abatement, air quality improvement, ground access, and water quality management. The Certificate issued by the Secretary on March 29, 2007, determined that the 2005 ESPR filing "adequately and properly complies with the Massachusetts Environmental Policy Act."

Massport filed the Proposed Scope for the 2012 Hanscom Field ESPR with the Executive Office of Energy and Environmental Affairs on February 29, 2012. A copy of The Proposed 2012 Hanscom ESPR Scope. In advance of the Secretary's Certificate the proposed scope for the 2012 Hanscom ESPR Scope is enclosed. The Certificate of the Secretary of Environmental Affairs will establish the Scope for the 2012 L. G. Hanscom Field Environmental Status and Planning Report. This contract will also include airside and landside planning services. Massport will develop a refined work order for preparation of the 2012 ESPR and associated planning (to be completed under this contract; the project budget is approximately $650,000) upon receipt of the Secretary's Certificate.

The Secretary's Certificate requires that the major areas of analyses for the 2012 ESPR include, but are not limited to, aviation planning, landside planning, ground access, noise, air quality, water quality, cultural and historical resources, sustainability and airport mitigation. Specific supplemental studies may also be required including both airside and landside planning for Hanscom Field scenarios for 2020 and 2030 (aviation forecasts for these scenarios have been completed).

Consultant Services

Massport expects this work to be done through a prime consultant with subconsultants (Consultant or Team). The Consultant will be expected to do all work necessary to produce the 2012 Hanscom Field ESPR.

Reporting Format

The reporting format for the 2012 ESPR will be similar to that used in the 2005 ESPR (please see the Massport website for a copy of the 2005 Hanscom ESPR). Going forward, the Authority wishes to explore ways to create a more streamlined, user friendly reporting format. The objectives of the new formats are several: (1) to reach a wider audience that is interested in the environmental issues at L. G. Hanscom Field but that is not necessarily trained to understand and interpret technical details; (2) highlight Massport's environmental initiatives and achievements at L. G. Hanscom Field; and (3) to compare and make available the technical details and analyses presented in prior environmental reports.

Project Schedule

Massport anticipates the filing of the 2012 ESPR in mid 2013. Since the Notice to Proceed is planned for April/May 2012, the response to the RFQ and any contract awarded to the successful team will confirm the Consultant's commitment to meet the filing dates.

Submittal Requirements

The submittal shall include:

1. Detailed discussion of the Team's proposed approach to preparing the ESPR in accordance with the Proposed Scope (or the Certificate of the Secretary of Environmental Affairs establishing the Scope if available) for the 2012 L. G. Hanscom Field ESPR and any additional tasks that the Team deems necessary in order to receive a Certificate of Adequacy from MEPA on the document;

2. Overview of the project managers and Team's relevant qualifications and experience;

3. Resumes for key staff to be assigned to the project and availability of the project manager for this effort.

4. Organizational chart and staffing plan description of specific project responsibilities and availability of key staff, including subsconsultants;

5. Overall project schedule, highlighting specific milestones and assumptions and ability to meet the filing deadline for the ESPR and budget, as estimated by the Authority.

6. The Consultant shall indicate the level of effort for each of the proposed tasks in the scope. It is expected that the contract for the ESPR with the successful Consultant will be based on a not-to-exceed fee.

7. Anticipated MBE/WBE participation (including proof of certification) and Affirmative Action efforts. MBE/WBE Certification shall be current at the time of submittal and a copy of the MBE/WBE certification letter from the State Office of Minority and Women Business Assistance (SOMWBA), or other agency which utilizes criteria similar to those found in Title 49 CFR, Part 26 should be provided in the submittal.

Submissions are limited to a maximum of 30 double sided sheets (60 printed pages), not including resumes, firm brochures, and **no** acetate covers. Fifteen copies of the Proposals should be submitted to Thomas W. Ennis, Senior Project Manager, Economic Planning & Development, Massachusetts Port Authority, Logan Office Center, One Harborside Drive, East Boston, MA 02128. All submissions must be received by the Economic Planning and Development Department, Logan Office Center, second floor, room 205S no later than **April 5, 2012 at 12:00 Noon.** Late submittals will not be accepted.

Pre-Proposal Briefing Session

A pre-proposal briefing session will be held at 10:00 am on Weds. **March 14, 2012** at the Logan Office Center (second floor EP&D Conference Room), One Harborside Drive, East Boston, MA. All questions shall be submitted by e-mail to Tom Ennis at tennis@massport.com no later then 5:00 pm on March 16, 2012. Questions and Massport response will be distributed to briefing session attendees by March 23, 2012. The session shall consist of a staff presentation followed by questions and answers.

Selection Criteria

Each Consultant will be evaluated on the basis of information provided by the prime Consultant and each of the subconsultants in its proposal concerning:

1. Relevant and demonstrated project experience of each member of the Team particularly in relation to aviation, environmental reviews, cumulative impacts, airport planning and development, land planning, transportation planning (regional and ground access), air quality assessment, noise monitoring and analysis, water quality analysis, cultural and historical resources, sustainable development, environmental permitting regulations, and preparation of similar environmental documents.

2. Project manager and individual project Team member qualifications and experience;

3. Quality, creativity, and time required for the proposed approach;

4. Familiarity with Massachusetts environmental regulations as they apply to L. G. Hanscom Field; knowledge and demonstrated sound judgment regarding relevant state and federal environmental regulations and technical analyses;

5. Project organization, document control and sub consultant management;

6. Ability to provide the required services and meet the filing deadline in the most timely and cost effect manner.

7. The Consultant's fee shall be negotiated. The budget to complete the 2012 ESPR is estimated to be approximately $650,000.

8. MBE/WBE composition of the team.

9. Other criteria that Massport deems appropriate.

Please note that the criteria listing above are not set forth in an order of priority. The Authority's analysis of the proposals received will weigh each of the criteria, as it deems appropriate.

The Authority expects that it will develop a list of qualified Consultants from the submitted proposals. Proposals that do not meet the requisite submittal requirements or demonstrate the specified experience will, at the sole discretion of the Authority, be eliminated.

In the interest of maintaining a fair selection process, consultants are respectfully requested to refrain from contacting the Authority staff or environmental regulators with regard to this project prior to the submittal deadline. Any questions with respect to the requirements of the RFP should be submitted in writing to Tom Ennis by email at

tennis@massport.com. Questions and responses will be available for review by contacting Mr. Ennis. The 2005 Hanscom Field ESPR is available for review at Massport's website.

The Authority is soliciting competitive proposals pursuant to a determination that such a process best serves the interests of the Authority and the general public, and not because of any legal requirement to do so. The Authority reserves the right to accept one or more of the proposals, to reject proposals, to modify or amend with the consent of the proposer any proposal prior to acceptance, to terminate this RFP process, and to effect any agreement otherwise, all as the Authority in its sole judgement may deem to be in its best interest.

By responding to this solicitation, consultants agree to accept the terms and conditions of the Authority's standard work order agreement, a copy of the agreement can be found on the Authority's web page at www.massport.com. The exception to this standard agreement is the insurance requirement of $1,000,000 of automobile liability insurance.

The Consultant selected by the Authority will be required to execute a standard Authority/Consultant contract with such changes as the Authority deems appropriate to this engagement.

Massachusetts Port Authority

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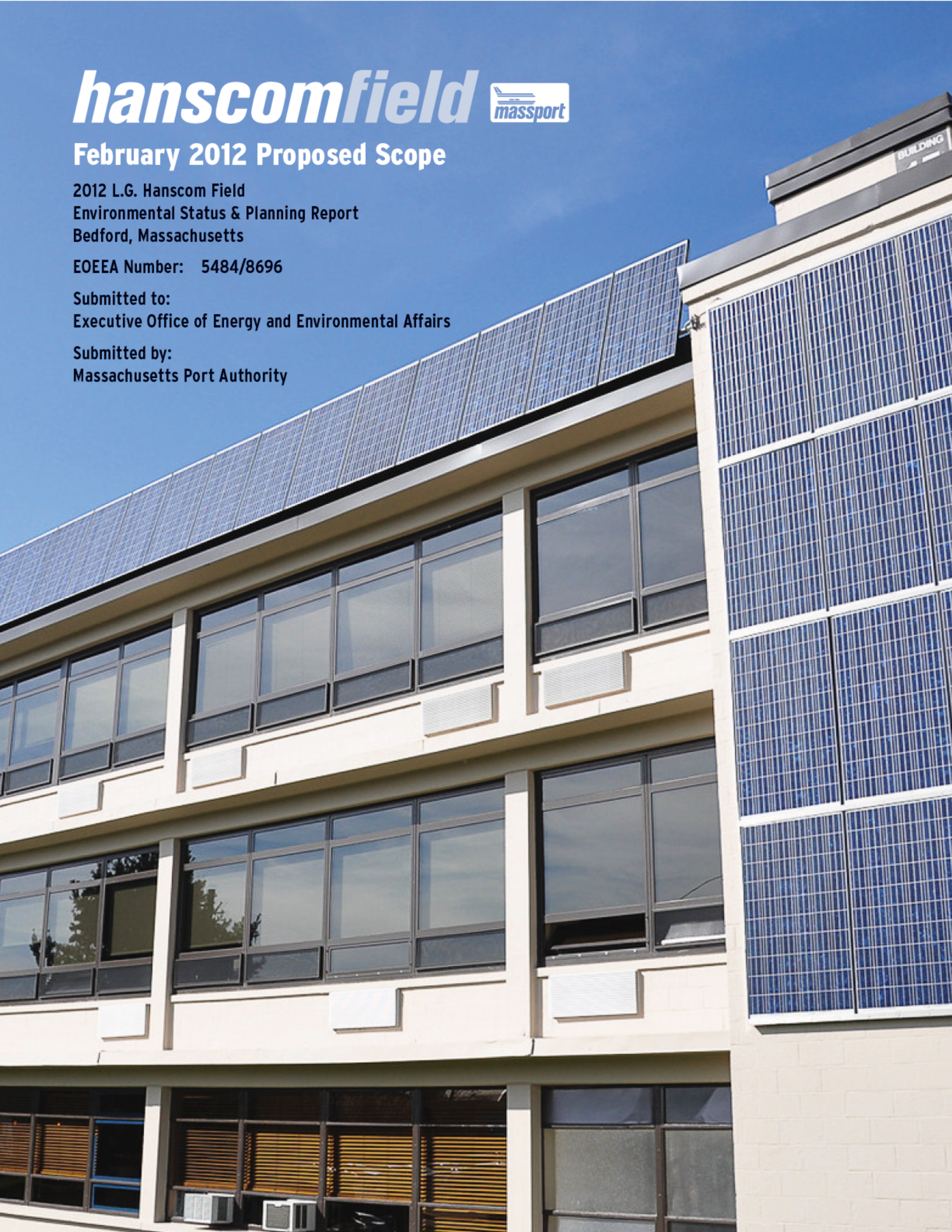
February 2012 Proposed Scope

2012 L.G. Hanscom Field
Environmental Status & Planning Report
Bedford, Massachusetts

EOEEA Number: 5484/8696

Submitted to:
Executive Office of Energy and Environmental Affairs

Submitted by:
Massachusetts Port Authority



Massachusetts Port Authority
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East Boston, MA 02128-2909
Telephone (617) 428-2800
www.massport.com

February 29, 2012

Secretary Richard K. Sullivan, Jr.
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

Re: Proposed Scope
2012 L. G. Hanscom Field Environmental Status & Planning Report
Bedford, MA
EOEA Number: 5484/8696

Dear Secretary Sullivan and Director Vallely-Bartlett:

The Massachusetts Port Authority (Massport) is pleased to submit for your review this Proposed Scope for the 2012 L. G. Hanscom Field Environmental Status & Planning Report (ESPR), the next filing in an ongoing review and evaluation of current and potential future operating and environmental conditions at Hanscom Field. The Proposed Scope is being submitted in accordance with the provisions of the Massachusetts Environmental Policy Act (MEPA), G.L. Chapter 30, Sections 62-62H and its regulations, 301 Code of Massachusetts Regulations (CMR) 11.00. The Proposed Scope responds to the Secretary's March 29, 2007 Certificate on the 2005 ESPR. A copy of the reviewers list is also attached.

Massport is requesting an extended 45-day comment period to accommodate community review and as requested by the Hanscom Field Advisory Commission (HFAC), with the close of comments on April 20, 2012. In addition to the MEPA Scoping Session, Massport will also hold an additional public meeting in mid-April and has offered to participate in additional community meetings within the 45 day review period to discuss the scope, as needed.

Tom Ennis, Senior Project Manager/Senior Planner will again be serving as the ESPR Project Manager. Tom and members of Massport's staff are available to discuss the ESPR and attached documents with you or your staff if needed. Please contact Tom at 617-568-3546 or me at 617-568-3524 with any questions or comments.

Sincerely,

Stewart Dalzell, Deputy Director
Environmental Planning and Permitting
Massachusetts Port Authority

Attachments

Cc: T. Ennis/Massport
B. Desrosiers/Massport

Proposed Scope
2012 L. G. Hanscom Field
Environmental Status & Planning Report

February 2012

PROJECT NAME: 2012 Hanscom Field Environmental Status & Planning Report
PROJECT LOCATION: Bedford, Massachusetts
EOEA NUMBER: 5484/8696
PROJECT PROPONENT: Massachusetts Port Authority (The Authority)

The Authority is committed to a multi-modal, multi-airport, multi-state regional transportation program that will satisfy future regional aviation demand. A key component of that transportation program is the use of regional airports to complement Boston-Logan International Airport (Logan). L.G. Hanscom Field, which is located in the four towns of Bedford, Concord, Lincoln, and Lexington, is New England's premier general aviation (GA) airport. Minute Man National Historical Park is located just south and west of the airport in Lincoln and Concord. As a reliever to Logan, Hanscom Field provides airside relief by annually serving approximately 170,000 GA operations. Hanscom Field handles over six times more GA operations than occur at Logan. The airport has supported niche commercial service. This role for Hanscom Field was established in the Master Plan for the airport in 1978, clarified in the 1980 Noise Rules, restated in the 1995 Generic Environmental Impact Report (GEIR), the 2000 L. G. Hanscom Field Environmental Status & Planning Report (ESPR), the 2005 ESPR, and continues to be the program for the future.

Hanscom Field's Master Plan and Noise Rules

The Authority assumed ownership of Hanscom Field in 1974. The airport is located approximately 20 miles northwest of Boston just outside Route 128/I-95 and is convenient to most of metropolitan Boston. The Federal Aviation Administration (FAA) identifies Hanscom Field as a reliever airport. As such, its primary role in the regional aviation system is to accommodate regional GA needs, which has included some commercial and cargo service. This allows larger nearby airports to concentrate on large-scale commercial and cargo activity.

In 1978, the Authority prepared a Master Plan for the airport. The preparation of the Master Plan included a lengthy and comprehensive public process. In 1980, after additional public process, Massport adopted the Hanscom Field Noise Rules, which were an outgrowth of the Master Plan. The Master Plan and the 1980 Noise Rules remain the framework for airport planning and operations today.

The variety of aviation activities at Hanscom Field include private corporate aviation, recreational flying, pilot training, air charter, cargo, commuter service and limited military flights. The Master Plan and the 1980 Noise Rules contemplate and provide for commercial airline service. In fact, the 1980 Noise Rules specifically allow for passenger aircraft with up to 60 seats. Commercial airlines have operated periodically at Hanscom Field since the mid-1970s. Pan Am is the most recent airline to provide commercial passenger services and Streamline currently provides scheduled charter service.

History and Purpose of Environmental Status and Planning Report

The Massachusetts Secretary of the Executive Office of Energy & Environmental Affairs (Secretary) has, since 1985, requested that the Authority prepare an Environmental Status and Planning Report (ESPR) every five years to evaluate the cumulative effect of growth and change at Hanscom Field and provide data and analyses on noise, ground transportation, air quality,

and water quality. The original GEIR, the 1995 GEIR Update, the 2000 ESPR, the 2005 ESPR , and now the 2012 ESPR provide a retrospective analysis of the environmental effects of Hanscom Field while including analyses for future conditions. The ESPR was deferred until analysis year 2012 due to the economic downturn and the number of aviation operations, which have remained well below the 2005 and future analysis years.

As a result, these documents remain an effective planning tool from which the Authority's policy and program developments are derived. The 2012 ESPR will present an overview of the operational environment and planning status of Hanscom Field and will provide long-range projections of environmental conditions against which the effects of future individual projects can be compared. The ESPR will allow the reader to see historical environmental information, current information, and a forecast of future environmental effects at Hanscom Field. The ESPR does not replace the requirement for filing an Environmental Notification Form (ENF) for a specific project if that project meets or exceeds a MEPA regulation threshold.

The Authority filed its 2005 Draft ESPR with the Executive Office of Environmental Affairs (EOEA) in November 2006, the Draft ESPR received its Certificate on February 15, 2007 where the Draft ESPR was accepted as a Final ESPR (FESPR) and was noticed in the Monitor on February 20, 2007. The Secretary issued the MEPA Certificate for the FESPR on March 29, 2007. The ESPR contains, among other things, an extensive discussion on air and ground transportation, cultural and historical resources, and detailed information on such technical issues as noise abatement, air quality, ground access, and water quality management. The MEPA Certificate issued by the Secretary on March 29, 2007 determined that the 2005 ESPR "adequately and properly complies with the Massachusetts Environmental Policy Act." The Secretary's Certificate requires that the major areas of analyses for the next ESPR include, but are not limited to, aviation planning, landside planning, ground access, noise, air quality, water quality, cultural and historical resources, sustainability and airport mitigation.

Public Review and Participation

In developing this proposed Scope, the Authority reviewed the Final MEPA Certificate for the 2005 ESPR. Per the proposed schedule, the Authority will convene the following:

- Hold a public meeting to discuss the proposed MEPA scope which will be in addition to the MEPA scoping session
- Convene up to four technical workshops during the public review process for the ESPR which will be in addition to the MEPA hearing for the ESPR.

Format of the 2012 ESPR

The 2012 ESPR will follow the general format of the 2005 ESPR. Massport proposes to prepare a single ESPR, similar to what is done at Logan. The 2005 Hanscom ESPR ended up being a single document because EOEEA accepted the 2005 ESPR Draft as the Final ESPR. In addition, Massport provides the Yearly Noise Report and the State of Hanscom every year to the public. Detailed ESPR technical studies will be summarized in a readable format to illustrate clearly the implications of recent trends, existing conditions and potential future scenarios. The ESPR will build on the base information developed for the 2005 ESPR, presenting policy considerations and an overview of the airport's current and potential future role within the regional planning context, including a status report on the Authority's proposed planning initiatives and projects. The 2012 ESPR technical studies will include analysis of airport activity levels, noise, ground access, air quality, water quality, natural resources, cultural and historical resources, and sustainability. The chapters on ground transportation management, noise, air quality, and water quality will include the following sections:

- Discussion of analysis methodologies and assumptions

- Report of 2012 conditions in comparison to previous years
- Prediction of 2020 and 2030 conditions

Forecasted activity levels for the future years may occur earlier or later than the forecast, but the analysis years of 2020 and 2030 will provide useful parameters for the analytical framework.

CD-ROM versions and limited printed copies of the ESPR will be available for public review. The ESPR will be posted on the Authority's web page. Supporting technical appendices will be provided as necessary. The following describes the proposed ESPR sections.

I. Introduction

This section will generally introduce the ESPR and place it in its environmental and regulatory context. This section will:

- Summarize the evolution of the Hanscom Field environmental review process.
- Describe the analysis framework for the environmental reporting and technical studies to be conducted.
- Describe the organization of the 2012 Hanscom Field ESPR.
- Summarize the major sections of the ESPR, with supporting graphics and data tables.

II. Facilities and Infrastructure

This section will update information presented in the 2005 ESPR regarding the airfield and its supporting infrastructure and utility system, including:

- The use and storage of hazardous materials at Hanscom Field, including jet fuel use and spill prevention efforts
- The status of the Authority's tenant audit program
- The current status of the 21E sites at Hanscom Field

III. Airport Activity Levels

This chapter will report on airport activity levels for 2005 to 2012 and describe the new forecasts of aviation activity for 2020 and 2030. This is based on aviation forecasts done for all three Massport airports; Logan, Hanscom, and Worcester. The ESPR will use forecasts to assist in developing fleet projections for each future analysis year.

The 2012 ESPR will describe historic airport activity levels. The ESPR uses specific analysis years to integrate airport activity levels with other areas of analysis, such as traffic projections. The ESPR will provide an update of activity levels at Hanscom Field according to the following:

- Report on aircraft fleet mix and on activity levels of GA, commuter and military operations from 2005 to 2012.
- Compare 2005-2012 activity levels to historic trends.
- Compare actual 2012 activity levels to forecasted 2010 activity levels from the 2005 ESPR.
- Report on current and future trends within the airline industry.

The ESPR will utilize forecasts developed for aviation activity for 2020 and 2030 based on recent trends at Hanscom Field and with consideration of the role that the airport plays in the regional airport system. The ESPR will report actual changes in fleet mix and aircraft operations at Hanscom Field – both increases and decreases – and compare these data to the

range of future activity levels and fleet mix defined by the moderate growth scenarios of the 2005 ESPR. Differences between actual and previously forecast activity levels will be explained and will be reflected in the underlying assumptions for the 2020 and 2030 forecasts. The forecasts will also include coordination with forecasting for the Logan ESPR.

- Prepare a 2020 growth scenario for activity levels and passenger forecasts.
- Prepare growth scenario for activity levels that will vary the fleet mix and passenger forecasts for the year 2030, which is consistent with the Logan ESPR and other regional planning efforts.

The fleet mix of the growth scenarios will include GA, military, commuter service and some cargo activity consistent with the 1978 Master Plan and 1980 Noise Rules. The scenarios will be based on recent trends at the airport as well as regional and national aviation trends.

IV. Airport Planning

The Authority continues to assess planning strategies for operating an efficient airport in an environmentally sensitive manner. As owner and operator of Hanscom Field, the Authority also must accommodate and guide airport tenant development. This section will describe the status of planning initiatives and projects for the:

- Terminal Area
- Airside Area
- Landside Area

This chapter will also report planning and development initiatives by the Minute Man National Historical Park, the Hanscom Air Force Base and the four contiguous towns that affect Hanscom Field and are affected by Hanscom Field.

V. Regional Transportation Context

Hanscom Field is the premier GA facility serving Massachusetts and the New England region. The ESPR will describe the role of Hanscom Field in the region's transportation system, and will report on the Authority's efforts to strengthen the regional transportation system and on its cooperative efforts with other transportation agencies to promote an efficient regional aviation system with improved public/private transportation access. The ESPR will also describe Massport's system of three airports and efforts to better utilize these facilities. This chapter will update the information provided in the 2005 ESPR with the most current information provided in the Logan EDRs and ESPR in relation to Hanscom Field and will include the following:

- For 2012, a report on regional airport operations, passenger activity levels, and the status of plans and new improvements as provided by regional airport authorities and a report on recent rail service initiatives by others that could affect air passenger travel including the North-South Station Rail Link, Acela Service, and bus service.
- A discussion of the role that Logan International Airport plays in intercity travel choices.
- Diversion opportunities to alternative modes and to New England airports.
- A report on the integration of New England regional airport facilities as a regional system
- A report on Hanscom Field's role in the GA airport network.
- A report on the current status of the ground access improvements at the four New England regional airports (Logan International Airport, T. F. Green Airport, Manchester Airport and Worcester Regional Airport) by state transportation agencies, including projected dates for completion of studies and/or construction

and an analysis to quantify the effects of these measures upon projected passenger levels at each of the airports.

In addition, the ESPR will report on the Authority's efforts to promote service at Worcester and other airports, as well as other Authority involvement to promote the regional transportation system.

A report on relevant regional and local highway studies and transit projects will be included.

VI. Ground Transportation

The ESPR will report on Ground Transportation conditions using the following indicators:

- Traffic, roadway and access analysis results
- Mode share data
- Alternative transportation modes; availability and use.
- Parking demand and management information

Background growth in traffic within the Study Area attributed to Hanscom Field as compared to other area sources will be evaluated. The Study Area for the traffic analysis in the 2005 ESPR was bounded by Route 2A, Old Bedford Road, Route 62, Routes 4/225 and Route 128/I-95. The 2012 ESPR will include the fourteen intersections that were counted for the 2005 ESPR within this Study Area. The 2012 ESPR will identify and evaluate those Study Area intersections that Hanscom Field traffic contributes 10-percent or more to the existing traffic volumes on each intersection approach. The 2012 ESPR will also use this approach to evaluate the Study Area intersections for the forecast activity levels and years.

Analyses conducted in support of the 2005 ESPR and other available information indicate that Hanscom Field currently does not have a sufficient commuting population to support a Transportation Management Association (TMA). The potential for developing partnerships with abutters and area businesses to facilitate a regional Transportation Demand Management (TDM) approach will be discussed in the ESPR. Other special topics will address recent studies, and issues raised in previous ESPR Certificates, reviewers' comments, and will:

- Report available information from the Authority's survey of Hanscom Field employees.
- Describe TDM strategies including potential for participation in a TMA.
- Review, summarize and analyze, as necessary, existing metropolitan transportation documents and report as to how they relate to Hanscom Field access.

VII. Noise

The Noise chapter of the ESPR will report current conditions for the year 2012 and projections for the forecast activity levels and years using the following indicators:

- EXP as calculated in accordance with FAA prescribed standards for the Integrated Noise Model (INM) and past practice at Hanscom Field
- Day-Night Average Sound Level (DNL) contours.
- Time-Above (TA) contours for a Given Threshold

All noise contour levels will be computed using the INM. The DNL levels depicted will be based on accepted EPA and FAA guidelines. Impacts assessment for both DNL and TA will be based on data from the 2010 U.S. Census. The ESPR will present the noise data from the

six permanent monitoring stations at Hanscom Field including minimum, maximum and average daily DNL values. Special topics will address recent studies, and issues raised in previous ESPR Certificates, reviewers' comments, and will include, in consultation with the Authority:

- A report on the Fly Friendly program at Hanscom Field and recommended touch and go procedures over the MMNHP.
- An analysis and review for areas that are affected by noise from aircraft upon start-up and take-off roll.
- Update on the incorporated recommendations from the 1999 Report of the Hanscom Field Noise Workgroup.
- Update on new noise monitoring system.

VIII. Air Quality

The Air Quality chapter of the 2012 ESPR will report current conditions for the year 2012, industry update on airport-related greenhouse gasses (GHG's), and projections for the forecast activity levels and years using the following indicators:

- Emissions Inventory for:
  - Carbon Monoxide (CO)
  - Oxides of Nitrogen (NOx)
  - Volatile Organic Compounds (VOCs)
  - Particulate matter (PM10) and (PM2.5)
  - Green House Gases (GHG)
- Available monitoring results for:
  - Ozone Precursors
  - Nitrogen Dioxide (NO2)

IX. Wetlands/Wildlife/Water Resources

The ESPR will include the most recent, wetlands delineation, and the identified vernal pools. The ESPR will report wildlife habitat mapping using available information from Massachusetts Natural Heritage and Endangered Species Program (NHESP). The ESPR will provide an update of the Authority's vegetation management program at Hanscom Field.

The ESPR will report on any incremental changes to the Hanscom Field storm water management system and to the Storm Water Pollution Prevention Plan (SWPPP). The ESPR will report on the water quality monitoring program at the Shawsheen River. The ESPR will provide any available public information on the National Pollutant Discharge Elimination System (NPDES) permit, and the SWPPP. Reporting indicators for water quality improvement will include NPDES Permit monitoring results. The ESPR will also report on the deicing monitoring program. The 2012 ESPR will also report on the Vegetation Management Plan, the Hanscom Field Grassland Management Program and all associated monitoring and maintenance.

X. Cultural and Historical Resources

The 2012 ESPR will review and update the extensive data on historic and archeological resources completed as part of the 2005 Hanscom Field ESPR. The most current version of the State Register of Historic Places and the files of the Massachusetts Historical Commission will be reviewed, as will previous available planning studies conducted within or adjacent to Hanscom Field. This information will be compared to the 2005 ESPR and updated where appropriate in the 2012 ESPR.

XI. Sustainable Development and Environmental Management System

The Sustainable Development and Environmental Management System (EMS) chapter of the ESPR will report on the development of the Authority's Sustainable Development Program and the EMS Program at Hanscom. The Authority received an ISO 14001 Certification for Hanscom Field in 2001, making it the first airport in the nation to qualify. The Certification establishes objectives and targets, monitoring procedures and roles and responsibilities to track and manage the environmental performance of Hanscom Field. This chapter will include a discussion of the following:

- Summary of existing sustainable practices currently being undertaken by the Authority at Hanscom Field
- Report on recycling policy and efforts
- Report on toxic reduction at the airport
- Report on the EMS Program at Hanscom Field, including the ISO 14001 Certification
- Opportunities for sustainable development practices

XII. MEPA Documentation

This section will include a copy of the Secretary's 2007 Certificate on the 2005 Hanscom Field ESPR, a copy of the Secretary's Certificate on the scope for the 2012 ESPR, a reviewers list and a glossary of terms. Supporting Technical appendices will be included in the report as necessary. The ESPR will respond to comments on the Proposed Scope in a topical format.

List of Reviewers

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Massachusetts Port Authority
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Richard Doucette
Manager Environmental Program
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Dimitros Merageas
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Nancy Nelson, Superintendent
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Dennis Reidenbach, Regional Director
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Philadelphia, PA 19106

Chris Perkins, Base Civil Engineer
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Colonel Charles P. Samaris, Division Engineer
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The following is a list of summarized comments submitted to the Secretary of Energy and Environmental Affairs (EEA) during the MEPA public comment period when MEPA issued a draft scope for the 2012 Hanscom ESPR. For each comment, a formal response from Massport is provided. The reader may also be referred to a specific section of the 2012 ESPR where a more detailed answer to the comment can be found.

Table A-1 Response to Comments

Number	Comment	Response
EEA Secretary's Certificate, May 18, 2012		
Facilities and Infrastructure		
EEA-1	Describe use and storage of hazardous materials including jet and leaded fuel, and spill prevention measures	Massport has developed a Spill Prevention Control and Countermeasures (SPCC) Plan that covers general Massport operations. Tenants that store a total of more than 42,000 gallons of oil in underground storage tanks (USTs) and/or more than 1,320 gallons of oil in ASTs or containers are required to have a SPCC Plan as required under 40 CFR 112 (Oil Pollution Prevention). For more information, see Section 2.4.6.
EEA-2	Describe deficiencies in the water and wastewater distribution systems	No deficiencies have been identified in Hanscom's water and wastewater systems. These facilities are described in Sections 2.4.3 and 2.4.4 respectively.
EEA-3	Compare changes in water demand and wastewater between 2005 and 2012, and projections for 2020 and 2030	The history of water use from 1988 to 2012 is presented in Table 2-3. Projections for future water usage have been generated based on the expected increase in airport operations. See Section 2.4.3.
EEA-4	Identify Massport's water conservation measures at Hanscom	Water conservation measures are directed by Massport's Sustainable Design Guidelines applicable aspects of LEED. See Section 11.3.3.
EEA-5	Identify infiltration/inflow removal process for the MWRA wastewater system	A summary of the MWRA's annual infiltration/inflow reduction report for Lexington is provided in Section 2.4.4. A variety of projects are being studied and implemented in the Town of Lexington, but none are located at Hanscom.
EEA-6	Status of Massport's tenant audit program	Massport continues to work cooperatively with tenants to ensure compliance with federal and state laws. The Environmental Audit Program is summarized in Section 9.15.
EEA-7	Status of 21E sites	Site remediation was completed in 2005 for the only MassDEP-listed disposal site that was open. Massport submitted documents to MassDEP and the U.S. EPA on May 22, 2006 to bring this site to regulatory closure. See Section 2.4.12.
EEA-8	Size and use of all existing structures and parking areas	A current inventory of parking areas and occupancy was conducted as part of the 2012 ESPR. See Section 2.4.2 and Table 2-2.
Airport Activity Levels		
EEA-9	Report on activity levels from 2005 to 2012 and historic trends	Hanscom's total aircraft operations have declined by 2.0 percent annually from approximately 218,000 operations in 2000 to 166,000 operations in 2012. These levels are considerably lower than peak operations of more than 300,000 in 1970. However, GA at Hanscom Field has recovered with an increase in operations of approximately 11 percent since 2009. See Section 3.4.
EEA-10	Forecasts for 2020 and 2030 including fleet projections including comparison to previous forecasts	GA activity at Hanscom Field is forecast to increase from approximately 164,800 operations in 2012 to 166,515 operations in 2020 and 190,600 operations in 2030. See Section 3.5.
EEA-11	Explain process a commercial airline must follow to initiate service at Hanscom	Procedures for new commercial service provider entrants are described in Section 3.4.5.1.
EEA-12	Consider the effects of federal military base closings	The forecasts assume that military operations will continue but remain low in future years. See Section

Number	Comment	Response
		3.5.
Airport Planning		
EEA-13	Status of planning initiatives for terminal area, airside, and landside	Planning initiatives are described in Chapter 4 and listed in Table 4-5.
EEA-14	List projects in 5-year capital improvement program and potential applicability of MEPA review	Massport's 5-year capital improvement program is described in Section 4.4.1.
EEA-15	Describe new FAA or Massport security requirements that could affect the environment	Security projects are described in Section 4.4.3. Security fencing has been replaced due to it reaching its useful life. Besides fencing, no security projects are expected to affect the environment.
EEA-16	Planning initiatives undertaken by the Hanscom AFB, MMNHP, and four host towns that have an affect or are affected by Hanscom Field	Planning activities at MMNHP are described in Section 4.2.4.1, at Hanscom AFB in Section 4.2.4.2, and the fours towns in Section 4.2.3.
EEA-17	Discuss status of Federal Interagency Group discussions	The federal interagency workgroup is described in Section 10.13.2. The group has not formally convened in recent years.
Regional Transportation Context		
EEA-18	Hanscom's role in regional transportation and efforts by Massport to coordinate with other agencies	Hanscom's central role as New England's premier GA airport is described in Section 5.3.
EEA-19	2012 status report on regional transportation system	A status report on the regional transportation system is discussed in Chapter 5 which covers aviation in Sections 5.4 and 5.5, Rail in Section 5.8, and Ground Access Improvements in Section 5.9.
EEA-20	Report on recent rail initiatives and potential effects on Hanscom passenger travel	Recent rail initiatives are discussed in Section 5.8.
EEA-21	Role of Logan	The role of Logan is described in Section 5.3.2.
EEA-22	Diversion opportunities to other airports and other modes	Diversion opportunities to other airports are described in Section 5.4 and 5.5, and other modes in 5.8 (Rail).
EEA-23	Report on integration of the New England Regional transportation	Integration of the New England Regional Transportation Plan is described among the various long range planning efforts in Section 5.7.
EEA-24	Status of ground access improvement at New England airports	The status of ground access improvements at New England Airports is described in Section 5.9.
EEA-25	Update on Massport's efforts to promote service at Worcester and other airports	Efforts to promote service at Worcester and other airports are covered in Section 5.9.2 and 5.9.3.
EEA-26	Report on relevant regional and local highway and transit projects	Regional and local highway and transit projects are described in Section 6.2.
Ground Transportation		
EEA-27	Report on 2012 ground transportation conditions including contribution of Hanscom Field to baseline	Hanscom Field is an off-peak generator, meaning that peak traffic for Hanscom Field does not coincide with more general peak traffic in the area. Hanscom-related traffic contributed only four percent of total traffic along Route 2A in 2012. See Section 6.4.
EEA-28	Show how Massport is working with the Hanscom AFB and other abutters on TDM	Massport has begun to collaborate with ground transportation coordinators at the AFB to provide information about TDM programs to employees and students working at Hanscom Field. Beginning in the winter of 2014, Massport and the AFB, in partnership with MassRIDES, will co-host a Transportation Fair on Hanscom Field to promote carpools, vanpools and available reward programs. See Section 6.6.2.
EEA-29	Update on Hanscom employee survey	A commuter survey of Hanscom employees was conducted in 2013 and is summarized in Section 6.4.1.1 with data provided in Appendix C.
EEA-30	Describe TMA opportunities	Massport has been exploring various TMA opportunities which are described in Section 6.6.2.5.
EEA-31	Summarize existing metropolitan transportation documents	Transportation planning is detailed in Section 6.3.
EEA-32	Assess potential affects from considered non-aviation development (such as the Air and Space Museum)	The potential affects from non-aviation development was programmed into future traffic forecasts as presented in Section 6.5.
Noise		
EEA-33	Present 2012 conditions and report historic trends	Noise levels at Hanscom Field decreased over the

Number	Comment	Response
		last several years, due primarily to quieter and better performing aircraft and decreases in operations. In addition, operational changes to the Fly Friendly Program which has reduced the number of touch-and-go flights over the MMNHP and nearby residences has also had a positive impact. See Section 7.6.
EEA-34	Report projected levels for future planning years based on activity forecasts	Noise levels for the planning years of 2020 and 2030 are presented in Section 7.8. 2020 levels will increase from 2012 levels, but are calculated to be lower than 2005 with 2030 levels being slightly lower than 2005.
EEA-35	Report any recent changes in INM	Massport upgraded to version 7.0c for noise calculations in the 2012 ESPR and for new calculations of EXP. See Section 7.5.3.
EEA-36	Address engine run-ups and APUs/GPUs	Massport has well-defined procedures for aircraft engine maintenance run-up and use of APUs/GPUs for Hanscom Field to minimize noise impacts. See Sections 7.4.1 and 7.4.2., respectively.
EEA-37	Consider ground monitoring of noise "hot spots" where complaints are common	The existing monitoring and modeling program provides an accurate representation of noise conditions at Hanscom. Elevated levels as would be expected are experienced near the runway ends. Massport will continue to work with stakeholder to minimize impacts of noise in accordance with the Hanscom Master Plan and Regulations.
EEA-38	Present data from six permanent monitoring locations including minimum, maximum, and average daily DNL	Data is presented in Appendix C.
EEA-39	Compare actual and predicted noise levels	Measured versus modeled noise is presented in Section 7.6.2.
EEA-40	Describe Noise Workgroup abatement measures that have been implemented and their effectiveness	The status of noise workgroup abatement measures is described in Section 7.3 and listed in Tables 7-2 and 7-3.
EEA-41	Include an acoustical treatment to reduce noise impacts in engine run-up areas	An acoustical treatment to reduce noise impacts in the engine run-up area is not feasible. Potential impacts from run-ups have been minimized by relocating a portion of them to the East Ramp.
EEA-42	Report on Fly Friendly Program	In 2009, Massport instituted changes in the Fly Friendly Program to minimize flights over the MMNHP and nearby residential areas. See section 7.8.5.
EEA-43	Status of noise mitigation recommended on 2005 Certificate at Wheeler-Meriam House, and proposal for other sites	Noise mitigation has been achieved through implementation of changes to the Fly Friendly Program.
EEA-44	Impacts of aircraft noise on wildlife and visitors at MMNHP and GMNWR	Noise levels at MMNHP and Great Meadows National Wildlife Refuge (GMNWR) are reported for 2005 and 2012 levels. They show a decrease in noise impacts since 2005. See Table 10-1.
EEA-45	Describe the MMNHP Soundscape Plan	The NPS continues to draft the Soundscape Plan. Data collected by the NPS Natural Sound office was collected in 2008-09 and draft results have been provided for information purposes.
Air Quality		
EEA-46	2012 levels and forecast for future years	Emissions for 2012 are reported in Section 8.3.9 and Table 8-8. Future emissions are presented in Section 8.3.13. These emission calculations demonstrate that emissions associated with Hanscom Field activity are a very small fraction of regional emissions. For all scenarios, air quality concentrations will be in compliance with the Massachusetts and National Ambient Air Quality Standards.
EEA-47	Goals and projections for reducing GHG	Goals for the reduction in GHG emissions are described in Section 8.3.3.
EEA-48	Measures to reduce emissions from all on-site sources	Measures to reduce on-site emissions are described in Section 8.4.
EEA-49	Report on efforts to get FBOs to purchase alternative fuels	A discussion of Massport's work with FBO's is presented in Section 8.4.1.

Number	Comment	Response
EEA-50	Federal standards for lead emissions from single piston aircraft and related public health information	A description of federal standards for lead emissions is provided in Section 8.4.6.
EEA-51	Report percentage of current and future fleet using 100LL Avgas	Based on 2013 operations at Hanscom (as of October 2013), there are a total 246 reciprocating (piston) engines requiring 100 LL fuel or 69 percent of the current aircraft count. See Section 8.4.6.1.
EEA-52	Overview of Ultrafine Particulate Matter issues and status of MassDOT's evaluation as outlined in the 2009 Transportation Act	Ultrafine Particulate Matter is summarized in Section 8.4.7.
Wetlands, Wildlife, Water Resources		
EEA-53	Status of wetland resources including vernal pools and perennial streams	Existing wetland resource areas are described in Section 9.4 and shown on Figure 9-1.
EEA-54	Update rare species, Vegetation Management Plan, and Grassland Management Plan	Rare species are discussed in Section 9.7.1. There are four listed species known to occur at Hanscom. The Vegetation Management Plan is discussed in Section 9.8. The Grassland Management Plan is discussed in Section 9.9.
EEA-55	Show GMNWR on all figures	GMNWR is shown and labeled on relevant figures.
EEA-56	Update on stormwater, NPDES, and the SWPPP	An update on stormwater including NPDES and the SWPPP is provided in Section 9.14.
EEA-57	Update on the Shawsheen River restoration work	Status of restoration work on the Shawsheen Basin is described in Section 2.4.5.
EEA-58	Update on water quality monitoring including that for deicing	An update on water quality monitoring is provided in Section 9.16.2.
EEA-59	Report on changes in impervious area from 2005 to 2012 and for future projections	There has been no change in impervious surface cover since 2005. Estimates for changes in impervious surface for planning years 2020 and 2030 are reported in Table 4-9.
Cultural and Historical Resources		
EEA-60	Update on historical and archaeological resources	An update on historical and archeological resources is provided in Section 10.1.
EEA-61	Respond to USFWS concerns about noise impacts on birds and turtles in the Concord Basin	Noise impacts on the GMNWR have decreased since 2005. Massport will continue to work with stakeholders to minimize potential impacts of Hanscom.
EEA-62	Consult with Towns to collect up to date information	Massport met with each of the four town historical commissions to collect up-to-date information. See section 10.4.
EEA-63	Report on activities of the interagency group	Activities of the interagency group are reported in Section 10.13.2.
EEA-64	Describe NPS Soundscape goals and plans	Soundscape goals and plans are described in Section 10.13.1.
EEA-65	Describe how Massport will work with the Massachusetts Department of Agricultural Resources (MADAR) and four communities to protect Massport agricultural land from conversion	Massport's coordination with MADAR is discussed in Section 10.14.9.
Sustainable Development and Environmental Management System		
EEA-66	Describe Massport's Program	Massport's Sustainable Development Program is described in Section 11.2.
EEA-67	Existing practices at Hanscom	Existing sustainability practices are described in Section 11.3.
EEA-68	Recycling	Since the 2005 ESPR, Massport has converted to single-stream recycling, which recycles a wider range of materials than the previous system. Hanscom will be outfitted with larger-capacity containers, which will be wirelessly monitored, reducing unnecessary services. See Section 11.3.5.4.
EEA-69	Toxic reduction	Hanscom Field is a Very Small Quantity generator (< 220 lb/month) of Resource Conservation and Recovery Act (RCRA)-regulated hazardous waste and a Small Quantity generator (< 2,200 lb/month) of Massachusetts regulated hazardous waste. See Section 11.3.5.3.
EEA-70	EMS	In May 2001, Hanscom Field became the first airport

Number	Comment	Response
		in the U.S. to receive ISO 14001 certification through the development and implementation of an EMS. An update on the implementation of the EMS is provided in Section 11.3.1.
EEA-71	Sustainable design associated with future development	Future sustainability efforts are described in Section 11.5.
EEA-72	Conformance to GreenDOT directives and guidelines	The GreenDOT Program and Massport's conformance is described in Section 11.2.4.5.
Environmentally-Beneficial Measures		
EEA-73	List measures with responsible parties and estimated cost	See Table 12-1.
EEA-74	Whether Massport will institute night-time landing surcharge as a penalty for both GA and commercial flights	Massport already institutes landing fees and a nighttime field-use surcharge for night-time operations.
EEA-75	Program to institute higher surcharges for noisier aircraft	This is not a legally feasible program to implement.
EEA-76	Efforts to extend Fly Friendly to commercial flights	Massport will consider a variety of practical measures to minimize noise impacts. Because commercial flights historically represent a very small percentage of overall flights, this is not a measure that is expected to minimize noise, but would be implemented as needed.
EEA-77	Noise attenuation at run-up areas	Noise from run-ups is mitigated by directing a portion of run-ups to the East Ramp and away from sensitive noise receptors.
Office of Niki Tsongas, U.S. House of Representatives, May 11, 2012		
TSO-1	Concerned about Massport's proposed plans to expand private jet infrastructure at Hanscom given its proximity to historic and natural resources and the recent designation of the area as one of the "11 Most Endangered Historic Places in America" by the National Trust for Historic Preservation.	Massport works with local communities and stakeholders to minimize impacts on environmental and cultural resources. The impacts of noise from aircraft activity have decreased over time. Changes in noise from forecasted aircraft activity levels have also been assessed as presented in in Chapter 7.
TSO-2	Given the interest of promoting economic development while preserving these resources, the ESPR should analyze proposed plans for expansion based on potential noise impacts to historic landscape.	Massport has evaluated changes in noise associated with planning years of 2020 and 2030. The detailed analysis is provided in Chapter 7, Noise and Chapter 10, Cultural and Historical Resources. No portion of MMNHP is located in the 65 dB contour in 2012 or the planning years of 2020 and 2030. No portion of MMNHP is located in the 55 dB contour in 2012 and 2020 and only 0.4 acres occurs in 2030.
TSO-3	Reiterates the recommendation to use 2010 actual conditions as baseline.	The 2012 Base Year includes data beyond actual/existing conditions that is useful in generating more accurate forecast conditions, including recent activity from 2011/2012, as well as other historical activity for several aircraft types dating back to 1990.
National Park Service, Minute Man National Historical Park, April 20, 2012		
NPS-1	Requests more focus on potential impacts to MMNHP and related non-federal, natural, cultural and archeological resources.	Massport has assessed the potential impacts on MMNHP and cultural resources for 2012 and planning years of 2020 and 2030. This detailed analysis is presented in Chapter 7, Noise and Chapter 10, Cultural and Historical Resources.
NPS-2	States the need to address impacts of increased air traffic noise over the park and ground traffic along the historic Battle Road and other key locations, which result in adverse effects on historical and natural resources and ability of visitors to enjoy park.	Massport prepared a noise impact assessment associated with air traffic over historic Battle Road and other key locations. Ground traffic impacts are analyzed in Chapter 6. Noise from aircraft is assessed in Chapter 7 and Chapter 10. Noise has decreased since 2005 due primarily to technological trends toward quieter and better performing aircraft and decreases in operations as well as changes to touch-and-go patterns adopted in 2009.
NPS-3	Suggests using the changes in aviation activity from 2005 to 2010 ESPR and their environmental impacts as the baseline case, and recommends holding new plans to at or below 2010 impact levels.	The 2012 Base Year includes data beyond actual/existing conditions that is useful in generating more accurate forecast conditions, including recent activity from 2011/2012, as well as other historical activity for several aircraft types dating back to 1990. Future development activities will be reviewed by

Number	Comment	Response
		Federal, State, and local agencies for compliance with applicable environmental laws and regulations. See Chapters 7 and 10.
NPS-4	Draws attention to Massport "L.G. Hanscom Field 2010 Annual Noise Report," which indicates that MMNHP noise levels (at 56.1 dBA) are above EPA speech interference threshold (52 dBA).	The reference to MMNHP noise levels of 56.1 dBA is a DNL measure which is averaged over the time period. The speech interference level of 52 dBA refers to a level when an impact may occur. Because one is an average and the other is an impact threshold, the two numbers cannot be compared to each other. Noise is addressed in further detail in Chapters 7 and 10.
NPS-5	Urges Massport to develop Hanscom within context of a regional transportation plan	Massport agrees with the importance of planning future development at Hanscom consistent with regional transportation. See Chapters 4 and 5 for information on consistency of development plans with regional planning efforts and the regional transportation network.
U.S. Department of the Interior, Fish and Wildlife Service, Eastern Massachusetts National Wildlife Refuge Complex		
FWS-1	Requests better acknowledgement of Great Meadows National Wildlife Refuge (NWR) including marking on maps, a listing in the Glossary of Terms, mention in the local and regional context section, and a description of the significance of Great Meadows in Chapter 10 when discussing Henry David Thoreau and Ralph Waldo Emerson.	Massport has included Great Meadows National Wildlife Refuge (GMNWR) on project figures and addressed specific comments in Chapter 10 including Section 10.14.5.
FWS-2	Concern is expressed regarding noise and lead pollution impacts on wildlife and visitors, particularly at the Concord Impoundment.	Chapter 7 presents an analysis of potential noise for planning years of 2020 and 2030. ESPR Chapter 8, Air Quality explains new Federal standards related to use of lead-based fuel. As shown in Figure 7-9, noise over the Concord impoundment has decreased significantly between 2005 and 2012. The future scenarios suggest that noise would increase in 2020 and2030 but remain below 2005 levels including over the Concord impoundment (see Figures 7-17 and 7-18).
FWS-3	Concern is expressed that the ESPR does not address noise reduction and provides specific recommendations for revising noise analysis.	Noise impacts and mitigation are discussed in Chapter 7.
FWS-4	Expresses concern regarding lead emissions based on "2008 EPA Report on Lead Emissions from the Use of Leaded Aviation Gasoline in the United States" and requests further testing.	Massport discusses the potential impacts of lead in Chapter 8, Air Quality.
Office of Jay Kaufman, Massachusetts House of Representatives, Lexington District, 5/14/12 (Massport's responses provided in writing)		
KAU-1	Requests clarification regarding use of single or multiple scenarios for forecast conditions and recommendation for use of one "realistic" scenario.	As directed in the MEPA scope, a single "moderate growth scenario" has been used for forecasting future aviation activity. A single forecast has been generated for both 2020 and 2030.
KAU-2	Expresses concern regarding use of different base years for each ESPR, for the reason that it reduces ability to measure cumulative impact.	The ESPR is a planning document, not a permit application. The ESPR has been prepared to include noise contours for the 2012 Base Year, and the 2020 and 2030 Forecast Conditions. These results are compared with historical contours from 2000, and 2005.
KAU-3	Asks whether Massport would perform lead monitoring studies at Hanscom due to community concerns and anticipated Federal standards.	ESPR Chapter 8, Air Quality describes the new Federal standards and includes a table illustrating current and future fleet use of lead-based fuel. Federal guidance targets study at other airports where it considers lead risks to be greater, therefore site specific studies at Hanscom are not warranted at this time.
KAU-4	Air Quality: Asks whether Massport would perform ultra-fine particulate matter monitoring studies at Hanscom due to community concerns and Federal standards.	ESPR Chapter 8, Air Quality describes ultra-fine particulates as well as requirements of the Transportation Reform Act of 2009.
Massachusetts Division of Fisheries and Wildlife, Natural Heritage & Endangered Species Program, May 15, 2012		

Number	Comment	Response
ESP-1	Requested that proposed scope for ESPR include mapping of Natural Heritage & Endangered Species Program (NHESP) as "Priority Habitat for state-listed grassland bird species.	Priority habitat of state listed species is included in Chapter 9.
Metropolitan Area Planning Council, April 20, 2012		
MPC-1	Requests that Massport address concerns related to lead emissions as reported in the EPA's 2008 report on lead emissions for aviation gasoline in the ESPR.	Massport included a discussion of potential impacts of lead emissions from aviation gasoline in Chapter 8, Air Quality.
Save Our Heritage, April 19, 2012		
SOH-1	Notes designation of historic and natural resources surrounding Hanscom as "Last Chance Landscape" (Scenic America) and "11 Most Endangered Historic Places in America" (National Trust for Historic Preservation). These issues are unresolved and the ESPR is an opportunity to address them.	Massport recognizes the importance of the environmental and cultural resources in the area surrounding Hanscom and supports the use of the ESPR in presenting existing conditions and minimizing impacts. See Chapter 10, Cultural and Historical Resources.
SOH-2	Lists historic and natural resources in the region and describes their importance.	Historic and natural areas are evaluated as part of the ESPR in Chapter 10.
SOH-3	Reminds Massport to "honor the 1978 Master Plan that stipulates a 30 seat limit for commuter aircraft and excludes certificated passenger service."	Massport's Master Plan and Noise Rules permit scheduled commercial passenger services with aircraft having not more than 60 seats, the current definitional size limit of commuter aircraft.
SOH-4	States that 1980 noise rules do not supersede 1978 Master Plan so Massport must comply with both by complying with the lower number of seats (30 rather than 60).	See response to SOH-3.
SOH-5	Encourages a single scenario scope that holds impacts at 2010 levels, implements an innovative plan to further mitigate all fleet-mix impacts, and complies with the Minute Man Park Soundscape Plan and the recommendations of the Federal Interagency Working Group charged with the mission to develop long-term protection goals for the Park and environs.	The 2012 Base Year includes data beyond actual/existing conditions that is useful in generating more accurate forecast conditions, including recent activity from 2011/2012, as well as other historical activity for several aircraft types. Massport will continue to work with stakeholders in minimizing impacts and ensuring compliance with Federal, state and local environmental laws and regulations. See Chapter 3, Activity Levels.
SOH-6	Airport Activity Levels - 2012 Hanscom ESPR should exclude study of additional commercial and cargo operations because Massport can facilitate these "limitations" via a multi-airport sponsorship; additionally, Massport should simultaneously prepare an ESPR for Worcester airport.	Cargo is not included in the forecasted scenario at this time. A modest level of commercial operations consistent with Massport Policy is included for the planning years 2020 and 2030. ESPR documents are prepared for both Boston Logan and Hanscom. Regional concerns, including issues related Worcester Airport, are summarized in Chapter 5, Regional Transportation.
SOH-7	Airport Planning - Emphasizes holding impacts to 2010 levels; recommends adherence to Minute Man National Historical Park Soundscape Plan; recommends investigating/implementing take-off and landing procedures at higher altitudes to reduce local noise impacts.	To ensure that the ESPR is as current as possible, the 2012 year is presented as a baseline. Aircraft activity levels are forecast for planning years of 2020 and 2030 based on a reasonable assessment of market demand. Massport will work with the local communities and stakeholders to minimize impacts of operations and associated airfield improvements including discussions about the MMNHP Soundscape Plan once it is produced. Massport will continue to follow take-off and landing procedures governed by criteria set by the FAA to ensure aviation safety and minimize potential impacts on the ground.
SOH-8	Landside Planning - Recommends establishing a "permanent boundary footprint" for Hanscom to ensure preservation of boundaries with adjacent resources.	Massport's activities are confined to the property boundary at Hanscom and any required modifications to adjacent properties to protect aviation safety in accordance with Federal Aviation Administration.
SOH-9	Traffic Impacts of Non-Active Aviation Development - Recommends evaluation of proposed Air and Space Museum for adverse traffic impacts to surrounding area, as well as flight operations due to air shows and performances.	Potential traffic impacts of the proposed Air and Space Museum are presented in Chapter 6, Ground Transportation.
SOH-10	Regional Transportation Context – the Hanscom expansion contradicts multi-airport transportation program, "as evidenced by the MAC study of	Hanscom is an important component of the regional transportation network as evidence by "Massachusetts Statewide Airport Economic Impact

Number	Comment	Response
	Massachusetts GA Airports."	Study" prepared by the Massachusetts Department of Transportation Aeronautics Division. It states that Hanscom's contributes $249 million to the state economy. See Chapters 3, Activity Levels, and 5, Regional Transportation Context.
SOH-11	Ground Transportation – development scenarios proposed in the ESPR should not increase traffic on Historic Battlefield Road.	Hanscom currently contributes 4% of traffic levels on Battle Road. That could rise to 5% in 2020 and 7% in 2030 assuming the increase in airport activity forecasted. Much of the traffic impact is associated with regional economic development and commuter patterns. See Table 1-4 and Chapter 6, Ground Transportation for more information.
SOH-12	Noise - the primary noise metric should be "Time Above (TA)" metric; additionally, suggests that MEPA require Massport to conduct a noise health assessment study of residents living under flight paths.	A number of supplemental noise metrics are presented for consideration. Only the 65 DNL has a regulatory implication. A historic review of noise impacts shows that noise has decreased overtime. See Chapter 7.
SOH-13	Air Quality - the 2012 ESPR must include lead in its air quality assessment.	Lead is addressed in Chapter 8, Air Quality.
SOH-14	Wetlands/Wildlife/Water Resources - States that lead measurements should be done by independent source.	Lead is addressed in Chapter 8, Air Quality.
SOH-15	Cultural and Historic Resources - Reminds Massport of Federal Interagency MOU to coordinate long-term preservation of area surrounding Hanscom due to its unique proximity to historical resources, as well as "Hanscom at Crossroads" document requesting moratorium on all new development until establishment of regional multi-modal transportation plan.	Massport recognizes the cultural and historic importance of the Hanscom area and will continue to work with the local communities and regional stakeholders in the planning and operation of Hanscom. See Chapter 10, Cultural and Historical Resources.
SOH-16	Sustainability - Reminds Massport that "sustainability" refers to environment and not just finances.	Massport has conducted a number of sustainability programs that reduce environmental impact and provide long-term cost savings. See Chapter 11.
Hanscom Area Towns Committee, Environmental Subcommittee 4/4/12 (Massport's responses provided in writing)		
HAT-1	Asks about parallel ESPR process for Worcester airport and incorporation of three airport regional system into ESPR scenario development and evaluation.	ESPR documents are prepared for both Boston Logan and Hanscom. Regional concerns, including issues related Worcester Airport, are summarized in Chapter 5, Regional Transportation.
HAT-2	Asks about rational basis for use of 2012 as Base Year versus 2010 Actual Conditions (preferred by HATS).	The 2012 Base Year includes data beyond actual/existing conditions that is useful in generating more accurate forecast conditions, including recent activity from 2011/2012, as well as other historical activity for several aircraft types dating back to 1990. See Chapter 3, Airport Activity Levels.
HAT-3	Asks about whether Base Year will account for actualization of 2005 forecast operations, as well as recommendations from Inter-agency Workgroup for protection of Minute Man Historical Park.	See response to HATS-2 above. Massport will also consider any recommendations from the Workgroup, however, at the time of writing, it was no longer active.
HAT-4	Reiterates recommendation for using 2010 actual conditions as baseline, asking for agreement.	See response to HATS-2 above.
HAT-5	Asks about conformance to MassDOT GreenDOT directives.	Massport is implementing a number of GreenDOT sustainability directives at Hanscom that mirrors GreenDOT goals, as well as Smart Growth regional planning considerations. See Chapter 11, Sustainable Development and Environmental Management System.
HAT-6	Asks about ESPR commitments related to monitoring and reducing lead emissions.	A summary of the status of the proposed Federal lead emission reduction program is presented in Chapter 8, Air Quality.
HAT-7	Asks whether ESPR would account for particulate matter in response to Transportation Health Act of 2009 and whether it would fund or study health effects.	Air quality reporting includes PM10 and PM2.5 particulate matter. See Chapter 8, Air Quality.
HAT-8	Asks about sufficient noise contour analysis to accurately assess annoyance and disturbance levels.	Noise contours for a number of planning scenarios are included in Chapter 7, Noise.
ShhAir, April 3, 2012		
Shh-1	Commits to active participation in the scoping process	Massport appreciates the participation

Number	Comment	Response
	for the Hanscom ESPR.	
Shh-2	Explains the strong community opposition to Hanscom expansion efforts in the past, reflecting stewardship of the area as unique in American history, as well as for environmental integrity.	Massport recognizes the important environmental and cultural resources and the importance of the ESPR in minimizing impacts.
Shh-3	Requests "good faith" collaboration between Massport and HATS ES in developing the ESPR scope.	Massport recognizes the importance of working with local communities and stakeholder organizations in the development of the ESPR.
Neighborhood Liaison for Concord Homes, May 7, 2012		
NLC-1	Provides detailed description of impact from Hanscom aircraft operations on daily life, due to noise and air quality disturbances, stated within the context of working to develop a "full, thorough, and open" ESPR.	Massport appreciates public comments on local effects of Hanscom operations. See Chapter 3, Airport Activity Levels, Chapter 7, Noise, and Chapter 10, Cultural and Historical Resources.
NLC-2	Chief concern: emission of fumes, especially from aircraft using lead-based fuel, with particular impact on children.	Massport has assessed potential effects from lead in Chapter 8, Air Quality.
NLC-3	Secondary concern: noise impact on families; states disagreement with FAA FONSI for plans to expand hangar capacity for storage and service of private jet aircraft; believes DNL 65 dB standard for incompatibility with residential land use is impractical; states that FAA/Massport have not performed noise testing on actual residential properties.	Noise impacts are assessed in Chapter 7. A variety of supplemental metrics are provided to understand potential effects.
NLC-4	Current and future scenarios for Hanscom Field should not exceed the 2010 baseline and impacts should be mitigated from 2010 levels down.	The 2012 Base Year includes data beyond actual/existing conditions that is useful in generating more accurate forecast conditions, including recent activity from 2011/2012, as well as other historical activity for several aircraft types dating back to 1990.
NLC-5	A permanent boundary footprint should be established to limit incremental expansion at Hanscom Field (such as Massport's recent bid to purchase new airside Naval property).	Massport appreciates the comments from the public.
NLC-6	Massport should use the 30-seat limit for passenger aircraft noted in the Master Plan, not the 60-seat limit noted in the Noise Regulations.	See response to SOH-3 above
NLC-7	No new commercial or cargo service should be studied in current or future scenarios.	Cargo is not included in future forecasts at this time. A modest increase is commercial operations consistent with Massport Policy is forecasted in the planning years based on expected demand.
Belinda Gower, April 4, 2012		
Bel-1	Expresses frustration with continued increase in air traffic and pollution generated by Hanscom, with particular concern for three young children.	Massport appreciates comments from the public. Information on aircraft activity shows that operations have decreased in recent years. See Chapter 3, Airport Activity Levels, Chapter 7, Noise, and Chapter 8, Air Quality.
Bel-2	Explains discomfort and stresses of living under flight path, including reports of neighbors moving away and health impacts like cardiovascular disease (e.g., hypertension, stroke).	Massport appreciates the comments from the public.
Bel-3	Requests that MEPA "take this environmental scoping process very seriously and request stringent measurements of lead, particulates, CO_2 equivalent, and noise contours" and that "all unhealthy impacts be mitigated thoroughly and appropriately."	Massport is complying with MEPA's requirements as directed in its scope for the 2012 ESPR.
Walden Woods Project, May 8, 2012		
WAL-1	Explains that the primary impact from Hanscom on Walden Woods is interruption to outdoor education programs due to the inability of students and teachers to adequately hear presenters, degrading the 18th and 19th century experience.	Massport has included an assessment of noise impacts in Chapter 7.
WAL-2	States concern that proposed scope of ESPR is too open-ended, with ability for Massport to make decisions based on market demands.	Massport works with the local communities and stakeholders to assess current impacts of future development in a manner that is consistent with Massport's mission to provide air transportation.
WAL-3	Explains that previous expansions in operations have	A historical perspective on aircraft activity levels is

Number	Comment	Response
	resulted in increased noise, degrading Walden Woods experience; thus, further increases of up to twice current capacity would further degrade the recreational and educational benefits.	presented in Chapter 3, Airport Activity Levels and it shows that operations have decreased in recent years.
WAL-4	Current and future scenarios for Hanscom Field should not exceed the 2010 baseline and impacts should be mitigated from 2010 levels down.	See responses to HATS comments.
WAL-5	A permanent boundary footprint should be established to limit incremental expansion at Hanscom Field (such as Massport's recent bid to purchase new airside Naval property).	See responses to HATS comments.
WAL-6	Massport should use the 30'seat limit for passenger aircraft noted in the Master Plan, not the 60-seat limit noted in the Noise Regulations.	See responses to HATS comments.
WAL-7	No new commercial or cargo service should be studied in current or future scenarios.	See responses to HATS comments.
Concord Museum, May 9, 2012		
MUS-1	Explains that the primary impact from Hanscom on the Concord Museum is interruption to outdoor education programs due to the inability of students and teachers to adequately hear presenters, degrading the 18th and 19th century experience.	Massport has included an assessment of noise impacts in Chapter 7.
MUS-2	States concern that proposed scope of ESPR is too open-ended, with ability for Massport to make decisions based on market demands.	Massport works with the local communities and stakeholders to assess current impacts and plan future development in a manner that is consistent with Massport's mission to provide air transportation.
MUS-3	Explains that previous expansions in operations have resulted in increased noise, degrading Walden Woods experience; thus, further increases of up to twice current capacity would further degrade the recreational and educational benefits.	A historical perspective on aircraft activity levels is presented in Chapter 3, Activity Levels and it shows that operations have decreased in recent years. Projected levels would be below historical peaks.
MUS-4	Current and future scenarios for Hanscom Field should not exceed the 2010 baseline and impacts should be mitigated from 2010 levels down.	See responses to HATS comments.
MUS-5	A permanent boundary footprint should be established to limit incremental expansion at Hanscom Field (such as Massport's recent bid to purchase new airside Naval property).	See responses to HATS comments.
MUS-6	Massport should use the 30 seat limit for passenger aircraft noted in the Master Plan, not the 60-seat limit noted in the Noise Regulations.	See responses to HATS comments.
MUS-7	No new commercial or cargo service should be studied in current or future scenarios.	See responses to HATS comments.

L.G. Hanscom Field — 2012 Environmental Planning and Status Report

Comment Received

	Commenter	Date of Letter/Email	Contact Information	Massport Comment Response Identifiers
1.	Richard Sullivan, Secretary of Energy and Environmental Affairs, Commonwealth of Massachusetts	5/18/2012	Richard K. Sullivan, Jr. Office of Energy and Environmental Affairs 100 Cambridge St, Suite 900 Boston, MA 02114	EEA-1 – EEA-77
1.	Niki Tsongas, Member of Congress John F. Kerry, United States Senator	5/11/2012	Niki Tsongas, Member of Congress John F. Kerry, United States Senator Congress of the United States Washington, DC 20515	TSO-1 – TSO-3
2.	U. S. Department of the Interior, National Park Service, Lou Sideris, Chief of Planning and Communications	4/20/2012	Lou Sideris Chief of Planning and Communications Minute Man National Historical Park 174 Liberty Street Concord, MA 01742	NPS-1 – NPS-5
3.	U. S. Department of the Interior, Fish and Wildlife Service, Elizabeth A. Herland, Project Leader	4/20/2012	Elizabeth A. Herland Project Leader U. S. Department of the Interior, Fish and Wildlife Service Eastern Massachusetts National Wildlife Refuge Complex 73 Weir Hill Road Sudbury, MA 01776	FWS-1 – FWS-4
4.	Jay Kaufman, Commonwealth of Massachusetts, House of Representatives	05/14/12 (to Massport)	Representative Jay Kaufman District Lexington State House, Room 34 Boston, MA 02133 Phone: 617-722-2320 Email: Jay.Kaufman@mahouse.gov	KAU-1 – KAU-4
5.	Jay Kaufman, Commonwealth of Massachusetts, House of Representatives	05/15/12 (to MEPA)	Representative Jay Kaufman District Lexington State House, Room 34 Boston, MA 02133 Phone: 617-722-2320 Email: Jay.Kaufman@mahouse.gov	KAU-1 – KAU-4
6.	Natural Heritage & Endangered Species Program Massachusetts Division of Fisheries and Wildlife,	4/20/2012	Everose Schluter, PhD Endangered Species Review Biologist Natural Heritage & Endangered Species Program Massachusetts Division of Fisheries and Wildlife 1	ESP-1

	Everose Schluter, PhD		Rabbit Hill Road Westborough, MA 01581 Voice: (508) 389-6346 Fax: (508) 389-7891	
7.	Metropolitan Area Planning Council (MAPC), Marc Draisen, Executive Director	4/20/2012	Marc Draisen Executive Director 60 Temple Place Boston, MA 02111 617-451-2770	MPC-1
8.	Save Our Heritage, Anna West Winter, Executive Director	4/19/2012	Anna West Winter, Executive Director Save Our Heritage 57 Main Street Concord, MA 01742 978-369-6662 Fax 978-369-6712 anna@saveourheritage.com	SOH-1 – SOH-16
9.	Hanscom Area Towns Committee Environmental Subcommittee (HATS ES), Richard Canale	4/4/2012	Richard Canale Hanscom Area Towns Committee Environmental Subcommittee (FIATS ES) Town Offices Town of Lexington Lexington, MA 02421 r.canale@rcn.com 781-861-0287	HAT-1 – HAT-9
10.	ShhAir, Margaret Coppe, President, ShhAir Board	4/3/2012	Margaret Coppe President, ShhAir Board 12 Barrymeade Drive Lexington, MA 02421 781-862-2637	Shh-1 – Shh-3
11.	Neighborhood Liaison for Concord Homes Lynn Vanacore Bloom	5/7/2012	Lynn Vanacore Bloom Neighborhood Liaison for Concord Homes 25 Fuller Lane Concord, MA 01742 lbloom1978@aol.com	NLC-1 – NLC-7
12.	Belinda Gower	4/4/2012	Belinda Gower 63 Cedar Way Concord, MA 01742 978-254-5915 bgower@mac.com	Bel-1 – Bel-3
13	The Walden Woods Project	5/8/2012	Kathi Anderson Executive Director 44 Baker Farm Lincoln, MA 01773-3004	WAL-1 – WAL-7
14	Concord Museum	5/9/2012	Peggy Burke Executive Director 200 Lexington Road PO Box 146 Concord, MA 01742-0146	MUS-1 – MUS-7

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May 18, 2012

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS ESTABLISHING THE SCOPE FOR THE 2012 L. G. HANSCOM FIELD ENVIRONMENTAL STATUS AND PLANNING REPORT

PROJECT NAME	: 2012 Hanscom Field Environmental Status and Planning Report
PROJECT MUNICIPALITY	: Bedford, Concord, Lexington, and Lincoln
PROJECT WATERSHED	: Shawsheen River
EEA NUMBER	: 5484/8696
PROJECT PROPONENT	: Massachusetts Port Authority (Massport)
DATE NOTICED IN MONITOR	: March 7, 2012

As Secretary of Environmental Affairs, I hereby establish the scope for analysis to be presented in the 2012 Hanscom Field Environmental Status and Planning Report (ESPR). In accordance with the provisions of 301 CMR 11.00 and 11.09 governing Special Review Procedures, this ESPR process was established by the proponent and this office to replace the 1995 Update to the Generic Environmental Impact Report (GEIR).

Project Description

Hanscom Field comprises approximately 1,300 acres of land, located approximately 20 miles northwest of Boston, within the municipalities of Bedford, Concord, Lexington, and Lincoln. Since 1974, when Massport assumed ownership of the field, it has primarily accommodated private general aviation (GA) activity, commercial, and cargo service. The Federal Aviation Administration (FAA) identifies Hanscom Field as a reliever airport to Logan Airport, whereby Hanscom Field provides substantial airside relief by annually serving approximately 164,000 GA operations. Hanscom Field also has supported limited commercial air service.

The ESPR inventories Hanscom's facilities and infrastructure, summarizes Massport's tenant audit program, identifies airport activity levels, describes ground transportation, explains Massport's Environmental Management system, and provides information on Hanscom's planned role in the future regional transportation system and its 5-year projected improvement program. It also examines noise and air quality levels under existing and a future scenario, and identifies cultural, historic, conservation and recreational resources.

History and Purpose of ESPR

Since the 2000 ESPR, Massport has provided in both ESPRs (2005 ESPR) a retrospective analysis of past trends in the environmental impacts of Hanscom Field and analyses for future conditions. As a result, these documents remain an effective planning tool from which the Massport's policy and program developments are derived. The 2012 ESPR should present an overview of the operational environment and planning status of Hanscom Field and should provide long-range projections of environmental conditions against which the effects of future individual projects can be compared. The ESPR should allow for the review of historical environmental information, current information, and the forecast of the future environmental effects at Hanscom Field.

The ESPR does not replace the MEPA review of specific projects at Hanscom that meet or exceed regulatory thresholds, with the exception of routine maintenance and replacement projects. For each project-specific review, Massport would be required to perform an individual analysis of impacts and mitigation (for those projects that require a stand-alone EIR and Section 61 Findings). The ESPR serves as a vehicle for ensuring that long-term, broad-scope planning informs the review and implementation of individual actions at Hanscom Field.

The Proposed Scope for the 2012 ESPR was submitted by Massport. While I have used that scope as a framework for this Certificate, I have modified it based on the 2005 ESPR Scope, in response to the comments received, and internal EEA review. Therefore, this scoping certificate is the governing document for the contents of the 2012 ESPR.

2012 ESPR Outline

The 2012 ESPR should follow the general format of the 2005 ESPR. Detailed technical studies should be summarized in a readable format to illustrate clearly the implications of recent trends, existing conditions and potential future scenarios. The 2012 ESPR should use the base information developed for the 2005 ESPR, present policy considerations and an overview of the airport's current and potential future role within the regional planning context, and include a status report on the Massport's proposed planning initiatives and projects. The 2012 ESPR's technical studies should include an analysis of airport activity levels, noise, ground access, air quality, water quality, and sustainability.

The chapters on ground transportation management, noise, air quality, and wetlands/ water resources should include the following sections:

- Discussion of analysis methodologies and assumptions.
- Report on 2012 conditions in comparison to trends from previous years, at least since 2000 (historical trends are most valuable when traced back 10 or 15 years, where the data is available).
- Prediction of 2020 and 2030 conditions, based upon the growth scenario described in Section III below.

SCOPE

Executive Summary

The Executive Summary should provide a summary of the major chapters of the ESPR, with supporting graphics and data tables. It should be made available as a separate document to facilitate wider distribution, including publication on Massport's web site.

I. Introduction

This chapter should introduce the 2012 ESPR and place it in its environmental and regulatory context. This section should:

- Summarize the evolution of the Hanscom Field environmental review process.
- Describe the analytical framework for the environmental reporting and technical studies to be conducted.
- Describe the organization of the 2012 Hanscom Field ESPR.

II. Facilities and Infrastructure

This chapter should update the information that was presented in the 2005 ESPR regarding the airfield and its supporting infrastructure and utility systems, including:

- The use and storage of hazardous materials at Hanscom Field, including jet and leaded fuel storage and spill prevention efforts.
- Report on any deficiencies in the water and wastewater distribution systems for Hanscom facilities, which connect to the Massachusetts Water Resources Authority (MWRA) system at the Air Force Base.
- Identify changes in water demand and wastewater generation at Hanscom facilities for 2005 to 2012, and projections for water use and wastewater flow for 2020 and 2030.
- Identify Massport's water conservation measures for equipment, plumbing, and landscape irrigation at Hanscom.
- Identify Infiltration/Inflow removal proposed for the MWRA wastewater system and report it in section XII.
- The status of Massport's tenant audit program.

- The current status of 21E sites at Hanscom Field.

This section should also contain information on the size and use of all existing structures and parking areas (including the number of spaces).

III. Airport Activity Levels

The 2012 ESPR should report on airport activity levels for 2005 to 2012 and describe the new growth forecasts of aviation activity for 2020 and 2030. This section is based on aviation growth forecasts done for all three Massport airports; Logan, Hanscom, and Worcester. The ESPR should use these forecasts to assist in developing fleet projections for each future analysis year. Historic airport activity levels should be described. The ESPR should explain the process a commercial airline must follow to commence service at Hanscom. It should provide an update of activity levels at Hanscom Field according to the following:

- Report on aircraft fleet mix and on activity levels of GA, commuter, and military operations from 2005 to 2012.
- Compare 2005-2012 activity levels to historic trends.
- Compare actual 2012 activity levels to forecasted 2010 activity levels from the 2005 ESPR.
- Report on current and future trends within the airline industry.

The ESPR should utilize growth forecasts developed for aviation activity for 2020 and 2030 based on recent trends at Hanscom Field and with consideration of the role that the airport plays in the regional airport system. The ESPR should report actual changes in fleet mix and aircraft operations at Hanscom Field – both increases and decreases – and compare this data to the range of future activity levels and fleet mix defined by the moderate growth scenarios of the 2005 ESPR. The new growth forecasts should incorporate lower annual growth assumptions compared with those used in the 2005 ESPR forecasts. Differences between actual and previously forecast activity levels should be explained and should be reflected in the underlying assumptions for the 2020 and 2030 forecasts. The forecasts should also include coordination with forecasting for the Logan ESPR and the development of forecasts for the New England regional aviation system.

Each forecast year should use a moderate growth scenario that will vary the fleet mix. The fleet mix of the moderate growth scenario should be comparable to the existing conditions, which include GA, military, and commuter service consistent with the 1978 Master Plan and the 1980 Noise Rules. This scenario should be based on recent trends at the airport as well as regional and national aviation trends. The ESPR should provide future aviation forecasts according to the following:

- Prepare a 2020 growth scenario for activity levels and passenger forecasts.
- Prepare a growth scenario for activity levels that vary the fleet mix and passenger forecasts for the year 2030, which is consistent with the Logan ESPR and other regional planning efforts.

The 2012 ESPR should consider the effects of federal military base closings on military activity levels at Hanscom Field.

IV. Airport Planning

The 2012 ESPR should assess Massport's planning strategies for operating an efficient airport in an environmentally sensitive manner. As owner and operator of Hanscom Field, Massport must accommodate and guide airport tenant development. The ESPR should describe the status of planning initiatives and projects for the:

- Terminal Area
- Airside Area
- Landside Area

The ESPR should identify and describe each project contained in Massport's five-year capital improvements program, and identify which, if any, of these projects may require individual MEPA review. The ESPR should describe any new FAA or Massport security policies that would affect environmental impacts relating to physical facilities or airfield operations.

This section should also report on planning and development initiatives by the Minute Man National Historical Park (MMNHP), the Hanscom Air Force Base, and the four contiguous towns that affect Hanscom Field and are affected by Hanscom Field. It should discuss the Federal Interagency Group, and its deliberations regarding Hanscom Field.

V. Regional Transportation Context

The 2012 ESPR should describe the role of Hanscom Field in the region's transportation system, and report on Massport's efforts to strengthen the regional transportation system and its cooperative efforts with other transportation agencies to promote an efficient regional aviation system with improved public/private transportation access. It should draw upon and update information provided in the most recent Logan ESPR Update in relation to Hanscom Field and include the following:

- Hanscom Field's role in the GA airport network.
- For 2012, a report on regional airport operations, passenger activity levels, and the status of plans and new improvements as provided by regional airport authorities and a report on recent rail service initiatives by others that could affect air passenger travel including Acela (rail) Service and bus service.
- The role that Logan International Airport plays in intercity travel choices.
- Diversion opportunities to alternative modes and to other New England airports.
- A report on the integration of New England regional airport facilities as a regional system.
- The current status of the ground access improvements at the four New England regional airports (Logan International Airport, T. F. Green Airport, Manchester Airport, and Worcester Regional Airport) by state transportation agencies, including projected dates

for completion of studies and/or construction and an analysis to quantify the effects of these measures upon projected passenger levels at each of the airports.
- A report on the Massport's efforts to promote service at Worcester and other airports.
- A report on relevant regional and local highway studies and transit projects.

VI. Ground Transportation

The 2012 ESPR should report on Ground Transportation conditions using the following indicators:

- Traffic, roadway and access analysis results.
- Mode share data.
- High occupancy vehicle (HOV) ridership alternatives.
- Alternative transportation modes; availability and use.
- Parking inventory, demand and management information.

The traffic analysis should be done in accordance with the EEA/MassDOT Guidelines for Traffic Impact Assessment. Background growth in traffic within the study area attributed to Hanscom Field as compared to other area sources will be evaluated. The study area for the traffic analysis in the 2005 ESPR was bounded by Route 2A, Old Bedford Road, Route 62, Routes 4/225 and Route 128/I-95. It should be maintained in the 2012 ESPR. The 2012 ESPR should include the fourteen intersections that were counted for the 2005 ESPR within this study area. The ESPR should identify and evaluate those study area intersections at which Hanscom Field traffic contributes 10-percent or more to the existing traffic volumes. The 2012 ESPR should also use this approach to evaluate the study area intersections for the forecast activity levels and years.

The ESPR should show how Massport is developing partnerships with the U.S. Air Force and other abutters and area businesses to facilitate an effective set of regional Transportation Demand Management (TDM) measures. Other special topics should address recent studies, and issues raised in the 2005 ESPR Certificates, reviewers' comments, and:

- Report available information from Massport's survey of Hanscom Field employees.
- Describe the full range of TDM strategies, including potential for participation in a TMA.
- Review, summarize and analyze, as necessary, existing metropolitan transportation documents and report as to how they relate to Hanscom Field access.

The ESPR should also identify the traffic impacts from non-active aviation development, such as an aviation museum, that may occur at Hanscom.

VII. Noise

The 2012 ESPR should report current conditions for the year 2012 and projections for the

forecast activity levels and years, using the following indicators:

- Noise Exposure (EXP) as calculated in accordance with FAA prescribed standards for the Integrated Noise Model (INM) and past practice at Hanscom Field.
- Day-Night Average Sound Level (DNL) contours (for 55, 60, 65, and 70 decibels (dBA)) and noise locations for approximately 150 sites in the four towns.
- Time-Above (TA) contours (showing 30, 60, and 90 minutes of exposure) for 55 and 65 dBA
- Single Event Level Distribution (SEL/D) metrics, as already incorporated into the annual Noise Report.
- A ranked tabulation of take-off noise levels for different classes of aircraft (used as the basis for SEL/D), and the numbers of operations for each class (on an average daily basis).

All noise contour levels should be computed with the Integrated Noise Model (INM): the DNL levels depicted should be based on accepted EPA and FAA guidelines. Impact assessment for both DNL and TA will be based on data from the 2010 U.S. Census. The basic structure for the TA analysis should follow the protocols developed for the Logan ESPR. The 2012 ESPR should identify any past or current changes in the INM, quantify the effect of modeling changes upon data, and ensure that reporting of past trends is adjusted for such changes. The ESPR should contain an analysis and review for areas that are affected by noise from aircraft upon start-up and take-off roll. The ESPR should address the issue of engine run-ups and the operation of Auxiliary Power Units (APU) and Ground Power Units (GPU). It should consider ground monitoring of noise "hot spots" where complaints are common.

The ESPR should present the noise data from the six permanent monitoring stations at Hanscom Field, including minimum, maximum and average daily DNL values. The ESPR should address the reliability of certain monitoring locations, particularly with respect to background noise levels, and it should compare predicted with actual noise measurements. Special topics should address recent studies, and issues raised in the previous 2005 ESPR Certificate.

In the Beneficial Measures section, the 2012 ESPR should describe the Hanscom Field Noise Workgroup noise abatement measures that have been implemented, and discuss their effectiveness. The 2012 ESPR should include an acoustical treatment to reduce noise impacts in engine run-up areas. It should report on the Fly Friendly program at Hanscom and the recommended "touch and go" procedures over the MMNHP. In the 2005 FESPR Certificate, the former Secretary recommended noise mitigation be proposed and implemented for the Wheeler-Merriam House in Concord because it was located within the 55dBA DNL contour. Massport should propose noise mitigation measures at other noise sensitive sites that fall within the established noise contours as they change over time. The National Park Service stated that aircraft noise potentially impacts wildlife and visitors to the Great Meadows National Wildlife

Refuge and the Minuteman National Historical Park. The ESPR should describe the Soundscape Plan of the Minuteman National Historical Park, and how aircraft operations at Hanscom affect it.

VIII. Air Quality

The 2012 ESPR should report on current conditions for the year 2012, which includes: airport-related greenhouse gases (GHGs), and projections for the forecast activity levels and years using the following indicators:

O Emissions Inventory for:
- Carbon Monoxide (CO)
- Oxides of Nitrogen (NO_x)
- Volatile Organic Compounds (VOCs)
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Greenhouse Gases (GHG) – CO_2, N_2O, and CH_4

O Available monitoring results for:
- Ozone Precursors
- Nitrogen Dioxide (NO_2)

Massport should set goals and projections in the ESPR for reducing GHG emissions, and the ESPR should identify the base level of GHG emissions for the airport. The 2012 ESPR should report on measures to reduce on-site emissions from all sources, including fuel handling, ground service equipment, and building heating and cooling (see also Section XII). It should report on Massport's efforts to encourage fixed base operators to consider purchasing alternatively fueled vehicles.

The 2012 ESPR should discuss the issue of lead emissions and the establishment of federal standards to control lead emissions from piston engine aircraft. It should discuss the state of the investigations and findings on the public health aspects of leaded aviation fuel. The ESPR should report on the status of the EPA's progress towards rulemaking. It should provide for the percentage of current and future aircraft fleets operating on aviation gasoline fuel (100LL) at Hanscom.

The 2012 ESPR should provide an overview of ultrafine particulate matter (UFP) issues in ongoing air quality studies. It will report on the status of MassDOT's evaluation of UFP, as outlined in the Transportation Reform Act of 2009.

IX. Wetlands/Wildlife/Water Resources

The ESPR should discuss the most recent wetlands delineation, the identified vernal pools, and the perennial status of Elm Brook. It should report on wildlife habitat mapping using

available information from the Massachusetts Natural Heritage and Endangered Species Program (NHESP). The ESPR should include an update of Massport's Vegetation Management Program and the Hanscom Field Grassland Management Program. It should highlight the location of the Great Meadow National Wildlife Refuge on ESPR figures.

The ESPR should report on any incremental changes to the Hanscom Field stormwater management system and to its Storm Water Pollution Prevention Plan (SWPPP). It should identify the Best Management Practices that Massport will undertake as part of the SWPPP. It should describe the water quality monitoring program at the Shawsheen River, other surface waters, and groundwater monitoring. The ESPR should provide information on the National Pollutant Discharge Elimination System (NPDES) permit. Reporting indicators for water quality improvement should include NPDES Permit monitoring results and the results from its limited monitoring program when it uses runway-deicing chemicals.

The ESPR should identify changes to the amount of impervious areas at Hanscom Field for 2005 to 2012, and that future changes to the amount of impervious area should be estimated for the 2020 and 2030 growth scenarios.

X. Cultural and Historical Resources

The 2012 ESPR should review the existing data on historic and archeological resources at Hanscom Field. The most current version of the State Register of Historic Places and the files of the Massachusetts Historical Commission (MHC) should be reviewed. The ESPR should describe Massport's efforts to address concerns raised by the Minute Man National Historical Park (MMNHP) and the Great Meadows National Wildlife Refuge. The National Park Service is concerned with the potential impacts of noise on the waterfowl, shorebirds, marsh birds, and turtles that use the Concord River basin. Massport should also consult with the Towns to obtain the latest historical/archaeological information. The ESPR should report on the interagency working group that was formed to review impacts on the MMNHP. It should identify and describe the National Park Service's soundscape goals and plans for the MMNHP.

The ESPR should identify how it will work with the four communities and the Massachusetts Department of Agricultural Resources to protect Massport-owned agricultural land from conversion to non-agricultural uses.

If the Federal Interagency Group is reconvened and if it publishes recommendations regarding Hanscom Field's operations, Massport should consider these recommendations and address this issue in the ESPR.

XI. Sustainable Development and Environmental Management System (EMS)

The ESPR should report on the development of Massport's Sustainable Development Program and its EMS Program. It should describe the objectives and targets, monitoring

procedures and roles and responsibilities to track and manage the environmental performance of Hanscom Field. This chapter should include a discussion of the following:

- Summary of existing sustainable practices currently being undertaken by Massport at Hanscom Field.
- Recycling policy and efforts.
- Toxic reduction at the airport.
- EMS Program at Hanscom Field.
- Opportunities for sustainable development practices.

The ESPR should include information on Massport's sustainable design program. It should include information on recycling and toxics reduction at the airport. The ESPR should also discuss the potential for incorporating other sustainable design elements into airport operations and/or the ongoing rehabilitation and expansion of existing airport facilities, including but not limited to the following:

- Optimization of natural day lighting, passive solar gain, and natural cooling;
- Use of energy efficient HVAC and lighting systems, appliances and other equipment, and use of solar preheating of makeup air;
- Favoring building supplies and materials that are non-toxic, made from recycled materials, and made with low embodied energy; and
- Provision of easily accessible and user-friendly recycling system infrastructure into building design; and development of an annual audit program for energy consumption, waste streams, and use of renewable resources.

Massport already incorporates some of these elements into its operation of the airport. The ESPR should summarize what steps Massport already takes, and how additional steps might increase environmental benefits. It should explain if Massport will conform to the MassDOT GreenDOT directives and guidelines. Additionally, Massport tenant leasing of Hanscom space should identify the sustainable measures that it requires of future tenants.

XII. Beneficial Measures

The 2012 ESPR should include a separate chapter on beneficial measures, which summarizes the actions described in the previous chapters (such as TDM, noise abatement, and sustainability measures). This chapter should include the identification of the parties responsible, a schedule for implementation, and the estimated costs.

The ESPR should report whether Massport will institute night-time (11:00 pm to 7:00 am) landing fees for both GA and commercial flights that charge a penalty over daytime operations. It should report on Massport's effort to develop landing fees based on noise-generated by type of aircraft, with higher fees for noisier aircraft. The ESPR should identify Massport's effort to extend the "Fly Friendly" program to commercial flights. It should report on Massport's plan to provide additional noise attenuation around engine run-up areas.

XIII. MEPA Documentation

The 2012 ESPR should include a copy of this Certificate, copies of all comments received, and a glossary of terms. It should include all Supporting Technical Appendices or report how reviewers can obtain a copy. The ESPR should identify when Massport will submit any interim review documents, such as Annual Reports. The documents should be made available in print and/or CD-ROM format.

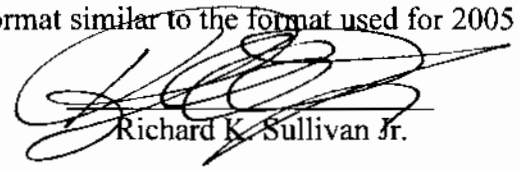
A cornerstone of MEPA review is making good information on environmental impacts readily available to the public. The internet offers an excellent medium through which information can be made accessible, and updated periodically. Therefore, I ask that Massport make available on its website the executive summary information for the 2012 ESPR.

Along with reliable information, ongoing public involvement will be key to a successful ESPR process. As part of its public information efforts, Massport has proposed to:

- Convene an additional public meeting for the 2012 ESPR, which will be in addition to the MEPA consultation session for the ESPR.
- Participate in additional community meetings within the 45-day review period to discuss the ESPR as needed.

At a minimum, Massport should circulate the 2012 ESPR to those parties who commented on this Certificate, and it should send a Notice of Availability of the 2012 ESPR to Massport's mailing list for Hanscom. Copies should also be placed in the public libraries of each of the four Towns. The ESPR should respond to comments received on this Certificate. I recommend a responses to comments format similar to the format used for 2005 ESPR.

May 18, 2012
Date



Richard K. Sullivan Jr.

Comments received:

HATS Environmental Subcommittee, 4/5/12
ShhAir, 4/5/12
Belinda Gower, 4/5/12
Massport, 4/18/12
U.S. Department of the Interior/Fish and Wildlife Service, 4/19/12
Save Our Heritage, 4/19/12
National Park Service/Minute Man National Historical Park, 4/20/12
MassWildlife/Natural Heritage & Endangered Species Program, 4/20/12
Metropolitan Area Planning Council, 4/23/12

Massachusetts Port Authority, 5/4/12
Neighborhood Liaison for Concord Homes (LV Bloom), 5/8/12
Concord Museum, 5/11/12
The Walden Woods Project, 5/11/12
Congress of the United States/Nicki Tsongas & John F. Kerry, 5/11/12
Massachusetts Port Authority, 5/11/12
Representative Jay R. Kaufman, 5/14/12
Representative Jay R. Kaufman, 5/15/12
Massachusetts Port Authority, 5/15/12
Massachusetts Port Authority, 5/15/12

8696esprscope2012.doc
RKS/WTG

Congress of the United States
House of Representatives
Washington, DC 20515

May 11, 2012

Richard K. Sullivan, Jr., Secretary
Executive Office of Energy and Environmental Affairs (EEA)
MEPA Office
100 Cambridge St., Suite 900 (9th floor)
Boston MA, 02114

Attn: Bill Gage

RE: Project EEA #5484 / EEA #8696
Proposed Scope for Hanscom Field Environmental Planning and Status Report (ESPR)

Dear Secretary Sullivan,

We appreciate the opportunity to submit these comments regarding the Proposed Scope for the 2012 L. G. Hanscom Field Environmental Status & Planning Report. We hear from our constituents frequently about concerns with future expansion efforts at Hanscom Field and the potential impact on neighboring national treasures. As Massport continues to review and evaluate the current and potential future operating and environmental conditions at Hanscom Field, we appreciate your solicitation of input from the many stakeholders in the communities surrounding the Field.

As you know, Hanscom Field abuts Minute Man National Historical Park, Great Meadows National Wildlife Refuge, Walden Pond and Walden Woods, three designated Wild and Scenic Rivers, Freedom's Way National Heritage Area, 8,000 acres of protected public open space, and many other historic and natural resources that are important to our national heritage and the tourist economy of Massachusetts.

Any plans to significantly increase the private jet infrastructure at the airport, as Massport has proposed, represent a direct threat to the historically and environmentally significant areas adjacent to the airport from increased jet aviation and the resulting noise and air pollution. Due to the severity of this threat, the National Trust for Historic Preservation has designated the surrounding area as one of the "11 Most Endangered Historic Places in America."

Great Meadows National Wildlife Refuge is one of eight national wildlife refuges in eastern Massachusetts protecting land in seven historically significant towns. The Refuge provides important habitat for a diversity of native fish and wildlife and provides visitors with many wildlife-oriented recreational opportunities.

Nearby, the Minute Man National Historical Park is visited by more than one million people each year and preserves for future generations the important sites associated with the opening battle of the American Revolution, which led to the founding of our country. Visitors are able to experience the sights, sounds and spirit of the landscape on which the revolutionary militiamen first fought for our nation's independence. Preserving the soundscapes of the Park is critical to achieving this goal.

We understand and value the role that economic development plays in the health of our economy. Historic preservation also plays an important role in spurring sustainable growth and maintaining the appeal of these historic areas. We believe that vibrant economic growth does not need to come at the expense of the unique historical character and environment of our communities. That is why we believe it is critical that the 2012 ESPR process appropriately analyzes any proposed expansion, particularly as it pertains to the unique soundscape of this region, and how it might potentially impact such a historic landscape.

We share the view of Minute Man National Historical Park that 2010 should be used as a baseline to assess if the planned outcomes and environmental impacts were realized from the last ESPR. And, that ideally, the new plan would be devised to hold impacts at or below 2010 levels. Likewise, Minute Man National Historical Park, the US Fish & Wildlife Service, and community groups including the HATS Environmental Subcommittee and Save Our Heritage have also submitted comments outlining their concerns regarding the impact proposed expansion could have on the region. We believe the concerns of these valuable community stakeholders deserve your attention and consideration and that their concerns are addressed in the ESPR.

Thank you again for the opportunity to share these comments, and we look forward to continuing to work with you to advance our shared goals.

Sincerely,

Niki Tsongas
Member of Congress

John F. Kerry
United States Senator

National Park Service
U.S. Department of the Interior

Minute Man
National Historical Park
174 Liberty Street
Concord, MA 01742

www.nps.gov/mima

April 20, 2012

To: Richard K. Sullivan Jr., Secretary
Executive Office of Energy and Environmental Affairs
MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

Attn: Bill Gage

RE: Project EEA #5484 / EEA #8696
Proposed Scope for Hanscom Field Environmental Planning and Status Report (ESPR)

Dear Mr. Sullivan,

Minute Man National Historical Park (MMNHP) is submitting these comments regarding the subject report.

Since the national park directly borders Hanscom Field and is greatly affected by operations there, we request that, as much as possible, the ESPR address specific impacts to the national park. As the starting place of the American Revolution which created our nation, MMNHP is one of the premier national parks in the U. S. Over one million visitors visit the national park each year seeking to have a contemplative experience in a historic atmosphere, in order to reflect on the origins and meaning of our nation.

We are pleased to see that there will be an analysis of the noise effects in the area and a report on the Fly Friendly program and recommended touch and go procedures over the MMNHP. However, the section on the Fly Friendly program is one of the few mentions of MMNHP in the report (besides being listed at the end as a reviewer) and we request more focus on many more potential impacts to the park and scores of related non- federal natural, cultural and archeological resources. Further airport expansion would likely result in an increase of air traffic noise over the park and ground traffic

along the historic Battle Road and other key locations. The plan's focus on growth projections will likely reveal additional adverse effects to the Park's historical and natural resources and the ability of park visitors to enjoy their experience.

The last ESPR was completed in 2005 and described planning through 2010. Therefore, we suggest that 2010 be used as a baseline so that we can assess if the planned outcomes and environmental impacts were realized. Ideally, the new plan would be devised to hold impacts at or below 2010 levels.

According to Massport's *L.G. Hanscom Field 2010 Annual Noise Report,* monitoring of noise levels in the national park show that levels are above 55 dBA, averaging 56.1 dBA. According to the National Park Service's Soundscape Indicators, ranger- conducted programs are presented in a "raised voice" with approximately 10 meters between the speakers and the furthest participants. Based on 95 percent speech intelligibility and raised voice communications at 10 meters, the EPA's speech interference threshold for this type of conversation is 52 dBA.

We commend you for including in the scope that the ESPR will report on Massport's efforts to promote service at Worcester and other airports. We urge Massport to develop a preservation solution that would place controls on development of the civilian airport within the context of a regional transportation plan.

Sincerely,

Lou Sideris

Lou Sideris
Chief of Planning and Communications

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Eastern Massachusetts National Wildlife Refuge Complex
73 Weir Hill Road
Sudbury, MA 01776

April 20, 2012

Secretary Richard K. Sullivan, Jr.
Executive Office of Energy and Environmental Affairs
MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

EOEA #5484/8696
Attn: Bill Gage

Dear Secretary Sullivan:

Thank you for the opportunity to provide comments on the scope for the 2012 L.G. Hanscom Field Environmental Status and Planning Report (ESPR). These comments reflect issues concerning visitors and wildlife at the Concord Unit of the Great Meadows National Wildlife Refuge (NWR) that we believe need more discussion in the 2012 ESPR.

The Great Meadows NWR is administered by the U.S. Fish and Wildlife Service, which is part of the U.S. Department of the Interior, as is the National Park Service. Great Meadows NWR was established in 1944 as an inviolate sanctuary for migratory birds, for the conservation of wetlands, to provide wildlife-oriented recreation, protect natural resources, and conserve endangered and threatened species. It is one of 556 refuges in the National Wildlife Refuge System, whose mission is "to manage a national network of lands and waters for the conservation, management, and where appropriate, restoration of fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

Great Meadows is visited by over 350,000 people each year. Most of these visits are at the impoundments located in Concord. These impoundments are one of the most important inland birding locations in the Commonwealth, and we manage them for migrating waterfowl and shorebirds. We also managed them for Blanding's turtle, a State-listed species which is also a species of regional concern due to its population status in the northeast. Additionally, the extensive wetlands along the Concord River support many migratory bird species. The Concord River itself, including the lands within the

Great Meadows NWR, is part of the National Wild and Scenic River System. It received this designation for its ecological, recreational, historical, scenic, and literary values.

In general, we request the 2012 ESPR better acknowledge the presence of the Great Meadows NWR. We request that maps that show the location of Minuteman National Historical Park next to the Hanscom Field also highlight the location of the Great Meadows NWR. The Glossary of Terms should include the Great Meadows National Wildlife Refuge. The local and regional context section of the ESPR should include a description of Great Meadows NWR and its use by visitors and wildlife. Currently most references to Great Meadows NWR are in Chapter 10 of the ESPR, which is the cultural and historical resources chapter. Interestingly enough, the historical significance of what is now the Great Meadows NWR to Henry David Thoreau and Ralph Waldo Emerson is absent from this chapter. The birthplace of the environmental movement in America is Concord, Massachusetts, and the Great Meadows themselves were heavily visited by Henry David Thoreau and others and played a significant role in the development of this environmental awareness.

The Concord Impoundments are located just west of runway 11-29, which is the primary runway at Hanscom Field. Our concerns are focused on noise and its impact on wildlife and visitors, and lead pollution in the sediments at the Concord Impoundments.

We are concerned that the potential impacts of noise on the waterfowl; shorebirds, marshbirds, and turtles that use the Concord Impoundment either year round or during important stages of their lifecycle has not been adequately addressed. Figures 7-5 and 7-7 in the 2005 draft ESPR showed numerous arrival flight tracks which come together just west of the Concord Impoundments on the way to Hanscom Field. According to the 2005 ESPR, Great Meadows NWR had by far the largest amount of conservation and historical land within the 55 Day Night Average Sound Level contour which is based on departures from Hanscom Field. Any growth models in the 2012 ESPR will likely show that this area will remain the same or will experience higher DNL contours, including up to or even above 65 DNL.

The impact of noise on wildlife has received increasing attention in the last few decades. Most researchers agree that noise can affect an animal's physiology and/or behavior. We recognize that there have been efforts to reduce the impact of noise on residents and Minuteman National Historical Park, but there is no recognition in the 2005 ESPR about the need to reduce noise to protect refuge wildlife. Aircraft noise does potentially impact wildlife, and it definitely impacts visitors who come to the refuge to observe and photograph wildlife or spend time in the solitude of nature. We request that Chapter 7 (Noise) address noise reduction at Great Meadows NWR or explain why this is not necessary at Great Meadows NWR. We also would be willing to discuss hosting a noise monitoring site at the Concord Impoundments so that more detailed information about noise levels could be obtained.

We also request that an independent lead test be conducted as part of the 2012 ESPR in the areas around Hanscom Field, including at the Concord Impoundments at Great

Meadows NWR. We are concerned about the level of lead emissions from aircraft using Hanscom Field as shown in the *2008 EPA Report on Lead Emissions from the Use of Leaded Aviation Gasoline in the United States*. We conducted sediment sampling in 2011 in the Concord Impoundments, and upon learning of this report, we re-evaluated our results and discovered that we had dry weight lead values ranging from 10.8 to 74.5 ppm. This is higher than we expected, and while we don't have an explanation of these higher lead levels, further testing of lead in the sediments around Hanscom Field, including at Great Meadows NWR, could provide valuable information. Research has shown that in freshwater ecosystems, the lowest effect level for lead is 31 and the probable effect level – the concentration above which adverse effects are expected to occur frequently – is 91.3. See MacDonald, D.D., et al, Alch. Environ. Contam. Toxicol. 39, 20-31 (2000). We will be testing the blood of several Blanding's turtles this spring to determine lead levels, and will be happy to share this information with Massport.

Lastly, please amend my address in the List of Reviewers to include U.S. Fish and Wildlife Service after my name.

Thank you for considering these comments. We look forward to working with Massport in the development of the 2012 ESPR. If there are questions about these comments, feel free to contact me at libby_herland@fws.gov or at 978-443-4661 ext 11.

Sincerely,

Elizabeth A. Herland
Project Leader

THE GENERAL COURT OF MASSACHUSETTS
STATE HOUSE, BOSTON 02133-1053

May 14, 2012

Mr. Thomas W. Ennis
Massachusetts Port Authority
One Harborside Drive, Suite 200S
East Boston, MA 02128-2909

Dear Mr. Ennis:

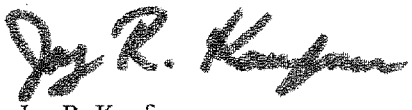
I want to thank you and Massport for the recent engagement with and responsiveness to the members of the Hanscom communities. After years of tension between Massport and the communities, I am hopeful that we have turned a page and that this more positive relationship will continue as we address the 2012 Hanscom Environmental Status and Planning Report (ESPR) and potential changes to Hanscom Field in the years ahead. It is in the context of that hope that I was most disappointed by your May 1 letter in response to the requests from the HATS Environmental Subcommittee with regard to the scope of the forthcoming ESPR.

Many of the Hanscom-area residents and officials who may wish to be involved in the ESPR process read your letter to suggest that we are clearly not on a new page. None of their concerns were addressed and none of their priority requests granted. Among the concerns are:

- **Scenarios:** During Massport's community meeting in Lexington, we were told that, unlike past ESPRs, this one would only look at a single scenario as multiple scenarios only complicated matters and muddied the waters. Our experience, in turn, of ESPRs with multiple scenarios was that Massport proceeded to argue that, having anticipated virtually any possible development in one or another of the scenarios, it was impossible for the communities to plan and Massport was in a position to claim a "blank check" for any new activity. In the course of the recent public meeting, it seemed that Massport and the communities had a shared interest in and commitment to a single-scenario ESPR this time. However, in your letter, there are references to "scenarios." I expect Massport to develop one realistic scenario grounded by Massport's clearly stated goals for Hanscom Field as part of Massport's multi-modal transportation strategy. Does Massport intend to submit one scenario as originally stated, or have you decided to pursue multiple scenarios, and, if so, why?
- **Base Line**: We continue to be deeply concerned by Massport's failure to adopt a baseline year against which to measure environmental impacts. Moving the base with every ESPR dramatically reduces the ability, indeed makes it impossible, to measure and account for cumulative impacts.
- **Lead Study:** Your May 1 letter notwithstanding, would Massport be willing to perform studies or monitoring of lead emissions from piston-engine aircraft at Hanscom in response to community concerns and the anticipated publication of new federal lead limits?
- **Air Quality:** Again, your letter notwithstanding and even though not currently required, would Massport be willing to perform studies or monitoring of fine and ultrafine particulate matter (UFP) at Hanscom, in anticipation of future federal limits and in response to community concerns?

I would very much appreciate information and clarification on the communities' issues at your earliest convenience. Please contact me with any further questions, and thank you again for your cooperation and prompt assistance in this important process.

Warmly,



Jay R. Kaufman

cc: Maeve Vallely-Bartlett, MEPA
David Mackey, Massport
HATS Selectmen

THE GENERAL COURT OF MASSACHUSETTS
STATE HOUSE, BOSTON 02133-1053

May 15, 2012

Ms. Maeve Vallely-Bartlett, Director
MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Ms. Vallely-Bartlett:

I am writing regarding the draft scope of the 2012 Hanscom Environmental Status and Planning Report (ESPR). Hanscom-area residents, including members of the HATS Environmental Subcommittee, would like to ensure that Massport follows all environmental laws, regulations and rules pursuant to the ESPR.

On behalf of these residents, I would like to request MEPA's assistance and action on the following issues, which were noted in my recent letter to Massport officials:

- **Scenarios:** During Massport's community meeting in Lexington, we were told that, unlike past ESPRs, this one would only look at a single scenario as multiple scenarios only complicated matters and muddied the waters. Our experience, in turn, of ESPRs with multiple scenarios was that Massport proceeded to argue that, having anticipated virtually any possible development in one or another of the scenarios, it was impossible for the communities to plan and Massport was in a position to claim a "blank check" for any new activity. In the course of the recent public meeting, it seemed that Massport and the communities had a shared interest in and commitment to a single-scenario ESPR this time. However, in Massport's recent letter, there are references to "scenarios." Can MEPA limit the ESPR to a single scenario, or otherwise focus Massport's work on realistic projections?
- **Base Line**: We continue to be deeply concerned by Massport's failure to adopt a baseline year against which to measure environmental impacts. Moving the base with every ESPR dramatically reduces the ability, indeed makes it impossible, to measure and account for cumulative impacts. Can MEPA take any action with Massport in establishing a baseline year that transcends ESPRs?
- **Lead Study:** Can MEPA require and/or ask Massport to perform studies or monitoring of lead emissions from piston-engine aircraft at Hanscom in response to community concerns and the anticipated publication of new federal lead limits? What would trigger action from MEPA in the event new federal rules or regulations are promulgated during the course of this five-year ESPR?
- **Air Quality:** Again, can MEPA require and/or ask Massport to perform studies or monitoring of fine and ultrafine particulate matter (UFP) at Hanscom, in anticipation of future federal limits and in response to community concerns? What would trigger action from MEPA in the event new federal rules or regulations are promulgated during the course of this five-year ESPR?

I would very much appreciate information and clarification on the communities' issues at your earliest convenience. Please contact me with any further questions, and thank you again for your cooperation and prompt assistance in this important process.

Warmly,

Jay R. Kaufman

cc: David Mackey, Massport
Thomas Ennis, Massport
HATS Selectmen

Ennis, Tom

From: Gage, Bill (ENV) [bill.gage@state.ma.us]
Sent: Friday, April 20, 2012 3:51 PM
To: Ennis, Tom
Subject: FW: Proposed scope for Hanscom Field Environmental Status and Planning Report (ESPR); EoEA # 8696 (NHESP # 01-9192)

From: Schluter, Eve (FWE)
Sent: Friday, April 20, 2012 1:05 PM
To: Gage, Bill (EEA)
Cc: Coman, Amy (FWE)
Subject: Proposed scope for Hanscom Field Environmental Status and Planning Report (ESPR); EoEA # 8696 (NHESP # 01-9192)

Dear Bill,

The Natural Heritage & Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries & Wildlife has reviewed the proposed scope for the Hanscom Field ESPR. The site is mapped Priority Habitat for state-listed grassland bird species. The NHESP looks forward to reviewing the ESPR pursuant to the MESA, including any newly proposed development initiatives and on-going vegetation management plans. Please let me know if you require any additional comments.

Thanks,

Eve

Everose Schlüter, PhD
Endangered Species Review Biologist
Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581
Voice: (508) 389-6346
Fax: (508) 389-7891

MAPC
METROPOLITAN AREA PLANNING COUNCIL

Smart Growth & Regional Collaboration

April 20, 2012

Richard K. Sullivan, Jr., Secretary
Executive Office of Energy & Environmental Affairs
Attention: MEPA Office
William Gage, MEPA#8696
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: Proposed Scope – 2012 L.G. Hanscom Field Environmental Status and Planning Report (ESPR), MEPA #8696

Dear Secretary Sullivan:

The Metropolitan Area Planning Council (MAPC) regularly reviews proposals deemed to have regional impacts. The Council reviews projects for consistency with *MetroFuture*, the regional policy plan for the Boston metropolitan area, MAPC's Smart Growth Principles, and the Commonwealth's Sustainable Development Principles, as well as for their impacts upon the environment.

Massport prepares an Environmental Status and Planning Report (ESPR) every five years to evaluate the cumulative impacts of growth and change at Hanscom Field and provide data and analyses on noise, transportation, air quality, and water quality. The 2012 ESPR will present an overview of the operational environment and planning status of Hanscom Field and will provide long-range projections of environmental conditions. The ESPR will contain historical environmental information, current information, and a forecast of future environmental effects at Hanscom Field.

At the March 20, 2012 ESPR scoping meeting, the issue of levels of lead emissions from aviation gasoline was raised and a U.S. EPA report, 'Lead Emissions from the Use of Leaded Aviation Gasoline in the United States' (2008) was referenced. According to this report, Hanscom Field releases an estimated 533 kilograms or 0.6 tons of lead by piston-engine aircraft during the landing and take-off cycle. Hanscom Field ranks 33rd of 3,414 airport facilities nationwide identified in this report. The potential of environmental impacts resulting from the current level of emissions, and the possibility of additional emissions if growth is projected for the airport, were raised at this meeting. MAPC respectfully requests that Massport address this concern in the ESPR.

MAPC looks forward to reviewing the draft ESPR.

Sincerely,

Marc D. Draisen
Executive Director

cc: Walter J. St. Onge III, Town of Bedford
K.C. Winslow, Town of Concord
Richard Canale, City of Lexington
Christopher Reilly, Town of Lincoln
Keith Bergman, MAGIC
Tom Ennis, Massport

60 Temple Place, Boston, MA 02111 • 617-451-2770 • Fax 617-482-7185 • www.mapc.org

Save Our Heritage

Protecting the birthplace of the American Revolution, the cradle of the American Environmental Movement, and the home of the American Literary Renaissance.

April 19, 2012

Richard K. Sullivan, Jr., Secretary
Executive Office of Energy and Environmental Affairs (EEA)
MEPA Office
100 Cambridge St., Suite 900 (9th floor)
Boston MA, 02114
Attn: Bill Gage

RE: Project EEA #5484 / EEA #8696
Proposed Scope for Hanscom Field Environmental Planning and Status Report (ESPR)

Dear Mr. Sullivan,

In 1974 Massport acquired ownership and operational control of L.G. Hanscom Field. Since that time, the abutting historic landscapes and natural resources -- along with the host historic communities -- have been designated a **Last Chance Landscape** by ***Scenic America*** and one of the **11 Most Endangered Historic Places in America** by ***The National Trust for Historic Preservation.*** These designations are a result of Massport's aviation impacts; they still stand, and they have yet to be resolved. We are hopeful that the 2012 ESPR process will usher in a unique yet critical opportunity to plan for a sensitively mitigated and environmentally responsible and sustainable future for Hanscom Airport.

Given the clear and highly unfortunate power disparity between Massport, a state authority committed to development (subject to no local zoning, noise ordinances, or taxes) and the four historic suburban towns committed to preservation (governed by town meeting vote) it is no wonder that decades of conflict, legal battles, and resentment have ensued.

Existing within a two-mile radius of the Airport are thousands of **nationally and internationally recognized landmarks** of significant historic and environmental importance. These sites draw millions of visitors annually and are a major contributor to the state's economy and, most importantly, to its nationally recognized identity.

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Sites directly abutting -- or within a 2 mile radius of the airport include:

- **Minute Man National Historical Park** (recently expanded - H.R. 146, an ***America's Great Outdoors*** public/private initiative, and honored by Congressional Resolution in 2009);
- **Great Meadows National Wildlife Refuge**
- **Thoreau's Walden Pond and Walden Woods**
- **Three Designated Wild and Scenic Rivers**
- **The Estabrook Woods**
- **Freedom's Way National Heritage Area**
- **The homes of Emerson, Thoreau, Hawthorne, and Alcott**
- **Over 1,000 National Register eligible sites**
- **8,000 acres of protected public open space (the largest tract of open space in the suburban Boston area).**

There are over **14,000 airports** in the United States. There is only **one Birthplace of the American Revolution,** only **one Home of the American Literary Renaissance,** and only **one Cradle of the American Environmental Movement. The 2012 ESPR should reflect a genuine commitment to preserve the sanctity of these national treasures.**

The following comments align with the named sections of the February 2012 Proposed Scope document

Comments on Introduction

The communities remain hopeful that Massport will prove to act in accordance with the statement that prefaces their proposed scope: "the authority is committed to a multi-modal, multi-airport, multi-state regional transportation system that will satisfy future regional aviation demand."

We ask that Massport be directed to respect the need for the establishment of a fair and balanced regional NE transportation system and encourage multi-modal services such as the Acela service to NY and DC. As a result, the ESPR should not study scenarios involving any additional ticketed commercial service out of Hanscom. In 2000-2003, when Massport was actively courting airlines, and subsidizing a lease to Shuttle America, the noise impacts of 220,000 operations over the residential communities proved intolerable (as evidenced by multiple citizen protests) and public enjoyment of the natural and historic resources was severely diminished. After decades of costly and failed attempts to establish viable commercial service at Hanscom, **we look to Massport to honor the 1978 Master Plan that stipulates a 30 seat limit for commuter aircraft and excludes certificated passenger service.**

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Hanscom Field's Master Plan and Noise Rules

Nowhere is it written that the 1980 noise rules supersede the 1978 Master Plan. Massport states they will study scenarios compatible with both. But the Master Plan limits commuters to 30 seats and the noise rules limit commuters to 60 seats. Inexplicably, Massport takes the position that the limit number is 60, but the Master Plan stipulates 30. The noise rules don't supersede the Master Plan; they are just other parallel rules. So, **for Massport to comply with both -- and honor the sensitive environment they already seriously impact -- they must comply with the lower number.**

History and Purpose of Environmental Status and Planning Report

As a result of previous GEIR/ESPR scenario growth studies, the communities have witnessed ESPR scope hypotheticals become quickly sought-after Massport objectives: i.e. ticketed commercial airline service, the introduction of heavy commercial cargo, and the doubling of hangar infrastructure. Despite Massport's attempts to encourage unprecedented expansion, the communities were heartened when the majority of Massport-solicited airlines and the FEDEX Corporation proved to value the sanctity of the historic resources over potential for corporate gain and ceased to pursue operating out of Hanscom.

At the present -- yet still evolving state of environmental regulations -- there are very few legal statues that exist to protect unique and invaluable natural and historic resources from aviation impacts. Only a unified commitment to common sense and sensibility on the part of all stakeholders can chart a shared course toward a responsible and sustainable balance between this airport and its host communities. **We look forward to MEPA's encouragement of a single scenario scope that holds impacts at 2010 levels; implements an innovative plan to further mitigate all fleet-mix impacts; and complies with the Minute Man Park Soundscape Plan and the recommendations of the Federal Interagency Working Group charged with the mission to develop long-term protection goals for the Park and environs.**

Public Review and Participation

As stewards of the cradle of the American Environmental Movement, the citizens of these communities take very seriously environmental stewardship and protection. They have been both hopeful and diligent as they have invested countless volunteer hours and financial resources in past ESPR processes. Unfortunately, after their research was ignored and their input and concerns summarily dismissed, the host towns viewed future participation as a futile proposition. In 2005, the communities and the National Park Service boycotted the process.

Massport has asked the communities, the sites stewards, the National Park Service and U.S. Fish and Wildlife, to return to the table and work with them on the 2012 ESPR. The communities

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would like nothing more than to find a commonality of purpose and direction, and will -- once again -- remain hopeful that Massport will seize the opportunity to engage in a sensitive and appropriate scoping process and an honest environmental assessment – limiting the growth scenarios studied and inclusive of new and innovative mitigation measures to be applied to current and future impacts.

Comments on proposed ESPR sections

III. Airport Activity Levels

The 2012 ESPR should exclude study of additional commercial and cargo operations; Massport, now owning and operating three Massachusetts Airports, can facilitate these limitations via a **multi-airport sponsorship**. In addition, Massport should simultaneously prepare an **ESPR for Worcester Airport.** The relationship between Hanscom and Worcester is of great significance. As Massport works to encourage commercial carriers to service central and western MA via Worcester, the growth of FBOs for large GA traffic may also present economic opportunity for the Worcester facility while serving to reduce the imbalance and monopoly of jet activity at Hanscom.

IV. Airport Planning

In order to hold impacts to 2010 levels, parameters, limitations, and mitigation methods need to be defined for the proposed current build-out of facilities *(please see attached chart)*. Massport's plans to double Hanscom hangar infrastructure to house some of the largest luxury private jets manufactured (Gulfstream 650s) has recently been given the green light to proceed by virtue of a Finding of No Significant Impact (FONSI). Once again, we are reminded that in order for the FAA and Massport to find a "significant" noise impact relative to any of their aviation practices, levels within the park and communities would need to reach a threshold deemed -- in FAA terms -- **"incompatible with residential land use"** (65 db DNL). Until the day dawns when the cradle of the American Environmental Movement is officially regarded as **humanly uninhabitable**, this internationally beloved landscape is succumbing, via "insignificant" incremental assault, to a fate of *death by a thousand cuts*. Unlike a condominium complex -- Walden Country, Minute Man Park, The Estabrook Woods, and Great Meadows National Wildlife Refuge can't be soundproofed with acoustic insulation panels.

Proposed aviation activity should be compatible with the Soundscape Plan of Minute Man National Historical Park. In the EA for Hangar 24 (including East Ramp build-out) Massport states that all new aircraft encouraged by the infrastructure expansion will most likely be large jet aircraft and that they ***will not*** impact Minute Man Park because they will be using the long runway. However, the North Bridge and Barrett's Farm Units of the National Park ***are*** impacted by the long runway. In addition, the "long runway" – the Concord-Lexington runway (11/29) –

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facilitates approx. 80% of operations and significantly impacts the historic downtown areas of Concord and Lexington as well as protected public open space areas which include Great Meadows National Wildlife Refuge and The Estabrook Woods. Study of operations on this runway should begin with mitigation of current disproportionate impacts. **Higher elevations employed in take-off and landing procedures should be investigated and implemented. Unlike Logan -- with an ocean to fly over as a means to reduce local impacts -- utilization of Rt. 2 and Rt. 128 corridors for flight patterns should be examined.**

Landside Planning

A permanent boundary footprint should be established for Hanscom Field. This is a key component in the establishment of an environmentally sustainable airport that abuts sensitive historic national landmarks. The threshold of reasonable soundscape preservation of these historic and natural resources of centuries past will never be increased, therefore, the environmental impact of this facility cannot continue to increase or these resources will be lost to future generations.

Traffic impacts of non-active aviation development

The communities supported a museum commemorating local aviation accomplishments to be housed in the historic Hangar 24 (18,000 sq. ft.). The size and content of such a museum was considered an appropriate addition to the community and of comparable scale with other local museums and historic sites. However, the proposed non-locally focused "Air and Space Museum" is slated to be a large structure (150,000 sq. ft.) built on 17 acres of tax exempt land and leased from Massport for a dollar a year. This tax-free facility will offer air-side facilities for individuals to house their private collections of aircraft and **needs to be evaluated for the potential to generate significant additional traffic on Battle Road (already considered failed at the intersections)**. In addition, any air-show aviation traffic it generates during the spring, summer, and fall seasons -- when children, families, and tourists venture out to enjoy the National Park, historic sites and open space -- would be viewed as detrimental and unwanted by the communities and site stewards. **Additional activity of these antique and "show" planes should be studied and added to the proposed fleet mix.**

V. Regional Transportation Context

As evidenced by the MAC study of Massachusetts GA Airports, any further Hanscom expansion plan threatens the "multi-airport" transportation program because it places a state agency in direct competition for aviation traffic with local smaller underutilized airports (and the related small businesses) that are seeking economic opportunities. In addition, the continued amassing of infrastructure, in order to monopolize operations, disproportionally concentrates environmental impacts on the Hanscom communities (The number of Hanscom operations is 2nd only to Logan International Airport within the New England Regional Aviation System).

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VI. Ground Transportation

The scenario studied should not increase ground traffic on the Historic Battle Road. We ask that Massport be directed to comply with the mission and plans of the National Park Service and honor the integrity of Freedom's Way National Heritage Area. Expanded intersections and additional traffic lights are antithetical to the congressional vision of the centerpiece of Minute Man National Historical Park.

VII. Noise

The primary noise impact metric for this ESPR should be the Time Above (TA) metric, which is the best metric for establishing duration of noise-impacted time, and has consistently been the measure of interest of the public and to the historic sites. The more common DNL metric should be reported for trending, but has been repeatedly shown to be primarily a measure of a small number of loud events and, because it is insensitive to the impacts of frequent smaller aircraft, it is unsuitable for describing the impacts of the diversity of aircraft at Hanscom Field. The TA standard metric was first reported by Massport in the 2000 ESPR. For comparison, trending, and scenario analysis, the following TA contours should be generated, in addition to the tabular TA data for sensitive receptor sites:

Contours for TA55dba: 15, 30, 60 and 90 minutes

Contours for TA65dba: 15, 30, 60, and 90 minutes

The Impact of Aviation Noise on Human Health:

Given the low ambient baseline sound levels that exist in the neighborhoods and within the protected public open space under the Hanscom flight paths, the negative impacts of aviation noise are often more substantial than in a city where ambient levels are higher and jet noise is less perceptible. **Multiple studies have confirmed that airplane noise is not simply a "disturbance" -- it is injurious to human health** *(Study: Airport Noise Increases Risk of Strokes – Tristen Moore/Berlin 2009).* It is now linked to cardiovascular disease, hypertension, depression, and stroke. In a study conducted by Germany's Federal Environmental Agency, men exposed to jet noise had a 69% higher risk of being hospitalized for cardiovascular disease and woman had a 93% higher risk than those not exposed. In addition, the study found women who are exposed to about 60 decibels of jet noise during the day are 172% more likely to suffer a stroke. Eberhard Greiser, professor of epidemiology at Bremen University, explains why aviation noise is hazardous to human health, " **Jet noise is more dangerous than any other kind of road-traffic noise because it is especially acute and sharp and induces stress hormones.**" His study concluded that females subjected to aviation noise had a significantly higher incidence of depressive disorders in addition to hypertension.

Once again, it becomes clear that an FAA metric defining the impacts of aviation noise as a one-

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metric-fits-all-and–every-landscape is profoundly flawed and needs proper assessment by our environmental protection agency. **MEPA should recommend that Massport conduct a health assessment study of those residents living under the flight paths in the four towns.**

VIII. Air Quality

The 2012 ESPR air quality assessment must include Lead. The EPA issued a 2008 report "Lead Emissions from the use of Leaded Aviation Gasoline in the United States" **listing Hanscom in the top 1% of lead emitters of over 3000 airports.** The atmospheric lead limits have recently been reduced by the EPA. In the U.S., piston planes still burn leaded fuel. A CA airport, with emissions near Hansom levels, was tested and found by the EPA to be outside of the Federal lead limits. Given that Hanscom generates over 100,000 piston plane operations per year, there is a legitimate concern that Hanscom may exceed federal lead limits. Proper abatement could involve switching planes over to unleaded fuel, reducing the number of piston plane operations, and/or ceasing to allow the piston planes to circle the towns. In addition, emission particulates and C02 equivalent should be measured and reported.

IX. Wetlands/Wildlife/Water Resources

Lead measurements should be conducted by an independent source. Samples should be taken from still bodies of water in areas under the flight paths and in close proximity to the airport. Special attention should be given to investigating possible pollution and contamination of water resources within Great Meadows National Wildlife Refuge where the turtle populations have been steadily declining. Lead tests should be done during the spring and fall seasons when recreational flying is at peak levels.

X. Cultural and Historic Resources

L.G. Hanscom Field is ***the only airport in the country*** that abuts a living history National Historical Park of the 18th century, a National Wildlife Refuge and the internationally recognized Birthplace of the American Conservation Movement. For these reasons, a one-size-fits-all approach to measuring and evaluating environmental impacts is both insufficient and inappropriate within a landscape that has been painstakingly protected and still offers preserved open space with low ambient natural sound (L_{90} of 35 - 40 dbA).

In 2001 (after Massport -- in contravention of the 1978 Master Plan -- changed the certification of the airport to allow for operations of 60 seat ticketed commercial aircraft) **President Clinton and FAA Administrator Jane Garvey established a Federal Interagency MOU between the National Park Service, the FAA, DOI, DOT, Federal Highway, and The Advisory Council on Historic Preservation to work towards long-term preservation goals for the historic area.** In

2002 – the document, ***Hanscom at the Crossroads*** **was submitted to Massport and the Governor - calling for an immediate moratorium on additional aviation, infrastructure improvements and new development** until a regional multi-modal transportation plan is established and enacted -- recognizing the need to preserve the historic environs of the National Park, the natural resources, and the four host towns. Signatories included: Congressmen Ed Markey, John Tierney, and Marty Meehan, Massachusetts State Senators and Representatives, and nine surrounding towns.

XI. Sustainability

In public meetings Massport commonly uses the term "sustainability" to mean financial sustainability rather than the more common use of environmental sustainability. Charging appropriate fees for landing, parking, and leases will provide L.G. Hanscom Field Civilian Airport with the financial resources to reach and retain financial sustainability without the need to expand beyond the current footprint or increase impacts beyond 2010 levels. Massport should not be allowed to use its financial "sustainability" goals as a justification for facility or operations growth.

In closing, we remain optimistic that the host towns of Concord, Lexington, Lincoln, and Bedford, the National Park Service, U.S. Fish and Wildlife and the site stewards will be successful in partnering with Massport in developing a responsible and economically sustainable plan for the future of L.G. Hanscom Field Airport. The only plan that will achieve the much-needed balance between this facility and its irreplaceable historic and natural resources will be a creative and innovative plan designed outside the box of monopolies, power, and profit. It must begin by the commencement of an honest study of legitimate environmental sustainability. The HATS Environmental Subcommittee has requested that the year 2010 be considered the baseline of impacts not to be exceeded. If we can all agree on this very reasonable starting point, then let's roll up our sleeves and get to work.

Sincerely,

Anna West Winter

Anna West Winter
Executive Director, Save Our Heritage Inc.

57 Main Street Concord MA 01742 phone: 978-369-6662 fax: 978-371-7550
e-mail: kati@saveourheritage.com web: www.saveourheritage.com

Massport Expansion of Infrastructure at Hanscom Field

(4.2.12)

Project	Square Feet	Timeline	Comments	Purpose
New FBO* at Hangar 24 site	96,000	Next 2 years	• 60,000 sq ft new hangar, plus 36,000 sq ft of office space • Hangar 24: 18,500 sq ft • Rectrix to invest $15 million here & $5 million at Worcester • This will be the 3rd FBO at Hanscom Field.	To attract, service and house new & larger aircraft (Gulfstream 650s), as well as other aircraft
New Jet Aviation hangar	44.000	This year	This will replace an existing 22,000 sq.ft hangar to accommodate & attract larger Gulfstream transatlantic jets.Jet Aviation is 1 of 2 existing FBOs at Hanscom.	To attract, service and house new & larger aircraft (Gulfstream 650s)
Navy surplus property	32,000	Near future	Massport submitted a bid for this airside property on 1/17/12. This, together with the FBO at the Hangar 24 site, would create two NEW active airside spaces at Hanscom	n/a
East Ramp, 6 – 10 new hangars	400,000	Pending	This is equivalent to 8 football fields.	To attract and house new aircraft, and house existing ones.
Mass. Air & Space Museum (MASM)	150,000	2015	The museum would be an additional source of increased air and ground traffic. The MASM brochure states, *"**The museum must be at an airport with aircraft ramp access**, in an easily accessible location at or near the population center of the state with good visitor traffic and accessibility. There must be adequate acreage to support an initial museum structure and provide expansion space for future growth."*	*"The mission of the Mass. Air & Space Museum is to preserve, display, educate, and motivate future MA generations to continue this important tradition [aeronautical research and development]."* *--MASM brochure*
TOTAL	**722,000 sq ft**		**TOTAL NEW INFRASTUCTURE** **Total existing infrastructure: 230,000 sq ft**	Cumulative impact on traffic? On noise? On pollution? On Minute Man Park, Great Meadows, and the 1000s of other historic & natural resources in our towns?

*Fixed Base Operator, service facility for private luxury jets and other aircraft

 EEA 5484 8696

HATS Environmental Subcommittee

c/o Town Office Building, Massachusetts Avenue, Lexington, MA 02420

April 4, 2012

Secretary Richard K. Sullivan Jr.
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Ms. Maeve Vallely-Bartlett
Executive Office of Energy and Environmental Affairs (EEA)
100 Cambridge St., Suite 900 (9th Floor)
Attn: MEPA Office
Boston MA, 02114

Dear Secretary Sullivan and Ms. Vallely-Bartlett,

As the Chairman of the Hanscom Area Towns Committee's Environmental Subcommittee (HATS ES), I am submitting these remarks on Massport's February 2012 Proposed Scope for the 2012 Environmental Planning and Status Report. The Hanscom Area Towns Committee (HATS) is the Growth and Development Policy Committee established under M.G.L. 40 § 4I with Bedford, Concord, Lexington, and Lincoln as member municipalities.

Massport indicates that its proposed scope responds to the Secretary's March 29, 2007 Certificate on the 2005 ESPR. However, significant events have occurred that should require Massport to modify its scope.

Massport has now acquired Worcester Airport making Hanscom Field now part of a three-airport system. Massport has begun a 2011 update process to its Logan ESPR, but it has not yet planned for an ESPR for Worcester Airport. Because of inter-related activities between Worcester and Bedford airports (e.g. the recent January announcement by Massport – "Massport Approves General Aviation Development at Worcester Regional Airport and L.G. Hanscom Field") it seems that there needs to be better planning as to how the activities at Worcester and Hanscom inter-relate. I believe the Secretary should require Massport to ensure that this scope will accomplish that by doing a concurrent ESPR or by other means. Because of the potential magnitude of this event, the scope should not be approved until there is better clarity on how the ESPR can address this issue.

The four communities did not participate in the review of the 2005 ESPR because the HATS communities regarded the ESPR process as an ineffective means of avoiding environmental

damage to the sensitive area surrounding Hanscom Civilian Airport. Among the concerns are that there is no articulated basis for the ESPR process within the MEPA Regulations, and that there are no longer any meaningful review thresholds that are applicable to addressing the environmental impacts caused by expansion at Hanscom Civilian Airport. The communities are hopeful that this ESPR process can be a productive process. We do seek your advice on how we can work with your Office to develop meaningful provisions that will effectively limit harmful environmental degradation as a result of Massport's articulated civilian airport expansion.

In any event, the following are my initial comments on what Massport has submitted. I have sent a number of questions to Massport on Monday, and obviously, they are still formulating responses. I have attached the list of questions. The HATS ES will have additional comments when Massport responds to these questions. We expect to meet with Massport sometime next week.

Master Plan and Noise Rules On page **2** of **5** "In 1978, the Authority prepared a Master Plan for the airport. The preparation of the Master Plan included a lengthy and comprehensive public process. In 1980, after additional public process, Massport adopted the Hanscom Field Noise Rules, which were an outgrowth of the Master Plan. The Master Plan and the 1980 Noise Rules remain the framework for airport planning and operations today"

Note, there is nowhere that it says the noise rules supersede the Master Plan, Massport states they will study scenarios compatible with both. But, the Master Plan limits commuters to 30 seats and the noise rules limit to 60 seats. Massport is taking the position that the limit number is 60, but the Master Plan says 30. Note the master plan also prohibits certificated passenger service, which is of course what Shuttle America operated. The noise rules do not supersede the master plan; they are just other parallel rules. Compliance requires the lower number be used. You should rule that the chosen scenario not include flights with more than 30 seats.

History and Purpose of ESPR In addition to the comments above, I urge you to require Massport to document how this Report series has historically been an effective planning tool. It will be helpful if Massport is required to show how they will actively plan for a constrained future buildout, rather than expanding whenever any entity asks for expansion of facilities or operations. Market demand for air travel could allow for unlimited growth and should not be permitted to be the ultimate determining factor in the ESPR analysis.

Public Review and Participation Community volunteers who have participated in the past have become discouraged by the perfunctory character of the previous ESPRs and their failure to protect in a meaningful way our surrounding historical sites and the US Minute Man Historical National Park (MMNHP) from environmental damage to the Environment. I hope that your office will ensure that this 2012 process will be meaningful.

Format of the 2012 ESPR We believe the format and process of the 2000 and 2005 ESPR was flawed. I have attached the HATS ES prior analysis of those flaws.

The 2005 ESPR was based upon 2005 data and forecast 2010 potential scenarios. The base year for this ESPR should be based upon 2010 actual conditions so that we can have a clear evaluation of 2010 forecasts vs. actual operations and environmental conditions. There is no rational basis to use 2012 as the base year as proposed. 2010 could be the baseline for all future planning and project analysis of environmental impacts so that the cumulative effects of incremental impacts don't get lost, provided that there is a retrospective look back to the real base line of 1985, the year of the first GEIR. Planning constraints for operations need to be put in place to ensure that environmental impacts are based on 2010 impact levels or lower.

You should require Massport to develop a metric that equates types of operation with types of environmental impacts. Massport uses numbers of operations as if it represented a fixed impact irrespective of whether it is a single engine plane operation or a commercial cargo plane operation.

The single scenario that is chosen for analysis should be required to be realistic and based upon factors such as how well the 2005 scenarios for 2010 were actualized, as well as taking into account additional factors such as: planned activities of Hanscom in the context of now being in a three airport system and the recommendations that come out of the Inter-agency Workgroup on protection of the Minute Man National Historical Park and Environs. A quantified limit to the scenario chosen should be defined up front and included in the Scope document and should be required to only include any scenario that falls within the parameters of the Master Plan.

Based on Massport's recent assertions, the fleet mix in the scenario should not include any commercial cargo operations and no expansion of the incidental cargo as currently operationalized today. The fleet mix should not include commercial passenger service in planes having more than 30 seats. Leaded fuel based operations should be limited as described in the Air Quality section.

Airport Planning & Regional Transportation Context My comments at the top of this letter are crucial to setting a New England regional transportation context. A multi-modal regional transportation policy coherence should be required to set the basis for future development planning at Hanscom.

Ground Transportation No specific comments at this time.

Noise Time Above (TA) metrics should be integrated into the ESPR at a level as recommended by the Hanscom Workgroup and as stated previously by your predecessor. The TA contours are much more important than the DNL contours for assessment of noise impacts. The analysis needs to include a sufficient number of TA noise contours at agreed upon spaced noise level

amounts above ambient in order to demonstrate more clearly the amounts of annoyance and disturbance to residents than the usual assortment of DNL type measurements

Air Quality & Wetlands/Wildlife/Water Resources ESPR should be required to conform to all the MassDOT GreenDOT directives. GreenDOT sets a goal of reducing greenhouse gas emissions over 2 million tons by 2020, a reduction of about 7.3 percent below 1990 transportation sector emission levels. Massport should set goals and projections in this ESPR, and report on what base level it will use going forward along with quantitative measures of current direct and indirect sources of GHGs at Hanscom. The ESPR should take into account particulate matter including fine and ultra-fine matter in conformance with the Transportation Reform Act of 2009 and report on how it will fund/study health effects in a parallel way as the Logan Health Study.

ESPR needs to report on its commitment to monitoring/measuring lead emissions from aircraft and measure lead levels in nearby ground, water, and air, and include any lead based emissions from other sources that could add to the already high level of airplane lead emissions at Hanscom. The ESPR air quality assessment must include lead measurements and modeling of lead migration into nearby ground, water, and air resources. The EPA issued a 2008 report "Lead Emissions from the use of Leaded Aviation Gasoline in the United States" saying Hanscom is in the top 1% of lead emitters of over 3000 airports. In addition, the EPA has recently reduced the atmospheric lead limits. Piston planes still burn leaded fuel. Another airport with emissions estimated to be near Hansom levels (located in California) was tested and found by the EPA to be outside of the Federal lead limits. There is a legitimate concern that Hanscom may exceed federal lead limits. According to the EPA report, Hanscom's lead emissions are 533 kg/year, or 1175 lbs./year, because of the large percentage of piston engine aircraft at Hanscom (71%) which still use leaded aviation fuel. Jets and commercial aircraft no longer use leaded fuel. Much of Europe has phased out leaded aviation fuel altogether, but lobbyists in the US have successfully fought its continued use. The ESPR needs to address how measured levels may affect fleet mix and operations of leaded fuel based planes. As part of the ESPR process, Massport should fund an independent study on the air, ground and standing water around Hanscom Field.

Cultural and Historical Resources No additional comments at this time.

Sustainable Development and Environmental Management System No additional comments at this time.

MEPA Documentation The communities hope that your office will include additional instructions that allow the 2012 ESPR to be a worthwhile process and for it to become a meaningful planning document.

Please let me or the HATS Chair, Ms. Deborah Mauger, know if you have questions or wish further discussion.

Sincerely,
Richard Canale (signed)
Richard Canale,
HATS ES Chair

Copies:
William Gage, MEPA Analyst
HATS Selectmen.
HATS ES members
Jeanne Krieger, HFAC Chair
Nancy Nelson, Superintendent, Minute Man National Historical Park
Tom Ennis, Massport
Dorothy Steele, Massport

HATS Environmental Subcommittee
c/o Town Office Building, Massachusetts Avenue, Lexington, MA 02420

February 15, 2005

To: The HATS Committee

RE: L. G. Hanscom Field Airport Environmental Status and Planning Report (ESPR)

In the past, the HATS Environmental Subcommittee (ES) has spent long hours in analyzing Massport documents, participating in meetings with Massport and other folks, and helping frame Community concerns through the ESPR/GEIR process.

At this time Massport wishes to begin to plan for a new 2000 ESPR and requests to meet with the HATS ES. We are aware that, for some time, the HATS Committee has questioned the efficiency and effectiveness of the ESPR process as it has unfolded.

Accordingly, we have canvassed the members of the ES Committee and conclude that HATS ES members are reluctant to participate in a 2005 ESPR process on behalf of the communities for the following reasons:

- During the 2000 ESPR process, we found that Massport was not sufficiently responsive to community questions or comments. We believe that the we and our consultants carefully reviewed Massport documents and asked pertinent questions in writing and verbally on presented issues, but did not receive complete answers. Nonetheless, our comments were based on solid analysis, and were well documented. Many of our comments still have not yet been addressed.

- MASSPORT unilaterally presented Hanscom growth scenarios without collaborating on how they aligned/misaligned with local and regional plans.

- Massport did not fully implement a number of the recommendations in the Certificate issued by the Secretary of the Executive Office of Environmental Affairs (EOEA) after the 2000 ESPR. HATS wrote to Massport about several MEPA Certificate recommendations that didn't seem to be addressed yet by Massport. Massport responded by letter to HATS but did not fully address the HATS concerns.

- The current MEPA regulations (301 CMR 11.00), as revised in 1998, were streamlined and the few review thresholds that might be triggered by Hanscom development were largely eliminated. The Secretary of the EOEA and the MEPA Office have little oversight of environmental degradation that occurs as a result of

Hanscom development. In any event, the workload of MEPA staff is not sufficient to allow more than a cursory review of an ESPR document.

- Community volunteers who have participated in the past have become discouraged by the perfunctory character of the previous ESPRs and their failure to protect in a meaningful way our surrounding historical sites and the US Minute Man Historical National Park (MMNHP) from environmental damage to the Environment.

The HATS ES requests that HATS seek more effective and efficient review processes. The HATS ES stands ready to work with you on this.

TOWN OF LINCOLN

LINCOLN TOWN HALL
16 LINCOLN ROAD / PO BOX 6353
LINCOLN, MA 01773
781/259-2600
FAX 781/259-1677

April 19, 2005

Secretary Ellen Roy Hertzfelder
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, MA 02114

RE: ESPR, EOEA #5484/8696, for L.G. Hanscom Field

Dear Secretary Hertzfelder:

The Hanscom Area Towns (HATS) are keenly interested in preserving the historic environment and resources of our communities and acting as responsible stewards of these resources for future generations. However, the Hanscom Field Airport Environmental Status and Planning Report (ESPR) has not proved to be a viable tool for assisting in that stewardship. It has not proven to be useful in managing the impacts of air traffic at the airport. Although the ESPR review process and report has had some use as a draft plan for Massport expansion of the field and has provided Massport's consultant's view of environmental impact, it has not resulted in any meaningful and tangible controls. (1)

The regulatory body, the Executive Office of Environmental Affairs, which oversees the ESPR process, apparently has neither the resources nor the mandate to effectively control the environmental degradation that occurs as a result of ever increasing civilian air traffic at Hanscom Field. (2)

Our experience has indicated that EOEA is apparently reluctant to referee the process and its result. During the 2000 ESPR process it was not responsive to the concerns that the ESC, (the Environmental Subcommittee of HATS), the volunteer citizen group that hired consultants and experts of national reputation, raised. (3) The ESC also found that Massport was not sufficiently responsive to community issues and comments. (4) Questions and concerns, supported by well-grounded analysis, still remain unanswered. The growth scenarios presented by Massport were deemed inconsistent with local and regional plans, as was their commitment to stewardship of national resources. (5)

(6) Recommendations outlined in the Certificate issued by the Secretary of the Executive Office of Environmental Affairs (EOEA) after the 2000 ESPR have not been fully addressed by Massport. Massport has characterized the draft scope of the 2005 ESPR as simply a replication of the same work of the 2000 ESPR. Current MEPA regulations (301 CMR 11.00) are judged to lack the teeth to adequately protect the environment. (7) Meaningful threshold limits, measuring the impacts of proposed development, have been largely eliminated. Changes in the law are called for to restore adequate protection and appropriate enforcement tools.

Massport). Massport expects the lease date by next month, November 2005, (as stated at the Hanscom Field Advisory Commission meeting on October 19, 2005 by Massport representatives). Thus, the 2005 ESPR final draft will be completed after the construction of the Crosspoint facility is finished. This means that there will be no meaningful environmental review of a site that is a delineated Zone II by Massachusetts DEP. The impervious surface proposed will increase dramatically by this development (appears to be nearly 100% coverage on schematic drawings) and a fuel farm will be established on this site in a magnitude large enough to drive down the cost of fuel at Hanscom Civilian Airfield. (3)

We believe that the current structure of Massport's ESPR process is inadequate for the reasons stated.

The HATS communities, while committed to participating in a viable planning exercise, depend upon your office and the Governor's office to propose a process that addresses the inadequacies of the current framework.

Sara Mattes /dp

Sara Mattes,
HATS Chair

TOWN OF LINCOLN

LINCOLN TOWN HALL
PO BOX 6355
LINCOLN, MA 01773
781-259-2600
FAX 781-259-1677

27 October 2005

Secretary Stephen R. Pritchard
Executive Office of Environmental Affairs
Attention: MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: L.G. Hanscom Field – 2005 ESPR Revised Scope Request
EOEA No. 5484/8696
MEPA Analyst: Bill Gage, tel. 617-626-1025
Proponent: Massachusetts Port Authority (Massport)
Filed 9/26/2005

Dear Secretary Pritchard:

The HATS Committee wrote to you earlier this year to let you know that we did not plan to participate in the 2005 ESPR. We have determined, after reviewing our past experience with the 2000 ESPR, the cost to the communities in time and effort far outweigh any marginal value gained either through the discussion or the final document.

The request for modifications to the scope proposed by Director Kinton not only adds nothing of value to the ESPR; it actually gives additional support to our original decision to not participate in the 2005 ESPR.

The scope includes no articulated "State transportation network" that would include air travel. There is no articulated "regional aviation network." Developing a multi-stakeholder (including public involvement) multi-state, multi-modal, long-range transportation plan needs to be a priority item for the State and Massport. Without some meaningful parameters and limits on activities at Hanscom Airport, Massport cannot achieve its goal of returning Hanscom from its present classification as a "Nonhub Primary Commercial Service Airport to a "General Aviation Reliever Airport."

We suggest to you that the structure of the ESPR is flawed without a clear setting of these limits. HATS concerns are compounded by EOEA- MEPA's apparent failure to hold Massport accountable for noncompliance with prior recommendations by EOEA. Massport has systematically been allowed to ignore scope requirements, even those documented by MEPA. Now, Massport seems to be able to allow up to 660,000 scheduled aviation passengers, scheduled cargo operation accessed by a vaguely referenced road, and a sevenfold increase in jet operations without attendant mitigation or regard to environmental impact.

Additionally, the proposed revised scope does not provide any mechanism for a recent proposal- the Crosspoint proposal-to be subjected to any review. The development proposed by Crosspoint was never anticipated and studied in the ESPR 2000 process. Crosspoint promises the construction on this development within 18 months of the signed lease date (stated in proposal documents by Crosspoint in the possession of (1) (2)

The four communities would be better served by devoting their efforts to describing environmentally responsible limits for air traffic at Hanscom civilian airport The expertise of the HATS Environmental subcommittee and the resources of the four HATS communities would be better spent promoting improved regulation rather than perpetuating what the HATS communities have experienced as a meaningless exercise

As a result, both HATS and the ESC will choose to remain essentially aloof from the 2005 ESPR process However, HATS would welcome the opportunity to work with Massport to fully implement the directives set forth by MEPA in response to the 2000 ESPR, and to develop a better mechanism to use public resources to find a balance between the needs of the Hanscom Civilian Airport and the historic environment in which it resides (8)

Sincerely,

Sara Mattes, Chair
Hanscom Area Towns (HATS)

Cc
Senator Susan Fargo
Senator Robert Havern
Representative Cory Atkins
Representative Jay Kaufman
Representative Charles Murphy
Representative Susan Pope
Representative Tom Stanley
Tom Ennis, Massport
Barbara Patzner, Hanscom Civilian Airport

ShhAir
Box 441
Concord, MA 01742

Citizens working to Safeguard the Historic Hanscom Area's Irreplaceable Resources
www.ShhAir.org

April 3, 2012

Maeve Vallely-Bartlett, Director
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
100 Cambridge St., Suite 900 (9th floor)
Boston MA, 02114
Re: Hanscom Field Environmental Planning and Status Report

Dear Ms. Vallely-Bartlett:

ShhAir (Safeguarding the Historic Hanscom Area Irreplaceable Resources) is a grassroots citizens' organization that has been active in the four towns of Bedford, Concord, Lexington and Lincoln for 20 years, with the mission of protecting the historic resources of our area from undue negative impacts of Hanscom Field.

Over the years we have participated in a number of environmental reviews conducted at Hanscom, and will actively participate in the current scoping process being established for the upcoming ESPR.

Our experience has demonstrated the profound importance of this issue, and this process, to the citizens of the towns surrounding Hanscom. Over the years, through Town Meeting resolutions, statements and actions from Boards of Selectmen, public demonstrations and legal challenges, the citizens of our towns have challenged expansion at Hanscom Field. These actions have reflected the great importance that citizens place, not only on the environmental integrity of our communities, but also on our role as the stewards of our historic area's unique role in American history. Both of these core values are severely threatened by the further expansion of activities at Hanscom.

We ask that Massport work together in good faith with the HATS (Hanscom Area Towns) Environmental Subcommittee to develop the kind of scope that will define a planning process that will result in real protection for the important natural and historical environment of the Hanscom area.

Margaret Coppe

Margaret Coppe
President, ShhAir Board
12 Barrymeade Drive
Lexington MA 02421
781-862-2637

May 7, 2012

Richard K. Sullivan, Jr., Secretary
Executive Office of Energy and Environmental Affairs
MEPA Office
100 Cambridge Street
Suite 900
Boston MA, 02114
Attn: Bill Gage

RE: Project EEA #5484 / EEA #8696
Proposed Scope for 2012 Hanscom Field Environmental Planning and Status Report (ESPR)

Dear Mr. Sullivan:

As the representative of nineteen families living in the Concord Homes development, which stands some 250 feet from Hanscom Field, I write to comment on Massport's February 2012 Proposed Scope for the 2012 Environmental Planning and Status Report. Few citizens of the Commonwealth have greater first-hand experience of the activities of aircraft at Hanscom Field and even fewer will be impacted as we will be by currently proposed or future growth at Hanscom Field. On any given morning, we already find our conversations at the family table interrupted by aircraft noise, and on any given afternoon, we can find ourselves driven inside by fumes created by aircraft. In light of proposed expansion, our particular concern for the health and safety of the families who live near Hanscom Field is heightened, and we seek your help in assuring a full, thorough, and open assessment of the environmental impact of activities at Hanscom Field both on the ground and in the air.

Our chief concern is the emission of fumes, especially those by aircraft using lead-based fuel. The impact of lead on children in particular is well established.[1] In spite of the long-term ban on leaded gasoline for vehicles traveling our roadways, we are unaware of any study conducted by Massport, the FAA, or any other government agency to measure the levels of lead being emitted through ground activity or activity in the air by aircraft on neighborhoods near Hanscom Field. The need for such a study is certainly warranted by the 2008 report of the EPA, which listed Hanscom Field in the top 1% of airport lead emitters nationwide at 33 of 3,414 airports facilities. Anecdotally, our air quality worsens greatly whenever planes stand idling beside their hangars, whenever de-icing is required, and whenever nearby runways are in use. We urge your vigilance in requiring Massport to reduce these emissions.

Our secondary concern lies with the impact of noise on families living adjacent to Hanscom Field. We continue to be troubled by the Finding of No Significant Impact by the FAA with regard to plans to double the hangar capacity at Hanscom in order to garage and service large private jets. We understand that this conclusion was drawn based on an impractical standard, defining 65 db DNL as "incompatible with residential land use." At no point has Massport or the FAA measured noise

[1] http://www.epa.gov/oms/aviation.htm

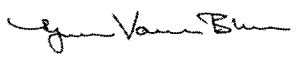
levels on our properties even though noise levels from airports have been shown to have a negative impact on the ability of children to learn and on the likelihood of adults to experience stroke.[2]

We would like to join the four Hanscom-area towns in requesting the following for the 2012 ESPR:

> that current and future scenarios for Hanscom Field not exceed the 2010 baseline and that impacts be mitigated from 2010 levels down,
>
> that a permanent boundary footprint be established to limit incremental expansion at Hanscom Field,
>
> that Massport honor a 30-seat limit for passenger aircraft noted in Massport's own Master Plan rather than a 60-seat limit noted in the noise regulations, and
>
> that no commercial or cargo service be permitted in current or future scenarios.

We would like to add our own request for your office to require Massport to complete a comprehensive study of the noise levels and air quality caused by fuel emissions on the ground and in the air in the neighborhoods adjacent to Hanscom Field.

Respectfully submitted,



Lynn Vanacore Bloom
Neighborhood Liaison for Concord Homes
25 Fuller Lane
Concord, MA 01742

---

2 Gary Evans and Lorraine Maxwell. http://www.chchearing.org/noise-center-home/children-and-noise/noise-childrens-health-learning-and-behavior

Tristan Moore. Study: Airport Noise Increases Risk of Strokes. http://www.time.com/time/specials/packages/article/0,28804,1929071_1929070_1947782,00.html

Belinda Gower

63 Cedar Way• Concord, MA 01742
Phone: (978) 254-5915 • E-Mail: bgower@mac.com

April 4, 2012

Maeve Vallely-Bartlett, Director
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
100 Cambridge St., Suite 900 (9th floor)
Boston MA, 02114
Re: Hanscom Field Environmental Planning and Status Report

Dear Ms. Vallely-Bartlett,

As a community member, I wish to express my frustration with the continued increase in air traffic and pollution generated by Hanscom Airport. I live, with my husband and 3 young children, on four acres of meadowlands in Concord. Our property includes protected wetlands and abuts the Minuteman National Historic Park. It is a surreally peaceful setting that is compromised by the thundering sound of jets landing too low and too frequently in our neighborhood. Over the past year, neighbors and I have noticed a significant amplification of noise and jet traffic.

After living abroad with my husband and children for nearly 8 years, we were eager to move back home. We both grew up in Massachusetts and couldn't think of a better place to raise our children than Concord – steeped in history, natural beauty and a strong sense of community rooted in the past—yet devoted to a sustainable and healthy future. We understood that Hanscom was a few miles from our house but because of its historic setting—abutting the Old North Bridge and the Estabrook Woods—we felt this area was protected, sacred almost. We were very wrong in that assumption. We wake and go to bed to the sounds of jet engines. My young children are startled awake in the middle of the night.

Neighbors have moved away as a result of having suffered stress reactions to the onslaught of the pounding jets. They have acquired the many well-documented illnesses that are now inarguably linked with living under a flight path which include cardiovascular disease, hypertension, and stroke. I am aware that Massport is intending to expand its infrastructure for large jets by 572,000 sq ft. and that, according to Massport's own admission, the new large luxury jets will be using the long runway—which already impacts Great Meadows, The Estabrook Woods, numerous schools, the National Park, and historic Concord and Lexington with 80% of the total operations that fly in and out of Hanscom. These resources and communities can't tolerate any increase in impacts.

We look to MEPA to take this environmental scoping process very seriously and request stringent measurements of lead, particulates, Co2 equivalent, and noise contours. We ask that all unhealthy impacts be mitigated thoroughly and appropriately. This historic community that has fought for and

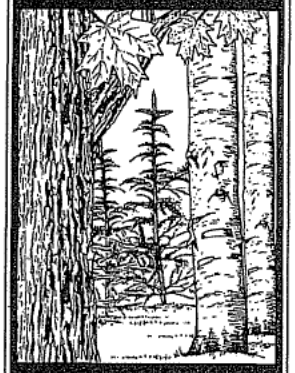
protected—for centuries – the natural public open space that is essential to the health and well-being of all citizens. We owe it to the children and to the next generations to protect this historic landscape from any additional pollution and degradation.

Sincerely,

Belinda Gower

Belinda Gower

· THE ·
WALDEN
WOODS
· PROJECT ·



· THE ·
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Don Henley
Founder and President

Kathi Anderson
Executive Director

BG

May 8, 2012

Richard K. Sullivan, Jr., Secretary
Executive Office of Energy and Environmental Affairs (EEA)
MEPA Office
100 Cambridge St., Suite 900 (9th floor)
Boston MA, 02114
Attn: Bill Gage

RE: Project EEA #5484 / EEA #8696
Proposed Scope for Hanscom Field Environmental Planning and Status Report (ESPR)

Dear Mr. Sullivan,

As a steward of nationally and internationally significant historic sites and tourist destinations in Concord, located within a two mile radius of Hanscom Field, the Walden Woods Project wishes to submit the following comments regarding Massport's February 2012 Proposed Scope for the 2012 Environmental Planning and Status Report (ESPR).

To date, the greatest threat posed to the Concord historic corridor by Hanscom Field is the noise generated by aircraft activity. Due to the proximity of Walden Pond and Walden Woods to the airport, the thousands of visitors who seek out these sites annually already experience negative impacts from Hanscom's current levels and types of operations. These impacts include interruptions to our outdoor education programs due to the inability of students and teachers to adequately hear presenters. Aircraft noise from Hanscom causes a degradation of the 18th and 19th century experience that people travel from all over the country, and the world, to experience.

We understand that Massport's Proposed Scope for its ESPR, as approved by MEPA, will create a framework for potential future plans for Hanscom Field through 2030. We are concerned that the Proposed Scope is unacceptably open-ended and would give Massport the leeway to move ahead with nearly any plan based on "the demands of the market". The only limitation placed on Hanscom Field appears to be that it cannot exceed 320,000 operations per year – its maximum capacity according to the Master Plan. Given that the historic Walden Pond/Woods area is already adversely impacted by the current 163,000

operations, a doubling of operations would be unacceptably injurious to the visitor's experience. From 1999- 2001, when commercial passenger service was operating out of Hanscom Field (bringing total operations up to 220,000/year), the impacts to Walden Woods were significantly worse. This involved an increase of 60,000 operations. Bringing Hanscom Field to maximum capacity would mean an increase of 160,000 additional operations.

To allow Massport to rely on "maximum capacity" and "demands of the market" as the key factors for guiding its plans for Hanscom Field will undermine the invaluable educational and recreational experiences these historic sites offer the public.

Therefore, the Walden Woods Project supports the recommendations of the Hanscom-area towns, via the HATS Environmental Subcommittee's comments submitted to MEPA, which we believe will provide more definition to the 2012 ESPR Scope, and a more acceptable future for the historic sites that we are responsible for preserving.

Specifically, we concur with these recommendations from the HATS Environmental Subcommittee:

- Current and future scenarios for Hanscom Field should not exceed the 2010 baseline, and impacts should be mitigated from 2010 levels down.
- A permanent boundary footprint should be established to limit incremental expansion at Hanscom Field (such as Massport's recent bid to purchase new airside Naval property).
- Massport should use the 30-seat limit for passenger aircraft noted in the Master Plan, not the 60-seat limit noted in the Noise Regulations.
- No new commercial or cargo service should be studied in current or future scenarios.

We respectfully request that you direct Massport to implement the HATS Environmental Subcommittee's recommendations in the finalized Scope for the 2012 ESPR. Only by doing so, will it be possible to begin to work towards achieving a better balance between Massport's plans and the needs of the historic and the natural resources preservation community.

Thank you for your time and consideration.

Sincerely,

Kathi R. Anderson
Executive Director
Walden Woods Project

CONCORD
MUSEUM

200 LEXINGTON ROAD
POST OFFICE BOX 146
CONCORD, MA
01742-0146

TELEPHONE: 978-369-9763
FAX: 978-369-9660

www.concordmuseum.org

13G

May 9, 2012

Richard K. Sullivan, Jr., Secretary
Executive Office of Energy and Environmental Affairs (EEA)
MEPA Office
100 Cambridge St., Suite 900 (9th floor)
Boston MA, 02114
Attn: Bill Gage

RE: Project EEA #5484 / EEA #8696
Proposed Scope for Hanscom Field Environmental Planning and Status Report (ESPR)

Dear Mr. Sullivan,

As stewards of nationally and internationally significant historic sites and tourist destinations in Concord, located within a two mile radius of Hanscom Field, the Concord Museum submits the following remarks on Massport's February 2012 Proposed Scope for the 2012 Environmental Planning and Status Report (ESPR).

To date, the greatest threat posed to the Concord historic corridor by Hanscom Field is the noise generated by aircraft activity. Due to proximity of these historic landmarks to the airport, the thousands of visitors who seek out the sites annually already experience negative impacts from Hanscom's current levels and types of operations. For some of us, these impacts include interruptions on our tours and the inability of our visitors to hear interpreters; for all of us, they cause a degradation of the 18th and 19th century experience that people travel from all over the country, and the world, to experience.

The Concord Museum understands that Massport's Proposed Scope for its ESPR, as approved by MEPA, will create a framework for potential future plans for Hanscom Field through 2030. The Museum is concerned that the Proposed Scope is unacceptably open-ended and would give Massport the leeway to move ahead with nearly any plan based on "the demands of the market." The only limitation placed on Hanscom Field appears to be that it cannot exceed 320,000 operations per year – its maximum capacity according to the Master Plan. Given that the historic area is already adversely impacted by the current 163,000 operations, a doubling of operations would be unacceptably injurious to the visitor's experience and to the sanctity of the sites. The Museum speaks from experience. From 1999- 2001, when certificated commercial passenger service was operating out of Hanscom Field

(bringing total operations up to 220,000/year), the impacts on the sites and visitor experience were significantly worse – this, with "only" an increase of 60,000 operations. Bringing Hanscom Field to maximum capacity would mean an increase of 160,000 additional operations.

To allow Massport to rely on "maximum capacity" and "demands of the market" as the key factors for guiding its plans for Hanscom Field will lead to the irreversible undermining of the invaluable experiences these historic sites offer the public.

Therefore, the Museum whole-heartedly supports the recommendations of the Hanscom-area towns, via the HATS Environmental Subcommittee's comments submitted to MEPA, which the Museum believes will provide more definition to the 2012 ESPR Scope, and a more acceptable future for the historic sites that we are responsible for preserving.

Specifically, the Museum concurs with these recommendations from the HATS Environmental Subcommittee:

- Current and future scenarios for Hanscom Field should not exceed the 2010 baseline and impacts should be mitigated from 2010 levels down.
- A permanent boundary footprint be established to limit incremental expansion at Hanscom Field (such as Massport's recent bid to purchase new airside Naval property).
- Massport should use the 30-seat limit for passenger aircraft noted in the Master Plan, not the 60-seat limit noted in the Noise Regulations.
- No new commercial or cargo service should be studied in current or future scenarios.

The Museum respectfully requests that you direct Massport to implement the HATS Environmental Subcommittee's recommendations in the finalized Scope for the 2012 ESPR. Only by doing so, will it be possible to begin to work towards achieving a better balance between Massport's plans and the needs of the historic and the natural resources preservation community.

Thank you for your time and consideration.

Sincerely,

Peggy Burke

Peggy Burke
Executive Director

Appendix B Airport Layout Plan

(Available by CD Upon Request)

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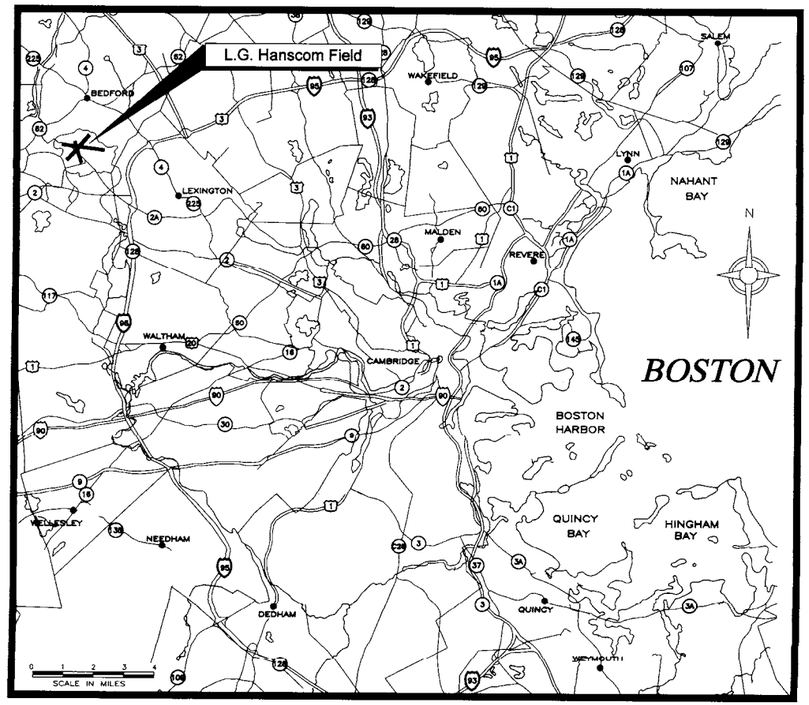


Location Map

L. G. Hanscom Field
Bedford, MA

Airport Layout Plan

Massachusetts Port Authority Approval

Approved _____ David Mackey, Interim CEO and Executive Director — Date 7/26/11

Approved _____ Edward Freni, Director of Aviation — Date 7-26-2011

Approved _____ Houssam Sleiman, P.E., Director of Capital Programs and Environmental Affairs — Date 7-26-2011

Revisions

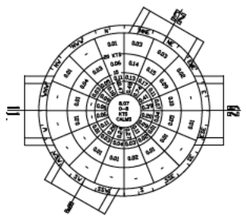
Date	By	Remarks

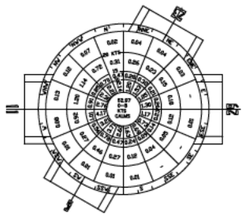
Prepared By

Massachusetts Port Authority
Capital Programs Department
One Harborside Drive
East Boston, MA 02128

Date July 26, 2011

Index of Sheets





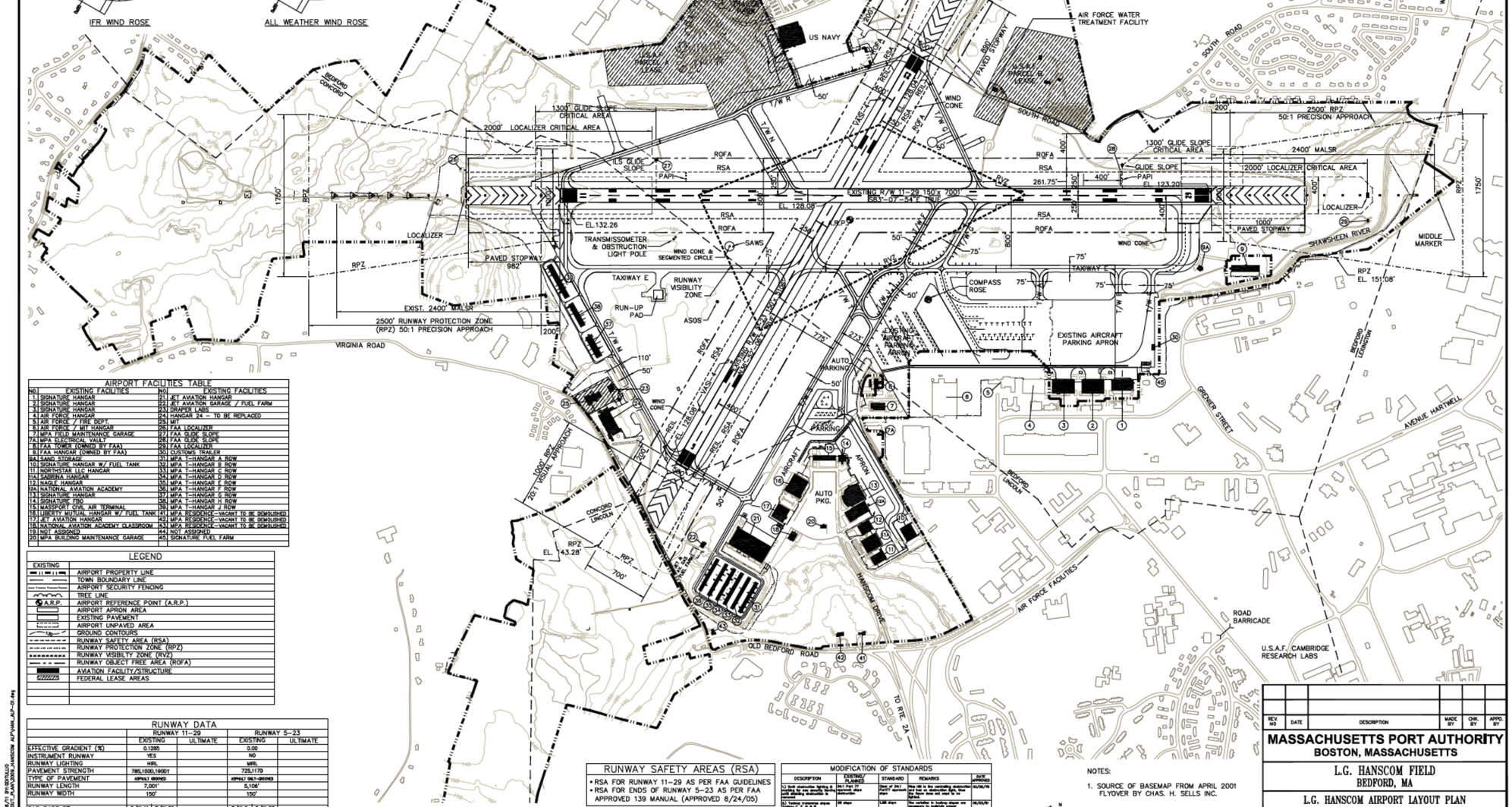
CROSSWIND COVERAGE (% OF TIME)

RUNWAY	ALL WEATHER (IFR. WEATHER) 15 KTS	10.5 KTS
11–29	97.84 (13.62)%	93.91 (13.05)%
5–23	96.47 (13.72)%	91.81 (13.39)%
COMBINED	98.95 (13.89)%	97.10 (13.76)%

VFR WEATHER = 86.04% IFR WEATHER = 13.96%

SOURCE: NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL CLIMATIC CENTER/ASHEVILLE, NORTH CAROLINA

PERIOD: 1961–1970 (87,589 TOTAL OBSERVATIONS)



AIRPORT FACILITIES TABLE

NO.	EXISTING FACILITIES	NO.	EXISTING FACILITIES
1.	SIGNATURE HANGAR	21.	JET AVIATION HANGAR
2.	SIGNATURE HANGAR	22.	JET AVIATION GARAGE / FUEL FARM
3.	SIGNATURE HANGAR	23.	DRAPER LABS
4.	AIR FORCE HANGAR	24.	HANGAR 24 – TO BE REPLACED
5.	AIR FORCE / FIRE DEPT.	25.	MIT
6.	AIR FORCE / MIT HANGAR	26.	FAA LOCALIZER
7.	MPA FIELD MAINTENANCE GARAGE	27.	FAA GLIDE SLOPE
7A.	MPA ELECTRICAL VAULT	28.	FAA GLIDE SLOPE
8.	FAA TOWER (OWNED BY FAA)	29.	FAA LOCALIZER
9.	FAA HANGAR (OWNED BY FAA)	30.	CUSTOMS TRAILER
9A.	SAND STORAGE	31.	MPA T-HANGAR A ROW
10.	SIGNATURE HANGAR W/ FUEL TANK	32.	MPA T-HANGAR B ROW
11.	NORTHSTAR LLC HANGAR	33.	MPA T-HANGAR C ROW
11A.	SABRINA HANGAR	34.	MPA T-HANGAR D ROW
12.	NAGLE HANGAR	35.	MPA T-HANGAR E ROW
13.	NATIONAL AVIATION ACADEMY	36.	MPA T-HANGAR F ROW
13A.	SIGNATURE HANGAR	37.	MPA T-HANGAR G ROW
14.	SIGNATURE FBO	38.	MPA T-HANGAR H ROW
15.	MASSPORT CIVIL AIR TERMINAL	39.	MPA T-HANGAR J ROW
16.	LIBERTY MUTUAL HANGAR W/ FUEL TANK	41.	MPA RESIDENCE–VACANT TO BE DEMOLISHED
17.	JET AVIATION HANGAR	42.	MPA RESIDENCE–VACANT TO BE DEMOLISHED
18.	NATIONAL AVIATION ACADEMY CLASSROOM	43.	MPA RESIDENCE–VACANT TO BE DEMOLISHED
19.	NOT ASSIGNED	44.	NOT ASSIGNED
20.	MPA BUILDING MAINTENANCE GARAGE	45.	SIGNATURE FUEL FARM

LEGEND

EXISTING	
	AIRPORT PROPERTY LINE
	TOWN BOUNDARY LINE
	AIRPORT SECURITY FENCING
	TREE LINE
A.R.P.	AIRPORT REFERENCE POINT (A.R.P.)
	AIRPORT APRON AREA
	EXISTING PAVEMENT
	AIRPORT UNPAVED AREA
	GROUND CONTOURS
	RUNWAY SAFETY AREA (RSA)
	RUNWAY PROTECTION ZONE (RPZ)
	RUNWAY VISIBILITY ZONE (RVZ)
	RUNWAY OBJECT FREE AREA (ROFA)
	AVIATION FACILITY/STRUCTURE
	FEDERAL LEASE AREAS

RUNWAY DATA

	RUNWAY 11–29 EXISTING	RUNWAY 11–29 ULTIMATE	RUNWAY 5–23 EXISTING	RUNWAY 5–23 ULTIMATE
EFFECTIVE GRADIENT (%)	0.1285		0.00	
INSTRUMENT RUNWAY	YES		NO	
RUNWAY LIGHTING	HIRL		MIRL	
PAVEMENT STRENGTH	785,1000,190DT		725,117D	
TYPE OF PAVEMENT	ASPHALT GROOVED		ASPHALT GRUT-GROOVED	
RUNWAY LENGTH	7,001'		5,100'	
RUNWAY WIDTH	150'		150'	
FAR PART 77	R/W 11	R/W 29	R/W 5	R/W 23
APPROACH SURFACES	50:1/40:1	50:1/40:1	20:1	34:1
RUNWAY END COORDINATES	42° 28' 13.13" N 71° 17' 22.00" W	42° 27' 28.87" N 71° 16' 54.00" W	42° 27' 54.00" N 71° 17' 11.00" W	42° 27' 54.00" N 71° 16' 37.00" W
VISUAL AIDS	MALSR	MALSR	VASI–4/MSL	VASI–4/MSL
NAVIGATION AIDS	ILS/RVR, NDB	ILS/NDB	VOR–23	VOR–23
RSA DIMENSIONS				
LENGTH BEYOND RW END	1,000	1,000	600' GL. EAST WEST, 890' EAST	890'
WIDTH	500'	500'	500'	500'
RUNWAY MARKING	PRECISION	PRECISION	VISUAL	NON PRECISION
OBJECT FREE AREA				
LENGTH BEYOND RW END	800'	800'	800'	800'
WIDTH	1,000'	1,000'	1,000'	1,000'
TDZ ELEVATION	132.6'	128.4'	N/A	128.6'

AIRPORT DATA

	EXISTING	ULTIMATE
AIRPORT ELEVATION (NAVD88)	132.28'	
AIRPORT REFERENCE POINT	LAT.42°-28'-13" LONG.71°-17'-22"	
MEAN MAX. TEMP. OF HOTTEST MONTH	82°F	
AIRPORT AND TERMINAL NAVIGATION AIDS	ILS,4LS,REIL,PAPI,VAS	
AIRPORT TYPE (AS PER FAA NPIAS)	CR	
AIRPORT REFERENCE CODE	C–IIE	
DESIGN AIRCRAFT	G–V	
WIND COVERAGE	98.95%	
TAXIWAY LIGHTING*	MITL	

*TAXIWAYS R & N NOT LIGHTED

RUNWAY SAFETY AREAS (RSA)

- RSA FOR RUNWAY 11–29 AS PER FAA GUIDELINES
- RSA FOR ENDS OF RUNWAY 5–23 AS PER FAA APPROVED 139 MANUAL (APPROVED 8/24/05)

MODIFICATION OF STANDARDS

DESCRIPTION	EXISTING/ PLANNED	STANDARD	REMARKS	DATE APPROVED
A1 Taxiway R to Runway 11-29 Holding Position Marking	Runway 11-29 Holding Position Marking	Part 77, 34:1 Approach Surface	This will be the existing condition and has no adverse effect. The Taxiway does not exist to 34:1 surface.	05/06/08
A2 Taxiway Centerline slopes Taxiway C, G, R & N	3% slope	1.5% slope	The variation in taxiway slopes are necessary to maintain runway gradings.	05/06/08
A3 Runway 5/23 Runway Safety Area Deficiency	Runway 5-23 RSA Dimensions: 600' x 500' (EAST) & 890' x 500' (WEST) Runway 11-29 RSA Dimensions: 600' x 500' (EAST) & 890' x 500' (WEST)	600' WIDE 1000' BEYOND RUNWAY END	FAA granted RSA Determination Letter 05-0003 agreeing Runway's RSA dimensions are adequate. The letter will not show in ALP.	05/06/08
A4 Two obstructions to Runway 05/23 Part 77 surface	Portions of the 5:1 Part 77 (51) surface extend beyond the end of the runway	Part 77 airport surface is clear of obstructions	FAA Aeronautical Study 2005-ANE-1048-OE has been issued to determine that these runway 5-23 obstructions are not a hazard to the NAVAID and will continue to be maintained. These obstructions will not show in ALP.	05/06/08
A5 Two obstructions to Runway 11/29 The tallest obscure display surfaces	Naturally, there are three obstructions to be removed. They are the treeline, BRL and the treetops of trees further to the	One tallest surface does not penetrate	The approved March 3, 2005 Airspace Study 2004-ANE-1048-OE has determined that these trees are not a hazard to air navigation. Clearing will not affect runway use. Clearing will be accomplished through the existing TREE process.	05/07/2008

Certification:
[Name of Engineer] certifies that all airport elements shown on this ALP are in accordance with criteria contained in the current edition of FAA Advisory Circular 150/5300-13, except as noted in table entitled, "Nonconforming Conditions".

[Name] Date

NOTES:

1. SOURCE OF BASEMAP FROM APRIL 2001 FLYOVER BY CHAS. H. SELLS INC.

400' 200' 0 200' 400' 800'
SCALE IN FEET
1"=400'

REV NO	DATE	DESCRIPTION	MADE BY	CHK BY	APPD. BY

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

L.G. HANSCOM FIELD
BEDFORD, MA

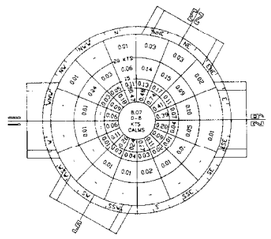
L.G. HANSCOM AIRPORT LAYOUT PLAN

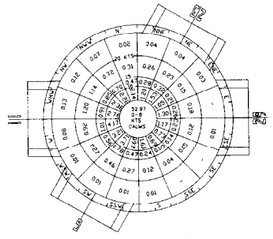
EXISTING CONDITIONS

CAPITAL PROGRAMS DEPARTMENT
ONE HARBORSIDE DRIVE, EAST BOSTON, MA. 02128-2909

DES. BY: TWE DWN. BY: GJD	CHKD. BY: JAC	LDC. CODE:
SCALE: 1"=400'	APPROVED: JAG DATE: 7/26/2011	DWG. NO.: 1
SHEET 2 OF 8	MPA PROJECT NO.	

PLOTTED: 7/26/11 BY:GDTULLO LAST SAVED: 7/26/11 BY:GDTULLO
DRAWING: T:\DRV\MPA\LEVY\HANSCOM AIRPORT - LAYOUT - PLAN\DWG\HANSCOM ALP\HANC_ALP-01.dwg





CROSSWIND COVERAGE (% OF TIME)

RUNWAY	ALL WEATHER (IFR WEATHER) 15 KTS	10.5 KTS
11-29	97.84 (13.62)%	93.91 (13.05)%
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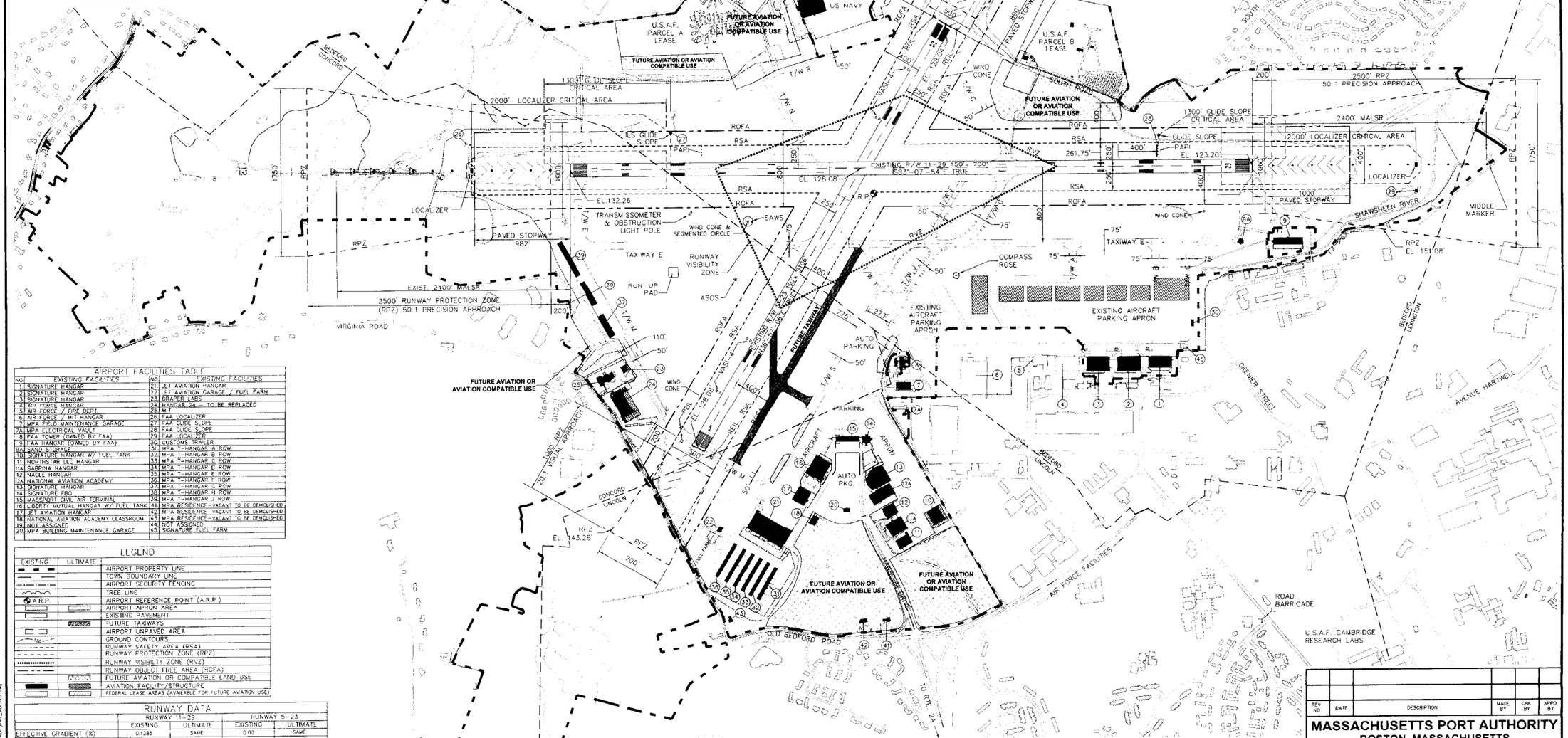
COMBINED	98.95 (13.88)%	97.10 (13.76)%

VFR WEATHER = 86.04% IFR WEATHER = 13.96%

SOURCE: NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL CLIMATIC CENTER/ASHEVILLE, NORTH CAROLINA

PERIOD: 1961-1970 (87,589 TOTAL OBSERVATIONS)



AIRPORT FACILITIES TABLE

NO	EXISTING FACILITIES	NO	EXISTING FACILITIES
1	SIGNATURE HANGAR	21	JET AVIATION HANGAR
2	SIGNATURE HANGAR	22	JET AVIATION GARAGE / FUEL FARM
3	SIGNATURE HANGAR	23	DRAPER LABS
4	AIR FORCES HANGAR	24	HANGAR 24 - TO BE REPLACED
5	AIR FORCE / FIRE DEPT.	25	MIT
6	AIR FORCE / MIT HANGAR	26	FAA LOCALIZER
7	MPA FIELD MAINTENANCE GARAGE	27	FAA GLIDE SLOPE
7A	MPA ELECTRICAL VAULT	28	FAA GLIDE SLOPE
8	FAA TOWER (OWNED BY FAA)	29	FAA LOCALIZER
9	FAA HANGAR (OWNED BY FAA)	30	CUSTOMS TRAILER
9A	SAND STORAGE	31	MPA T-HANGAR A ROW
10	SIGNATURE HANGAR W/ FUEL TANK	32	MPA T-HANGAR B ROW
11	NORTHSTAR LLC HANGAR	33	MPA T-HANGAR C ROW
11A	SABRINA HANGAR	34	MPA T-HANGAR D ROW
12	NAGLE HANGAR	35	MPA T-HANGAR E ROW
12A	NATIONAL AVIATION ACADEMY	36	MPA T-HANGAR F ROW
13	SIGNATURE HANGAR	37	MPA T-HANGAR G ROW
14	SIGNATURE FBO	38	MPA T-HANGAR H ROW
15	MASSPORT CIVIL AIR TERMINAL	39	MPA T-HANGAR J ROW
16	LIBERTY MUTUAL HANGAR W/ FUEL TANK	41	MPA RESIDENCE - VACANT TO BE DEMOLISHED
17	JET AVIATION HANGAR	42	MPA RESIDENCE - VACANT TO BE DEMOLISHED
18	NATIONAL AVIATION ACADEMY CLASSROOM	43	MPA RESIDENCE - VACANT TO BE DEMOLISHED
19	NOT ASSIGNED	44	NOT ASSIGNED
20	MPA BUILDING MAINTENANCE GARAGE	45	SIGNATURE FUEL FARM

LEGEND

EXISTING	ULTIMATE	
		AIRPORT PROPERTY LINE
		TOWN BOUNDARY LINE
		AIRPORT SECURITY FENCING
		TREE LINE
A.R.P.		AIRPORT REFERENCE POINT (A.R.P.)
		AIRPORT APRON AREA
		EXISTING PAVEMENT
		FUTURE TAXIWAYS
		AIRPORT UNPAVED AREA
		GROUND CONTOURS
		RUNWAY SAFETY AREA (RSA)
		RUNWAY PROTECTION ZONE (RPZ)
		RUNWAY VISIBILITY ZONE (RVZ)
		RUNWAY OBJECT FREE AREA (ROFA)
		FUTURE AVIATION OR COMPATIBLE LAND USE
		AVIATION FACILITY/STRUCTURE
		FEDERAL LEASE AREAS (AVAILABLE FOR FUTURE AVIATION USE)

RUNWAY DATA

	RUNWAY 11-29 EXISTING	RUNWAY 11-29 ULTIMATE	RUNWAY 5-23 EXISTING	RUNWAY 5-23 ULTIMATE
EFFECTIVE GRADIENT (%)	0.1285	SAME	0.90	SAME
INSTRUMENT RUNWAY	YES	SAME	NO	SAME
RUNWAY LIGHTING	HIRL	SAME	MIRL	SAME
PAVEMENT STRENGTH	785,000#/SWGL	SAME	725,117D	SAME
TYPE OF PAVEMENT	ASPHALT GROOVED	SAME	ASPHALT GROOVED	SAME
RUNWAY LENGTH	7,001'	SAME	5,106'	SAME
RUNWAY WIDTH	150'	SAME	150'	SAME
	R/W 11 / R/W 29	R/W 11 / R/W 29	R/W 5 / R/W 23	R/W 5 / R/W 23
FAR PART 77 APPROACH SURFACES	50:1/40:1	SAME	SAME	20:1 / 34:1	SAME	34:1
RUNWAY END COORDINATES	42°-28'-12.00" N 71°-17'-22.00" W / 42°-26'-12.00" N 71°-19'-22.00" W	SAME	SAME	42°-27'-27.00" N 71°-18'-22.00" W / 42°-26'-57.00" N 71°-18'-22.00" W	SAME	SAME
VISUAL AIDS	MALSR / MALSR	SAME	SAME	MALS-41(RCR) / MALS-41(RCR)	SAME	SAME
NAVIGATION AIDS	ILS,RVR, NDB / ILS,NDB,	SAME	SAME	VOR-23 / VOR-23	SAME	SAME
RSA DIMENSIONS						
LENGTH BEYOND RW END	1,000'	1,000'	SAME	SAME	600' (S23 WEST SAS EAST) / 890'	SAME	SAME
WIDTH	500'	500'	SAME	SAME	500'	500'	SAME	SAME
RUNWAY MARKING	PRECISION / PRECISION	SAME	SAME	VISUAL / NON-PRECISION	SAME	SAME
OBJECT FREE AREA						
LENGTH BEYOND RW END	1,000'	1,000'	SAME	SAME	600' (S23 WEST SAS EAST) / 890'	SAME	SAME
WIDTH	800'	800'	SAME	SAME	800'	800'	SAME	SAME
RPZ ELEVATION	128.8'	128.8'	SAME	SAME	132.6'	132.6'	SAME	SAME

AIRPORT DATA

	EXISTING	ULTIMATE
AIRPORT ELEVATION (NAVD88)	132.26'	SAME
AIRPORT REFERENCE POINT	LAT.42°-28'-12" LONG.71°-17'-22"	SAME
MEAN MAX. TEMP. OF HOTTEST MONTH	82°F	SAME
AIRPORT AND TERMINAL NAVIGATION AIDS	ILS,MLS,RNAV,GPS,VASI	SAME
AIRPORT TYPE (AS PER FAA 'AP ASI)	CR	SAME
AIRPORT REFERENCE CODE	C-III	SAME
DESIGN AIRCRAFT	C-V	SAME
WIND COVERAGE	98.95%	SAME
RUNWAY LIGHTING*	MITL	SAME

* FAA AWOS P & V NOT COMMISSIONED

RUNWAY SAFETY AREAS (RSA)

- RSA FOR RUNWAY 11-29 AS PER FAA GUIDELINES
- RSA FOR ENDS OF RUNWAY 5-23 AS PER FAA APPROVED 139 MANUAL (APPROVED 8/24/05)

MASSACHUSETTS PORT AUTHORITY BOSTON, MASSACHUSETTS

APPROVED BY: INTERIM EXECUTIVE DIRECTOR

DIRECTOR OF AVIATION

DIRECTOR OF CAPITAL PROGRAMS AND ENVIRONMENTAL AFFAIRS

DATE: 7-26-2011

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION NEW ENGLAND REGION

APPROVED BY: for MANAGER, AIRPORTS

DATE: 8/24/2011

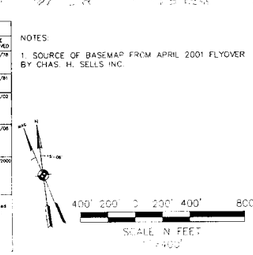
MODIFICATION OF STANDARDS

DESCRIPTION	EXISTING/ PLANNED	STANDARD	REMARKS	DATE APPROVED
1.) Less obstruction lighting & marking for non security fencing (anti-shielding obstruction is required)	341' Part 77 approach area obstruction	Clear of 34:1 Part77 approach area	Fence will be the penetrating obstruction but not an obstruction light. Thus lighting does not need to be applied	03/29/07
2.) Taxiway transverse slope	2% slope	1.5% slope	Flat variation to taxiway slopes are necessary to maintain proper drainage	03/23/07
3.) Runway 5/23 Runway Safety Area Deficiency	Runway 5 1000' BEYOND RSA Runway 23 1000' BEYOND RSA 300' W & 300' BFC	300' WIDE 1000' BEYOND RSA (1000' BEYOND RSA)	FAA provided RSA Determination letter 29 2003 approving Airport's RSA recommendation for runway end 5/23 with full access to 300'	03/29/07
4.) Tree obstructions to Runway 05/23 Part 77 surface	Part 77 object to clear of obstructions	Part 77 object to clear of obstructions	FAA Aeronautical Study 2006-ANE-1081-NRA dated February 8, 2006 assessed the Part 77 approach as not a hazard to air navigation. Thus no new RSAO, SALT RUNS will be required to provide a clear approach to Runway 23	02/08/06
5.) Tree obstructions to Runway 11/29 FAA defined airspace clearing surfaces	Historically, there have been penetrations to the FAA defined airspace surfaces. MPA will trim obstructions as they occur	FAA defined airspace surfaces clear of obstructions	FAA approved March 2, 2000 alternate clearing methods for both Runway 11-29 and Runway 5-23. Under this plan, MPA will trim obstructions to the existing 200' river within runway end. Obstructions beyond the river will be trimmed through the ongoing part 77 process	03/07/2000

Certification:
Owners or Sponsors certifies that all airport alterations shown on this ALP are in accordance with criteria contained in the current edition of FAA Advisory Circular 150/5300-13, except as noted in table entitled "Modifications of Standards"

NOTES:

1. SOURCE OF BASEMAP FROM APRIL 2001 FLYOVER BY CHAS. H. SELLS INC.



REV NO	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

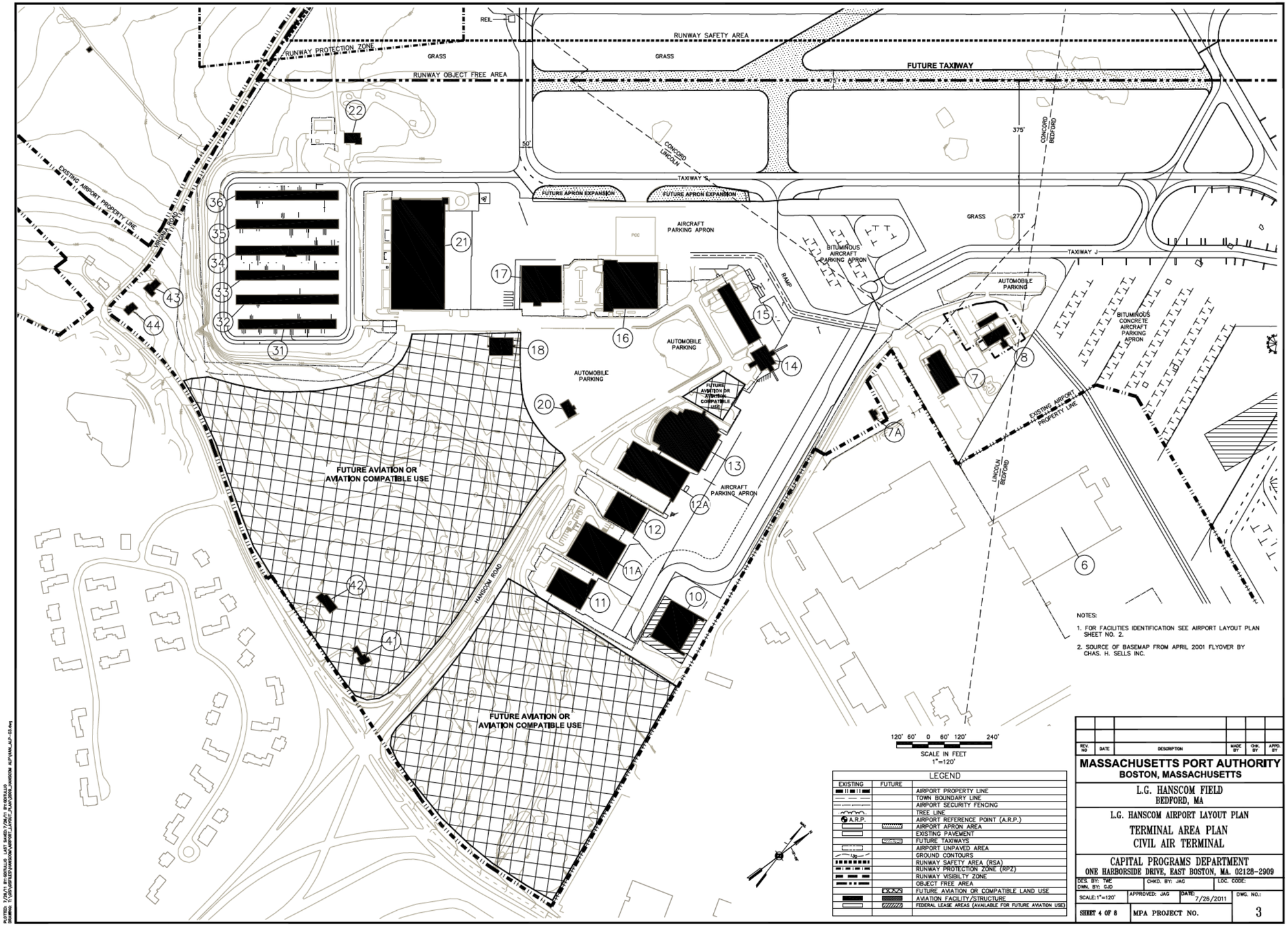
L.G. HANSCOM FIELD
BEDFORD, MA

L.G. HANSCOM AIRPORT LAYOUT PLAN

ULTIMATE
AIRPORT LAYOUT PLAN

CAPITAL PROGRAMS DEPARTMENT
ONE HARBORSIDE DRIVE, EAST BOSTON, MA. 02128-2909

DES. BY: TME	CHKD. BY: JAG	LOC. CODE	
DWN. BY: GJC			
SCALE 1"=400'	APPROVED: JAG	DATE: 7/26/2011	DWG. NO. 2
SHEET 3 OF 8	MPA PROJECT NO.		



NOTES:

1. FOR FACILITIES IDENTIFICATION SEE AIRPORT LAYOUT PLAN SHEET NO. 2.
2. SOURCE OF BASEMAP FROM APRIL 2001 FLYOVER BY CHAS. H. SELLS INC.

120' 60' 0 60' 120' 240'

SCALE IN FEET
1"=120'

LEGEND

EXISTING	FUTURE	
		AIRPORT PROPERTY LINE
		TOWN BOUNDARY LINE
		AIRPORT SECURITY FENCING
		TREE LINE
A.R.P.		AIRPORT REFERENCE POINT (A.R.P.)
		AIRPORT APRON AREA
		EXISTING PAVEMENT
		FUTURE TAXIWAYS
		AIRPORT UNPAVED AREA
		GROUND CONTOURS
		RUNWAY SAFETY AREA (RSA)
		RUNWAY PROTECTION ZONE (RPZ)
		RUNWAY VISIBILITY ZONE
		OBJECT FREE AREA
		FUTURE AVIATION OR COMPATIBLE LAND USE
		AVIATION FACILITY/STRUCTURE
		FEDERAL LEASE AREAS (AVAILABLE FOR FUTURE AVIATION USE)

REV. NO	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

L.G. HANSCOM FIELD
BEDFORD, MA

L.G. HANSCOM AIRPORT LAYOUT PLAN

TERMINAL AREA PLAN
CIVIL AIR TERMINAL

CAPITAL PROGRAMS DEPARTMENT
ONE HARBORSIDE DRIVE, EAST BOSTON, MA. 02128-2909

DES. BY: TWE DWN. BY: GJD	CHKD. BY: JAG	LOC. CODE:	
SCALE:1"=120'	APPROVED: JAG	DATE: 7/26/2011	DWG. NO.: 3
SHEET 4 OF 8	MPA PROJECT NO.		

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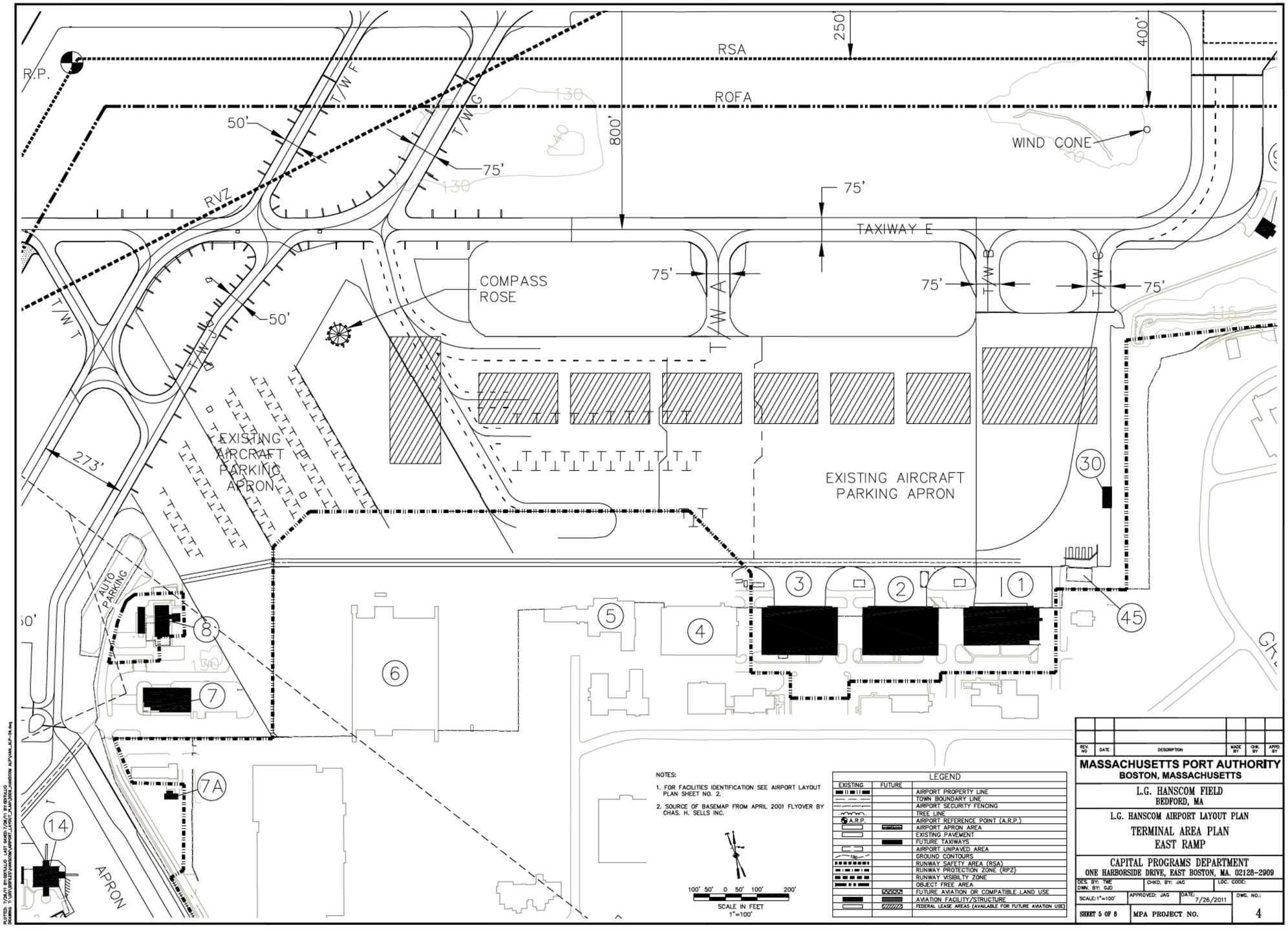
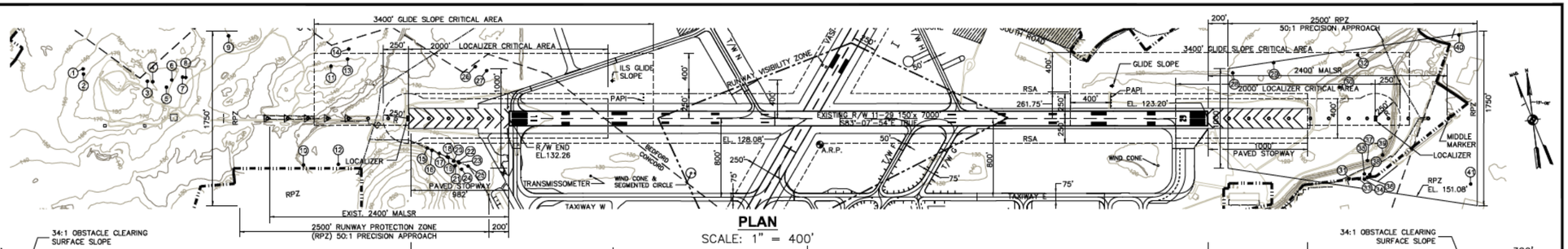
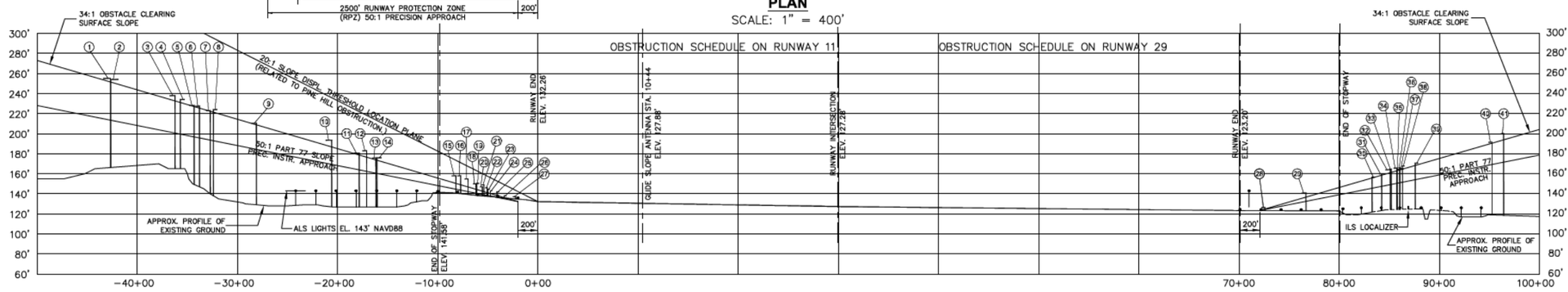

R.P.
RSA
ROFA
250'
400'
800'
WIND CONE
50'
75'
RVZ
T/W F
T/W G
T/W J
T/W T
T/W A
T/W B
T/W C
TAXIWAY E
COMPASS ROSE
273'
EXISTING AIRCRAFT PARKING APRON
EXISTING AIRCRAFT PARKING APRON
AUTO PARKING
APRON
30
45
1
2
3
4
5
6
7
7A
8
14
130
115
NOTES:
1. FOR FACILITIES IDENTIFICATION SEE AIRPORT LAYOUT PLAN SHEET NO. 2.
2. SOURCE OF BASEMAP FROM APRIL 2001 FLYOVER BY CHAS. H. SELLS INC.
100' 50' 0 50' 100' 200'
SCALE IN FEET
1"=100'
LEGEND
EXISTING
FUTURE
AIRPORT PROPERTY LINE
TOWN BOUNDARY LINE
AIRPORT SECURITY FENCING
TREE LINE
A.R.P.
AIRPORT REFERENCE POINT (A.R.P.)
AIRPORT APRON AREA
EXISTING PAVEMENT
FUTURE TAXIWAYS
AIRPORT UNPAVED AREA
GROUND CONTOURS
RUNWAY SAFETY AREA (RSA)
RUNWAY PROTECTION ZONE (RPZ)
RUNWAY VISIBILITY ZONE
OBJECT FREE AREA
FUTURE AVIATION OR COMPATIBLE LAND USE
AVIATION FACILITY/STRUCTURE
FEDERAL LEASE AREAS (AVAILABLE FOR FUTURE AVIATION USE)
REV. NO
DATE
DESCRIPTION
MADE BY
CHK. BY
APPD. BY
MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS
L.G. HANSCOM FIELD
BEDFORD, MA
L.G. HANSCOM AIRPORT LAYOUT PLAN
TERMINAL AREA PLAN
EAST RAMP
CAPITAL PROGRAMS DEPARTMENT
ONE HARBORSIDE DRIVE, EAST BOSTON, MA. 02128-2909
DES. BY: TWE
DWN. BY: GJD
CHKD. BY: JAG
LOC. CODE:
SCALE: 1"=100'
APPROVED: JAG
DATE: 7/26/2011
DWG. NO.: 4
SHEET 5 OF 8
MPA PROJECT NO.
PLOTTED: 7/26/11 BY: EDITOLLO LAST SAVED: 7/26/11 BY: EDITOLLO
DRAWING: T:\DRY\DEPTS\HANSCOM AIRPORT\LAYOUT_PLAN\2004_HANSCOM ALP\ANAL_ALP-04.dwg



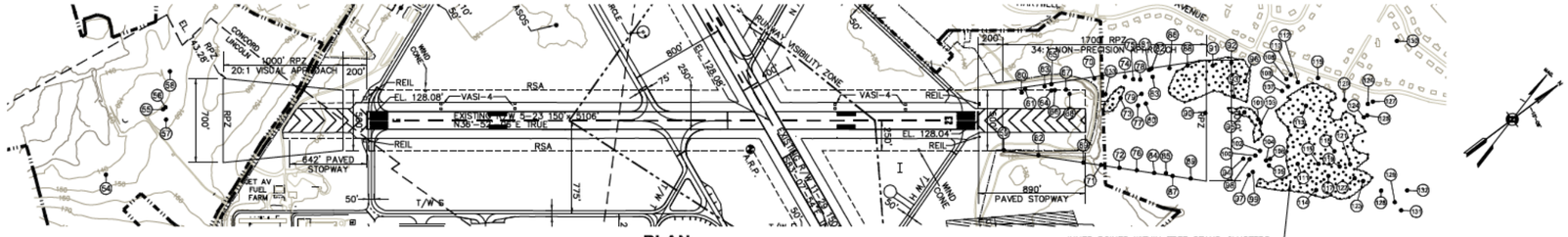
PLAN

SCALE: 1" = 400'



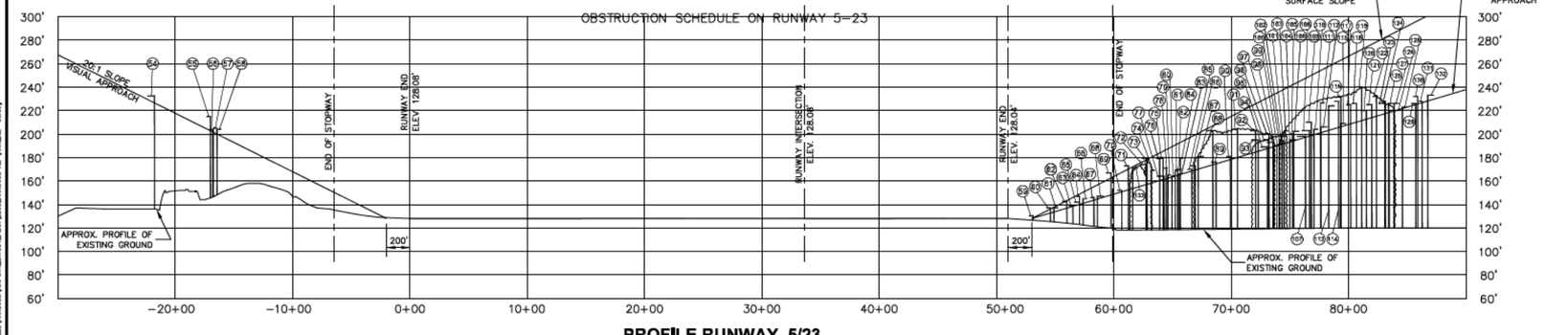
PROFILE RUNWAY 11/29

SCALE: 1" = 400' HORIZONTAL
1' = 40' VERTICAL



PLAN

SCALE: 1" = 400'

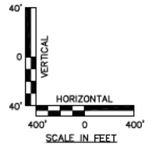


PROFILE RUNWAY 5/23

SCALE: 1" = 400' HORIZONTAL
1' = 40' VERTICAL

NOTES:

1. ALL ELEVATIONS ARE RELATIVE TO NAVD88.
2. OBSTRUCTIONS SHOWN OBTAINED FROM THE DUFRESNE-HENRY L.G. HANSCOM OBSTRUCTION ANALYSIS 2004.
3. OBSTRUCTIONS SHOWN FOR RUNWAY 11/29 REPRESENTS THE 34:1 TERPS OCS AS CALCULATED BY DUFRESNE-HENRY L.G. HANSCOM OBSTRUCTION ANALYSIS 2004.
4. A STUDY IS BEING COMPLETED FOR RUNWAY END 23 TO CLEAR TREES TO THE TERPS 20:1 OCS. COMPLETION OF STUDY IS EXPECTED BY THE END OF 2006.
5. OBSTRUCTIONS IDENTIFIED ON RUNWAY 23 WITHIN TREE STAND CLUSTERS REPRESENT TALLEST TREE PENETRATIONS.
6. TREE OBSTRUCTIONS WILL BE ADDRESSED THROUGH A VEGETATION MANAGEMENT PLAN (VMP) AND MAINTENANCE PROGRAM.



REV. NO	DATE	DESCRIPTION	MADE BY	CHK. BY	APPD. BY

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

L.G. HANSCOM FIELD
BEDFORD, MA

L.G. HANSCOM AIRPORT LAYOUT PLAN

PLANS/PROFILES,
RUNWAY APPROACHES

CAPITAL PROGRAMS DEPARTMENT
ONE HARBORSIDE DRIVE, EAST BOSTON, MA. 02128-2909

DES. BY: TWE DWN. BY: GJD	CHKD. BY: JAG	LOC. CODE:	
SCALE: AS NOTED	APPROVED: JAG	DATE: 7/26/2011	DWG. NO.: 5
SHEET 6 OF 8	MPA PROJECT NO.		

PLOTTED: 7/26/11 BY:GDITULIO LAST SAVED: 7/26/11 BY:GDITULIO
DRAWING: T:\DEPUSER\LEVY\HANSCOM AIRPORT\LAYOUT_PLAN\2004_HANSCOM ALP\VIAL_ALP-05.dwg

NOTES:

1. AIRPORT ELEVATION & IMAGINARY SURFACE PLAN ELEVATIONS ARE BASED ON NAVD88.
2. 1:25,000 SCALE USGS TOPOGRAPHIC QUADRANGLES OBTAINED FROM MASSGIS. ELEVATIONS AND GROUND CONTOURS ON USGS QUADRANGLES ARE DEPICTED IN METERS. (METERS X 3.281 = FEET).
3. SOURCE OF WOODED AREA PENETRATIONS FROM MARCH 1994 AIRPORT OBSTUCTION CHART SURVEYED AND COMPILED BY THE NATIONAL OCEAN SERVICE, U.S. DEPARTMENT OF COMMERCE.
4. CLOSE-IN OBSTRUCTIONS ARE NOT SHOWN ON THIS DRAWING. PLEASE REFER TO SHEET 6 – PLANS/PROFILES RUNWAY APPROACHES.
5. THIS DRAWING IS NOT TO BE USED FOR AIR NAVIGATIONAL PURPOSES.

800' 400' 0 400' 800' 1600'

SCALE IN FEET
1"=800'

REV. NO	DATE	DESCRIPTION	MADE BY	CHK. BY	APP'D. BY

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

L.G. HANSCOM FIELD
BEDFORD, MA

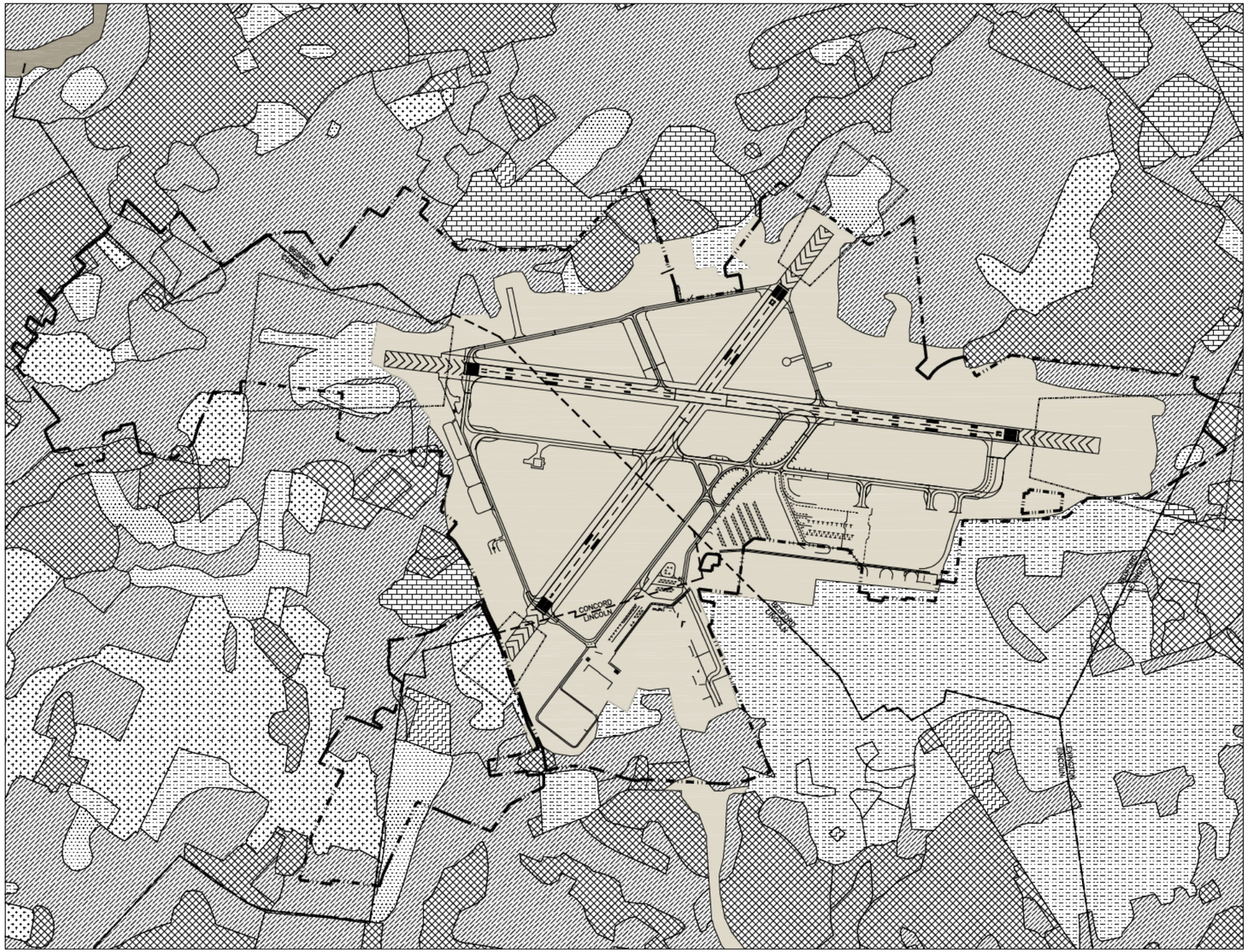
L.G. HANSCOM AIRPORT LAYOUT PLAN

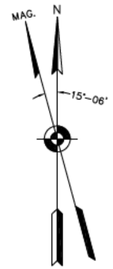
PART 77
IMAGINARY SURFACES PLAN

CAPITAL PROGRAMS DEPARTMENT
ONE HARBORSIDE DRIVE, EAST BOSTON, MA. 02128-2909

DES. BY: TME DWN. BY: GJD	CHKD. BY: JAG		LOC. CODE:
SCALE: AS NOTED	APPROVED: JAG	DATE: 7/26/2011	DWG. NO.: 6
SHEET 7 OF 8	MPA PROJECT NO.		

PLOTTED: 7/26/11 BY: GDITULLIO LAST SAVED: 7/26/11 BY: GDITULLIO
DRAWING: T:\CAD\LAYOUTS\HANSCOM\AIRPORT_LAYOUT_PLAN\2009_HANSCOM_ALP\ANH_ALP-06.dwg





OPEN LAND
RESIDENTIAL
FOREST
RUNWAY PROTECTION ZONE
COMMERCIAL
BODIES OF WATER
PARTICIPATION/SPECTATOR RECREATION
INDUSTRIAL
WETLAND
MASSPORT BOUNDARY
TRANSPORTATION
AGRICULTURE
TOWN BOUNDARY

NOTES:

1. DEPICTED LAND USE AREAS OBTAINED FROM THE 2002 MASSGIS LAND USE DATALAYER.
2. FOR AIRCRAFT NOISE CONTOURS, REFER TO THE MOST RECENT ENVIRONMENTAL STATUS PLANNING REPORT (ESPR) FOR HANSCOM FIELD. THE ESPR IS AVAILABLE THROUGH THE MASSACHUSETTS PORT AUTHORITY.

500' 250' 0 250' 500' 1000'
SCALE IN FEET
1"=500'

REV. NO.	DATE	DESCRIPTION	MADE BY	CHK BY	APPD. BY

MASSACHUSETTS PORT AUTHORITY
BOSTON, MASSACHUSETTS

L.G. HANSCOM FIELD
BEDFORD, MA

L.G. HANSCOM AIRPORT LAYOUT PLAN

EXISTING LAND USE PLAN

CAPITAL PROGRAMS DEPARTMENT
ONE HARBORSIDE DRIVE, EAST BOSTON, MA. 02128-2909

DES. BY: TWE DWN. BY: GJD	CHKD. BY: JAG		LOC. CODE:
SCALE: 1"=500'	APPROVED: JAG	DATE: 7/26/2011	DWG. NO.:
SHEET 8 OF 8	MPA PROJECT NO.		7

PLOTTED: 7/26/11 BY: BERTOLLO LAST SAVED:7/26/11 BY:BERTOLLO
DRAWING: T:\DATA\ES\HANSCOM AIRPORT_LAYOUT_PLAN\2004_HANSCOM AIRPORT_ALP-07.dwg

Appendix C Ground Transportation

Appendix C
Ground Transportation

Appendix C-1

2013 Hanscom Field Travel Questionnaire

2013 Hanscom Field Travel Questionnaire

Page One

2013 Hanscom Field Travel Questionnaire

To all commuters to Hanscom Field (employees and students):

Thank you for taking the time to give us your feedback.

Why have you been given this questionnaire:

Massport is conducting a commute survey of all people working or attending classes at Hanscom Field. These surveys provide information to improve travel to and from the airport.

How to return the completed questionnaires:

Please complete this survey by July 26, 2013.

Should you have any questions regarding the survey:

Please contact Tom Ennis at 617.568.3546 or tennis@massport.com

We appreciate your participation and cooperation in completing the survey!

Page 2

1. Where do you currently reside?

Street address or nearest intersection

City

State

ZIP

2. If your trip to the field does not begin at your residence, from where does it originate?

Street address or nearest intersection

City

State

ZIP

3. Are you a student or employee at Hanscom Field?

- Student
- Employee

What company at Hanscom is your main employer?

What school at Hanscom do you attend?

4. Which of the following best describes your job/student status?

- Permanent full-time
- Permanent part-time
- Temporary full-time
- Temporary part-time

5. What time do you typically arrive and depart Hanscom?

	Arrival Time	Departure Time
Monday		
Tuesday		

Wednesday		
Thursday		
Friday		
Saturday		
Sunday		

6. How often do you vary your work or school hours by more than 30 minutes?

- 1-2 days per week
- 3+ days per week
- 1-2 days per month
- 3+ days per month
- Other *

7. How do you get to Hanscom on most days? What type of transportation do you take?

- Drive alone
- Dropped off by someone who does not work at Hanscom
- Car pool with other Hanscom employees or students
- Public Transportation
- Walk
- Bicycle
- Other *

Which of the following do you use? (check all that apply)

- MBTA 76 Bus
- LexExpress

- MBTA Commuter Rail
- Other _____ *

How many people are usually in the car (including yourself)?

_____

Do you have a valid Driver's license?

- Yes
- No

Do you have a working vehicle to use?

- Yes
- No
- Sometimes

Page 3

8. If you usually drive alone or carpool to Hanscom, where do you usually park?

- In your employer's/school's parking area near your place of work/school
- In the Civil Terminal parking area
- On the military base
- Elsewhere on airport _____ *
- Elsewhere off airport _____ *

9. On average, how often do you leave Hanscom during the day:

For work/school-related reasons

-- Please Select --
Frequently
Sometimes
Rarely

For personal reasons

-- Please Select --
Frequently
Sometimes
Rarely

Do you use your personal vehicle for these trips?

- Yes
- No, I use a work vehicle
- No (other) *

10. How long does it take you to travel to Hanscom on a typical day (minutes one-way)?

11. How much do YOU pay for your commute?

	Per day	Per month
Parking		
Tolls		
Bus, train fares or passes		

12. If you sometimes get to work a different way, how do you make the trip? (check all that apply)

- [ ] Drive alone
- [ ] Dropped off by someone who does not work at Hanscom
- [ ] Car pool with other Hanscom employees or students
- [ ] Public Transportation
- [ ] Walk

- [ ] Bicycle
- [ ] Other _____ *

Which of the following do you use? (check all that apply)

- ○ MBTA 76 Bus
- ○ LexExpress
- ○ MBTA Commuter Rail
- ○ Other _____ *

---

13. If you drive alone to Hanscom, which of the following describes your reasons? (rank all that apply)

Drag items from the left-hand list into the right-hand list to order them.

- Convenience
- Privacy
- Quickest way to work
- Irregular work schedule
- Need car for personal reasons
- Other modes not as safe
- Other modes cost too much
- Transit schedules do not work for me
- Need car for work-related trips

Don't like taking the bus

Need car for daycare

Need car for emergencies

Not aware of other options

Other

Page 4

14. Please rank the TOP THREE alternatives that you would consider for traveling to Hanscom Field:

Drag items from the left-hand list into the right-hand list to order them.

Transit

Bicycle

Walk

Carpool (2+ passengers)

Vanpool (6+ passengers)

Other

15. Would you be willing to share a ride (i.e. carpool) for part or all of the week to and from work with others who might live near you if the schedule was accommodating?

- Yes
- No
- Already do

16. Would you be willing to change to RIDESHARING (i.e. carpooling) if the following incentives or

services were in place? (rank all that apply)

Drag items from the left-hand list into the right-hand list to order them.

- Free guaranteed ride home
- Preferential parking for carpools
- Finding someone to carpool with
- Company car available if necessary
- Financial incentive
- Shuttle bus from park and ride
- Other

17. If you currently drive alone, would you be willing to change to using TRANSIT if the following incentives or services were in place? (rank all that apply)

Drag items from the left-hand list into the right-hand list to order them.

- Subsidy for bus passes
- On-site information on routes and times
- Better transit routes
- Guaranteed ride home
- Company car available if necessary

Other

18. What prevents you from using public bus transportation service? (check all that apply)

- [ ] No bus near home
- [ ] Bus schedule does not work for me
- [ ] The bus is not safe
- [ ] The cost savings is not enough
- [ ] There is no direct route from my home
- [ ] Other *

Page 5

19. Would you be willing to change to riding a BICYCLE if the following incentives or services were in place? (rank all that apply)

Drag items from the left-hand list into the right-hand list to order them.

Reward programs

Lockers and showers

Secured/covered bike parking

Bad weather plans

Company car available if necessary

Bike path from home to Hanscom Field

Other

20. What prevents you from riding a bicycle to Hanscom? (check all that apply)

- [ ] No safe route from my home
- [ ] No bicycle parking at Hanscom
- [ ] Too far to bike from home
- [ ] I do not own a bicycle
- [ ] Unpredictable weather
- [ ] Mobility impairment
- [ ] Other _____ *

21. Would you be willing to use a combination or public transportation and bicycling/walking to get to Hanscom?

- ○ Yes
- ○ No

22. Would you be willing to change to WALKING if the following incentives or services were in place? (rank all that apply)

Drag items from the left-hand list into the right-hand list to order them.

- Reward programs
- Lockers and showers
- Bad weather plans
- Company car available if necessary
- Sidewalks from home to Hanscom field

Other

23. What prevents you from walking to Hanscom? (check all that apply)

- [ ] No safe route from my home
- [ ] Too far to walk from home
- [ ] Unpredictable weather
- [ ] Mobility impairment
- [ ] Other *

24. What would most motivate you to choose to shared a ride, take transit, walk or bike? (rank all that apply)

Drag items from the left-hand list into the right-hand list to order them.

The incentives offered

Helping the environment

Reducing traffic and congestion

Health benefits of walking/biking

Social interactions of car pools

Reduced cost of commuting

Other

Page 6

25. Would you like to learn more about programs and incentives to encourage alternative commuting choices?

- Yes
- No

26. Are you:

- Male
- Female

27. What is your age?

- Under 18
- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 or over

28. Do you have any other thoughts or comments on transportation to/from Hanscom Field?

Thank You!

Thank you for taking our survey. Your response is very important to us.

Summary Report - Sep 4, 2013 (Q5)

Survey: 2013 Hanscom Field Travel Questionnaire

1. Where do you currently reside?:Street address or nearest intersection

Count	Response
1	10 Durant Aveune
1	10 Old Beach Road
1	100 Farm Road
1	117 East Bare Hill Road
1	12 Trotting Horse
1	13 Liberty Rosd
1	15 hillside ter.
1	150 hanscom Dr
1	17 Ernies Drive
1	2 Coral St.
1	20 Archdale Rd
1	22 Blackburnian Rd
1	28 Aborn Place
1	29 Denny Road
1	291 granite st
1	3315 Stearns ill rd
1	35 Meriam Street
1	378 Chatham St
1	39 Whitney Farms RD
1	4 Nehemiah rd
1	401 Sandy Valley Rd
1	43 12th Street
1	5 Partridge Ln
1	52 violetwood cir
1	65 Brainerd Rd
1	7 Oak Knoll Dr
1	76 coburn hill road
1	9 Diane La
1	90 Jackson Drive

1	909 Pleasant St
1	99 B Wilmington Rd
1	99 Mill Pond Rd
1	Avon St
1	BROADWAY
1	Bayberry St.
1	Carlton St
1	Depot St
1	Faxon St.
1	Hanscom Drive
1	Mill Brook High st
1	New Road
1	Orris Street at Orris Place
1	Porter Ave
1	Railroad ave
1	South Road
1	WINN STREET
1	Washington St.
1	Westford Rd
1	mount hope
1	munroe ave

1. Where do you currently reside?:City

Count	Response
1	Allston
1	Arlington
1	BURLINGTON
3	Bedford
1	Beford
1	Brockton
1	Brookline
2	Burlington
1	CONCORD
1	Canton
1	Carlisle
1	Chestnut Hill

1	Derry
1	Duxbury
1	Exeter
1	Harvard
4	Lexington
1	Lincoln
1	Littleton
1	Lowell
3	Lynn
1	Marshfield
1	Maynard
1	Melrose
1	Middleton
1	Nashua
1	Newmarket
1	Newton
1	North Yarmouth
1	Pepperell
1	Raynham
1	Roslindale
1	SOMERVILLE
1	SUdbury
1	Salem
1	Sandown
1	Sherborn
1	Shirley
1	Wakefield
1	Waltham
1	West Roxbury
1	Westwood
1	Weymouth
1	Woburn
1	concord
1	lowell
1	malden
1	marlborough
1	quincy
1	walpole

1	woburn

1. Where do you currently reside?:State

Count	Response
35	MA
2	MA
1	MA.
1	ME
6	Ma
1	Massachusetts
4	NH
1	RI
6	ma
1	mass
2	nh

1. Where do you currently reside?:ZIP

Count	Response
1	01451
1	01460
1	01463
1	01464
4	01730
1	01741
2	01742
1	01752
1	01754
1	01770
1	01773
1	01776
2	01801
3	01803
1	01850
1	01854

1	01880
3	01902
1	01949
1	02021
1	02050
1	02081
1	02090
1	02131
1	02132
1	02134
1	02145
1	02148
1	02169
1	02176
1	02189
1	02302
1	02332
1	02420
2	02421
1	02446
1	02458
1	02467
1	02474
1	02767
1	02822
1	03038
1	03062
1	03079
1	03857
1	03873
1	04097
1	MA 02421

2. If your trip to the field does not begin at your residence, from where does it originate?:Street address or nearest intersection

Count	Response

1	1 Harborside Drive
1	150 Hanscom Drive
1	Alewife Station Busway
1	NA
1	South Road
1	Wonderland

2. If your trip to the field does not begin at your residence, from where does it originate?:City

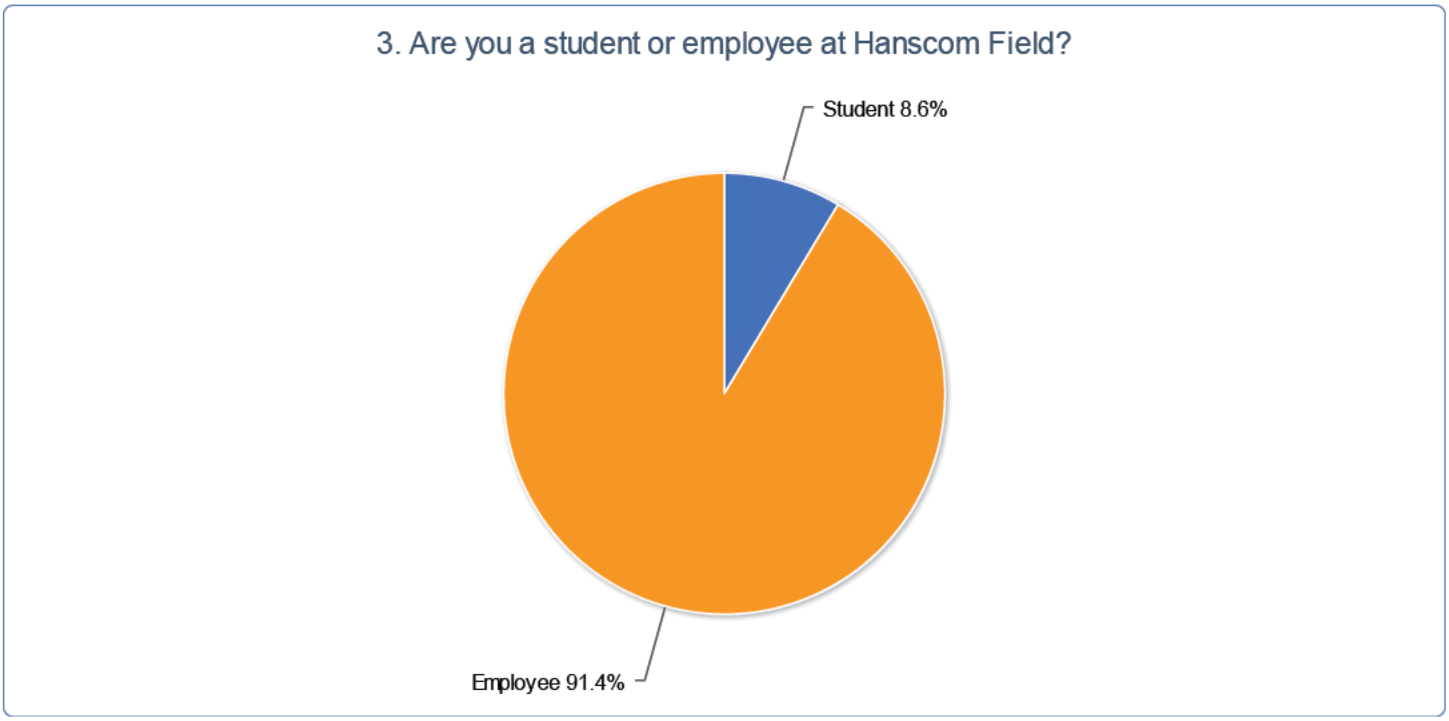
Count	Response
2	Bedford
1	Boston
1	Brockton
1	LEXINGTON
1	Lexington
1	medford
1	revere

2. If your trip to the field does not begin at your residence, from where does it originate?:State

Count	Response
6	MA
1	MA
1	ma

2. If your trip to the field does not begin at your residence, from where does it originate?:ZIP

Count	Response
2	01730
1	02128
1	02135
1	02302



3. Are you a student or employee at Hanscom Field?

Value	Count	Percent %
Student	5	8.6%
Employee	53	91.4%

Statistics	
Total Responses	58

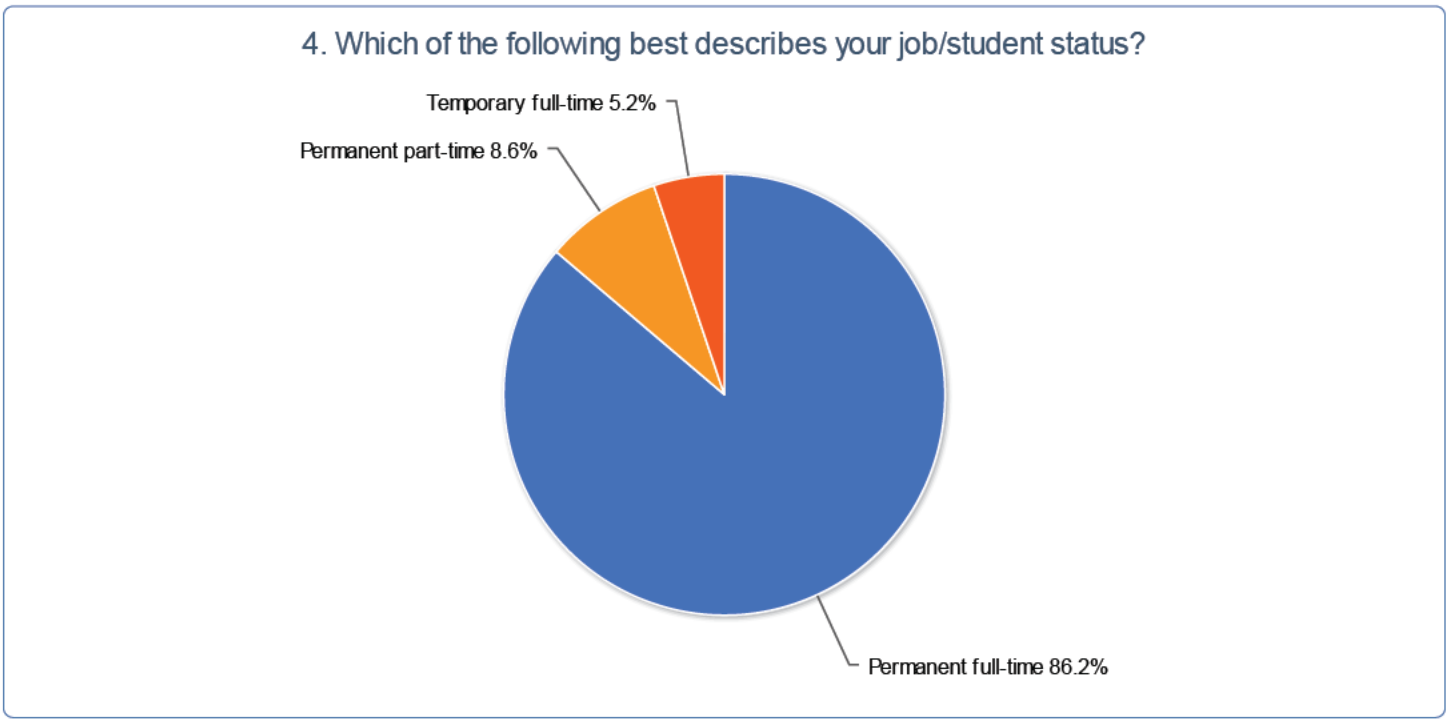
What company at Hanscom is your main employer?

Count	Response
1	AirShares Elite & MedFlight
1	BSC/Stream Ent
1	Boston Aviation
2	Boston JetSearch, Inc.
1	Boston MedFlight
1	Boston Medflight
3	Boston Scientific
1	Cordinates Operations LLC
1	East Coast Aero Club
1	FAA
3	Jet Aviation
1	Jet Aviation (Tenant)
2	Linear Air

1	Massachusetts Air And Space Museum
5	Massport
1	Midon
1	NAA
1	NATIONAL AVIATION ACADEMY
7	National Aviation Academy
2	Raytheon
1	Raytheon Company
4	Rectrix
3	Rectrix Aviation
3	Signature Flight Support
1	Stream Enterprise
1	THL Partners
1	THL Partners, LLC
1	The National Aviation Academy
1	national aviation accademy

What school at Hanscom do you attend?

Count	Response
4	National Aviation Academy
1	naa



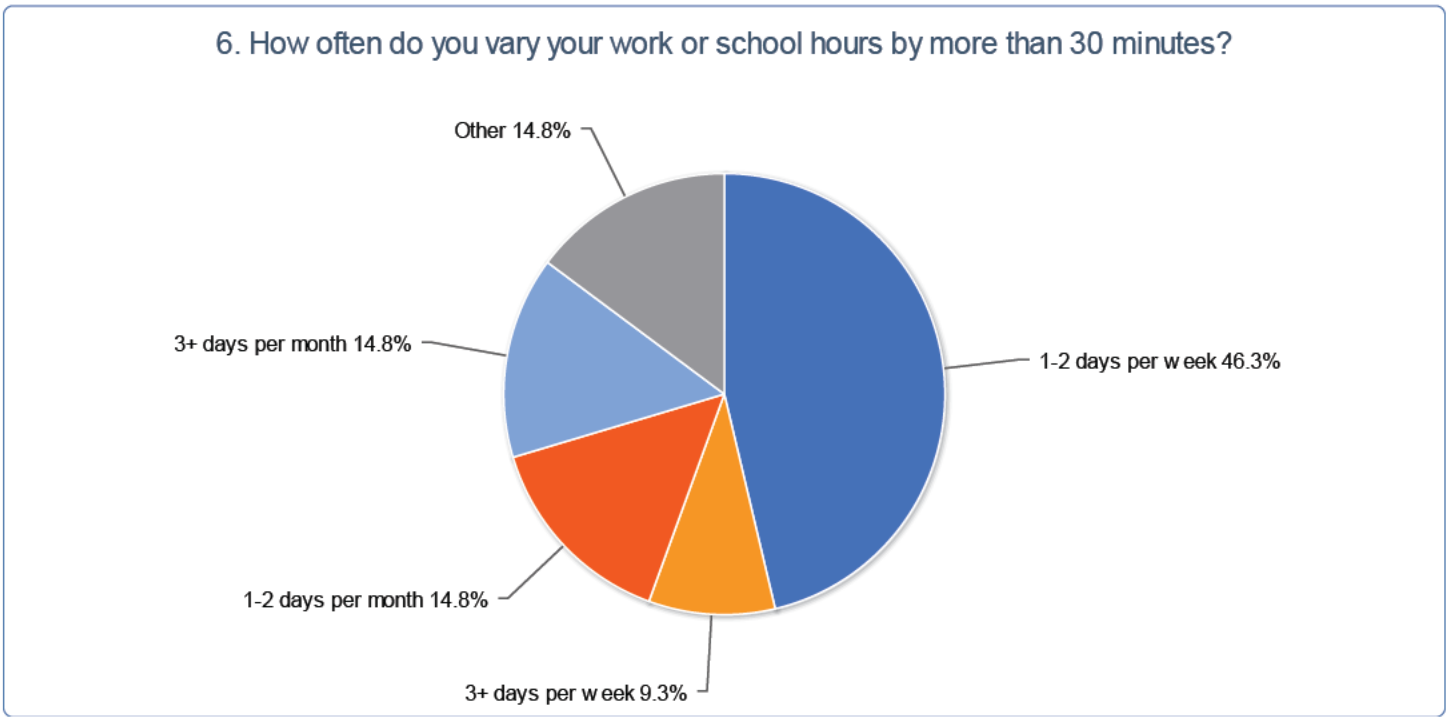
4. Which of the following best describes your job/student status?

Value	Count	Percent %
Permanent full-time	50	86.2%
Permanent part-time	5	8.6%
Temporary full-time	3	5.2%
Temporary part-time	0	0.0%

Statistics	
Total Responses	58

5. What time do you typically arrive and depart Hanscom?

	Arrival Time	Departure Time	Responses
Monday	**100.0%** 54	**98.1%** 53	**54**
Tuesday	**100.0%** 52	**98.1%** 51	**52**
Wednesday	**100.0%** 52	**98.1%** 51	**52**
Thursday	**100.0%** 51	**98.0%** 50	**51**
Friday	**100.0%** 51	**100.0%** 51	**51**
Saturday	**100.0%** 13	**100.0%** 13	**13**
Sunday	**100.0%** 10	**90.0%** 9	**10**

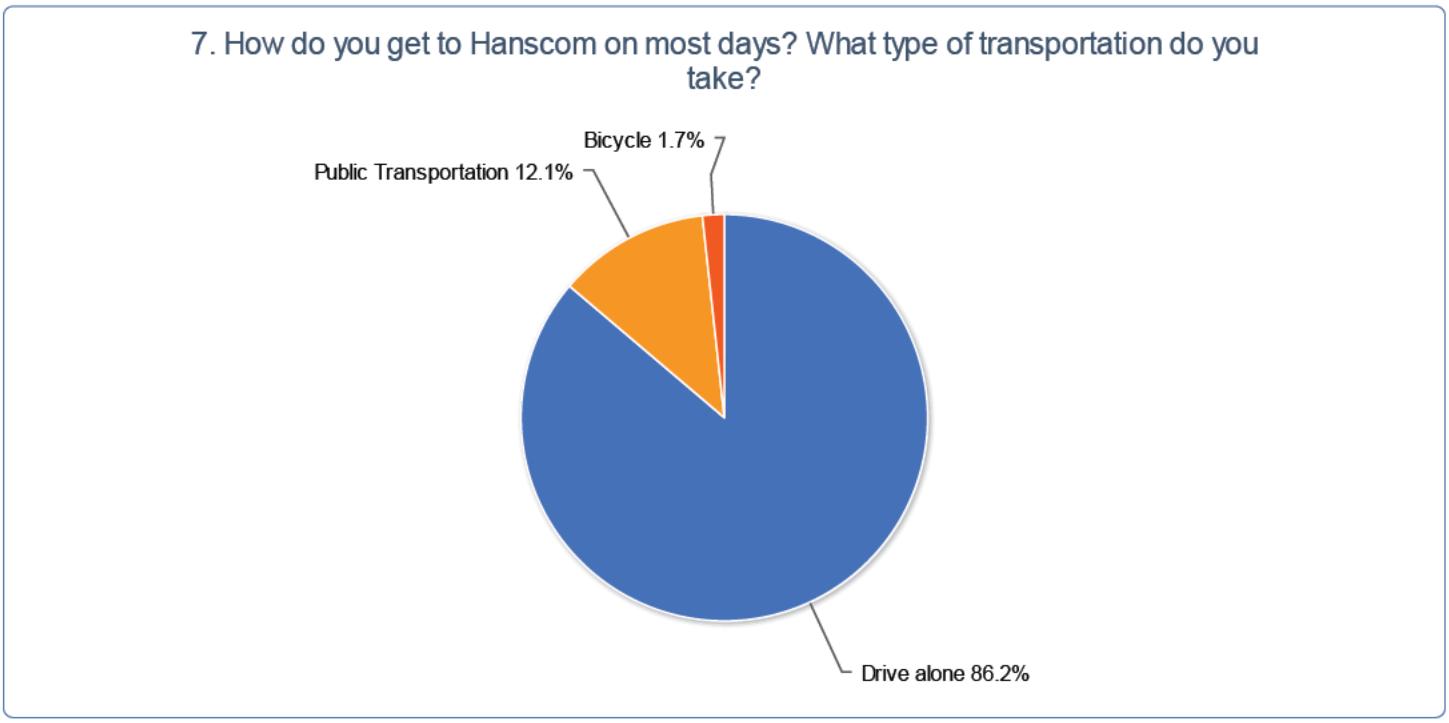


6. How often do you vary your work or school hours by more than 30 minutes?

Value	Count	Percent %
1-2 days per week	25	46.3%
3+ days per week	5	9.3%
1-2 days per month	8	14.8%
3+ days per month	8	14.8%
Other	8	14.8%

Statistics	
Total Responses	54
Sum	72.0
Avg.	1.6
StdDev	0.9
Max	3.0

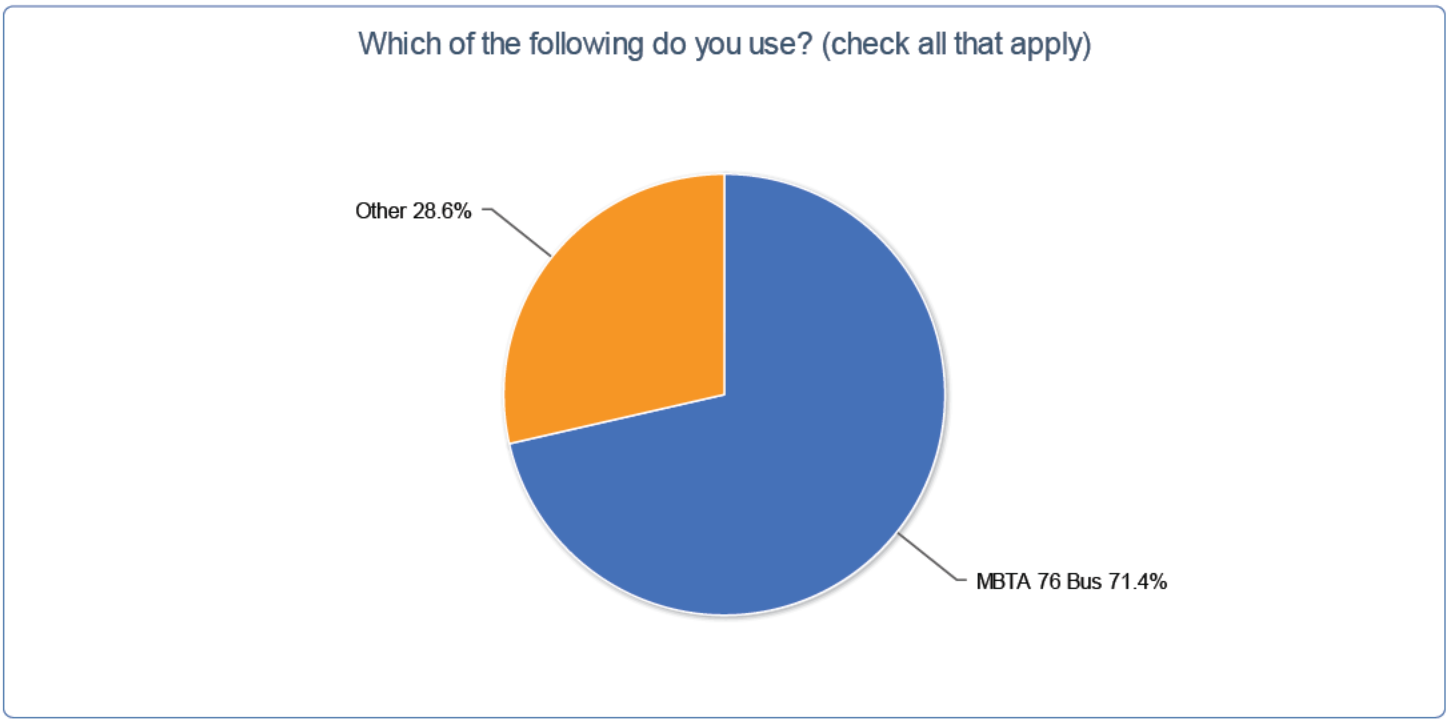
Open-Text Response Breakdown for "Other"	Count
16 out of 16 per/mo	1
Depends if I need to flex	1
Retired	1
Varies all the time	1
never	2
none	1
I work at Hanscom approximately 8-10 per month arriving and departing at various times during the day and traveling either from my home or LOC	1



7. How do you get to Hanscom on most days? What type of transportation do you take?

Value	Count	Percent %
Drive alone	50	86.2%
Dropped off by someone who does not work at Hanscom	0	0.0%
Car pool with other Hanscom employees or students	0	0.0%
Public Transportation	7	12.1%
Walk	0	0.0%
Bicycle	1	1.7%
Other	0	0.0%

Statistics	
Total Responses	58



Which of the following do you use? (check all that apply)

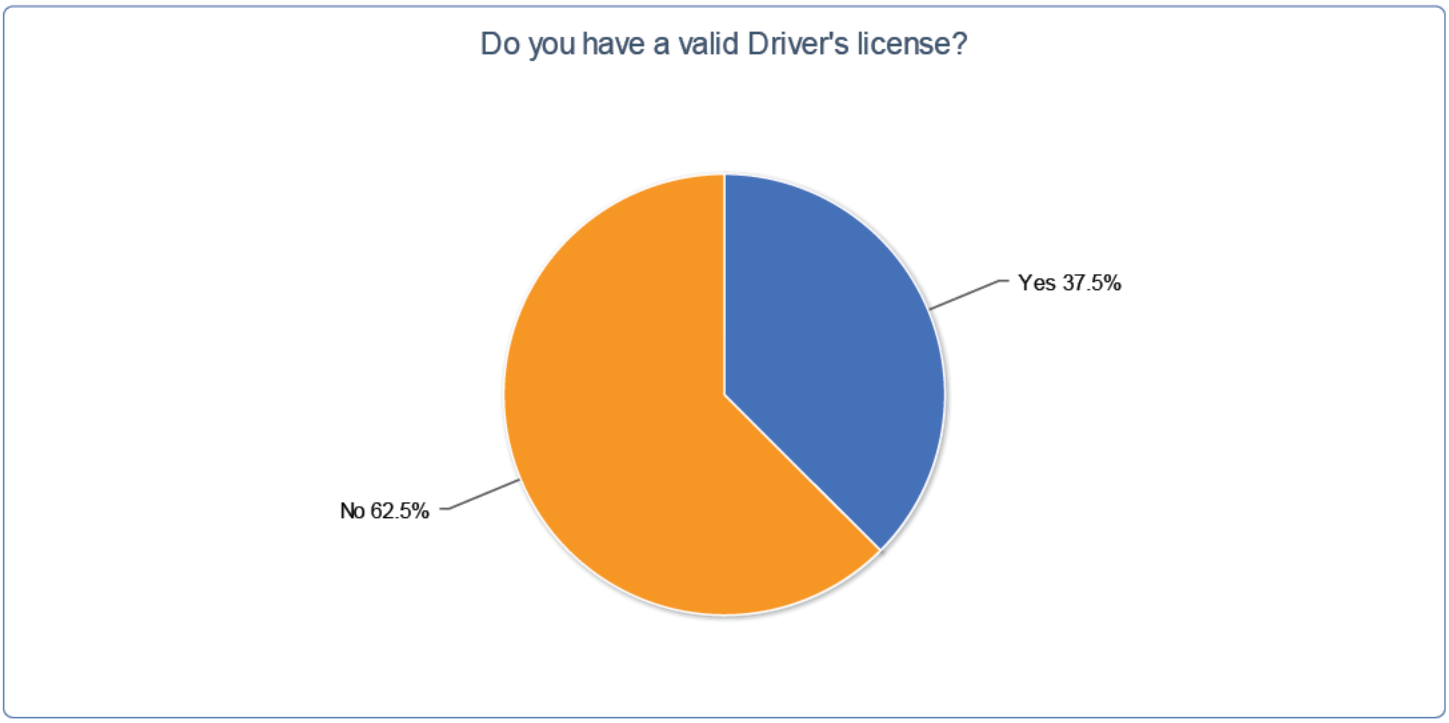
Value	Count	Percent %
MBTA 76 Bus	5	71.4%
LexExpress	0	0.0%
MBTA Commuter Rail	0	0.0%
Other	2	28.6%

Statistics	
Total Responses	7

Open-Text Response Breakdown for "Other"	Count
MBTA Green and Red line	1
Subway(Blue,Green or Orange, Red Lines)	1

How many people are usually in the car (including yourself)?

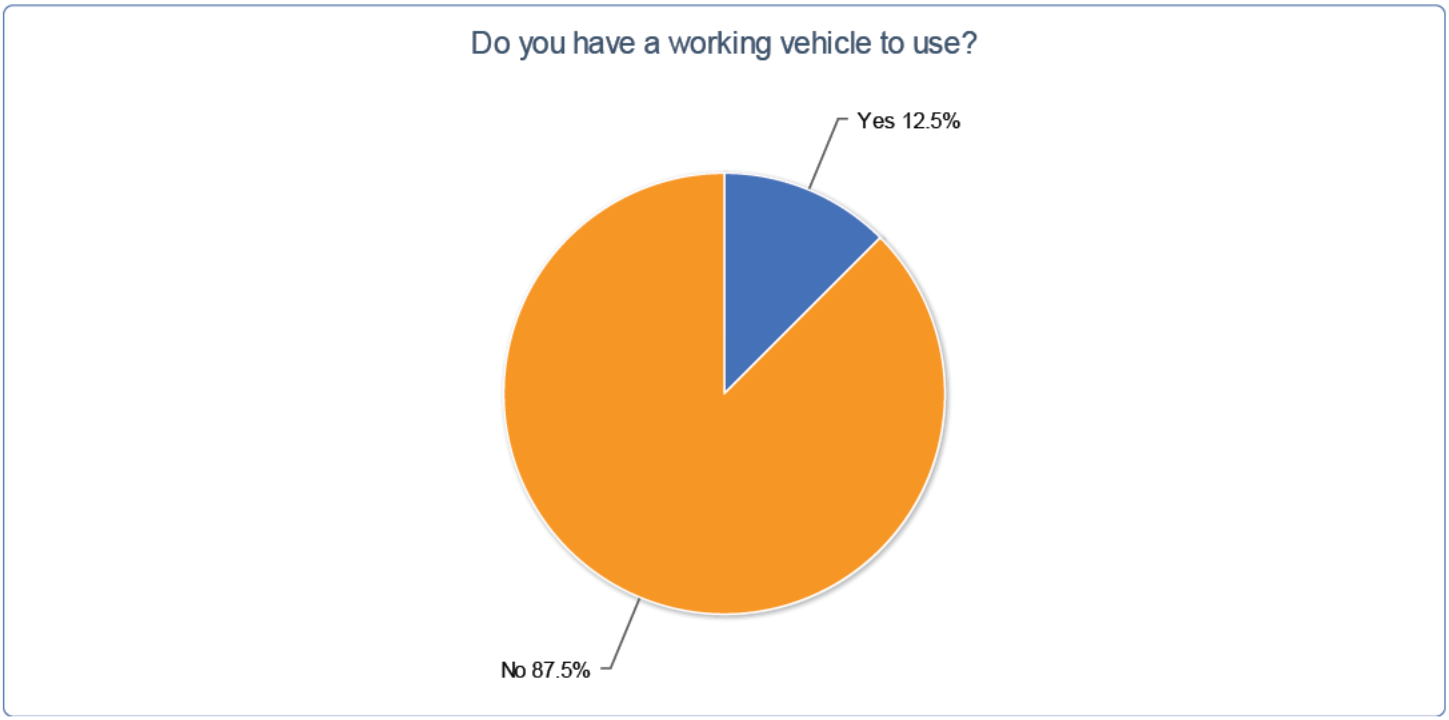
Count	Response



Do you have a valid Driver's license?

Value	Count	Percent %
Yes	3	37.5%
No	5	62.5%

Statistics	
Total Responses	8



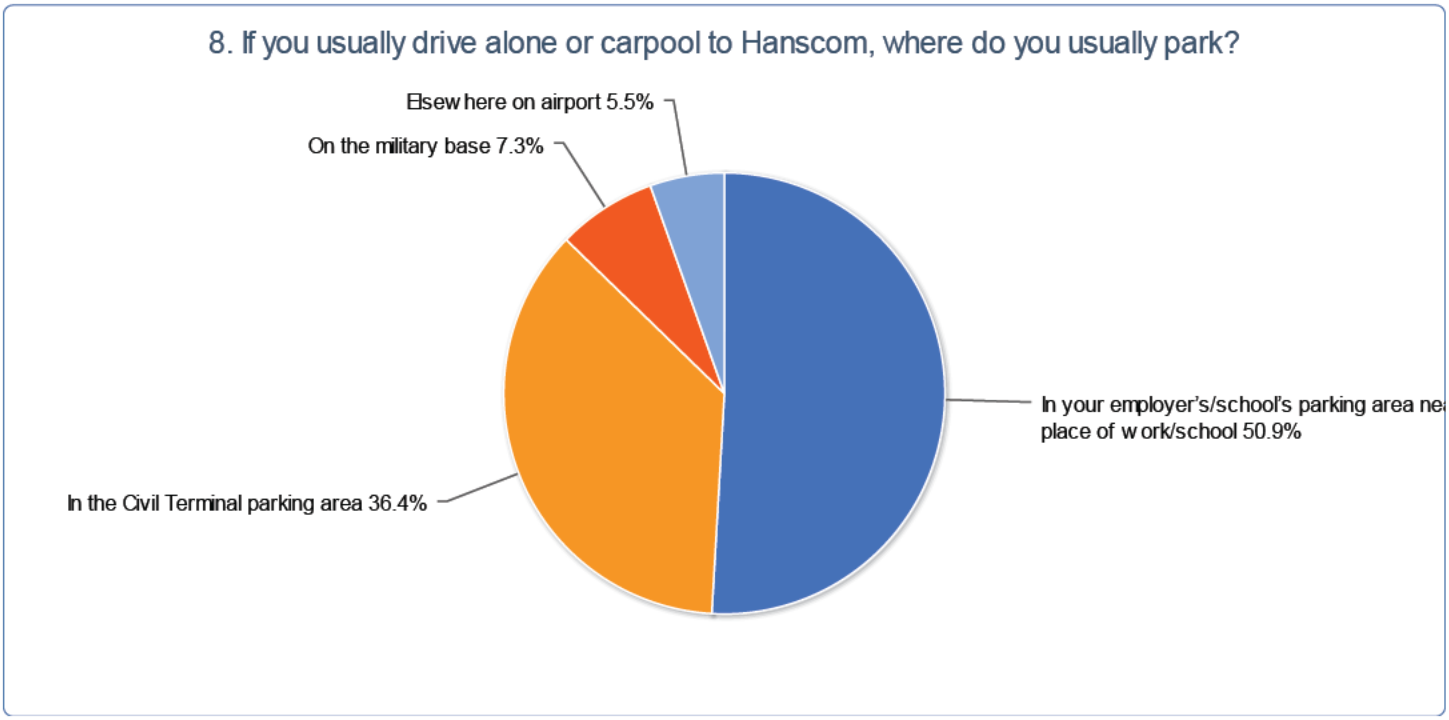
Do you have a working vehicle to use?

Value	Count	Percent %

Statistics	

Yes	1	12.5%
No	7	87.5%
Sometimes	0	0.0%

Total Responses	8



8. If you usually drive alone or carpool to Hanscom, where do you usually park?

Value	Count	Percent %
In your employer's/school's parking area near your place of work/school	28	50.9%
In the Civil Terminal parking area	20	36.4%
On the military base	4	7.3%
Elsewhere on airport	3	5.5%
Elsewhere off airport	0	0.0%

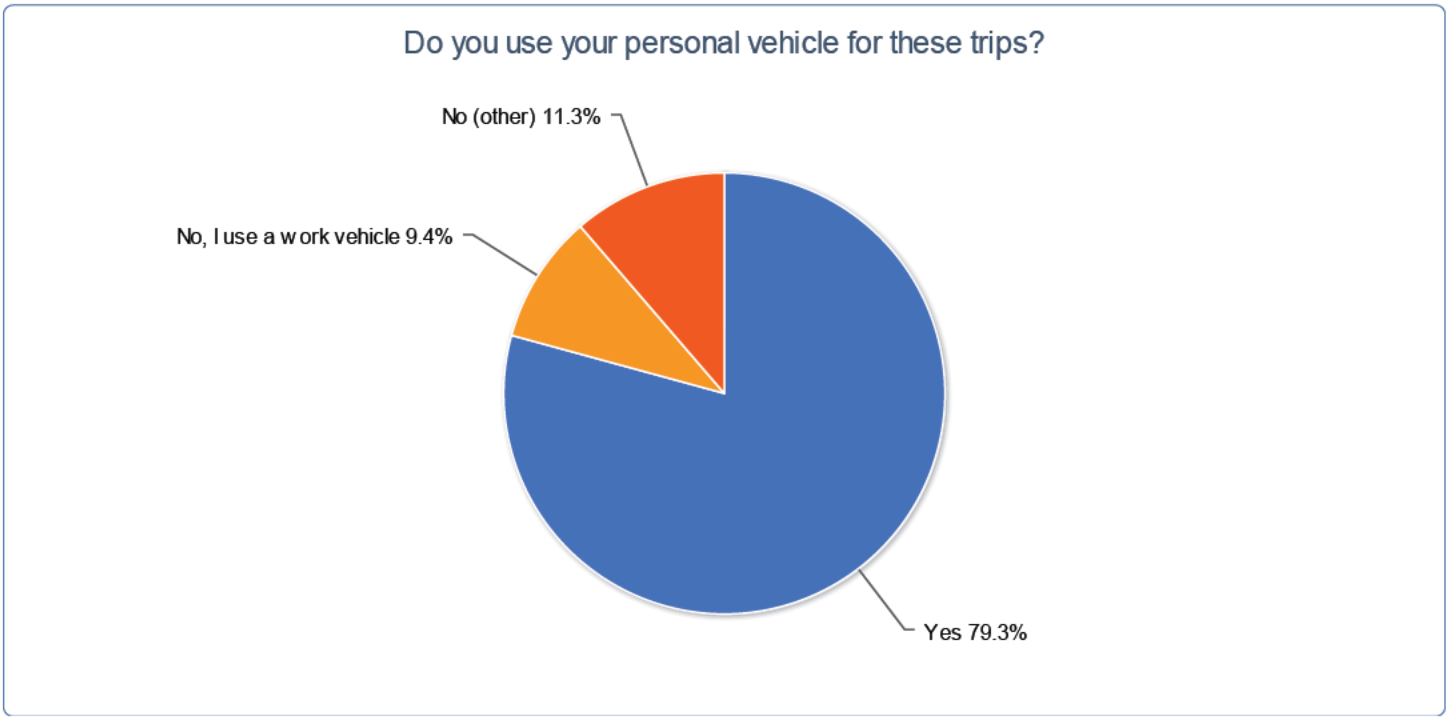
Statistics	
Total Responses	55

Open-Text Response Breakdown for "Elsewhere on airport"	Count
FAA CONTROL TWR	1
Outter Parking lot	1
i dont drive	1

9. On average, how often do you leave Hanscom during the day:

	Frequently	Sometimes	Rarely	Never	Responses
For work/school-related reasons	12.7%	27.3%	45.5%	14.5%	55

	7	15	25	8	
For personal reasons	7.1% 4	16.1% 9	57.1% 32	19.6% 11	56



Do you use your personal vehicle for these trips?

Value	Count	Percent %
Yes	42	79.3%
No, I use a work vehicle	5	9.4%
No (other)	6	11.3%

Statistics	
Total Responses	53

Open-Text Response Breakdown for "No (other)"	Count
Bus, Trains	1
MBTA bus 76	1
Mbta 76	1
bus	1
dont have a car	1
work car for work, personal car for personal	1

10. How long does it take you to travel to Hanscom on a typical day (minutes one-way)?

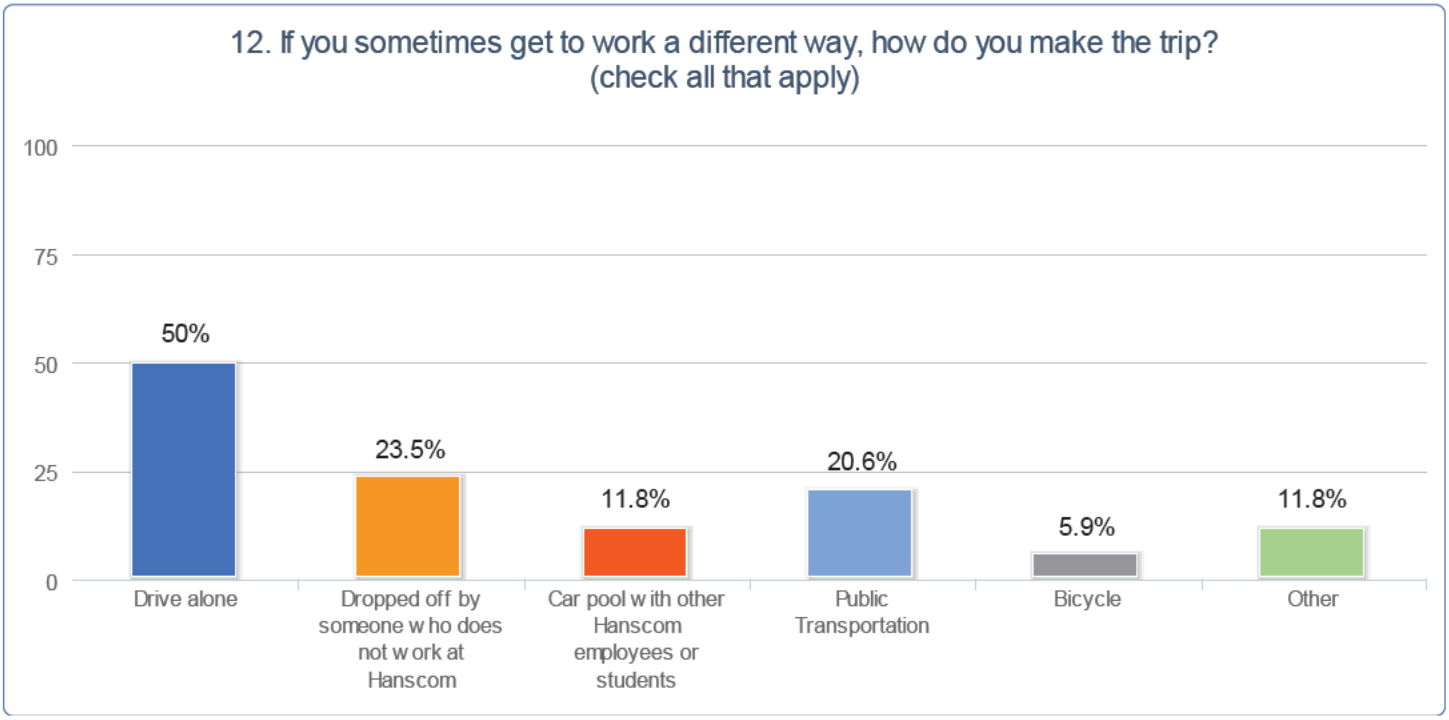
Count	Response

1	1 -2 hours
1	1 hour
1	1.5 hours
1	10 minutes
4	120
5	15
2	15 minutes
1	2 hours
1	2 hrs.
1	20
3	20 minutes
1	20 to 30 mins
1	20-45
1	25
1	25 MINUTES
1	25 minutes
1	25,-35 with traffic on rte 2.
1	2hr
2	30
1	30 MINUTES
1	30 minutes
1	35-45 minutes
3	40
1	40 min.
2	40 minutes
6	45
1	45 min
1	45 minutes
1	45-60 minutes
1	45min
1	55
1	6
1	60
1	60 minutes
1	80 minutes
3	90
1	:30
1	:35
1	half hour

1	hour to hour and half

11. How much do YOU pay for your commute?

	Per day	Per month	Responses
Parking	96.4% 27	78.6% 22	28
Tolls	96.6% 28	82.8% 24	29
Bus, train fares or passes	84.8% 28	84.8% 28	33



12. If you sometimes get to work a different way, how do you make the trip? (check all that apply)

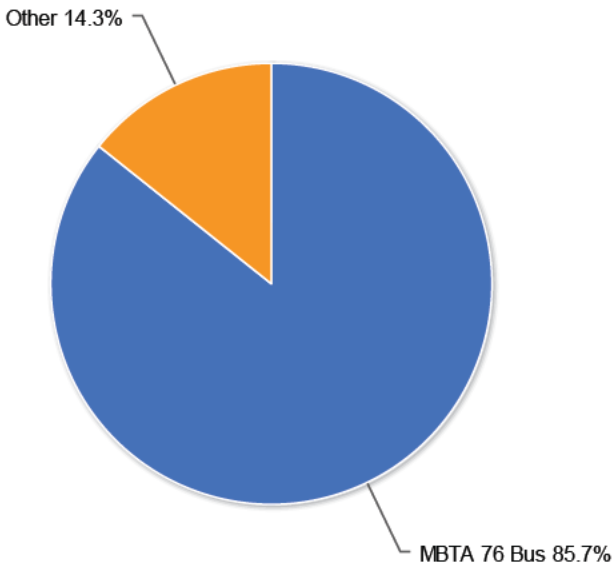
Value	Count	Percent %
Drive alone	17	50.0%
Dropped off by someone who does not work at Hanscom	8	23.5%
Car pool with other Hanscom employees or students	4	11.8%
Public Transportation	7	20.6%
Walk	0	0.0%
Bicycle	2	5.9%

Statistics	
Total Responses	34

Other	4	11.8%

Open-Text Response Breakdown for "Other"	Count
Left Blank	63
Retired	1
motorcycle	2

Which of the following do you use? (check all that apply)



Which of the following do you use? (check all that apply)

Value	Count	Percent %
MBTA 76 Bus	6	85.7%
LexExpress	0	0.0%
MBTA Commuter Rail	0	0.0%
Other	1	14.3%

Statistics	
Total Responses	7

Open-Text Response Breakdown for "Other"	Count
Bus, Subway	1

13. If you drive alone to Hanscom, which of the following describes your reasons? (rank all that apply)

Item	Total Score[1]	Overall Rank

Quickest way to work	539	1
Convenience	520	2
Irregular work schedule	322	3
Need car for personal reasons	302	4
Transit schedules do not work for me	266	5
Need car for work-related trips	185	6
Privacy	178	7
Need car for emergencies	125	8
Not aware of other options	91	9
Don't like taking the bus	68	10
Need car for daycare	42	11
Other modes not as safe	42	12
Other	40	13
Other modes cost too much	18	14

Total Respondents: 54

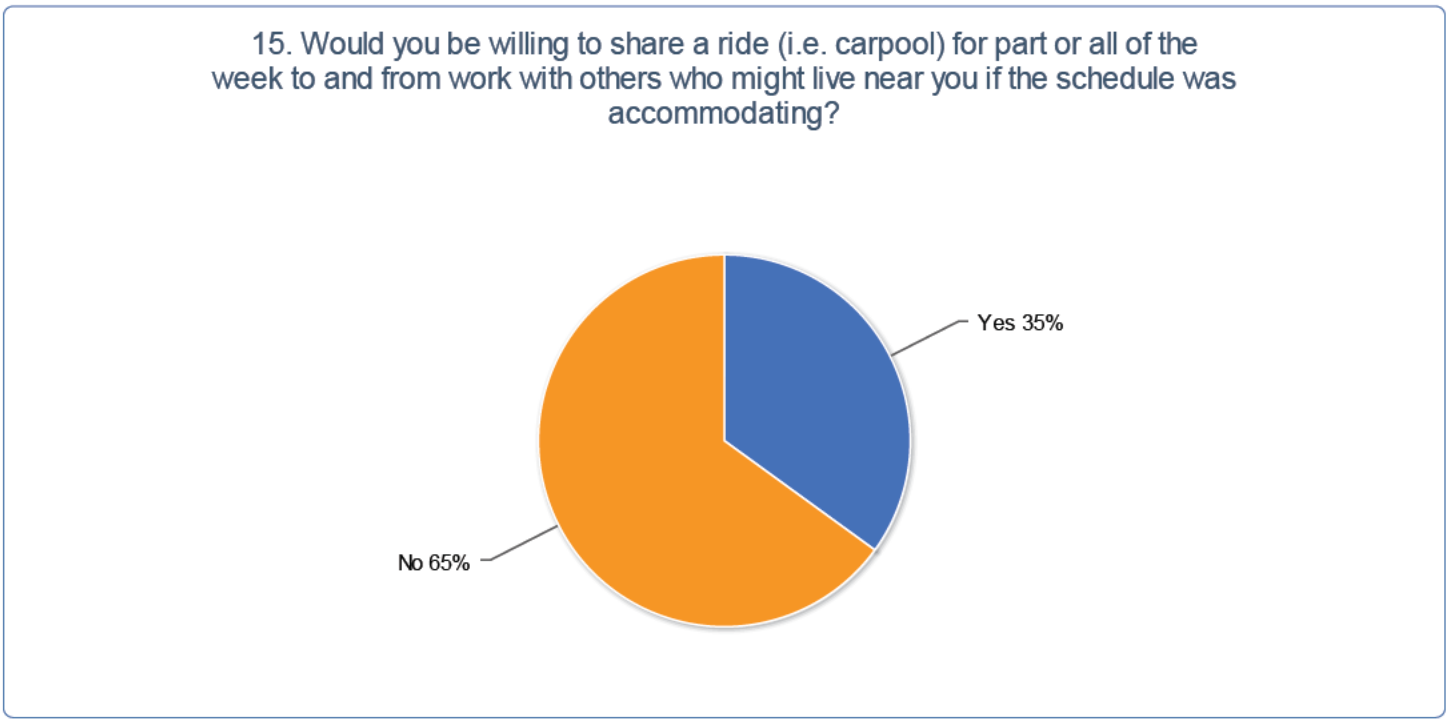
[1] Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

14. Please rank the TOP THREE alternatives that you would consider for traveling to Hanscom Field:

Item	Total Score[1]	Overall Rank
Transit	149	1
Carpool (2+ passengers)	141	2
Other	78	3
Vanpool (6+ passengers)	60	4
Bicycle	45	5
Walk	23	6

Total Respondents: 42

[1] Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.



15. Would you be willing to share a ride (i.e. carpool) for part or all of the week to and from work with others who might live near you if the schedule was accommodating?

Value	Count	Percent %
Yes	21	35.0%
No	39	65.0%
Already do	0	0.0%

Statistics	
Total Responses	60

16. Would you be willing to change to RIDESHARING (i.e. carpooling) if the following incentives or services were in place? (rank all that apply)

Item	Total Score[1]	Overall Rank
Financial incentive	57	1
Finding someone to carpool with	50	2
Free guaranteed ride home	45	3
Company car available if necessary	31	4
Other	25	5
Shuttle bus from park and ride	22	6
Preferential parking for carpools	2	7

Total Respondents: 32

[1] Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

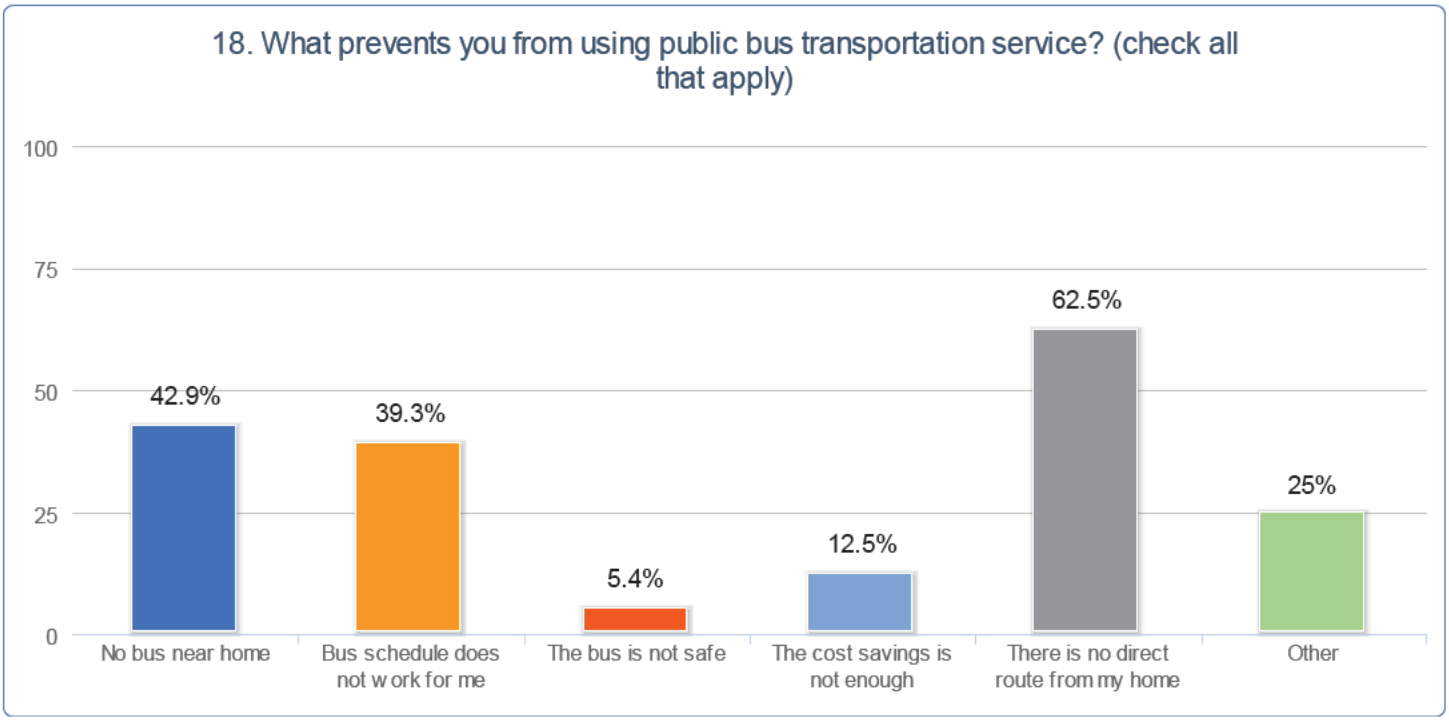
17. If you currently drive alone, would you be willing to change to using TRANSIT if

the following incentives or services were in place? (rank all that apply)

Item	Total Score[1]	Overall Rank
Better transit routes	65	1
Guaranteed ride home	45	2
Company car available if necessary	41	3
Other	27	4
Subsidy for bus passes	26	5
On-site information on routes and times	23	6

Total Respondents: 27

[1] Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.



18. What prevents you from using public bus transportation service? (check all that apply)

Value	Count	Percent %
No bus near home	24	42.9%
Bus schedule does not work for me	22	39.3%
The bus is not safe	3	5.4%
The cost savings is not enough	7	12.5%
There is no direct route from my home	35	62.5%
Other	14	25.0%

Statistics	
Total Responses	56

Open-Text Response Breakdown for "Other"	Count

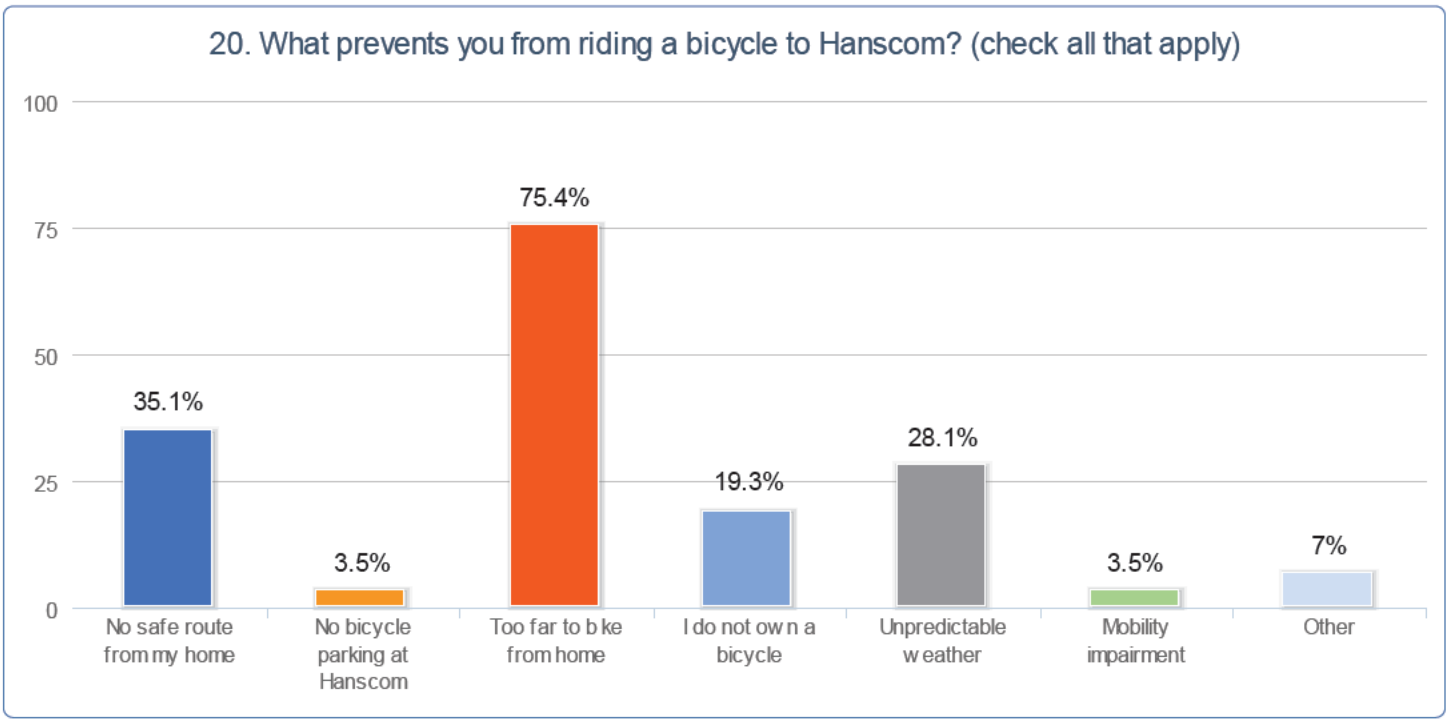
Left Blank	52
Already take bus	1
Irregular schedule	1
Irregular schedule	1
Manager	1
Not convenient	1
There is no route, direct or indirect, from my home.	1
Would cost more, since I'd keep my car and related costs	1
i already take the bus	1
i need to travel to various sites during the day and need a vehicle	1
need car at times	1
need car for daycare pickup	1
no need	1
nothing keep the 76	1
unpredictable work schedules	1

19. Would you be willing to change to riding a BICYCLE if the following incentives or services were in place? (rank all that apply)

Item	Total Score[1]	Overall Rank
Lockers and showers	39	1
Bike path from home to Hanscom Field	34	2
Other	28	3
Secured/covered bike parking	20	4
Reward programs	20	5
Company car available if necessary	13	6
Bad weather plans	12	7

Total Respondents: 20

[1] Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

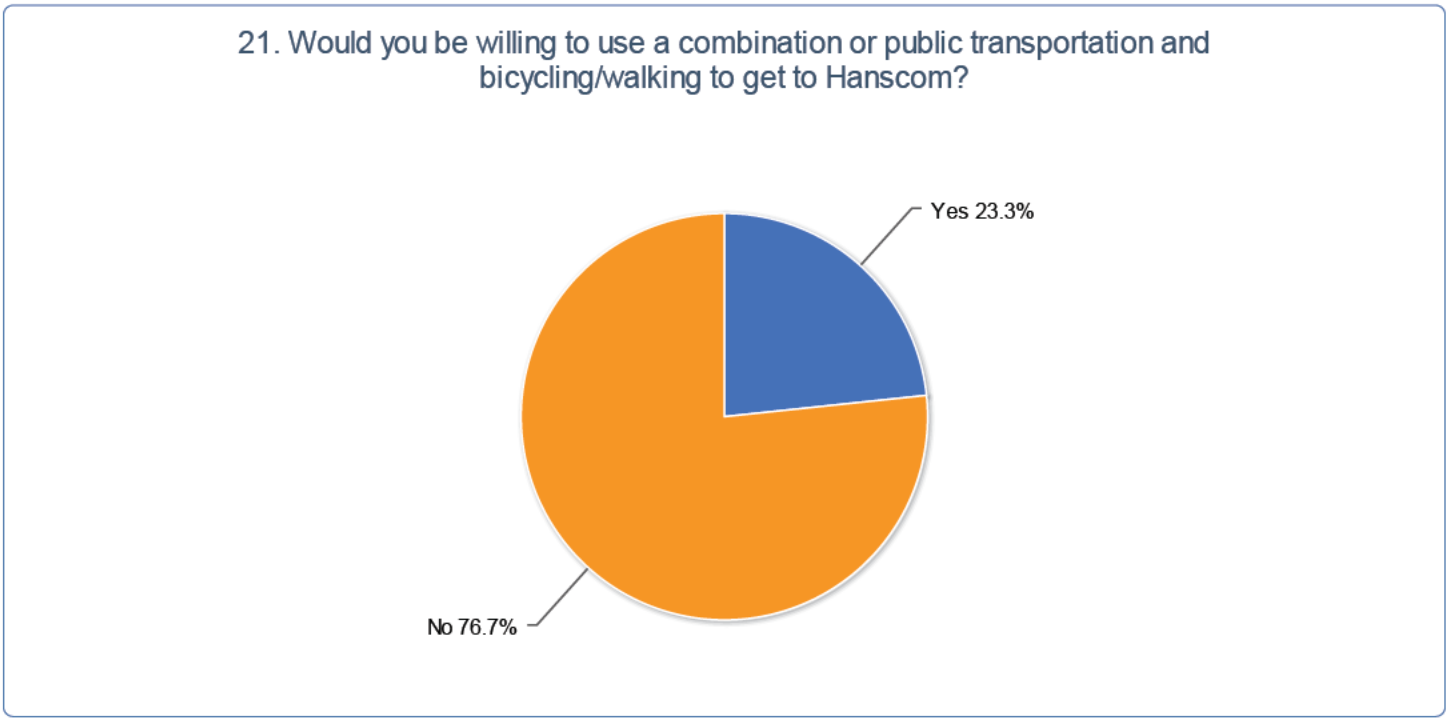


20. What prevents you from riding a bicycle to Hanscom? (check all that apply)

Value	Count	Percent %
No safe route from my home	20	35.1%
No bicycle parking at Hanscom	2	3.5%
Too far to bike from home	43	75.4%
I do not own a bicycle	11	19.3%
Unpredictable weather	16	28.1%
Mobility impairment	2	3.5%
Other	4	7.0%

Statistics	
Total Responses	57

Open-Text Response Breakdown for "Other"	Count
Left Blank	62
Costs me an hour of work time in my day, and I arrive uncomfortably sweaty	1
Not as convenient	1
Unpredictable schedule/need for car	1
age	1



21. Would you be willing to use a combination or public transportation and bicycling/walking to get to Hanscom?

Value	Count	Percent %
Yes	14	23.3%
No	46	76.7%

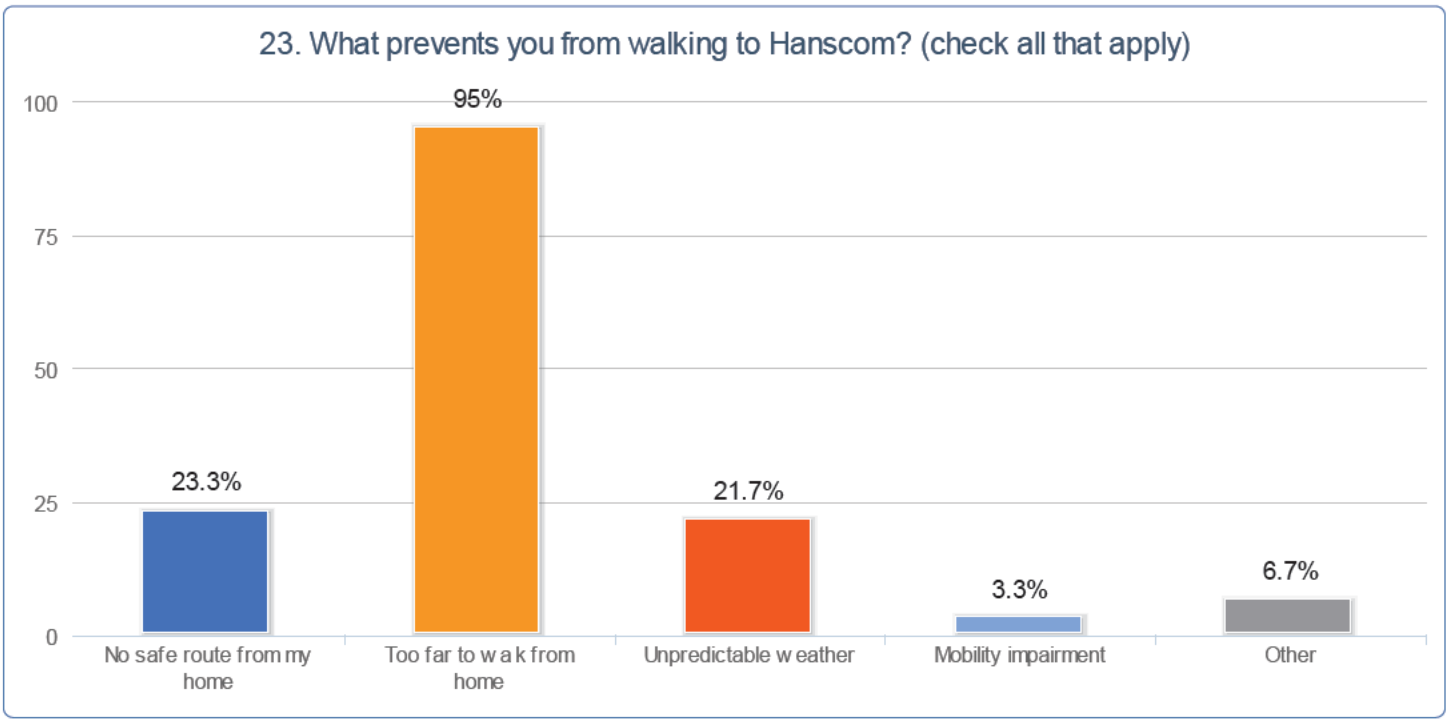
Statistics	
Total Responses	60

22. Would you be willing to change to WALKING if the following incentives or services were in place? (rank all that apply)

Item	Total Score[1]	Overall Rank
Other	16	1
Reward programs	11	2
Sidewalks from home to Hanscom field	8	3
Bad weather plans	8	4
Company car available if necessary	7	5
Lockers and showers	3	6

Total Respondents: 10

[1] Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.



23. What prevents you from walking to Hanscom? (check all that apply)

Value	Count	Percent %
No safe route from my home	14	23.3%
Too far to walk from home	57	95.0%
Unpredictable weather	13	21.7%
Mobility impairment	2	3.3%
Other	4	6.7%

Statistics	
Total Responses	60

Open-Text Response Breakdown for "Other"	Count
Left Blank	62
I am 73 years old	1
Takes too long	1
baggage	1
need car for daycare pickup	1

24. What would most motivate you to choose to shared a ride, take transit, walk or bike? (rank all that apply)

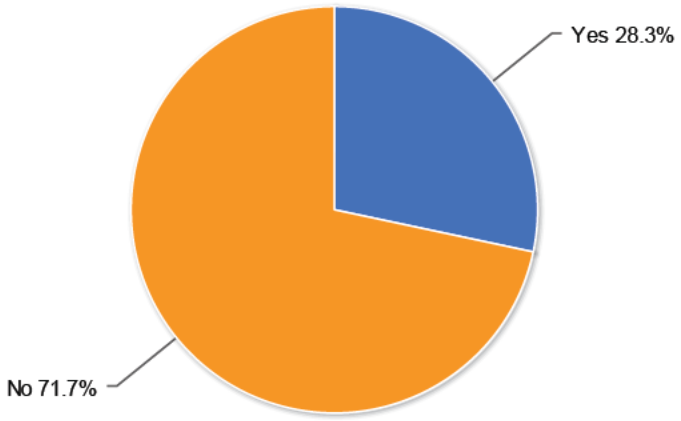
Item	Total Score[1]	Overall Rank
Reduced cost of commuting	85	1
The incentives offered	67	2
Reducing traffic and congestion	37	3
Health benefits of walking/biking	33	4

Helping the environment	27	5
Other	14	6
Social interactions of car pools	13	7

Total Respondents: 34

[1] Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

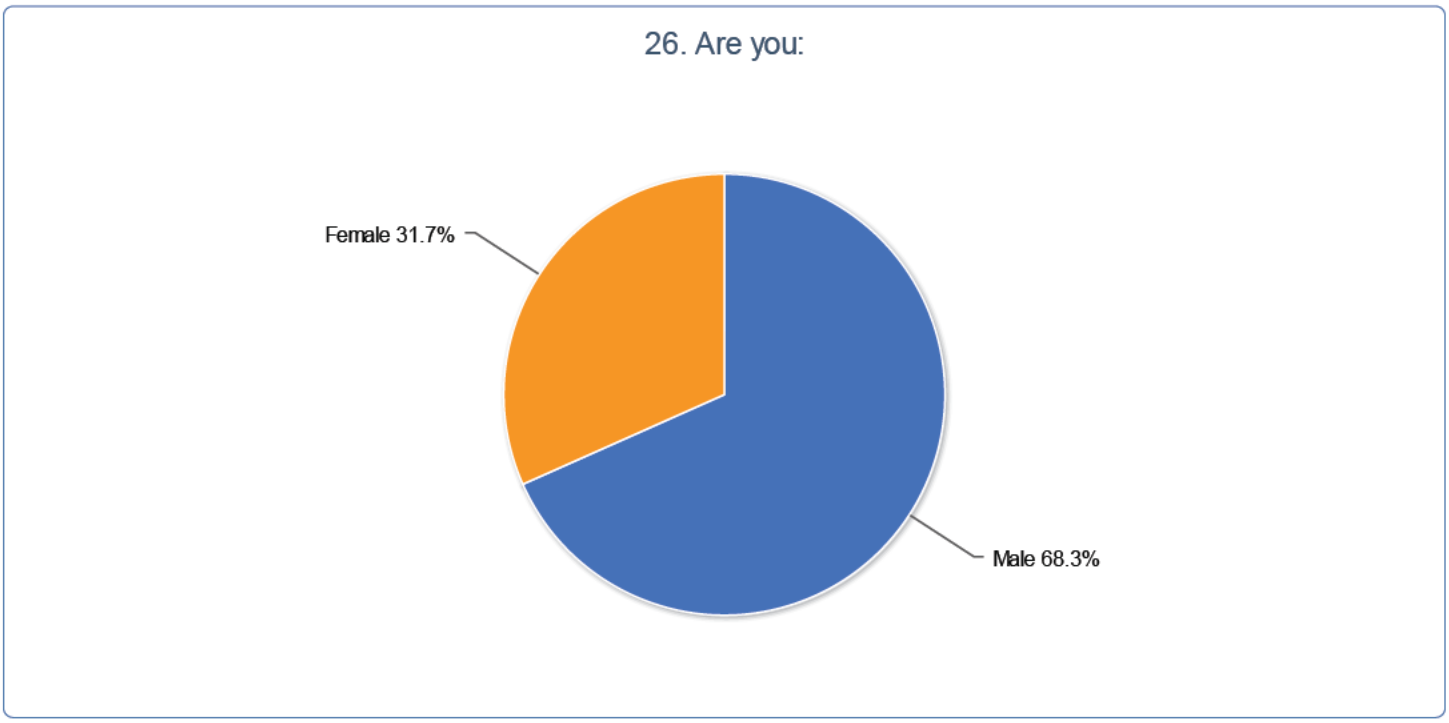
25. Would you like to learn more about programs and incentives to encourage alternative commuting choices?



25. Would you like to learn more about programs and incentives to encourage alternative commuting choices?

Value	Count	Percent %
Yes	17	28.3%
No	43	71.7%

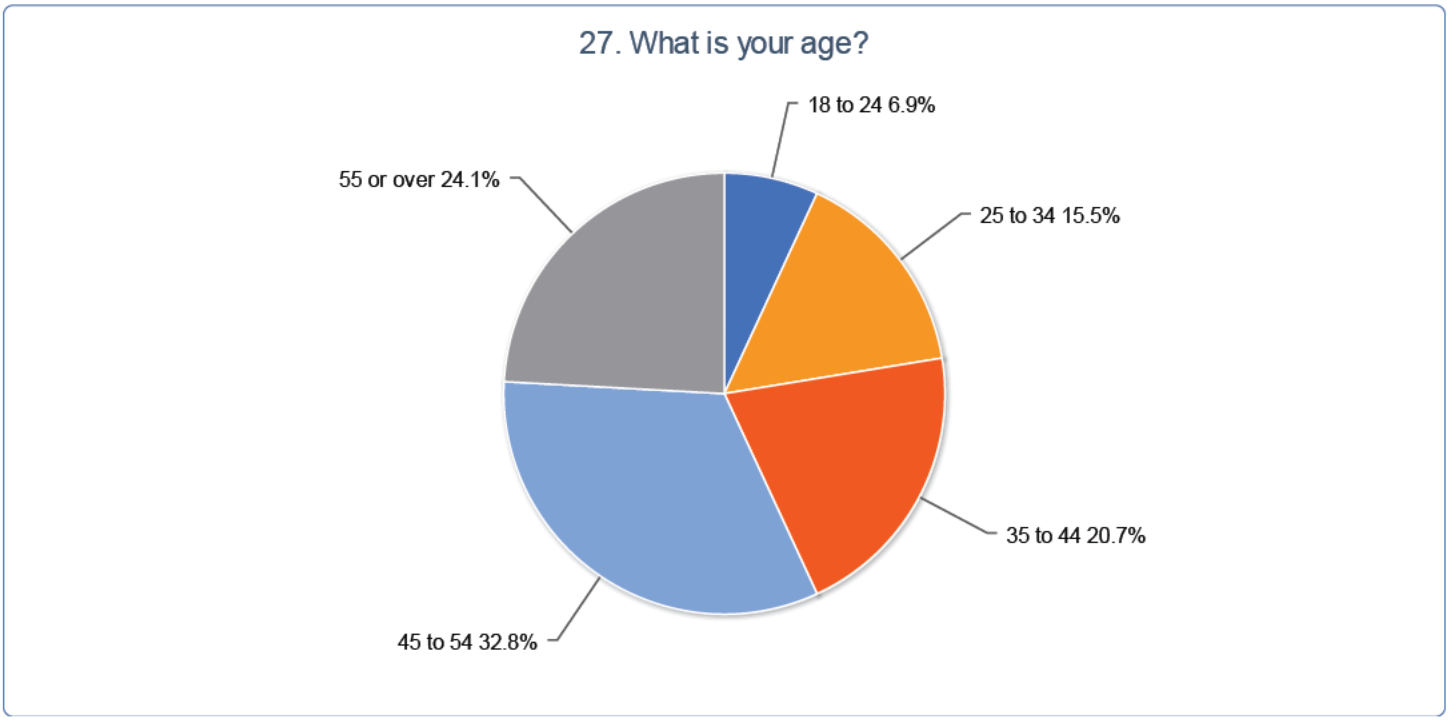
Statistics	
Total Responses	60



26. Are you:

Value	Count	Percent %
Male	41	68.3%
Female	19	31.7%

Statistics	
Total Responses	60



27. What is your age?

Value	Count	Percent %

Statistics	

Under 18	0	0.0%
18 to 24	4	6.9%
25 to 34	9	15.5%
35 to 44	12	20.7%
45 to 54	19	32.8%
55 or over	14	24.1%

Total Responses	58
Sum	2,342.0
Avg.	40.4
StdDev	11.7
Max	55.0

28. Do you have any other thoughts or comments on transportation to/from Hanscom Field?

Count	Response
1	76 Bus driver at 6:20 a.m. is always late
1	Dangerous intersection at the entrance
1	I live 110 miles away none of it is going to work for me
1	Ready auto or bike access through the air base. It would cut off five miles of commute a day.
1	arrive/leave early
1	keep the bus it is busy no need to get rid of it.
1	no
1	no :)
1	More choices and times for arrivals and departures from Hanscom Field. I feel our public transportation system is inadequate and even more inadequate for people who live in the suburbs.
1	I need the bus 76 to get home, work, and school everyday. I've been using this bus for 10 months. It helps me and some of my other classmates. We need this to get to school. Education is important I trust my safety with the mbta. Please keep the line open. Thank you
1	I am neither a student, nor an employee. I rent a hanger and need to drive my car on an irregular schedule to Hanscom
1	I use the Battle Road Trail for 1/2 of my commute to work on a bicycle. However, we need a BIKE LANE on Virginia Rd and the other access roads.
1	Shave the 90 degree turn on Virginia Road (behind T hangars) and eliminate the stop sign there. Increase speed limit to 40 mph on Virginia Road along straight stretch behind RW 5. Offer rush-hour shuttle service to/from area around K-Mart or Roche Brothers in Acton.
1	Keep the bus route of 76 from Alewife to hanscom so I can graduate from the National Aviation Acadamy

Appendix C-2

2012 Intersection Turning Movement Counts

N/S: Jughandle/ Hartwell Avenue
E/W: Bedford Street (Route 4/225)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 123082 A
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Jughandle From North				Bedford Road (Route 4/225) From East				Hartwell Avenue From South				Bedford Road (Route 4/225) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	0	144	13	0	0	61	1	0	16	0	1	0	76	120	0	0	432
06:15 AM	0	165	20	0	0	81	0	0	29	0	0	0	101	136	0	0	532
06:30 AM	0	198	31	0	0	119	0	0	31	0	10	0	107	208	0	0	704
06:45 AM	0	209	47	0	0	140	0	0	48	0	10	0	109	231	0	0	794
Total	0	716	111	0	0	401	1	0	124	0	21	0	393	695	0	0	2462
07:00 AM	0	189	47	0	0	144	0	0	52	0	17	0	109	243	0	0	801
07:15 AM	0	187	40	0	0	159	0	0	67	0	14	0	101	258	0	0	826
07:30 AM	0	181	46	0	0	156	0	0	69	0	5	0	109	275	0	0	841
07:45 AM	1	266	42	0	0	179	0	0	80	0	20	0	121	225	0	0	934
Total	1	823	175	0	0	638	0	0	268	0	56	0	440	1001	0	0	3402
08:00 AM	0	213	50	0	0	151	0	0	117	0	20	0	124	227	0	0	902
08:15 AM	0	238	48	0	0	155	0	0	97	0	16	0	94	226	0	0	874
08:30 AM	0	268	59	0	0	148	0	0	71	0	12	0	127	188	0	0	873
08:45 AM	0	231	63	0	0	176	0	0	76	0	12	0	103	200	0	0	861
Total	0	950	220	0	0	630	0	0	361	0	60	0	448	841	0	0	3510
Grand Total	1	2489	506	0	0	1669	1	0	753	0	137	0	1281	2537	0	0	9374
Apprch %	0	83.1	16.9	0	0	99.9	0.1	0	84.6	0	15.4	0	33.6	66.4	0	0	
Total %	0	26.6	5.4	0	0	17.8	0	0	8	0	1.5	0	13.7	27.1	0	0	
Cars	1	2425	498	0	0	1597	1	0	686	0	128	0	1271	2468	0	0	9075
% Cars	100	97.4	98.4	0	0	95.7	100	0	91.1	0	93.4	0	99.2	97.3	0	0	96.8
Heavy Vehicles	0	64	8	0	0	72	0	0	67	0	9	0	10	69	0	0	299
% Heavy Vehicles	0	2.6	1.6	0	0	4.3	0	0	8.9	0	6.6	0	0.8	2.7	0	0	3.2

	Jughandle From North					Bedford Road (Route 4/225) From East					Hartwell Avenue From South					Bedford Road (Route 4/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	1	266	42	0	309	0	179	0	0	179	80	0	20	0	100	121	225	0	0	346	934
08:00 AM	0	213	50	0	263	0	151	0	0	151	117	0	20	0	137	124	227	0	0	351	902
08:15 AM	0	238	48	0	286	0	155	0	0	155	97	0	16	0	113	94	226	0	0	320	874
08:30 AM	0	268	59	0	327	0	148	0	0	148	71	0	12	0	83	127	188	0	0	315	873
Total Volume	1	985	199	0	1185	0	633	0	0	633	365	0	68	0	433	466	866	0	0	1332	3583
% App. Total	0.1	83.1	16.8	0		0	100	0	0		84.3	0	15.7	0		35	65	0	0		
PHF	.250	.919	.843	.000	.906	.000	.884	.000	.000	.884	.780	.000	.850	.000	.790	.917	.954	.000	.000	.949	.959
Cars	1	959	196	0	1156	0	607	0	0	607	335	0	64	0	399	465	841	0	0	1306	3468
% Cars	100	97.4	98.5	0	97.6	0	95.9	0	0	95.9	91.8	0	94.1	0	92.1	99.8	97.1	0	0	98.0	96.8
Heavy Vehicles	0	26	3	0	29	0	26	0	0	26	30	0	4	0	34	1	25	0	0	26	115
% Heavy Vehicles	0	2.6	1.5	0	2.4	0	4.1	0	0	4.1	8.2	0	5.9	0	7.9	0.2	2.9	0	0	2.0	3.2

N/S: Jughandle/ Hartwell Avenue
E/W: Bedford Street (Route 4/225)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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File Name : 123082 A
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Groups Printed- Cars

	Jughandle From North				Bedford Road (Route 4/225) From East				Hartwell Avenue From South				Bedford Road (Route 4/225) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	0	141	13	0	0	58	1	0	15	0	1	0	76	115	0	0	420
06:15 AM	0	163	18	0	0	77	0	0	24	0	0	0	99	134	0	0	515
06:30 AM	0	196	31	0	0	115	0	0	30	0	6	0	106	203	0	0	687
06:45 AM	0	204	47	0	0	130	0	0	44	0	9	0	107	228	0	0	769
Total	0	704	109	0	0	380	1	0	113	0	16	0	388	680	0	0	2391
07:00 AM	0	182	47	0	0	141	0	0	49	0	17	0	107	238	0	0	781
07:15 AM	0	182	39	0	0	155	0	0	57	0	14	0	100	248	0	0	795
07:30 AM	0	175	44	0	0	151	0	0	66	0	5	0	109	267	0	0	817
07:45 AM	1	261	42	0	0	171	0	0	72	0	20	0	121	218	0	0	906
Total	1	800	172	0	0	618	0	0	244	0	56	0	437	971	0	0	3299
08:00 AM	0	209	49	0	0	143	0	0	106	0	19	0	124	220	0	0	870
08:15 AM	0	226	47	0	0	147	0	0	91	0	15	0	94	221	0	0	841
08:30 AM	0	263	58	0	0	146	0	0	66	0	10	0	126	182	0	0	851
08:45 AM	0	223	63	0	0	163	0	0	66	0	12	0	102	194	0	0	823
Total	0	921	217	0	0	599	0	0	329	0	56	0	446	817	0	0	3385
Grand Total	1	2425	498	0	0	1597	1	0	686	0	128	0	1271	2468	0	0	9075
Apprch %	0	82.9	17	0	0	99.9	0.1	0	84.3	0	15.7	0	34	66	0	0	
Total %	0	26.7	5.5	0	0	17.6	0	0	7.6	0	1.4	0	14	27.2	0	0	

	Jughandle From North					Bedford Road (Route 4/225) From East					Hartwell Avenue From South					Bedford Road (Route 4/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	1	261	42	0	304	0	171	0	0	171	72	0	20	0	92	121	218	0	0	339	906
08:00 AM	0	209	49	0	258	0	143	0	0	143	106	0	19	0	125	124	220	0	0	344	870
08:15 AM	0	226	47	0	273	0	147	0	0	147	91	0	15	0	106	94	221	0	0	315	841
08:30 AM	0	263	58	0	321	0	146	0	0	146	66	0	10	0	76	126	182	0	0	308	851
Total Volume	1	959	196	0	1156	0	607	0	0	607	335	0	64	0	399	465	841	0	0	1306	3468
% App. Total	0.1	83	17	0		0	100	0	0		84	0	16	0		35.6	64.4	0	0		
PHF	.250	.912	.845	.000	.900	.000	.887	.000	.000	.887	.790	.000	.800	.000	.798	.923	.951	.000	.000	.949	.957

N/S: Jughandle/ Hartwell Avenue
E/W: Bedford Street (Route 4/225)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 A
Site Code : TBA
Start Date : 11/13/2012
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Groups Printed- Heavy Vehicles

	Jughandle From North				Bedford Road (Route 4/225) From East				Hartwell Avenue From South				Bedford Road (Route 4/225) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	0	3	0	0	0	3	0	0	1	0	0	0	0	5	0	0	12
06:15 AM	0	2	2	0	0	4	0	0	5	0	0	0	2	2	0	0	17
06:30 AM	0	2	0	0	0	4	0	0	1	0	4	0	1	5	0	0	17
06:45 AM	0	5	0	0	0	10	0	0	4	0	1	0	2	3	0	0	25
Total	0	12	2	0	0	21	0	0	11	0	5	0	5	15	0	0	71
07:00 AM	0	7	0	0	0	3	0	0	3	0	0	0	2	5	0	0	20
07:15 AM	0	5	1	0	0	4	0	0	10	0	0	0	1	10	0	0	31
07:30 AM	0	6	2	0	0	5	0	0	3	0	0	0	0	8	0	0	24
07:45 AM	0	5	0	0	0	8	0	0	8	0	0	0	0	7	0	0	28
Total	0	23	3	0	0	20	0	0	24	0	0	0	3	30	0	0	103
08:00 AM	0	4	1	0	0	8	0	0	11	0	1	0	0	7	0	0	32
08:15 AM	0	12	1	0	0	8	0	0	6	0	1	0	0	5	0	0	33
08:30 AM	0	5	1	0	0	2	0	0	5	0	2	0	1	6	0	0	22
08:45 AM	0	8	0	0	0	13	0	0	10	0	0	0	1	6	0	0	38
Total	0	29	3	0	0	31	0	0	32	0	4	0	2	24	0	0	125
Grand Total	0	64	8	0	0	72	0	0	67	0	9	0	10	69	0	0	299
Apprch %	0	88.9	11.1	0	0	100	0	0	88.2	0	11.8	0	12.7	87.3	0	0	
Total %	0	21.4	2.7	0	0	24.1	0	0	22.4	0	3	0	3.3	23.1	0	0	

	Jughandle From North					Bedford Road (Route 4/225) From East					Hartwell Avenue From South					Bedford Road (Route 4/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	0	4	1	0	5	0	8	0	0	8	11	0	1	0	12	0	7	0	0	7	32
08:15 AM	0	12	1	0	13	0	8	0	0	8	6	0	1	0	7	0	5	0	0	5	33
08:30 AM	0	5	1	0	6	0	2	0	0	2	5	0	2	0	7	1	6	0	0	7	22
08:45 AM	0	8	0	0	8	0	13	0	0	13	10	0	0	0	10	1	6	0	0	7	38
Total Volume	0	29	3	0	32	0	31	0	0	31	32	0	4	0	36	2	24	0	0	26	125
% App. Total	0	90.6	9.4	0		0	100	0	0		88.9	0	11.1	0		7.7	92.3	0	0		
PHF	.000	.604	.750	.000	.615	.000	.596	.000	.000	.596	.727	.000	.500	.000	.750	.500	.857	.000	.000	.929	.822

N/S: Jughandle/ Hartwell Avenue
E/W: Bedford Street (Route 4/225)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 A
Site Code : TBA
Start Date : 11/13/2012
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Groups Printed- Peds and Bicycles

	Jughandle From North				Bedford Road (Route 4/225) From East				Hartwell Avenue From South				Bedford Road (Route 4/225) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
06:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
06:30 AM	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	0	8
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	0	4	1	0	0	4	0	2	0	0	11
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
07:30 AM	0	0	0	2	0	0	0	1	0	0	0	1	0	0	0	2	6
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	0	0	1	0	0	1	1	0	0	0	2	7
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
Grand Total	0	0	0	3	0	0	0	5	1	0	1	5	0	2	0	3	20
Apprch %	0	0	0	100	0	0	0	100	14.3	0	14.3	71.4	0	40	0	60	
Total %	0	0	0	15	0	0	0	25	5	0	5	25	0	10	0	15	

	Jughandle From North					Bedford Road (Route 4/225) From East					Hartwell Avenue From South					Bedford Road (Route 4/225) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. 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	0	0	0	0	0	0	0	1	0	0	1	1
06:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
06:30 AM	0	0	0	0	0	0	0	0	4	4	0	0	0	4	4	0	0	0	0	0	8
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total Volume	0	0	0	0	0	0	0	0	4	4	1	0	0	4	5	0	2	0	0	2	11
% App. Total	0	0	0	0		0	0	0	100		20	0	0	80		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.250	.000	.000	.250	.313	.000	.500	.000	.000	.500	.344

N/S: Jughandle/ Hartwell Avenue
E/W: Bedford Street (Route 4/225)
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Client: Toole Engineering/ C. Fink

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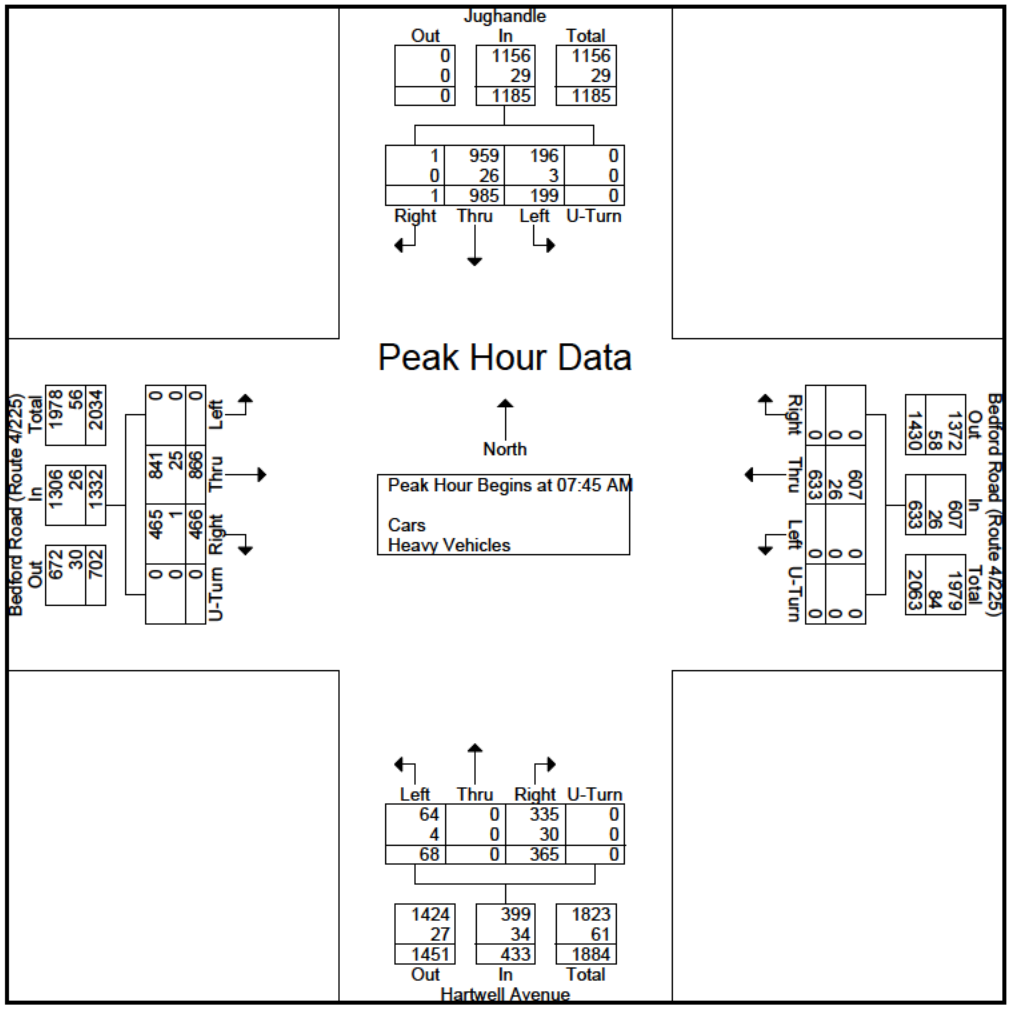
	Jughandle From North					Bedford Road (Route 4/225) From East					Hartwell Avenue From South					Bedford Road (Route 4/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak 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	1	266	42	0	309	0	179	0	0	179	80	0	20	0	100	121	225	0	0	346	934
08:00 AM	0	213	50	0	263	0	151	0	0	151	117	0	20	0	137	124	227	0	0	351	902
08:15 AM	0	238	48	0	286	0	155	0	0	155	97	0	16	0	113	94	226	0	0	320	874
08:30 AM	0	268	59	0	327	0	148	0	0	148	71	0	12	0	83	127	188	0	0	315	873
Total Volume	1	985	199	0	1185	0	633	0	0	633	365	0	68	0	433	466	866	0	0	1332	3583
% App. Total	0.1	83.1	16.8	0		0	100	0	0		84.3	0	15.7	0		35	65	0	0		
PHF	.250	.919	.843	.000	.906	.000	.884	.000	.000	.884	.780	.000	.850	.000	.790	.917	.954	.000	.000	.949	.959
Cars	1	959	196	0	1156	0	607	0	0	607	335	0	64	0	399	465	841	0	0	1306	3468
% Cars	100	97.4	98.5	0	97.6	0	95.9	0	0	95.9	91.8	0	94.1	0	92.1	99.8	97.1	0	0	98.0	96.8
Heavy Vehicles	0	26	3	0	29	0	26	0	0	26	30	0	4	0	34	1	25	0	0	26	115
% Heavy Vehicles	0	2.6	1.5	0	2.4	0	4.1	0	0	4.1	8.2	0	5.9	0	7.9	0.2	2.9	0	0	2.0	3.2



N/S: Massachusetts Avenu/ Cranberry Hill
E/W: Marrett Road (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 B
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Cranberry Hill From South				Marrett Road (Route 2A) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	3	1	13	0	33	91	9	0	2	0	0	0	1	33	8	0	194
06:15 AM	3	0	23	0	38	118	10	0	0	0	0	0	1	50	8	0	251
06:30 AM	10	1	28	0	46	127	12	0	1	0	0	0	2	84	12	0	323
06:45 AM	12	4	25	0	58	150	21	0	2	0	0	0	2	88	21	0	383
Total	28	6	89	0	175	486	52	0	5	0	0	0	6	255	49	0	1151
07:00 AM	28	5	53	0	59	166	28	0	5	1	1	0	4	103	22	0	475
07:15 AM	19	14	62	0	76	150	54	0	16	0	0	0	5	137	23	0	556
07:30 AM	33	23	55	0	65	146	74	0	26	5	2	0	2	150	24	0	605
07:45 AM	33	18	83	0	85	156	37	0	20	14	4	0	5	159	33	0	647
Total	113	60	253	0	285	618	193	0	67	20	7	0	16	549	102	0	2283
08:00 AM	33	7	79	0	85	115	31	0	12	5	0	0	3	165	30	0	565
08:15 AM	39	18	82	0	99	117	29	0	7	3	1	0	8	157	32	0	592
08:30 AM	38	5	92	0	88	103	19	0	9	5	4	0	7	164	38	0	572
08:45 AM	27	6	72	0	86	126	34	0	4	3	1	0	14	146	42	0	561
Total	137	36	325	0	358	461	113	0	32	16	6	0	32	632	142	0	2290
Grand Total	278	102	667	0	818	1565	358	0	104	36	13	0	54	1436	293	0	5724
Apprch %	26.6	9.7	63.7	0	29.8	57.1	13.1	0	68	23.5	8.5	0	3	80.5	16.4	0	
Total %	4.9	1.8	11.7	0	14.3	27.3	6.3	0	1.8	0.6	0.2	0	0.9	25.1	5.1	0	
Cars	268	99	656	0	799	1495	346	0	97	35	13	0	54	1390	280	0	5532
% Cars	96.4	97.1	98.4	0	97.7	95.5	96.6	0	93.3	97.2	100	0	100	96.8	95.6	0	96.6
Heavy Vehicles	10	3	11	0	19	70	12	0	7	1	0	0	0	46	13	0	192
% Heavy Vehicles	3.6	2.9	1.6	0	2.3	4.5	3.4	0	6.7	2.8	0	0	0	3.2	4.4	0	3.4

	Massachusetts Avenue From North					Marrett Road (Route 2A) From East					Cranberry Hill From South					Marrett Road (Route 2A) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	33	23	55	0	111	65	146	74	0	285	26	5	2	0	33	2	150	24	0	176	605
07:45 AM	33	18	83	0	134	85	156	37	0	278	20	14	4	0	38	5	159	33	0	197	647
08:00 AM	33	7	79	0	119	85	115	31	0	231	12	5	0	0	17	3	165	30	0	198	565
08:15 AM	39	18	82	0	139	99	117	29	0	245	7	3	1	0	11	8	157	32	0	197	592
Total Volume	138	66	299	0	503	334	534	171	0	1039	65	27	7	0	99	18	631	119	0	768	2409
% App. Total	27.4	13.1	59.4	0		32.1	51.4	16.5	0		65.7	27.3	7.1	0		2.3	82.2	15.5	0		
PHF	.885	.717	.901	.000	.905	.843	.856	.578	.000	.911	.625	.482	.438	.000	.651	.563	.956	.902	.000	.970	.931
Cars	134	65	295	0	494	323	510	162	0	995	62	26	7	0	95	18	609	114	0	741	2325
% Cars	97.1	98.5	98.7	0	98.2	96.7	95.5	94.7	0	95.8	95.4	96.3	100	0	96.0	100	96.5	95.8	0	96.5	96.5
Heavy Vehicles	4	1	4	0	9	11	24	9	0	44	3	1	0	0	4	0	22	5	0	27	84
% Heavy Vehicles	2.9	1.5	1.3	0	1.8	3.3	4.5	5.3	0	4.2	4.6	3.7	0	0	4.0	0	3.5	4.2	0	3.5	3.5

N/S: Massachusetts Avenu/ Cranberry Hill
E/W: Marrett Road (Route 2A)
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Groups Printed- Cars

	Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Cranberry Hill From South				Marrett Road (Route 2A) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	2	1	13	0	33	88	9	0	2	0	0	0	1	32	8	0	189
06:15 AM	3	0	23	0	37	112	10	0	0	0	0	0	1	49	7	0	242
06:30 AM	9	1	28	0	46	124	12	0	0	0	0	0	2	82	12	0	316
06:45 AM	12	4	25	0	57	139	21	0	2	0	0	0	2	82	20	0	364
Total	26	6	89	0	173	463	52	0	4	0	0	0	6	245	47	0	1111
07:00 AM	27	4	50	0	59	161	27	0	4	1	1	0	4	103	21	0	462
07:15 AM	18	13	61	0	76	142	52	0	14	0	0	0	5	132	21	0	534
07:30 AM	32	22	54	0	63	139	67	0	23	4	2	0	2	142	24	0	574
07:45 AM	32	18	82	0	82	149	36	0	20	14	4	0	5	153	29	0	624
Total	109	57	247	0	280	591	182	0	61	19	7	0	16	530	95	0	2194
08:00 AM	31	7	77	0	84	111	31	0	12	5	0	0	3	161	30	0	552
08:15 AM	39	18	82	0	94	111	28	0	7	3	1	0	8	153	31	0	575
08:30 AM	37	5	90	0	85	96	19	0	9	5	4	0	7	158	36	0	551
08:45 AM	26	6	71	0	83	123	34	0	4	3	1	0	14	143	41	0	549
Total	133	36	320	0	346	441	112	0	32	16	6	0	32	615	138	0	2227
Grand Total	268	99	656	0	799	1495	346	0	97	35	13	0	54	1390	280	0	5532
Apprch %	26.2	9.7	64.1	0	30.3	56.6	13.1	0	66.9	24.1	9	0	3.1	80.6	16.2	0	
Total %	4.8	1.8	11.9	0	14.4	27	6.3	0	1.8	0.6	0.2	0	1	25.1	5.1	0	

	Massachusetts Avenue From North					Marrett Road (Route 2A) From East					Cranberry Hill From South					Marrett Road (Route 2A) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	32	22	54	0	108	63	139	67	0	269	23	4	2	0	29	2	142	24	0	168	574
07:45 AM	32	18	82	0	132	82	149	36	0	267	20	14	4	0	38	5	153	29	0	187	624
08:00 AM	31	7	77	0	115	84	111	31	0	226	12	5	0	0	17	3	161	30	0	194	552
08:15 AM	39	18	82	0	139	94	111	28	0	233	7	3	1	0	11	8	153	31	0	192	575
Total Volume	134	65	295	0	494	323	510	162	0	995	62	26	7	0	95	18	609	114	0	741	2325
% App. Total	27.1	13.2	59.7	0		32.5	51.3	16.3	0		65.3	27.4	7.4	0		2.4	82.2	15.4	0		
PHF	.859	.739	.899	.000	.888	.859	.856	.604	.000	.925	.674	.464	.438	.000	.625	.563	.946	.919	.000	.955	.931

N/S: Massachusetts Avenu/ Cranberry Hill
E/W: Marrett Road (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 B
Site Code : TBA
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Groups Printed- Heavy Vehicles

	Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Cranberry Hill From South				Marrett Road (Route 2A) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	1	0	0	0	0	3	0	0	0	0	0	0	0	1	0	0	5
06:15 AM	0	0	0	0	1	6	0	0	0	0	0	0	0	1	1	0	9
06:30 AM	1	0	0	0	0	3	0	0	1	0	0	0	0	2	0	0	7
06:45 AM	0	0	0	0	1	11	0	0	0	0	0	0	0	6	1	0	19
Total	2	0	0	0	2	23	0	0	1	0	0	0	0	10	2	0	40
07:00 AM	1	1	3	0	0	5	1	0	1	0	0	0	0	0	1	0	13
07:15 AM	1	1	1	0	0	8	2	0	2	0	0	0	0	5	2	0	22
07:30 AM	1	1	1	0	2	7	7	0	3	1	0	0	0	8	0	0	31
07:45 AM	1	0	1	0	3	7	1	0	0	0	0	0	0	6	4	0	23
Total	4	3	6	0	5	27	11	0	6	1	0	0	0	19	7	0	89
08:00 AM	2	0	2	0	1	4	0	0	0	0	0	0	0	4	0	0	13
08:15 AM	0	0	0	0	5	6	1	0	0	0	0	0	0	4	1	0	17
08:30 AM	1	0	2	0	3	7	0	0	0	0	0	0	0	6	2	0	21
08:45 AM	1	0	1	0	3	3	0	0	0	0	0	0	0	3	1	0	12
Total	4	0	5	0	12	20	1	0	0	0	0	0	0	17	4	0	63
Grand Total	10	3	11	0	19	70	12	0	7	1	0	0	0	46	13	0	192
Apprch %	41.7	12.5	45.8	0	18.8	69.3	11.9	0	87.5	12.5	0	0	0	78	22	0	
Total %	5.2	1.6	5.7	0	9.9	36.5	6.2	0	3.6	0.5	0	0	0	24	6.8	0	

	Massachusetts Avenue From North					Marrett Road (Route 2A) From East					Cranberry Hill From South					Marrett Road (Route 2A) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	1	1	3	0	5	0	5	1	0	6	1	0	0	0	1	0	0	1	0	1	13
07:15 AM	1	1	1	0	3	0	8	2	0	10	2	0	0	0	2	0	5	2	0	7	22
07:30 AM	1	1	1	0	3	2	7	7	0	16	3	1	0	0	4	0	8	0	0	8	31
07:45 AM	1	0	1	0	2	3	7	1	0	11	0	0	0	0	0	0	6	4	0	10	23
Total Volume	4	3	6	0	13	5	27	11	0	43	6	1	0	0	7	0	19	7	0	26	89
% App. Total	30.8	23.1	46.2	0		11.6	62.8	25.6	0		85.7	14.3	0	0		0	73.1	26.9	0		
PHF	1.00	.750	.500	.000	.650	.417	.844	.393	.000	.672	.500	.250	.000	.000	.438	.000	.594	.438	.000	.650	.718

N/S: Massachusetts Avenu/ Cranberry Hill
E/W: Marrett Road (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 B
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Cranberry Hill From South				Marrett Road (Route 2A) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
06:15 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
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	0	0	0	0	0
Total	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	3
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	1	0	1	1	0	0	1	0	0	0	0	0	0	1	0	1	6
Apprch %	33.3	0	33.3	33.3	0	0	100	0	0	0	0	0	0	50	0	50	
Total %	16.7	0	16.7	16.7	0	0	16.7	0	0	0	0	0	0	16.7	0	16.7	

	Massachusetts Avenue From North					Marrett Road (Route 2A) From East					Cranberry Hill From South					Marrett Road (Route 2A) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. 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	0	0	0	0	0	0	0	1	0	0	1	1
06:15 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
06:30 AM	0	0	0	0	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	0	0	0	0	0	0	0	0	0
Total Volume	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	3
% App. Total	0	0	100	0		0	0	100	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.250	.000	.250	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.375

N/S: Massachusetts Avenu/ Cranberry Hill
E/W: Marrett Road (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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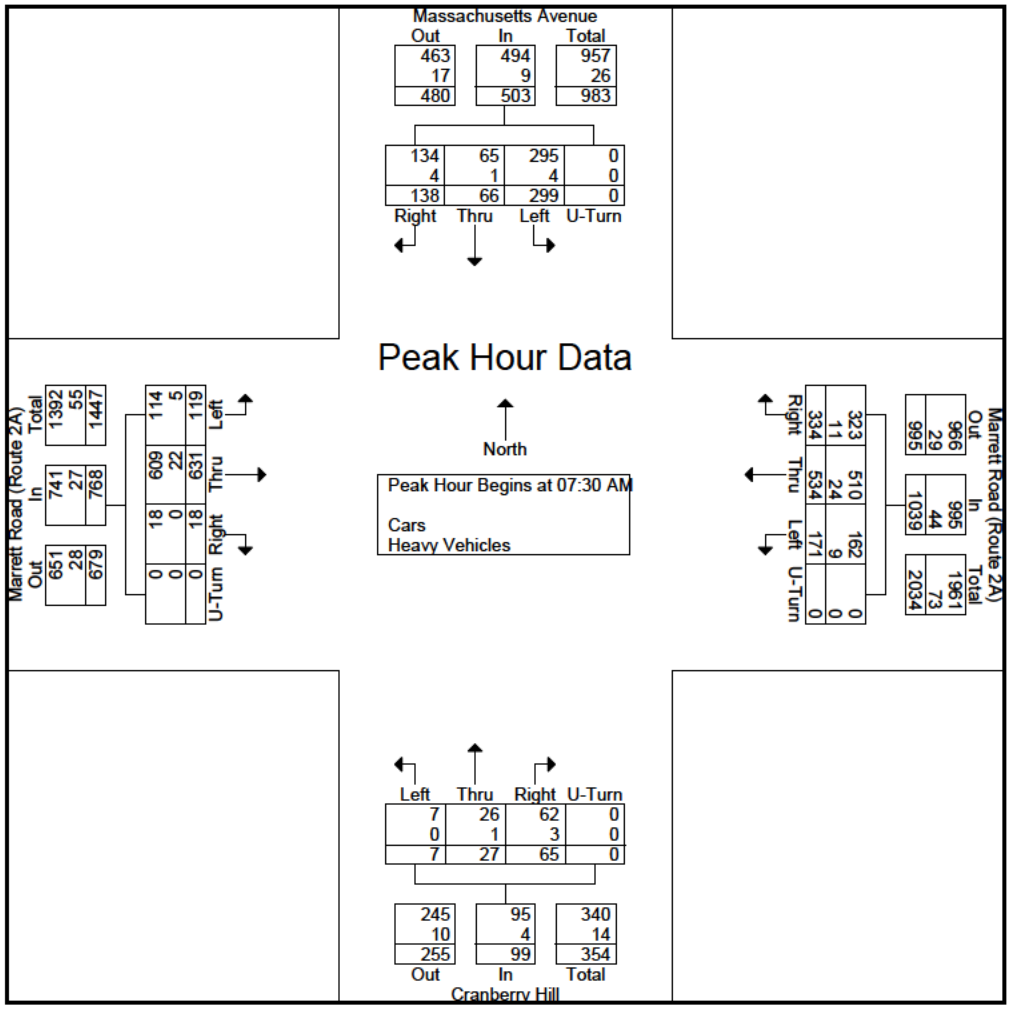
	Massachusetts Avenue From North					Marrett Road (Route 2A) From East					Cranberry Hill From South					Marrett Road (Route 2A) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
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	33	23	55	0	111	65	146	74	0	285	26	5	2	0	33	2	150	24	0	176	605
07:45 AM	33	18	83	0	134	85	156	37	0	278	20	14	4	0	38	5	159	33	0	197	647
08:00 AM	33	7	79	0	119	85	115	31	0	231	12	5	0	0	17	3	165	30	0	198	565
08:15 AM	39	18	82	0	139	99	117	29	0	245	7	3	1	0	11	8	157	32	0	197	592
Total Volume	138	66	299	0	503	334	534	171	0	1039	65	27	7	0	99	18	631	119	0	768	2409
% App. Total	27.4	13.1	59.4	0		32.1	51.4	16.5	0		65.7	27.3	7.1	0		2.3	82.2	15.5	0		
PHF	.885	.717	.901	.000	.905	.843	.856	.578	.000	.911	.625	.482	.438	.000	.651	.563	.956	.902	.000	.970	.931
Cars	134	65	295	0	494	323	510	162	0	995	62	26	7	0	95	18	609	114	0	741	2325
% Cars	97.1	98.5	98.7	0	98.2	96.7	95.5	94.7	0	95.8	95.4	96.3	100	0	96.0	100	96.5	95.8	0	96.5	96.5
Heavy Vehicles	4	1	4	0	9	11	24	9	0	44	3	1	0	0	4	0	22	5	0	27	84
% Heavy Vehicles	2.9	1.5	1.3	0	1.8	3.3	4.5	5.3	0	4.2	4.6	3.7	0	0	4.0	0	3.5	4.2	0	3.5	3.5



N: Old Massachusetts Avenue
E/W: Marrett Road (Route 2A)/ Mass Ave
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
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File Name : 123082 C
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Old Massachusetts Avenue From North			Marrett Road (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	5	0	0	0	97	0	42	8	0	152
06:15 AM	4	0	0	1	120	0	60	13	0	198
06:30 AM	6	4	0	1	139	0	92	23	0	265
06:45 AM	6	0	0	1	155	0	113	21	0	296
Total	21	4	0	3	511	0	307	65	0	911
07:00 AM	14	1	0	0	201	0	128	19	0	363
07:15 AM	15	2	0	1	161	0	165	21	0	365
07:30 AM	20	2	0	0	186	0	183	22	0	413
07:45 AM	29	3	0	1	191	0	190	30	0	444
Total	78	8	0	2	739	0	666	92	0	1585
08:00 AM	25	3	0	3	140	0	195	27	0	393
08:15 AM	23	1	0	2	156	0	196	35	0	413
08:30 AM	28	4	0	2	141	0	209	37	0	421
08:45 AM	27	0	0	0	160	0	193	39	0	419
Total	103	8	0	7	597	0	793	138	0	1646
Grand Total	202	20	0	12	1847	0	1766	295	0	4142
Apprch %	91	9	0	0.6	99.4	0	85.7	14.3	0	
Total %	4.9	0.5	0	0.3	44.6	0	42.6	7.1	0	
Cars	190	20	0	7	1774	0	1707	292	0	3990
% Cars	94.1	100	0	58.3	96	0	96.7	99	0	96.3
Heavy Vehicles	12	0	0	5	73	0	59	3	0	152
% Heavy Vehicles	5.9	0	0	41.7	4	0	3.3	1	0	3.7

	Old Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	29	3	0	32	1	191	0	192	190	30	0	220	444
08:00 AM	25	3	0	28	3	140	0	143	195	27	0	222	393
08:15 AM	23	1	0	24	2	156	0	158	196	35	0	231	413
08:30 AM	28	4	0	32	2	141	0	143	209	37	0	246	421
Total Volume	105	11	0	116	8	628	0	636	790	129	0	919	1671
% App. Total	90.5	9.5	0		1.3	98.7	0		86	14	0		
PHF	.905	.688	.000	.906	.667	.822	.000	.828	.945	.872	.000	.934	.941
Cars	100	11	0	111	6	602	0	608	763	127	0	890	1609
% Cars	95.2	100	0	95.7	75.0	95.9	0	95.6	96.6	98.4	0	96.8	96.3
Heavy Vehicles	5	0	0	5	2	26	0	28	27	2	0	29	62
% Heavy Vehicles	4.8	0	0	4.3	25.0	4.1	0	4.4	3.4	1.6	0	3.2	3.7

N: Old Massachusetts Avenue
E/W: Marrett Road (Route 2A)/ Mass Ave
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File Name : 123082 C
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Groups Printed- Cars

	Old Massachusetts Avenue From North			Marrett Road (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	4	0	0	0	91	0	40	8	0	143
06:15 AM	4	0	0	0	116	0	58	13	0	191
06:30 AM	5	4	0	1	135	0	90	23	0	258
06:45 AM	6	0	0	0	146	0	106	21	0	279
Total	19	4	0	1	488	0	294	65	0	871
07:00 AM	12	1	0	0	194	0	127	19	0	353
07:15 AM	15	2	0	0	155	0	160	21	0	353
07:30 AM	18	2	0	0	178	0	174	22	0	394
07:45 AM	27	3	0	1	183	0	180	28	0	422
Total	72	8	0	1	710	0	641	90	0	1522
08:00 AM	25	3	0	2	135	0	191	27	0	383
08:15 AM	21	1	0	2	149	0	190	35	0	398
08:30 AM	27	4	0	1	135	0	202	37	0	406
08:45 AM	26	0	0	0	157	0	189	38	0	410
Total	99	8	0	5	576	0	772	137	0	1597
Grand Total	190	20	0	7	1774	0	1707	292	0	3990
Apprch %	90.5	9.5	0	0.4	99.6	0	85.4	14.6	0	
Total %	4.8	0.5	0	0.2	44.5	0	42.8	7.3	0	

	Old Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	27	3	0	30	1	183	0	184	180	28	0	208	422
08:00 AM	25	3	0	28	2	135	0	137	191	27	0	218	383
08:15 AM	21	1	0	22	2	149	0	151	190	35	0	225	398
08:30 AM	27	4	0	31	1	135	0	136	202	37	0	239	406
Total Volume	100	11	0	111	6	602	0	608	763	127	0	890	1609
% App. Total	90.1	9.9	0		1	99	0		85.7	14.3	0		
PHF	.926	.688	.000	.895	.750	.822	.000	.826	.944	.858	.000	.931	.953

N: Old Massachusetts Avenue
E/W: Marrett Road (Route 2A)/ Mass Ave
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Groups Printed- Heavy Vehicles

	Old Massachusetts Avenue From North			Marrett Road (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	1	0	0	0	6	0	2	0	0	9
06:15 AM	0	0	0	1	4	0	2	0	0	7
06:30 AM	1	0	0	0	4	0	2	0	0	7
06:45 AM	0	0	0	1	9	0	7	0	0	17
Total	2	0	0	2	23	0	13	0	0	40
07:00 AM	2	0	0	0	7	0	1	0	0	10
07:15 AM	0	0	0	1	6	0	5	0	0	12
07:30 AM	2	0	0	0	8	0	9	0	0	19
07:45 AM	2	0	0	0	8	0	10	2	0	22
Total	6	0	0	1	29	0	25	2	0	63
08:00 AM	0	0	0	1	5	0	4	0	0	10
08:15 AM	2	0	0	0	7	0	6	0	0	15
08:30 AM	1	0	0	1	6	0	7	0	0	15
08:45 AM	1	0	0	0	3	0	4	1	0	9
Total	4	0	0	2	21	0	21	1	0	49
Grand Total	12	0	0	5	73	0	59	3	0	152
Apprch %	100	0	0	6.4	93.6	0	95.2	4.8	0	
Total %	7.9	0	0	3.3	48	0	38.8	2	0	

	Old Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	2	0	0	2	0	8	0	8	9	0	0	9	19
07:45 AM	2	0	0	2	0	8	0	8	10	2	0	12	22
08:00 AM	0	0	0	0	1	5	0	6	4	0	0	4	10
08:15 AM	2	0	0	2	0	7	0	7	6	0	0	6	15
Total Volume	6	0	0	6	1	28	0	29	29	2	0	31	66
% App. Total	100	0	0		3.4	96.6	0		93.5	6.5	0		
PHF	.750	.000	.000	.750	.250	.875	.000	.906	.725	.250	.000	.646	.750

N: Old Massachusetts Avenue
E/W: Marrett Road (Route 2A)/ Mass Ave
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Groups Printed- Peds and Bicycles

	Old Massachusetts Avenue From North			Marrett Road (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	1	0	0	1
06:15 AM	0	0	0	1	0	0	0	0	0	1
06:30 AM	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	1	0	0	2
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	1	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	1	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	0	0	1
Grand Total	0	0	0	1	1	0	2	0	0	4
Apprch %	0	0	0	50	50	0	100	0	0	
Total %	0	0	0	25	25	0	50	0	0	

	Old Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. 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	1	0	0	1	1
06:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
06:30 AM	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	0
Total Volume	0	0	0	0	1	0	0	1	1	0	0	1	2
% App. Total	0	0	0		100	0	0		100	0	0		
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.250	.000	.000	.250	.500

N: Old Massachusetts Avenue
E/W: Marrett Road (Route 2A)/ Mass Ave
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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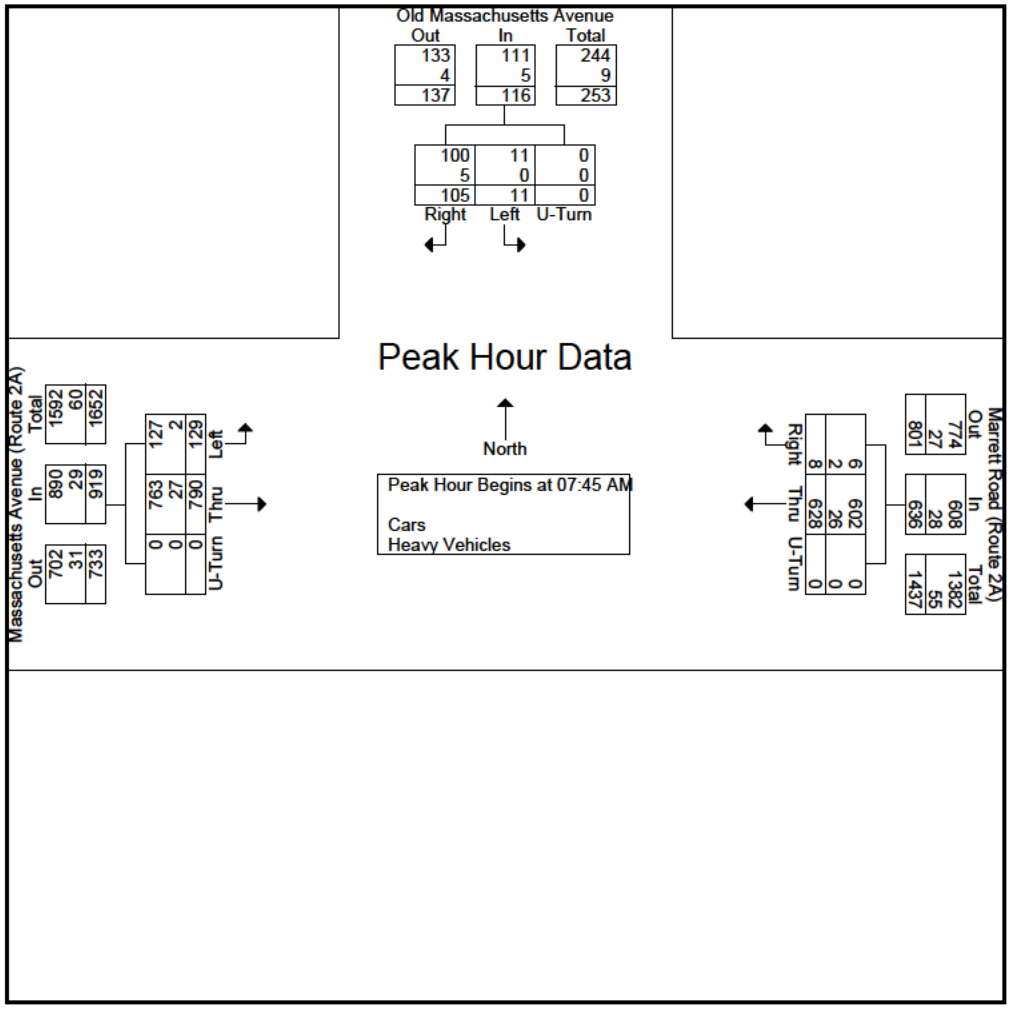
Page No : 1

	Old Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	29	3	0	32	1	191	0	192	190	30	0	220	444
08:00 AM	25	3	0	28	3	140	0	143	195	27	0	222	393
08:15 AM	23	1	0	24	2	156	0	158	196	35	0	231	413
08:30 AM	28	4	0	32	2	141	0	143	209	37	0	246	421
Total Volume	105	11	0	116	8	628	0	636	790	129	0	919	1671
% App. Total	90.5	9.5	0		1.3	98.7	0		86	14	0		
PHF	.905	.688	.000	.906	.667	.822	.000	.828	.945	.872	.000	.934	.941
Cars	100	11	0	111	6	602	0	608	763	127	0	890	1609
% Cars	95.2	100	0	95.7	75.0	95.9	0	95.6	96.6	98.4	0	96.8	96.3
Heavy Vehicles	5	0	0	5	2	26	0	28	27	2	0	29	62
% Heavy Vehicles	4.8	0	0	4.3	25.0	4.1	0	4.4	3.4	1.6	0	3.2	3.7



N: Marrett Street (Airport Road)
E/W: Massachusetts Avenue (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars - Heavy Vehicles

	Marrett Street (Airport Road) From North			Massachusetts Avenue (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	0	0	0	0	99	0	48	0	0	147
06:15 AM	1	0	0	0	116	0	78	2	0	197
06:30 AM	0	1	0	0	150	0	113	0	0	264
06:45 AM	0	1	0	1	162	0	137	0	0	301
Total	1	2	0	1	527	0	376	2	0	909
07:00 AM	0	0	0	0	207	0	147	0	0	354
07:15 AM	2	0	0	0	177	0	180	1	0	360
07:30 AM	1	0	0	2	200	0	200	0	0	403
07:45 AM	0	0	0	1	218	0	219	0	0	438
Total	3	0	0	3	802	0	746	1	0	1555
08:00 AM	0	1	0	0	166	0	222	0	0	389
08:15 AM	0	0	0	0	177	0	237	0	0	414
08:30 AM	0	0	0	0	168	0	246	0	0	414
08:45 AM	0	1	0	0	186	0	235	3	0	425
Total	0	2	0	0	697	0	940	3	0	1642
Grand Total	4	4	0	4	2026	0	2062	6	0	4106
Apprch %	50	50	0	0.2	99.8	0	99.7	0.3	0	
Total %	0.1	0.1	0	0.1	49.3	0	50.2	0.1	0	
Cars	4	4	0	4	1944	0	2007	6	0	3969
% Cars	100	100	0	100	96	0	97.3	100	0	96.7
Heavy Vehicles	0	0	0	0	82	0	55	0	0	137
% Heavy Vehicles	0	0	0	0	4	0	2.7	0	0	3.3

	Marrett Street (Airport Road) From North				Massachusetts Avenue (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	1	218	0	219	219	0	0	219	438
08:00 AM	0	1	0	1	0	166	0	166	222	0	0	222	389
08:15 AM	0	0	0	0	0	177	0	177	237	0	0	237	414
08:30 AM	0	0	0	0	0	168	0	168	246	0	0	246	414
Total Volume	0	1	0	1	1	729	0	730	924	0	0	924	1655
% App. Total	0	100	0		0.1	99.9	0		100	0	0		
PHF	.000	.250	.000	.250	.250	.836	.000	.833	.939	.000	.000	.939	.945
Cars	0	1	0	1	1	699	0	700	897	0	0	897	1598
% Cars	0	100	0	100	100	95.9	0	95.9	97.1	0	0	97.1	96.6
Heavy Vehicles	0	0	0	0	0	30	0	30	27	0	0	27	57
% Heavy Vehicles	0	0	0	0	0	4.1	0	4.1	2.9	0	0	2.9	3.4

N: Marrett Street (Airport Road)
E/W: Massachusetts Avenue (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION
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Site Code : TBA
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Groups Printed- Cars

	Marrett Street (Airport Road) From North			Massachusetts Avenue (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	0	0	0	0	93	0	46	0	0	139
06:15 AM	1	0	0	0	111	0	76	2	0	190
06:30 AM	0	1	0	0	147	0	110	0	0	258
06:45 AM	0	1	0	1	152	0	129	0	0	283
Total	1	2	0	1	503	0	361	2	0	870
07:00 AM	0	0	0	0	200	0	146	0	0	346
07:15 AM	2	0	0	0	170	0	175	1	0	348
07:30 AM	1	0	0	2	190	0	198	0	0	391
07:45 AM	0	0	0	1	209	0	207	0	0	417
Total	3	0	0	3	769	0	726	1	0	1502
08:00 AM	0	1	0	0	161	0	219	0	0	381
08:15 AM	0	0	0	0	168	0	232	0	0	400
08:30 AM	0	0	0	0	161	0	239	0	0	400
08:45 AM	0	1	0	0	182	0	230	3	0	416
Total	0	2	0	0	672	0	920	3	0	1597
Grand Total	4	4	0	4	1944	0	2007	6	0	3969
Apprch %	50	50	0	0.2	99.8	0	99.7	0.3	0	
Total %	0.1	0.1	0	0.1	49	0	50.6	0.2	0	

	Marrett Street (Airport Road) From North				Massachusetts Avenue (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	1	209	0	210	207	0	0	207	417
08:00 AM	0	1	0	1	0	161	0	161	219	0	0	219	381
08:15 AM	0	0	0	0	0	168	0	168	232	0	0	232	400
08:30 AM	0	0	0	0	0	161	0	161	239	0	0	239	400
Total Volume	0	1	0	1	1	699	0	700	897	0	0	897	1598
% App. Total	0	100	0		0.1	99.9	0		100	0	0		
PHF	.000	.250	.000	.250	.250	.836	.000	.833	.938	.000	.000	.938	.958

N: Marrett Street (Airport Road)
E/W: Massachusetts Avenue (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 D
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Marrett Street (Airport Road) From North			Massachusetts Avenue (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	0	0	0	0	6	0	2	0	0	8
06:15 AM	0	0	0	0	5	0	2	0	0	7
06:30 AM	0	0	0	0	3	0	3	0	0	6
06:45 AM	0	0	0	0	10	0	8	0	0	18
Total	0	0	0	0	24	0	15	0	0	39
07:00 AM	0	0	0	0	7	0	1	0	0	8
07:15 AM	0	0	0	0	7	0	5	0	0	12
07:30 AM	0	0	0	0	10	0	2	0	0	12
07:45 AM	0	0	0	0	9	0	12	0	0	21
Total	0	0	0	0	33	0	20	0	0	53
08:00 AM	0	0	0	0	5	0	3	0	0	8
08:15 AM	0	0	0	0	9	0	5	0	0	14
08:30 AM	0	0	0	0	7	0	7	0	0	14
08:45 AM	0	0	0	0	4	0	5	0	0	9
Total	0	0	0	0	25	0	20	0	0	45
Grand Total	0	0	0	0	82	0	55	0	0	137
Apprch %	0	0	0	0	100	0	100	0	0	
Total %	0	0	0	0	59.9	0	40.1	0	0	

	Marrett Street (Airport Road) From North				Massachusetts Avenue (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	9	0	9	12	0	0	12	21
08:00 AM	0	0	0	0	0	5	0	5	3	0	0	3	8
08:15 AM	0	0	0	0	0	9	0	9	5	0	0	5	14
08:30 AM	0	0	0	0	0	7	0	7	7	0	0	7	14
Total Volume	0	0	0	0	0	30	0	30	27	0	0	27	57
% App. Total	0	0	0		0	100	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.833	.000	.833	.563	.000	.000	.563	.679

N: Marrett Street (Airport Road)
E/W: Massachusetts Avenue (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Peds and Bicycles

	Marrett Street (Airport Road) From North			Massachusetts Avenue (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	1	0	0	1
06:15 AM	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	1
07:00 AM	0	0	0	0	1	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	1	0	0	1
07:30 AM	0	0	0	0	0	0	7	0	0	7
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	8	0	0	9
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	1	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	0	0	1
Grand Total	0	0	0	0	2	0	9	0	0	11
Apprch %	0	0	0	0	100	0	100	0	0	
Total %	0	0	0	0	18.2	0	81.8	0	0	

	Marrett Street (Airport Road) From North				Massachusetts Avenue (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. 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	0	0	0
07:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
07:30 AM	0	0	0	0	0	0	0	0	7	0	0	7	7
Total Volume	0	0	0	0	0	1	0	1	8	0	0	8	9
% App. Total	0	0	0		0	100	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.286	.000	.000	.286	.321

N: Marrett Street (Airport Road)
E/W: Massachusetts Avenue (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

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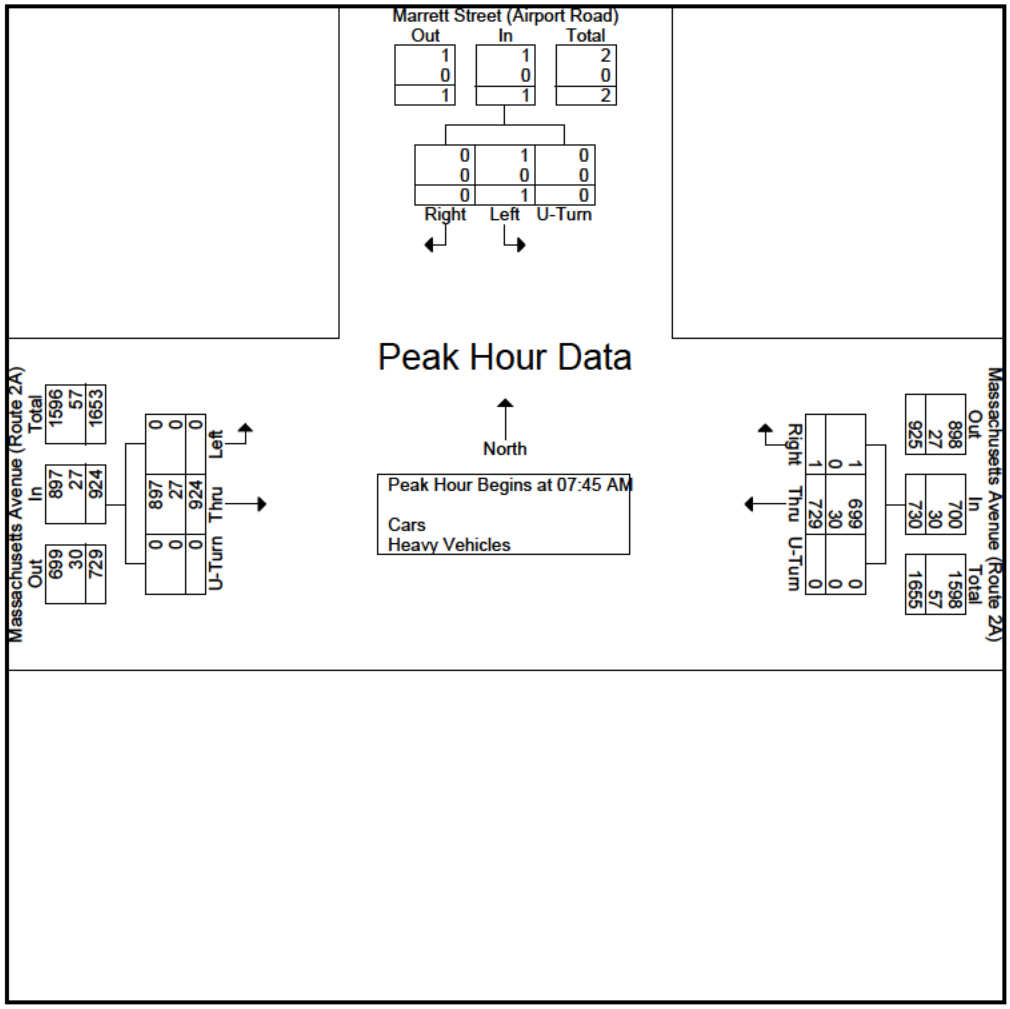
	Marrett Street (Airport Road) From North				Massachusetts Avenue (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	0	0	0	0	1	218	0	219	219	0	0	219	438
08:00 AM	0	1	0	1	0	166	0	166	222	0	0	222	389
08:15 AM	0	0	0	0	0	177	0	177	237	0	0	237	414
08:30 AM	0	0	0	0	0	168	0	168	246	0	0	246	414
Total Volume	0	1	0	1	1	729	0	730	924	0	0	924	1655
% App. Total	0	100	0		0.1	99.9	0		100	0	0		
PHF	.000	.250	.000	.250	.250	.836	.000	.833	.939	.000	.000	.939	.945
Cars	0	1	0	1	1	699	0	700	897	0	0	897	1598
% Cars	0	100	0	100	100	95.9	0	95.9	97.1	0	0	97.1	96.6
Heavy Vehicles	0	0	0	0	0	30	0	30	27	0	0	27	57
% Heavy Vehicles	0	0	0	0	0	4.1	0	4.1	2.9	0	0	2.9	3.4



N/S: Airport/ Hanscom Drive
E/W: Vandenburg Gate/ Old Bedford Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

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Site Code : TBA
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Groups Printed- Cars - Heavy Vehicles

	Hanscom Drive (Airport) From North				Old Bedford Road (Vandenburg Gate) From East				Hanscom Drive From South				Old Bedford Road From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	0	3	0	0	1	0	10	0	83	15	9	0	7	8	5	0	141
06:15 AM	0	2	0	0	0	1	17	0	70	20	12	0	7	17	2	0	148
06:30 AM	1	5	0	0	0	2	22	0	100	19	30	1	19	23	3	0	225
06:45 AM	1	4	1	0	1	2	28	0	114	13	28	0	6	41	5	0	244
Total	2	14	1	0	2	5	77	0	367	67	79	1	39	89	15	0	758
07:00 AM	1	2	1	0	0	3	28	0	108	18	41	0	26	35	10	0	273
07:15 AM	1	4	0	0	0	4	22	0	97	27	34	0	24	50	14	0	277
07:30 AM	1	5	0	0	0	4	34	0	121	12	31	1	30	68	5	0	312
07:45 AM	1	7	0	0	0	8	30	0	110	14	31	0	36	63	4	0	304
Total	4	18	1	0	0	19	114	0	436	71	137	1	116	216	33	0	1166
08:00 AM	0	4	0	0	1	7	28	0	88	8	26	0	27	60	4	0	253
08:15 AM	0	7	1	0	0	3	15	0	93	13	47	0	31	63	3	1	277
08:30 AM	0	3	0	0	0	4	19	0	86	15	43	1	22	50	3	0	246
08:45 AM	1	11	3	0	0	3	21	0	88	9	48	0	25	42	5	0	256
Total	1	25	4	0	1	17	83	0	355	45	164	1	105	215	15	1	1032
Grand Total	7	57	6	0	3	41	274	0	1158	183	380	3	260	520	63	1	2956
Apprch %	10	81.4	8.6	0	0.9	12.9	86.2	0	67.2	10.6	22	0.2	30.8	61.6	7.5	0.1	
Total %	0.2	1.9	0.2	0	0.1	1.4	9.3	0	39.2	6.2	12.9	0.1	8.8	17.6	2.1	0	
Cars	7	47	4	0	2	41	261	0	1125	173	371	3	255	515	63	1	2868
% Cars	100	82.5	66.7	0	66.7	100	95.3	0	97.2	94.5	97.6	100	98.1	99	100	100	97
Heavy Vehicles	0	10	2	0	1	0	13	0	33	10	9	0	5	5	0	0	88
% Heavy Vehicles	0	17.5	33.3	0	33.3	0	4.7	0	2.8	5.5	2.4	0	1.9	1	0	0	3

	Hanscom Drive (Airport) From North					Old Bedford Road (Vandenburg Gate) From East					Hanscom Drive From South					Old Bedford Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	1	2	1	0	4	0	3	28	0	31	108	18	41	0	167	26	35	10	0	71	273
07:15 AM	1	4	0	0	5	0	4	22	0	26	97	27	34	0	158	24	50	14	0	88	277
07:30 AM	1	5	0	0	6	0	4	34	0	38	121	12	31	1	165	30	68	5	0	103	312
07:45 AM	1	7	0	0	8	0	8	30	0	38	110	14	31	0	155	36	63	4	0	103	304
Total Volume	4	18	1	0	23	0	19	114	0	133	436	71	137	1	645	116	216	33	0	365	1166
% App. Total	17.4	78.3	4.3	0		0	14.3	85.7	0		67.6	11	21.2	0.2		31.8	59.2	9	0		
PHF	1.00	.643	.250	.000	.719	.000	.594	.838	.000	.875	.901	.657	.835	.250	.966	.806	.794	.589	.000	.886	.934
Cars	4	15	1	0	20	0	19	109	0	128	424	69	134	1	628	114	213	33	0	360	1136
% Cars	100	83.3	100	0	87.0	0	100	95.6	0	96.2	97.2	97.2	97.8	100	97.4	98.3	98.6	100	0	98.6	97.4
Heavy Vehicles	0	3	0	0	3	0	0	5	0	5	12	2	3	0	17	2	3	0	0	5	30
% Heavy Vehicles	0	16.7	0	0	13.0	0	0	4.4	0	3.8	2.8	2.8	2.2	0	2.6	1.7	1.4	0	0	1.4	2.6

N/S: Airport/ Hanscom Drive
E/W: Vandenburg Gate/ Old Bedford Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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File Name : 123082 E
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	Hanscom Drive (Airport) From North				Old Bedford Road (Vandenburg Gate) From East				Hanscom Drive From South				Old Bedford Road From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	0	2	0	0	1	0	9	0	79	14	9	0	7	7	5	0	133
06:15 AM	0	2	0	0	0	1	16	0	68	20	12	0	7	17	2	0	145
06:30 AM	1	5	0	0	0	2	22	0	98	18	29	1	18	23	3	0	220
06:45 AM	1	3	1	0	1	2	26	0	109	12	27	0	6	40	5	0	233
Total	2	12	1	0	2	5	73	0	354	64	77	1	38	87	15	0	731
07:00 AM	1	1	1	0	0	3	28	0	104	17	39	0	25	33	10	0	262
07:15 AM	1	4	0	0	0	4	21	0	94	27	34	0	24	49	14	0	272
07:30 AM	1	4	0	0	0	4	34	0	118	11	30	1	29	68	5	0	305
07:45 AM	1	6	0	0	0	8	26	0	108	14	31	0	36	63	4	0	297
Total	4	15	1	0	0	19	109	0	424	69	134	1	114	213	33	0	1136
08:00 AM	0	4	0	0	0	7	27	0	86	7	24	0	27	60	4	0	246
08:15 AM	0	4	1	0	0	3	14	0	90	12	45	0	30	63	3	1	266
08:30 AM	0	3	0	0	0	4	17	0	83	13	43	1	22	50	3	0	239
08:45 AM	1	9	1	0	0	3	21	0	88	8	48	0	24	42	5	0	250
Total	1	20	2	0	0	17	79	0	347	40	160	1	103	215	15	1	1001
Grand Total	7	47	4	0	2	41	261	0	1125	173	371	3	255	515	63	1	2868
Apprch %	12.1	81	6.9	0	0.7	13.5	85.9	0	67.3	10.3	22.2	0.2	30.6	61.8	7.6	0.1	
Total %	0.2	1.6	0.1	0	0.1	1.4	9.1	0	39.2	6	12.9	0.1	8.9	18	2.2	0	

	Hanscom Drive (Airport) From North					Old Bedford Road (Vandenburg Gate) From East					Hanscom Drive From South					Old Bedford Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	1	1	1	0	3	0	3	28	0	31	104	17	39	0	160	25	33	10	0	68	262
07:15 AM	1	4	0	0	5	0	4	21	0	25	94	27	34	0	155	24	49	14	0	87	272
07:30 AM	1	4	0	0	5	0	4	34	0	38	118	11	30	1	160	29	68	5	0	102	305
07:45 AM	1	6	0	0	7	0	8	26	0	34	108	14	31	0	153	36	63	4	0	103	297
Total Volume	4	15	1	0	20	0	19	109	0	128	424	69	134	1	628	114	213	33	0	360	1136
% App. Total	20	75	5	0		0	14.8	85.2	0		67.5	11	21.3	0.2		31.7	59.2	9.2	0		
PHF	1.00	.625	.250	.000	.714	.000	.594	.801	.000	.842	.898	.639	.859	.250	.981	.792	.783	.589	.000	.874	.931

N/S: Airport/ Hanscom Drive
E/W: Vandenburg Gate/ Old Bedford Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
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File Name : 123082 E
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Hanscom Drive (Airport) From North				Old Bedford Road (Vandenburg Gate) From East				Hanscom Drive From South				Old Bedford Road From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	0	1	0	0	0	0	1	0	4	1	0	0	0	1	0	0	8
06:15 AM	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	3
06:30 AM	0	0	0	0	0	0	0	0	2	1	1	0	1	0	0	0	5
06:45 AM	0	1	0	0	0	0	2	0	5	1	1	0	0	1	0	0	11
Total	0	2	0	0	0	0	4	0	13	3	2	0	1	2	0	0	27
07:00 AM	0	1	0	0	0	0	0	0	4	1	2	0	1	2	0	0	11
07:15 AM	0	0	0	0	0	0	1	0	3	0	0	0	0	1	0	0	5
07:30 AM	0	1	0	0	0	0	0	0	3	1	1	0	1	0	0	0	7
07:45 AM	0	1	0	0	0	0	4	0	2	0	0	0	0	0	0	0	7
Total	0	3	0	0	0	0	5	0	12	2	3	0	2	3	0	0	30
08:00 AM	0	0	0	0	1	0	1	0	2	1	2	0	0	0	0	0	7
08:15 AM	0	3	0	0	0	0	1	0	3	1	2	0	1	0	0	0	11
08:30 AM	0	0	0	0	0	0	2	0	3	2	0	0	0	0	0	0	7
08:45 AM	0	2	2	0	0	0	0	0	0	1	0	0	1	0	0	0	6
Total	0	5	2	0	1	0	4	0	8	5	4	0	2	0	0	0	31
Grand Total	0	10	2	0	1	0	13	0	33	10	9	0	5	5	0	0	88
Apprch %	0	83.3	16.7	0	7.1	0	92.9	0	63.5	19.2	17.3	0	50	50	0	0	
Total %	0	11.4	2.3	0	1.1	0	14.8	0	37.5	11.4	10.2	0	5.7	5.7	0	0	

	Hanscom Drive (Airport) From North					Old Bedford Road (Vandenburg Gate) From East					Hanscom Drive From South					Old Bedford Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	1	0	0	1	0	0	2	0	2	5	1	1	0	7	0	1	0	0	1	11
07:00 AM	0	1	0	0	1	0	0	0	0	0	4	1	2	0	7	1	2	0	0	3	11
07:15 AM	0	0	0	0	0	0	0	1	0	1	3	0	0	0	3	0	1	0	0	1	5
07:30 AM	0	1	0	0	1	0	0	0	0	0	3	1	1	0	5	1	0	0	0	1	7
Total Volume	0	3	0	0	3	0	0	3	0	3	15	3	4	0	22	2	4	0	0	6	34
% App. Total	0	100	0	0		0	0	100	0		68.2	13.6	18.2	0		33.3	66.7	0	0		
PHF	.000	.750	.000	.000	.750	.000	.000	.375	.000	.375	.750	.750	.500	.000	.786	.500	.500	.000	.000	.500	.773

N/S: Airport/ Hanscom Drive
E/W: Vandenburg Gate/ Old Bedford Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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File Name : 123082 E
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Hanscom Drive (Airport) From North				Old Bedford Road (Vandenburg Gate) From East				Hanscom Drive From South				Old Bedford Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. 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	0	0	0	0
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	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	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	0	0	0	0	0	0	0	0
Total	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
Grand Total	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	6
Apprch %	0	16.7	0	83.3	0	0	0	0	0	0	0	0	0	0	0	0	
Total %	0	16.7	0	83.3	0	0	0	0	0	0	0	0	0	0	0	0	

	Hanscom Drive (Airport) From North					Old Bedford Road (Vandenburg Gate) From East					Hanscom Drive From South					Old Bedford Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. 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	0	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
% App. Total	0	0	0	100		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.333	.333	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.333

N/S: Airport/ Hanscom Drive
E/W: Vandenburg Gate/ Old Bedford Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

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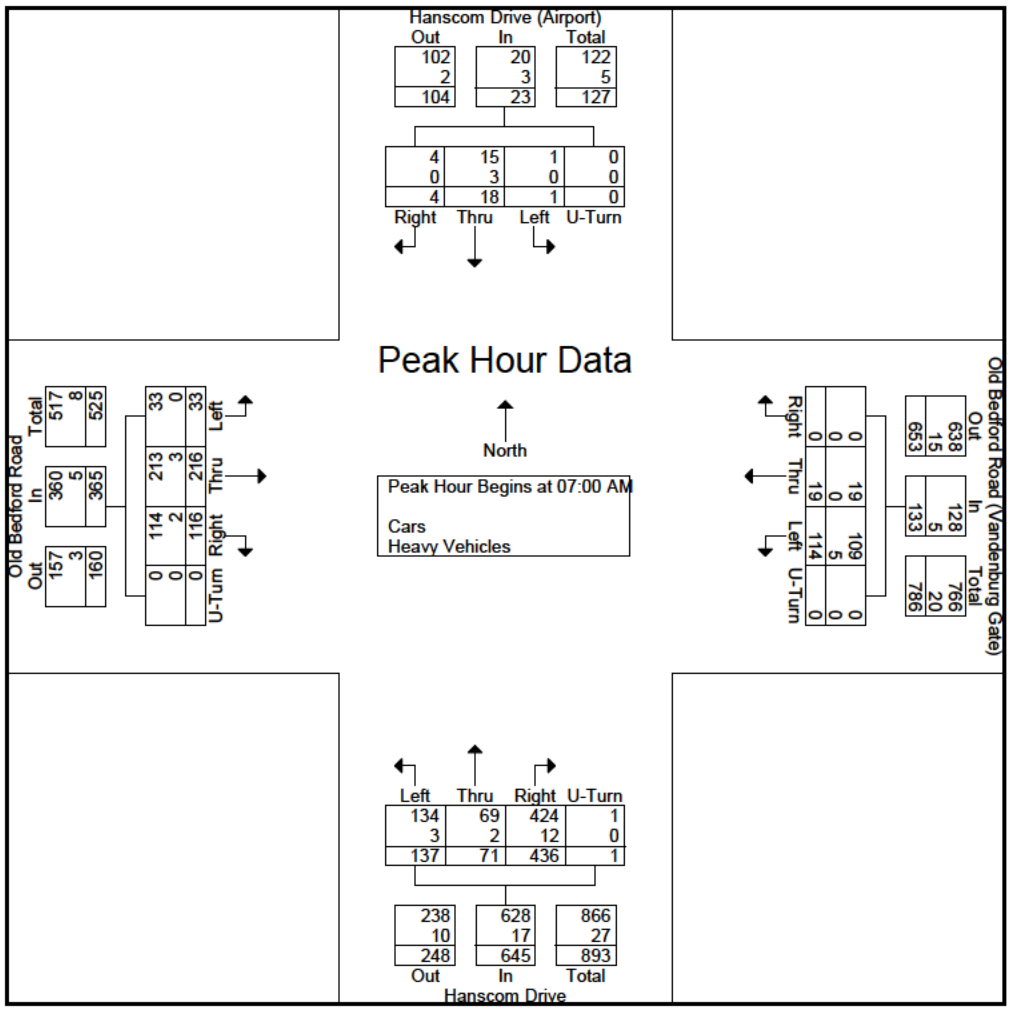
File Name : 123082 E
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

	Hanscom Drive (Airport) From North					Old Bedford Road (Vandenburg Gate) From East					Hanscom Drive From South					Old Bedford Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	1	2	1	0	4	0	3	28	0	31	108	18	41	0	167	26	35	10	0	71	273
07:15 AM	1	4	0	0	5	0	4	22	0	26	97	27	34	0	158	24	50	14	0	88	277
07:30 AM	1	5	0	0	6	0	4	34	0	38	121	12	31	1	165	30	68	5	0	103	312
07:45 AM	1	7	0	0	8	0	8	30	0	38	110	14	31	0	155	36	63	4	0	103	304
Total Volume	4	18	1	0	23	0	19	114	0	133	436	71	137	1	645	116	216	33	0	365	1166
% App. Total	17.4	78.3	4.3	0		0	14.3	85.7	0		67.6	11	21.2	0.2		31.8	59.2	9	0		
PHF	1.00	.643	.250	.000	.719	.000	.594	.838	.000	.875	.901	.657	.835	.250	.966	.806	.794	.589	.000	.886	.934
Cars	4	15	1	0	20	0	19	109	0	128	424	69	134	1	628	114	213	33	0	360	1136
% Cars	100	83.3	100	0	87.0	0	100	95.6	0	96.2	97.2	97.2	97.8	100	97.4	98.3	98.6	100	0	98.6	97.4
Heavy Vehicles	0	3	0	0	3	0	0	5	0	5	12	2	3	0	17	2	3	0	0	5	30
% Heavy Vehicles	0	16.7	0	0	13.0	0	0	4.4	0	3.8	2.8	2.8	2.2	0	2.6	1.7	1.4	0	0	1.4	2.6



N: Hanscom Drive
E/W: North Great Road (Route 2A)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
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File Name : 123082 F
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Hanscom Drive From North			North Great Road (Route 2A) From East			North Great Road (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	5	11	0	63	36	0	37	41	0	193
06:15 AM	4	24	0	72	46	0	63	35	0	244
06:30 AM	21	22	0	98	45	0	97	51	0	334
06:45 AM	22	16	0	112	55	0	115	60	0	380
Total	52	73	0	345	182	0	312	187	0	1151
07:00 AM	21	23	0	116	89	0	136	54	0	439
07:15 AM	32	23	0	105	74	0	177	50	0	461
07:30 AM	36	23	0	95	97	0	189	74	0	514
07:45 AM	41	37	0	98	120	0	181	73	0	550
Total	130	106	0	414	380	0	683	251	0	1964
08:00 AM	37	27	1	81	92	0	209	58	0	505
08:15 AM	23	26	0	90	95	0	216	66	0	516
08:30 AM	18	24	0	63	101	0	220	80	0	506
08:45 AM	32	26	0	84	102	0	191	58	0	493
Total	110	103	1	318	390	0	836	262	0	2020
Grand Total	292	282	1	1077	952	0	1831	700	0	5135
Apprch %	50.8	49	0.2	53.1	46.9	0	72.3	27.7	0	
Total %	5.7	5.5	0	21	18.5	0	35.7	13.6	0	
Cars	287	262	1	1029	917	0	1796	694	0	4986
% Cars	98.3	92.9	100	95.5	96.3	0	98.1	99.1	0	97.1
Heavy Vehicles	5	20	0	48	35	0	35	6	0	149
% Heavy Vehicles	1.7	7.1	0	4.5	3.7	0	1.9	0.9	0	2.9

	Hanscom Drive From North				North Great Road (Route 2A) From East				North Great Road (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	36	23	0	59	95	97	0	192	189	74	0	263	514
07:45 AM	41	37	0	78	98	120	0	218	181	73	0	254	550
08:00 AM	37	27	1	65	81	92	0	173	209	58	0	267	505
08:15 AM	23	26	0	49	90	95	0	185	216	66	0	282	516
Total Volume	137	113	1	251	364	404	0	768	795	271	0	1066	2085
% App. Total	54.6	45	0.4		47.4	52.6	0		74.6	25.4	0		
PHF	.835	.764	.250	.804	.929	.842	.000	.881	.920	.916	.000	.945	.948
Cars	134	106	1	241	346	387	0	733	782	268	0	1050	2024
% Cars	97.8	93.8	100	96.0	95.1	95.8	0	95.4	98.4	98.9	0	98.5	97.1
Heavy Vehicles	3	7	0	10	18	17	0	35	13	3	0	16	61
% Heavy Vehicles	2.2	6.2	0	4.0	4.9	4.2	0	4.6	1.6	1.1	0	1.5	2.9

N: Hanscom Drive
E/W: North Great Road (Route 2A)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
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File Name : 123082 F
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	Hanscom Drive From North			North Great Road (Route 2A) From East			North Great Road (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	4	10	0	59	35	0	36	41	0	185
06:15 AM	4	24	0	70	43	0	61	35	0	237
06:30 AM	21	20	0	95	45	0	96	50	0	327
06:45 AM	22	13	0	105	53	0	111	60	0	364
Total	51	67	0	329	176	0	304	186	0	1113
07:00 AM	21	21	0	110	86	0	134	53	0	425
07:15 AM	32	22	0	102	71	0	173	50	0	450
07:30 AM	35	23	0	90	93	0	183	72	0	496
07:45 AM	40	33	0	94	114	0	179	73	0	533
Total	128	99	0	396	364	0	669	248	0	1904
08:00 AM	37	27	1	77	92	0	208	58	0	500
08:15 AM	22	23	0	85	88	0	212	65	0	495
08:30 AM	18	22	0	59	99	0	214	79	0	491
08:45 AM	31	24	0	83	98	0	189	58	0	483
Total	108	96	1	304	377	0	823	260	0	1969
Grand Total	287	262	1	1029	917	0	1796	694	0	4986
Apprch %	52.2	47.6	0.2	52.9	47.1	0	72.1	27.9	0	
Total %	5.8	5.3	0	20.6	18.4	0	36	13.9	0	

	Hanscom Drive From North				North Great Road (Route 2A) From East				North Great Road (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	35	23	0	58	90	93	0	183	183	72	0	255	496
07:45 AM	40	33	0	73	94	114	0	208	179	73	0	252	533
08:00 AM	37	27	1	65	77	92	0	169	208	58	0	266	500
08:15 AM	22	23	0	45	85	88	0	173	212	65	0	277	495
Total Volume	134	106	1	241	346	387	0	733	782	268	0	1050	2024
% App. Total	55.6	44	0.4		47.2	52.8	0		74.5	25.5	0		
PHF	.838	.803	.250	.825	.920	.849	.000	.881	.922	.918	.000	.948	.949

N: Hanscom Drive
E/W: North Great Road (Route 2A)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
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File Name : 123082 F
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Hanscom Drive From North			North Great Road (Route 2A) From East			North Great Road (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	1	1	0	4	1	0	1	0	0	8
06:15 AM	0	0	0	2	3	0	2	0	0	7
06:30 AM	0	2	0	3	0	0	1	1	0	7
06:45 AM	0	3	0	7	2	0	4	0	0	16
Total	1	6	0	16	6	0	8	1	0	38
07:00 AM	0	2	0	6	3	0	2	1	0	14
07:15 AM	0	1	0	3	3	0	4	0	0	11
07:30 AM	1	0	0	5	4	0	6	2	0	18
07:45 AM	1	4	0	4	6	0	2	0	0	17
Total	2	7	0	18	16	0	14	3	0	60
08:00 AM	0	0	0	4	0	0	1	0	0	5
08:15 AM	1	3	0	5	7	0	4	1	0	21
08:30 AM	0	2	0	4	2	0	6	1	0	15
08:45 AM	1	2	0	1	4	0	2	0	0	10
Total	2	7	0	14	13	0	13	2	0	51
Grand Total	5	20	0	48	35	0	35	6	0	149
Apprch %	20	80	0	57.8	42.2	0	85.4	14.6	0	
Total %	3.4	13.4	0	32.2	23.5	0	23.5	4	0	

	Hanscom Drive From North				North Great Road (Route 2A) From East				North Great Road (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	1	0	0	1	5	4	0	9	6	2	0	8	18
07:45 AM	1	4	0	5	4	6	0	10	2	0	0	2	17
08:00 AM	0	0	0	0	4	0	0	4	1	0	0	1	5
08:15 AM	1	3	0	4	5	7	0	12	4	1	0	5	21
Total Volume	3	7	0	10	18	17	0	35	13	3	0	16	61
% App. Total	30	70	0		51.4	48.6	0		81.2	18.8	0		
PHF	.750	.438	.000	.500	.900	.607	.000	.729	.542	.375	.000	.500	.726

N: Hanscom Drive
E/W: North Great Road (Route 2A)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 F
Site Code : TBA
Start Date : 11/13/2012
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Groups Printed- Peds and Bicycles

	Hanscom Drive From North			North Great Road (Route 2A) From East			North Great Road (Route 2A) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	1	0	1
06:15 AM	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	1
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	1	0	0	1
08:30 AM	0	0	0	0	1	0	1	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	2	0	0	3
Grand Total	0	0	0	0	1	0	2	1	0	4
Apprch %	0	0	0	0	100	0	66.7	33.3	0	
Total %	0	0	0	0	25	0	50	25	0	

	Hanscom Drive From North				North Great Road (Route 2A) From East				North Great Road (Route 2A) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. 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	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
08:30 AM	0	0	0	0	0	1	0	1	1	0	0	1	2
Total Volume	0	0	0	0	0	1	0	1	2	0	0	2	3
% App. Total	0	0	0		0	100	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.500	.000	.000	.500	.375

N: Hanscom Drive
E/W: North Great Road (Route 2A)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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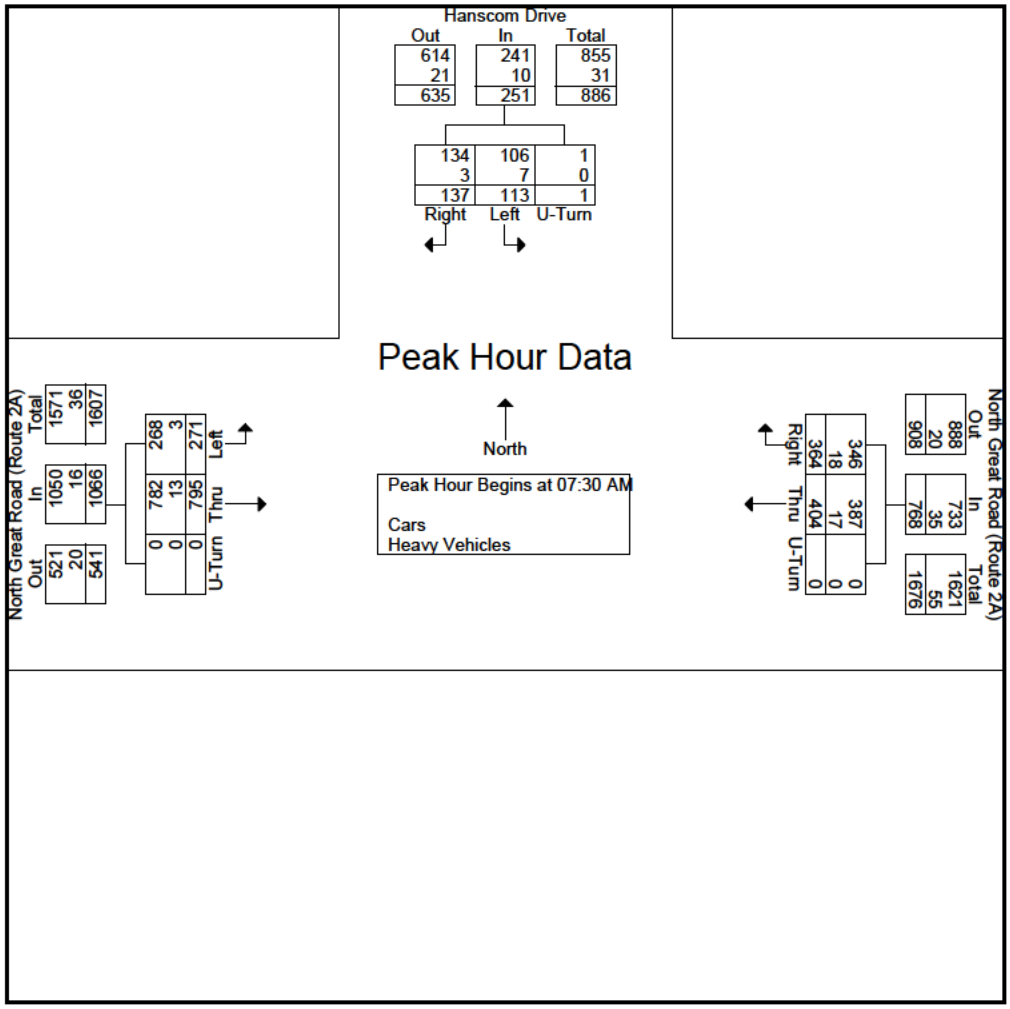
	Hanscom Drive From North				North Great Road (Route 2A) From East				North Great Road (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	36	23	0	59	95	97	0	192	189	74	0	263	514
07:45 AM	41	37	0	78	98	120	0	218	181	73	0	254	550
08:00 AM	37	27	1	65	81	92	0	173	209	58	0	267	505
08:15 AM	23	26	0	49	90	95	0	185	216	66	0	282	516
Total Volume	137	113	1	251	364	404	0	768	795	271	0	1066	2085
% App. Total	54.6	45	0.4		47.4	52.6	0		74.6	25.4	0		
PHF	.835	.764	.250	.804	.929	.842	.000	.881	.920	.916	.000	.945	.948
Cars	134	106	1	241	346	387	0	733	782	268	0	1050	2024
% Cars	97.8	93.8	100	96.0	95.1	95.8	0	95.4	98.4	98.9	0	98.5	97.1
Heavy Vehicles	3	7	0	10	18	17	0	35	13	3	0	16	61
% Heavy Vehicles	2.2	6.2	0	4.0	4.9	4.2	0	4.6	1.6	1.1	0	1.5	2.9



S: Bedford Road
E/W: North Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 G
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Start Date : 11/13/2012
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Groups Printed- Cars - Heavy Vehicles

	North Great Road (Route 2A) From East			Bedford Road From South			North Great Road (Route 2A) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
06:00 AM	35	4	0	4	0	0	3	70	0	116
06:15 AM	43	7	1	16	0	0	14	85	0	166
06:30 AM	47	21	0	14	1	0	15	129	0	227
06:45 AM	67	11	0	34	0	0	45	147	0	304
Total	192	43	1	68	1	0	77	431	0	813
07:00 AM	86	19	0	28	0	0	48	165	0	346
07:15 AM	83	26	0	28	3	0	45	191	0	376
07:30 AM	95	33	1	54	1	0	58	212	0	454
07:45 AM	113	49	0	59	5	0	51	197	0	474
Total	377	127	1	169	9	0	202	765	0	1650
08:00 AM	84	42	0	50	6	0	43	225	0	450
08:15 AM	86	30	0	61	2	0	46	221	0	446
08:30 AM	88	28	0	64	4	0	40	235	0	459
08:45 AM	111	28	1	61	5	0	40	192	0	438
Total	369	128	1	236	17	0	169	873	0	1793
Grand Total	938	298	3	473	27	0	448	2069	0	4256
Apprch %	75.7	24.1	0.2	94.6	5.4	0	17.8	82.2	0	
Total %	22	7	0.1	11.1	0.6	0	10.5	48.6	0	
Cars	901	293	3	470	27	0	447	2029	0	4170
% Cars	96.1	98.3	100	99.4	100	0	99.8	98.1	0	98
Heavy Vehicles	37	5	0	3	0	0	1	40	0	86
% Heavy Vehicles	3.9	1.7	0	0.6	0	0	0.2	1.9	0	2

	North Great Road (Route 2A) From East				Bedford Road From South				North Great Road (Route 2A) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. 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	113	49	0	162	59	5	0	64	51	197	0	248	474
08:00 AM	84	42	0	126	50	6	0	56	43	225	0	268	450
08:15 AM	86	30	0	116	61	2	0	63	46	221	0	267	446
08:30 AM	88	28	0	116	64	4	0	68	40	235	0	275	459
Total Volume	371	149	0	520	234	17	0	251	180	878	0	1058	1829
% App. Total	71.3	28.7	0		93.2	6.8	0		17	83	0		
PHF	.821	.760	.000	.802	.914	.708	.000	.923	.882	.934	.000	.962	.965
Cars	355	148	0	503	234	17	0	251	179	860	0	1039	1793
% Cars	95.7	99.3	0	96.7	100	100	0	100	99.4	97.9	0	98.2	98.0
Heavy Vehicles	16	1	0	17	0	0	0	0	1	18	0	19	36
% Heavy Vehicles	4.3	0.7	0	3.3	0	0	0	0	0.6	2.1	0	1.8	2.0

S: Bedford Road
E/W: North Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 G
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	North Great Road (Route 2A) From East			Bedford Road From South			North Great Road (Route 2A) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
06:00 AM	33	3	0	4	0	0	3	69	0	112
06:15 AM	41	7	1	16	0	0	14	84	0	163
06:30 AM	47	21	0	14	1	0	15	126	0	224
06:45 AM	66	11	0	34	0	0	45	143	0	299
Total	187	42	1	68	1	0	77	422	0	798
07:00 AM	82	19	0	28	0	0	48	162	0	339
07:15 AM	80	25	0	28	3	0	45	188	0	369
07:30 AM	91	31	1	51	1	0	58	207	0	440
07:45 AM	107	49	0	59	5	0	50	195	0	465
Total	360	124	1	166	9	0	201	752	0	1613
08:00 AM	83	42	0	50	6	0	43	222	0	446
08:15 AM	79	29	0	61	2	0	46	215	0	432
08:30 AM	86	28	0	64	4	0	40	228	0	450
08:45 AM	106	28	1	61	5	0	40	190	0	431
Total	354	127	1	236	17	0	169	855	0	1759
Grand Total	901	293	3	470	27	0	447	2029	0	4170
Apprch %	75.3	24.5	0.3	94.6	5.4	0	18.1	81.9	0	
Total %	21.6	7	0.1	11.3	0.6	0	10.7	48.7	0	

	North Great Road (Route 2A) From East				Bedford Road From South				North Great Road (Route 2A) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. 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	107	49	0	156	59	5	0	64	50	195	0	245	465
08:00 AM	83	42	0	125	50	6	0	56	43	222	0	265	446
08:15 AM	79	29	0	108	61	2	0	63	46	215	0	261	432
08:30 AM	86	28	0	114	64	4	0	68	40	228	0	268	450
Total Volume	355	148	0	503	234	17	0	251	179	860	0	1039	1793
% App. Total	70.6	29.4	0		93.2	6.8	0		17.2	82.8	0		
PHF	.829	.755	.000	.806	.914	.708	.000	.923	.895	.943	.000	.969	.964

S: Bedford Road
E/W: North Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 G
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	North Great Road (Route 2A) From East			Bedford Road From South			North Great Road (Route 2A) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
06:00 AM	2	1	0	0	0	0	0	1	0	4
06:15 AM	2	0	0	0	0	0	0	1	0	3
06:30 AM	0	0	0	0	0	0	0	3	0	3
06:45 AM	1	0	0	0	0	0	0	4	0	5
Total	5	1	0	0	0	0	0	9	0	15
07:00 AM	4	0	0	0	0	0	0	3	0	7
07:15 AM	3	1	0	0	0	0	0	3	0	7
07:30 AM	4	2	0	3	0	0	0	5	0	14
07:45 AM	6	0	0	0	0	0	1	2	0	9
Total	17	3	0	3	0	0	1	13	0	37
08:00 AM	1	0	0	0	0	0	0	3	0	4
08:15 AM	7	1	0	0	0	0	0	6	0	14
08:30 AM	2	0	0	0	0	0	0	7	0	9
08:45 AM	5	0	0	0	0	0	0	2	0	7
Total	15	1	0	0	0	0	0	18	0	34
Grand Total	37	5	0	3	0	0	1	40	0	86
Apprch %	88.1	11.9	0	100	0	0	2.4	97.6	0	
Total %	43	5.8	0	3.5	0	0	1.2	46.5	0	

	North Great Road (Route 2A) From East				Bedford Road From South				North Great Road (Route 2A) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. 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	4	2	0	6	3	0	0	3	0	5	0	5	14
07:45 AM	6	0	0	6	0	0	0	0	1	2	0	3	9
08:00 AM	1	0	0	1	0	0	0	0	0	3	0	3	4
08:15 AM	7	1	0	8	0	0	0	0	0	6	0	6	14
Total Volume	18	3	0	21	3	0	0	3	1	16	0	17	41
% App. Total	85.7	14.3	0		100	0	0		5.9	94.1	0		
PHF	.643	.375	.000	.656	.250	.000	.000	.250	.250	.667	.000	.708	.732

S: Bedford Road
E/W: North Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION
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Page No : 1

Groups Printed- Peds and Bicycles

	North Great Road (Route 2A) From East			Bedford Road From South			North Great Road (Route 2A) From West			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
06:00 AM	0	0	0	1	0	0	0	1	0	2
06:15 AM	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	0	1	0	2
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	1	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	1	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	0	0	1
Grand Total	1	0	0	1	0	0	0	2	0	4
Apprch %	100	0	0	100	0	0	0	100	0	
Total %	25	0	0	25	0	0	0	50	0	

	North Great Road (Route 2A) From East				Bedford Road From South				North Great Road (Route 2A) From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. 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	1	0	0	1	0	1	0	1	2
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 AM	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	0
Total Volume	0	0	0	0	1	0	0	1	0	1	0	1	2
% App. Total	0	0	0		100	0	0		0	100	0		
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	.250	.000	.250	.250

S: Bedford Road
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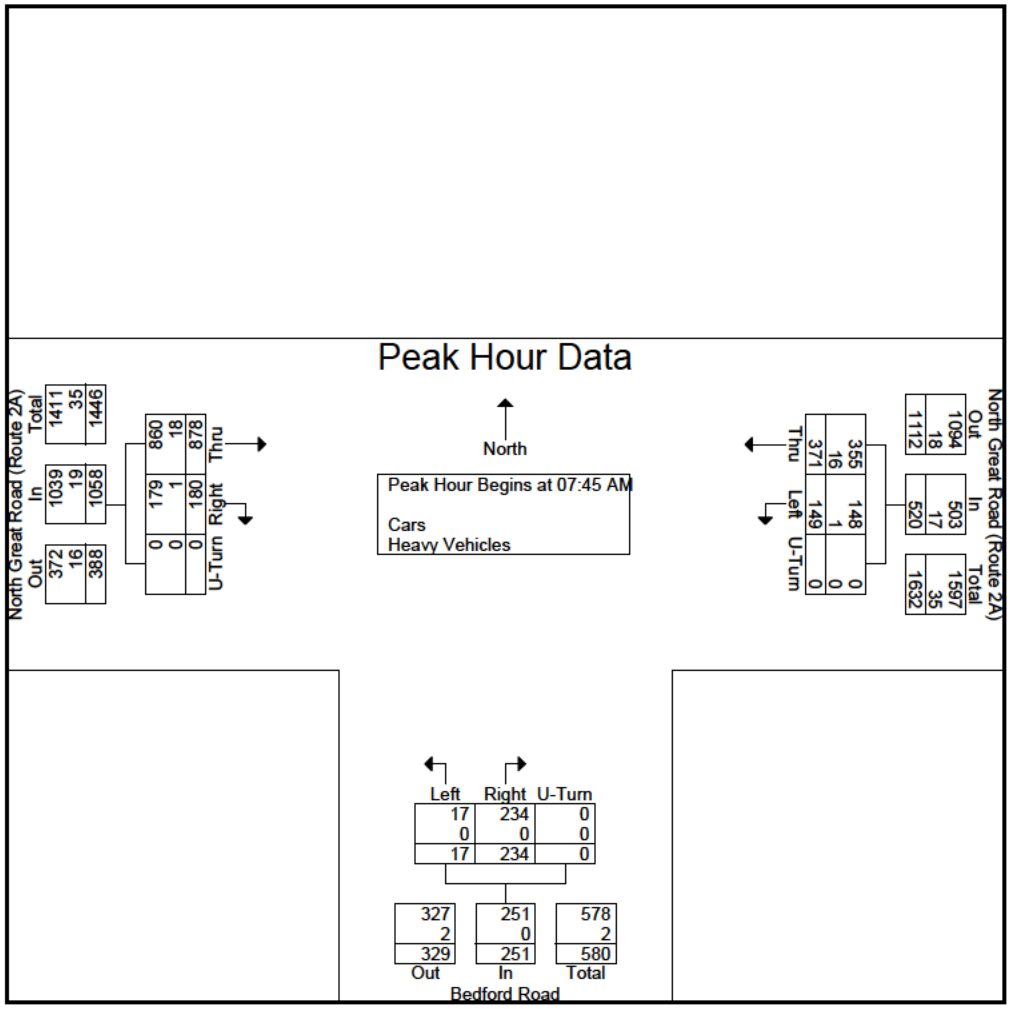
	North Great Road (Route 2A) From East				Bedford Road From South				North Great Road (Route 2A) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	113	49	0	162	59	5	0	64	51	197	0	248	474
08:00 AM	84	42	0	126	50	6	0	56	43	225	0	268	450
08:15 AM	86	30	0	116	61	2	0	63	46	221	0	267	446
08:30 AM	88	28	0	116	64	4	0	68	40	235	0	275	459
Total Volume	371	149	0	520	234	17	0	251	180	878	0	1058	1829
% App. Total	71.3	28.7	0		93.2	6.8	0		17	83	0		
PHF	.821	.760	.000	.802	.914	.708	.000	.923	.882	.934	.000	.962	.965
Cars	355	148	0	503	234	17	0	251	179	860	0	1039	1793
% Cars	95.7	99.3	0	96.7	100	100	0	100	99.4	97.9	0	98.2	98.0
Heavy Vehicles	16	1	0	17	0	0	0	0	1	18	0	19	36
% Heavy Vehicles	4.3	0.7	0	3.3	0	0	0	0	0.6	2.1	0	1.8	2.0



N/S: Lexington Road (Rt 2A)/ Brooks Road
E/W: N.Great Rd (Rt 2A)/ Bypass Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 123082 H
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Lexington Road (Route 2A) From North				North Great Road (Route 2A) From East				Brooks Road From South				Bypass Road From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	1	0	17	0	4	26	0	0	0	0	0	0	0	68	1	0	117
06:15 AM	1	0	29	0	3	39	0	0	1	0	0	0	0	55	0	0	128
06:30 AM	2	0	71	0	10	36	0	0	0	0	0	0	0	89	6	0	214
06:45 AM	3	0	108	0	14	58	0	0	1	0	0	0	0	78	0	0	262
Total	7	0	225	0	31	159	0	0	2	0	0	0	0	290	7	0	721
07:00 AM	5	0	124	0	20	64	1	0	1	0	1	0	0	98	0	0	314
07:15 AM	0	0	137	0	15	70	0	0	2	0	0	0	1	113	0	0	338
07:30 AM	5	1	148	0	34	61	1	0	5	2	1	0	0	113	0	0	371
07:45 AM	9	0	135	0	43	74	0	0	1	0	0	0	0	107	1	0	370
Total	19	1	544	0	112	269	2	0	9	2	2	0	1	431	1	0	1393
08:00 AM	4	0	143	0	31	71	1	0	7	0	0	0	0	123	0	0	380
08:15 AM	4	0	143	0	27	57	1	0	3	4	0	0	0	121	1	0	361
08:30 AM	7	0	126	0	27	61	0	0	2	0	2	0	1	141	2	0	369
08:45 AM	4	2	111	0	22	70	1	0	4	0	0	0	1	102	1	0	318
Total	19	2	523	0	107	259	3	0	16	4	2	0	2	487	4	0	1428
Grand Total	45	3	1292	0	250	687	5	0	27	6	4	0	3	1208	12	0	3542
Apprch %	3.4	0.2	96.4	0	26.5	72.9	0.5	0	73	16.2	10.8	0	0.2	98.8	1	0	
Total %	1.3	0.1	36.5	0	7.1	19.4	0.1	0	0.8	0.2	0.1	0	0.1	34.1	0.3	0	
Cars	44	3	1284	0	242	658	5	0	26	6	4	0	2	1175	10	0	3459
% Cars	97.8	100	99.4	0	96.8	95.8	100	0	96.3	100	100	0	66.7	97.3	83.3	0	97.7
Heavy Vehicles	1	0	8	0	8	29	0	0	1	0	0	0	1	33	2	0	83
% Heavy Vehicles	2.2	0	0.6	0	3.2	4.2	0	0	3.7	0	0	0	33.3	2.7	16.7	0	2.3

	Lexington Road (Route 2A) From North					North Great Road (Route 2A) From East					Brooks Road From South					Bypass Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	5	1	148	0	154	34	61	1	0	96	5	2	1	0	8	0	113	0	0	113	371
07:45 AM	9	0	135	0	144	43	74	0	0	117	1	0	0	0	1	0	107	1	0	108	370
08:00 AM	4	0	143	0	147	31	71	1	0	103	7	0	0	0	7	0	123	0	0	123	380
08:15 AM	4	0	143	0	147	27	57	1	0	85	3	4	0	0	7	0	121	1	0	122	361
Total Volume	22	1	569	0	592	135	263	3	0	401	16	6	1	0	23	0	464	2	0	466	1482
% App. Total	3.7	0.2	96.1	0		33.7	65.6	0.7	0		69.6	26.1	4.3	0		0	99.6	0.4	0		
PHF	.611	.250	.961	.000	.961	.785	.889	.750	.000	.857	.571	.375	.250	.000	.719	.000	.943	.500	.000	.947	.975
Cars	22	1	565	0	588	133	248	3	0	384	15	6	1	0	22	0	451	2	0	453	1447
% Cars	100	100	99.3	0	99.3	98.5	94.3	100	0	95.8	93.8	100	100	0	95.7	0	97.2	100	0	97.2	97.6
Heavy Vehicles	0	0	4	0	4	2	15	0	0	17	1	0	0	0	1	0	13	0	0	13	35
% Heavy Vehicles	0	0	0.7	0	0.7	1.5	5.7	0	0	4.2	6.3	0	0	0	4.3	0	2.8	0	0	2.8	2.4

N/S: Lexington Road (Rt 2A)/ Brooks Road
E/W: N.Great Rd (Rt 2A)/ Bypass Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

File Name : 123082 H
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	Lexington Road (Route 2A) From North				North Great Road (Route 2A) From East				Brooks Road From South				Bypass Road From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	1	0	17	0	3	25	0	0	0	0	0	0	0	68	1	0	115
06:15 AM	0	0	29	0	2	38	0	0	1	0	0	0	0	54	0	0	124
06:30 AM	2	0	70	0	10	36	0	0	0	0	0	0	0	88	5	0	211
06:45 AM	3	0	107	0	14	56	0	0	1	0	0	0	0	74	0	0	255
Total	6	0	223	0	29	155	0	0	2	0	0	0	0	284	6	0	705
07:00 AM	5	0	123	0	19	62	1	0	1	0	1	0	0	96	0	0	308
07:15 AM	0	0	136	0	14	67	0	0	2	0	0	0	0	109	0	0	328
07:30 AM	5	1	147	0	33	59	1	0	4	2	1	0	0	110	0	0	363
07:45 AM	9	0	134	0	42	69	0	0	1	0	0	0	0	105	1	0	361
Total	19	1	540	0	108	257	2	0	8	2	2	0	0	420	1	0	1360
08:00 AM	4	0	143	0	31	70	1	0	7	0	0	0	0	119	0	0	375
08:15 AM	4	0	141	0	27	50	1	0	3	4	0	0	0	117	1	0	348
08:30 AM	7	0	126	0	26	61	0	0	2	0	2	0	1	135	2	0	362
08:45 AM	4	2	111	0	21	65	1	0	4	0	0	0	1	100	0	0	309
Total	19	2	521	0	105	246	3	0	16	4	2	0	2	471	3	0	1394
Grand Total	44	3	1284	0	242	658	5	0	26	6	4	0	2	1175	10	0	3459
Apprch %	3.3	0.2	96.5	0	26.7	72.7	0.6	0	72.2	16.7	11.1	0	0.2	99	0.8	0	
Total %	1.3	0.1	37.1	0	7	19	0.1	0	0.8	0.2	0.1	0	0.1	34	0.3	0	

	Lexington Road (Route 2A) From North					North Great Road (Route 2A) From East					Brooks Road From South					Bypass Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	5	1	147	0	153	33	59	1	0	93	4	2	1	0	7	0	110	0	0	110	363
07:45 AM	9	0	134	0	143	42	69	0	0	111	1	0	0	0	1	0	105	1	0	106	361
08:00 AM	4	0	143	0	147	31	70	1	0	102	7	0	0	0	7	0	119	0	0	119	375
08:15 AM	4	0	141	0	145	27	50	1	0	78	3	4	0	0	7	0	117	1	0	118	348
Total Volume	22	1	565	0	588	133	248	3	0	384	15	6	1	0	22	0	451	2	0	453	1447
% App. Total	3.7	0.2	96.1	0		34.6	64.6	0.8	0		68.2	27.3	4.5	0		0	99.6	0.4	0		
PHF	.611	.250	.961	.000	.961	.792	.886	.750	.000	.865	.536	.375	.250	.000	.786	.000	.947	.500	.000	.952	.965

N/S: Lexington Road (Rt 2A)/ Brooks Road
E/W: N.Great Rd (Rt 2A)/ Bypass Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 123082 H
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Lexington Road (Route 2A) From North				North Great Road (Route 2A) From East				Brooks Road From South				Bypass Road From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
06:15 AM	1	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	4
06:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	3
06:45 AM	0	0	1	0	0	2	0	0	0	0	0	0	0	4	0	0	7
Total	1	0	2	0	2	4	0	0	0	0	0	0	0	6	1	0	16
07:00 AM	0	0	1	0	1	2	0	0	0	0	0	0	0	2	0	0	6
07:15 AM	0	0	1	0	1	3	0	0	0	0	0	0	1	4	0	0	10
07:30 AM	0	0	1	0	1	2	0	0	1	0	0	0	0	3	0	0	8
07:45 AM	0	0	1	0	1	5	0	0	0	0	0	0	0	2	0	0	9
Total	0	0	4	0	4	12	0	0	1	0	0	0	1	11	0	0	33
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0	0	5
08:15 AM	0	0	2	0	0	7	0	0	0	0	0	0	0	4	0	0	13
08:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	6	0	0	7
08:45 AM	0	0	0	0	1	5	0	0	0	0	0	0	0	2	1	0	9
Total	0	0	2	0	2	13	0	0	0	0	0	0	0	16	1	0	34
Grand Total	1	0	8	0	8	29	0	0	1	0	0	0	1	33	2	0	83
Apprch %	11.1	0	88.9	0	21.6	78.4	0	0	100	0	0	0	2.8	91.7	5.6	0	
Total %	1.2	0	9.6	0	9.6	34.9	0	0	1.2	0	0	0	1.2	39.8	2.4	0	

	Lexington Road (Route 2A) From North					North Great Road (Route 2A) From East					Brooks Road From South					Bypass Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	1	0	1	1	2	0	0	3	1	0	0	0	1	0	3	0	0	3	8
07:45 AM	0	0	1	0	1	1	5	0	0	6	0	0	0	0	0	0	2	0	0	2	9
08:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	5
08:15 AM	0	0	2	0	2	0	7	0	0	7	0	0	0	0	0	0	4	0	0	4	13
Total Volume	0	0	4	0	4	2	15	0	0	17	1	0	0	0	1	0	13	0	0	13	35
% App. Total	0	0	100	0		11.8	88.2	0	0		100	0	0	0		0	100	0	0		
PHF	.000	.000	.500	.000	.500	.500	.536	.000	.000	.607	.250	.000	.000	.000	.250	.000	.813	.000	.000	.813	.673

N/S: Lexington Road (Rt 2A)/ Brooks Road
E/W: N.Great Rd (Rt 2A)/ Bypass Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 H
Site Code : TBA
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Page No : 1

Groups Printed- Peds and Bicycles

	Lexington Road (Route 2A) From North				North Great Road (Route 2A) From East				Brooks Road From South				Bypass Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	2
Grand Total	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0	0	4
Apprch %	0	0	0	0	100	0	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	25	0	0	0	0	0	0	0	0	75	0	0	

	Lexington Road (Route 2A) From North					North Great Road (Route 2A) From East					Brooks Road From South					Bypass Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. 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	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
08:30 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% App. Total	0	0	0	0		100	0	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.500

N/S: Lexington Road (Rt 2A)/ Brooks Road
E/W: N.Great Rd (Rt 2A)/ Bypass Road
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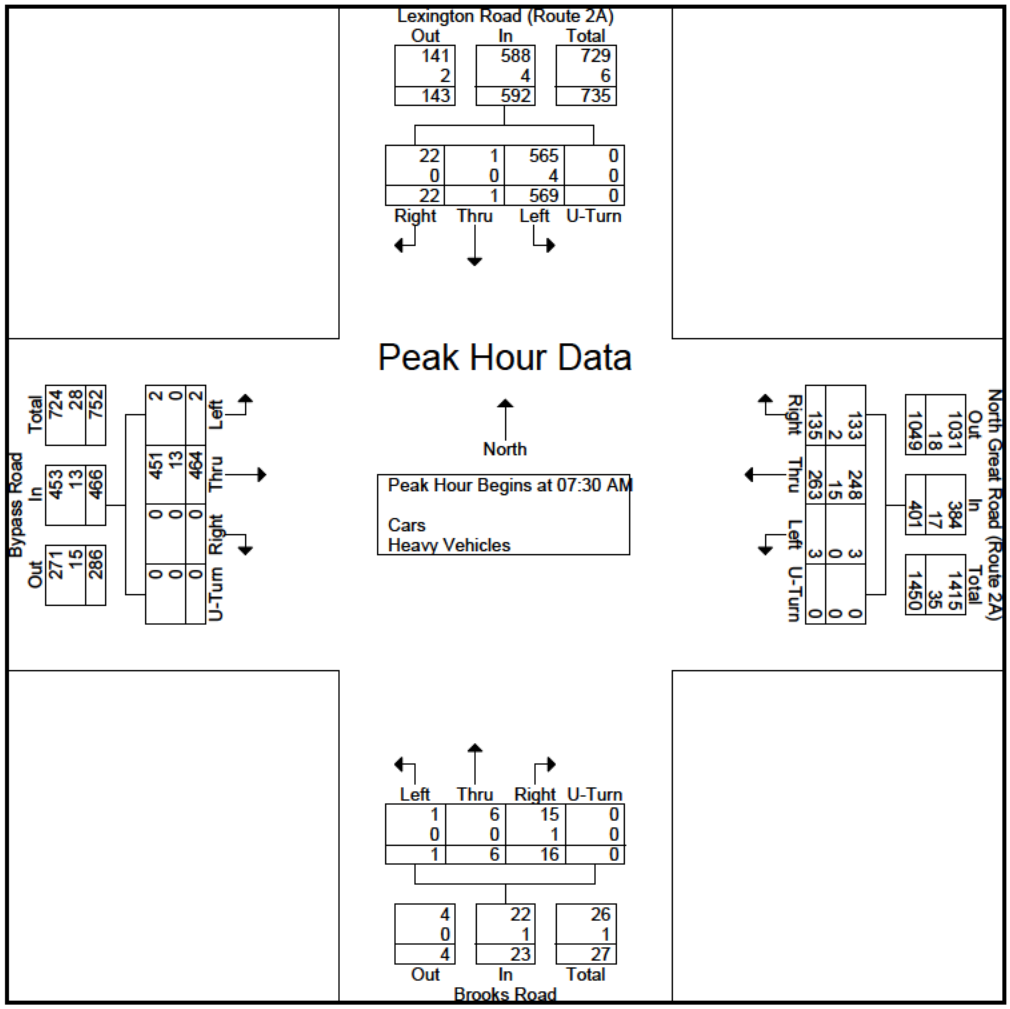
	Lexington Road (Route 2A) From North					North Great Road (Route 2A) From East					Brooks Road From South					Bypass Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour 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	5	1	148	0	154	34	61	1	0	96	5	2	1	0	8	0	113	0	0	113	371
07:45 AM	9	0	135	0	144	43	74	0	0	117	1	0	0	0	1	0	107	1	0	108	370
08:00 AM	4	0	143	0	147	31	71	1	0	103	7	0	0	0	7	0	123	0	0	123	380
08:15 AM	4	0	143	0	147	27	57	1	0	85	3	4	0	0	7	0	121	1	0	122	361
Total Volume	22	1	569	0	592	135	263	3	0	401	16	6	1	0	23	0	464	2	0	466	1482
% App. Total	3.7	0.2	96.1	0		33.7	65.6	0.7	0		69.6	26.1	4.3	0		0	99.6	0.4	0		
PHF	.611	.250	.961	.000	.961	.785	.889	.750	.000	.857	.571	.375	.250	.000	.719	.000	.943	.500	.000	.947	.975
Cars	22	1	565	0	588	133	248	3	0	384	15	6	1	0	22	0	451	2	0	453	1447
% Cars	100	100	99.3	0	99.3	98.5	94.3	100	0	95.8	93.8	100	100	0	95.7	0	97.2	100	0	97.2	97.6
Heavy Vehicles	0	0	4	0	4	2	15	0	0	17	1	0	0	0	1	0	13	0	0	13	35
% Heavy Vehicles	0	0	0.7	0	0.7	1.5	5.7	0	0	4.2	6.3	0	0	0	4.3	0	2.8	0	0	2.8	2.4



N: Old Bedford Road
E/W: Lexington Road
City, State: Concord, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
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Groups Printed- Cars - Heavy Vehicles

	Old Bedford Road From North			Lexington Road From East			Lexington Road From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	5	4	0	0	3	0	14	15	0	41
06:15 AM	5	8	0	0	4	0	27	24	0	68
06:30 AM	9	20	0	6	6	0	47	35	0	123
06:45 AM	16	26	0	3	12	0	79	53	0	189
Total	35	58	0	9	25	0	167	127	0	421
07:00 AM	23	36	0	4	18	0	104	54	0	239
07:15 AM	27	32	0	4	13	0	110	99	0	285
07:30 AM	24	40	0	8	30	0	106	105	0	313
07:45 AM	28	43	0	13	34	0	110	109	0	337
Total	102	151	0	29	95	0	430	367	0	1174
08:00 AM	29	31	0	13	30	0	116	105	1	325
08:15 AM	33	18	0	16	19	0	97	108	0	291
08:30 AM	30	28	0	12	17	0	100	99	0	286
08:45 AM	32	26	0	15	18	0	84	105	0	280
Total	124	103	0	56	84	0	397	417	1	1182
Grand Total	261	312	0	94	204	0	994	911	1	2777
Apprch %	45.5	54.5	0	31.5	68.5	0	52.2	47.8	0.1	
Total %	9.4	11.2	0	3.4	7.3	0	35.8	32.8	0	
Cars	245	309	0	88	196	0	985	900	1	2724
% Cars	93.9	99	0	93.6	96.1	0	99.1	98.8	100	98.1
Heavy Vehicles	16	3	0	6	8	0	9	11	0	53
% Heavy Vehicles	6.1	1	0	6.4	3.9	0	0.9	1.2	0	1.9

	Old Bedford Road From North				Lexington Road From East				Lexington Road From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	24	40	0	64	8	30	0	38	106	105	0	211	313
07:45 AM	28	43	0	71	13	34	0	47	110	109	0	219	337
08:00 AM	29	31	0	60	13	30	0	43	116	105	1	222	325
08:15 AM	33	18	0	51	16	19	0	35	97	108	0	205	291
Total Volume	114	132	0	246	50	113	0	163	429	427	1	857	1266
% App. Total	46.3	53.7	0		30.7	69.3	0		50.1	49.8	0.1		
PHF	.864	.767	.000	.866	.781	.831	.000	.867	.925	.979	.250	.965	.939
Cars	108	131	0	239	49	110	0	159	426	424	1	851	1249
% Cars	94.7	99.2	0	97.2	98.0	97.3	0	97.5	99.3	99.3	100	99.3	98.7
Heavy Vehicles	6	1	0	7	1	3	0	4	3	3	0	6	17
% Heavy Vehicles	5.3	0.8	0	2.8	2.0	2.7	0	2.5	0.7	0.7	0	0.7	1.3

N: Old Bedford Road
E/W: Lexington Road
City, State: Concord, MA
Client: Toole Engineering/ C. Fink

PRECISION
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Groups Printed- Cars

	Old Bedford Road From North			Lexington Road From East			Lexington Road From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	5	4	0	0	2	0	14	15	0	40
06:15 AM	5	7	0	0	3	0	27	24	0	66
06:30 AM	9	20	0	6	6	0	45	34	0	120
06:45 AM	13	26	0	2	12	0	78	53	0	184
Total	32	57	0	8	23	0	164	126	0	410
07:00 AM	21	36	0	3	17	0	103	53	0	233
07:15 AM	27	31	0	3	13	0	108	96	0	278
07:30 AM	19	40	0	7	28	0	105	104	0	303
07:45 AM	28	43	0	13	33	0	110	109	0	336
Total	95	150	0	26	91	0	426	362	0	1150
08:00 AM	29	30	0	13	30	0	116	105	1	324
08:15 AM	32	18	0	16	19	0	95	106	0	286
08:30 AM	28	28	0	11	16	0	100	97	0	280
08:45 AM	29	26	0	14	17	0	84	104	0	274
Total	118	102	0	54	82	0	395	412	1	1164
Grand Total	245	309	0	88	196	0	985	900	1	2724
Apprch %	44.2	55.8	0	31	69	0	52.2	47.7	0.1	
Total %	9	11.3	0	3.2	7.2	0	36.2	33	0	

	Old Bedford Road From North				Lexington Road From East				Lexington Road From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	19	40	0	59	7	28	0	35	105	104	0	209	303
07:45 AM	28	43	0	71	13	33	0	46	110	109	0	219	336
08:00 AM	29	30	0	59	13	30	0	43	116	105	1	222	324
08:15 AM	32	18	0	50	16	19	0	35	95	106	0	201	286
Total Volume	108	131	0	239	49	110	0	159	426	424	1	851	1249
% App. Total	45.2	54.8	0		30.8	69.2	0		50.1	49.8	0.1		
PHF	.844	.762	.000	.842	.766	.833	.000	.864	.918	.972	.250	.958	.929

N: Old Bedford Road
E/W: Lexington Road
City, State: Concord, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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Groups Printed- Heavy Vehicles

	Old Bedford Road From North			Lexington Road From East			Lexington Road From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	0	0	0	0	1	0	0	0	0	1
06:15 AM	0	1	0	0	1	0	0	0	0	2
06:30 AM	0	0	0	0	0	0	2	1	0	3
06:45 AM	3	0	0	1	0	0	1	0	0	5
Total	3	1	0	1	2	0	3	1	0	11
07:00 AM	2	0	0	1	1	0	1	1	0	6
07:15 AM	0	1	0	1	0	0	2	3	0	7
07:30 AM	5	0	0	1	2	0	1	1	0	10
07:45 AM	0	0	0	0	1	0	0	0	0	1
Total	7	1	0	3	4	0	4	5	0	24
08:00 AM	0	1	0	0	0	0	0	0	0	1
08:15 AM	1	0	0	0	0	0	2	2	0	5
08:30 AM	2	0	0	1	1	0	0	2	0	6
08:45 AM	3	0	0	1	1	0	0	1	0	6
Total	6	1	0	2	2	0	2	5	0	18
Grand Total	16	3	0	6	8	0	9	11	0	53
Apprch %	84.2	15.8	0	42.9	57.1	0	45	55	0	
Total %	30.2	5.7	0	11.3	15.1	0	17	20.8	0	

	Old Bedford Road From North				Lexington Road From East				Lexington Road From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	0	3	1	0	0	1	1	0	0	1	5
07:00 AM	2	0	0	2	1	1	0	2	1	1	0	2	6
07:15 AM	0	1	0	1	1	0	0	1	2	3	0	5	7
07:30 AM	5	0	0	5	1	2	0	3	1	1	0	2	10
Total Volume	10	1	0	11	4	3	0	7	5	5	0	10	28
% App. Total	90.9	9.1	0		57.1	42.9	0		50	50	0		
PHF	.500	.250	.000	.550	1.00	.375	.000	.583	.625	.417	.000	.500	.700

N: Old Bedford Road
E/W: Lexington Road
City, State: Concord, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Peds and Bicycles

	Old Bedford Road From North			Lexington Road From East			Lexington Road From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	1	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	0	0	1
Grand Total	0	0	0	0	1	0	0	0	0	1
Apprch %	0	0	0	0	100	0	0	0	0	
Total %	0	0	0	0	100	0	0	0	0	

	Old Bedford Road From North				Lexington Road From East				Lexington Road From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. 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	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	1
% App. Total	0	0	0		0	100	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.250

N: Old Bedford Road
E/W: Lexington Road
City, State: Concord, MA
Client: Toole Engineering/ C. Fink

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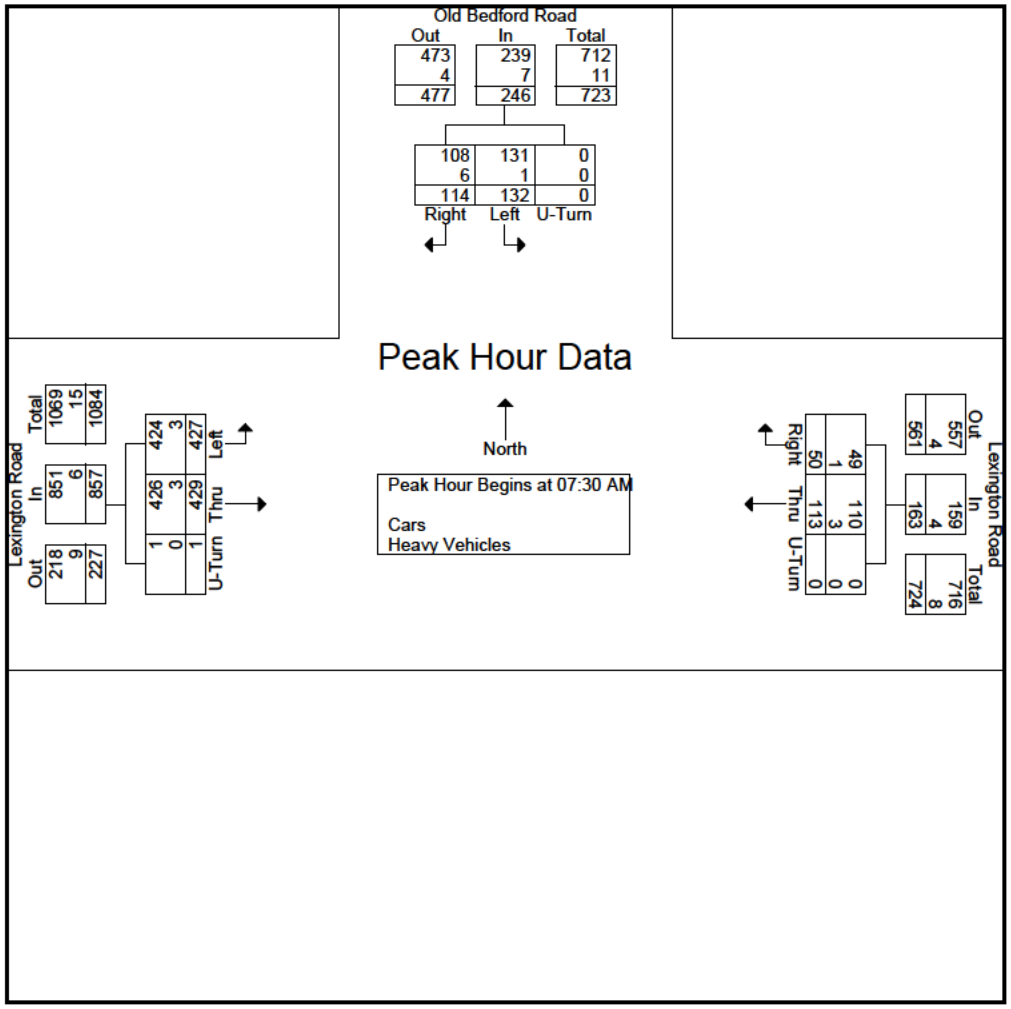
	Old Bedford Road From North				Lexington Road From East				Lexington Road From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	24	40	0	64	8	30	0	38	106	105	0	211	313
07:45 AM	28	43	0	71	13	34	0	47	110	109	0	219	337
08:00 AM	29	31	0	60	13	30	0	43	116	105	1	222	325
08:15 AM	33	18	0	51	16	19	0	35	97	108	0	205	291
Total Volume	114	132	0	246	50	113	0	163	429	427	1	857	1266
% App. Total	46.3	53.7	0		30.7	69.3	0		50.1	49.8	0.1		
PHF	.864	.767	.000	.866	.781	.831	.000	.867	.925	.979	.250	.965	.939
Cars	108	131	0	239	49	110	0	159	426	424	1	851	1249
% Cars	94.7	99.2	0	97.2	98.0	97.3	0	97.5	99.3	99.3	100	99.3	98.7
Heavy Vehicles	6	1	0	7	1	3	0	4	3	3	0	6	17
% Heavy Vehicles	5.3	0.8	0	2.8	2.0	2.7	0	2.5	0.7	0.7	0	0.7	1.3



N/S: Old Bedford Road
E/W: Virginia Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars - Heavy Vehicles

	Old Bedford Road From North			Virginia Road From East			Old Bedford Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
06:00 AM	11	11	0	1	4	0	17	3	0	47
06:15 AM	14	11	0	0	0	0	18	3	0	46
06:30 AM	29	15	0	2	3	0	31	7	1	88
06:45 AM	34	27	0	4	4	0	43	12	0	124
Total	88	64	0	7	11	0	109	25	1	305
07:00 AM	56	33	0	2	6	0	39	17	0	153
07:15 AM	43	40	0	5	13	0	73	22	0	196
07:30 AM	56	38	0	5	8	0	68	35	0	210
07:45 AM	47	45	0	2	3	0	64	35	0	196
Total	202	156	0	14	30	0	244	109	0	755
08:00 AM	37	25	0	6	10	0	74	30	0	182
08:15 AM	46	32	0	2	4	0	71	40	0	195
08:30 AM	43	33	0	5	5	0	69	37	0	192
08:45 AM	46	33	0	2	5	0	54	51	0	191
Total	172	123	0	15	24	0	268	158	0	760
Grand Total	462	343	0	36	65	0	621	292	1	1820
Apprch %	57.4	42.6	0	35.6	64.4	0	67.9	31.9	0.1	
Total %	25.4	18.8	0	2	3.6	0	34.1	16	0.1	
Cars	449	342	0	35	61	0	616	287	1	1791
% Cars	97.2	99.7	0	97.2	93.8	0	99.2	98.3	100	98.4
Heavy Vehicles	13	1	0	1	4	0	5	5	0	29
% Heavy Vehicles	2.8	0.3	0	2.8	6.2	0	0.8	1.7	0	1.6

	Old Bedford Road From North				Virginia Road From East				Old Bedford Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. 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	43	40	0	83	5	13	0	18	73	22	0	95	196
07:30 AM	56	38	0	94	5	8	0	13	68	35	0	103	210
07:45 AM	47	45	0	92	2	3	0	5	64	35	0	99	196
08:00 AM	37	25	0	62	6	10	0	16	74	30	0	104	182
Total Volume	183	148	0	331	18	34	0	52	279	122	0	401	784
% App. Total	55.3	44.7	0		34.6	65.4	0		69.6	30.4	0		
PHF	.817	.822	.000	.880	.750	.654	.000	.722	.943	.871	.000	.964	.933
Cars	180	148	0	328	18	33	0	51	278	119	0	397	776
% Cars	98.4	100	0	99.1	100	97.1	0	98.1	99.6	97.5	0	99.0	99.0
Heavy Vehicles	3	0	0	3	0	1	0	1	1	3	0	4	8
% Heavy Vehicles	1.6	0	0	0.9	0	2.9	0	1.9	0.4	2.5	0	1.0	1.0

N/S: Old Bedford Road
E/W: Virginia Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars

	Old Bedford Road From North			Virginia Road From East			Old Bedford Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
06:00 AM	10	11	0	1	4	0	17	3	0	46
06:15 AM	13	11	0	0	0	0	18	3	0	45
06:30 AM	29	15	0	2	3	0	30	7	1	87
06:45 AM	32	27	0	3	3	0	42	12	0	119
Total	84	64	0	6	10	0	107	25	1	297
07:00 AM	54	32	0	2	6	0	38	17	0	149
07:15 AM	42	40	0	5	13	0	73	20	0	193
07:30 AM	54	38	0	5	7	0	67	34	0	205
07:45 AM	47	45	0	2	3	0	64	35	0	196
Total	197	155	0	14	29	0	242	106	0	743
08:00 AM	37	25	0	6	10	0	74	30	0	182
08:15 AM	44	32	0	2	3	0	71	40	0	192
08:30 AM	42	33	0	5	5	0	68	36	0	189
08:45 AM	45	33	0	2	4	0	54	50	0	188
Total	168	123	0	15	22	0	267	156	0	751
Grand Total	449	342	0	35	61	0	616	287	1	1791
Apprch %	56.8	43.2	0	36.5	63.5	0	68.1	31.7	0.1	
Total %	25.1	19.1	0	2	3.4	0	34.4	16	0.1	

	Old Bedford Road From North				Virginia Road From East				Old Bedford Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. 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	40	0	82	5	13	0	18	73	20	0	93	193
07:30 AM	54	38	0	92	5	7	0	12	67	34	0	101	205
07:45 AM	47	45	0	92	2	3	0	5	64	35	0	99	196
08:00 AM	37	25	0	62	6	10	0	16	74	30	0	104	182
Total Volume	180	148	0	328	18	33	0	51	278	119	0	397	776
% App. Total	54.9	45.1	0		35.3	64.7	0		70	30	0		
PHF	.833	.822	.000	.891	.750	.635	.000	.708	.939	.850	.000	.954	.946

N/S: Old Bedford Road
E/W: Virginia Road
City, State: Bedford, MA
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Groups Printed- Heavy Vehicles

	Old Bedford Road From North			Virginia Road From East			Old Bedford Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
06:00 AM	1	0	0	0	0	0	0	0	0	1
06:15 AM	1	0	0	0	0	0	0	0	0	1
06:30 AM	0	0	0	0	0	0	1	0	0	1
06:45 AM	2	0	0	1	1	0	1	0	0	5
Total	4	0	0	1	1	0	2	0	0	8
07:00 AM	2	1	0	0	0	0	1	0	0	4
07:15 AM	1	0	0	0	0	0	0	2	0	3
07:30 AM	2	0	0	0	1	0	1	1	0	5
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	5	1	0	0	1	0	2	3	0	12
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	2	0	0	0	1	0	0	0	0	3
08:30 AM	1	0	0	0	0	0	1	1	0	3
08:45 AM	1	0	0	0	1	0	0	1	0	3
Total	4	0	0	0	2	0	1	2	0	9
Grand Total	13	1	0	1	4	0	5	5	0	29
Apprch %	92.9	7.1	0	20	80	0	50	50	0	
Total %	44.8	3.4	0	3.4	13.8	0	17.2	17.2	0	

	Old Bedford Road From North				Virginia Road From East				Old Bedford Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. 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	2	0	0	2	1	1	0	2	1	0	0	1	5
07:00 AM	2	1	0	3	0	0	0	0	1	0	0	1	4
07:15 AM	1	0	0	1	0	0	0	0	0	2	0	2	3
07:30 AM	2	0	0	2	0	1	0	1	1	1	0	2	5
Total Volume	7	1	0	8	1	2	0	3	3	3	0	6	17
% App. Total	87.5	12.5	0		33.3	66.7	0		50	50	0		
PHF	.875	.250	.000	.667	.250	.500	.000	.375	.750	.375	.000	.750	.850

N/S: Old Bedford Road
E/W: Virginia Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Peds and Bicycles

	Old Bedford Road From North			Virginia Road From East			Old Bedford Road From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	1	0	0	0	1
06:30 AM	0	0	1	0	0	0	0	0	0	1
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	1	0	0	0	2
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	1	0	0	0	0	0	0	0	1	2
07:30 AM	0	0	0	0	0	1	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	1	0	0	1	3
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	1	0	0	2	0	0	1	5
Apprch %	50	0	50	0	0	100	0	0	100	
Total %	20	0	20	0	0	40	0	0	20	

	Old Bedford Road From North				Virginia Road From East				Old Bedford Road From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. 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	1	1	0	0	0	0	0	0	0	0	1
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	1	0	0	1	0	0	0	0	0	0	1	1	2
Total Volume	1	0	1	2	0	0	0	0	0	0	1	1	3
% App. Total	50	0	50		0	0	0		0	0	100		
PHF	.250	.000	.250	.500	.000	.000	.000	.000	.000	.000	.250	.250	.375

N/S: Old Bedford Road
E/W: Virginia Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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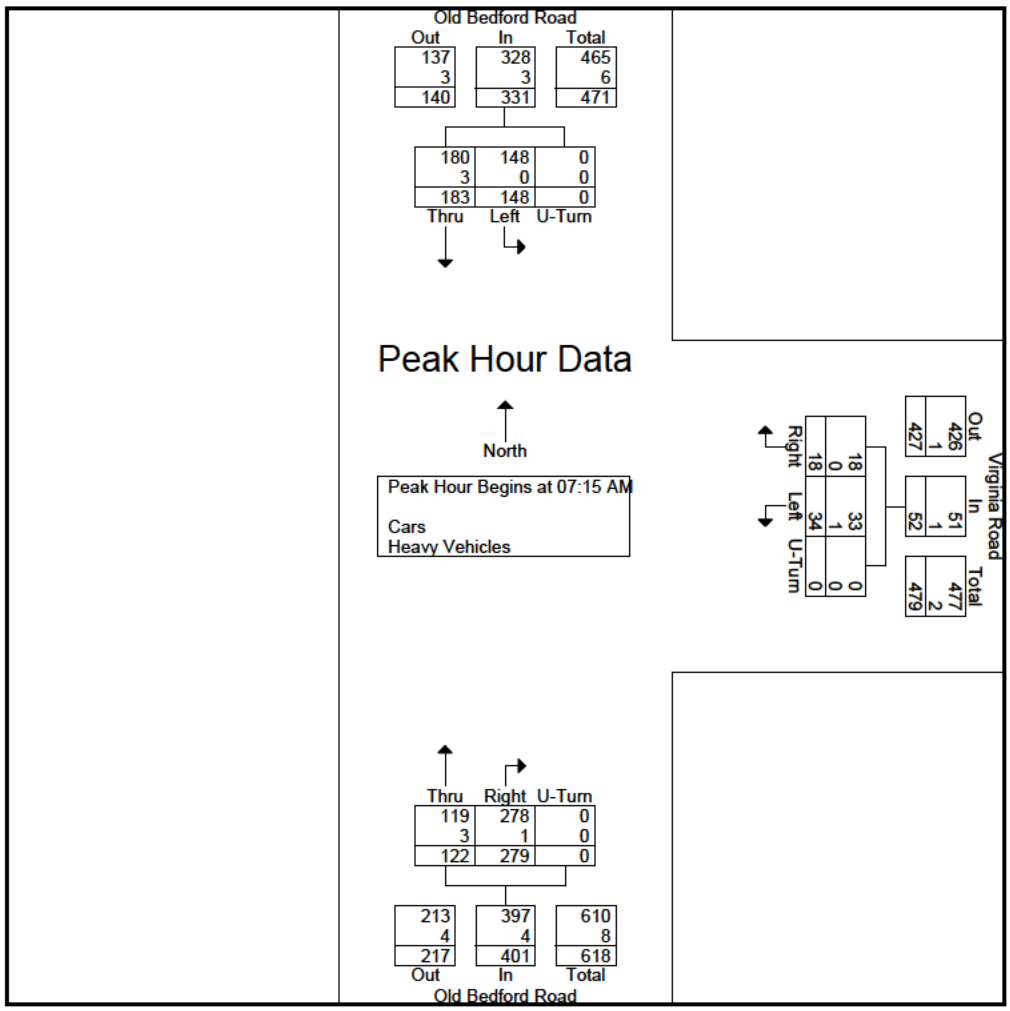
	Old Bedford Road From North				Virginia Road From East				Old Bedford Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	43	40	0	83	5	13	0	18	73	22	0	95	196
07:30 AM	56	38	0	94	5	8	0	13	68	35	0	103	210
07:45 AM	47	45	0	92	2	3	0	5	64	35	0	99	196
08:00 AM	37	25	0	62	6	10	0	16	74	30	0	104	182
Total Volume	183	148	0	331	18	34	0	52	279	122	0	401	784
% App. Total	55.3	44.7	0		34.6	65.4	0		69.6	30.4	0		
PHF	.817	.822	.000	.880	.750	.654	.000	.722	.943	.871	.000	.964	.933
Cars	180	148	0	328	18	33	0	51	278	119	0	397	776
% Cars	98.4	100	0	99.1	100	97.1	0	98.1	99.6	97.5	0	99.0	99.0
Heavy Vehicles	3	0	0	3	0	1	0	1	1	3	0	4	8
% Heavy Vehicles	1.6	0	0	0.9	0	2.9	0	1.9	0.4	2.5	0	1.0	1.0



S: Old Bedford Road
E/W: Bedford Street (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars - Heavy Vehicles

	Bedford Street (Route 62) From East			Old Bedford Road From South			Bedford Street (Route 62) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
06:00 AM	18	7	0	3	0	0	3	21	0	52
06:15 AM	27	22	0	4	0	0	2	25	0	80
06:30 AM	32	36	0	8	0	0	6	37	0	119
06:45 AM	41	49	0	16	1	0	10	56	0	173
Total	118	114	0	31	1	0	21	139	0	424
07:00 AM	54	75	0	15	3	0	13	73	0	233
07:15 AM	54	65	0	21	3	0	16	67	0	226
07:30 AM	57	88	0	32	5	0	10	86	0	278
07:45 AM	69	72	0	45	3	0	25	99	0	313
Total	234	300	0	113	14	0	64	325	0	1050
08:00 AM	59	62	0	32	4	0	13	114	0	284
08:15 AM	62	75	0	52	1	0	14	115	0	319
08:30 AM	71	63	0	41	3	0	14	91	0	283
08:45 AM	63	65	0	54	5	0	10	106	0	303
Total	255	265	0	179	13	0	51	426	0	1189
Grand Total	607	679	0	323	28	0	136	890	0	2663
Apprch %	47.2	52.8	0	92	8	0	13.3	86.7	0	
Total %	22.8	25.5	0	12.1	1.1	0	5.1	33.4	0	
Cars	589	670	0	318	27	0	133	871	0	2608
% Cars	97	98.7	0	98.5	96.4	0	97.8	97.9	0	97.9
Heavy Vehicles	18	9	0	5	1	0	3	19	0	55
% Heavy Vehicles	3	1.3	0	1.5	3.6	0	2.2	2.1	0	2.1

	Bedford Street (Route 62) From East				Old Bedford Road From South				Bedford Street (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. 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	69	72	0	141	45	3	0	48	25	99	0	124	313
08:00 AM	59	62	0	121	32	4	0	36	13	114	0	127	284
08:15 AM	62	75	0	137	52	1	0	53	14	115	0	129	319
08:30 AM	71	63	0	134	41	3	0	44	14	91	0	105	283
Total Volume	261	272	0	533	170	11	0	181	66	419	0	485	1199
% App. Total	49	51	0		93.9	6.1	0		13.6	86.4	0		
PHF	.919	.907	.000	.945	.817	.688	.000	.854	.660	.911	.000	.940	.940
Cars	251	267	0	518	169	11	0	180	66	412	0	478	1176
% Cars	96.2	98.2	0	97.2	99.4	100	0	99.4	100	98.3	0	98.6	98.1
Heavy Vehicles	10	5	0	15	1	0	0	1	0	7	0	7	23
% Heavy Vehicles	3.8	1.8	0	2.8	0.6	0	0	0.6	0	1.7	0	1.4	1.9

S: Old Bedford Road
E/W: Bedford Street (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars

	Bedford Street (Route 62) From East			Old Bedford Road From South			Bedford Street (Route 62) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
06:00 AM	18	7	0	3	0	0	3	21	0	52
06:15 AM	27	22	0	4	0	0	2	23	0	78
06:30 AM	32	36	0	8	0	0	6	36	0	118
06:45 AM	39	48	0	15	1	0	10	54	0	167
Total	116	113	0	30	1	0	21	134	0	415
07:00 AM	53	74	0	15	3	0	11	69	0	225
07:15 AM	53	64	0	19	3	0	16	67	0	222
07:30 AM	53	87	0	32	4	0	9	83	0	268
07:45 AM	66	71	0	45	3	0	25	97	0	307
Total	225	296	0	111	13	0	61	316	0	1022
08:00 AM	56	62	0	32	4	0	13	114	0	281
08:15 AM	59	73	0	52	1	0	14	111	0	310
08:30 AM	70	61	0	40	3	0	14	90	0	278
08:45 AM	63	65	0	53	5	0	10	106	0	302
Total	248	261	0	177	13	0	51	421	0	1171
Grand Total	589	670	0	318	27	0	133	871	0	2608
Apprch %	46.8	53.2	0	92.2	7.8	0	13.2	86.8	0	
Total %	22.6	25.7	0	12.2	1	0	5.1	33.4	0	

	Bedford Street (Route 62) From East				Old Bedford Road From South				Bedford Street (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. 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	66	71	0	137	45	3	0	48	25	97	0	122	307
08:00 AM	56	62	0	118	32	4	0	36	13	114	0	127	281
08:15 AM	59	73	0	132	52	1	0	53	14	111	0	125	310
08:30 AM	70	61	0	131	40	3	0	43	14	90	0	104	278
Total Volume	251	267	0	518	169	11	0	180	66	412	0	478	1176
% App. Total	48.5	51.5	0		93.9	6.1	0		13.8	86.2	0		
PHF	.896	.914	.000	.945	.813	.688	.000	.849	.660	.904	.000	.941	.948

S: Old Bedford Road
E/W: Bedford Street (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Page No : 1

Groups Printed- Heavy Vehicles

	Bedford Street (Route 62) From East			Old Bedford Road From South			Bedford Street (Route 62) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	2	0	2
06:30 AM	0	0	0	0	0	0	0	1	0	1
06:45 AM	2	1	0	1	0	0	0	2	0	6
Total	2	1	0	1	0	0	0	5	0	9
07:00 AM	1	1	0	0	0	0	2	4	0	8
07:15 AM	1	1	0	2	0	0	0	0	0	4
07:30 AM	4	1	0	0	1	0	1	3	0	10
07:45 AM	3	1	0	0	0	0	0	2	0	6
Total	9	4	0	2	1	0	3	9	0	28
08:00 AM	3	0	0	0	0	0	0	0	0	3
08:15 AM	3	2	0	0	0	0	0	4	0	9
08:30 AM	1	2	0	1	0	0	0	1	0	5
08:45 AM	0	0	0	1	0	0	0	0	0	1
Total	7	4	0	2	0	0	0	5	0	18
Grand Total	18	9	0	5	1	0	3	19	0	55
Apprch %	66.7	33.3	0	83.3	16.7	0	13.6	86.4	0	
Total %	32.7	16.4	0	9.1	1.8	0	5.5	34.5	0	

	Bedford Street (Route 62) From East				Old Bedford Road From South				Bedford Street (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. 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	2	1	0	3	1	0	0	1	0	2	0	2	6
07:00 AM	1	1	0	2	0	0	0	0	2	4	0	6	8
07:15 AM	1	1	0	2	2	0	0	2	0	0	0	0	4
07:30 AM	4	1	0	5	0	1	0	1	1	3	0	4	10
Total Volume	8	4	0	12	3	1	0	4	3	9	0	12	28
% App. Total	66.7	33.3	0		75	25	0		25	75	0		
PHF	.500	1.00	.000	.600	.375	.250	.000	.500	.375	.563	.000	.500	.700

S: Old Bedford Road
E/W: Bedford Street (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Page No : 1

Groups Printed- Peds and Bicycles

	Bedford Street (Route 62) From East			Old Bedford Road From South			Bedford Street (Route 62) From West			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	2	0	0	0	0	0	0	2
06:30 AM	0	0	1	0	0	0	0	0	0	1
06:45 AM	0	0	0	0	0	0	0	1	0	1
Total	0	0	3	0	0	0	0	1	0	4
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	1	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	3	0	0	0	0	1	0	5
Apprch %	0	25	75	0	0	0	0	100	0	
Total %	0	20	60	0	0	0	0	20	0	

	Bedford Street (Route 62) From East				Old Bedford Road From South				Bedford Street (Route 62) From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. 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	0	0	0	0
06:15 AM	0	0	2	2	0	0	0	0	0	0	0	0	2
06:30 AM	0	0	1	1	0	0	0	0	0	0	0	0	1
06:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	3	3	0	0	0	0	0	1	0	1	4
% App. Total	0	0	100		0	0	0		0	100	0		
PHF	.000	.000	.375	.375	.000	.000	.000	.000	.000	.250	.000	.250	.500

S: Old Bedford Road
E/W: Bedford Street (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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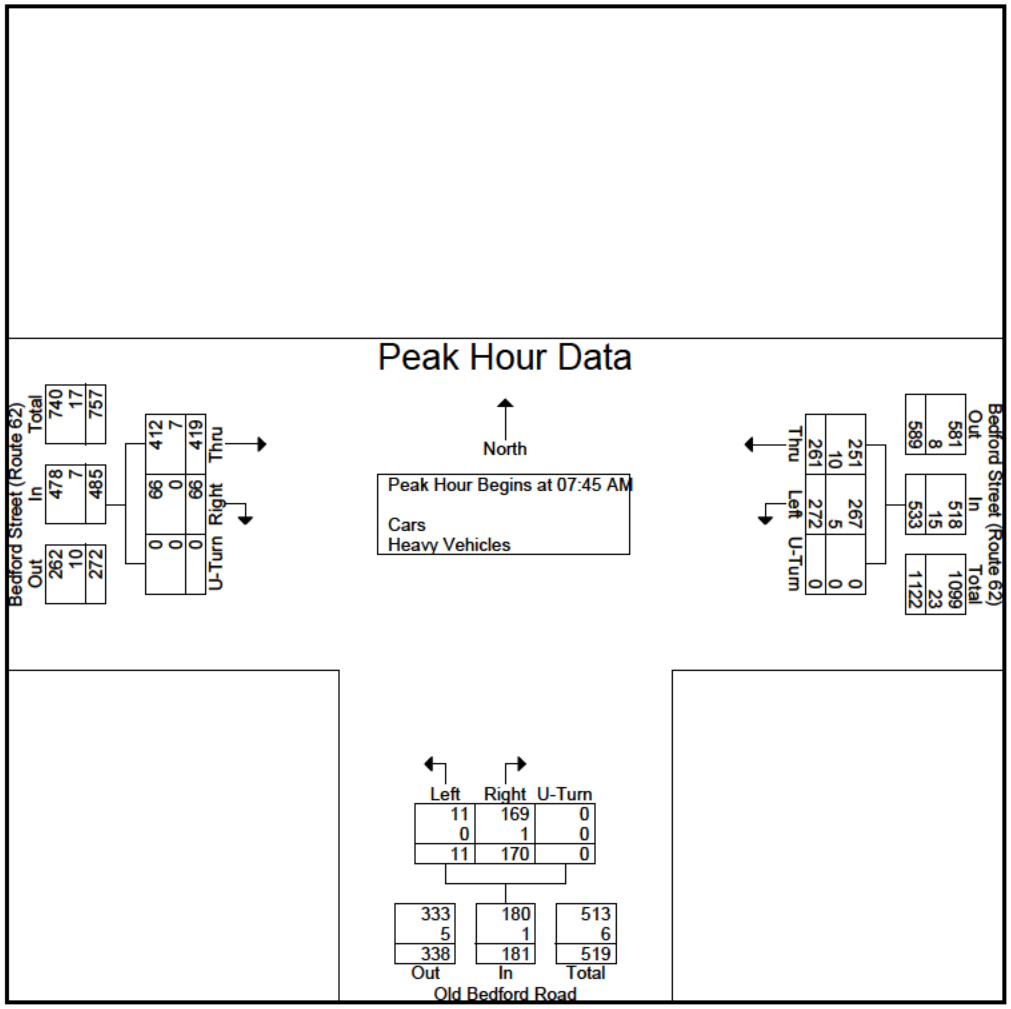
	Bedford Street (Route 62) From East				Old Bedford Road From South				Bedford Street (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:45 AM													
07:45 AM	69	72	0	141	45	3	0	48	25	99	0	124	313
08:00 AM	59	62	0	121	32	4	0	36	13	114	0	127	284
08:15 AM	62	75	0	137	52	1	0	53	14	115	0	129	319
08:30 AM	71	63	0	134	41	3	0	44	14	91	0	105	283
Total Volume	261	272	0	533	170	11	0	181	66	419	0	485	1199
% App. Total	49	51	0		93.9	6.1	0		13.6	86.4	0		
PHF	.919	.907	.000	.945	.817	.688	.000	.854	.660	.911	.000	.940	.940
Cars	251	267	0	518	169	11	0	180	66	412	0	478	1176
% Cars	96.2	98.2	0	97.2	99.4	100	0	99.4	100	98.3	0	98.6	98.1
Heavy Vehicles	10	5	0	15	1	0	0	1	0	7	0	7	23
% Heavy Vehicles	3.8	1.8	0	2.8	0.6	0	0	0.6	0	1.7	0	1.4	1.9



S: Hartwell Road
E/W: Concord Road (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars - Heavy Vehicles

	Concord Road (Route 62) From East			Hartwell Road From South			Concord Road (Route 62) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
06:00 AM	26	25	0	2	0	0	6	27	0	86
06:15 AM	39	14	0	3	2	0	6	31	0	95
06:30 AM	67	8	0	0	5	0	11	44	0	135
06:45 AM	90	26	1	0	5	0	11	55	0	188
Total	222	73	1	5	12	0	34	157	0	504
07:00 AM	91	25	0	1	10	0	18	86	0	231
07:15 AM	90	7	0	2	12	0	24	89	0	224
07:30 AM	133	20	0	6	9	0	34	121	0	323
07:45 AM	106	19	0	5	11	0	47	107	0	295
Total	420	71	0	14	42	0	123	403	0	1073
08:00 AM	120	30	0	2	11	0	43	124	0	330
08:15 AM	109	27	0	3	13	0	44	141	0	337
08:30 AM	131	12	0	9	9	0	28	124	0	313
08:45 AM	148	11	0	3	14	0	38	158	0	372
Total	508	80	0	17	47	0	153	547	0	1352
Grand Total	1150	224	1	36	101	0	310	1107	0	2929
Apprch %	83.6	16.3	0.1	26.3	73.7	0	21.9	78.1	0	
Total %	39.3	7.6	0	1.2	3.4	0	10.6	37.8	0	
Cars	1115	219	1	33	94	0	304	1082	0	2848
% Cars	97	97.8	100	91.7	93.1	0	98.1	97.7	0	97.2
Heavy Vehicles	35	5	0	3	7	0	6	25	0	81
% Heavy Vehicles	3	2.2	0	8.3	6.9	0	1.9	2.3	0	2.8

	Concord Road (Route 62) From East				Hartwell Road From South				Concord Road (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. 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	120	30	0	150	2	11	0	13	43	124	0	167	330
08:15 AM	109	27	0	136	3	13	0	16	44	141	0	185	337
08:30 AM	131	12	0	143	9	9	0	18	28	124	0	152	313
08:45 AM	148	11	0	159	3	14	0	17	38	158	0	196	372
Total Volume	508	80	0	588	17	47	0	64	153	547	0	700	1352
% App. Total	86.4	13.6	0		26.6	73.4	0		21.9	78.1	0		
PHF	.858	.667	.000	.925	.472	.839	.000	.889	.869	.866	.000	.893	.909
Cars	484	80	0	564	15	45	0	60	152	535	0	687	1311
% Cars	95.3	100	0	95.9	88.2	95.7	0	93.8	99.3	97.8	0	98.1	97.0
Heavy Vehicles	24	0	0	24	2	2	0	4	1	12	0	13	41
% Heavy Vehicles	4.7	0	0	4.1	11.8	4.3	0	6.3	0.7	2.2	0	1.9	3.0

S: Hartwell Road
E/W: Concord Road (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

File Name : 123082 L
Site Code : TBA
Start Date : 11/13/2012
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Groups Printed- Cars

	Concord Road (Route 62) From East			Hartwell Road From South			Concord Road (Route 62) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
06:00 AM	26	25	0	2	0	0	6	27	0	86
06:15 AM	39	14	0	3	2	0	6	29	0	93
06:30 AM	66	8	0	0	5	0	11	44	0	134
06:45 AM	89	25	1	0	4	0	11	54	0	184
Total	220	72	1	5	11	0	34	154	0	497
07:00 AM	89	21	0	1	10	0	16	83	0	220
07:15 AM	88	7	0	2	9	0	24	83	0	213
07:30 AM	131	20	0	5	9	0	34	121	0	320
07:45 AM	103	19	0	5	10	0	44	106	0	287
Total	411	67	0	13	38	0	118	393	0	1040
08:00 AM	115	30	0	2	9	0	43	123	0	322
08:15 AM	103	27	0	2	13	0	44	137	0	326
08:30 AM	126	12	0	8	9	0	28	121	0	304
08:45 AM	140	11	0	3	14	0	37	154	0	359
Total	484	80	0	15	45	0	152	535	0	1311
Grand Total	1115	219	1	33	94	0	304	1082	0	2848
Apprch %	83.5	16.4	0.1	26	74	0	21.9	78.1	0	
Total %	39.2	7.7	0	1.2	3.3	0	10.7	38	0	

	Concord Road (Route 62) From East				Hartwell Road From South				Concord Road (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. 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	115	30	0	145	2	9	0	11	43	123	0	166	322
08:15 AM	103	27	0	130	2	13	0	15	44	137	0	181	326
08:30 AM	126	12	0	138	8	9	0	17	28	121	0	149	304
08:45 AM	140	11	0	151	3	14	0	17	37	154	0	191	359
Total Volume	484	80	0	564	15	45	0	60	152	535	0	687	1311
% App. Total	85.8	14.2	0		25	75	0		22.1	77.9	0		
PHF	.864	.667	.000	.934	.469	.804	.000	.882	.864	.869	.000	.899	.913

S: Hartwell Road
E/W: Concord Road (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 L
Site Code : TBA
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Groups Printed- Heavy Vehicles

	Concord Road (Route 62) From East			Hartwell Road From South			Concord Road (Route 62) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	2	0	2
06:30 AM	1	0	0	0	0	0	0	0	0	1
06:45 AM	1	1	0	0	1	0	0	1	0	4
Total	2	1	0	0	1	0	0	3	0	7
07:00 AM	2	4	0	0	0	0	2	3	0	11
07:15 AM	2	0	0	0	3	0	0	6	0	11
07:30 AM	2	0	0	1	0	0	0	0	0	3
07:45 AM	3	0	0	0	1	0	3	1	0	8
Total	9	4	0	1	4	0	5	10	0	33
08:00 AM	5	0	0	0	2	0	0	1	0	8
08:15 AM	6	0	0	1	0	0	0	4	0	11
08:30 AM	5	0	0	1	0	0	0	3	0	9
08:45 AM	8	0	0	0	0	0	1	4	0	13
Total	24	0	0	2	2	0	1	12	0	41
Grand Total	35	5	0	3	7	0	6	25	0	81
Apprch %	87.5	12.5	0	30	70	0	19.4	80.6	0	
Total %	43.2	6.2	0	3.7	8.6	0	7.4	30.9	0	

	Concord Road (Route 62) From East				Hartwell Road From South				Concord Road (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. 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	5	0	0	5	0	2	0	2	0	1	0	1	8
08:15 AM	6	0	0	6	1	0	0	1	0	4	0	4	11
08:30 AM	5	0	0	5	1	0	0	1	0	3	0	3	9
08:45 AM	8	0	0	8	0	0	0	0	1	4	0	5	13
Total Volume	24	0	0	24	2	2	0	4	1	12	0	13	41
% App. Total	100	0	0		50	50	0		7.7	92.3	0		
PHF	.750	.000	.000	.750	.500	.250	.000	.500	.250	.750	.000	.650	.788

S: Hartwell Road
E/W: Concord Road (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 L
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Groups Printed- Peds and Bicycles

	Concord Road (Route 62) From East			Hartwell Road From South			Concord Road (Route 62) From West			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
07:00 AM	1	0	0	0	0	0	0	1	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	1	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	0	0	0	0	0	1	0	2
Apprch %	100	0	0	0	0	0	0	100	0	
Total %	50	0	0	0	0	0	0	50	0	

	Concord Road (Route 62) From East				Hartwell Road From South				Concord Road (Route 62) From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 06:15 AM													
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 AM	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	0
07:00 AM	1	0	0	1	0	0	0	0	0	1	0	1	2
Total Volume	1	0	0	1	0	0	0	0	0	1	0	1	2
% App. Total	100	0	0		0	0	0		0	100	0		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.250

S: Hartwell Road
E/W: Concord Road (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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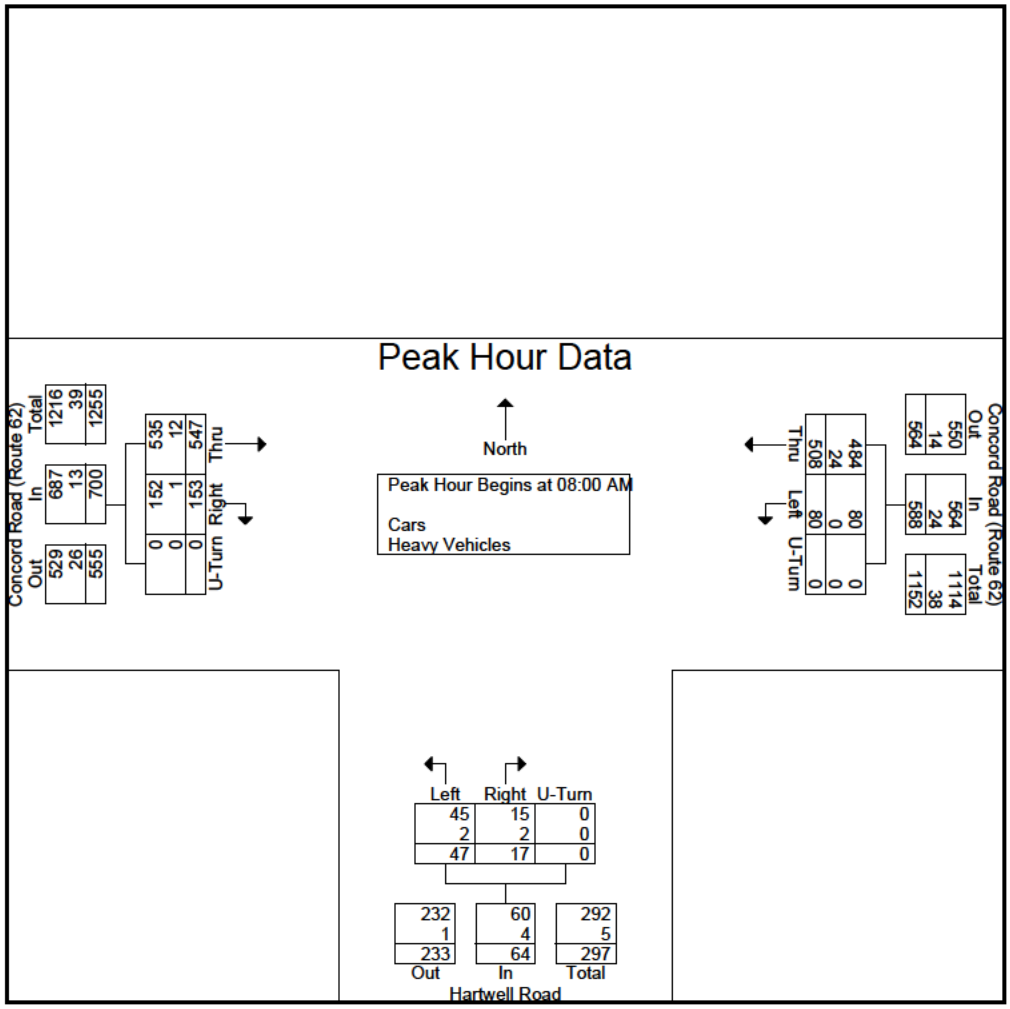
	Concord Road (Route 62) From East				Hartwell Road From South				Concord Road (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	120	30	0	150	2	11	0	13	43	124	0	167	330
08:15 AM	109	27	0	136	3	13	0	16	44	141	0	185	337
08:30 AM	131	12	0	143	9	9	0	18	28	124	0	152	313
08:45 AM	148	11	0	159	3	14	0	17	38	158	0	196	372
Total Volume	508	80	0	588	17	47	0	64	153	547	0	700	1352
% App. Total	86.4	13.6	0		26.6	73.4	0		21.9	78.1	0		
PHF	.858	.667	.000	.925	.472	.839	.000	.889	.869	.866	.000	.893	.909
Cars	484	80	0	564	15	45	0	60	152	535	0	687	1311
% Cars	95.3	100	0	95.9	88.2	95.7	0	93.8	99.3	97.8	0	98.1	97.0
Heavy Vehicles	24	0	0	24	2	2	0	4	1	12	0	13	41
% Heavy Vehicles	4.7	0	0	4.1	11.8	4.3	0	6.3	0.7	2.2	0	1.9	3.0



N/S: South Road
W: Hartwell Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 M
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	South Road From North			South Road From South			Hartwell Road From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
06:00 AM	5	26	0	29	1	0	2	0	0	63
06:15 AM	6	64	0	11	10	0	4	1	0	96
06:30 AM	12	67	0	21	11	0	7	7	0	125
06:45 AM	10	130	0	28	8	0	9	11	0	196
Total	33	287	0	89	30	0	22	19	0	480
07:00 AM	13	118	0	28	18	0	12	8	0	197
07:15 AM	7	125	0	54	12	0	15	9	0	222
07:30 AM	11	161	0	47	15	0	22	33	0	289
07:45 AM	16	169	0	45	23	0	40	13	0	306
Total	47	573	0	174	68	0	89	63	0	1014
08:00 AM	13	171	0	27	14	0	37	21	0	283
08:15 AM	12	134	0	31	15	0	29	19	0	240
08:30 AM	8	125	0	28	17	0	14	20	0	212
08:45 AM	14	115	0	34	18	0	20	17	0	218
Total	47	545	0	120	64	0	100	77	0	953
Grand Total	127	1405	0	383	162	0	211	159	0	2447
Apprch %	8.3	91.7	0	70.3	29.7	0	57	43	0	
Total %	5.2	57.4	0	15.7	6.6	0	8.6	6.5	0	
Cars	122	1379	0	355	151	0	200	155	0	2362
% Cars	96.1	98.1	0	92.7	93.2	0	94.8	97.5	0	96.5
Heavy Vehicles	5	26	0	28	11	0	11	4	0	85
% Heavy Vehicles	3.9	1.9	0	7.3	6.8	0	5.2	2.5	0	3.5

	South Road From North				South Road From South				Hartwell Road From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. 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	11	161	0	172	47	15	0	62	22	33	0	55	289
07:45 AM	16	169	0	185	45	23	0	68	40	13	0	53	306
08:00 AM	13	171	0	184	27	14	0	41	37	21	0	58	283
08:15 AM	12	134	0	146	31	15	0	46	29	19	0	48	240
Total Volume	52	635	0	687	150	67	0	217	128	86	0	214	1118
% App. Total	7.6	92.4	0		69.1	30.9	0		59.8	40.2	0		
PHF	.813	.928	.000	.928	.798	.728	.000	.798	.800	.652	.000	.922	.913
Cars	50	627	0	677	137	59	0	196	119	86	0	205	1078
% Cars	96.2	98.7	0	98.5	91.3	88.1	0	90.3	93.0	100	0	95.8	96.4
Heavy Vehicles	2	8	0	10	13	8	0	21	9	0	0	9	40
% Heavy Vehicles	3.8	1.3	0	1.5	8.7	11.9	0	9.7	7.0	0	0	4.2	3.6

N/S: South Road
W: Hartwell Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	South Road From North			South Road From South			Hartwell Road From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
06:00 AM	5	24	0	28	1	0	2	0	0	60
06:15 AM	6	64	0	9	10	0	4	1	0	94
06:30 AM	12	65	0	21	11	0	7	7	0	123
06:45 AM	9	127	0	26	8	0	9	11	0	190
Total	32	280	0	84	30	0	22	19	0	467
07:00 AM	13	117	0	27	18	0	12	8	0	195
07:15 AM	7	124	0	48	10	0	15	8	0	212
07:30 AM	11	158	0	46	13	0	21	33	0	282
07:45 AM	15	169	0	43	20	0	36	13	0	296
Total	46	568	0	164	61	0	84	62	0	985
08:00 AM	12	168	0	21	13	0	35	21	0	270
08:15 AM	12	132	0	27	13	0	27	19	0	230
08:30 AM	7	120	0	27	17	0	13	20	0	204
08:45 AM	13	111	0	32	17	0	19	14	0	206
Total	44	531	0	107	60	0	94	74	0	910
Grand Total	122	1379	0	355	151	0	200	155	0	2362
Apprch %	8.1	91.9	0	70.2	29.8	0	56.3	43.7	0	
Total %	5.2	58.4	0	15	6.4	0	8.5	6.6	0	

	South Road From North				South Road From South				Hartwell Road From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. 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	11	158	0	169	46	13	0	59	21	33	0	54	282
07:45 AM	15	169	0	184	43	20	0	63	36	13	0	49	296
08:00 AM	12	168	0	180	21	13	0	34	35	21	0	56	270
08:15 AM	12	132	0	144	27	13	0	40	27	19	0	46	230
Total Volume	50	627	0	677	137	59	0	196	119	86	0	205	1078
% App. Total	7.4	92.6	0		69.9	30.1	0		58	42	0		
PHF	.833	.928	.000	.920	.745	.738	.000	.778	.826	.652	.000	.915	.910

N/S: South Road
W: Hartwell Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Heavy Vehicles

	South Road From North			South Road From South			Hartwell Road From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
06:00 AM	0	2	0	1	0	0	0	0	0	3
06:15 AM	0	0	0	2	0	0	0	0	0	2
06:30 AM	0	2	0	0	0	0	0	0	0	2
06:45 AM	1	3	0	2	0	0	0	0	0	6
Total	1	7	0	5	0	0	0	0	0	13
07:00 AM	0	1	0	1	0	0	0	0	0	2
07:15 AM	0	1	0	6	2	0	0	1	0	10
07:30 AM	0	3	0	1	2	0	1	0	0	7
07:45 AM	1	0	0	2	3	0	4	0	0	10
Total	1	5	0	10	7	0	5	1	0	29
08:00 AM	1	3	0	6	1	0	2	0	0	13
08:15 AM	0	2	0	4	2	0	2	0	0	10
08:30 AM	1	5	0	1	0	0	1	0	0	8
08:45 AM	1	4	0	2	1	0	1	3	0	12
Total	3	14	0	13	4	0	6	3	0	43
Grand Total	5	26	0	28	11	0	11	4	0	85
Apprch %	16.1	83.9	0	71.8	28.2	0	73.3	26.7	0	
Total %	5.9	30.6	0	32.9	12.9	0	12.9	4.7	0	

	South Road From North				South Road From South				Hartwell Road From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. 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	3	0	4	6	1	0	7	2	0	0	2	13
08:15 AM	0	2	0	2	4	2	0	6	2	0	0	2	10
08:30 AM	1	5	0	6	1	0	0	1	1	0	0	1	8
08:45 AM	1	4	0	5	2	1	0	3	1	3	0	4	12
Total Volume	3	14	0	17	13	4	0	17	6	3	0	9	43
% App. Total	17.6	82.4	0		76.5	23.5	0		66.7	33.3	0		
PHF	.750	.700	.000	.708	.542	.500	.000	.607	.750	.250	.000	.563	.827

N/S: South Road
W: Hartwell Road
City, State: Bedford, MA
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Groups Printed- Peds and Bicycles

	South Road From North			South Road From South			Hartwell Road From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	4	0	0	0	0	0	4
06:30 AM	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	4	0	0	0	0	0	4
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	2	0	0	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	0	1	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	2	0	0	0	0	1	0	3
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	2	4	0	0	0	1	0	7
Apprch %	0	0	100	100	0	0	0	100	0	
Total %	0	0	28.6	57.1	0	0	0	14.3	0	

	South Road From North				South Road From South				Hartwell Road From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. 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	0	0	0	0
06:15 AM	0	0	0	0	4	0	0	4	0	0	0	0	4
06:30 AM	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	0
Total Volume	0	0	0	0	4	0	0	4	0	0	0	0	4
% App. Total	0	0	0		100	0	0		0	0	0		
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.250

N/S: South Road
W: Hartwell Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Start Date : 11/13/2012
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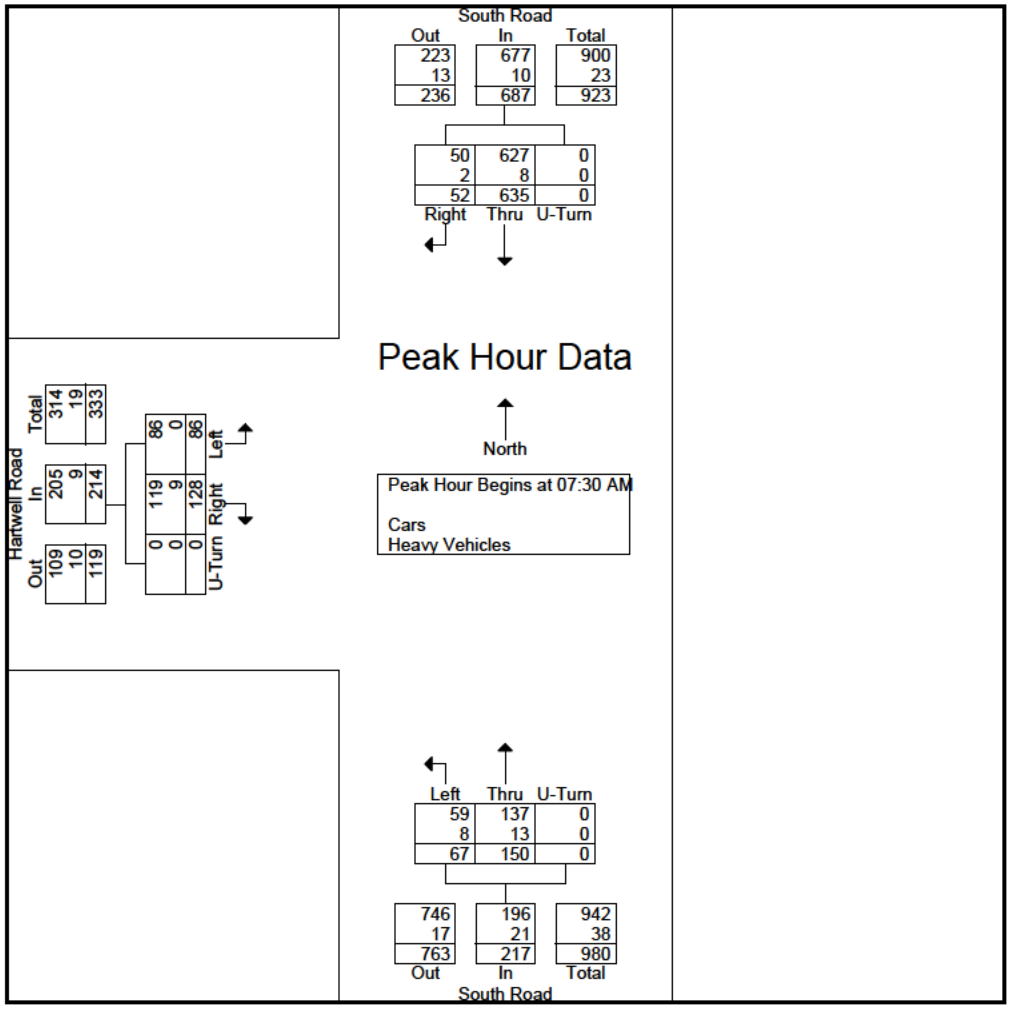
	South Road From North				South Road From South				Hartwell Road From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	11	161	0	172	47	15	0	62	22	33	0	55	289
07:45 AM	16	169	0	185	45	23	0	68	40	13	0	53	306
08:00 AM	13	171	0	184	27	14	0	41	37	21	0	58	283
08:15 AM	12	134	0	146	31	15	0	46	29	19	0	48	240
Total Volume	52	635	0	687	150	67	0	217	128	86	0	214	1118
% App. Total	7.6	92.4	0		69.1	30.9	0		59.8	40.2	0		
PHF	.813	.928	.000	.928	.798	.728	.000	.798	.800	.652	.000	.922	.913
Cars	50	627	0	677	137	59	0	196	119	86	0	205	1078
% Cars	96.2	98.7	0	98.5	91.3	88.1	0	90.3	93.0	100	0	95.8	96.4
Heavy Vehicles	2	8	0	10	13	8	0	21	9	0	0	9	40
% Heavy Vehicles	3.8	1.3	0	1.5	8.7	11.9	0	9.7	7.0	0	0	4.2	3.6



N: North Road (Route 4/225)
E/W: Great Rd (4/225)/ Concord Rd (62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars - Heavy Vehicles

	North Road (Route 4/225) From North			Great Road (Route 4/225) From East			Concord Road (Route 62) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	33	109	0	17	15	0	25	10	0	209
06:15 AM	44	169	0	23	11	0	39	11	0	297
06:30 AM	57	187	0	39	24	0	36	13	0	356
06:45 AM	91	264	0	53	33	0	44	21	0	506
Total	225	729	0	132	83	0	144	55	0	1368
07:00 AM	91	189	0	55	37	0	63	32	0	467
07:15 AM	118	169	0	48	42	0	49	42	0	468
07:30 AM	140	141	0	81	78	0	68	60	0	568
07:45 AM	111	158	0	73	64	0	76	49	0	531
Total	460	657	0	257	221	0	256	183	0	2034
08:00 AM	104	152	0	56	55	0	87	38	0	492
08:15 AM	96	162	0	68	72	0	83	57	0	538
08:30 AM	100	140	0	62	77	0	79	53	0	511
08:45 AM	119	163	0	74	88	0	80	38	0	562
Total	419	617	0	260	292	0	329	186	0	2103
Grand Total	1104	2003	0	649	596	0	729	424	0	5505
Apprch %	35.5	64.5	0	52.1	47.9	0	63.2	36.8	0	
Total %	20.1	36.4	0	11.8	10.8	0	13.2	7.7	0	
Cars	1078	1970	0	592	567	0	708	417	0	5332
% Cars	97.6	98.4	0	91.2	95.1	0	97.1	98.3	0	96.9
Heavy Vehicles	26	33	0	57	29	0	21	7	0	173
% Heavy Vehicles	2.4	1.6	0	8.8	4.9	0	2.9	1.7	0	3.1

	North Road (Route 4/225) From North				Great Road (Route 4/225) From East				Concord Road (Route 62) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	140	141	0	281	81	78	0	159	68	60	0	128	568
07:45 AM	111	158	0	269	73	64	0	137	76	49	0	125	531
08:00 AM	104	152	0	256	56	55	0	111	87	38	0	125	492
08:15 AM	96	162	0	258	68	72	0	140	83	57	0	140	538
Total Volume	451	613	0	1064	278	269	0	547	314	204	0	518	2129
% App. Total	42.4	57.6	0		50.8	49.2	0		60.6	39.4	0		
PHF	.805	.946	.000	.947	.858	.862	.000	.860	.902	.850	.000	.925	.937
Cars	442	606	0	1048	258	260	0	518	306	199	0	505	2071
% Cars	98.0	98.9	0	98.5	92.8	96.7	0	94.7	97.5	97.5	0	97.5	97.3
Heavy Vehicles	9	7	0	16	20	9	0	29	8	5	0	13	58
% Heavy Vehicles	2.0	1.1	0	1.5	7.2	3.3	0	5.3	2.5	2.5	0	2.5	2.7

N: North Road (Route 4/225)
E/W: Great Rd (4/225)/ Concord Rd (62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars

	North Road (Route 4/225) From North			Great Road (Route 4/225) From East			Concord Road (Route 62) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	33	107	0	16	15	0	25	10	0	206
06:15 AM	44	165	0	23	11	0	37	11	0	291
06:30 AM	56	186	0	35	24	0	36	13	0	350
06:45 AM	91	262	0	46	29	0	43	21	0	492
Total	224	720	0	120	79	0	141	55	0	1339
07:00 AM	88	187	0	45	35	0	62	30	0	447
07:15 AM	113	165	0	47	40	0	47	42	0	454
07:30 AM	138	140	0	79	76	0	65	60	0	558
07:45 AM	109	156	0	70	63	0	75	49	0	522
Total	448	648	0	241	214	0	249	181	0	1981
08:00 AM	102	152	0	50	54	0	86	38	0	482
08:15 AM	93	158	0	59	67	0	80	52	0	509
08:30 AM	95	133	0	60	71	0	77	53	0	489
08:45 AM	116	159	0	62	82	0	75	38	0	532
Total	406	602	0	231	274	0	318	181	0	2012
Grand Total	1078	1970	0	592	567	0	708	417	0	5332
Apprch %	35.4	64.6	0	51.1	48.9	0	62.9	37.1	0	
Total %	20.2	36.9	0	11.1	10.6	0	13.3	7.8	0	

	North Road (Route 4/225) From North				Great Road (Route 4/225) From East				Concord Road (Route 62) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	138	140	0	278	79	76	0	155	65	60	0	125	558
07:45 AM	109	156	0	265	70	63	0	133	75	49	0	124	522
08:00 AM	102	152	0	254	50	54	0	104	86	38	0	124	482
08:15 AM	93	158	0	251	59	67	0	126	80	52	0	132	509
Total Volume	442	606	0	1048	258	260	0	518	306	199	0	505	2071
% App. Total	42.2	57.8	0		49.8	50.2	0		60.6	39.4	0		
PHF	.801	.959	.000	.942	.816	.855	.000	.835	.890	.829	.000	.956	.928

N: North Road (Route 4/225)
E/W: Great Rd (4/225)/ Concord Rd (62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Heavy Vehicles

	North Road (Route 4/225) From North			Great Road (Route 4/225) From East			Concord Road (Route 62) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
06:00 AM	0	2	0	1	0	0	0	0	0	3
06:15 AM	0	4	0	0	0	0	2	0	0	6
06:30 AM	1	1	0	4	0	0	0	0	0	6
06:45 AM	0	2	0	7	4	0	1	0	0	14
Total	1	9	0	12	4	0	3	0	0	29
07:00 AM	3	2	0	10	2	0	1	2	0	20
07:15 AM	5	4	0	1	2	0	2	0	0	14
07:30 AM	2	1	0	2	2	0	3	0	0	10
07:45 AM	2	2	0	3	1	0	1	0	0	9
Total	12	9	0	16	7	0	7	2	0	53
08:00 AM	2	0	0	6	1	0	1	0	0	10
08:15 AM	3	4	0	9	5	0	3	5	0	29
08:30 AM	5	7	0	2	6	0	2	0	0	22
08:45 AM	3	4	0	12	6	0	5	0	0	30
Total	13	15	0	29	18	0	11	5	0	91
Grand Total	26	33	0	57	29	0	21	7	0	173
Apprch %	44.1	55.9	0	66.3	33.7	0	75	25	0	
Total %	15	19.1	0	32.9	16.8	0	12.1	4	0	

	North Road (Route 4/225) From North				Great Road (Route 4/225) From East				Concord Road (Route 62) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. 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	2	0	0	2	6	1	0	7	1	0	0	1	10
08:15 AM	3	4	0	7	9	5	0	14	3	5	0	8	29
08:30 AM	5	7	0	12	2	6	0	8	2	0	0	2	22
08:45 AM	3	4	0	7	12	6	0	18	5	0	0	5	30
Total Volume	13	15	0	28	29	18	0	47	11	5	0	16	91
% App. Total	46.4	53.6	0		61.7	38.3	0		68.8	31.2	0		
PHF	.650	.536	.000	.583	.604	.750	.000	.653	.550	.250	.000	.500	.758

N: North Road (Route 4/225)
E/W: Great Rd (4/225)/ Concord Rd (62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Peds and Bicycles

	North Road (Route 4/225) From North			Great Road (Route 4/225) From East			Concord Road (Route 62) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	1	0	0	0	0	0	0	0	1
06:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	1
07:00 AM	1	0	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	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	1	1	0	0	0	0	0	0	0	2
Apprch %	50	50	0	0	0	0	0	0	0	
Total %	50	50	0	0	0	0	0	0	0	

	North Road (Route 4/225) From North				Great Road (Route 4/225) From East				Concord Road (Route 62) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 06:15 AM													
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	1	1	0	2	0	0	0	0	0	0	0	0	2
% App. Total	50	50	0		0	0	0		0	0	0		
PHF	.250	.250	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.500

N: North Road (Route 4/225)
E/W: Great Rd (4/225)/ Concord Rd (62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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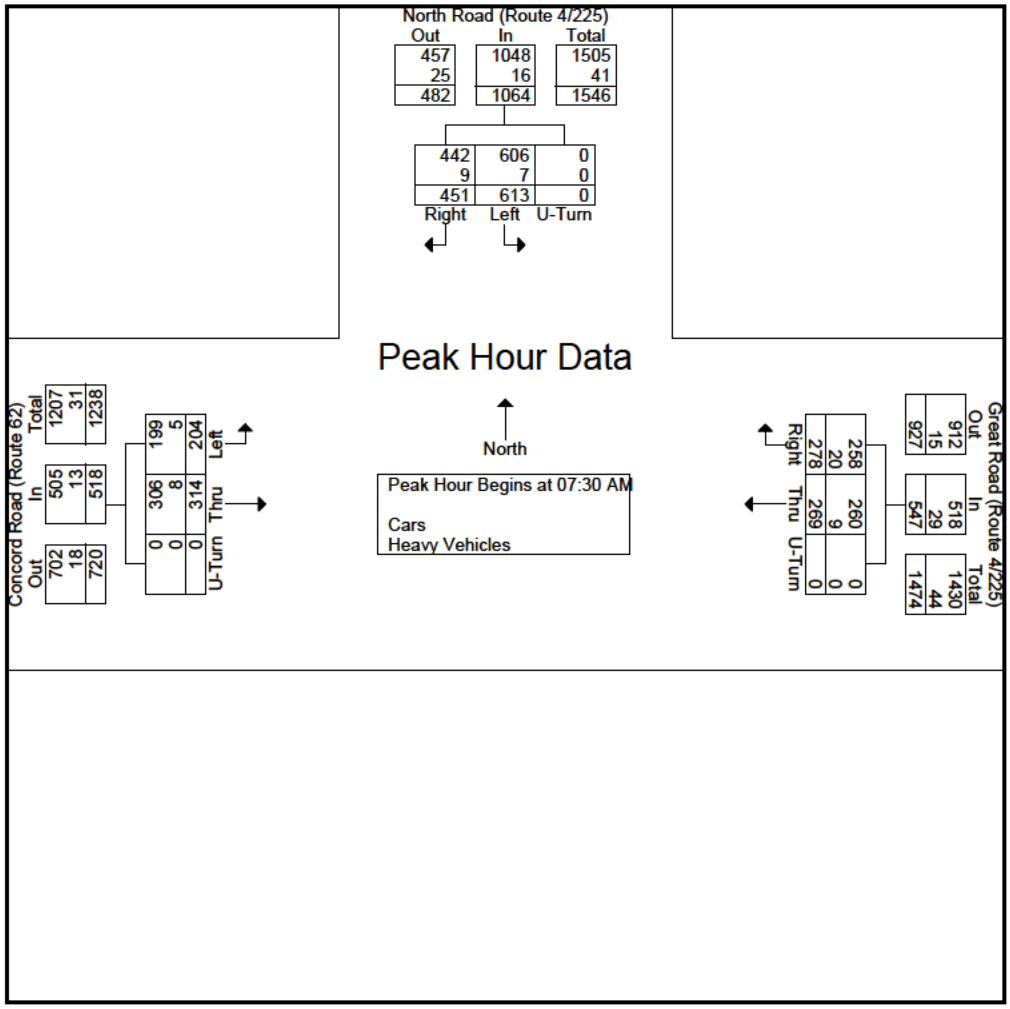
	North Road (Route 4/225) From North				Great Road (Route 4/225) From East				Concord Road (Route 62) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	140	141	0	281	81	78	0	159	68	60	0	128	568
07:45 AM	111	158	0	269	73	64	0	137	76	49	0	125	531
08:00 AM	104	152	0	256	56	55	0	111	87	38	0	125	492
08:15 AM	96	162	0	258	68	72	0	140	83	57	0	140	538
Total Volume	451	613	0	1064	278	269	0	547	314	204	0	518	2129
% App. Total	42.4	57.6	0		50.8	49.2	0		60.6	39.4	0		
PHF	.805	.946	.000	.947	.858	.862	.000	.860	.902	.850	.000	.925	.937
Cars	442	606	0	1048	258	260	0	518	306	199	0	505	2071
% Cars	98.0	98.9	0	98.5	92.8	96.7	0	94.7	97.5	97.5	0	97.5	97.3
Heavy Vehicles	9	7	0	16	20	9	0	29	8	5	0	13	58
% Heavy Vehicles	2.0	1.1	0	1.5	7.2	3.3	0	5.3	2.5	2.5	0	2.5	2.7



N/S: Springs Road/ South Road
E/W: Great Road (Route 4/62/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars - Heavy Vehicles

	Springs Road From North				Great Road (Route 4/62/225) From East				South Road From South				Great Road (Route 4/62/225) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	3	1	4	0	1	28	1	0	0	0	3	0	29	91	3	0	164
06:15 AM	6	6	2	0	0	21	1	0	1	0	6	0	55	144	4	0	246
06:30 AM	7	9	8	0	1	61	1	0	5	1	8	0	47	162	9	0	319
06:45 AM	5	51	25	0	3	73	0	0	1	2	15	0	46	200	13	0	434
Total	21	67	39	0	5	183	3	0	7	3	32	0	177	597	29	0	1163
07:00 AM	8	61	24	0	1	86	0	0	3	6	16	0	37	176	17	0	435
07:15 AM	13	77	25	0	3	84	0	0	4	16	26	0	15	162	23	0	448
07:30 AM	13	80	25	0	4	140	1	0	15	28	47	0	19	173	14	0	559
07:45 AM	17	92	27	0	3	97	1	0	17	14	30	0	14	182	15	0	509
Total	51	310	101	0	11	407	2	0	39	64	119	0	85	693	69	0	1951
08:00 AM	15	88	34	0	2	94	2	0	6	9	19	0	17	180	16	0	482
08:15 AM	14	54	37	0	3	112	0	0	7	6	26	0	19	171	21	0	470
08:30 AM	14	48	30	0	1	111	1	0	11	11	20	0	25	163	24	0	459
08:45 AM	34	51	27	0	2	112	1	0	8	8	23	0	25	163	14	0	468
Total	77	241	128	0	8	429	4	0	32	34	88	0	86	677	75	0	1879
Grand Total	149	618	268	0	24	1019	9	0	78	101	239	0	348	1967	173	0	4993
Apprch %	14.4	59.7	25.9	0	2.3	96.9	0.9	0	18.7	24.2	57.2	0	14	79.1	7	0	
Total %	3	12.4	5.4	0	0.5	20.4	0.2	0	1.6	2	4.8	0	7	39.4	3.5	0	
Cars	142	611	266	0	22	958	8	0	77	92	217	0	342	1929	172	0	4836
% Cars	95.3	98.9	99.3	0	91.7	94	88.9	0	98.7	91.1	90.8	0	98.3	98.1	99.4	0	96.9
Heavy Vehicles	7	7	2	0	2	61	1	0	1	9	22	0	6	38	1	0	157
% Heavy Vehicles	4.7	1.1	0.7	0	8.3	6	11.1	0	1.3	8.9	9.2	0	1.7	1.9	0.6	0	3.1

	Springs Road From North					Great Road (Route 4/62/225) From East					South Road From South					Great Road (Route 4/62/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	13	80	25	0	118	4	140	1	0	145	15	28	47	0	90	19	173	14	0	206	559
07:45 AM	17	92	27	0	136	3	97	1	0	101	17	14	30	0	61	14	182	15	0	211	509
08:00 AM	15	88	34	0	137	2	94	2	0	98	6	9	19	0	34	17	180	16	0	213	482
08:15 AM	14	54	37	0	105	3	112	0	0	115	7	6	26	0	39	19	171	21	0	211	470
Total Volume	59	314	123	0	496	12	443	4	0	459	45	57	122	0	224	69	706	66	0	841	2020
% App. Total	11.9	63.3	24.8	0		2.6	96.5	0.9	0		20.1	25.4	54.5	0		8.2	83.9	7.8	0		
PHF	.868	.853	.831	.000	.905	.750	.791	.500	.000	.791	.662	.509	.649	.000	.622	.908	.970	.786	.000	.987	.903
Cars	58	313	122	0	493	12	417	4	0	433	44	53	114	0	211	67	699	66	0	832	1969
% Cars	98.3	99.7	99.2	0	99.4	100	94.1	100	0	94.3	97.8	93.0	93.4	0	94.2	97.1	99.0	100	0	98.9	97.5
Heavy Vehicles	1	1	1	0	3	0	26	0	0	26	1	4	8	0	13	2	7	0	0	9	51
% Heavy Vehicles	1.7	0.3	0.8	0	0.6	0	5.9	0	0	5.7	2.2	7.0	6.6	0	5.8	2.9	1.0	0	0	1.1	2.5

N/S: Springs Road/ South Road
E/W: Great Road (Route 4/62/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 123082 O
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	Springs Road From North				Great Road (Route 4/62/225) From East				South Road From South				Great Road (Route 4/62/225) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	3	1	4	0	1	27	0	0	0	0	3	0	29	91	3	0	162
06:15 AM	6	6	2	0	0	21	1	0	1	0	6	0	55	138	4	0	240
06:30 AM	7	9	8	0	1	57	1	0	5	1	7	0	47	161	9	0	313
06:45 AM	5	50	25	0	3	68	0	0	1	1	12	0	46	198	13	0	422
Total	21	66	39	0	5	173	2	0	7	2	28	0	177	588	29	0	1137
07:00 AM	8	61	24	0	0	78	0	0	3	3	11	0	37	172	17	0	414
07:15 AM	13	74	25	0	2	81	0	0	4	16	24	0	15	157	23	0	434
07:30 AM	12	80	24	0	4	138	1	0	15	27	45	0	18	171	14	0	549
07:45 AM	17	92	27	0	3	92	1	0	17	14	29	0	14	180	15	0	501
Total	50	307	100	0	9	389	2	0	39	60	109	0	84	680	69	0	1898
08:00 AM	15	87	34	0	2	89	2	0	6	8	18	0	17	178	16	0	472
08:15 AM	14	54	37	0	3	98	0	0	6	4	22	0	18	170	21	0	447
08:30 AM	14	46	29	0	1	107	1	0	11	10	19	0	22	159	23	0	442
08:45 AM	28	51	27	0	2	102	1	0	8	8	21	0	24	154	14	0	440
Total	71	238	127	0	8	396	4	0	31	30	80	0	81	661	74	0	1801
Grand Total	142	611	266	0	22	958	8	0	77	92	217	0	342	1929	172	0	4836
Apprch %	13.9	60	26.1	0	2.2	97	0.8	0	19.9	23.8	56.2	0	14	79	7	0	
Total %	2.9	12.6	5.5	0	0.5	19.8	0.2	0	1.6	1.9	4.5	0	7.1	39.9	3.6	0	

	Springs Road From North					Great Road (Route 4/62/225) From East					South Road From South					Great Road (Route 4/62/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	12	80	24	0	116	4	138	1	0	143	15	27	45	0	87	18	171	14	0	203	549
07:45 AM	17	92	27	0	136	3	92	1	0	96	17	14	29	0	60	14	180	15	0	209	501
08:00 AM	15	87	34	0	136	2	89	2	0	93	6	8	18	0	32	17	178	16	0	211	472
08:15 AM	14	54	37	0	105	3	98	0	0	101	6	4	22	0	32	18	170	21	0	209	447
Total Volume	58	313	122	0	493	12	417	4	0	433	44	53	114	0	211	67	699	66	0	832	1969
% App. Total	11.8	63.5	24.7	0		2.8	96.3	0.9	0		20.9	25.1	54	0		8.1	84	7.9	0		
PHF	.853	.851	.824	.000	.906	.750	.755	.500	.000	.757	.647	.491	.633	.000	.606	.931	.971	.786	.000	.986	.897

N/S: Springs Road/ South Road
E/W: Great Road (Route 4/62/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION D A T A INDUSTRIES, LLC
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File Name : 123082 O
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Springs Road From North				Great Road (Route 4/62/225) From East				South Road From South				Great Road (Route 4/62/225) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
06:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6
06:30 AM	0	0	0	0	0	4	0	0	0	0	1	0	0	1	0	0	6
06:45 AM	0	1	0	0	0	5	0	0	0	1	3	0	0	2	0	0	12
Total	0	1	0	0	0	10	1	0	0	1	4	0	0	9	0	0	26
07:00 AM	0	0	0	0	1	8	0	0	0	3	5	0	0	4	0	0	21
07:15 AM	0	3	0	0	1	3	0	0	0	0	2	0	0	5	0	0	14
07:30 AM	1	0	1	0	0	2	0	0	0	1	2	0	1	2	0	0	10
07:45 AM	0	0	0	0	0	5	0	0	0	0	1	0	0	2	0	0	8
Total	1	3	1	0	2	18	0	0	0	4	10	0	1	13	0	0	53
08:00 AM	0	1	0	0	0	5	0	0	0	1	1	0	0	2	0	0	10
08:15 AM	0	0	0	0	0	14	0	0	1	2	4	0	1	1	0	0	23
08:30 AM	0	2	1	0	0	4	0	0	0	1	1	0	3	4	1	0	17
08:45 AM	6	0	0	0	0	10	0	0	0	0	2	0	1	9	0	0	28
Total	6	3	1	0	0	33	0	0	1	4	8	0	5	16	1	0	78
Grand Total	7	7	2	0	2	61	1	0	1	9	22	0	6	38	1	0	157
Apprch %	43.8	43.8	12.5	0	3.1	95.3	1.6	0	3.1	28.1	68.8	0	13.3	84.4	2.2	0	
Total %	4.5	4.5	1.3	0	1.3	38.9	0.6	0	0.6	5.7	14	0	3.8	24.2	0.6	0	

	Springs Road From North					Great Road (Route 4/62/225) From East					South Road From South					Great Road (Route 4/62/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	0	1	0	0	1	0	5	0	0	5	0	1	1	0	2	0	2	0	0	2	10
08:15 AM	0	0	0	0	0	0	14	0	0	14	1	2	4	0	7	1	1	0	0	2	23
08:30 AM	0	2	1	0	3	0	4	0	0	4	0	1	1	0	2	3	4	1	0	8	17
08:45 AM	6	0	0	0	6	0	10	0	0	10	0	0	2	0	2	1	9	0	0	10	28
Total Volume	6	3	1	0	10	0	33	0	0	33	1	4	8	0	13	5	16	1	0	22	78
% App. Total	60	30	10	0		0	100	0	0		7.7	30.8	61.5	0		22.7	72.7	4.5	0		
PHF	.250	.375	.250	.000	.417	.000	.589	.000	.000	.589	.250	.500	.500	.000	.464	.417	.444	.250	.000	.550	.696

N/S: Springs Road/ South Road
E/W: Great Road (Route 4/62/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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File Name : 123082 O
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Springs Road From North				Great Road (Route 4/62/225) From East				South Road From South				Great Road (Route 4/62/225) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
06:15 AM	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0	0	6
06:30 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
06:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
Total	0	0	0	3	0	0	0	2	0	4	0	3	0	0	0	2	14
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	2	0	0	0	1	0	0	0	1	0	0	0	0	4
07:30 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0	0	6
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	3
Grand Total	0	0	0	5	0	0	0	6	0	4	0	6	0	0	0	2	23
Apprch %	0	0	0	100	0	0	0	100	0	40	0	60	0	0	0	100	
Total %	0	0	0	21.7	0	0	0	26.1	0	17.4	0	26.1	0	0	0	8.7	

	Springs Road From North					Great Road (Route 4/62/225) From East					South Road From South					Great Road (Route 4/62/225) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. 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	0	0	0	0	1	1	0	0	0	1	1	2
06:15 AM	0	0	0	2	2	0	0	0	2	2	0	0	0	2	2	0	0	0	0	0	6
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	4
06:45 AM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Total Volume	0	0	0	3	3	0	0	0	2	2	0	4	0	3	7	0	0	0	2	2	14
% App. Total	0	0	0	100		0	0	0	100		0	57.1	0	42.9		0	0	0	100		
PHF	.000	.000	.000	.375	.375	.000	.000	.000	.250	.250	.000	.250	.000	.375	.438	.000	.000	.000	.500	.500	.583

N/S: Springs Road/ South Road
E/W: Great Road (Route 4/62/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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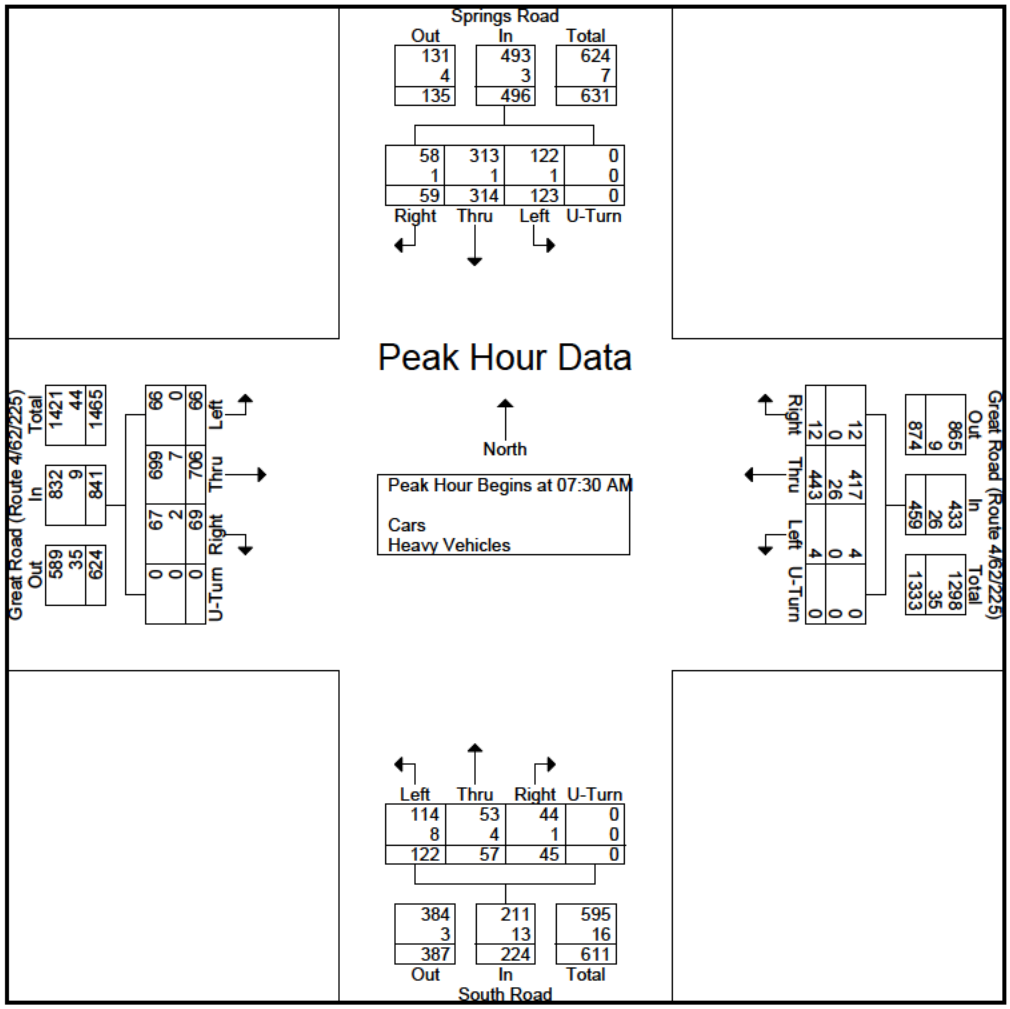
Page No : 1

	Springs Road From North					Great Road (Route 4/62/225) From East					South Road From South					Great Road (Route 4/62/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	13	80	25	0	118	4	140	1	0	145	15	28	47	0	90	19	173	14	0	206	559
07:45 AM	17	92	27	0	136	3	97	1	0	101	17	14	30	0	61	14	182	15	0	211	509
08:00 AM	15	88	34	0	137	2	94	2	0	98	6	9	19	0	34	17	180	16	0	213	482
08:15 AM	14	54	37	0	105	3	112	0	0	115	7	6	26	0	39	19	171	21	0	211	470
Total Volume	59	314	123	0	496	12	443	4	0	459	45	57	122	0	224	69	706	66	0	841	2020
% App. Total	11.9	63.3	24.8	0		2.6	96.5	0.9	0		20.1	25.4	54.5	0		8.2	83.9	7.8	0		
PHF	.868	.853	.831	.000	.905	.750	.791	.500	.000	.791	.662	.509	.649	.000	.622	.908	.970	.786	.000	.987	.903
Cars	58	313	122	0	493	12	417	4	0	433	44	53	114	0	211	67	699	66	0	832	1969
% Cars	98.3	99.7	99.2	0	99.4	100	94.1	100	0	94.3	97.8	93.0	93.4	0	94.2	97.1	99.0	100	0	98.9	97.5
Heavy Vehicles	1	1	1	0	3	0	26	0	0	26	1	4	8	0	13	2	7	0	0	9	51
% Heavy Vehicles	1.7	0.3	0.8	0	0.6	0	5.9	0	0	5.7	2.2	7.0	6.6	0	5.8	2.9	1.0	0	0	1.1	2.5



N/S: South Road
E/W: Loomis Street/ Railroad Avenue
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
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INDUSTRIES, LLC
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File Name : 123082 P
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	South Road From North				Loomis Street From East				South Road From South				Railroad Avenue From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	2	23	3	0	0	3	14	0	7	3	1	0	2	7	0	0	65
06:15 AM	7	58	4	0	0	6	12	0	3	6	2	0	1	3	1	0	103
06:30 AM	2	60	1	0	1	3	22	0	15	12	3	0	3	4	0	0	126
06:45 AM	9	110	5	0	1	13	22	0	15	17	7	0	6	15	3	0	223
Total	20	251	13	0	2	25	70	0	40	38	13	0	12	29	4	0	517
07:00 AM	10	106	2	0	1	24	24	0	19	9	10	0	8	18	7	0	238
07:15 AM	14	103	2	0	0	37	19	0	20	28	18	0	14	36	8	0	299
07:30 AM	24	117	8	0	3	34	29	0	29	45	19	0	37	46	20	0	411
07:45 AM	2	144	8	0	1	7	37	0	25	27	8	0	20	36	4	0	319
Total	50	470	20	0	5	102	109	0	93	109	55	0	79	136	39	0	1267
08:00 AM	5	123	6	0	1	16	42	0	32	22	9	0	29	33	4	0	322
08:15 AM	3	114	6	0	1	12	36	0	32	21	4	0	17	35	1	0	282
08:30 AM	4	102	7	0	3	7	28	0	28	23	6	0	15	33	3	0	259
08:45 AM	5	88	6	0	0	14	24	0	30	29	5	0	16	29	5	0	251
Total	17	427	25	0	5	49	130	0	122	95	24	0	77	130	13	0	1114
Grand Total	87	1148	58	0	12	176	309	0	255	242	92	0	168	295	56	0	2898
Apprch %	6.7	88.8	4.5	0	2.4	35.4	62.2	0	43.3	41.1	15.6	0	32.4	56.8	10.8	0	
Total %	3	39.6	2	0	0.4	6.1	10.7	0	8.8	8.4	3.2	0	5.8	10.2	1.9	0	
Cars	78	1140	52	0	7	161	298	0	244	230	83	0	154	272	46	0	2765
% Cars	89.7	99.3	89.7	0	58.3	91.5	96.4	0	95.7	95	90.2	0	91.7	92.2	82.1	0	95.4
Heavy Vehicles	9	8	6	0	5	15	11	0	11	12	9	0	14	23	10	0	133
% Heavy Vehicles	10.3	0.7	10.3	0	41.7	8.5	3.6	0	4.3	5	9.8	0	8.3	7.8	17.9	0	4.6

	South Road From North					Loomis Street From East					South Road From South					Railroad Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	14	103	2	0	119	0	37	19	0	56	20	28	18	0	66	14	36	8	0	58	299
07:30 AM	24	117	8	0	149	3	34	29	0	66	29	45	19	0	93	37	46	20	0	103	411
07:45 AM	2	144	8	0	154	1	7	37	0	45	25	27	8	0	60	20	36	4	0	60	319
08:00 AM	5	123	6	0	134	1	16	42	0	59	32	22	9	0	63	29	33	4	0	66	322
Total Volume	45	487	24	0	556	5	94	127	0	226	106	122	54	0	282	100	151	36	0	287	1351
% App. Total	8.1	87.6	4.3	0		2.2	41.6	56.2	0		37.6	43.3	19.1	0		34.8	52.6	12.5	0		
PHF	.469	.845	.750	.000	.903	.417	.635	.756	.000	.856	.828	.678	.711	.000	.758	.676	.821	.450	.000	.697	.822
Cars	39	485	22	0	546	3	86	127	0	216	100	117	47	0	264	95	140	35	0	270	1296
% Cars	86.7	99.6	91.7	0	98.2	60.0	91.5	100	0	95.6	94.3	95.9	87.0	0	93.6	95.0	92.7	97.2	0	94.1	95.9
Heavy Vehicles	6	2	2	0	10	2	8	0	0	10	6	5	7	0	18	5	11	1	0	17	55
% Heavy Vehicles	13.3	0.4	8.3	0	1.8	40.0	8.5	0	0	4.4	5.7	4.1	13.0	0	6.4	5.0	7.3	2.8	0	5.9	4.1

N/S: South Road
E/W: Loomis Street/ Railroad Avenue
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File Name : 123082 P
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	South Road From North				Loomis Street From East				South Road From South				Railroad Avenue From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	2	23	3	0	0	3	13	0	7	3	1	0	1	4	0	0	60
06:15 AM	7	58	3	0	0	6	11	0	3	6	2	0	1	3	1	0	101
06:30 AM	2	59	1	0	1	3	20	0	15	11	3	0	2	4	0	0	121
06:45 AM	9	110	4	0	0	13	21	0	15	16	6	0	3	12	0	0	209
Total	20	250	11	0	1	25	65	0	40	36	12	0	7	23	1	0	491
07:00 AM	9	106	2	0	0	22	24	0	16	8	10	0	6	13	1	0	217
07:15 AM	12	103	1	0	0	35	19	0	18	26	17	0	13	34	8	0	286
07:30 AM	20	117	8	0	2	30	29	0	29	43	18	0	37	42	20	0	395
07:45 AM	2	142	8	0	1	7	37	0	24	26	7	0	20	33	4	0	311
Total	43	468	19	0	3	94	109	0	87	103	52	0	76	122	33	0	1209
08:00 AM	5	123	5	0	0	14	42	0	29	22	5	0	25	31	3	0	304
08:15 AM	3	113	5	0	0	8	35	0	31	18	4	0	16	34	1	0	268
08:30 AM	2	99	6	0	3	7	25	0	28	23	5	0	15	33	3	0	249
08:45 AM	5	87	6	0	0	13	22	0	29	28	5	0	15	29	5	0	244
Total	15	422	22	0	3	42	124	0	117	91	19	0	71	127	12	0	1065
Grand Total	78	1140	52	0	7	161	298	0	244	230	83	0	154	272	46	0	2765
Apprch %	6.1	89.8	4.1	0	1.5	34.5	63.9	0	43.8	41.3	14.9	0	32.6	57.6	9.7	0	
Total %	2.8	41.2	1.9	0	0.3	5.8	10.8	0	8.8	8.3	3	0	5.6	9.8	1.7	0	

	South Road From North					Loomis Street From East					South Road From South					Railroad Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	12	103	1	0	116	0	35	19	0	54	18	26	17	0	61	13	34	8	0	55	286
07:30 AM	20	117	8	0	145	2	30	29	0	61	29	43	18	0	90	37	42	20	0	99	395
07:45 AM	2	142	8	0	152	1	7	37	0	45	24	26	7	0	57	20	33	4	0	57	311
08:00 AM	5	123	5	0	133	0	14	42	0	56	29	22	5	0	56	25	31	3	0	59	304
Total Volume	39	485	22	0	546	3	86	127	0	216	100	117	47	0	264	95	140	35	0	270	1296
% App. Total	7.1	88.8	4	0		1.4	39.8	58.8	0		37.9	44.3	17.8	0		35.2	51.9	13	0		
PHF	.488	.854	.688	.000	.898	.375	.614	.756	.000	.885	.862	.680	.653	.000	.733	.642	.833	.438	.000	.682	.820

N/S: South Road
E/W: Loomis Street/ Railroad Avenue
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 123082 P
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	South Road From North				Loomis Street From East				South Road From South				Railroad Avenue From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
06:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	1	3	0	0	5
06:15 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
06:30 AM	0	1	0	0	0	0	2	0	0	1	0	0	1	0	0	0	5
06:45 AM	0	0	1	0	1	0	1	0	0	1	1	0	3	3	3	0	14
Total	0	1	2	0	1	0	5	0	0	2	1	0	5	6	3	0	26
07:00 AM	1	0	0	0	1	2	0	0	3	1	0	0	2	5	6	0	21
07:15 AM	2	0	1	0	0	2	0	0	2	2	1	0	1	2	0	0	13
07:30 AM	4	0	0	0	1	4	0	0	0	2	1	0	0	4	0	0	16
07:45 AM	0	2	0	0	0	0	0	0	1	1	1	0	0	3	0	0	8
Total	7	2	1	0	2	8	0	0	6	6	3	0	3	14	6	0	58
08:00 AM	0	0	1	0	1	2	0	0	3	0	4	0	4	2	1	0	18
08:15 AM	0	1	1	0	1	4	1	0	1	3	0	0	1	1	0	0	14
08:30 AM	2	3	1	0	0	0	3	0	0	0	1	0	0	0	0	0	10
08:45 AM	0	1	0	0	0	1	2	0	1	1	0	0	1	0	0	0	7
Total	2	5	3	0	2	7	6	0	5	4	5	0	6	3	1	0	49
Grand Total	9	8	6	0	5	15	11	0	11	12	9	0	14	23	10	0	133
Apprch %	39.1	34.8	26.1	0	16.1	48.4	35.5	0	34.4	37.5	28.1	0	29.8	48.9	21.3	0	
Total %	6.8	6	4.5	0	3.8	11.3	8.3	0	8.3	9	6.8	0	10.5	17.3	7.5	0	

	South Road From North					Loomis Street From East					South Road From South					Railroad Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. 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	1	0	1	1	0	1	0	2	0	1	1	0	2	3	3	3	0	9	14
07:00 AM	1	0	0	0	1	1	2	0	0	3	3	1	0	0	4	2	5	6	0	13	21
07:15 AM	2	0	1	0	3	0	2	0	0	2	2	2	1	0	5	1	2	0	0	3	13
07:30 AM	4	0	0	0	4	1	4	0	0	5	0	2	1	0	3	0	4	0	0	4	16
Total Volume	7	0	2	0	9	3	8	1	0	12	5	6	3	0	14	6	14	9	0	29	64
% App. Total	77.8	0	22.2	0		25	66.7	8.3	0		35.7	42.9	21.4	0		20.7	48.3	31	0		
PHF	.438	.000	.500	.000	.563	.750	.500	.250	.000	.600	.417	.750	.750	.000	.700	.500	.700	.375	.000	.558	.762

N/S: South Road
E/W: Loomis Street/ Railroad Avenue
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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File Name : 123082 P
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Peds and Bicycles

	South Road From North				Loomis Street From East				South Road From South				Railroad Avenue From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3
06:15 AM	0	0	0	0	0	0	0	1	0	4	0	3	0	0	0	2	10
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	4	0	9	0	0	0	2	16
07:00 AM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	3
07:15 AM	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	4
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	0	0	0	0	0	1	4	0	0	0	0	7
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	3
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	0	0	2	0	0	0	2	0	0	0	0	5
Grand Total	0	0	0	3	0	0	0	3	0	4	1	15	0	0	0	2	28
Apprch %	0	0	0	100	0	0	0	100	0	20	5	75	0	0	0	100	
Total %	0	0	0	10.7	0	0	0	10.7	0	14.3	3.6	53.6	0	0	0	7.1	

	South Road From North					Loomis Street From East					South Road From South					Railroad Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. 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	0	0	0	0	3	3	0	0	0	0	0	3
06:15 AM	0	0	0	0	0	0	0	0	1	1	0	4	0	3	7	0	0	0	2	2	10
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	3
06:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	1	1	0	4	0	9	13	0	0	0	2	2	16
% App. Total	0	0	0	0		0	0	0	100		0	30.8	0	69.2		0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.250	.000	.750	.464	.000	.000	.000	.250	.250	.400

N/S: South Road
E/W: Loomis Street/ Railroad Avenue
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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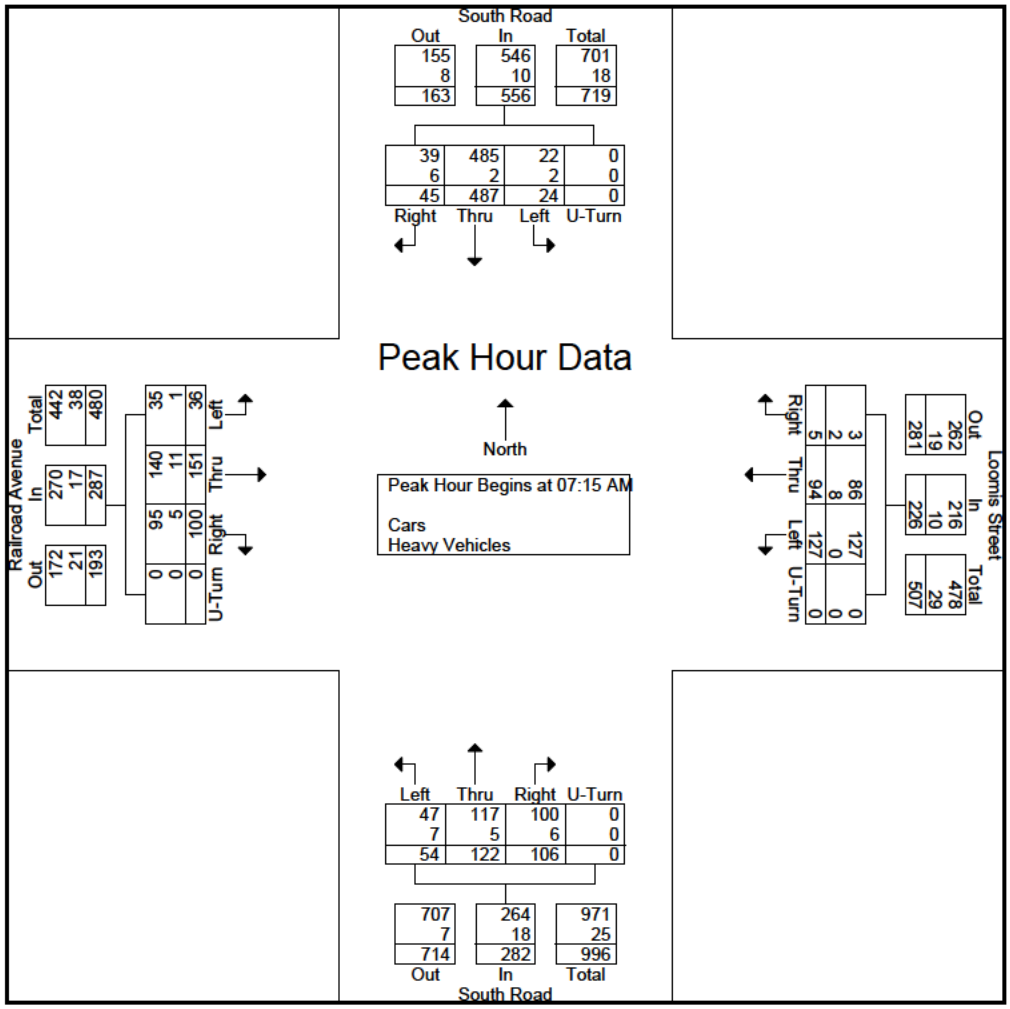
	South Road From North					Loomis Street From East					South Road From South					Railroad Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 06 00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	14	103	2	0	119	0	37	19	0	56	20	28	18	0	66	14	36	8	0	58	299
07:30 AM	24	117	8	0	149	3	34	29	0	66	29	45	19	0	93	37	46	20	0	103	411
07:45 AM	2	144	8	0	154	1	7	37	0	45	25	27	8	0	60	20	36	4	0	60	319
08:00 AM	5	123	6	0	134	1	16	42	0	59	32	22	9	0	63	29	33	4	0	66	322
Total Volume	45	487	24	0	556	5	94	127	0	226	106	122	54	0	282	100	151	36	0	287	1351
% App. Total	8.1	87.6	4.3	0		2.2	41.6	56.2	0		37.6	43.3	19.1	0		34.8	52.6	12.5	0		
PHF	.469	.845	.750	.000	.903	.417	.635	.756	.000	.856	.828	.678	.711	.000	.758	.676	.821	.450	.000	.697	.822
Cars	39	485	22	0	546	3	86	127	0	216	100	117	47	0	264	95	140	35	0	270	1296
% Cars	86.7	99.6	91.7	0	98.2	60.0	91.5	100	0	95.6	94.3	95.9	87.0	0	93.6	95.0	92.7	97.2	0	94.1	95.9
Heavy Vehicles	6	2	2	0	10	2	8	0	0	10	6	5	7	0	18	5	11	1	0	17	55
% Heavy Vehicles	13.3	0.4	8.3	0	1.8	40.0	8.5	0	0	4.4	5.7	4.1	13.0	0	6.4	5.0	7.3	2.8	0	5.9	4.1



N/S: Massachusetts Avenu/ Cranberry Hill
E/W: Marrett Road (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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File Name : 123082 BB
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Cranberry Hill From South				Marrett Road (Route 2A) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	31	2	76	0	33	96	16	0	37	3	4	0	4	142	19	0	463
03:15 PM	36	10	56	0	47	116	23	0	26	9	0	0	0	121	26	0	470
03:30 PM	40	2	67	0	69	146	15	0	49	13	4	0	1	103	27	0	536
03:45 PM	34	8	65	0	46	152	11	0	25	6	2	0	2	107	36	0	494
Total	141	22	264	0	195	510	65	0	137	31	10	0	7	473	108	0	1963
04:00 PM	32	3	76	0	66	178	10	0	20	9	3	0	0	103	34	0	534
04:15 PM	41	4	64	0	58	148	8	0	19	7	4	0	0	105	31	0	489
04:30 PM	48	6	106	0	43	159	12	0	22	7	5	0	2	111	27	0	548
04:45 PM	45	5	104	0	50	125	11	0	14	9	7	0	1	112	42	0	525
Total	166	18	350	0	217	610	41	0	75	32	19	0	3	431	134	0	2096
05:00 PM	43	10	93	0	52	163	8	0	31	19	4	0	2	109	22	0	556
05:15 PM	36	8	78	0	63	157	10	0	39	28	2	0	3	113	36	0	573
05:30 PM	44	15	103	0	51	151	12	0	19	19	7	0	3	114	30	0	568
05:45 PM	37	10	98	0	52	168	13	0	26	8	4	0	4	105	37	0	562
Total	160	43	372	0	218	639	43	0	115	74	17	0	12	441	125	0	2259
Grand Total	467	83	986	0	630	1759	149	0	327	137	46	0	22	1345	367	0	6318
Apprch %	30.4	5.4	64.2	0	24.8	69.3	5.9	0	64.1	26.9	9	0	1.3	77.6	21.2	0	
Total %	7.4	1.3	15.6	0	10	27.8	2.4	0	5.2	2.2	0.7	0	0.3	21.3	5.8	0	
Cars	465	78	974	0	612	1728	143	0	321	132	46	0	21	1309	358	0	6187
% Cars	99.6	94	98.8	0	97.1	98.2	96	0	98.2	96.4	100	0	95.5	97.3	97.5	0	97.9
Heavy Vehicles	2	5	12	0	18	31	6	0	6	5	0	0	1	36	9	0	131
% Heavy Vehicles	0.4	6	1.2	0	2.9	1.8	4	0	1.8	3.6	0	0	4.5	2.7	2.5	0	2.1

	Massachusetts Avenue From North					Marrett Road (Route 2A) From East					Cranberry Hill From South					Marrett Road (Route 2A) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	43	10	93	0	146	52	163	8	0	223	31	19	4	0	54	2	109	22	0	133	556
05:15 PM	36	8	78	0	122	63	157	10	0	230	39	28	2	0	69	3	113	36	0	152	573
05:30 PM	44	15	103	0	162	51	151	12	0	214	19	19	7	0	45	3	114	30	0	147	568
05:45 PM	37	10	98	0	145	52	168	13	0	233	26	8	4	0	38	4	105	37	0	146	562
Total Volume	160	43	372	0	575	218	639	43	0	900	115	74	17	0	206	12	441	125	0	578	2259
% App. Total	27.8	7.5	64.7	0		24.2	71	4.8	0		55.8	35.9	8.3	0		2.1	76.3	21.6	0		
PHF	.909	.717	.903	.000	.887	.865	.951	.827	.000	.966	.737	.661	.607	.000	.746	.750	.967	.845	.000	.951	.986
Cars	160	39	369	0	568	215	631	41	0	887	112	72	17	0	201	11	432	124	0	567	2223
% Cars	100	90.7	99.2	0	98.8	98.6	98.7	95.3	0	98.6	97.4	97.3	100	0	97.6	91.7	98.0	99.2	0	98.1	98.4
Heavy Vehicles	0	4	3	0	7	3	8	2	0	13	3	2	0	0	5	1	9	1	0	11	36
% Heavy Vehicles	0	9.3	0.8	0	1.2	1.4	1.3	4.7	0	1.4	2.6	2.7	0	0	2.4	8.3	2.0	0.8	0	1.9	1.6

N/S: Massachusetts Avenu/ Cranberry Hill
E/W: Marrett Road (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 BB
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Cranberry Hill From South				Marrett Road (Route 2A) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	31	2	73	0	33	96	15	0	37	3	4	0	4	138	18	0	454
03:15 PM	35	9	55	0	46	113	23	0	26	9	0	0	0	113	26	0	455
03:30 PM	39	2	66	0	69	144	13	0	46	12	4	0	1	100	26	0	522
03:45 PM	34	8	65	0	43	148	11	0	25	6	2	0	2	104	35	0	483
Total	139	21	259	0	191	501	62	0	134	30	10	0	7	455	105	0	1914
04:00 PM	32	3	73	0	64	172	9	0	20	8	3	0	0	102	32	0	518
04:15 PM	41	4	64	0	57	145	8	0	19	7	4	0	0	101	29	0	479
04:30 PM	48	6	105	0	40	157	12	0	22	6	5	0	2	108	26	0	537
04:45 PM	45	5	104	0	45	122	11	0	14	9	7	0	1	111	42	0	516
Total	166	18	346	0	206	596	40	0	75	30	19	0	3	422	129	0	2050
05:00 PM	43	10	91	0	52	163	8	0	31	19	4	0	2	107	21	0	551
05:15 PM	36	6	78	0	61	154	10	0	38	28	2	0	2	110	36	0	561
05:30 PM	44	13	102	0	51	148	10	0	19	18	7	0	3	112	30	0	557
05:45 PM	37	10	98	0	51	166	13	0	24	7	4	0	4	103	37	0	554
Total	160	39	369	0	215	631	41	0	112	72	17	0	11	432	124	0	2223
Grand Total	465	78	974	0	612	1728	143	0	321	132	46	0	21	1309	358	0	6187
Apprch %	30.7	5.1	64.2	0	24.6	69.6	5.8	0	64.3	26.5	9.2	0	1.2	77.5	21.2	0	
Total %	7.5	1.3	15.7	0	9.9	27.9	2.3	0	5.2	2.1	0.7	0	0.3	21.2	5.8	0	

	Massachusetts Avenue From North					Marrett Road (Route 2A) From East					Cranberry Hill From South					Marrett Road (Route 2A) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	43	10	91	0	144	52	163	8	0	223	31	19	4	0	54	2	107	21	0	130	551
05:15 PM	36	6	78	0	120	61	154	10	0	225	38	28	2	0	68	2	110	36	0	148	561
05:30 PM	44	13	102	0	159	51	148	10	0	209	19	18	7	0	44	3	112	30	0	145	557
05:45 PM	37	10	98	0	145	51	166	13	0	230	24	7	4	0	35	4	103	37	0	144	554
Total Volume	160	39	369	0	568	215	631	41	0	887	112	72	17	0	201	11	432	124	0	567	2223
% App. Total	28.2	6.9	65	0		24.2	71.1	4.6	0		55.7	35.8	8.5	0		1.9	76.2	21.9	0		
PHF	.909	.750	.904	.000	.893	.881	.950	.788	.000	.964	.737	.643	.607	.000	.739	.688	.964	.838	.000	.958	.991

N/S: Massachusetts Avenu/ Cranberry Hill
E/W: Marrett Road (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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File Name : 123082 BB
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Cranberry Hill From South				Marrett Road (Route 2A) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	4	1	0	9
03:15 PM	1	1	1	0	1	3	0	0	0	0	0	0	0	8	0	0	15
03:30 PM	1	0	1	0	0	2	2	0	3	1	0	0	0	3	1	0	14
03:45 PM	0	0	0	0	3	4	0	0	0	0	0	0	0	3	1	0	11
Total	2	1	5	0	4	9	3	0	3	1	0	0	0	18	3	0	49
04:00 PM	0	0	3	0	2	6	1	0	0	1	0	0	0	1	2	0	16
04:15 PM	0	0	0	0	1	3	0	0	0	0	0	0	0	4	2	0	10
04:30 PM	0	0	1	0	3	2	0	0	0	1	0	0	0	3	1	0	11
04:45 PM	0	0	0	0	5	3	0	0	0	0	0	0	0	1	0	0	9
Total	0	0	4	0	11	14	1	0	0	2	0	0	0	9	5	0	46
05:00 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	2	1	0	5
05:15 PM	0	2	0	0	2	3	0	0	1	0	0	0	1	3	0	0	12
05:30 PM	0	2	1	0	0	3	2	0	0	1	0	0	0	2	0	0	11
05:45 PM	0	0	0	0	1	2	0	0	2	1	0	0	0	2	0	0	8
Total	0	4	3	0	3	8	2	0	3	2	0	0	1	9	1	0	36
Grand Total	2	5	12	0	18	31	6	0	6	5	0	0	1	36	9	0	131
Apprch %	10.5	26.3	63.2	0	32.7	56.4	10.9	0	54.5	45.5	0	0	2.2	78.3	19.6	0	
Total %	1.5	3.8	9.2	0	13.7	23.7	4.6	0	4.6	3.8	0	0	0.8	27.5	6.9	0	

	Massachusetts Avenue From North					Marrett Road (Route 2A) From East					Cranberry Hill From South					Marrett Road (Route 2A) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:15 PM																					
03:15 PM	1	1	1	0	3	1	3	0	0	4	0	0	0	0	0	0	8	0	0	8	15
03:30 PM	1	0	1	0	2	0	2	2	0	4	3	1	0	0	4	0	3	1	0	4	14
03:45 PM	0	0	0	0	0	3	4	0	0	7	0	0	0	0	0	0	3	1	0	4	11
04:00 PM	0	0	3	0	3	2	6	1	0	9	0	1	0	0	1	0	1	2	0	3	16
Total Volume	2	1	5	0	8	6	15	3	0	24	3	2	0	0	5	0	15	4	0	19	56
% App. Total	25	12.5	62.5	0		25	62.5	12.5	0		60	40	0	0		0	78.9	21.1	0		
PHF	.500	.250	.417	.000	.667	.500	.625	.375	.000	.667	.250	.500	.000	.000	.313	.000	.469	.500	.000	.594	.875

N/S: Massachusetts Avenu/ Cranberry Hill
E/W: Marrett Road (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION
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INDUSTRIES, LLC
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File Name : 123082 BB
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Cranberry Hill From South				Marrett Road (Route 2A) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	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
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	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Apprch %	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	
Total %	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	

	Massachusetts Avenue From North					Marrett Road (Route 2A) From East					Cranberry Hill From South					Marrett Road (Route 2A) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2
% App. Total	0	0	0	0		0	0	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.250

N/S: Massachusetts Avenu/ Cranberry Hill
E/W: Marrett Road (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 BB
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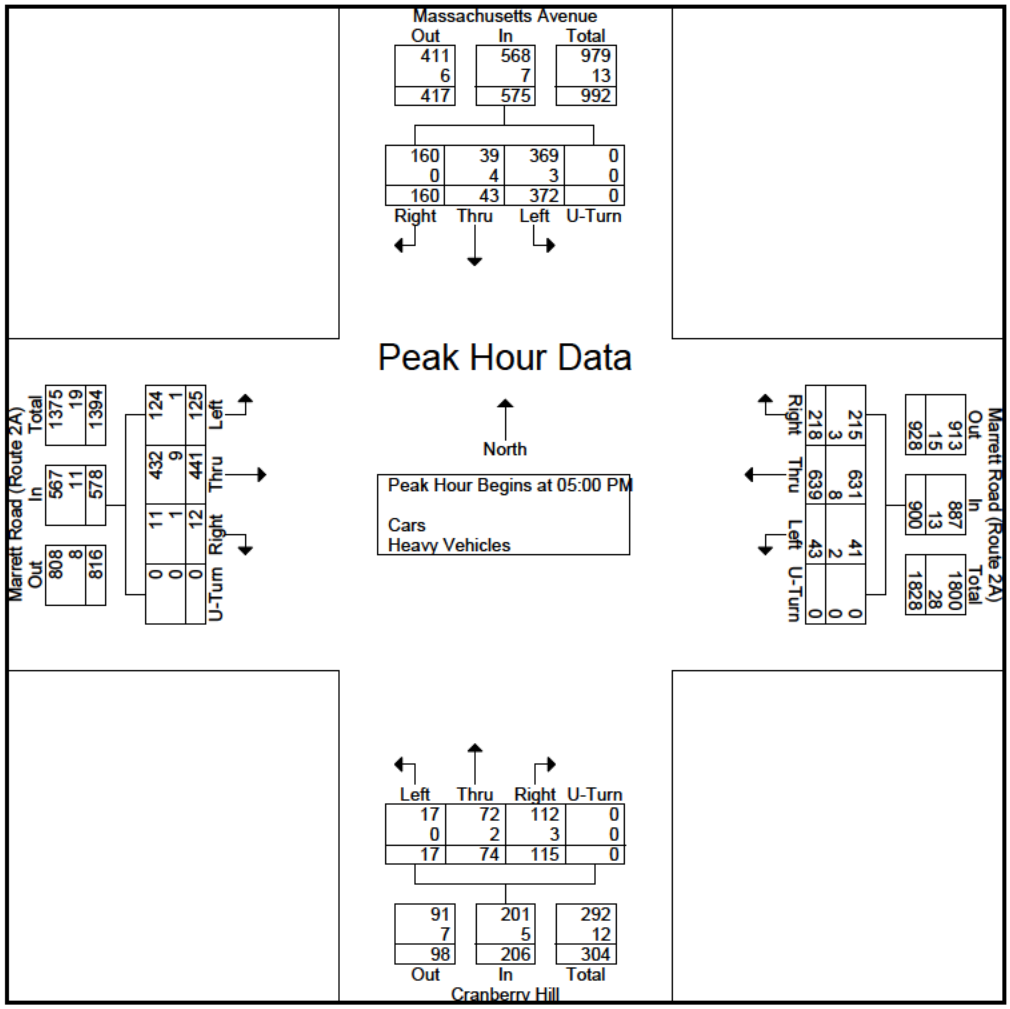
	Massachusetts Avenue From North					Marrett Road (Route 2A) From East					Cranberry Hill From South					Marrett Road (Route 2A) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	43	10	93	0	146	52	163	8	0	223	31	19	4	0	54	2	109	22	0	133	556
05:15 PM	36	8	78	0	122	63	157	10	0	230	39	28	2	0	69	3	113	36	0	152	573
05:30 PM	44	15	103	0	162	51	151	12	0	214	19	19	7	0	45	3	114	30	0	147	568
05:45 PM	37	10	98	0	145	52	168	13	0	233	26	8	4	0	38	4	105	37	0	146	562
Total Volume	160	43	372	0	575	218	639	43	0	900	115	74	17	0	206	12	441	125	0	578	2259
% App. Total	27.8	7.5	64.7	0		24.2	71	4.8	0		55.8	35.9	8.3	0		2.1	76.3	21.6	0		
PHF	.909	.717	.903	.000	.887	.865	.951	.827	.000	.966	.737	.661	.607	.000	.746	.750	.967	.845	.000	.951	.986
Cars	160	39	369	0	568	215	631	41	0	887	112	72	17	0	201	11	432	124	0	567	2223
% Cars	100	90.7	99.2	0	98.8	98.6	98.7	95.3	0	98.6	97.4	97.3	100	0	97.6	91.7	98.0	99.2	0	98.1	98.4
Heavy Vehicles	0	4	3	0	7	3	8	2	0	13	3	2	0	0	5	1	9	1	0	11	36
% Heavy Vehicles	0	9.3	0.8	0	1.2	1.4	1.3	4.7	0	1.4	2.6	2.7	0	0	2.4	8.3	2.0	0.8	0	1.9	1.6



N: Old Massachusetts Avenue
E/W: Marrett Road (Route 2A)/ Mass Ave
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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File Name : 123082 CC
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Old Massachusetts Avenue From North			Marrett Road (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	17	1	0	2	124	0	162	11	0	317
03:15 PM	15	4	0	3	152	1	140	16	0	331
03:30 PM	34	0	0	2	186	0	135	16	0	373
03:45 PM	24	2	0	4	184	0	141	14	0	369
Total	90	7	0	11	646	1	578	57	0	1390
04:00 PM	44	0	0	2	209	0	135	15	0	405
04:15 PM	41	1	0	1	191	0	138	12	0	384
04:30 PM	49	7	0	1	206	0	133	14	0	410
04:45 PM	47	8	0	1	184	0	146	8	0	394
Total	181	16	0	5	790	0	552	49	0	1593
05:00 PM	43	7	0	4	196	0	126	7	0	383
05:15 PM	38	19	0	2	182	0	130	10	0	381
05:30 PM	49	23	0	1	210	0	129	15	0	427
05:45 PM	43	13	0	1	204	0	132	6	0	399
Total	173	62	0	8	792	0	517	38	0	1590
Grand Total	444	85	0	24	2228	1	1647	144	0	4573
Apprch %	83.9	16.1	0	1.1	98.9	0	92	8	0	
Total %	9.7	1.9	0	0.5	48.7	0	36	3.1	0	
Cars	442	79	0	23	2198	1	1608	138	0	4489
% Cars	99.5	92.9	0	95.8	98.7	100	97.6	95.8	0	98.2
Heavy Vehicles	2	6	0	1	30	0	39	6	0	84
% Heavy Vehicles	0.5	7.1	0	4.2	1.3	0	2.4	4.2	0	1.8

	Old Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	44	0	0	44	2	209	0	211	135	15	0	150	405
04:15 PM	41	1	0	42	1	191	0	192	138	12	0	150	384
04:30 PM	49	7	0	56	1	206	0	207	133	14	0	147	410
04:45 PM	47	8	0	55	1	184	0	185	146	8	0	154	394
Total Volume	181	16	0	197	5	790	0	795	552	49	0	601	1593
% App. Total	91.9	8.1	0		0.6	99.4	0		91.8	8.2	0		
PHF	.923	.500	.000	.879	.625	.945	.000	.942	.945	.817	.000	.976	.971
Cars	181	15	0	196	5	776	0	781	540	47	0	587	1564
% Cars	100	93.8	0	99.5	100	98.2	0	98.2	97.8	95.9	0	97.7	98.2
Heavy Vehicles	0	1	0	1	0	14	0	14	12	2	0	14	29
% Heavy Vehicles	0	6.3	0	0.5	0	1.8	0	1.8	2.2	4.1	0	2.3	1.8

N: Old Massachusetts Avenue
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Groups Printed- Cars

	Old Massachusetts Avenue From North			Marrett Road (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	17	1	0	2	124	0	157	11	0	312
03:15 PM	15	3	0	3	148	1	133	15	0	318
03:30 PM	33	0	0	2	184	0	131	16	0	366
03:45 PM	23	2	0	4	180	0	137	12	0	358
Total	88	6	0	11	636	1	558	54	0	1354
04:00 PM	44	0	0	2	203	0	133	15	0	397
04:15 PM	41	1	0	1	189	0	132	11	0	375
04:30 PM	49	6	0	1	202	0	130	14	0	402
04:45 PM	47	8	0	1	182	0	145	7	0	390
Total	181	15	0	5	776	0	540	47	0	1564
05:00 PM	43	6	0	3	196	0	124	7	0	379
05:15 PM	38	17	0	2	180	0	128	10	0	375
05:30 PM	49	23	0	1	208	0	127	14	0	422
05:45 PM	43	12	0	1	202	0	131	6	0	395
Total	173	58	0	7	786	0	510	37	0	1571
Grand Total	442	79	0	23	2198	1	1608	138	0	4489
Apprch %	84.8	15.2	0	1	98.9	0	92.1	7.9	0	
Total %	9.8	1.8	0	0.5	49	0	35.8	3.1	0	

	Old Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	43	6	0	49	3	196	0	199	124	7	0	131	379
05:15 PM	38	17	0	55	2	180	0	182	128	10	0	138	375
05:30 PM	49	23	0	72	1	208	0	209	127	14	0	141	422
05:45 PM	43	12	0	55	1	202	0	203	131	6	0	137	395
Total Volume	173	58	0	231	7	786	0	793	510	37	0	547	1571
% App. Total	74.9	25.1	0		0.9	99.1	0		93.2	6.8	0		
PHF	.883	.630	.000	.802	.583	.945	.000	.949	.973	.661	.000	.970	.931

N: Old Massachusetts Avenue
E/W: Marrett Road (Route 2A)/ Mass Ave
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Groups Printed- Heavy Vehicles

	Old Massachusetts Avenue From North			Marrett Road (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	0	0	0	0	0	0	5	0	0	5
03:15 PM	0	1	0	0	4	0	7	1	0	13
03:30 PM	1	0	0	0	2	0	4	0	0	7
03:45 PM	1	0	0	0	4	0	4	2	0	11
Total	2	1	0	0	10	0	20	3	0	36
04:00 PM	0	0	0	0	6	0	2	0	0	8
04:15 PM	0	0	0	0	2	0	6	1	0	9
04:30 PM	0	1	0	0	4	0	3	0	0	8
04:45 PM	0	0	0	0	2	0	1	1	0	4
Total	0	1	0	0	14	0	12	2	0	29
05:00 PM	0	1	0	1	0	0	2	0	0	4
05:15 PM	0	2	0	0	2	0	2	0	0	6
05:30 PM	0	0	0	0	2	0	2	1	0	5
05:45 PM	0	1	0	0	2	0	1	0	0	4
Total	0	4	0	1	6	0	7	1	0	19
Grand Total	2	6	0	1	30	0	39	6	0	84
Apprch %	25	75	0	3.2	96.8	0	86.7	13.3	0	
Total %	2.4	7.1	0	1.2	35.7	0	46.4	7.1	0	

	Old Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:15 PM													
03:15 PM	0	1	0	1	0	4	0	4	7	1	0	8	13
03:30 PM	1	0	0	1	0	2	0	2	4	0	0	4	7
03:45 PM	1	0	0	1	0	4	0	4	4	2	0	6	11
04:00 PM	0	0	0	0	0	6	0	6	2	0	0	2	8
Total Volume	2	1	0	3	0	16	0	16	17	3	0	20	39
% App. Total	66.7	33.3	0		0	100	0		85	15	0		
PHF	.500	.250	.000	.750	.000	.667	.000	.667	.607	.375	.000	.625	.750

N: Old Massachusetts Avenue
E/W: Marrett Road (Route 2A)/ Mass Ave
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Old Massachusetts Avenue From North			Marrett Road (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
03:00 PM	0	0	1	0	0	0	0	0	0	1
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	1	0	0	0	0	1
Total	0	0	1	0	1	0	0	0	0	2
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	1	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	0	0	0	0	0	1
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	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	1	0	1	0	0	0	0	3
Apprch %	50	0	50	0	100	0	0	0	0	
Total %	33.3	0	33.3	0	33.3	0	0	0	0	

	Old Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	0	0	1	1	0	0	0	0	0	0	0	0	1
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	0	1	1	0	1	0	1	0	0	0	0	2
% App. Total	0	0	100		0	100	0		0	0	0		
PHF	.000	.000	.250	.250	.000	.250	.000	.250	.000	.000	.000	.000	.500

N: Old Massachusetts Avenue
E/W: Marrett Road (Route 2A)/ Mass Ave
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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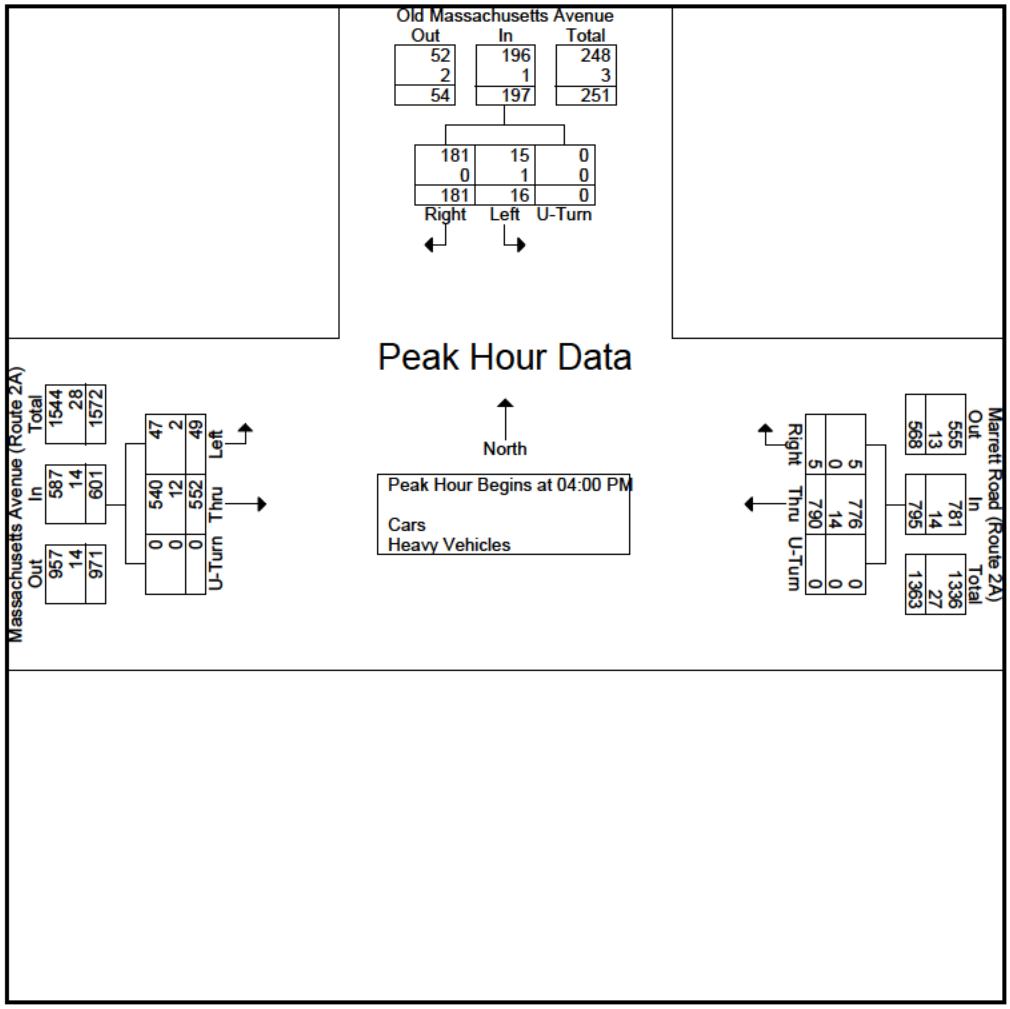
Start Date : 11/13/2012
Page No : 1

	Old Massachusetts Avenue From North				Marrett Road (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	44	0	0	44	2	209	0	211	135	15	0	150	405
04:15 PM	41	1	0	42	1	191	0	192	138	12	0	150	384
04:30 PM	49	7	0	56	1	206	0	207	133	14	0	147	410
04:45 PM	47	8	0	55	1	184	0	185	146	8	0	154	394
Total Volume	181	16	0	197	5	790	0	795	552	49	0	601	1593
% App. Total	91.9	8.1	0		0.6	99.4	0		91.8	8.2	0		
PHF	.923	.500	.000	.879	.625	.945	.000	.942	.945	.817	.000	.976	.971
Cars	181	15	0	196	5	776	0	781	540	47	0	587	1564
% Cars	100	93.8	0	99.5	100	98.2	0	98.2	97.8	95.9	0	97.7	98.2
Heavy Vehicles	0	1	0	1	0	14	0	14	12	2	0	14	29
% Heavy Vehicles	0	6.3	0	0.5	0	1.8	0	1.8	2.2	4.1	0	2.3	1.8



N: Marrett Street (Airport Road)
E/W: Massachusetts Avenue (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 DD
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Marrett Street (Airport Road) From North			Massachusetts Avenue (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	0	0	0	0	141	1	172	0	0	314
03:15 PM	0	1	0	1	166	0	158	0	0	326
03:30 PM	0	0	0	1	214	0	149	0	0	364
03:45 PM	0	1	0	0	212	0	156	0	0	369
Total	0	2	0	2	733	1	635	0	0	1373
04:00 PM	1	2	0	0	249	2	139	0	1	394
04:15 PM	0	0	0	2	229	0	151	0	0	382
04:30 PM	0	1	0	0	255	0	149	0	0	405
04:45 PM	0	0	0	0	231	1	150	0	0	382
Total	1	3	0	2	964	3	589	0	1	1563
05:00 PM	0	0	0	0	238	0	136	0	0	374
05:15 PM	0	0	0	0	208	0	140	0	0	348
05:30 PM	0	0	0	0	254	3	145	0	0	402
05:45 PM	0	0	0	1	252	1	136	0	0	390
Total	0	0	0	1	952	4	557	0	0	1514
Grand Total	1	5	0	5	2649	8	1781	0	1	4450
Apprch %	16.7	83.3	0	0.2	99.5	0.3	99.9	0	0.1	
Total %	0	0.1	0	0.1	59.5	0.2	40	0	0	
Cars	1	5	0	5	2619	8	1739	0	1	4378
% Cars	100	100	0	100	98.9	100	97.6	0	100	98.4
Heavy Vehicles	0	0	0	0	30	0	42	0	0	72
% Heavy Vehicles	0	0	0	0	1.1	0	2.4	0	0	1.6

	Marrett Street (Airport Road) From North				Massachusetts Avenue (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	1	2	0	3	0	249	2	251	139	0	1	140	394
04:15 PM	0	0	0	0	2	229	0	231	151	0	0	151	382
04:30 PM	0	1	0	1	0	255	0	255	149	0	0	149	405
04:45 PM	0	0	0	0	0	231	1	232	150	0	0	150	382
Total Volume	1	3	0	4	2	964	3	969	589	0	1	590	1563
% App. Total	25	75	0		0.2	99.5	0.3		99.8	0	0.2		
PHF	.250	.375	.000	.333	.250	.945	.375	.950	.975	.000	.250	.977	.965
Cars	1	3	0	4	2	952	3	957	575	0	1	576	1537
% Cars	100	100	0	100	100	98.8	100	98.8	97.6	0	100	97.6	98.3
Heavy Vehicles	0	0	0	0	0	12	0	12	14	0	0	14	26
% Heavy Vehicles	0	0	0	0	0	1.2	0	1.2	2.4	0	0	2.4	1.7

N: Marrett Street (Airport Road)
E/W: Massachusetts Avenue (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 DD
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	Marrett Street (Airport Road) From North			Massachusetts Avenue (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	0	0	0	0	141	1	167	0	0	309
03:15 PM	0	1	0	1	163	0	153	0	0	318
03:30 PM	0	0	0	1	210	0	144	0	0	355
03:45 PM	0	1	0	0	207	0	151	0	0	359
Total	0	2	0	2	721	1	615	0	0	1341
04:00 PM	1	2	0	0	244	2	136	0	1	386
04:15 PM	0	0	0	2	227	0	145	0	0	374
04:30 PM	0	1	0	0	252	0	146	0	0	399
04:45 PM	0	0	0	0	229	1	148	0	0	378
Total	1	3	0	2	952	3	575	0	1	1537
05:00 PM	0	0	0	0	238	0	134	0	0	372
05:15 PM	0	0	0	0	206	0	138	0	0	344
05:30 PM	0	0	0	0	252	3	142	0	0	397
05:45 PM	0	0	0	1	250	1	135	0	0	387
Total	0	0	0	1	946	4	549	0	0	1500
Grand Total	1	5	0	5	2619	8	1739	0	1	4378
Apprch %	16.7	83.3	0	0.2	99.5	0.3	99.9	0	0.1	
Total %	0	0.1	0	0.1	59.8	0.2	39.7	0	0	

	Marrett Street (Airport Road) From North				Massachusetts Avenue (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	1	2	0	3	0	244	2	246	136	0	1	137	386
04:15 PM	0	0	0	0	2	227	0	229	145	0	0	145	374
04:30 PM	0	1	0	1	0	252	0	252	146	0	0	146	399
04:45 PM	0	0	0	0	0	229	1	230	148	0	0	148	378
Total Volume	1	3	0	4	2	952	3	957	575	0	1	576	1537
% App. Total	25	75	0		0.2	99.5	0.3		99.8	0	0.2		
PHF	.250	.375	.000	.333	.250	.944	.375	.949	.971	.000	.250	.973	.963

N: Marrett Street (Airport Road)
E/W: Massachusetts Avenue (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 DD
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Marrett Street (Airport Road) From North			Massachusetts Avenue (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	0	0	0	0	0	0	5	0	0	5
03:15 PM	0	0	0	0	3	0	5	0	0	8
03:30 PM	0	0	0	0	4	0	5	0	0	9
03:45 PM	0	0	0	0	5	0	5	0	0	10
Total	0	0	0	0	12	0	20	0	0	32
04:00 PM	0	0	0	0	5	0	3	0	0	8
04:15 PM	0	0	0	0	2	0	6	0	0	8
04:30 PM	0	0	0	0	3	0	3	0	0	6
04:45 PM	0	0	0	0	2	0	2	0	0	4
Total	0	0	0	0	12	0	14	0	0	26
05:00 PM	0	0	0	0	0	0	2	0	0	2
05:15 PM	0	0	0	0	2	0	2	0	0	4
05:30 PM	0	0	0	0	2	0	3	0	0	5
05:45 PM	0	0	0	0	2	0	1	0	0	3
Total	0	0	0	0	6	0	8	0	0	14
Grand Total	0	0	0	0	30	0	42	0	0	72
Apprch %	0	0	0	0	100	0	100	0	0	
Total %	0	0	0	0	41.7	0	58.3	0	0	

	Marrett Street (Airport Road) From North				Massachusetts Avenue (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:15 PM													
03:15 PM	0	0	0	0	0	3	0	3	5	0	0	5	8
03:30 PM	0	0	0	0	0	4	0	4	5	0	0	5	9
03:45 PM	0	0	0	0	0	5	0	5	5	0	0	5	10
04:00 PM	0	0	0	0	0	5	0	5	3	0	0	3	8
Total Volume	0	0	0	0	0	17	0	17	18	0	0	18	35
% App. Total	0	0	0		0	100	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.850	.000	.850	.900	.000	.000	.900	.875

N: Marrett Street (Airport Road)
E/W: Massachusetts Avenue (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 DD
Site Code : TBA
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Groups Printed- Peds and Bicycles

	Marrett Street (Airport Road) From North			Massachusetts Avenue (Route 2A) From East			Massachusetts Avenue (Route 2A) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	1	0	0	0	0	1
Total	0	0	0	0	1	0	0	0	0	1
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	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	1	0	0	0	0	1
Apprch %	0	0	0	0	100	0	0	0	0	
Total %	0	0	0	0	100	0	0	0	0	

	Marrett Street (Airport Road) From North				Massachusetts Avenue (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	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
04:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	1
% App. Total	0	0	0		0	100	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.250

N: Marrett Street (Airport Road)
E/W: Massachusetts Avenue (Route 2A)
City, State: Lexington, MA
Client: Toole Engineering/ C. Fink

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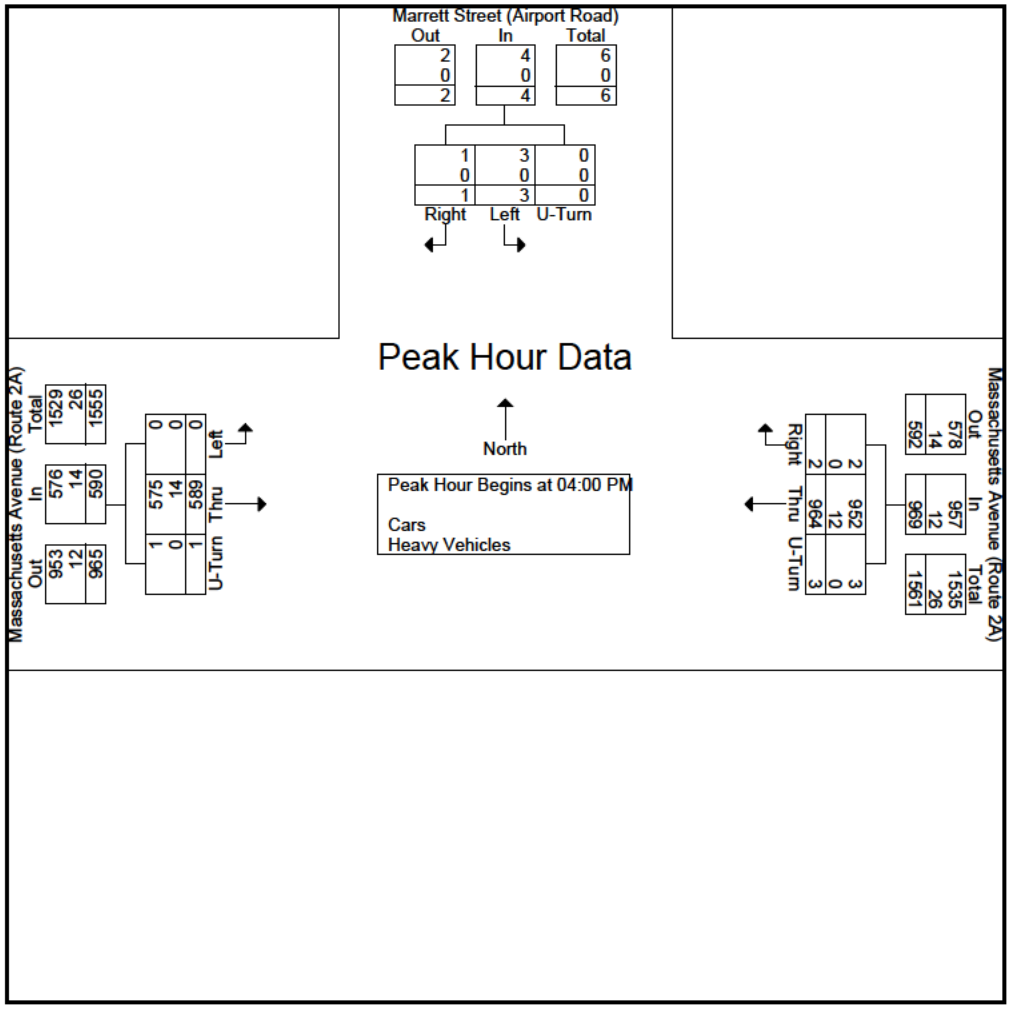
	Marrett Street (Airport Road) From North				Massachusetts Avenue (Route 2A) From East				Massachusetts Avenue (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	1	2	0	3	0	249	2	251	139	0	1	140	394
04:15 PM	0	0	0	0	2	229	0	231	151	0	0	151	382
04:30 PM	0	1	0	1	0	255	0	255	149	0	0	149	405
04:45 PM	0	0	0	0	0	231	1	232	150	0	0	150	382
Total Volume	1	3	0	4	2	964	3	969	589	0	1	590	1563
% App. Total	25	75	0		0.2	99.5	0.3		99.8	0	0.2		
PHF	.250	.375	.000	.333	.250	.945	.375	.950	.975	.000	.250	.977	.965
Cars	1	3	0	4	2	952	3	957	575	0	1	576	1537
% Cars	100	100	0	100	100	98.8	100	98.8	97.6	0	100	97.6	98.3
Heavy Vehicles	0	0	0	0	0	12	0	12	14	0	0	14	26
% Heavy Vehicles	0	0	0	0	0	1.2	0	1.2	2.4	0	0	2.4	1.7



N/S: Airport/ Hanscom Drive
E/W: Vandenburg Gate/ Old Bedford Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 EE
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Hanscom Drive (Airport) From North				Old Bedford Road (Vandenburg Gate) From East				Hanscom Drive From South				Old Bedford Road From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	5	65	3	0	2	28	88	0	12	6	15	1	47	7	5	0	284
03:15 PM	2	15	0	0	2	15	54	0	28	8	22	1	16	3	1	0	167
03:30 PM	1	18	0	0	0	44	93	0	18	8	11	0	31	10	1	0	235
03:45 PM	2	11	0	0	0	14	79	0	22	3	12	0	22	5	0	0	170
Total	10	109	3	0	4	101	314	0	80	25	60	2	116	25	7	0	856
04:00 PM	1	22	2	0	0	36	112	0	17	7	16	0	34	8	0	0	255
04:15 PM	0	16	0	0	0	44	117	0	34	6	20	0	29	6	1	0	273
04:30 PM	0	15	1	0	0	72	131	0	22	4	30	0	30	6	2	0	313
04:45 PM	0	7	2	0	0	51	109	0	25	6	29	0	18	6	2	0	255
Total	1	60	5	0	0	203	469	0	98	23	95	0	111	26	5	0	1096
05:00 PM	0	16	0	0	0	53	99	0	26	7	21	0	47	3	0	0	272
05:15 PM	0	9	0	0	0	59	86	0	24	6	25	1	32	1	0	0	243
05:30 PM	0	13	0	0	0	23	85	0	13	4	20	0	39	7	0	0	204
05:45 PM	0	11	0	0	0	20	69	0	11	2	19	0	32	6	0	0	170
Total	0	49	0	0	0	155	339	0	74	19	85	1	150	17	0	0	889
Grand Total	11	218	8	0	4	459	1122	0	252	67	240	3	377	68	12	0	2841
Apprch %	4.6	92	3.4	0	0.3	29	70.8	0	44.8	11.9	42.7	0.5	82.5	14.9	2.6	0	
Total %	0.4	7.7	0.3	0	0.1	16.2	39.5	0	8.9	2.4	8.4	0.1	13.3	2.4	0.4	0	
Cars	11	209	8	0	3	458	1110	0	248	61	236	3	374	68	12	0	2801
% Cars	100	95.9	100	0	75	99.8	98.9	0	98.4	91	98.3	100	99.2	100	100	0	98.6
Heavy Vehicles	0	9	0	0	1	1	12	0	4	6	4	0	3	0	0	0	40
% Heavy Vehicles	0	4.1	0	0	25	0.2	1.1	0	1.6	9	1.7	0	0.8	0	0	0	1.4

	Hanscom Drive (Airport) From North					Old Bedford Road (Vandenburg Gate) From East					Hanscom Drive From South					Old Bedford Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	16	0	0	16	0	44	117	0	161	34	6	20	0	60	29	6	1	0	36	273
04:30 PM	0	15	1	0	16	0	72	131	0	203	22	4	30	0	56	30	6	2	0	38	313
04:45 PM	0	7	2	0	9	0	51	109	0	160	25	6	29	0	60	18	6	2	0	26	255
05:00 PM	0	16	0	0	16	0	53	99	0	152	26	7	21	0	54	47	3	0	0	50	272
Total Volume	0	54	3	0	57	0	220	456	0	676	107	23	100	0	230	124	21	5	0	150	1113
% App. Total	0	94.7	5.3	0		0	32.5	67.5	0		46.5	10	43.5	0		82.7	14	3.3	0		
PHF	.000	.844	.375	.000	.891	.000	.764	.870	.000	.833	.787	.821	.833	.000	.958	.660	.875	.625	.000	.750	.889
Cars	0	52	3	0	55	0	220	450	0	670	106	21	99	0	226	124	21	5	0	150	1101
% Cars	0	96.3	100	0	96.5	0	100	98.7	0	99.1	99.1	91.3	99.0	0	98.3	100	100	100	0	100	98.9
Heavy Vehicles	0	2	0	0	2	0	0	6	0	6	1	2	1	0	4	0	0	0	0	0	12
% Heavy Vehicles	0	3.7	0	0	3.5	0	0	1.3	0	0.9	0.9	8.7	1.0	0	1.7	0	0	0	0	0	1.1

N/S: Airport/ Hanscom Drive
E/W: Vandenburg Gate/ Old Bedford Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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File Name : 123082 EE
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	Hanscom Drive (Airport) From North				Old Bedford Road (Vandenburg Gate) From East				Hanscom Drive From South				Old Bedford Road From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	5	63	3	0	2	28	87	0	11	5	14	1	45	7	5	0	276
03:15 PM	2	15	0	0	1	14	54	0	27	7	21	1	15	3	1	0	161
03:30 PM	1	17	0	0	0	44	92	0	18	8	11	0	31	10	1	0	233
03:45 PM	2	10	0	0	0	14	77	0	22	3	12	0	22	5	0	0	167
Total	10	105	3	0	3	100	310	0	78	23	58	2	113	25	7	0	837
04:00 PM	1	22	2	0	0	36	112	0	16	6	16	0	34	8	0	0	253
04:15 PM	0	15	0	0	0	44	115	0	34	6	20	0	29	6	1	0	270
04:30 PM	0	15	1	0	0	72	129	0	21	4	30	0	30	6	2	0	310
04:45 PM	0	6	2	0	0	51	109	0	25	4	28	0	18	6	2	0	251
Total	1	58	5	0	0	203	465	0	96	20	94	0	111	26	5	0	1084
05:00 PM	0	16	0	0	0	53	97	0	26	7	21	0	47	3	0	0	270
05:15 PM	0	9	0	0	0	59	85	0	24	6	24	1	32	1	0	0	241
05:30 PM	0	11	0	0	0	23	85	0	13	3	20	0	39	7	0	0	201
05:45 PM	0	10	0	0	0	20	68	0	11	2	19	0	32	6	0	0	168
Total	0	46	0	0	0	155	335	0	74	18	84	1	150	17	0	0	880
Grand Total	11	209	8	0	3	458	1110	0	248	61	236	3	374	68	12	0	2801
Apprch %	4.8	91.7	3.5	0	0.2	29.2	70.7	0	45.3	11.1	43.1	0.5	82.4	15	2.6	0	
Total %	0.4	7.5	0.3	0	0.1	16.4	39.6	0	8.9	2.2	8.4	0.1	13.4	2.4	0.4	0	

	Hanscom Drive (Airport) From North					Old Bedford Road (Vandenburg Gate) From East					Hanscom Drive From South					Old Bedford Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	15	0	0	15	0	44	115	0	159	34	6	20	0	60	29	6	1	0	36	270
04:30 PM	0	15	1	0	16	0	72	129	0	201	21	4	30	0	55	30	6	2	0	38	310
04:45 PM	0	6	2	0	8	0	51	109	0	160	25	4	28	0	57	18	6	2	0	26	251
05:00 PM	0	16	0	0	16	0	53	97	0	150	26	7	21	0	54	47	3	0	0	50	270
Total Volume	0	52	3	0	55	0	220	450	0	670	106	21	99	0	226	124	21	5	0	150	1101
% App. Total	0	94.5	5.5	0		0	32.8	67.2	0		46.9	9.3	43.8	0		82.7	14	3.3	0		
PHF	.000	.813	.375	.000	.859	.000	.764	.872	.000	.833	.779	.750	.825	.000	.942	.660	.875	.625	.000	.750	.888

N/S: Airport/ Hanscom Drive
E/W: Vandenburg Gate/ Old Bedford Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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File Name : 123082 EE
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Hanscom Drive (Airport) From North				Old Bedford Road (Vandenburg Gate) From East				Hanscom Drive From South				Old Bedford Road From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	0	2	0	0	0	0	1	0	1	1	1	0	2	0	0	0	8
03:15 PM	0	0	0	0	1	1	0	0	1	1	1	0	1	0	0	0	6
03:30 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
03:45 PM	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3
Total	0	4	0	0	1	1	4	0	2	2	2	0	3	0	0	0	19
04:00 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
04:15 PM	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	3
04:45 PM	0	1	0	0	0	0	0	0	0	2	1	0	0	0	0	0	4
Total	0	2	0	0	0	0	4	0	2	3	1	0	0	0	0	0	12
05:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
05:30 PM	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
05:45 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
Total	0	3	0	0	0	0	4	0	0	1	1	0	0	0	0	0	9
Grand Total	0	9	0	0	1	1	12	0	4	6	4	0	3	0	0	0	40
Apprch %	0	100	0	0	7.1	7.1	85.7	0	28.6	42.9	28.6	0	100	0	0	0	
Total %	0	22.5	0	0	2.5	2.5	30	0	10	15	10	0	7.5	0	0	0	

	Hanscom Drive (Airport) From North					Old Bedford Road (Vandenburg Gate) From East					Hanscom Drive From South					Old Bedford Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	0	2	0	0	2	0	0	1	0	1	1	1	1	0	3	2	0	0	0	2	8
03:15 PM	0	0	0	0	0	1	1	0	0	2	1	1	1	0	3	1	0	0	0	1	6
03:30 PM	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
03:45 PM	0	1	0	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	4	0	0	4	1	1	4	0	6	2	2	2	0	6	3	0	0	0	3	19
% App. Total	0	100	0	0		16.7	16.7	66.7	0		33.3	33.3	33.3	0		100	0	0	0		
PHF	.000	.500	.000	.000	.500	.250	.250	.500	.000	.750	.500	.500	.500	.000	.500	.375	.000	.000	.000	.375	.594

N/S: Airport/ Hanscom Drive
E/W: Vandenburg Gate/ Old Bedford Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
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File Name : 123082 EE
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Hanscom Drive (Airport) From North				Old Bedford Road (Vandenburg Gate) From East				Hanscom Drive From South				Old Bedford Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	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	1	0	0	0	0	0	0	0	0	0	1
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	0	0	0
Total	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	
Total %	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	

	Hanscom Drive (Airport) From North					Old Bedford Road (Vandenburg Gate) From East					Hanscom Drive From South					Old Bedford Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0	0		0	0	100	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

N/S: Airport/ Hanscom Drive
E/W: Vandenburg Gate/ Old Bedford Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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File Name : 123082 EE
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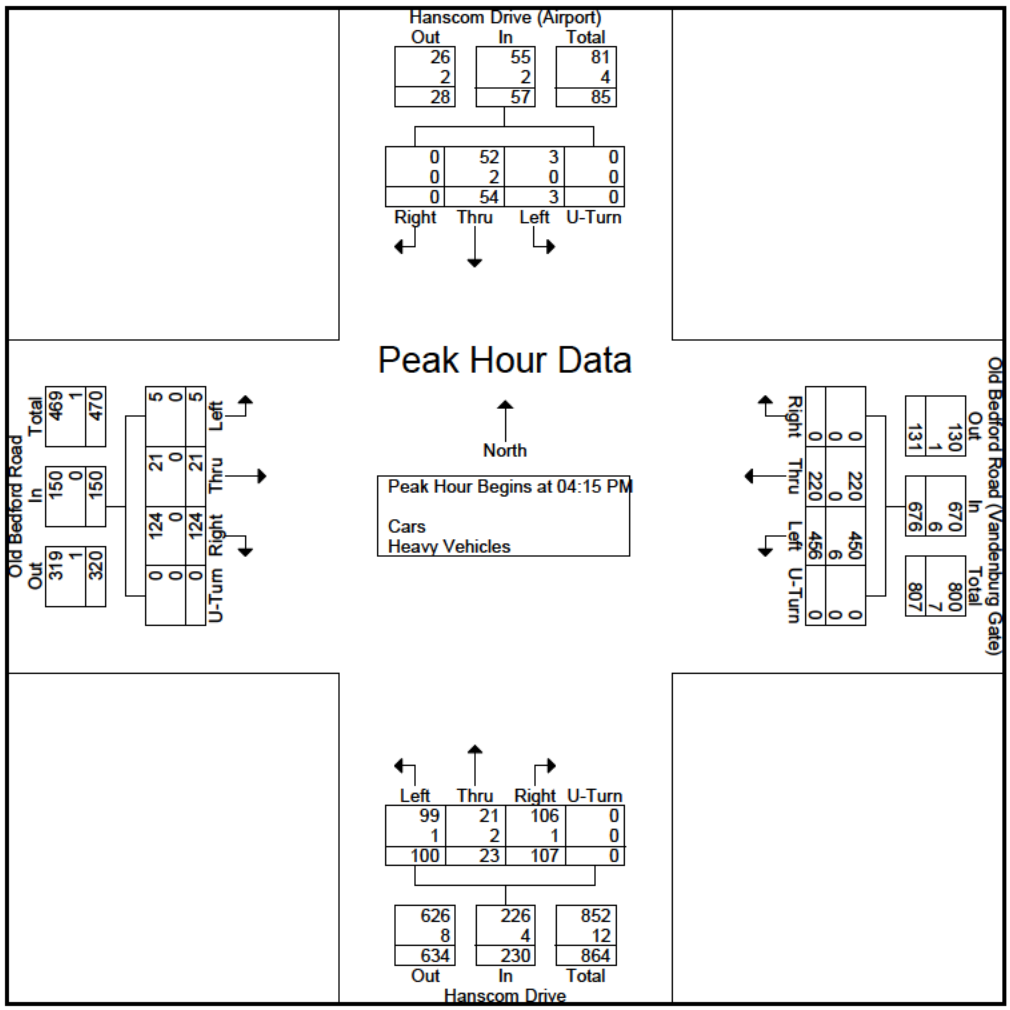
Start Date : 11/13/2012
Page No : 1

	Hanscom Drive (Airport) From North					Old Bedford Road (Vandenburg Gate) From East					Hanscom Drive From South					Old Bedford Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	16	0	0	16	0	44	117	0	161	34	6	20	0	60	29	6	1	0	36	273
04:30 PM	0	15	1	0	16	0	72	131	0	203	22	4	30	0	56	30	6	2	0	38	313
04:45 PM	0	7	2	0	9	0	51	109	0	160	25	6	29	0	60	18	6	2	0	26	255
05:00 PM	0	16	0	0	16	0	53	99	0	152	26	7	21	0	54	47	3	0	0	50	272
Total Volume	0	54	3	0	57	0	220	456	0	676	107	23	100	0	230	124	21	5	0	150	1113
% App. Total	0	94.7	5.3	0		0	32.5	67.5	0		46.5	10	43.5	0		82.7	14	3.3	0		
PHF	.000	.844	.375	.000	.891	.000	.764	.870	.000	.833	.787	.821	.833	.000	.958	.660	.875	.625	.000	.750	.889
Cars	0	52	3	0	55	0	220	450	0	670	106	21	99	0	226	124	21	5	0	150	1101
% Cars	0	96.3	100	0	96.5	0	100	98.7	0	99.1	99.1	91.3	99.0	0	98.3	100	100	100	0	100	98.9
Heavy Vehicles	0	2	0	0	2	0	0	6	0	6	1	2	1	0	4	0	0	0	0	0	12
% Heavy Vehicles	0	3.7	0	0	3.5	0	0	1.3	0	0.9	0.9	8.7	1.0	0	1.7	0	0	0	0	0	1.1



N: Hanscom Drive
E/W: North Great Road (Route 2A)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
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P.O. Box 301 Berlin, MA 01503
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File Name : 123082 FF
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Hanscom Drive From North			North Great Road (Route 2A) From East			North Great Road (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	138	92	0	33	114	0	76	11	0	464
03:15 PM	52	65	0	33	126	0	107	28	0	411
03:30 PM	69	54	0	27	193	0	99	11	0	453
03:45 PM	62	61	0	26	197	0	79	20	0	445
Total	321	272	0	119	630	0	361	70	0	1773
04:00 PM	84	69	0	25	203	0	79	23	0	483
04:15 PM	96	64	0	39	201	0	83	25	0	508
04:30 PM	104	73	0	33	187	0	77	20	0	494
04:45 PM	81	52	0	53	208	0	85	24	0	503
Total	365	258	0	150	799	0	324	92	0	1988
05:00 PM	89	54	0	33	214	0	80	18	0	488
05:15 PM	85	66	0	47	189	0	70	17	0	474
05:30 PM	78	62	0	32	209	0	90	14	0	485
05:45 PM	49	47	0	30	229	0	86	21	0	462
Total	301	229	0	142	841	0	326	70	0	1909
Grand Total	987	759	0	411	2270	0	1011	232	0	5670
Apprch %	56.5	43.5	0	15.3	84.7	0	81.3	18.7	0	
Total %	17.4	13.4	0	7.2	40	0	17.8	4.1	0	
Cars	975	742	0	400	2244	0	984	227	0	5572
% Cars	98.8	97.8	0	97.3	98.9	0	97.3	97.8	0	98.3
Heavy Vehicles	12	17	0	11	26	0	27	5	0	98
% Heavy Vehicles	1.2	2.2	0	2.7	1.1	0	2.7	2.2	0	1.7

	Hanscom Drive From North				North Great Road (Route 2A) From East				North Great Road (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	96	64	0	160	39	201	0	240	83	25	0	108	508
04:30 PM	104	73	0	177	33	187	0	220	77	20	0	97	494
04:45 PM	81	52	0	133	53	208	0	261	85	24	0	109	503
05:00 PM	89	54	0	143	33	214	0	247	80	18	0	98	488
Total Volume	370	243	0	613	158	810	0	968	325	87	0	412	1993
% App. Total	60.4	39.6	0		16.3	83.7	0		78.9	21.1	0		
PHF	.889	.832	.000	.866	.745	.946	.000	.927	.956	.870	.000	.945	.981
Cars	367	240	0	607	156	803	0	959	314	86	0	400	1966
% Cars	99.2	98.8	0	99.0	98.7	99.1	0	99.1	96.6	98.9	0	97.1	98.6
Heavy Vehicles	3	3	0	6	2	7	0	9	11	1	0	12	27
% Heavy Vehicles	0.8	1.2	0	1.0	1.3	0.9	0	0.9	3.4	1.1	0	2.9	1.4

N: Hanscom Drive
E/W: North Great Road (Route 2A)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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File Name : 123082 FF
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	Hanscom Drive From North			North Great Road (Route 2A) From East			North Great Road (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	134	88	0	32	114	0	75	9	0	452
03:15 PM	49	64	0	32	124	0	102	26	0	397
03:30 PM	69	52	0	27	186	0	96	11	0	441
03:45 PM	62	59	0	26	194	0	76	20	0	437
Total	314	263	0	117	618	0	349	66	0	1727
04:00 PM	83	69	0	22	198	0	77	23	0	472
04:15 PM	94	63	0	39	199	0	77	25	0	497
04:30 PM	104	72	0	33	185	0	75	19	0	488
04:45 PM	80	51	0	51	205	0	84	24	0	495
Total	361	255	0	145	787	0	313	91	0	1952
05:00 PM	89	54	0	33	214	0	78	18	0	486
05:15 PM	85	64	0	47	188	0	70	17	0	471
05:30 PM	78	60	0	30	208	0	88	14	0	478
05:45 PM	48	46	0	28	229	0	86	21	0	458
Total	300	224	0	138	839	0	322	70	0	1893
Grand Total	975	742	0	400	2244	0	984	227	0	5572
Apprch %	56.8	43.2	0	15.1	84.9	0	81.3	18.7	0	
Total %	17.5	13.3	0	7.2	40.3	0	17.7	4.1	0	

	Hanscom Drive From North				North Great Road (Route 2A) From East				North Great Road (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	94	63	0	157	39	199	0	238	77	25	0	102	497
04:30 PM	104	72	0	176	33	185	0	218	75	19	0	94	488
04:45 PM	80	51	0	131	51	205	0	256	84	24	0	108	495
05:00 PM	89	54	0	143	33	214	0	247	78	18	0	96	486
Total Volume	367	240	0	607	156	803	0	959	314	86	0	400	1966
% App. Total	60.5	39.5	0		16.3	83.7	0		78.5	21.5	0		
PHF	.882	.833	.000	.862	.765	.938	.000	.937	.935	.860	.000	.926	.989

N: Hanscom Drive
E/W: North Great Road (Route 2A)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
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File Name : 123082 FF
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Hanscom Drive From North			North Great Road (Route 2A) From East			North Great Road (Route 2A) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	4	4	0	1	0	0	1	2	0	12
03:15 PM	3	1	0	1	2	0	5	2	0	14
03:30 PM	0	2	0	0	7	0	3	0	0	12
03:45 PM	0	2	0	0	3	0	3	0	0	8
Total	7	9	0	2	12	0	12	4	0	46
04:00 PM	1	0	0	3	5	0	2	0	0	11
04:15 PM	2	1	0	0	2	0	6	0	0	11
04:30 PM	0	1	0	0	2	0	2	1	0	6
04:45 PM	1	1	0	2	3	0	1	0	0	8
Total	4	3	0	5	12	0	11	1	0	36
05:00 PM	0	0	0	0	0	0	2	0	0	2
05:15 PM	0	2	0	0	1	0	0	0	0	3
05:30 PM	0	2	0	2	1	0	2	0	0	7
05:45 PM	1	1	0	2	0	0	0	0	0	4
Total	1	5	0	4	2	0	4	0	0	16
Grand Total	12	17	0	11	26	0	27	5	0	98
Apprch %	41.4	58.6	0	29.7	70.3	0	84.4	15.6	0	
Total %	12.2	17.3	0	11.2	26.5	0	27.6	5.1	0	

	Hanscom Drive From North				North Great Road (Route 2A) From East				North Great Road (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	4	4	0	8	1	0	0	1	1	2	0	3	12
03:15 PM	3	1	0	4	1	2	0	3	5	2	0	7	14
03:30 PM	0	2	0	2	0	7	0	7	3	0	0	3	12
03:45 PM	0	2	0	2	0	3	0	3	3	0	0	3	8
Total Volume	7	9	0	16	2	12	0	14	12	4	0	16	46
% App. Total	43.8	56.2	0		14.3	85.7	0		75	25	0		
PHF	.438	.563	.000	.500	.500	.429	.000	.500	.600	.500	.000	.571	.821

N: Hanscom Drive
E/W: North Great Road (Route 2A)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 FF
Site Code : TBA
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Page No : 1

Groups Printed- Peds and Bicycles

	Hanscom Drive From North			North Great Road (Route 2A) From East			North Great Road (Route 2A) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	1	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	1	0	0	0	0	1
Total	0	0	0	0	2	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	1	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	0	0	0	0	2
Grand Total	1	0	0	0	3	0	0	0	0	4
Apprch %	100	0	0	0	100	0	0	0	0	
Total %	25	0	0	0	75	0	0	0	0	

	Hanscom Drive From North				North Great Road (Route 2A) From East				North Great Road (Route 2A) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 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	1	0	1	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	1	0	0	1	0	2	0	2	0	0	0	0	3
% App. Total	100	0	0		0	100	0		0	0	0		
PHF	.250	.000	.000	.250	.000	.500	.000	.500	.000	.000	.000	.000	.750

N: Hanscom Drive
E/W: North Great Road (Route 2A)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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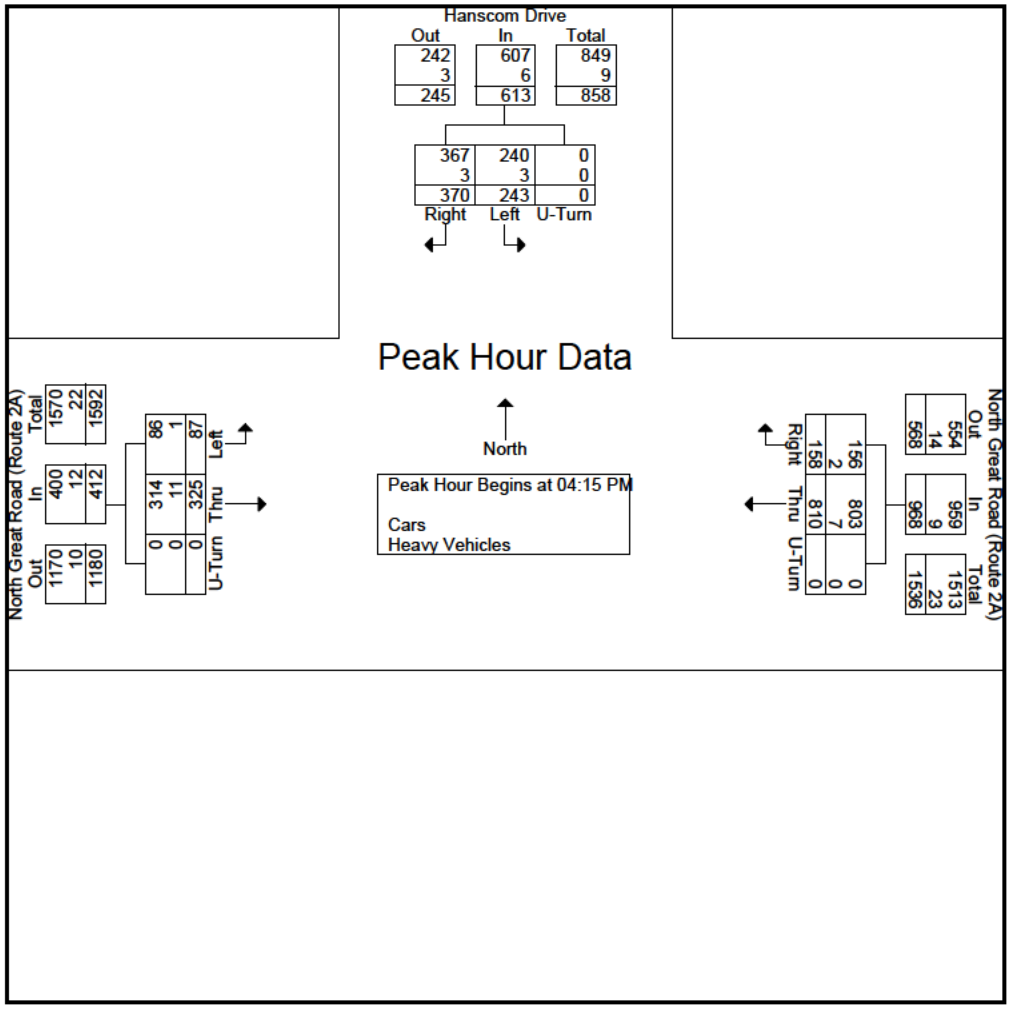
	Hanscom Drive From North				North Great Road (Route 2A) From East				North Great Road (Route 2A) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	96	64	0	160	39	201	0	240	83	25	0	108	508
04:30 PM	104	73	0	177	33	187	0	220	77	20	0	97	494
04:45 PM	81	52	0	133	53	208	0	261	85	24	0	109	503
05:00 PM	89	54	0	143	33	214	0	247	80	18	0	98	488
Total Volume	370	243	0	613	158	810	0	968	325	87	0	412	1993
% App. Total	60.4	39.6	0		16.3	83.7	0		78.9	21.1	0		
PHF	.889	.832	.000	.866	.745	.946	.000	.927	.956	.870	.000	.945	.981
Cars	367	240	0	607	156	803	0	959	314	86	0	400	1966
% Cars	99.2	98.8	0	99.0	98.7	99.1	0	99.1	96.6	98.9	0	97.1	98.6
Heavy Vehicles	3	3	0	6	2	7	0	9	11	1	0	12	27
% Heavy Vehicles	0.8	1.2	0	1.0	1.3	0.9	0	0.9	3.4	1.1	0	2.9	1.4



S: Bedford Road
E/W: North Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 GG
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	North Great Road (Route 2A) From East			Bedford Road From South			North Great Road (Route 2A) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	156	72	17	16	9	0	6	62	0	338
03:15 PM	159	24	2	30	14	0	10	89	0	328
03:30 PM	201	53	0	17	17	0	8	91	0	387
03:45 PM	192	66	0	33	17	0	5	72	0	385
Total	708	215	19	96	57	0	29	314	0	1438
04:00 PM	201	74	0	25	32	0	12	73	0	417
04:15 PM	212	86	0	25	30	0	15	86	0	454
04:30 PM	190	96	0	24	31	0	6	68	0	415
04:45 PM	214	67	0	23	27	0	8	85	0	424
Total	817	323	0	97	120	0	41	312	0	1710
05:00 PM	200	100	1	22	25	0	8	73	0	429
05:15 PM	191	86	0	11	31	0	10	77	0	406
05:30 PM	201	87	0	17	28	0	21	83	0	437
05:45 PM	205	72	0	26	32	0	7	81	0	423
Total	797	345	1	76	116	0	46	314	0	1695
Grand Total	2322	883	20	269	293	0	116	940	0	4843
Apprch %	72	27.4	0.6	47.9	52.1	0	11	89	0	
Total %	47.9	18.2	0.4	5.6	6	0	2.4	19.4	0	
Cars	2293	880	20	262	292	0	113	911	0	4771
% Cars	98.8	99.7	100	97.4	99.7	0	97.4	96.9	0	98.5
Heavy Vehicles	29	3	0	7	1	0	3	29	0	72
% Heavy Vehicles	1.2	0.3	0	2.6	0.3	0	2.6	3.1	0	1.5

	North Great Road (Route 2A) From East				Bedford Road From South				North Great Road (Route 2A) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	212	86	0	298	25	30	0	55	15	86	0	101	454
04:30 PM	190	96	0	286	24	31	0	55	6	68	0	74	415
04:45 PM	214	67	0	281	23	27	0	50	8	85	0	93	424
05:00 PM	200	100	1	301	22	25	0	47	8	73	0	81	429
Total Volume	816	349	1	1166	94	113	0	207	37	312	0	349	1722
% App. Total	70	29.9	0.1		45.4	54.6	0		10.6	89.4	0		
PHF	.953	.873	.250	.968	.940	.911	.000	.941	.617	.907	.000	.864	.948
Cars	806	349	1	1156	91	113	0	204	36	304	0	340	1700
% Cars	98.8	100	100	99.1	96.8	100	0	98.6	97.3	97.4	0	97.4	98.7
Heavy Vehicles	10	0	0	10	3	0	0	3	1	8	0	9	22
% Heavy Vehicles	1.2	0	0	0.9	3.2	0	0	1.4	2.7	2.6	0	2.6	1.3

S: Bedford Road
E/W: North Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 GG
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	North Great Road (Route 2A) From East			Bedford Road From South			North Great Road (Route 2A) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	153	71	17	15	9	0	6	56	0	327
03:15 PM	156	23	2	28	14	0	9	84	0	316
03:30 PM	199	52	0	17	17	0	8	88	0	381
03:45 PM	189	66	0	32	16	0	4	69	0	376
Total	697	212	19	92	56	0	27	297	0	1400
04:00 PM	196	74	0	25	32	0	12	71	0	410
04:15 PM	207	86	0	23	30	0	15	82	0	443
04:30 PM	189	96	0	23	31	0	5	67	0	411
04:45 PM	210	67	0	23	27	0	8	84	0	419
Total	802	323	0	94	120	0	40	304	0	1683
05:00 PM	200	100	1	22	25	0	8	71	0	427
05:15 PM	190	86	0	11	31	0	10	77	0	405
05:30 PM	200	87	0	17	28	0	21	81	0	434
05:45 PM	204	72	0	26	32	0	7	81	0	422
Total	794	345	1	76	116	0	46	310	0	1688
Grand Total	2293	880	20	262	292	0	113	911	0	4771
Apprch %	71.8	27.6	0.6	47.3	52.7	0	11	89	0	
Total %	48.1	18.4	0.4	5.5	6.1	0	2.4	19.1	0	

	North Great Road (Route 2A) From East				Bedford Road From South				North Great Road (Route 2A) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	207	86	0	293	23	30	0	53	15	82	0	97	443
04:30 PM	189	96	0	285	23	31	0	54	5	67	0	72	411
04:45 PM	210	67	0	277	23	27	0	50	8	84	0	92	419
05:00 PM	200	100	1	301	22	25	0	47	8	71	0	79	427
Total Volume	806	349	1	1156	91	113	0	204	36	304	0	340	1700
% App. Total	69.7	30.2	0.1		44.6	55.4	0		10.6	89.4	0		
PHF	.960	.873	.250	.960	.989	.911	.000	.944	.600	.905	.000	.876	.959

S: Bedford Road
E/W: North Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 GG
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	North Great Road (Route 2A) From East			Bedford Road From South			North Great Road (Route 2A) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	3	1	0	1	0	0	0	6	0	11
03:15 PM	3	1	0	2	0	0	1	5	0	12
03:30 PM	2	1	0	0	0	0	0	3	0	6
03:45 PM	3	0	0	1	1	0	1	3	0	9
Total	11	3	0	4	1	0	2	17	0	38
04:00 PM	5	0	0	0	0	0	0	2	0	7
04:15 PM	5	0	0	2	0	0	0	4	0	11
04:30 PM	1	0	0	1	0	0	1	1	0	4
04:45 PM	4	0	0	0	0	0	0	1	0	5
Total	15	0	0	3	0	0	1	8	0	27
05:00 PM	0	0	0	0	0	0	0	2	0	2
05:15 PM	1	0	0	0	0	0	0	0	0	1
05:30 PM	1	0	0	0	0	0	0	2	0	3
05:45 PM	1	0	0	0	0	0	0	0	0	1
Total	3	0	0	0	0	0	0	4	0	7
Grand Total	29	3	0	7	1	0	3	29	0	72
Apprch %	90.6	9.4	0	87.5	12.5	0	9.4	90.6	0	
Total %	40.3	4.2	0	9.7	1.4	0	4.2	40.3	0	

	North Great Road (Route 2A) From East				Bedford Road From South				North Great Road (Route 2A) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	3	1	0	4	1	0	0	1	0	6	0	6	11
03:15 PM	3	1	0	4	2	0	0	2	1	5	0	6	12
03:30 PM	2	1	0	3	0	0	0	0	0	3	0	3	6
03:45 PM	3	0	0	3	1	1	0	2	1	3	0	4	9
Total Volume	11	3	0	14	4	1	0	5	2	17	0	19	38
% App. Total	78.6	21.4	0		80	20	0		10.5	89.5	0		
PHF	.917	.750	.000	.875	.500	.250	.000	.625	.500	.708	.000	.792	.792

S: Bedford Road
E/W: North Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Peds and Bicycles

	North Great Road (Route 2A) From East			Bedford Road From South			North Great Road (Route 2A) From West			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	1	0	0	0	0	0	0	0	0	1
03:30 PM	3	0	0	0	0	0	0	0	0	3
03:45 PM	0	0	0	0	1	0	0	0	0	1
Total	4	0	0	0	1	0	0	0	0	5
04:00 PM	1	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	1	0	0	0	0	0	0	0	1
Total	1	1	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	1	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	1
Grand Total	5	2	0	0	1	0	0	0	0	8
Apprch %	71.4	28.6	0	0	100	0	0	0	0	
Total %	62.5	25	0	0	12.5	0	0	0	0	

	North Great Road (Route 2A) From East				Bedford Road From South				North Great Road (Route 2A) From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:15 PM													
03:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
03:30 PM	3	0	0	3	0	0	0	0	0	0	0	0	3
03:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
04:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	5	0	0	5	0	1	0	1	0	0	0	0	6
% App. Total	100	0	0		0	100	0		0	0	0		
PHF	.417	.000	.000	.417	.000	.250	.000	.250	.000	.000	.000	.000	.500

S: Bedford Road
E/W: North Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

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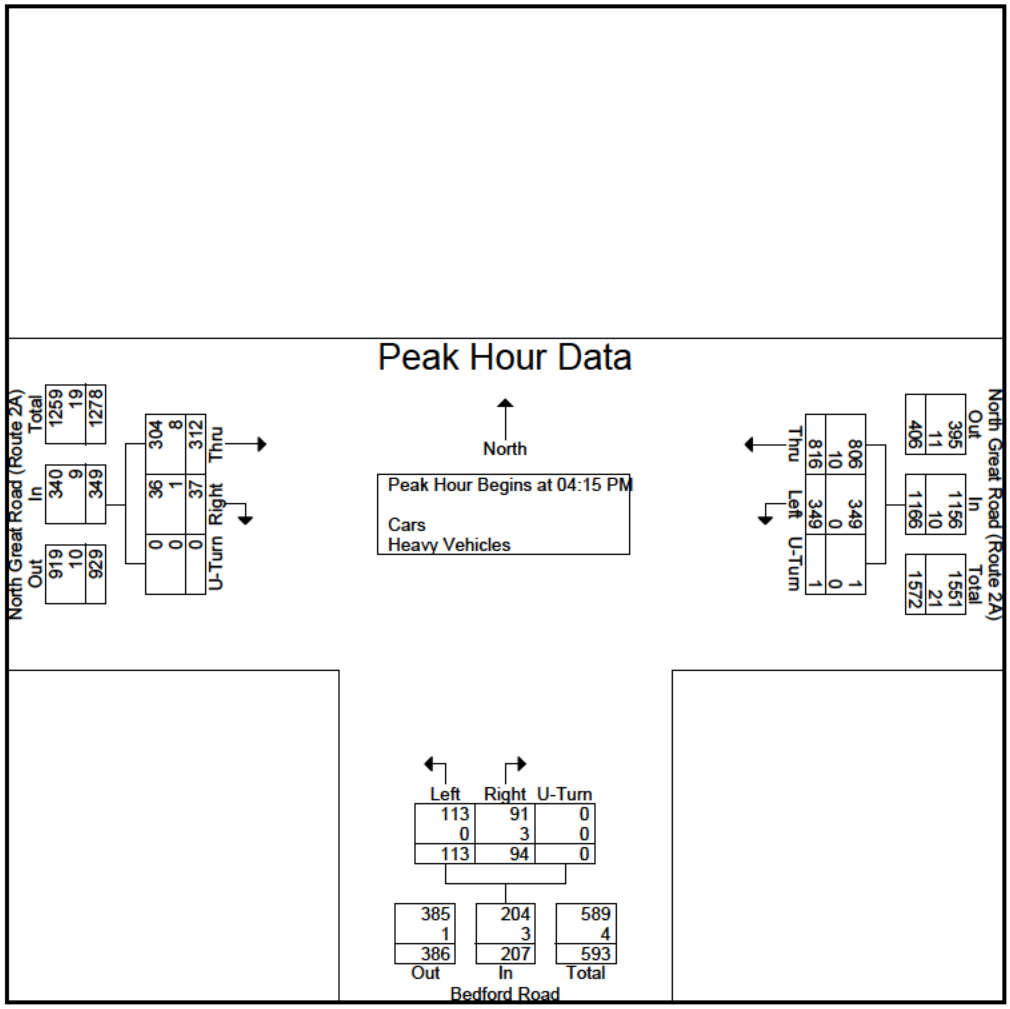
File Name : 123082 GG
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

	North Great Road (Route 2A) From East				Bedford Road From South				North Great Road (Route 2A) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	212	86	0	298	25	30	0	55	15	86	0	101	454
04:30 PM	190	96	0	286	24	31	0	55	6	68	0	74	415
04:45 PM	214	67	0	281	23	27	0	50	8	85	0	93	424
05:00 PM	200	100	1	301	22	25	0	47	8	73	0	81	429
Total Volume	816	349	1	1166	94	113	0	207	37	312	0	349	1722
% App. Total	70	29.9	0.1		45.4	54.6	0		10.6	89.4	0		
PHF	.953	.873	.250	.968	.940	.911	.000	.941	.617	.907	.000	.864	.948
Cars	806	349	1	1156	91	113	0	204	36	304	0	340	1700
% Cars	98.8	100	100	99.1	96.8	100	0	98.6	97.3	97.4	0	97.4	98.7
Heavy Vehicles	10	0	0	10	3	0	0	3	1	8	0	9	22
% Heavy Vehicles	1.2	0	0	0.9	3.2	0	0	1.4	2.7	2.6	0	2.6	1.3



N/S: Lexington Road (Rt 2A)/ Brooks Road
E/W: N.Great Rd (Rt 2A)/ Bypass Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

File Name : 123082 HH
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Lexington Road (Route 2A) From North				North Great Road (Route 2A) From East				Brooks Road From South				Bypass Road From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	3	0	27	0	56	106	1	0	2	0	1	0	1	52	2	0	251
03:15 PM	2	0	28	0	60	115	3	0	2	0	1	0	1	66	0	0	278
03:30 PM	5	0	35	0	89	123	2	0	1	0	0	0	0	55	0	0	310
03:45 PM	6	0	27	0	76	138	1	0	0	0	0	0	0	60	2	0	310
Total	16	0	117	0	281	482	7	0	5	0	2	0	2	233	4	0	1149
04:00 PM	5	1	38	0	103	129	3	0	2	1	0	0	0	48	1	0	331
04:15 PM	3	1	28	0	90	145	2	0	2	3	0	0	2	61	0	0	337
04:30 PM	4	1	25	0	92	139	4	0	0	0	0	0	1	59	2	0	327
04:45 PM	4	1	23	0	90	143	3	0	1	0	1	0	1	64	3	0	334
Total	16	4	114	0	375	556	12	0	5	4	1	0	4	232	6	0	1329
05:00 PM	5	1	35	0	113	123	0	0	1	0	0	0	0	44	14	0	336
05:15 PM	3	0	35	0	100	115	0	0	0	0	0	0	0	61	5	0	319
05:30 PM	5	2	35	0	106	127	0	0	2	0	0	0	1	58	4	0	340
05:45 PM	4	0	31	0	98	144	0	0	3	0	0	0	2	61	7	0	350
Total	17	3	136	0	417	509	0	0	6	0	0	0	3	224	30	0	1345
Grand Total	49	7	367	0	1073	1547	19	0	16	4	3	0	9	689	40	0	3823
Apprch %	11.6	1.7	86.8	0	40.7	58.6	0.7	0	69.6	17.4	13	0	1.2	93.4	5.4	0	
Total %	1.3	0.2	9.6	0	28.1	40.5	0.5	0	0.4	0.1	0.1	0	0.2	18	1	0	
Cars	49	6	359	0	1069	1520	17	0	15	4	2	0	8	665	40	0	3754
% Cars	100	85.7	97.8	0	99.6	98.3	89.5	0	93.8	100	66.7	0	88.9	96.5	100	0	98.2
Heavy Vehicles	0	1	8	0	4	27	2	0	1	0	1	0	1	24	0	0	69
% Heavy Vehicles	0	14.3	2.2	0	0.4	1.7	10.5	0	6.2	0	33.3	0	11.1	3.5	0	0	1.8

	Lexington Road (Route 2A) From North					North Great Road (Route 2A) From East					Brooks Road From South					Bypass Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	5	1	35	0	41	113	123	0	0	236	1	0	0	0	1	0	44	14	0	58	336
05:15 PM	3	0	35	0	38	100	115	0	0	215	0	0	0	0	0	0	61	5	0	66	319
05:30 PM	5	2	35	0	42	106	127	0	0	233	2	0	0	0	2	1	58	4	0	63	340
05:45 PM	4	0	31	0	35	98	144	0	0	242	3	0	0	0	3	2	61	7	0	70	350
Total Volume	17	3	136	0	156	417	509	0	0	926	6	0	0	0	6	3	224	30	0	257	1345
% App. Total	10.9	1.9	87.2	0		45	55	0	0		100	0	0	0		1.2	87.2	11.7	0		
PHF	.850	.375	.971	.000	.929	.923	.884	.000	.000	.957	.500	.000	.000	.000	.500	.375	.918	.536	.000	.918	.961
Cars	17	3	136	0	156	417	506	0	0	923	6	0	0	0	6	3	220	30	0	253	1338
% Cars	100	100	100	0	100	100	99.4	0	0	99.7	100	0	0	0	100	100	98.2	100	0	98.4	99.5
Heavy Vehicles	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	7
% Heavy Vehicles	0	0	0	0	0	0	0.6	0	0	0.3	0	0	0	0	0	0	1.8	0	0	1.6	0.5

N/S: Lexington Road (Rt 2A)/ Brooks Road
E/W: N.Great Rd (Rt 2A)/ Bypass Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

File Name : 123082 HH
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	Lexington Road (Route 2A) From North				North Great Road (Route 2A) From East				Brooks Road From South				Bypass Road From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	3	0	24	0	56	104	1	0	1	0	1	0	0	48	2	0	240
03:15 PM	2	0	26	0	60	112	2	0	2	0	0	0	1	64	0	0	269
03:30 PM	5	0	34	0	88	121	2	0	1	0	0	0	0	52	0	0	303
03:45 PM	6	0	27	0	75	134	1	0	0	0	0	0	0	58	2	0	303
Total	16	0	111	0	279	471	6	0	4	0	1	0	1	222	4	0	1115
04:00 PM	5	1	38	0	102	125	2	0	2	1	0	0	0	44	1	0	321
04:15 PM	3	1	27	0	89	140	2	0	2	3	0	0	2	58	0	0	327
04:30 PM	4	1	24	0	92	138	4	0	0	0	0	0	1	58	2	0	324
04:45 PM	4	0	23	0	90	140	3	0	1	0	1	0	1	63	3	0	329
Total	16	3	112	0	373	543	11	0	5	4	1	0	4	223	6	0	1301
05:00 PM	5	1	35	0	113	122	0	0	1	0	0	0	0	42	14	0	333
05:15 PM	3	0	35	0	100	115	0	0	0	0	0	0	0	61	5	0	319
05:30 PM	5	2	35	0	106	126	0	0	2	0	0	0	1	56	4	0	337
05:45 PM	4	0	31	0	98	143	0	0	3	0	0	0	2	61	7	0	349
Total	17	3	136	0	417	506	0	0	6	0	0	0	3	220	30	0	1338
Grand Total	49	6	359	0	1069	1520	17	0	15	4	2	0	8	665	40	0	3754
Apprch %	11.8	1.4	86.7	0	41	58.3	0.7	0	71.4	19	9.5	0	1.1	93.3	5.6	0	
Total %	1.3	0.2	9.6	0	28.5	40.5	0.5	0	0.4	0.1	0.1	0	0.2	17.7	1.1	0	

	Lexington Road (Route 2A) From North					North Great Road (Route 2A) From East					Brooks Road From South					Bypass Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	5	1	35	0	41	113	122	0	0	235	1	0	0	0	1	0	42	14	0	56	333
05:15 PM	3	0	35	0	38	100	115	0	0	215	0	0	0	0	0	0	61	5	0	66	319
05:30 PM	5	2	35	0	42	106	126	0	0	232	2	0	0	0	2	1	56	4	0	61	337
05:45 PM	4	0	31	0	35	98	143	0	0	241	3	0	0	0	3	2	61	7	0	70	349
Total Volume	17	3	136	0	156	417	506	0	0	923	6	0	0	0	6	3	220	30	0	253	1338
% App. Total	10.9	1.9	87.2	0		45.2	54.8	0	0		100	0	0	0		1.2	87	11.9	0		
PHF	.850	.375	.971	.000	.929	.923	.885	.000	.000	.957	.500	.000	.000	.000	.500	.375	.902	.536	.000	.904	.958

N/S: Lexington Road (Rt 2A)/ Brooks Road
E/W: N.Great Rd (Rt 2A)/ Bypass Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

File Name : 123082 HH
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Lexington Road (Route 2A) From North				North Great Road (Route 2A) From East				Brooks Road From South				Bypass Road From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	0	0	3	0	0	2	0	0	1	0	0	0	1	4	0	0	11
03:15 PM	0	0	2	0	0	3	1	0	0	0	1	0	0	2	0	0	9
03:30 PM	0	0	1	0	1	2	0	0	0	0	0	0	0	3	0	0	7
03:45 PM	0	0	0	0	1	4	0	0	0	0	0	0	0	2	0	0	7
Total	0	0	6	0	2	11	1	0	1	0	1	0	1	11	0	0	34
04:00 PM	0	0	0	0	1	4	1	0	0	0	0	0	0	4	0	0	10
04:15 PM	0	0	1	0	1	5	0	0	0	0	0	0	0	3	0	0	10
04:30 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	3
04:45 PM	0	1	0	0	0	3	0	0	0	0	0	0	0	1	0	0	5
Total	0	1	2	0	2	13	1	0	0	0	0	0	0	9	0	0	28
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
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	1	0	0	0	0	0	0	0	2	0	0	3
05:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	3	0	0	0	0	0	0	0	4	0	0	7
Grand Total	0	1	8	0	4	27	2	0	1	0	1	0	1	24	0	0	69
Apprch %	0	11.1	88.9	0	12.1	81.8	6.1	0	50	0	50	0	4	96	0	0	
Total %	0	1.4	11.6	0	5.8	39.1	2.9	0	1.4	0	1.4	0	1.4	34.8	0	0	

	Lexington Road (Route 2A) From North					North Great Road (Route 2A) From East					Brooks Road From South					Bypass Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	0	0	3	0	3	0	2	0	0	2	1	0	0	0	1	1	4	0	0	5	11
03:15 PM	0	0	2	0	2	0	3	1	0	4	0	0	1	0	1	0	2	0	0	2	9
03:30 PM	0	0	1	0	1	1	2	0	0	3	0	0	0	0	0	0	3	0	0	3	7
03:45 PM	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	0	2	0	0	2	7
Total Volume	0	0	6	0	6	2	11	1	0	14	1	0	1	0	2	1	11	0	0	12	34
% App. Total	0	0	100	0		14.3	78.6	7.1	0		50	0	50	0		8.3	91.7	0	0		
PHF	.000	.000	.500	.000	.500	.500	.688	.250	.000	.700	.250	.000	.250	.000	.500	.250	.688	.000	.000	.600	.773

N/S: Lexington Road (Rt 2A)/ Brooks Road
E/W: N.Great Rd (Rt 2A)/ Bypass Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 HH
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Lexington Road (Route 2A) From North				North Great Road (Route 2A) From East				Brooks Road From South				Bypass Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
04:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
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
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	
Total %	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	

	Lexington Road (Route 2A) From North					North Great Road (Route 2A) From East					Brooks Road From South					Bypass Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:15 PM																					
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
% App. Total	0	0	0	0		0	100	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.375	.000	.000	.375	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375

N/S: Lexington Road (Rt 2A)/ Brooks Road
E/W: N.Great Rd (Rt 2A)/ Bypass Road
City, State: Lincoln, MA
Client: Toole Engineering/ C. Fink

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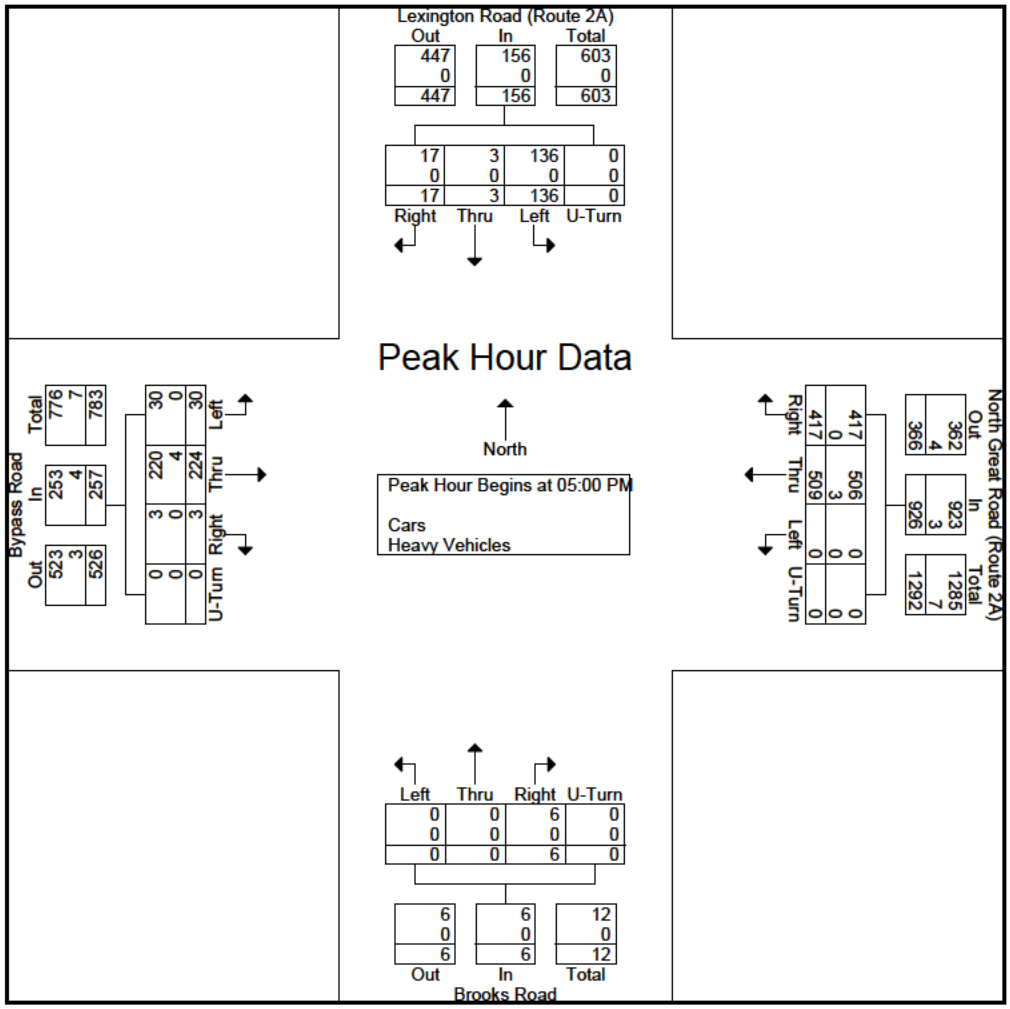
	Lexington Road (Route 2A) From North					North Great Road (Route 2A) From East					Brooks Road From South					Bypass Road From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	5	1	35	0	41	113	123	0	0	236	1	0	0	0	1	0	44	14	0	58	336
05:15 PM	3	0	35	0	38	100	115	0	0	215	0	0	0	0	0	0	61	5	0	66	319
05:30 PM	5	2	35	0	42	106	127	0	0	233	2	0	0	0	2	1	58	4	0	63	340
05:45 PM	4	0	31	0	35	98	144	0	0	242	3	0	0	0	3	2	61	7	0	70	350
Total Volume	17	3	136	0	156	417	509	0	0	926	6	0	0	0	6	3	224	30	0	257	1345
% App. Total	10.9	1.9	87.2	0		45	55	0	0		100	0	0	0		1.2	87.2	11.7	0		
PHF	.850	.375	.971	.000	.929	.923	.884	.000	.000	.957	.500	.000	.000	.000	.500	.375	.918	.536	.000	.918	.961
Cars	17	3	136	0	156	417	506	0	0	923	6	0	0	0	6	3	220	30	0	253	1338
% Cars	100	100	100	0	100	100	99.4	0	0	99.7	100	0	0	0	100	100	98.2	100	0	98.4	99.5
Heavy Vehicles	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	7
% Heavy Vehicles	0	0	0	0	0	0	0.6	0	0	0.3	0	0	0	0	0	0	1.8	0	0	1.6	0.5



N: Old Bedford Road
E/W: Lexington Road
City, State: Concord, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 123082 II
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Old Bedford Road From North			Lexington Road From East			Lexington Road From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	42	12	0	8	48	0	19	31	0	160
03:15 PM	41	9	0	18	49	0	23	32	0	172
03:30 PM	42	17	0	19	64	0	27	40	1	210
03:45 PM	54	14	0	27	64	0	21	37	0	217
Total	179	52	0	72	225	0	90	140	1	759
04:00 PM	55	17	0	21	81	0	23	35	0	232
04:15 PM	57	11	0	26	77	0	15	25	0	211
04:30 PM	40	9	1	32	67	0	25	26	0	200
04:45 PM	55	20	0	33	60	0	11	19	0	198
Total	207	57	1	112	285	0	74	105	0	841
05:00 PM	68	7	0	46	80	0	24	31	0	256
05:15 PM	40	20	0	38	70	0	25	27	0	220
05:30 PM	48	10	0	34	78	0	19	31	1	221
05:45 PM	53	11	0	36	64	0	29	26	0	219
Total	209	48	0	154	292	0	97	115	1	916
Grand Total	595	157	1	338	802	0	261	360	2	2516
Apprch %	79	20.8	0.1	29.6	70.4	0	41.9	57.8	0.3	
Total %	23.6	6.2	0	13.4	31.9	0	10.4	14.3	0.1	
Cars	588	154	0	336	799	0	254	350	2	2483
% Cars	98.8	98.1	0	99.4	99.6	0	97.3	97.2	100	98.7
Heavy Vehicles	7	3	1	2	3	0	7	10	0	33
% Heavy Vehicles	1.2	1.9	100	0.6	0.4	0	2.7	2.8	0	1.3

	Old Bedford Road From North				Lexington Road From East				Lexington Road From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	68	7	0	75	46	80	0	126	24	31	0	55	256
05:15 PM	40	20	0	60	38	70	0	108	25	27	0	52	220
05:30 PM	48	10	0	58	34	78	0	112	19	31	1	51	221
05:45 PM	53	11	0	64	36	64	0	100	29	26	0	55	219
Total Volume	209	48	0	257	154	292	0	446	97	115	1	213	916
% App. Total	81.3	18.7	0		34.5	65.5	0		45.5	54	0.5		
PHF	.768	.600	.000	.857	.837	.913	.000	.885	.836	.927	.250	.968	.895
Cars	207	48	0	255	154	291	0	445	97	112	1	210	910
% Cars	99.0	100	0	99.2	100	99.7	0	99.8	100	97.4	100	98.6	99.3
Heavy Vehicles	2	0	0	2	0	1	0	1	0	3	0	3	6
% Heavy Vehicles	1.0	0	0	0.8	0	0.3	0	0.2	0	2.6	0	1.4	0.7

N: Old Bedford Road
E/W: Lexington Road
City, State: Concord, MA
Client: Toole Engineering/ C. Fink

PRECISION
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Groups Printed- Cars

	Old Bedford Road From North			Lexington Road From East			Lexington Road From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	42	11	0	8	48	0	19	31	0	159
03:15 PM	40	8	0	18	49	0	22	31	0	168
03:30 PM	42	17	0	19	64	0	24	38	1	205
03:45 PM	52	14	0	27	63	0	21	37	0	214
Total	176	50	0	72	224	0	86	137	1	746
04:00 PM	55	17	0	19	81	0	23	34	0	229
04:15 PM	57	11	0	26	76	0	13	24	0	207
04:30 PM	40	9	0	32	67	0	24	24	0	196
04:45 PM	53	19	0	33	60	0	11	19	0	195
Total	205	56	0	110	284	0	71	101	0	827
05:00 PM	67	7	0	46	80	0	24	30	0	254
05:15 PM	40	20	0	38	70	0	25	26	0	219
05:30 PM	47	10	0	34	77	0	19	30	1	218
05:45 PM	53	11	0	36	64	0	29	26	0	219
Total	207	48	0	154	291	0	97	112	1	910
Grand Total	588	154	0	336	799	0	254	350	2	2483
Apprch %	79.2	20.8	0	29.6	70.4	0	41.9	57.8	0.3	
Total %	23.7	6.2	0	13.5	32.2	0	10.2	14.1	0.1	

	Old Bedford Road From North				Lexington Road From East				Lexington Road From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	67	7	0	74	46	80	0	126	24	30	0	54	254
05:15 PM	40	20	0	60	38	70	0	108	25	26	0	51	219
05:30 PM	47	10	0	57	34	77	0	111	19	30	1	50	218
05:45 PM	53	11	0	64	36	64	0	100	29	26	0	55	219
Total Volume	207	48	0	255	154	291	0	445	97	112	1	210	910
% App. Total	81.2	18.8	0		34.6	65.4	0		46.2	53.3	0.5		
PHF	.772	.600	.000	.861	.837	.909	.000	.883	.836	.933	.250	.955	.896

N: Old Bedford Road
E/W: Lexington Road
City, State: Concord, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 II
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Start Date : 11/13/2012
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Groups Printed- Heavy Vehicles

	Old Bedford Road From North			Lexington Road From East			Lexington Road From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	0	1	0	0	0	0	0	0	0	1
03:15 PM	1	1	0	0	0	0	1	1	0	4
03:30 PM	0	0	0	0	0	0	3	2	0	5
03:45 PM	2	0	0	0	1	0	0	0	0	3
Total	3	2	0	0	1	0	4	3	0	13
04:00 PM	0	0	0	2	0	0	0	1	0	3
04:15 PM	0	0	0	0	1	0	2	1	0	4
04:30 PM	0	0	1	0	0	0	1	2	0	4
04:45 PM	2	1	0	0	0	0	0	0	0	3
Total	2	1	1	2	1	0	3	4	0	14
05:00 PM	1	0	0	0	0	0	0	1	0	2
05:15 PM	0	0	0	0	0	0	0	1	0	1
05:30 PM	1	0	0	0	1	0	0	1	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	0	1	0	0	3	0	6
Grand Total	7	3	1	2	3	0	7	10	0	33
Apprch %	63.6	27.3	9.1	40	60	0	41.2	58.8	0	
Total %	21.2	9.1	3	6.1	9.1	0	21.2	30.3	0	

	Old Bedford Road From North				Lexington Road From East				Lexington Road From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:15 PM													
03:15 PM	1	1	0	2	0	0	0	0	1	1	0	2	4
03:30 PM	0	0	0	0	0	0	0	0	3	2	0	5	5
03:45 PM	2	0	0	2	0	1	0	1	0	0	0	0	3
04:00 PM	0	0	0	0	2	0	0	2	0	1	0	1	3
Total Volume	3	1	0	4	2	1	0	3	4	4	0	8	15
% App. Total	75	25	0		66.7	33.3	0		50	50	0		
PHF	.375	.250	.000	.500	.250	.250	.000	.375	.333	.500	.000	.400	.750

N: Old Bedford Road
E/W: Lexington Road
City, State: Concord, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Peds and Bicycles

	Old Bedford Road From North			Lexington Road From East			Lexington Road From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	Old Bedford Road From North				Lexington Road From East				Lexington Road From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

N: Old Bedford Road
E/W: Lexington Road
City, State: Concord, MA
Client: Toole Engineering/ C. Fink

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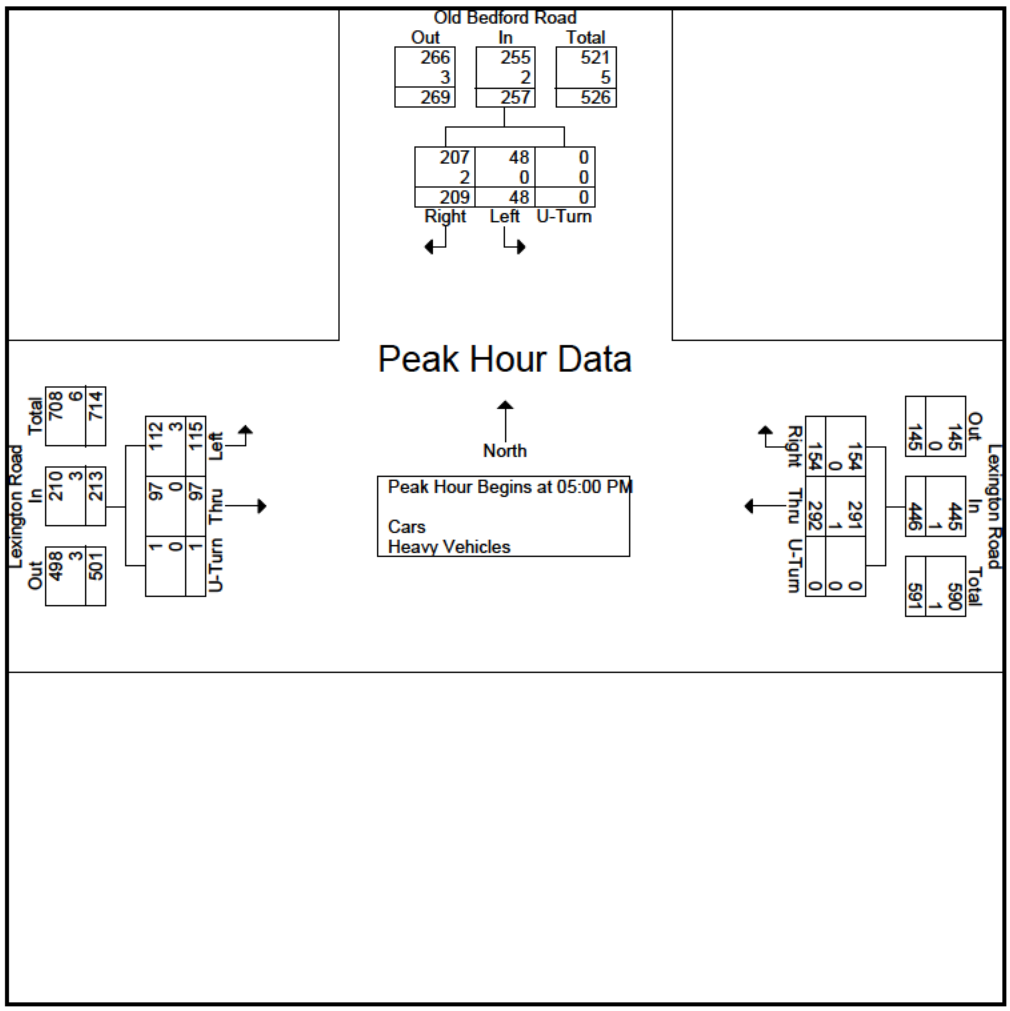
	Old Bedford Road From North				Lexington Road From East				Lexington Road From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	68	7	0	75	46	80	0	126	24	31	0	55	256
05:15 PM	40	20	0	60	38	70	0	108	25	27	0	52	220
05:30 PM	48	10	0	58	34	78	0	112	19	31	1	51	221
05:45 PM	53	11	0	64	36	64	0	100	29	26	0	55	219
Total Volume	209	48	0	257	154	292	0	446	97	115	1	213	916
% App. Total	81.3	18.7	0		34.5	65.5	0		45.5	54	0.5		
PHF	.768	.600	.000	.857	.837	.913	.000	.885	.836	.927	.250	.968	.895
Cars	207	48	0	255	154	291	0	445	97	112	1	210	910
% Cars	99.0	100	0	99.2	100	99.7	0	99.8	100	97.4	100	98.6	99.3
Heavy Vehicles	2	0	0	2	0	1	0	1	0	3	0	3	6
% Heavy Vehicles	1.0	0	0	0.8	0	0.3	0	0.2	0	2.6	0	1.4	0.7



N/S: Old Bedford Road
E/W: Virginia Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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D A T A
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File Name : 123082 JJ
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Old Bedford Road From North			Virginia Road From East			Old Bedford Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	30	5	0	44	27	0	8	31	0	145
03:15 PM	21	7	0	23	25	0	8	41	0	125
03:30 PM	36	3	0	34	23	0	11	40	0	147
03:45 PM	36	7	0	25	27	0	9	54	0	158
Total	123	22	0	126	102	0	36	166	0	575
04:00 PM	37	3	0	55	30	0	6	56	0	187
04:15 PM	30	9	0	44	28	0	6	47	0	164
04:30 PM	24	5	0	80	26	0	12	45	0	192
04:45 PM	36	3	0	69	39	0	5	54	0	206
Total	127	20	0	248	123	0	29	202	0	749
05:00 PM	34	3	0	60	37	0	10	63	0	207
05:15 PM	36	4	0	84	30	0	42	20	4	220
05:30 PM	29	5	0	55	38	0	12	48	0	187
05:45 PM	33	1	0	53	24	1	8	53	0	173
Total	132	13	0	252	129	1	72	184	4	787
Grand Total	382	55	0	626	354	1	137	552	4	2111
Apprch %	87.4	12.6	0	63.8	36.1	0.1	19.8	79.7	0.6	
Total %	18.1	2.6	0	29.7	16.8	0	6.5	26.1	0.2	
Cars	377	54	0	626	350	1	131	546	4	2089
% Cars	98.7	98.2	0	100	98.9	100	95.6	98.9	100	99
Heavy Vehicles	5	1	0	0	4	0	6	6	0	22
% Heavy Vehicles	1.3	1.8	0	0	1.1	0	4.4	1.1	0	1

	Old Bedford Road From North				Virginia Road From East				Old Bedford Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	24	5	0	29	80	26	0	106	12	45	0	57	192
04:45 PM	36	3	0	39	69	39	0	108	5	54	0	59	206
05:00 PM	34	3	0	37	60	37	0	97	10	63	0	73	207
05:15 PM	36	4	0	40	84	30	0	114	42	20	4	66	220
Total Volume	130	15	0	145	293	132	0	425	69	182	4	255	825
% App. Total	89.7	10.3	0		68.9	31.1	0		27.1	71.4	1.6		
PHF	.903	.750	.000	.906	.872	.846	.000	.932	.411	.722	.250	.873	.938
Cars	129	15	0	144	293	131	0	424	67	181	4	252	820
% Cars	99.2	100	0	99.3	100	99.2	0	99.8	97.1	99.5	100	98.8	99.4
Heavy Vehicles	1	0	0	1	0	1	0	1	2	1	0	3	5
% Heavy Vehicles	0.8	0	0	0.7	0	0.8	0	0.2	2.9	0.5	0	1.2	0.6

N/S: Old Bedford Road
E/W: Virginia Road
City, State: Bedford, MA
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Groups Printed- Cars

	Old Bedford Road From North			Virginia Road From East			Old Bedford Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	28	5	0	44	27	0	8	31	0	143
03:15 PM	19	7	0	23	25	0	8	41	0	123
03:30 PM	36	3	0	34	23	0	9	39	0	144
03:45 PM	36	7	0	25	25	0	8	54	0	155
Total	119	22	0	126	100	0	33	165	0	565
04:00 PM	37	2	0	55	30	0	6	53	0	183
04:15 PM	30	9	0	44	28	0	6	46	0	163
04:30 PM	23	5	0	80	26	0	12	45	0	191
04:45 PM	36	3	0	69	38	0	5	54	0	205
Total	126	19	0	248	122	0	29	198	0	742
05:00 PM	34	3	0	60	37	0	9	63	0	206
05:15 PM	36	4	0	84	30	0	41	19	4	218
05:30 PM	29	5	0	55	37	0	11	48	0	185
05:45 PM	33	1	0	53	24	1	8	53	0	173
Total	132	13	0	252	128	1	69	183	4	782
Grand Total	377	54	0	626	350	1	131	546	4	2089
Apprch %	87.5	12.5	0	64.1	35.8	0.1	19.2	80.2	0.6	
Total %	18	2.6	0	30	16.8	0	6.3	26.1	0.2	

	Old Bedford Road From North				Virginia Road From East				Old Bedford Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	23	5	0	28	80	26	0	106	12	45	0	57	191
04:45 PM	36	3	0	39	69	38	0	107	5	54	0	59	205
05:00 PM	34	3	0	37	60	37	0	97	9	63	0	72	206
05:15 PM	36	4	0	40	84	30	0	114	41	19	4	64	218
Total Volume	129	15	0	144	293	131	0	424	67	181	4	252	820
% App. Total	89.6	10.4	0		69.1	30.9	0		26.6	71.8	1.6		
PHF	.896	.750	.000	.900	.872	.862	.000	.930	.409	.718	.250	.875	.940

N/S: Old Bedford Road
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Groups Printed- Heavy Vehicles

	Old Bedford Road From North			Virginia Road From East			Old Bedford Road From South			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	2	0	0	0	0	0	0	0	0	2
03:15 PM	2	0	0	0	0	0	0	0	0	2
03:30 PM	0	0	0	0	0	0	2	1	0	3
03:45 PM	0	0	0	0	2	0	1	0	0	3
Total	4	0	0	0	2	0	3	1	0	10
04:00 PM	0	1	0	0	0	0	0	3	0	4
04:15 PM	0	0	0	0	0	0	0	1	0	1
04:30 PM	1	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	1	0	0	0	0	1
Total	1	1	0	0	1	0	0	4	0	7
05:00 PM	0	0	0	0	0	0	1	0	0	1
05:15 PM	0	0	0	0	0	0	1	1	0	2
05:30 PM	0	0	0	0	1	0	1	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	3	1	0	5
Grand Total	5	1	0	0	4	0	6	6	0	22
Apprch %	83.3	16.7	0	0	100	0	50	50	0	
Total %	22.7	4.5	0	0	18.2	0	27.3	27.3	0	

	Old Bedford Road From North				Virginia Road From East				Old Bedford Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:15 PM													
03:15 PM	2	0	0	2	0	0	0	0	0	0	0	0	2
03:30 PM	0	0	0	0	0	0	0	0	2	1	0	3	3
03:45 PM	0	0	0	0	0	2	0	2	1	0	0	1	3
04:00 PM	0	1	0	1	0	0	0	0	0	3	0	3	4
Total Volume	2	1	0	3	0	2	0	2	3	4	0	7	12
% App. Total	66.7	33.3	0		0	100	0		42.9	57.1	0		
PHF	.250	.250	.000	.375	.000	.250	.000	.250	.375	.333	.000	.583	.750

N/S: Old Bedford Road
E/W: Virginia Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Peds and Bicycles

	Old Bedford Road From North			Virginia Road From East			Old Bedford Road From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	1	0	0	0	1
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	1
04:00 PM	0	0	0	0	0	0	0	1	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	1
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	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	1	0	1	0	2
Apprch %	0	0	0	0	0	100	0	100	0	
Total %	0	0	0	0	0	50	0	50	0	

	Old Bedford Road From North				Virginia Road From East				Old Bedford Road From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:15 PM													
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	1
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	1	1	0	1	0	1	2
% App. Total	0	0	0		0	0	100		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.250	.000	.250	.500

N/S: Old Bedford Road
E/W: Virginia Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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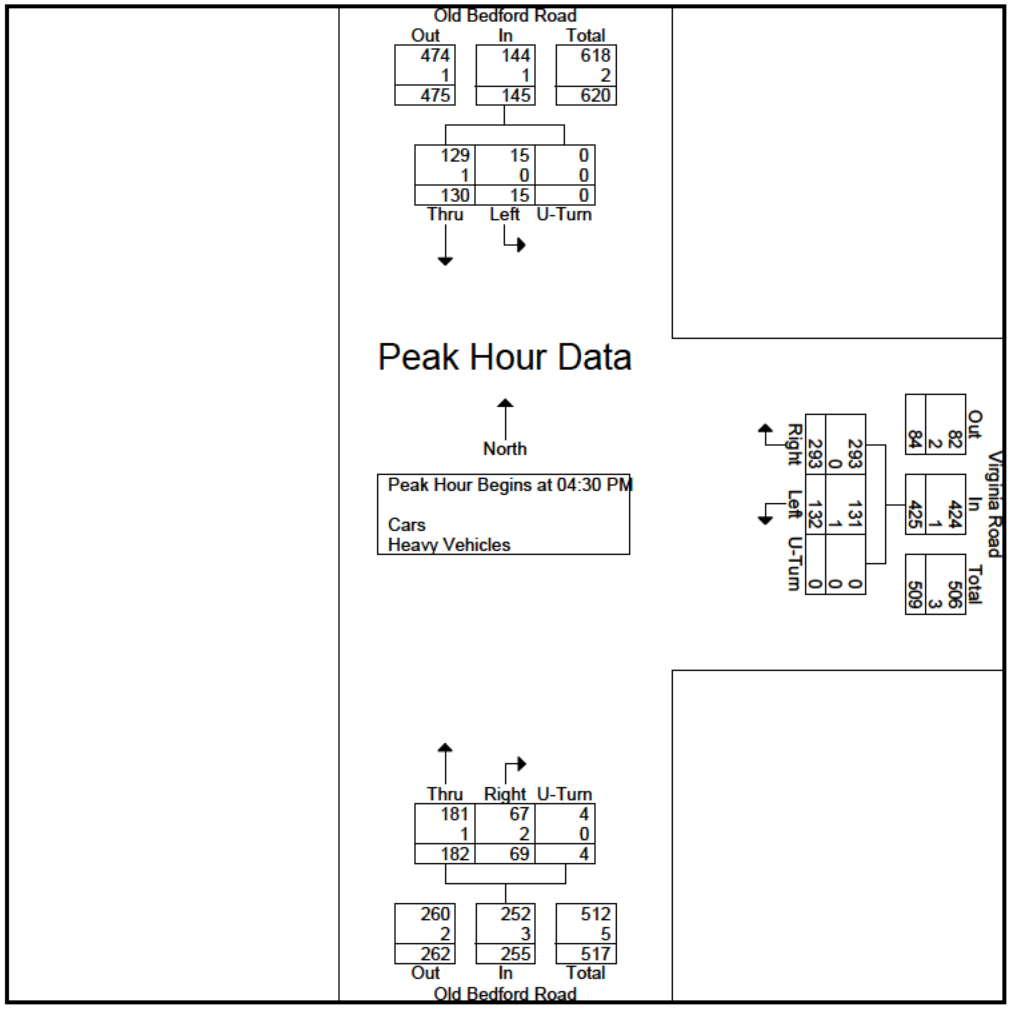
	Old Bedford Road From North				Virginia Road From East				Old Bedford Road From South				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	24	5	0	29	80	26	0	106	12	45	0	57	192
04:45 PM	36	3	0	39	69	39	0	108	5	54	0	59	206
05:00 PM	34	3	0	37	60	37	0	97	10	63	0	73	207
05:15 PM	36	4	0	40	84	30	0	114	42	20	4	66	220
Total Volume	130	15	0	145	293	132	0	425	69	182	4	255	825
% App. Total	89.7	10.3	0		68.9	31.1	0		27.1	71.4	1.6		
PHF	.903	.750	.000	.906	.872	.846	.000	.932	.411	.722	.250	.873	.938
Cars	129	15	0	144	293	131	0	424	67	181	4	252	820
% Cars	99.2	100	0	99.3	100	99.2	0	99.8	97.1	99.5	100	98.8	99.4
Heavy Vehicles	1	0	0	1	0	1	0	1	2	1	0	3	5
% Heavy Vehicles	0.8	0	0	0.7	0	0.8	0	0.2	2.9	0.5	0	1.2	0.6



S: Old Bedford Road
E/W: Bedford Street (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars - Heavy Vehicles

	Bedford Street (Route 62) From East			Old Bedford Road From South			Bedford Street (Route 62) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	67	27	0	57	14	0	5	42	0	212
03:15 PM	69	20	0	53	10	0	6	49	1	208
03:30 PM	75	34	0	53	17	0	5	59	0	243
03:45 PM	67	37	0	66	17	0	6	67	0	260
Total	278	118	0	229	58	0	22	217	1	923
04:00 PM	70	35	0	77	27	0	4	51	0	264
04:15 PM	99	32	0	60	28	0	5	63	0	287
04:30 PM	93	25	0	71	52	0	4	65	0	310
04:45 PM	107	33	0	76	49	0	9	49	0	323
Total	369	125	0	284	156	0	22	228	0	1184
05:00 PM	114	34	0	76	46	0	5	45	0	320
05:15 PM	115	39	0	79	60	0	4	73	0	370
05:30 PM	120	33	0	63	50	0	1	60	0	327
05:45 PM	94	30	0	75	40	0	2	56	0	297
Total	443	136	0	293	196	0	12	234	0	1314
Grand Total	1090	379	0	806	410	0	56	679	1	3421
Apprch %	74.2	25.8	0	66.3	33.7	0	7.6	92.3	0.1	
Total %	31.9	11.1	0	23.6	12	0	1.6	19.8	0	
Cars	1076	375	0	800	409	0	55	667	1	3383
% Cars	98.7	98.9	0	99.3	99.8	0	98.2	98.2	100	98.9
Heavy Vehicles	14	4	0	6	1	0	1	12	0	38
% Heavy Vehicles	1.3	1.1	0	0.7	0.2	0	1.8	1.8	0	1.1

	Bedford Street (Route 62) From East				Old Bedford Road From South				Bedford Street (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	107	33	0	140	76	49	0	125	9	49	0	58	323
05:00 PM	114	34	0	148	76	46	0	122	5	45	0	50	320
05:15 PM	115	39	0	154	79	60	0	139	4	73	0	77	370
05:30 PM	120	33	0	153	63	50	0	113	1	60	0	61	327
Total Volume	456	139	0	595	294	205	0	499	19	227	0	246	1340
% App. Total	76.6	23.4	0		58.9	41.1	0		7.7	92.3	0		
PHF	.950	.891	.000	.966	.930	.854	.000	.897	.528	.777	.000	.799	.905
Cars	453	139	0	592	294	204	0	498	19	222	0	241	1331
% Cars	99.3	100	0	99.5	100	99.5	0	99.8	100	97.8	0	98.0	99.3
Heavy Vehicles	3	0	0	3	0	1	0	1	0	5	0	5	9
% Heavy Vehicles	0.7	0	0	0.5	0	0.5	0	0.2	0	2.2	0	2.0	0.7

S: Old Bedford Road
E/W: Bedford Street (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars

	Bedford Street (Route 62) From East			Old Bedford Road From South			Bedford Street (Route 62) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	64	27	0	57	14	0	4	42	0	208
03:15 PM	69	18	0	53	10	0	6	47	1	204
03:30 PM	73	34	0	52	17	0	5	59	0	240
03:45 PM	66	37	0	66	17	0	6	66	0	258
Total	272	116	0	228	58	0	21	214	1	910
04:00 PM	69	34	0	73	27	0	4	49	0	256
04:15 PM	96	32	0	59	28	0	5	61	0	281
04:30 PM	92	24	0	71	52	0	4	65	0	308
04:45 PM	106	33	0	76	49	0	9	49	0	322
Total	363	123	0	279	156	0	22	224	0	1167
05:00 PM	113	34	0	76	46	0	5	44	0	318
05:15 PM	114	39	0	79	59	0	4	73	0	368
05:30 PM	120	33	0	63	50	0	1	56	0	323
05:45 PM	94	30	0	75	40	0	2	56	0	297
Total	441	136	0	293	195	0	12	229	0	1306
Grand Total	1076	375	0	800	409	0	55	667	1	3383
Apprch %	74.2	25.8	0	66.2	33.8	0	7.6	92.3	0.1	
Total %	31.8	11.1	0	23.6	12.1	0	1.6	19.7	0	

	Bedford Street (Route 62) From East				Old Bedford Road From South				Bedford Street (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	106	33	0	139	76	49	0	125	9	49	0	58	322
05:00 PM	113	34	0	147	76	46	0	122	5	44	0	49	318
05:15 PM	114	39	0	153	79	59	0	138	4	73	0	77	368
05:30 PM	120	33	0	153	63	50	0	113	1	56	0	57	323
Total Volume	453	139	0	592	294	204	0	498	19	222	0	241	1331
% App. Total	76.5	23.5	0		59	41	0		7.9	92.1	0		
PHF	.944	.891	.000	.967	.930	.864	.000	.902	.528	.760	.000	.782	.904

S: Old Bedford Road
E/W: Bedford Street (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Bedford Street (Route 62) From East			Old Bedford Road From South			Bedford Street (Route 62) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	3	0	0	0	0	0	1	0	0	4
03:15 PM	0	2	0	0	0	0	0	2	0	4
03:30 PM	2	0	0	1	0	0	0	0	0	3
03:45 PM	1	0	0	0	0	0	0	1	0	2
Total	6	2	0	1	0	0	1	3	0	13
04:00 PM	1	1	0	4	0	0	0	2	0	8
04:15 PM	3	0	0	1	0	0	0	2	0	6
04:30 PM	1	1	0	0	0	0	0	0	0	2
04:45 PM	1	0	0	0	0	0	0	0	0	1
Total	6	2	0	5	0	0	0	4	0	17
05:00 PM	1	0	0	0	0	0	0	1	0	2
05:15 PM	1	0	0	0	1	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	4	0	4
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	0	1	0	0	5	0	8
Grand Total	14	4	0	6	1	0	1	12	0	38
Apprch %	77.8	22.2	0	85.7	14.3	0	7.7	92.3	0	
Total %	36.8	10.5	0	15.8	2.6	0	2.6	31.6	0	

	Bedford Street (Route 62) From East				Old Bedford Road From South				Bedford Street (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:30 PM													
03:30 PM	2	0	0	2	1	0	0	1	0	0	0	0	3
03:45 PM	1	0	0	1	0	0	0	0	0	1	0	1	2
04:00 PM	1	1	0	2	4	0	0	4	0	2	0	2	8
04:15 PM	3	0	0	3	1	0	0	1	0	2	0	2	6
Total Volume	7	1	0	8	6	0	0	6	0	5	0	5	19
% App. Total	87.5	12.5	0		100	0	0		0	100	0		
PHF	.583	.250	.000	.667	.375	.000	.000	.375	.000	.625	.000	.625	.594

S: Old Bedford Road
E/W: Bedford Street (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Peds and Bicycles

	Bedford Street (Route 62) From East			Old Bedford Road From South			Bedford Street (Route 62) From West			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
03:00 PM	0	1	0	0	0	0	0	0	0	1
03:15 PM	0	0	0	0	0	0	0	1	0	1
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	1	0	2
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	1	0	1
Grand Total	0	1	0	0	0	0	0	2	0	3
Apprch %	0	100	0	0	0	0	0	100	0	
Total %	0	33.3	0	0	0	0	0	66.7	0	

	Bedford Street (Route 62) From East				Old Bedford Road From South				Bedford Street (Route 62) From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
03:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	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	2
% App. Total	0	100	0		0	0	0		0	100	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.500

S: Old Bedford Road
E/W: Bedford Street (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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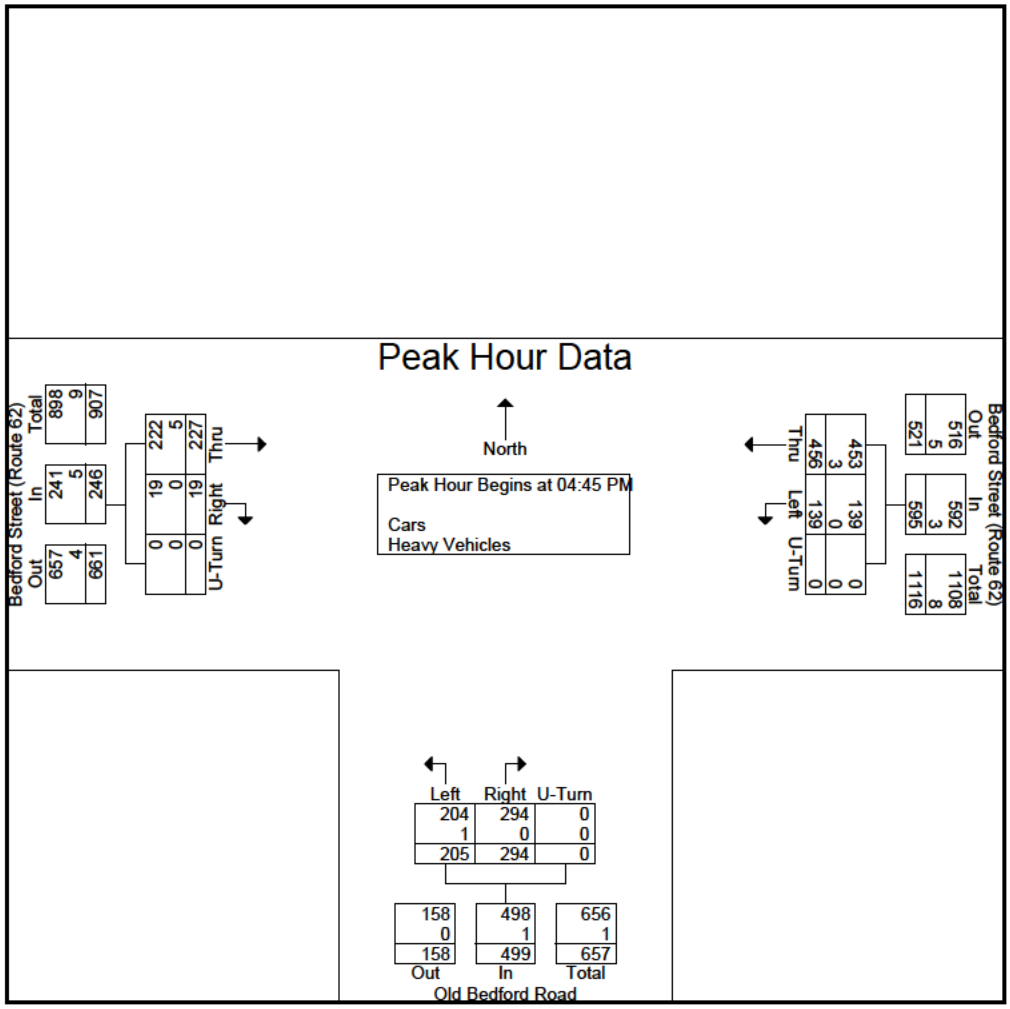
	Bedford Street (Route 62) From East				Old Bedford Road From South				Bedford Street (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	107	33	0	140	76	49	0	125	9	49	0	58	323
05:00 PM	114	34	0	148	76	46	0	122	5	45	0	50	320
05:15 PM	115	39	0	154	79	60	0	139	4	73	0	77	370
05:30 PM	120	33	0	153	63	50	0	113	1	60	0	61	327
Total Volume	456	139	0	595	294	205	0	499	19	227	0	246	1340
% App. Total	76.6	23.4	0		58.9	41.1	0		7.7	92.3	0		
PHF	.950	.891	.000	.966	.930	.854	.000	.897	.528	.777	.000	.799	.905
Cars	453	139	0	592	294	204	0	498	19	222	0	241	1331
% Cars	99.3	100	0	99.5	100	99.5	0	99.8	100	97.8	0	98.0	99.3
Heavy Vehicles	3	0	0	3	0	1	0	1	0	5	0	5	9
% Heavy Vehicles	0.7	0	0	0.5	0	0.5	0	0.2	0	2.2	0	2.0	0.7



S: Hartwell Road
E/W: Concord Road (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars - Heavy Vehicles

	Concord Road (Route 62) From East			Hartwell Road From South			Concord Road (Route 62) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	93	13	0	23	15	0	9	89	0	242
03:15 PM	100	3	0	11	19	0	22	138	0	293
03:30 PM	93	5	0	20	22	0	14	124	0	278
03:45 PM	83	4	0	13	25	0	10	119	0	254
Total	369	25	0	67	81	0	55	470	0	1067
04:00 PM	109	2	0	12	18	0	10	125	0	276
04:15 PM	114	9	0	15	32	0	15	114	0	299
04:30 PM	103	12	0	30	33	0	28	133	0	339
04:45 PM	111	8	0	11	41	0	17	101	0	289
Total	437	31	0	68	124	0	70	473	0	1203
05:00 PM	114	5	0	24	48	0	22	102	0	315
05:15 PM	142	5	0	11	38	0	15	137	0	348
05:30 PM	102	8	0	22	51	0	11	111	0	305
05:45 PM	113	9	0	17	35	0	17	101	0	292
Total	471	27	0	74	172	0	65	451	0	1260
Grand Total	1277	83	0	209	377	0	190	1394	0	3530
Apprch %	93.9	6.1	0	35.7	64.3	0	12	88	0	
Total %	36.2	2.4	0	5.9	10.7	0	5.4	39.5	0	
Cars	1252	82	0	206	374	0	187	1365	0	3466
% Cars	98	98.8	0	98.6	99.2	0	98.4	97.9	0	98.2
Heavy Vehicles	25	1	0	3	3	0	3	29	0	64
% Heavy Vehicles	2	1.2	0	1.4	0.8	0	1.6	2.1	0	1.8

	Concord Road (Route 62) From East				Hartwell Road From South				Concord Road (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	103	12	0	115	30	33	0	63	28	133	0	161	339
04:45 PM	111	8	0	119	11	41	0	52	17	101	0	118	289
05:00 PM	114	5	0	119	24	48	0	72	22	102	0	124	315
05:15 PM	142	5	0	147	11	38	0	49	15	137	0	152	348
Total Volume	470	30	0	500	76	160	0	236	82	473	0	555	1291
% App. Total	94	6	0		32.2	67.8	0		14.8	85.2	0		
PHF	.827	.625	.000	.850	.633	.833	.000	.819	.732	.863	.000	.862	.927
Cars	465	30	0	495	75	160	0	235	82	470	0	552	1282
% Cars	98.9	100	0	99.0	98.7	100	0	99.6	100	99.4	0	99.5	99.3
Heavy Vehicles	5	0	0	5	1	0	0	1	0	3	0	3	9
% Heavy Vehicles	1.1	0	0	1.0	1.3	0	0	0.4	0	0.6	0	0.5	0.7

S: Hartwell Road
E/W: Concord Road (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

File Name : 123082 LL
Site Code : TBA
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Page No : 1

Groups Printed- Cars

	Concord Road (Route 62) From East			Hartwell Road From South			Concord Road (Route 62) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	91	13	0	21	14	0	9	88	0	236
03:15 PM	89	3	0	11	17	0	22	136	0	278
03:30 PM	91	5	0	20	22	0	13	111	0	262
03:45 PM	82	4	0	13	25	0	10	117	0	251
Total	353	25	0	65	78	0	54	452	0	1027
04:00 PM	108	2	0	12	18	0	10	122	0	272
04:15 PM	111	8	0	15	32	0	14	112	0	292
04:30 PM	101	12	0	30	33	0	28	132	0	336
04:45 PM	110	8	0	10	41	0	17	101	0	287
Total	430	30	0	67	124	0	69	467	0	1187
05:00 PM	113	5	0	24	48	0	22	102	0	314
05:15 PM	141	5	0	11	38	0	15	135	0	345
05:30 PM	102	8	0	22	51	0	10	109	0	302
05:45 PM	113	9	0	17	35	0	17	100	0	291
Total	469	27	0	74	172	0	64	446	0	1252
Grand Total	1252	82	0	206	374	0	187	1365	0	3466
Apprch %	93.9	6.1	0	35.5	64.5	0	12	88	0	
Total %	36.1	2.4	0	5.9	10.8	0	5.4	39.4	0	

	Concord Road (Route 62) From East				Hartwell Road From South				Concord Road (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	101	12	0	113	30	33	0	63	28	132	0	160	336
04:45 PM	110	8	0	118	10	41	0	51	17	101	0	118	287
05:00 PM	113	5	0	118	24	48	0	72	22	102	0	124	314
05:15 PM	141	5	0	146	11	38	0	49	15	135	0	150	345
Total Volume	465	30	0	495	75	160	0	235	82	470	0	552	1282
% App. Total	93.9	6.1	0		31.9	68.1	0		14.9	85.1	0		
PHF	.824	.625	.000	.848	.625	.833	.000	.816	.732	.870	.000	.863	.929

S: Hartwell Road
E/W: Concord Road (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 LL
Site Code : TBA
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Groups Printed- Heavy Vehicles

	Concord Road (Route 62) From East			Hartwell Road From South			Concord Road (Route 62) From West			
Start Time	Thru	Left	U-Turn	Right	Left	U-Turn	Right	Thru	U-Turn	Int. Total
03:00 PM	2	0	0	2	1	0	0	1	0	6
03:15 PM	11	0	0	0	2	0	0	2	0	15
03:30 PM	2	0	0	0	0	0	1	13	0	16
03:45 PM	1	0	0	0	0	0	0	2	0	3
Total	16	0	0	2	3	0	1	18	0	40
04:00 PM	1	0	0	0	0	0	0	3	0	4
04:15 PM	3	1	0	0	0	0	1	2	0	7
04:30 PM	2	0	0	0	0	0	0	1	0	3
04:45 PM	1	0	0	1	0	0	0	0	0	2
Total	7	1	0	1	0	0	1	6	0	16
05:00 PM	1	0	0	0	0	0	0	0	0	1
05:15 PM	1	0	0	0	0	0	0	2	0	3
05:30 PM	0	0	0	0	0	0	1	2	0	3
05:45 PM	0	0	0	0	0	0	0	1	0	1
Total	2	0	0	0	0	0	1	5	0	8
Grand Total	25	1	0	3	3	0	3	29	0	64
Apprch %	96.2	3.8	0	50	50	0	9.4	90.6	0	
Total %	39.1	1.6	0	4.7	4.7	0	4.7	45.3	0	

	Concord Road (Route 62) From East				Hartwell Road From South				Concord Road (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	2	0	0	2	2	1	0	3	0	1	0	1	6
03:15 PM	11	0	0	11	0	2	0	2	0	2	0	2	15
03:30 PM	2	0	0	2	0	0	0	0	1	13	0	14	16
03:45 PM	1	0	0	1	0	0	0	0	0	2	0	2	3
Total Volume	16	0	0	16	2	3	0	5	1	18	0	19	40
% App. Total	100	0	0		40	60	0		5.3	94.7	0		
PHF	.364	.000	.000	.364	.250	.375	.000	.417	.250	.346	.000	.339	.625

S: Hartwell Road
E/W: Concord Road (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Peds and Bicycles

	Concord Road (Route 62) From East			Hartwell Road From South			Concord Road (Route 62) From West			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
03:00 PM	1	0	0	0	0	1	0	0	0	2
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	1	0	1
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	1	0	1	0	3
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	1	0	0	0	0	0	0	1	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	0	0	1	0	2
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	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	1	0	1
Grand Total	2	0	0	0	0	1	0	3	0	6
Apprch %	100	0	0	0	0	100	0	100	0	
Total %	33.3	0	0	0	0	16.7	0	50	0	

	Concord Road (Route 62) From East				Hartwell Road From South				Concord Road (Route 62) From West				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	1	0	0	1	0	0	1	1	0	0	0	0	2
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	1	0	0	1	1	0	1	0	1	3
% App. Total	100	0	0		0	0	100		0	100	0		
PHF	.250	.000	.000	.250	.000	.000	.250	.250	.000	.250	.000	.250	.375

S: Hartwell Road
E/W: Concord Road (Route 62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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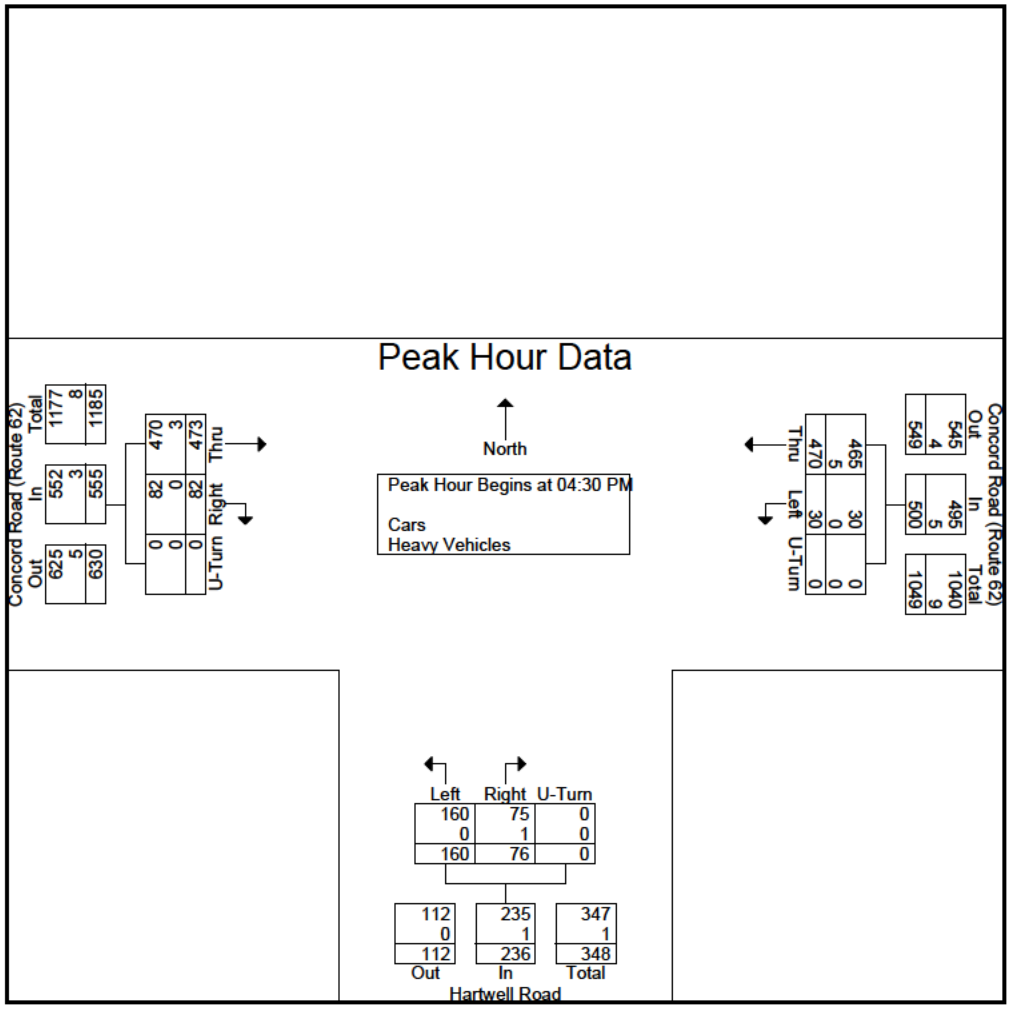
	Concord Road (Route 62) From East				Hartwell Road From South				Concord Road (Route 62) From West				
Start Time	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	103	12	0	115	30	33	0	63	28	133	0	161	339
04:45 PM	111	8	0	119	11	41	0	52	17	101	0	118	289
05:00 PM	114	5	0	119	24	48	0	72	22	102	0	124	315
05:15 PM	142	5	0	147	11	38	0	49	15	137	0	152	348
Total Volume	470	30	0	500	76	160	0	236	82	473	0	555	1291
% App. Total	94	6	0		32.2	67.8	0		14.8	85.2	0		
PHF	.827	.625	.000	.850	.633	.833	.000	.819	.732	.863	.000	.862	.927
Cars	465	30	0	495	75	160	0	235	82	470	0	552	1282
% Cars	98.9	100	0	99.0	98.7	100	0	99.6	100	99.4	0	99.5	99.3
Heavy Vehicles	5	0	0	5	1	0	0	1	0	3	0	3	9
% Heavy Vehicles	1.1	0	0	1.0	1.3	0	0	0.4	0	0.6	0	0.5	0.7



N/S: South Road
W: Hartwell Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 MM
Site Code : TBA
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Groups Printed- Cars - Heavy Vehicles

	South Road From North			South Road From South			Hartwell Road From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
03:00 PM	10	31	0	80	15	0	10	13	0	159
03:15 PM	18	25	0	79	14	0	15	13	0	164
03:30 PM	14	50	0	116	13	0	13	31	0	237
03:45 PM	21	28	0	151	17	0	8	20	0	245
Total	63	134	0	426	59	0	46	77	0	805
04:00 PM	18	35	0	146	16	0	16	15	0	246
04:15 PM	16	33	0	189	17	0	11	19	0	285
04:30 PM	17	30	0	181	29	0	16	29	0	302
04:45 PM	24	37	0	189	23	0	13	39	0	325
Total	75	135	0	705	85	0	56	102	0	1158
05:00 PM	11	41	0	237	28	0	16	34	0	367
05:15 PM	18	29	0	210	33	0	17	22	0	329
05:30 PM	11	33	0	220	35	0	13	19	0	331
05:45 PM	25	23	0	204	38	0	7	14	0	311
Total	65	126	0	871	134	0	53	89	0	1338
Grand Total	203	395	0	2002	278	0	155	268	0	3301
Apprch %	33.9	66.1	0	87.8	12.2	0	36.6	63.4	0	
Total %	6.1	12	0	60.6	8.4	0	4.7	8.1	0	
Cars	200	386	0	1975	273	0	150	263	0	3247
% Cars	98.5	97.7	0	98.7	98.2	0	96.8	98.1	0	98.4
Heavy Vehicles	3	9	0	27	5	0	5	5	0	54
% Heavy Vehicles	1.5	2.3	0	1.3	1.8	0	3.2	1.9	0	1.6

	South Road From North				South Road From South				Hartwell Road From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	24	37	0	61	189	23	0	212	13	39	0	52	325
05:00 PM	11	41	0	52	237	28	0	265	16	34	0	50	367
05:15 PM	18	29	0	47	210	33	0	243	17	22	0	39	329
05:30 PM	11	33	0	44	220	35	0	255	13	19	0	32	331
Total Volume	64	140	0	204	856	119	0	975	59	114	0	173	1352
% App. Total	31.4	68.6	0		87.8	12.2	0		34.1	65.9	0		
PHF	.667	.854	.000	.836	.903	.850	.000	.920	.868	.731	.000	.832	.921
Cars	64	139	0	203	846	119	0	965	59	111	0	170	1338
% Cars	100	99.3	0	99.5	98.8	100	0	99.0	100	97.4	0	98.3	99.0
Heavy Vehicles	0	1	0	1	10	0	0	10	0	3	0	3	14
% Heavy Vehicles	0	0.7	0	0.5	1.2	0	0	1.0	0	2.6	0	1.7	1.0

N/S: South Road
W: Hartwell Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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Site Code : TBA
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Groups Printed- Cars

	South Road From North			South Road From South			Hartwell Road From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
03:00 PM	9	29	0	77	15	0	9	12	0	151
03:15 PM	18	24	0	78	12	0	13	13	0	158
03:30 PM	14	49	0	109	13	0	12	31	0	228
03:45 PM	21	27	0	149	16	0	8	20	0	241
Total	62	129	0	413	56	0	42	76	0	778
04:00 PM	16	34	0	144	16	0	16	15	0	241
04:15 PM	16	32	0	188	16	0	11	18	0	281
04:30 PM	17	29	0	180	28	0	16	29	0	299
04:45 PM	24	37	0	185	23	0	13	38	0	320
Total	73	132	0	697	83	0	56	100	0	1141
05:00 PM	11	41	0	235	28	0	16	32	0	363
05:15 PM	18	28	0	207	33	0	17	22	0	325
05:30 PM	11	33	0	219	35	0	13	19	0	330
05:45 PM	25	23	0	204	38	0	6	14	0	310
Total	65	125	0	865	134	0	52	87	0	1328
Grand Total	200	386	0	1975	273	0	150	263	0	3247
Apprch %	34.1	65.9	0	87.9	12.1	0	36.3	63.7	0	
Total %	6.2	11.9	0	60.8	8.4	0	4.6	8.1	0	

	South Road From North				South Road From South				Hartwell Road From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	24	37	0	61	185	23	0	208	13	38	0	51	320
05:00 PM	11	41	0	52	235	28	0	263	16	32	0	48	363
05:15 PM	18	28	0	46	207	33	0	240	17	22	0	39	325
05:30 PM	11	33	0	44	219	35	0	254	13	19	0	32	330
Total Volume	64	139	0	203	846	119	0	965	59	111	0	170	1338
% App. Total	31.5	68.5	0		87.7	12.3	0		34.7	65.3	0		
PHF	.667	.848	.000	.832	.900	.850	.000	.917	.868	.730	.000	.833	.921

N/S: South Road
W: Hartwell Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 MM
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Groups Printed- Heavy Vehicles

	South Road From North			South Road From South			Hartwell Road From West			
Start Time	Right	Thru	U-Turn	Thru	Left	U-Turn	Right	Left	U-Turn	Int. Total
03:00 PM	1	2	0	3	0	0	1	1	0	8
03:15 PM	0	1	0	1	2	0	2	0	0	6
03:30 PM	0	1	0	7	0	0	1	0	0	9
03:45 PM	0	1	0	2	1	0	0	0	0	4
Total	1	5	0	13	3	0	4	1	0	27
04:00 PM	2	1	0	2	0	0	0	0	0	5
04:15 PM	0	1	0	1	1	0	0	1	0	4
04:30 PM	0	1	0	1	1	0	0	0	0	3
04:45 PM	0	0	0	4	0	0	0	1	0	5
Total	2	3	0	8	2	0	0	2	0	17
05:00 PM	0	0	0	2	0	0	0	2	0	4
05:15 PM	0	1	0	3	0	0	0	0	0	4
05:30 PM	0	0	0	1	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	1	0	0	1
Total	0	1	0	6	0	0	1	2	0	10
Grand Total	3	9	0	27	5	0	5	5	0	54
Apprch %	25	75	0	84.4	15.6	0	50	50	0	
Total %	5.6	16.7	0	50	9.3	0	9.3	9.3	0	

	South Road From North				South Road From South				Hartwell Road From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	1	2	0	3	3	0	0	3	1	1	0	2	8
03:15 PM	0	1	0	1	1	2	0	3	2	0	0	2	6
03:30 PM	0	1	0	1	7	0	0	7	1	0	0	1	9
03:45 PM	0	1	0	1	2	1	0	3	0	0	0	0	4
Total Volume	1	5	0	6	13	3	0	16	4	1	0	5	27
% App. Total	16.7	83.3	0		81.2	18.8	0		80	20	0		
PHF	.250	.625	.000	.500	.464	.375	.000	.571	.500	.250	.000	.625	.750

N/S: South Road
W: Hartwell Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Peds and Bicycles

	South Road From North			South Road From South			Hartwell Road From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	1	1
03:45 PM	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	2	2
04:00 PM	0	0	0	0	1	0	0	0	0	1
04:15 PM	1	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	1	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	0	0	1	0	3
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	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	0	0	1	0	0	1	2	5
Apprch %	100	0	0	0	100	0	0	33.3	66.7	
Total %	20	0	0	0	20	0	0	20	40	

	South Road From North				South Road From South				Hartwell Road From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:30 PM													
03:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	1
03:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	1
04:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
04:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Volume	1	0	0	1	0	1	0	1	0	0	2	2	4
% App. Total	100	0	0		0	100	0		0	0	100		
PHF	.250	.000	.000	.250	.000	.250	.000	.250	.000	.000	.500	.500	1.00

N/S: South Road
W: Hartwell Road
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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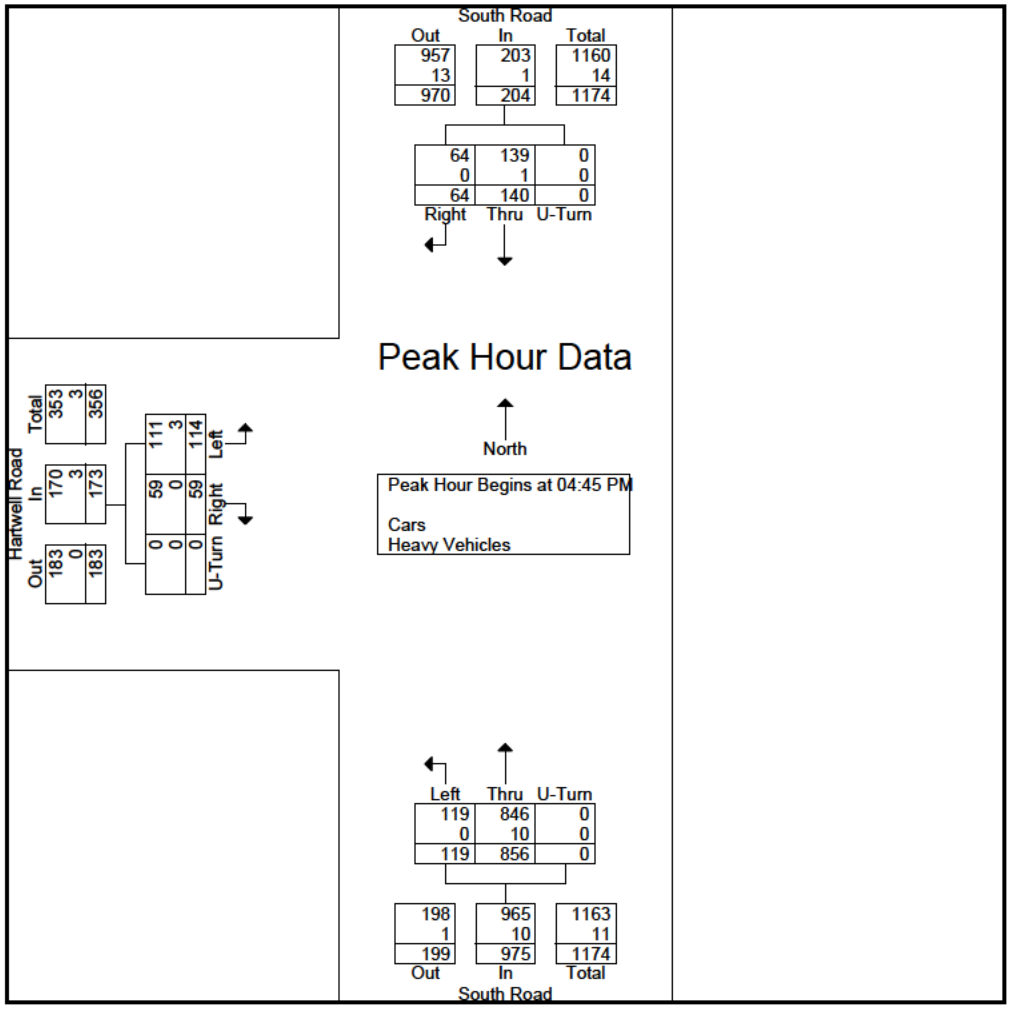
	South Road From North				South Road From South				Hartwell Road From West				
Start Time	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Right	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	24	37	0	61	189	23	0	212	13	39	0	52	325
05:00 PM	11	41	0	52	237	28	0	265	16	34	0	50	367
05:15 PM	18	29	0	47	210	33	0	243	17	22	0	39	329
05:30 PM	11	33	0	44	220	35	0	255	13	19	0	32	331
Total Volume	64	140	0	204	856	119	0	975	59	114	0	173	1352
% App. Total	31.4	68.6	0		87.8	12.2	0		34.1	65.9	0		
PHF	.667	.854	.000	.836	.903	.850	.000	.920	.868	.731	.000	.832	.921
Cars	64	139	0	203	846	119	0	965	59	111	0	170	1338
% Cars	100	99.3	0	99.5	98.8	100	0	99.0	100	97.4	0	98.3	99.0
Heavy Vehicles	0	1	0	1	10	0	0	10	0	3	0	3	14
% Heavy Vehicles	0	0.7	0	0.5	1.2	0	0	1.0	0	2.6	0	1.7	1.0



N: North Road (Route 4/225)
E/W: Great Rd (4/225)/ Concord Rd (62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars - Heavy Vehicles

	North Road (Route 4/225) From North			Great Road (Route 4/225) From East			Concord Road (Route 62) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	49	95	0	160	73	0	55	68	0	500
03:15 PM	37	70	0	166	82	0	88	67	0	510
03:30 PM	35	85	0	166	78	0	72	69	0	505
03:45 PM	34	89	0	203	61	0	73	64	0	524
Total	155	339	0	695	294	0	288	268	0	2039
04:00 PM	34	80	0	234	84	0	46	73	0	551
04:15 PM	41	85	0	242	89	0	42	74	0	573
04:30 PM	44	67	0	246	69	0	44	66	0	536
04:45 PM	34	69	0	246	89	0	26	79	0	543
Total	153	301	0	968	331	0	158	292	0	2203
05:00 PM	52	78	0	252	79	0	27	72	0	560
05:15 PM	47	86	0	255	74	0	28	78	0	568
05:30 PM	44	105	0	249	67	0	22	64	0	551
05:45 PM	54	75	0	266	69	0	26	65	0	555
Total	197	344	0	1022	289	0	103	279	0	2234
Grand Total	505	984	0	2685	914	0	549	839	0	6476
Apprch %	33.9	66.1	0	74.6	25.4	0	39.6	60.4	0	
Total %	7.8	15.2	0	41.5	14.1	0	8.5	13	0	
Cars	494	960	0	2652	899	0	534	827	0	6366
% Cars	97.8	97.6	0	98.8	98.4	0	97.3	98.6	0	98.3
Heavy Vehicles	11	24	0	33	15	0	15	12	0	110
% Heavy Vehicles	2.2	2.4	0	1.2	1.6	0	2.7	1.4	0	1.7

	North Road (Route 4/225) From North				Great Road (Route 4/225) From East				Concord Road (Route 62) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	52	78	0	130	252	79	0	331	27	72	0	99	560
05:15 PM	47	86	0	133	255	74	0	329	28	78	0	106	568
05:30 PM	44	105	0	149	249	67	0	316	22	64	0	86	551
05:45 PM	54	75	0	129	266	69	0	335	26	65	0	91	555
Total Volume	197	344	0	541	1022	289	0	1311	103	279	0	382	2234
% App. Total	36.4	63.6	0		78	22	0		27	73	0		
PHF	.912	.819	.000	.908	.961	.915	.000	.978	.920	.894	.000	.901	.983
Cars	197	337	0	534	1017	288	0	1305	100	277	0	377	2216
% Cars	100	98.0	0	98.7	99.5	99.7	0	99.5	97.1	99.3	0	98.7	99.2
Heavy Vehicles	0	7	0	7	5	1	0	6	3	2	0	5	18
% Heavy Vehicles	0	2.0	0	1.3	0.5	0.3	0	0.5	2.9	0.7	0	1.3	0.8

N: North Road (Route 4/225)
E/W: Great Rd (4/225)/ Concord Rd (62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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Site Code : TBA
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Groups Printed- Cars

	North Road (Route 4/225) From North			Great Road (Route 4/225) From East			Concord Road (Route 62) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	44	86	0	156	70	0	54	65	0	475
03:15 PM	36	69	0	162	77	0	86	67	0	497
03:30 PM	34	83	0	162	78	0	68	64	0	489
03:45 PM	34	88	0	196	60	0	73	64	0	515
Total	148	326	0	676	285	0	281	260	0	1976
04:00 PM	32	77	0	229	83	0	45	71	0	537
04:15 PM	40	85	0	239	87	0	41	74	0	566
04:30 PM	43	66	0	246	69	0	42	66	0	532
04:45 PM	34	69	0	245	87	0	25	79	0	539
Total	149	297	0	959	326	0	153	290	0	2174
05:00 PM	52	75	0	250	79	0	27	72	0	555
05:15 PM	47	84	0	253	73	0	26	78	0	561
05:30 PM	44	104	0	249	67	0	22	63	0	549
05:45 PM	54	74	0	265	69	0	25	64	0	551
Total	197	337	0	1017	288	0	100	277	0	2216
Grand Total	494	960	0	2652	899	0	534	827	0	6366
Apprch %	34	66	0	74.7	25.3	0	39.2	60.8	0	
Total %	7.8	15.1	0	41.7	14.1	0	8.4	13	0	

	North Road (Route 4/225) From North				Great Road (Route 4/225) From East				Concord Road (Route 62) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	52	75	0	127	250	79	0	329	27	72	0	99	555
05:15 PM	47	84	0	131	253	73	0	326	26	78	0	104	561
05:30 PM	44	104	0	148	249	67	0	316	22	63	0	85	549
05:45 PM	54	74	0	128	265	69	0	334	25	64	0	89	551
Total Volume	197	337	0	534	1017	288	0	1305	100	277	0	377	2216
% App. Total	36.9	63.1	0		77.9	22.1	0		26.5	73.5	0		
PHF	.912	.810	.000	.902	.959	.911	.000	.977	.926	.888	.000	.906	.988

N: North Road (Route 4/225)
E/W: Great Rd (4/225)/ Concord Rd (62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Site Code : TBA
Start Date : 11/13/2012
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Groups Printed- Heavy Vehicles

	North Road (Route 4/225) From North			Great Road (Route 4/225) From East			Concord Road (Route 62) From West			
Start Time	Right	Left	U-Turn	Right	Thru	U-Turn	Thru	Left	U-Turn	Int. Total
03:00 PM	5	9	0	4	3	0	1	3	0	25
03:15 PM	1	1	0	4	5	0	2	0	0	13
03:30 PM	1	2	0	4	0	0	4	5	0	16
03:45 PM	0	1	0	7	1	0	0	0	0	9
Total	7	13	0	19	9	0	7	8	0	63
04:00 PM	2	3	0	5	1	0	1	2	0	14
04:15 PM	1	0	0	3	2	0	1	0	0	7
04:30 PM	1	1	0	0	0	0	2	0	0	4
04:45 PM	0	0	0	1	2	0	1	0	0	4
Total	4	4	0	9	5	0	5	2	0	29
05:00 PM	0	3	0	2	0	0	0	0	0	5
05:15 PM	0	2	0	2	1	0	2	0	0	7
05:30 PM	0	1	0	0	0	0	0	1	0	2
05:45 PM	0	1	0	1	0	0	1	1	0	4
Total	0	7	0	5	1	0	3	2	0	18
Grand Total	11	24	0	33	15	0	15	12	0	110
Apprch %	31.4	68.6	0	68.8	31.2	0	55.6	44.4	0	
Total %	10	21.8	0	30	13.6	0	13.6	10.9	0	

	North Road (Route 4/225) From North				Great Road (Route 4/225) From East				Concord Road (Route 62) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	5	9	0	14	4	3	0	7	1	3	0	4	25
03:15 PM	1	1	0	2	4	5	0	9	2	0	0	2	13
03:30 PM	1	2	0	3	4	0	0	4	4	5	0	9	16
03:45 PM	0	1	0	1	7	1	0	8	0	0	0	0	9
Total Volume	7	13	0	20	19	9	0	28	7	8	0	15	63
% App. Total	35	65	0		67.9	32.1	0		46.7	53.3	0		
PHF	.350	.361	.000	.357	.679	.450	.000	.778	.438	.400	.000	.417	.630

N: North Road (Route 4/225)
E/W: Great Rd (4/225)/ Concord Rd (62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Peds and Bicycles

	North Road (Route 4/225) From North			Great Road (Route 4/225) From East			Concord Road (Route 62) From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	1	0	0	0	0	1
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	0	0	1
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	1	1	0	0	1	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	1	0	0	1	0	3
05:00 PM	0	0	0	1	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	1	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	1	0	0	0	0	0	2
Grand Total	0	0	1	2	2	0	0	1	0	6
Apprch %	0	0	100	50	50	0	0	100	0	
Total %	0	0	16.7	33.3	33.3	0	0	16.7	0	

	North Road (Route 4/225) From North				Great Road (Route 4/225) From East				Concord Road (Route 62) From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:15 PM													
04:15 PM	0	0	0	0	1	1	0	2	0	1	0	1	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total Volume	0	0	0	0	2	1	0	3	0	1	0	1	4
% App. Total	0	0	0		66.7	33.3	0		0	100	0		
PHF	.000	.000	.000	.000	.500	.250	.000	.375	.000	.250	.000	.250	.333

N: North Road (Route 4/225)
E/W: Great Rd (4/225)/ Concord Rd (62)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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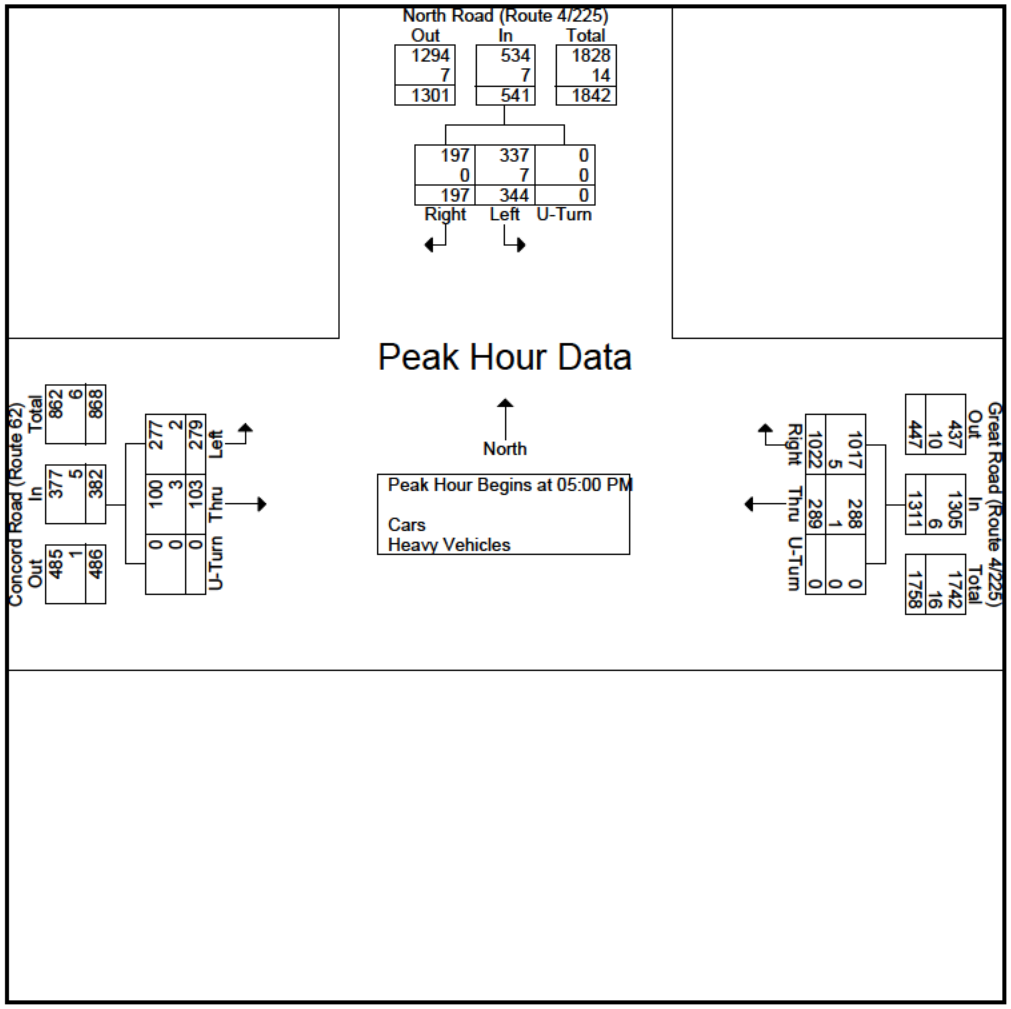
	North Road (Route 4/225) From North				Great Road (Route 4/225) From East				Concord Road (Route 62) From West				
Start Time	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 05:00 PM													
05:00 PM	52	78	0	130	252	79	0	331	27	72	0	99	560
05:15 PM	47	86	0	133	255	74	0	329	28	78	0	106	568
05:30 PM	44	105	0	149	249	67	0	316	22	64	0	86	551
05:45 PM	54	75	0	129	266	69	0	335	26	65	0	91	555
Total Volume	197	344	0	541	1022	289	0	1311	103	279	0	382	2234
% App. Total	36.4	63.6	0		78	22	0		27	73	0		
PHF	.912	.819	.000	.908	.961	.915	.000	.978	.920	.894	.000	.901	.983
Cars	197	337	0	534	1017	288	0	1305	100	277	0	377	2216
% Cars	100	98.0	0	98.7	99.5	99.7	0	99.5	97.1	99.3	0	98.7	99.2
Heavy Vehicles	0	7	0	7	5	1	0	6	3	2	0	5	18
% Heavy Vehicles	0	2.0	0	1.3	0.5	0.3	0	0.5	2.9	0.7	0	1.3	0.8



N/S: Springs Road/ South Road
E/W: Great Road (Route 4/62/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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Groups Printed- Cars - Heavy Vehicles

	Springs Road From North				Great Road (Route 4/62/225) From East				South Road From South				Great Road (Route 4/62/225) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	36	11	15	0	0	145	1	0	14	16	61	0	9	156	4	0	468
03:15 PM	32	6	18	0	4	162	3	0	10	17	55	0	10	139	9	0	465
03:30 PM	35	4	17	0	1	160	0	0	12	27	74	0	8	149	11	0	498
03:45 PM	31	5	16	0	3	155	3	0	14	45	94	0	11	133	9	0	519
Total	134	26	66	0	8	622	7	0	50	105	284	0	38	577	33	0	1950
04:00 PM	55	8	28	0	3	160	0	0	17	44	95	0	3	117	8	0	538
04:15 PM	60	4	20	0	1	173	1	0	9	61	96	0	7	126	5	0	563
04:30 PM	55	2	20	0	3	171	2	0	9	48	93	0	4	101	9	0	517
04:45 PM	64	11	17	0	0	177	0	0	5	52	85	0	9	94	6	0	520
Total	234	25	85	0	7	681	3	0	40	205	369	0	23	438	28	0	2138
05:00 PM	49	8	10	0	3	185	0	0	10	37	89	0	15	100	7	0	513
05:15 PM	57	3	10	0	2	173	0	0	3	47	89	0	8	115	8	0	515
05:30 PM	67	7	9	0	3	174	0	0	2	33	87	0	8	125	8	0	523
05:45 PM	48	6	11	0	2	175	2	0	4	44	103	0	8	96	6	0	505
Total	221	24	40	0	10	707	2	0	19	161	368	0	39	436	29	0	2056
Grand Total	589	75	191	0	25	2010	12	0	109	471	1021	0	100	1451	90	0	6144
Apprch %	68.9	8.8	22.3	0	1.2	98.2	0.6	0	6.8	29.4	63.8	0	6.1	88.4	5.5	0	
Total %	9.6	1.2	3.1	0	0.4	32.7	0.2	0	1.8	7.7	16.6	0	1.6	23.6	1.5	0	
Cars	586	72	187	0	24	1981	12	0	109	467	1013	0	99	1415	89	0	6054
% Cars	99.5	96	97.9	0	96	98.6	100	0	100	99.2	99.2	0	99	97.5	98.9	0	98.5
Heavy Vehicles	3	3	4	0	1	29	0	0	0	4	8	0	1	36	1	0	90
% Heavy Vehicles	0.5	4	2.1	0	4	1.4	0	0	0	0.8	0.8	0	1	2.5	1.1	0	1.5

	Springs Road From North					Great Road (Route 4/62/225) From East					South Road From South					Great Road (Route 4/62/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	55	8	28	0	91	3	160	0	0	163	17	44	95	0	156	3	117	8	0	128	538
04:15 PM	60	4	20	0	84	1	173	1	0	175	9	61	96	0	166	7	126	5	0	138	563
04:30 PM	55	2	20	0	77	3	171	2	0	176	9	48	93	0	150	4	101	9	0	114	517
04:45 PM	64	11	17	0	92	0	177	0	0	177	5	52	85	0	142	9	94	6	0	109	520
Total Volume	234	25	85	0	344	7	681	3	0	691	40	205	369	0	614	23	438	28	0	489	2138
% App. Total	68	7.3	24.7	0		1	98.6	0.4	0		6.5	33.4	60.1	0		4.7	89.6	5.7	0		
PHF	.914	.568	.759	.000	.935	.583	.962	.375	.000	.976	.588	.840	.961	.000	.925	.639	.869	.778	.000	.886	.949
Cars	233	24	82	0	339	7	672	3	0	682	40	203	366	0	609	23	430	28	0	481	2111
% Cars	99.6	96.0	96.5	0	98.5	100	98.7	100	0	98.7	100	99.0	99.2	0	99.2	100	98.2	100	0	98.4	98.7
Heavy Vehicles	1	1	3	0	5	0	9	0	0	9	0	2	3	0	5	0	8	0	0	8	27
% Heavy Vehicles	0.4	4.0	3.5	0	1.5	0	1.3	0	0	1.3	0	1.0	0.8	0	0.8	0	1.8	0	0	1.6	1.3

N/S: Springs Road/ South Road
E/W: Great Road (Route 4/62/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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File Name : 123082 OO
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	Springs Road From North				Great Road (Route 4/62/225) From East				South Road From South				Great Road (Route 4/62/225) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	34	11	15	0	0	143	1	0	14	16	60	0	9	151	4	0	458
03:15 PM	32	6	18	0	4	156	3	0	10	17	55	0	9	134	9	0	453
03:30 PM	35	4	17	0	1	157	0	0	12	26	72	0	8	144	10	0	486
03:45 PM	31	4	15	0	3	150	3	0	14	45	93	0	11	131	9	0	509
Total	132	25	65	0	8	606	7	0	50	104	280	0	37	560	32	0	1906
04:00 PM	55	8	28	0	3	157	0	0	17	44	93	0	3	112	8	0	528
04:15 PM	60	4	19	0	1	170	1	0	9	60	95	0	7	124	5	0	555
04:30 PM	55	1	19	0	3	170	2	0	9	48	93	0	4	100	9	0	513
04:45 PM	63	11	16	0	0	175	0	0	5	51	85	0	9	94	6	0	515
Total	233	24	82	0	7	672	3	0	40	203	366	0	23	430	28	0	2111
05:00 PM	49	7	10	0	3	184	0	0	10	37	88	0	15	96	7	0	506
05:15 PM	57	3	10	0	1	170	0	0	3	47	89	0	8	111	8	0	507
05:30 PM	67	7	9	0	3	174	0	0	2	33	87	0	8	124	8	0	522
05:45 PM	48	6	11	0	2	175	2	0	4	43	103	0	8	94	6	0	502
Total	221	23	40	0	9	703	2	0	19	160	367	0	39	425	29	0	2037
Grand Total	586	72	187	0	24	1981	12	0	109	467	1013	0	99	1415	89	0	6054
Apprch %	69.3	8.5	22.1	0	1.2	98.2	0.6	0	6.9	29.4	63.8	0	6.2	88.3	5.6	0	
Total %	9.7	1.2	3.1	0	0.4	32.7	0.2	0	1.8	7.7	16.7	0	1.6	23.4	1.5	0	

	Springs Road From North					Great Road (Route 4/62/225) From East					South Road From South					Great Road (Route 4/62/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	55	8	28	0	91	3	157	0	0	160	17	44	93	0	154	3	112	8	0	123	528
04:15 PM	60	4	19	0	83	1	170	1	0	172	9	60	95	0	164	7	124	5	0	136	555
04:30 PM	55	1	19	0	75	3	170	2	0	175	9	48	93	0	150	4	100	9	0	113	513
04:45 PM	63	11	16	0	90	0	175	0	0	175	5	51	85	0	141	9	94	6	0	109	515
Total Volume	233	24	82	0	339	7	672	3	0	682	40	203	366	0	609	23	430	28	0	481	2111
% App. Total	68.7	7.1	24.2	0		1	98.5	0.4	0		6.6	33.3	60.1	0		4.8	89.4	5.8	0		
PHF	.925	.545	.732	.000	.931	.583	.960	.375	.000	.974	.588	.846	.963	.000	.928	.639	.867	.778	.000	.884	.951

N/S: Springs Road/ South Road
E/W: Great Road (Route 4/62/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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Email: datarequests@pdillc.com

File Name : 123082 OO
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Springs Road From North				Great Road (Route 4/62/225) From East				South Road From South				Great Road (Route 4/62/225) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	2	0	0	0	0	2	0	0	0	0	1	0	0	5	0	0	10
03:15 PM	0	0	0	0	0	6	0	0	0	0	0	0	1	5	0	0	12
03:30 PM	0	0	0	0	0	3	0	0	0	1	2	0	0	5	1	0	12
03:45 PM	0	1	1	0	0	5	0	0	0	0	1	0	0	2	0	0	10
Total	2	1	1	0	0	16	0	0	0	1	4	0	1	17	1	0	44
04:00 PM	0	0	0	0	0	3	0	0	0	0	2	0	0	5	0	0	10
04:15 PM	0	0	1	0	0	3	0	0	0	1	1	0	0	2	0	0	8
04:30 PM	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	0	4
04:45 PM	1	0	1	0	0	2	0	0	0	1	0	0	0	0	0	0	5
Total	1	1	3	0	0	9	0	0	0	2	3	0	0	8	0	0	27
05:00 PM	0	1	0	0	0	1	0	0	0	0	1	0	0	4	0	0	7
05:15 PM	0	0	0	0	1	3	0	0	0	0	0	0	0	4	0	0	8
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3
Total	0	1	0	0	1	4	0	0	0	1	1	0	0	11	0	0	19
Grand Total	3	3	4	0	1	29	0	0	0	4	8	0	1	36	1	0	90
Apprch %	30	30	40	0	3.3	96.7	0	0	0	33.3	66.7	0	2.6	94.7	2.6	0	
Total %	3.3	3.3	4.4	0	1.1	32.2	0	0	0	4.4	8.9	0	1.1	40	1.1	0	

	Springs Road From North					Great Road (Route 4/62/225) From East					South Road From South					Great Road (Route 4/62/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	2	0	0	0	2	0	2	0	0	2	0	0	1	0	1	0	5	0	0	5	10
03:15 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	1	5	0	0	6	12
03:30 PM	0	0	0	0	0	0	3	0	0	3	0	1	2	0	3	0	5	1	0	6	12
03:45 PM	0	1	1	0	2	0	5	0	0	5	0	0	1	0	1	0	2	0	0	2	10
Total Volume	2	1	1	0	4	0	16	0	0	16	0	1	4	0	5	1	17	1	0	19	44
% App. Total	50	25	25	0		0	100	0	0		0	20	80	0		5.3	89.5	5.3	0		
PHF	.250	.250	.250	.000	.500	.000	.667	.000	.000	.667	.000	.250	.500	.000	.417	.250	.850	.250	.000	.792	.917

N/S: Springs Road/ South Road
E/W: Great Road (Route 4/62/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 OO
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Springs Road From North				Great Road (Route 4/62/225) From East				South Road From South				Great Road (Route 4/62/225) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	4
03:15 PM	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	4
03:30 PM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	3
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Total	0	0	0	0	0	1	0	8	0	0	0	4	0	0	0	0	13
04:00 PM	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	4
04:15 PM	1	0	0	1	0	0	0	2	0	0	0	1	0	0	0	0	5
04:30 PM	0	0	0	2	0	0	0	1	0	0	0	2	0	0	0	1	6
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	1	0	0	4	0	0	0	4	0	0	0	5	0	0	0	2	16
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	1	0	1	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0	1	7
Total	0	0	0	2	0	1	0	5	0	0	0	2	0	0	0	1	11
Grand Total	1	0	0	6	0	2	0	17	0	0	0	11	0	0	0	3	40
Apprch %	14.3	0	0	85.7	0	10.5	0	89.5	0	0	0	100	0	0	0	100	
Total %	2.5	0	0	15	0	5	0	42.5	0	0	0	27.5	0	0	0	7.5	

	Springs Road From North					Great Road (Route 4/62/225) From East					South Road From South					Great Road (Route 4/62/225) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2
04:00 PM	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	4
04:15 PM	1	0	0	1	2	0	0	0	2	2	0	0	0	1	1	0	0	0	0	0	5
04:30 PM	0	0	0	2	2	0	0	0	1	1	0	0	0	2	2	0	0	0	1	1	6
Total Volume	1	0	0	4	5	0	0	0	4	4	0	0	0	6	6	0	0	0	2	2	17
% App. Total	20	0	0	80		0	0	0	100		0	0	0	100		0	0	0	100		
PHF	.250	.000	.000	.500	.625	.000	.000	.000	.500	.500	.000	.000	.000	.750	.750	.000	.000	.000	.500	.500	.708

N/S: Springs Road/ South Road
E/W: Great Road (Route 4/62/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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File Name : 123082 OO
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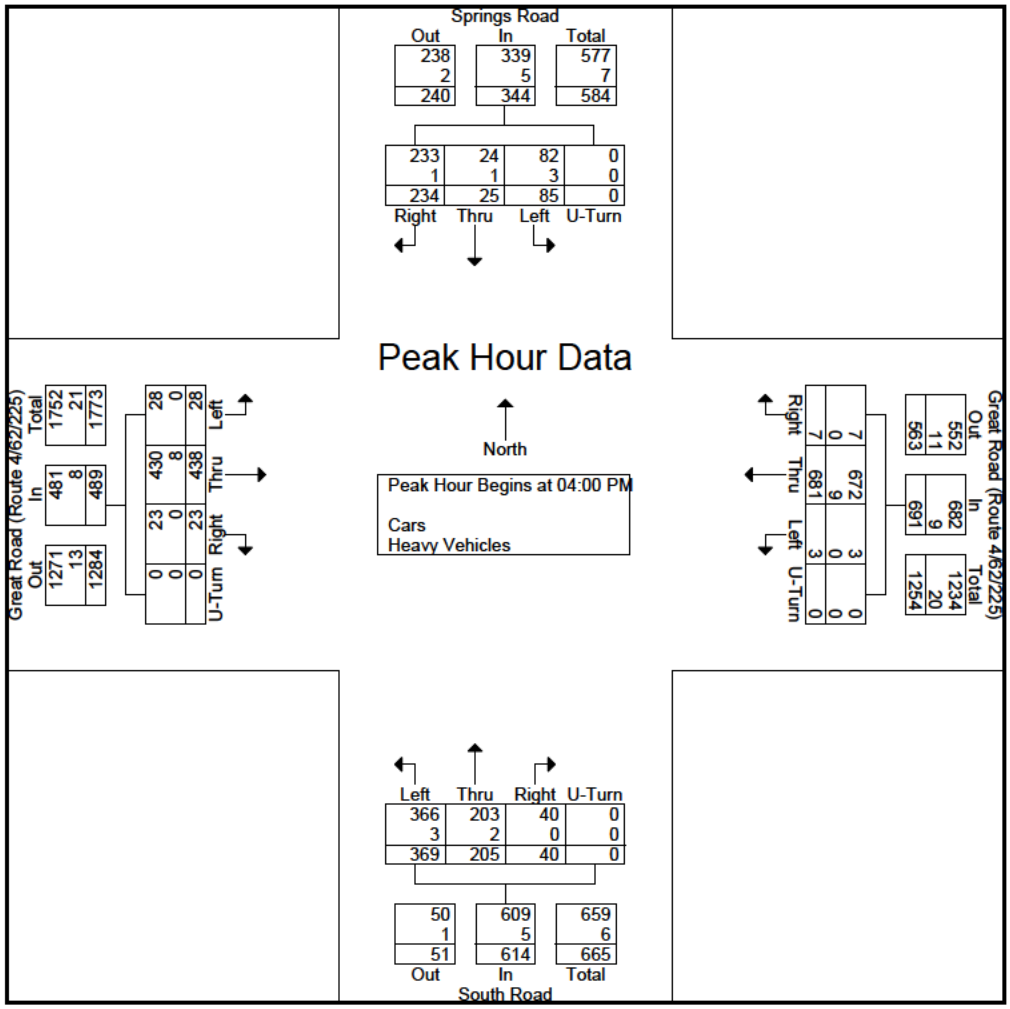
Start Date : 11/13/2012
Page No : 1

	Springs Road From North					Great Road (Route 4/62/225) From East					South Road From South					Great Road (Route 4/62/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	55	8	28	0	91	3	160	0	0	163	17	44	95	0	156	3	117	8	0	128	538
04:15 PM	60	4	20	0	84	1	173	1	0	175	9	61	96	0	166	7	126	5	0	138	563
04:30 PM	55	2	20	0	77	3	171	2	0	176	9	48	93	0	150	4	101	9	0	114	517
04:45 PM	64	11	17	0	92	0	177	0	0	177	5	52	85	0	142	9	94	6	0	109	520
Total Volume	234	25	85	0	344	7	681	3	0	691	40	205	369	0	614	23	438	28	0	489	2138
% App. Total	68	7.3	24.7	0		1	98.6	0.4	0		6.5	33.4	60.1	0		4.7	89.6	5.7	0		
PHF	.914	.568	.759	.000	.935	.583	.962	.375	.000	.976	.588	.840	.961	.000	.925	.639	.869	.778	.000	.886	.949
Cars	233	24	82	0	339	7	672	3	0	682	40	203	366	0	609	23	430	28	0	481	2111
% Cars	99.6	96.0	96.5	0	98.5	100	98.7	100	0	98.7	100	99.0	99.2	0	99.2	100	98.2	100	0	98.4	98.7
Heavy Vehicles	1	1	3	0	5	0	9	0	0	9	0	2	3	0	5	0	8	0	0	8	27
% Heavy Vehicles	0.4	4.0	3.5	0	1.5	0	1.3	0	0	1.3	0	1.0	0.8	0	0.8	0	1.8	0	0	1.6	1.3



N/S: Jughandle/ Hartwell Avenue
E/W: Bedford Street (Route 4/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

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File Name : 123082 AA
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Jughandle From North				Bedford Road (Route 4/225) From East				Hartwell Avenue From South				Bedford Road (Route 4/225) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	0	67	26	0	0	212	0	0	204	0	96	0	19	240	0	0	864
03:15 PM	0	70	33	0	0	206	0	0	162	0	87	0	25	234	0	0	817
03:30 PM	0	66	33	0	0	189	0	0	199	0	111	0	24	219	0	0	841
03:45 PM	0	73	35	0	0	175	0	0	177	0	130	0	22	186	0	0	798
Total	0	276	127	0	0	782	0	0	742	0	424	0	90	879	0	0	3320
04:00 PM	0	65	32	0	0	184	0	0	192	0	119	0	36	175	0	0	803
04:15 PM	0	75	34	0	0	215	0	0	195	0	109	0	31	164	0	0	823
04:30 PM	0	68	31	0	0	210	2	0	198	0	118	0	34	196	0	0	857
04:45 PM	0	96	23	0	0	216	0	0	216	0	121	0	34	177	0	0	883
Total	0	304	120	0	0	825	2	0	801	0	467	0	135	712	0	0	3366
05:00 PM	1	89	24	0	0	206	1	0	220	0	110	1	34	176	0	0	862
05:15 PM	0	95	41	0	0	214	0	0	226	0	116	0	45	179	0	0	916
05:30 PM	1	83	39	0	0	202	0	0	206	0	103	0	43	183	0	0	860
05:45 PM	0	91	29	0	0	207	0	0	198	0	113	1	48	175	0	0	862
Total	2	358	133	0	0	829	1	0	850	0	442	2	170	713	0	0	3500
Grand Total	2	938	380	0	0	2436	3	0	2393	0	1333	2	395	2304	0	0	10186
Apprch %	0.2	71.1	28.8	0	0	99.9	0.1	0	64.2	0	35.8	0.1	14.6	85.4	0	0	
Total %	0	9.2	3.7	0	0	23.9	0	0	23.5	0	13.1	0	3.9	22.6	0	0	
Cars	2	906	375	0	0	2383	3	0	2361	0	1326	2	391	2262	0	0	10011
% Cars	100	96.6	98.7	0	0	97.8	100	0	98.7	0	99.5	100	99	98.2	0	0	98.3
Heavy Vehicles	0	32	5	0	0	53	0	0	32	0	7	0	4	42	0	0	175
% Heavy Vehicles	0	3.4	1.3	0	0	2.2	0	0	1.3	0	0.5	0	1	1.8	0	0	1.7

	Jughandle From North					Bedford Road (Route 4/225) From East					Hartwell Avenue From South					Bedford Road (Route 4/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	96	23	0	119	0	216	0	0	216	216	0	121	0	337	34	177	0	0	211	883
05:00 PM	1	89	24	0	114	0	206	1	0	207	220	0	110	1	331	34	176	0	0	210	862
05:15 PM	0	95	41	0	136	0	214	0	0	214	226	0	116	0	342	45	179	0	0	224	916
05:30 PM	1	83	39	0	123	0	202	0	0	202	206	0	103	0	309	43	183	0	0	226	860
Total Volume	2	363	127	0	492	0	838	1	0	839	868	0	450	1	1319	156	715	0	0	871	3521
% App. Total	0.4	73.8	25.8	0		0	99.9	0.1	0		65.8	0	34.1	0.1		17.9	82.1	0	0		
PHF	.500	.945	.774	.000	.904	.000	.970	.250	.000	.971	.960	.000	.930	.250	.964	.867	.977	.000	.000	.963	.961
Cars	2	356	127	0	485	0	829	1	0	830	861	0	449	1	1311	156	702	0	0	858	3484
% Cars	100	98.1	100	0	98.6	0	98.9	100	0	98.9	99.2	0	99.8	100	99.4	100	98.2	0	0	98.5	98.9
Heavy Vehicles	0	7	0	0	7	0	9	0	0	9	7	0	1	0	8	0	13	0	0	13	37
% Heavy Vehicles	0	1.9	0	0	1.4	0	1.1	0	0	1.1	0.8	0	0.2	0	0.6	0	1.8	0	0	1.5	1.1

N/S: Jughandle/ Hartwell Avenue
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File Name : 123082 AA
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars

	Jughandle From North				Bedford Road (Route 4/225) From East				Hartwell Avenue From South				Bedford Road (Route 4/225) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	0	61	26	0	0	202	0	0	200	0	94	0	19	235	0	0	837
03:15 PM	0	67	31	0	0	202	0	0	155	0	87	0	25	232	0	0	799
03:30 PM	0	59	33	0	0	180	0	0	194	0	111	0	24	214	0	0	815
03:45 PM	0	72	35	0	0	168	0	0	175	0	127	0	22	180	0	0	779
Total	0	259	125	0	0	752	0	0	724	0	419	0	90	861	0	0	3230
04:00 PM	0	63	31	0	0	179	0	0	192	0	119	0	33	171	0	0	788
04:15 PM	0	72	33	0	0	212	0	0	194	0	108	0	30	161	0	0	810
04:30 PM	0	65	30	0	0	207	2	0	196	0	118	0	34	193	0	0	845
04:45 PM	0	94	23	0	0	214	0	0	214	0	120	0	34	174	0	0	873
Total	0	294	117	0	0	812	2	0	796	0	465	0	131	699	0	0	3316
05:00 PM	1	86	24	0	0	202	1	0	218	0	110	1	34	174	0	0	851
05:15 PM	0	94	41	0	0	211	0	0	224	0	116	0	45	175	0	0	906
05:30 PM	1	82	39	0	0	202	0	0	205	0	103	0	43	179	0	0	854
05:45 PM	0	91	29	0	0	204	0	0	194	0	113	1	48	174	0	0	854
Total	2	353	133	0	0	819	1	0	841	0	442	2	170	702	0	0	3465
Grand Total	2	906	375	0	0	2383	3	0	2361	0	1326	2	391	2262	0	0	10011
Apprch %	0.2	70.6	29.2	0	0	99.9	0.1	0	64	0	35.9	0.1	14.7	85.3	0	0	
Total %	0	9.1	3.7	0	0	23.8	0	0	23.6	0	13.2	0	3.9	22.6	0	0	

	Jughandle From North					Bedford Road (Route 4/225) From East					Hartwell Avenue From South					Bedford Road (Route 4/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	94	23	0	117	0	214	0	0	214	214	0	120	0	334	34	174	0	0	208	873
05:00 PM	1	86	24	0	111	0	202	1	0	203	218	0	110	1	329	34	174	0	0	208	851
05:15 PM	0	94	41	0	135	0	211	0	0	211	224	0	116	0	340	45	175	0	0	220	906
05:30 PM	1	82	39	0	122	0	202	0	0	202	205	0	103	0	308	43	179	0	0	222	854
Total Volume	2	356	127	0	485	0	829	1	0	830	861	0	449	1	1311	156	702	0	0	858	3484
% App. Total	0.4	73.4	26.2	0		0	99.9	0.1	0		65.7	0	34.2	0.1		18.2	81.8	0	0		
PHF	.500	.947	.774	.000	.898	.000	.968	.250	.000	.970	.961	.000	.935	.250	.964	.867	.980	.000	.000	.966	.961

N/S: Jughandle/ Hartwell Avenue
E/W: Bedford Street (Route 4/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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File Name : 123082 AA
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	Jughandle From North				Bedford Road (Route 4/225) From East				Hartwell Avenue From South				Bedford Road (Route 4/225) From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	0	6	0	0	0	10	0	0	4	0	2	0	0	5	0	0	27
03:15 PM	0	3	2	0	0	4	0	0	7	0	0	0	0	2	0	0	18
03:30 PM	0	7	0	0	0	9	0	0	5	0	0	0	0	5	0	0	26
03:45 PM	0	1	0	0	0	7	0	0	2	0	3	0	0	6	0	0	19
Total	0	17	2	0	0	30	0	0	18	0	5	0	0	18	0	0	90
04:00 PM	0	2	1	0	0	5	0	0	0	0	0	0	3	4	0	0	15
04:15 PM	0	3	1	0	0	3	0	0	1	0	1	0	1	3	0	0	13
04:30 PM	0	3	1	0	0	3	0	0	2	0	0	0	0	3	0	0	12
04:45 PM	0	2	0	0	0	2	0	0	2	0	1	0	0	3	0	0	10
Total	0	10	3	0	0	13	0	0	5	0	2	0	4	13	0	0	50
05:00 PM	0	3	0	0	0	4	0	0	2	0	0	0	0	2	0	0	11
05:15 PM	0	1	0	0	0	3	0	0	2	0	0	0	0	4	0	0	10
05:30 PM	0	1	0	0	0	0	0	0	1	0	0	0	0	4	0	0	6
05:45 PM	0	0	0	0	0	3	0	0	4	0	0	0	0	1	0	0	8
Total	0	5	0	0	0	10	0	0	9	0	0	0	0	11	0	0	35
Grand Total	0	32	5	0	0	53	0	0	32	0	7	0	4	42	0	0	175
Apprch %	0	86.5	13.5	0	0	100	0	0	82.1	0	17.9	0	8.7	91.3	0	0	
Total %	0	18.3	2.9	0	0	30.3	0	0	18.3	0	4	0	2.3	24	0	0	

	Jughandle From North					Bedford Road (Route 4/225) From East					Hartwell Avenue From South					Bedford Road (Route 4/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	0	6	0	0	6	0	10	0	0	10	4	0	2	0	6	0	5	0	0	5	27
03:15 PM	0	3	2	0	5	0	4	0	0	4	7	0	0	0	7	0	2	0	0	2	18
03:30 PM	0	7	0	0	7	0	9	0	0	9	5	0	0	0	5	0	5	0	0	5	26
03:45 PM	0	1	0	0	1	0	7	0	0	7	2	0	3	0	5	0	6	0	0	6	19
Total Volume	0	17	2	0	19	0	30	0	0	30	18	0	5	0	23	0	18	0	0	18	90
% App. Total	0	89.5	10.5	0		0	100	0	0		78.3	0	21.7	0		0	100	0	0		
PHF	.000	.607	.250	.000	.679	.000	.750	.000	.000	.750	.643	.000	.417	.000	.821	.000	.750	.000	.000	.750	.833

N/S: Jughandle/ Hartwell Avenue
E/W: Bedford Street (Route 4/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
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INDUSTRIES, LLC
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File Name : 123082 AA
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Peds and Bicycles

	Jughandle From North				Bedford Road (Route 4/225) From East				Hartwell Avenue From South				Bedford Road (Route 4/225) From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
03:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
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	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	2
Grand Total	0	1	0	2	0	1	0	0	0	0	0	1	0	1	0	0	6
Apprch %	0	33.3	0	66.7	0	100	0	0	0	0	0	100	0	100	0	0	
Total %	0	16.7	0	33.3	0	16.7	0	0	0	0	0	16.7	0	16.7	0	0	

	Jughandle From North					Bedford Road (Route 4/225) From East					Hartwell Avenue From South					Bedford Road (Route 4/225) From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Total Volume	0	0	0	1	1	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	3
% App. Total	0	0	0	100		0	100	0	0		0	0	0	100		0	0	0	0		
PHF	.000	.000	.000	.250	.250	.000	.250	.000	.000	.250	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.750

N/S: Jughandle/ Hartwell Avenue
E/W: Bedford Street (Route 4/225)
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
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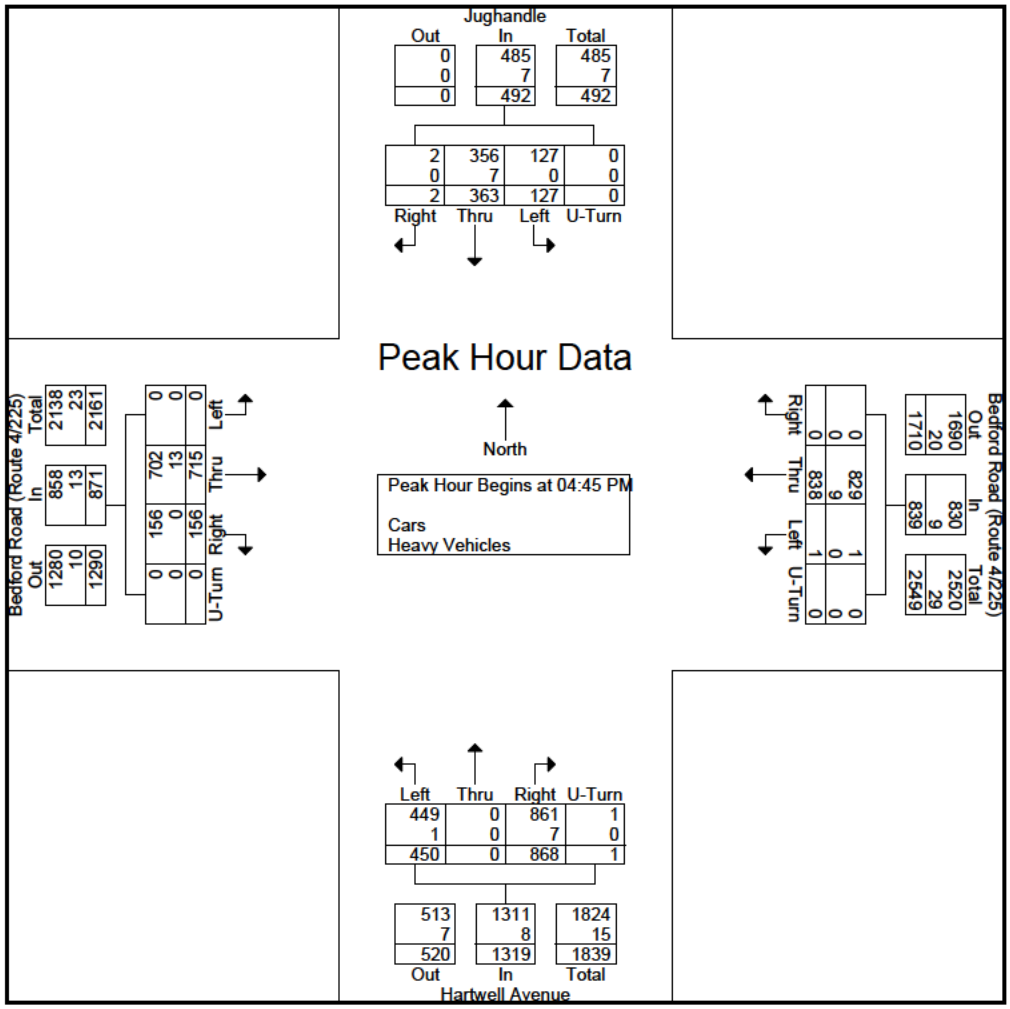
	Jughandle From North					Bedford Road (Route 4/225) From East					Hartwell Avenue From South					Bedford Road (Route 4/225) From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	96	23	0	119	0	216	0	0	216	216	0	121	0	337	34	177	0	0	211	883
05:00 PM	1	89	24	0	114	0	206	1	0	207	220	0	110	1	331	34	176	0	0	210	862
05:15 PM	0	95	41	0	136	0	214	0	0	214	226	0	116	0	342	45	179	0	0	224	916
05:30 PM	1	83	39	0	123	0	202	0	0	202	206	0	103	0	309	43	183	0	0	226	860
Total Volume	2	363	127	0	492	0	838	1	0	839	868	0	450	1	1319	156	715	0	0	871	3521
% App. Total	0.4	73.8	25.8	0		0	99.9	0.1	0		65.8	0	34.1	0.1		17.9	82.1	0	0		
PHF	.500	.945	.774	.000	.904	.000	.970	.250	.000	.971	.960	.000	.930	.250	.964	.867	.977	.000	.000	.963	.961
Cars	2	356	127	0	485	0	829	1	0	830	861	0	449	1	1311	156	702	0	0	858	3484
% Cars	100	98.1	100	0	98.6	0	98.9	100	0	98.9	99.2	0	99.8	100	99.4	100	98.2	0	0	98.5	98.9
Heavy Vehicles	0	7	0	0	7	0	9	0	0	9	7	0	1	0	8	0	13	0	0	13	37
% Heavy Vehicles	0	1.9	0	0	1.4	0	1.1	0	0	1.1	0.8	0	0.2	0	0.6	0	1.8	0	0	1.5	1.1



N/S: South Road
E/W: Loomis Street/ Railroad Avenue
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
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File Name : 123082 PP
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	South Road From North				Loomis Street From East				South Road From South				Railroad Avenue From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	3	18	6	0	3	12	23	0	21	67	8	0	6	9	6	0	182
03:15 PM	6	24	5	0	12	18	30	0	31	63	6	1	2	20	3	0	221
03:30 PM	5	16	1	0	6	12	32	0	51	90	12	0	11	34	3	0	273
03:45 PM	11	20	5	0	5	18	32	0	36	122	14	0	11	30	14	0	318
Total	25	78	17	0	26	60	117	0	139	342	40	1	30	93	26	0	994
04:00 PM	4	19	4	0	9	17	31	0	42	119	5	0	6	26	8	0	290
04:15 PM	0	17	5	0	3	23	29	0	50	153	3	0	8	16	2	0	309
04:30 PM	0	11	5	0	4	25	35	0	61	140	4	0	4	41	7	0	337
04:45 PM	3	16	5	0	10	27	33	0	74	145	11	0	3	24	9	0	360
Total	7	63	19	0	26	92	128	0	227	557	23	0	21	107	26	0	1296
05:00 PM	4	30	5	0	2	28	22	0	116	131	19	0	5	23	4	0	389
05:15 PM	0	21	3	0	7	26	26	0	103	126	19	0	1	24	4	0	360
05:30 PM	3	23	4	0	7	21	23	0	102	117	18	0	4	38	3	0	363
05:45 PM	5	15	7	0	9	31	25	0	91	113	17	0	3	20	3	0	339
Total	12	89	19	0	25	106	96	0	412	487	73	0	13	105	14	0	1451
Grand Total	44	230	55	0	77	258	341	0	778	1386	136	1	64	305	66	0	3741
Apprch %	13.4	69.9	16.7	0	11.4	38.2	50.4	0	33.8	60.2	5.9	0	14.7	70.1	15.2	0	
Total %	1.2	6.1	1.5	0	2.1	6.9	9.1	0	20.8	37	3.6	0	1.7	8.2	1.8	0	
Cars	40	226	51	0	72	248	334	0	766	1380	118	1	62	298	65	0	3661
% Cars	90.9	98.3	92.7	0	93.5	96.1	97.9	0	98.5	99.6	86.8	100	96.9	97.7	98.5	0	97.9
Heavy Vehicles	4	4	4	0	5	10	7	0	12	6	18	0	2	7	1	0	80
% Heavy Vehicles	9.1	1.7	7.3	0	6.5	3.9	2.1	0	1.5	0.4	13.2	0	3.1	2.3	1.5	0	2.1

	South Road From North					Loomis Street From East					South Road From South					Railroad Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	3	16	5	0	24	10	27	33	0	70	74	145	11	0	230	3	24	9	0	36	360
05:00 PM	4	30	5	0	39	2	28	22	0	52	116	131	19	0	266	5	23	4	0	32	389
05:15 PM	0	21	3	0	24	7	26	26	0	59	103	126	19	0	248	1	24	4	0	29	360
05:30 PM	3	23	4	0	30	7	21	23	0	51	102	117	18	0	237	4	38	3	0	45	363
Total Volume	10	90	17	0	117	26	102	104	0	232	395	519	67	0	981	13	109	20	0	142	1472
% App. Total	8.5	76.9	14.5	0		11.2	44	44.8	0		40.3	52.9	6.8	0		9.2	76.8	14.1	0		
PHF	.625	.750	.850	.000	.750	.650	.911	.788	.000	.829	.851	.895	.882	.000	.922	.650	.717	.556	.000	.789	.946
Cars	10	90	16	0	116	25	101	102	0	228	389	519	60	0	968	13	109	20	0	142	1454
% Cars	100	100	94.1	0	99.1	96.2	99.0	98.1	0	98.3	98.5	100	89.6	0	98.7	100	100	100	0	100	98.8
Heavy Vehicles	0	0	1	0	1	1	1	2	0	4	6	0	7	0	13	0	0	0	0	0	18
% Heavy Vehicles	0	0	5.9	0	0.9	3.8	1.0	1.9	0	1.7	1.5	0	10.4	0	1.3	0	0	0	0	0	1.2

N/S: South Road
E/W: Loomis Street/ Railroad Avenue
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Groups Printed- Cars

	South Road From North				Loomis Street From East				South Road From South				Railroad Avenue From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	3	16	6	0	3	12	23	0	20	67	5	0	5	9	6	0	175
03:15 PM	6	24	4	0	12	16	28	0	30	63	6	1	2	19	3	0	214
03:30 PM	5	15	1	0	4	12	32	0	50	88	7	0	11	30	3	0	258
03:45 PM	7	20	4	0	5	16	32	0	35	121	13	0	10	30	14	0	307
Total	21	75	15	0	24	56	115	0	135	339	31	1	28	88	26	0	954
04:00 PM	4	18	4	0	9	14	29	0	42	118	4	0	6	25	7	0	280
04:15 PM	0	17	5	0	2	21	29	0	48	151	3	0	8	15	2	0	301
04:30 PM	0	11	4	0	4	25	34	0	61	140	3	0	4	41	7	0	334
04:45 PM	3	16	5	0	9	27	33	0	73	145	8	0	3	24	9	0	355
Total	7	62	18	0	24	87	125	0	224	554	18	0	21	105	25	0	1270
05:00 PM	4	30	4	0	2	28	21	0	112	131	18	0	5	23	4	0	382
05:15 PM	0	21	3	0	7	26	25	0	102	126	17	0	1	24	4	0	356
05:30 PM	3	23	4	0	7	20	23	0	102	117	17	0	4	38	3	0	361
05:45 PM	5	15	7	0	8	31	25	0	91	113	17	0	3	20	3	0	338
Total	12	89	18	0	24	105	94	0	407	487	69	0	13	105	14	0	1437
Grand Total	40	226	51	0	72	248	334	0	766	1380	118	1	62	298	65	0	3661
Apprch %	12.6	71.3	16.1	0	11	37.9	51.1	0	33.8	60.9	5.2	0	14.6	70.1	15.3	0	
Total %	1.1	6.2	1.4	0	2	6.8	9.1	0	20.9	37.7	3.2	0	1.7	8.1	1.8	0	

	South Road From North					Loomis Street From East					South Road From South					Railroad Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	3	16	5	0	24	9	27	33	0	69	73	145	8	0	226	3	24	9	0	36	355
05:00 PM	4	30	4	0	38	2	28	21	0	51	112	131	18	0	261	5	23	4	0	32	382
05:15 PM	0	21	3	0	24	7	26	25	0	58	102	126	17	0	245	1	24	4	0	29	356
05:30 PM	3	23	4	0	30	7	20	23	0	50	102	117	17	0	236	4	38	3	0	45	361
Total Volume	10	90	16	0	116	25	101	102	0	228	389	519	60	0	968	13	109	20	0	142	1454
% App. Total	8.6	77.6	13.8	0		11	44.3	44.7	0		40.2	53.6	6.2	0		9.2	76.8	14.1	0		
PHF	.625	.750	.800	.000	.763	.694	.902	.773	.000	.826	.868	.895	.833	.000	.927	.650	.717	.556	.000	.789	.952

N/S: South Road
E/W: Loomis Street/ Railroad Avenue
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

File Name : 123082 PP
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Heavy Vehicles

	South Road From North				Loomis Street From East				South Road From South				Railroad Avenue From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
03:00 PM	0	2	0	0	0	0	0	0	1	0	3	0	1	0	0	0	7
03:15 PM	0	0	1	0	0	2	2	0	1	0	0	0	0	1	0	0	7
03:30 PM	0	1	0	0	2	0	0	0	1	2	5	0	0	4	0	0	15
03:45 PM	4	0	1	0	0	2	0	0	1	1	1	0	1	0	0	0	11
Total	4	3	2	0	2	4	2	0	4	3	9	0	2	5	0	0	40
04:00 PM	0	1	0	0	0	3	2	0	0	1	1	0	0	1	1	0	10
04:15 PM	0	0	0	0	1	2	0	0	2	2	0	0	0	1	0	0	8
04:30 PM	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	3
04:45 PM	0	0	0	0	1	0	0	0	1	0	3	0	0	0	0	0	5
Total	0	1	1	0	2	5	3	0	3	3	5	0	0	2	1	0	26
05:00 PM	0	0	1	0	0	0	1	0	4	0	1	0	0	0	0	0	7
05:15 PM	0	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	4
05:30 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
05:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	1	0	1	1	2	0	5	0	4	0	0	0	0	0	14
Grand Total	4	4	4	0	5	10	7	0	12	6	18	0	2	7	1	0	80
Apprch %	33.3	33.3	33.3	0	22.7	45.5	31.8	0	33.3	16.7	50	0	20	70	10	0	
Total %	5	5	5	0	6.2	12.5	8.8	0	15	7.5	22.5	0	2.5	8.8	1.2	0	

	South Road From North					Loomis Street From East					South Road From South					Railroad Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:30 PM																					
03:30 PM	0	1	0	0	1	2	0	0	0	2	1	2	5	0	8	0	4	0	0	4	15
03:45 PM	4	0	1	0	5	0	2	0	0	2	1	1	1	0	3	1	0	0	0	1	11
04:00 PM	0	1	0	0	1	0	3	2	0	5	0	1	1	0	2	0	1	1	0	2	10
04:15 PM	0	0	0	0	0	1	2	0	0	3	2	2	0	0	4	0	1	0	0	1	8
Total Volume	4	2	1	0	7	3	7	2	0	12	4	6	7	0	17	1	6	1	0	8	44
% App. Total	57.1	28.6	14.3	0		25	58.3	16.7	0		23.5	35.3	41.2	0		12.5	75	12.5	0		
PHF	.250	.500	.250	.000	.350	.375	.583	.250	.000	.600	.500	.750	.350	.000	.531	.250	.375	.250	.000	.500	.733

N/S: South Road
E/W: Loomis Street/ Railroad Avenue
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION
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File Name : 123082 PP
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

Groups Printed- Peds and Bicycles

	South Road From North				Loomis Street From East				South Road From South				Railroad Avenue From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	3
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
03:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	1	0	0	0	2	0	0	1	1	0	0	0	1	6
04:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	3
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	7	0	0	0	0	2	0	0	0	0	0	9
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
Total	0	0	0	0	0	7	0	0	0	0	2	1	0	0	0	1	11
Grand Total	0	0	0	1	0	7	0	4	0	0	3	3	0	0	0	2	20
Apprch %	0	0	0	100	0	63.6	0	36.4	0	0	50	50	0	0	0	100	
Total %	0	0	0	5	0	35	0	20	0	0	15	15	0	0	0	10	

	South Road From North					Loomis Street From East					South Road From South					Railroad Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 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	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	7	0	0	7	0	0	2	0	2	0	0	0	0	0	9
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	2
Total Volume	0	0	0	0	0	0	7	0	0	7	0	0	2	1	3	0	0	0	1	1	11
% App. Total	0	0	0	0		0	100	0	0		0	0	66.7	33.3		0	0	0	100		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.250	.250	.375	.000	.000	.000	.250	.250	.306

N/S: South Road
E/W: Loomis Street/ Railroad Avenue
City, State: Bedford, MA
Client: Toole Engineering/ C. Fink

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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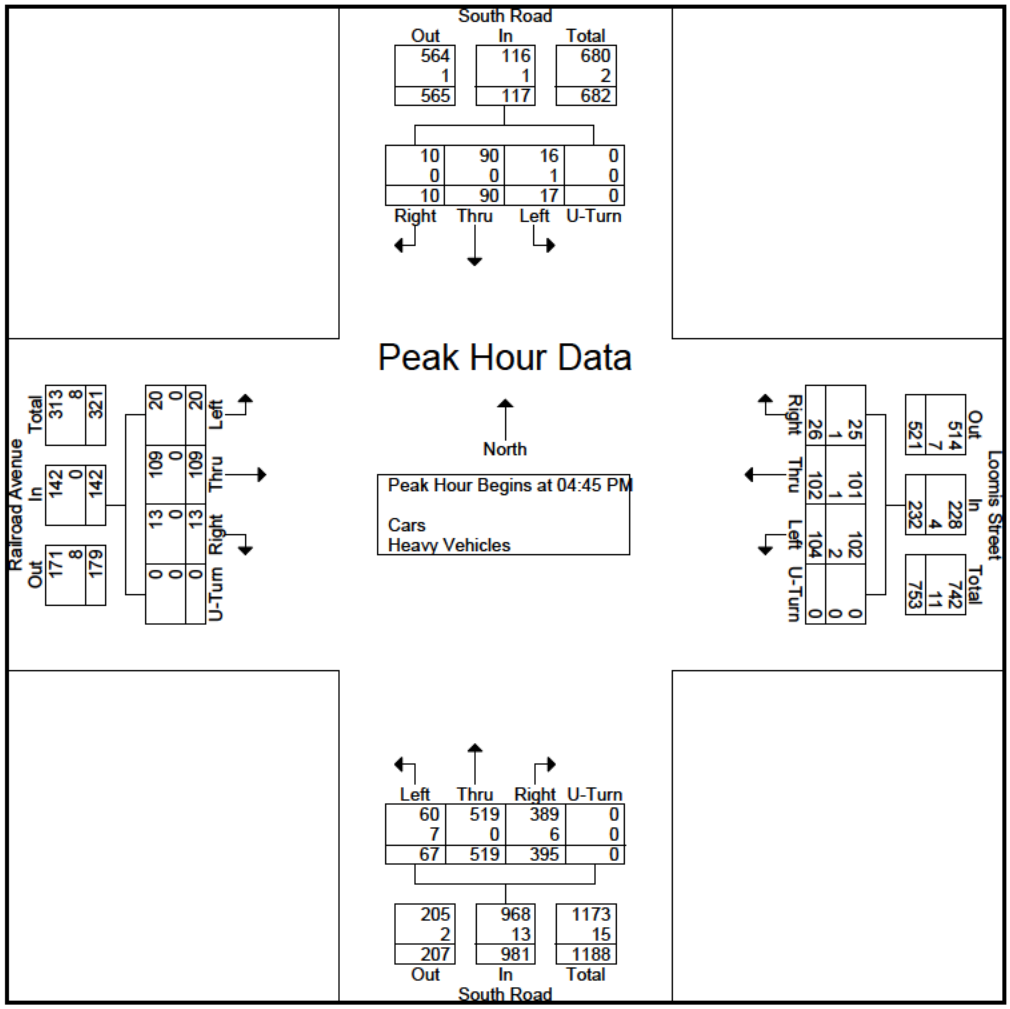
File Name : 123082 PP
Site Code : TBA
Start Date : 11/13/2012
Page No : 1

	South Road From North					Loomis Street From East					South Road From South					Railroad Avenue From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 03 00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	3	16	5	0	24	10	27	33	0	70	74	145	11	0	230	3	24	9	0	36	360
05:00 PM	4	30	5	0	39	2	28	22	0	52	116	131	19	0	266	5	23	4	0	32	389
05:15 PM	0	21	3	0	24	7	26	26	0	59	103	126	19	0	248	1	24	4	0	29	360
05:30 PM	3	23	4	0	30	7	21	23	0	51	102	117	18	0	237	4	38	3	0	45	363
Total Volume	10	90	17	0	117	26	102	104	0	232	395	519	67	0	981	13	109	20	0	142	1472
% App. Total	8.5	76.9	14.5	0		11.2	44	44.8	0		40.3	52.9	6.8	0		9.2	76.8	14.1	0		
PHF	.625	.750	.850	.000	.750	.650	.911	.788	.000	.829	.851	.895	.882	.000	.922	.650	.717	.556	.000	.789	.946
Cars	10	90	16	0	116	25	101	102	0	228	389	519	60	0	968	13	109	20	0	142	1454
% Cars	100	100	94.1	0	99.1	96.2	99.0	98.1	0	98.3	98.5	100	89.6	0	98.7	100	100	100	0	100	98.8
Heavy Vehicles	0	0	1	0	1	1	1	2	0	4	6	0	7	0	13	0	0	0	0	0	18
% Heavy Vehicles	0	0	5.9	0	0.9	3.8	1.0	1.9	0	1.7	1.5	0	10.4	0	1.3	0	0	0	0	0	1.2



Appendix C-3

2012 Automatic Traffic Recorder (ATR) Counts

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

WB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 A Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/26/1														
3	0	11	2	0	0	0	0	0	0	0	0	0	0	13
01:00	0	8	0	0	0	0	0	0	1	0	0	0	0	9
02:00	0	6	3	0	0	0	0	0	0	0	0	0	0	9
03:00	0	12	1	0	0	0	0	0	0	0	0	0	0	13
04:00	0	15	5	0	0	0	0	0	0	0	0	0	0	20
05:00	0	112	22	9	2	1	0	2	2	1	0	0	0	151
06:00	1	385	66	7	14	3	0	4	2	0	0	0	0	482
07:00	2	717	61	4	12	1	0	1	2	0	0	0	0	800
08:00	7	537	54	5	15	3	1	2	3	0	0	0	0	627
09:00	2	480	59	8	16	3	1	2	3	0	0	0	0	574
10:00	1	283	42	7	9	1	1	3	4	1	0	0	0	352
11:00	2	332	51	1	9	2	1	2	1	0	0	0	1	402
12 PM	1	398	54	6	4	3	2	3	6	2	0	0	0	479
13:00	0	393	60	3	5	3	1	3	1	1	0	0	0	470
14:00	0	444	61	9	4	1	0	1	5	0	0	0	0	525
15:00	0	510	66	1	8	0	0	1	0	0	0	0	0	586
16:00	6	659	63	2	5	3	0	2	0	0	0	0	0	740
17:00	3	799	44	2	7	0	0	0	0	0	0	0	0	855
18:00	2	645	30	2	2	0	0	0	0	0	0	0	0	681
19:00	1	341	22	1	0	0	0	0	1	0	0	0	0	366
20:00	0	224	18	0	3	0	0	0	0	1	0	0	0	246
21:00	0	173	11	1	1	0	0	0	0	0	0	0	0	186
22:00	0	88	15	0	0	0	0	0	0	0	0	0	0	103
23:00	0	42	5	0	0	0	0	0	0	0	0	0	0	47
Total	28	7614	815	68	116	24	7	26	31	6	0	0	1	8736
Percent	0.3%	87.2%	9.3%	0.8%	1.3%	0.3%	0.1%	0.3%	0.4%	0.1%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	06:00	05:00	09:00	06:00	08:00	06:00	10:00	05:00			11:00	07:00
Vol.	7	717	66	9	16	3	1	4	4	1			1	800
PM Peak	16:00	17:00	15:00	14:00	15:00	12:00	12:00	12:00	12:00	12:00				17:00
Vol.	6	799	66	9	8	3	2	3	6	2				855

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

WB

PRECISION
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INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

133213 A Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/27/1														
3	0	14	2	0	0	0	0	0	0	0	0	0	0	16
01:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	10	4	0	1	0	0	0	0	0	0	0	0	15
04:00	0	15	4	0	0	0	0	0	3	0	0	0	0	22
05:00	0	101	24	7	2	3	0	0	1	2	0	0	0	140
06:00	1	377	53	8	10	1	1	3	0	0	0	1	0	455
07:00	4	642	63	5	9	1	0	3	0	0	0	0	0	727
08:00	3	529	58	4	10	3	1	0	0	0	0	0	0	608
09:00	2	443	77	13	16	1	0	0	1	0	0	0	0	553
10:00	2	277	54	5	7	2	1	6	4	0	0	0	0	358
11:00	0	300	39	6	9	3	0	0	4	0	0	0	0	361
12 PM	1	333	36	5	14	1	1	1	5	1	0	0	0	398
13:00	1	345	53	3	10	2	1	4	2	0	0	0	0	421
14:00	1	389	49	10	6	0	1	1	1	0	0	0	0	458
15:00	0	270	32	0	3	2	0	2	1	0	0	0	0	310
16:00	7	634	60	1	5	2	0	1	2	0	0	0	0	712
17:00	4	776	62	2	8	2	0	1	4	0	0	0	0	859
18:00	1	686	54	2	5	0	0	0	0	0	0	0	0	748
19:00	1	287	29	1	0	0	0	0	0	0	0	0	0	318
20:00	0	249	18	0	1	0	0	0	1	0	0	0	0	269
21:00	0	184	13	1	2	0	0	1	0	0	0	0	0	201
22:00	0	70	4	1	1	0	0	0	0	0	0	0	0	76
23:00	0	25	6	0	0	0	0	0	0	0	0	0	0	31
Total	28	6968	796	74	119	23	6	23	29	3	0	1	0	8070
Percent	0.3%	86.3%	9.9%	0.9%	1.5%	0.3%	0.1%	0.3%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	09:00	09:00	09:00	05:00	06:00	10:00	10:00	05:00		06:00		07:00
Vol.	4	642	77	13	16	3	1	6	4	2		1		727
PM Peak	16:00	17:00	17:00	14:00	12:00	13:00	12:00	13:00	12:00	12:00				17:00
Vol.	7	776	62	10	14	2	1	4	5	1				859

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

WB

PRECISION
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 A Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/28/1														
3	0	21	1	0	2	0	0	0	0	0	0	0	0	24
01:00	0	10	2	0	1	0	0	0	0	0	0	0	0	13
02:00	0	7	0	0	1	0	0	0	1	0	0	0	0	9
03:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
04:00	0	14	6	1	1	0	0	0	1	0	0	0	0	23
05:00	0	120	23	9	5	0	0	0	1	1	0	0	0	159
06:00	0	416	72	4	9	2	0	3	4	0	0	0	0	510
07:00	0	687	46	7	12	5	0	4	1	1	0	0	0	763
08:00	4	570	70	6	13	2	2	1	2	0	0	0	0	670
09:00	1	445	47	4	16	1	0	1	0	0	0	0	0	515
10:00	1	273	40	5	14	2	1	2	5	1	0	0	0	344
11:00	0	303	55	7	14	1	1	4	1	0	0	0	0	386
12 PM	2	419	43	6	12	8	2	2	2	0	0	0	0	496
13:00	1	397	45	2	9	4	1	1	1	1	0	0	0	462
14:00	1	461	61	10	3	7	1	2	4	1	0	0	0	551
15:00	5	557	59	2	11	1	1	0	1	0	0	0	0	637
16:00	1	746	75	4	9	1	0	2	0	0	0	0	0	838
17:00	1	809	50	2	7	1	0	1	0	0	0	0	0	871
18:00	2	592	37	2	2	0	0	1	0	0	0	0	0	636
19:00	0	368	25	1	1	0	0	1	0	0	0	0	0	396
20:00	0	255	19	0	1	0	0	0	0	0	0	0	0	275
21:00	0	182	14	2	1	1	0	0	0	0	0	0	0	200
22:00	0	105	7	0	1	0	0	0	0	0	0	0	0	113
23:00	0	49	3	0	3	0	0	0	1	0	0	0	0	56
Total	19	7815	801	74	148	36	9	25	25	5	0	0	0	8957
Percent	0.2%	87.3%	8.9%	0.8%	1.7%	0.4%	0.1%	0.3%	0.3%	0.1%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	06:00	05:00	09:00	07:00	08:00	07:00	10:00	05:00				07:00
Vol.	4	687	72	9	16	5	2	4	5	1				763
PM Peak	15:00	17:00	16:00	14:00	12:00	12:00	12:00	12:00	14:00	13:00				17:00
Vol.	5	809	75	10	12	8	2	2	4	1				871

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

WB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 A Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/01/1														
3	0	20	4	0	0	0	0	0	0	0	0	0	0	24
01:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
02:00	0	8	1	0	1	0	0	0	0	0	0	0	0	10
03:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
04:00	0	18	5	0	1	0	0	1	1	0	0	0	0	26
05:00	0	104	21	9	2	1	0	2	2	0	0	0	0	141
06:00	1	373	67	5	9	0	0	3	4	0	0	0	0	462
07:00	5	660	65	4	10	2	2	1	2	0	0	0	0	751
08:00	4	521	64	5	10	5	0	0	0	0	0	0	0	609
09:00	4	400	47	9	16	4	2	3	4	0	0	0	0	489
10:00	0	331	56	4	13	4	1	5	0	1	0	0	0	415
11:00	0	353	38	3	5	1	1	2	3	0	0	0	0	406
12 PM	1	389	55	6	11	1	1	2	3	1	0	0	0	470
13:00	5	398	60	3	5	4	0	0	2	0	0	0	0	477
14:00	1	481	55	8	7	2	1	1	0	0	0	0	0	556
15:00	0	579	63	1	9	1	0	0	0	0	0	0	0	653
16:00	6	668	47	3	8	2	0	3	0	0	0	0	0	737
17:00	4	724	36	5	6	2	0	2	0	0	0	0	0	779
18:00	1	573	36	1	4	0	0	0	0	0	0	0	0	615
19:00	2	305	17	1	2	0	0	0	0	0	0	0	0	327
20:00	2	205	13	0	1	0	0	0	0	0	0	0	0	221
21:00	0	191	4	2	1	0	0	0	0	0	0	0	0	198
22:00	0	193	9	0	1	0	0	0	1	0	0	0	0	204
23:00	0	73	3	0	0	0	0	0	1	0	0	0	0	77
Total	36	7585	767	69	122	29	8	25	23	2	0	0	0	8666
Percent	0.4%	87.5%	8.9%	0.8%	1.4%	0.3%	0.1%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	06:00	05:00	09:00	08:00	07:00	10:00	06:00	10:00				07:00
Vol.	5	660	67	9	16	5	2	5	4	1				751
PM Peak	16:00	17:00	15:00	14:00	12:00	13:00	12:00	16:00	12:00	12:00				17:00
Vol.	6	724	63	8	11	4	1	3	3	1				779

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

WB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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133213 A Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/02/1														
3	1	29	3	0	0	0	0	0	0	0	0	0	0	33
01:00	0	20	2	0	0	0	0	0	0	0	0	0	0	22
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	7	4	0	0	0	0	0	1	0	0	0	0	12
04:00	0	5	4	0	1	0	0	0	0	0	0	0	0	10
05:00	0	25	5	2	3	0	0	0	0	1	0	0	0	36
06:00	0	105	19	1	3	0	0	1	0	0	0	0	0	129
07:00	0	191	28	1	2	0	0	0	1	1	0	0	0	224
08:00	1	232	23	2	6	0	0	1	1	1	0	0	0	267
09:00	1	269	26	3	3	1	0	1	1	0	0	0	0	305
10:00	1	304	29	4	4	0	0	0	2	0	0	0	0	344
11:00	1	391	19	2	1	0	0	0	1	0	0	0	0	415
12 PM	1	421	41	2	4	0	0	1	0	0	0	0	0	470
13:00	5	425	35	3	4	0	0	0	0	0	0	0	0	472
14:00	5	439	29	3	3	0	0	0	0	0	0	0	0	479
15:00	0	439	28	4	2	1	0	0	1	0	0	0	0	475
16:00	2	378	25	2	4	0	0	0	0	0	0	0	0	411
17:00	0	344	14	2	2	0	0	1	0	0	0	0	0	363
18:00	0	323	18	2	2	0	0	0	0	0	0	0	0	345
19:00	0	201	13	2	1	0	0	0	0	0	0	0	0	217
20:00	0	160	9	0	1	0	0	0	0	0	0	0	0	170
21:00	0	192	21	0	1	0	0	0	0	0	0	0	0	214
22:00	0	120	17	0	0	0	0	0	0	0	0	0	0	137
23:00	0	104	4	0	0	0	0	0	0	0	0	0	0	108
Total	18	5130	416	35	47	2	0	5	8	3	0	0	0	5664
Percent	0.3%	90.6%	7.3%	0.6%	0.8%	0.0%	0.0%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	
AM Peak	00:00	11:00	10:00	10:00	08:00	09:00		06:00	10:00	05:00				11:00
Vol.	1	391	29	4	6	1		1	2	1				415
PM Peak	13:00	14:00	12:00	15:00	12:00	15:00		12:00	15:00					14:00
Vol.	5	439	41	4	4	1		1	1					479

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

WB

PRECISION
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 A Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/03/1														
3	0	41	3	0	0	0	0	0	0	0	0	0	0	44
01:00	0	14	0	0	1	0	0	0	0	0	0	0	0	15
02:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
03:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
04:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
05:00	0	23	5	0	0	0	0	0	0	0	0	0	0	28
06:00	0	63	14	0	0	0	0	0	1	0	0	0	0	78
07:00	0	139	16	1	1	0	0	0	0	1	0	0	0	158
08:00	0	146	11	0	1	0	0	0	1	1	0	0	0	160
09:00	0	207	20	0	4	0	0	0	0	0	0	0	0	231
10:00	1	315	19	2	3	0	0	0	0	0	0	0	0	340
11:00	5	295	23	0	0	1	0	1	0	0	0	0	0	325
12 PM	2	419	25	0	2	0	0	0	0	0	0	0	0	448
13:00	2	407	23	0	5	0	0	0	0	0	0	0	0	437
14:00	0	381	34	1	1	2	0	1	0	0	0	0	0	420
15:00	0	385	25	1	1	0	0	0	0	0	0	0	0	412
16:00	3	385	25	0	5	0	0	0	0	0	0	0	0	418
17:00	0	285	29	0	1	0	0	0	0	0	0	0	0	315
18:00	1	254	17	1	0	0	0	0	0	0	0	0	0	273
19:00	1	191	17	1	3	0	0	0	1	0	0	0	0	214
20:00	1	143	13	0	2	0	0	0	0	0	0	0	0	159
21:00	0	92	6	0	1	0	0	0	0	0	0	0	0	99
22:00	0	41	7	0	0	0	0	0	0	0	0	0	0	48
23:00	0	24	0	0	0	0	0	0	0	0	0	0	0	24
Total	16	4275	335	7	31	3	0	2	3	2	0	0	0	4674
Percent	0.3%	91.5%	7.2%	0.1%	0.7%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	10:00	11:00	10:00	09:00	11:00		11:00	06:00	07:00				10:00
Vol.	5	315	23	2	4	1		1	1	1				340
PM Peak	16:00	12:00	14:00	14:00	13:00	14:00		14:00	19:00					12:00
Vol.	3	419	34	1	5	2		1	1					448

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

WB

PRECISION
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Email: datarequests@pdillc.com

133213 A Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/04/1														
3	0	12	3	0	0	0	0	0	0	0	0	0	0	15
01:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	4	2	0	1	0	0	0	0	0	0	0	0	7
04:00	0	17	5	0	0	0	0	0	0	0	0	0	0	22
05:00	1	132	27	7	3	0	0	1	4	0	0	0	0	175
06:00	1	415	67	6	10	3	0	1	1	0	0	0	0	504
07:00	5	629	47	5	8	4	0	2	1	1	0	0	0	702
08:00	6	561	45	6	14	3	0	1	2	0	0	0	0	638
09:00	2	352	55	4	8	1	0	0	3	1	0	0	0	426
10:00	0	273	43	5	15	3	0	2	1	2	0	0	0	344
11:00	1	322	44	3	11	4	1	2	1	0	0	0	0	389
12 PM	1	360	44	4	11	5	2	4	2	2	0	0	0	435
13:00	2	391	55	3	11	5	0	5	3	0	0	0	0	475
14:00	1	451	60	7	8	2	0	2	1	0	0	0	0	532
15:00	4	496	73	1	10	2	0	1	1	0	0	0	0	588
16:00	2	644	81	4	6	1	0	0	0	0	0	0	0	738
17:00	3	796	42	2	5	2	0	2	1	1	0	0	0	854
18:00	1	584	29	2	7	1	0	1	0	0	0	0	0	625
19:00	0	306	27	1	2	0	0	0	0	0	0	0	0	336
20:00	0	180	11	0	3	0	0	0	0	1	0	0	0	195
21:00	0	157	13	1	0	0	0	0	0	0	0	0	0	171
22:00	0	78	4	0	0	0	0	0	0	0	0	0	0	82
23:00	0	37	3	2	1	0	0	0	0	0	0	0	0	43
Total	30	7206	780	63	134	36	3	24	21	8	0	0	0	8305
Percent	0.4%	86.8%	9.4%	0.8%	1.6%	0.4%	0.0%	0.3%	0.3%	0.1%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	06:00	05:00	10:00	07:00	11:00	07:00	05:00	10:00				07:00
Vol.	6	629	67	7	15	4	1	2	4	2				702
PM Peak	15:00	17:00	16:00	14:00	12:00	12:00	12:00	13:00	13:00	12:00				17:00
Vol.	4	796	81	7	11	5	2	5	3	2				854
Total		46593	4710	390	717	153	33	130	140	29	0	1	1	53072

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

EB

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P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 A Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/26/1														
3	0	12	1	0	1	0	0	0	0	0	0	0	0	14
01:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
02:00	0	5	0	0	1	0	0	0	0	0	0	0	0	6
03:00	0	3	3	0	0	0	0	0	1	0	0	0	0	7
04:00	0	19	6	0	3	0	0	0	2	0	0	0	0	30
05:00	0	82	18	0	3	0	0	0	2	0	0	0	0	105
06:00	1	321	45	4	5	1	0	0	1	0	0	0	0	378
07:00	5	641	72	12	4	2	0	2	1	0	0	0	0	739
08:00	3	829	62	4	15	1	0	1	5	0	0	0	0	920
09:00	4	545	61	3	4	2	0	2	3	0	0	0	0	624
10:00	0	350	50	3	10	3	0	7	4	1	0	0	0	428
11:00	0	334	68	6	8	1	0	6	1	0	0	0	0	424
12 PM	1	329	56	1	8	2	0	2	2	0	0	0	0	401
13:00	0	349	50	4	3	1	1	0	4	0	0	0	0	412
14:00	0	399	54	8	3	2	0	2	1	0	0	0	0	469
15:00	1	561	70	4	6	2	0	2	1	0	0	0	0	647
16:00	3	505	45	6	4	0	0	1	1	0	0	0	0	565
17:00	2	510	42	3	1	2	0	0	0	0	0	0	0	560
18:00	2	373	36	2	3	0	0	0	0	0	0	0	0	416
19:00	0	235	22	1	2	0	0	0	0	0	0	0	0	260
20:00	1	154	17	0	0	0	0	0	0	0	0	0	0	172
21:00	0	81	4	0	1	0	0	0	1	0	0	0	0	87
22:00	0	51	14	1	0	0	0	0	0	0	0	0	0	66
23:00	0	43	4	0	0	0	0	0	0	0	0	0	0	47
Total	23	6735	801	62	85	19	1	25	30	1	0	0	0	7782
Percent	0.3%	86.5%	10.3%	0.8%	1.1%	0.2%	0.0%	0.3%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	07:00	07:00	08:00	10:00		10:00	08:00	10:00				08:00
Vol.	5	829	72	12	15	3		7	5	1				920
PM Peak	16:00	15:00	15:00	14:00	12:00	12:00	13:00	12:00	13:00					15:00
Vol.	3	561	70	8	8	2	1	2	4					647

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

EB

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133213 A Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/27/1														
3	0	30	7	0	1	0	0	0	0	0	0	0	0	38
01:00	0	8	2	0	1	0	0	0	0	1	0	0	0	12
02:00	0	8	0	1	0	0	0	0	1	0	0	0	0	10
03:00	0	8	3	0	1	0	0	0	0	0	0	0	0	12
04:00	0	15	8	0	1	0	0	0	3	0	0	0	0	27
05:00	0	74	17	1	1	0	0	0	0	0	0	0	0	93
06:00	2	303	34	3	2	2	0	0	1	0	0	0	0	347
07:00	6	689	65	14	8	3	0	1	2	0	0	0	0	788
08:00	2	851	65	5	8	3	0	0	1	0	0	0	0	935
09:00	2	536	65	4	7	0	0	0	0	0	0	0	0	614
10:00	2	285	37	3	10	2	0	1	1	0	1	0	0	342
11:00	0	285	63	9	9	2	0	0	4	0	0	0	0	372
12 PM	2	299	41	7	5	1	0	1	2	0	0	0	0	358
13:00	1	258	47	3	8	2	0	0	0	1	0	0	0	320
14:00	3	352	57	4	8	2	0	3	1	2	0	0	0	432
15:00	7	365	58	4	6	0	0	3	0	0	0	0	0	443
16:00	3	453	47	5	2	3	0	1	0	0	0	0	0	514
17:00	5	442	37	2	1	0	0	0	0	0	0	0	0	487
18:00	1	351	26	3	2	0	0	0	1	0	0	0	0	384
19:00	0	214	22	1	2	0	0	1	0	0	0	0	0	240
20:00	0	134	19	0	1	1	0	0	1	0	0	0	0	156
21:00	0	81	13	0	0	0	0	0	0	0	0	0	0	94
22:00	0	47	10	1	0	0	0	0	1	0	0	0	0	59
23:00	0	36	3	0	0	0	0	0	0	0	0	0	0	39
Total	36	6124	746	70	84	21	0	11	19	4	1	0	0	7116
Percent	0.5%	86.1%	10.5%	1.0%	1.2%	0.3%	0.0%	0.2%	0.3%	0.1%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	07:00	07:00	10:00	07:00		07:00	11:00	01:00	10:00			08:00
Vol.	6	851	65	14	10	3		1	4	1	1			935
PM Peak	15:00	16:00	15:00	12:00	13:00	16:00		14:00	12:00	14:00				16:00
Vol.	7	453	58	7	8	3		3	2	2				514

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

EB

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 A Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/28/1														
3	0	13	0	0	1	0	0	0	0	0	0	0	0	14
01:00	0	5	0	1	0	0	0	0	0	0	0	0	0	6
02:00	0	12	2	1	1	0	0	0	0	0	0	0	0	16
03:00	0	6	2	0	0	0	0	0	2	0	0	0	0	10
04:00	0	12	7	0	3	0	0	0	2	0	0	0	0	24
05:00	0	82	13	0	3	1	0	0	3	0	0	0	0	102
06:00	1	289	47	3	3	0	0	0	0	1	0	0	0	344
07:00	5	705	70	12	11	3	0	1	1	0	0	0	0	808
08:00	5	809	59	5	15	1	0	3	1	0	0	0	0	898
09:00	2	504	70	4	9	1	0	1	1	0	0	0	0	592
10:00	0	321	45	4	10	3	0	2	2	0	0	0	0	387
11:00	1	345	50	4	13	1	0	2	1	0	0	0	0	417
12 PM	3	355	58	3	10	0	0	2	3	0	0	0	0	434
13:00	2	357	31	2	12	2	0	1	2	0	0	0	0	409
14:00	3	373	45	4	8	6	0	3	1	0	0	0	0	443
15:00	0	563	92	6	12	1	0	2	0	0	0	0	0	676
16:00	5	537	60	5	7	0	0	0	0	0	0	0	0	614
17:00	1	465	37	1	1	1	0	1	0	0	0	0	0	507
18:00	2	378	27	2	2	1	0	0	0	0	0	0	0	412
19:00	1	241	33	1	2	0	0	2	0	0	0	0	0	280
20:00	1	150	13	0	2	0	0	0	0	0	0	0	0	166
21:00	0	107	11	0	0	0	0	0	0	0	0	0	0	118
22:00	0	72	9	1	0	0	0	0	2	0	0	0	0	84
23:00	0	54	4	0	0	0	0	0	0	0	0	0	0	58
Total	32	6755	785	59	125	21	0	20	21	1	0	0	0	7819
Percent	0.4%	86.4%	10.0%	0.8%	1.6%	0.3%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	07:00	07:00	08:00	07:00		08:00	05:00	06:00				08:00
Vol.	5	809	70	12	15	3		3	3	1				898
PM Peak	16:00	15:00	15:00	15:00	13:00	14:00		14:00	12:00					15:00
Vol.	5	563	92	6	12	6		3	3					676

PRECISION
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Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Class
Site Code: TBA

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/01/1														
3	0	10	1	1	1	0	0	0	0	0	0	0	0	13
01:00	0	11	4	0	0	0	0	0	0	0	0	0	0	15
02:00	0	5	3	0	1	0	0	0	3	0	0	0	0	12
03:00	0	4	3	0	0	0	0	0	1	0	0	0	0	8
04:00	0	19	8	0	2	0	0	0	2	0	0	0	0	31
05:00	0	75	12	1	1	0	0	0	0	1	0	0	0	90
06:00	0	281	45	3	8	1	0	0	0	0	0	0	0	338
07:00	2	643	74	10	2	2	0	2	2	0	0	0	0	737
08:00	3	732	61	6	9	3	0	1	1	2	0	0	0	818
09:00	3	493	44	5	9	0	0	1	0	0	0	0	0	555
10:00	1	338	62	4	10	3	0	0	2	0	0	0	0	420
11:00	0	391	59	5	9	1	0	3	1	0	0	0	0	469
12 PM	0	365	56	6	4	0	0	2	1	0	0	0	0	434
13:00	0	314	56	3	6	2	0	2	2	0	0	0	0	385
14:00	2	438	62	4	4	1	0	0	1	0	0	0	0	512
15:00	1	542	74	4	5	0	0	1	1	0	0	0	0	628
16:00	6	507	48	5	3	0	0	2	0	0	0	0	0	571
17:00	4	450	32	1	6	0	1	0	0	0	0	0	0	494
18:00	1	403	25	2	1	1	0	0	0	0	0	0	0	433
19:00	1	234	17	1	2	1	0	1	0	0	0	0	0	257
20:00	1	111	12	0	2	0	0	0	0	0	0	0	0	126
21:00	0	115	9	1	0	0	0	1	0	0	0	0	0	126
22:00	0	72	6	1	0	0	0	0	0	0	0	0	0	79
23:00	0	70	4	0	0	0	0	0	0	0	0	0	0	74
Total	25	6623	777	63	85	15	1	16	17	3	0	0	0	7625
Percent	0.3%	86.9%	10.2%	0.8%	1.1%	0.2%	0.0%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	07:00	07:00	10:00	08:00		11:00	02:00	08:00				08:00
Vol.	3	732	74	10	10	3		3	3	2				818
PM Peak	16:00	15:00	15:00	12:00	13:00	13:00	17:00	12:00	13:00					15:00
Vol.	6	542	74	6	6	2	1	2	2					628

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

EB

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133213 A Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/02/1														
3	0	28	3	0	2	0	0	0	0	0	0	0	0	33
01:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
02:00	0	7	0	0	2	0	0	0	0	0	0	0	0	9
03:00	0	2	3	0	0	0	0	0	0	0	0	0	0	5
04:00	0	10	2	0	2	0	0	1	1	0	0	0	0	16
05:00	0	25	4	0	1	0	0	0	0	0	0	0	0	30
06:00	0	70	15	0	3	1	0	0	1	0	0	0	0	90
07:00	0	140	18	1	1	0	0	0	1	0	0	0	0	161
08:00	1	212	20	2	5	1	0	0	1	1	0	0	0	243
09:00	1	277	30	2	4	0	0	0	2	0	0	0	0	316
10:00	4	356	29	3	3	0	0	2	3	0	0	0	0	400
11:00	5	405	31	2	3	0	0	0	3	0	0	0	0	449
12 PM	3	381	32	2	6	0	0	0	0	0	0	0	0	424
13:00	0	401	28	2	2	0	0	0	0	0	0	0	0	433
14:00	6	389	49	3	4	0	0	1	0	0	0	0	0	452
15:00	2	401	25	3	5	0	0	1	0	0	0	0	0	437
16:00	0	380	24	4	1	0	0	0	0	0	0	0	0	409
17:00	0	321	28	3	2	1	0	0	0	0	0	0	0	355
18:00	1	235	20	2	2	0	0	0	0	1	0	0	0	261
19:00	0	153	19	2	1	0	0	0	0	1	0	0	0	176
20:00	0	84	8	1	0	0	0	0	0	0	0	0	0	93
21:00	0	112	4	0	0	0	0	0	0	0	0	0	0	116
22:00	0	74	11	0	0	0	0	0	0	0	0	0	0	85
23:00	0	76	4	0	0	0	0	0	0	0	0	0	0	80
Total	23	4547	408	32	49	3	0	5	12	3	0	0	0	5082
Percent	0.5%	89.5%	8.0%	0.6%	1.0%	0.1%	0.0%	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00	10:00	08:00	06:00		10:00	10:00	08:00				11:00
Vol.	5	405	31	3	5	1		2	3	1				449
PM Peak	14:00	13:00	14:00	16:00	12:00	17:00		14:00		18:00				14:00
Vol.	6	401	49	4	6	1		1		1				452

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

EB

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133213 A Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/03/1														
3	0	26	1	0	0	0	0	0	0	0	0	0	0	27
01:00	1	15	1	0	1	0	0	0	0	0	0	0	0	18
02:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
05:00	0	12	2	0	0	0	0	0	1	0	0	0	0	15
06:00	0	44	8	0	0	0	0	0	1	0	0	0	0	53
07:00	0	74	14	0	1	0	0	0	1	0	0	0	0	90
08:00	0	181	9	1	2	0	0	0	1	0	0	0	0	194
09:00	0	222	20	0	1	0	0	0	0	0	0	0	0	243
10:00	1	307	26	0	1	0	0	1	1	0	0	0	0	337
11:00	3	300	39	0	1	1	0	0	0	0	0	0	0	344
12 PM	0	355	37	1	5	0	0	0	0	0	0	0	0	398
13:00	1	368	28	0	2	0	0	0	0	0	0	0	0	399
14:00	1	351	37	0	4	0	0	0	0	0	0	0	0	393
15:00	4	380	34	1	3	0	0	1	1	0	0	0	0	424
16:00	1	353	23	0	3	0	0	0	0	0	0	0	0	380
17:00	0	245	29	0	2	0	0	0	0	0	0	0	0	276
18:00	1	179	21	0	1	0	0	0	0	0	0	0	0	202
19:00	0	132	19	1	1	0	0	0	0	0	0	0	0	153
20:00	0	83	8	0	0	1	0	0	0	0	0	0	0	92
21:00	0	63	8	0	0	0	0	0	0	0	0	0	0	71
22:00	0	38	3	0	0	0	0	0	0	0	0	0	0	41
23:00	0	29	2	0	0	0	0	0	0	0	0	0	0	31
Total	13	3770	372	4	28	2	0	2	6	0	0	0	0	4197
Percent	0.3%	89.8%	8.9%	0.1%	0.7%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	10:00	11:00	08:00	08:00	11:00		10:00	05:00					11:00
Vol.	3	307	39	1	2	1		1	1					344
PM Peak	15:00	15:00	12:00	12:00	12:00	20:00		15:00	15:00					15:00
Vol.	4	380	37	1	5	1		1	1					424

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Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Class
Site Code: TBA

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/04/1														
3	0	5	1	0	1	0	0	0	0	0	0	0	0	7
01:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
02:00	0	3	0	1	0	0	0	0	1	0	0	0	0	5
03:00	0	3	3	1	0	0	0	0	1	0	0	0	0	8
04:00	0	15	11	0	3	0	0	0	1	1	0	0	0	31
05:00	0	84	17	0	1	0	0	0	2	0	0	0	0	104
06:00	1	309	46	3	1	2	0	0	1	0	0	0	0	363
07:00	6	673	64	13	9	2	0	3	1	0	0	0	1	772
08:00	3	812	51	6	12	5	1	2	2	1	0	0	0	895
09:00	0	454	54	5	6	5	0	2	1	0	0	0	0	527
10:00	0	310	45	3	7	2	0	1	4	0	0	0	0	372
11:00	0	286	61	4	13	2	0	2	1	0	0	0	0	369
12 PM	1	312	32	3	5	2	0	0	4	1	0	0	0	360
13:00	2	288	32	2	7	4	1	2	0	1	0	0	0	339
14:00	1	338	68	3	4	5	0	3	1	0	0	0	0	423
15:00	3	530	80	6	9	2	0	0	1	0	0	0	0	631
16:00	1	482	44	6	6	0	0	0	0	0	0	0	0	539
17:00	4	481	41	3	10	0	0	1	1	0	0	0	0	541
18:00	2	362	26	1	2	0	0	0	0	0	0	0	0	393
19:00	0	226	17	1	1	0	0	0	0	0	0	0	0	245
20:00	0	123	17	0	1	0	0	0	0	0	0	0	0	141
21:00	0	91	7	0	0	0	0	0	1	0	0	0	0	99
22:00	0	52	5	1	0	0	0	0	0	0	0	0	0	58
23:00	0	31	12	0	0	0	0	1	0	0	0	0	0	44
Total	24	6276	735	62	98	31	2	17	23	4	0	0	1	7273
Percent	0.3%	86.3%	10.1%	0.9%	1.3%	0.4%	0.0%	0.2%	0.3%	0.1%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	07:00	07:00	11:00	08:00	08:00	07:00	10:00	04:00			07:00	08:00
Vol.	6	812	64	13	13	5	1	3	4	1			1	895
PM Peak	17:00	15:00	15:00	15:00	17:00	14:00	13:00	14:00	12:00	12:00				15:00
Vol.	4	530	80	6	10	5	1	3	4	1				631
Total		40830	4624	352	554	112	4	96	128	16	1	0	1	46894

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Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
02/26/1																
3	0	0	0	0	1	6	6	0	0	0	0	0	0	13	42	39
01:00	0	0	0	0	3	3	3	0	0	0	0	0	0	9	40	37
02:00	0	0	0	1	1	3	4	0	0	0	0	0	0	9	41	38
03:00	0	0	0	0	0	9	2	2	0	0	0	0	0	13	39	39
04:00	0	0	0	0	2	3	11	3	1	0	0	0	0	20	45	41
05:00	0	0	0	1	16	64	63	7	0	0	0	0	0	151	42	39
06:00	0	0	0	**8**	64	227	172	10	1	0	0	0	0	482	42	38
07:00	0	0	0	6	116	**468**	**195**	13	**2**	0	0	0	0	**800**	41	38
08:00	**1**	**1**	**1**	8	**128**	376	99	11	2	0	0	0	0	627	40	37
09:00	0	0	0	3	100	290	159	**21**	1	0	0	0	0	574	41	38
10:00	0	0	0	9	50	168	114	10	1	0	0	0	0	352	42	38
11:00	0	0	0	4	66	207	111	14	0	0	0	0	0	402	41	38
12 PM	0	0	0	**15**	**93**	262	101	8	0	0	0	0	0	479	40	37
13:00	0	0	0	1	71	243	140	14	**1**	0	0	0	0	470	42	38
14:00	0	0	**1**	12	68	**264**	**159**	**20**	1	0	0	0	0	**525**	42	38
15:00	0	0	0	1	80	310	180	**14**	**1**	0	0	0	0	586	41	38
16:00	0	0	0	9	109	402	**212**	8	0	0	0	0	0	740	41	38
17:00	0	0	**2**	**22**	**251**	**454**	121	5	0	0	0	0	0	**855**	39	36
18:00	0	0	0	20	207	363	78	12	1	0	0	0	0	681	39	36
19:00	0	0	0	2	60	198	97	9	0	0	0	0	0	366	41	38
20:00	0	0	0	2	41	122	68	12	1	0	0	0	0	246	42	38
21:00	0	0	0	1	14	91	71	9	0	0	0	0	0	186	42	39
22:00	0	0	0	0	12	49	33	9	0	0	0	0	0	103	43	39
23:00	0	0	0	0	4	23	16	3	1	0	0	0	0	47	43	39
%	0.0%	0.0%	0.0%	1.4%	17.8%	52.7%	25.4%	2.4%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	06:00	08:00	07:00	07:00	09:00	07:00					07:00		
Vol.	1	1	1	8	128	468	195	21	2					800		
Midday Peak			14:00	12:00	12:00	14:00	14:00	14:00	13:00					14:00		
Vol.			1	15	93	264	159	20	1					525		
PM Peak			17:00	17:00	17:00	17:00	16:00	15:00	15:00					17:00		
Vol.			2	22	251	454	212	14	1					855		

% iles	
15th Percentile :	32 MPH
50th Percentile :	36 MPH
85th Percentile :	41 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	33-42 MPH
Number in Pace :	6556
Percent in Pace :	75.0%
Number of Vehicles > 40 MPH :	2095
Percent of Vehicles > 40 MPH :	24.0%
Mean Speed(Average) :	37 MPH

PRECISION
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Massachusetts Avenue (Route 2A)
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City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
02/27/1																
3	0	0	0	0	2	7	7	0	0	0	0	0	0	16	43	39
01:00	0	0	0	0	3	2	2	0	1	0	0	0	0	8	33	38
02:00	0	0	0	0	0	2	2	2	0	0	0	0	0	6	*	42
03:00	0	0	0	0	3	6	3	3	0	0	0	0	0	15	44	39
04:00	0	0	0	1	3	6	10	2	0	0	0	0	0	22	42	39
05:00	0	0	0	2	23	67	37	**11**	0	0	0	0	0	140	42	38
06:00	0	0	0	5	55	247	**137**	11	0	0	0	0	0	455	41	38
07:00	**2**	0	0	8	**191**	**413**	102	10	1	0	0	0	0	**727**	39	36
08:00	0	0	**5**	25	160	342	70	5	0	0	0	0	**1**	608	39	36
09:00	0	0	4	**27**	134	290	87	8	**3**	0	0	0	0	553	40	36
10:00	0	0	0	10	62	197	79	9	0	1	0	0	0	358	41	37
11:00	0	0	0	6	74	165	**105**	8	**3**	0	0	0	0	361	41	38
12 PM	0	0	**4**	6	86	201	94	6	0	0	0	0	**1**	398	41	37
13:00	0	0	0	**17**	71	**229**	93	**11**	0	0	0	0	0	421	41	37
14:00	0	0	0	17	**105**	224	105	7	0	0	0	0	0	**458**	41	37
15:00	**101**	32	**34**	35	44	57	6	1	0	0	0	0	0	310	34	19
16:00	39	**33**	27	18	129	**349**	**109**	**8**	0	0	0	0	0	712	39	32
17:00	0	0	20	121	321	320	73	4	0	0	0	0	0	**859**	38	34
18:00	0	0	19	**128**	**356**	218	23	4	0	0	0	0	0	748	37	33
19:00	0	0	0	8	84	173	49	3	**1**	0	0	0	0	318	39	36
20:00	0	0	0	4	74	143	46	2	0	0	0	0	0	269	40	36
21:00	0	0	1	6	52	102	35	4	1	0	0	0	0	201	40	36
22:00	0	0	0	2	8	38	22	6	0	0	0	0	0	76	42	38
23:00	0	0	0	0	8	12	9	2	0	0	0	0	0	31	42	38
%	1.8%	0.8%	1.4%	5.5%	25.4%	47.2%	16.2%	1.6%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00		08:00	09:00	07:00	07:00	06:00	05:00	09:00				08:00	07:00		
Vol.	2		5	27	191	413	137	11	3				1	727		
Midday Peak			12:00	13:00	14:00	13:00	11:00	13:00	11:00				12:00	14:00		
Vol.			4	17	105	229	105	11	3				1	458		
PM Peak	15:00	16:00	15:00	18:00	18:00	16:00	16:00	16:00	19:00					17:00		
Vol.	101	33	34	128	356	349	109	8	1					859		

% iles	
15th Percentile :	29 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH

Stats	
10 MPH Pace Speed :	32-41 MPH
Number in Pace :	5471
Percent in Pace :	67.8%
Number of Vehicles > 40 MPH :	1262
Percent of Vehicles > 40 MPH :	15.6%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
02/28/1																
3	0	0	0	0	1	13	7	3	0	0	0	0	0	24	43	39
01:00	0	0	0	0	1	7	3	1	**1**	0	0	0	0	13	41	40
02:00	0	0	0	0	1	4	4	0	0	0	0	0	0	9	41	39
03:00	0	0	0	0	1	2	5	1	1	0	0	0	0	10	43	42
04:00	0	0	0	0	3	9	10	1	0	0	0	0	0	23	42	39
05:00	0	0	**1**	1	21	72	56	8	0	0	0	0	0	159	42	38
06:00	0	0	0	8	53	258	167	**22**	1	0	**1**	0	0	510	42	38
07:00	0	0	0	**15**	131	**418**	**186**	13	0	0	0	0	0	**763**	41	37
08:00	**1**	0	0	12	**155**	355	132	14	1	0	0	0	0	670	40	37
09:00	0	0	1	8	81	269	141	15	0	0	0	0	0	515	41	38
10:00	0	4	0	7	40	163	120	9	1	0	0	0	0	344	42	38
11:00	**3**	**11**	**9**	7	55	163	124	13	0	**1**	0	0	0	386	42	36
12 PM	0	0	9	8	98	260	112	7	**1**	1	0	0	0	496	40	37
13:00	0	0	1	5	62	204	**169**	**20**	1	0	0	0	0	462	42	38
14:00	0	0	0	**16**	**103**	**266**	154	11	1	0	0	0	0	**551**	41	37
15:00	**1**	0	0	4	101	356	159	**16**	0	0	0	0	0	637	41	38
16:00	0	0	3	13	131	494	**191**	6	0	0	0	0	0	838	40	37
17:00	0	0	4	19	**196**	**500**	145	7	0	0	0	0	0	**871**	40	37
18:00	0	**1**	**6**	**21**	176	329	99	4	0	0	0	0	0	636	39	36
19:00	0	0	0	2	56	233	93	12	0	0	0	0	0	396	41	38
20:00	1	0	0	2	26	134	100	10	**2**	0	0	0	0	275	42	39
21:00	0	0	0	2	30	92	65	10	1	0	0	0	0	200	42	38
22:00	0	0	0	0	13	47	47	6	0	0	0	0	0	113	42	39
23:00	0	0	0	0	6	24	20	6	0	0	0	0	0	56	43	39
%	0.1%	0.2%	0.4%	1.7%	17.2%	52.2%	25.8%	2.4%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00		05:00	07:00	08:00	07:00	07:00	06:00	01:00		06:00			07:00		
Vol.	1		1	15	155	418	186	22	1		1			763		
Midday Peak	11:00	11:00	11:00	14:00	14:00	14:00	13:00	13:00	12:00	11:00				14:00		
Vol.	3	11	9	16	103	266	169	20	1	1				551		
PM Peak	15:00	18:00	18:00	18:00	17:00	17:00	16:00	15:00	20:00					17:00		
Vol.	1	1	6	21	196	500	191	16	2					871		

% iles	
15th Percentile :	32 MPH
50th Percentile :	36 MPH
85th Percentile :	41 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	33-42 MPH
Number in Pace :	6665
Percent in Pace :	74.4%
Number of Vehicles > 40 MPH :	2168
Percent of Vehicles > 40 MPH :	24.2%
Mean Speed(Average) :	37 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/01/1																
3	0	0	0	0	2	8	9	5	0	0	0	0	0	24	45	41
01:00	0	0	0	0	3	1	5	1	0	0	0	0	0	10	43	39
02:00	0	0	0	0	0	3	5	2	0	0	0	0	0	10	44	42
03:00	0	0	1	0	1	2	1	4	0	0	0	0	0	9	47	40
04:00	0	0	0	0	4	12	7	2	0	**1**	0	0	0	26	42	39
05:00	0	0	0	1	10	55	52	22	1	0	0	0	0	141	44	40
06:00	0	0	0	0	44	192	186	**37**	**3**	0	0	0	0	462	43	39
07:00	**1**	**1**	0	**21**	**121**	**392**	**194**	19	1	1	0	0	0	**751**	41	37
08:00	0	0	**2**	5	85	328	174	15	0	0	0	0	0	609	41	38
09:00	0	0	0	8	103	250	120	8	0	0	0	0	0	489	41	37
10:00	0	0	0	4	59	201	136	14	1	0	0	0	0	415	42	38
11:00	0	0	2	2	79	204	104	14	**1**	0	0	0	0	406	41	38
12 PM	0	0	0	3	76	221	148	**22**	0	0	0	0	0	470	42	38
13:00	0	0	0	2	53	259	145	17	1	0	0	0	0	477	42	38
14:00	0	0	**3**	**9**	**93**	**278**	**159**	14	0	0	0	0	0	**556**	41	38
15:00	0	0	0	4	118	367	156	7	0	**1**	0	0	0	653	41	37
16:00	0	0	0	3	136	390	**191**	**17**	0	0	0	0	0	737	41	38
17:00	**1**	**1**	**1**	**14**	**166**	**443**	141	11	**1**	0	0	0	0	**779**	40	37
18:00	0	0	0	10	159	331	109	6	0	0	0	0	0	615	40	37
19:00	0	0	0	1	56	160	97	13	0	0	0	0	0	327	42	38
20:00	0	0	0	3	32	116	65	4	1	0	0	0	0	221	41	38
21:00	0	1	0	2	29	101	56	8	1	0	0	0	0	198	42	38
22:00	0	0	0	0	23	108	65	7	1	0	0	0	0	204	42	38
23:00	0	0	0	0	8	37	28	3	1	0	0	0	0	77	42	39
%	0.0%	0.0%	0.1%	1.1%	16.8%	51.5%	27.2%	3.1%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	08:00	07:00	07:00	07:00	07:00	06:00	06:00	04:00				07:00		
Vol.	1	1	2	21	121	392	194	37	3	1				751		
Midday Peak			14:00	14:00	14:00	14:00	14:00	12:00	11:00					14:00		
Vol.			3	9	93	278	159	22	1					556		
PM Peak	17:00	17:00	17:00	17:00	17:00	17:00	16:00	16:00	17:00	15:00				17:00		
Vol.	1	1	1	14	166	443	191	17	1	1				779		

% iles	
15th Percentile :	32 MPH
50th Percentile :	37 MPH
85th Percentile :	41 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	33-42 MPH
Number in Pace :	6453
Percent in Pace :	74.5%
Number of Vehicles > 40 MPH :	2254
Percent of Vehicles > 40 MPH :	26.0%
Mean Speed(Average) :	38 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/02/1																
3	0	0	0	0	2	16	14	1	0	0	0	0	0	33	42	39
01:00	0	0	0	2	1	13	4	2	0	0	0	0	0	22	42	38
02:00	0	0	0	0	0	3	2	1	0	0	0	0	0	6	38	40
03:00	0	0	**1**	0	1	3	4	3	0	0	0	0	0	12	45	40
04:00	0	0	0	0	1	6	2	1	0	0	0	0	0	10	39	39
05:00	0	0	0	0	3	13	12	7	1	0	0	0	0	36	45	41
06:00	0	0	0	0	8	35	65	20	0	**1**	0	0	0	129	44	41
07:00	0	0	0	**3**	12	92	95	19	**3**	0	0	0	0	224	43	40
08:00	0	0	0	0	15	102	**118**	**30**	2	0	0	0	0	267	44	40
09:00	0	0	0	3	**33**	**148**	105	15	1	0	0	0	0	**305**	42	39
10:00	0	0	0	2	34	187	110	11	0	0	0	0	0	344	42	38
11:00	0	0	**2**	5	69	198	128	13	0	0	0	0	0	415	42	38
12 PM	0	**1**	0	**8**	63	**276**	110	12	0	0	0	0	0	470	41	38
13:00	0	0	0	3	75	223	**159**	12	0	0	0	0	0	472	42	38
14:00	0	0	0	8	**97**	203	155	**16**	0	0	0	0	0	**479**	42	38
15:00	0	0	0	**7**	61	**251**	**136**	**20**	0	0	0	0	0	**475**	42	38
16:00	0	0	0	7	60	209	116	19	0	0	0	0	0	411	42	38
17:00	0	0	0	2	31	183	131	15	1	0	0	0	0	363	42	39
18:00	0	0	0	6	**70**	186	73	10	0	0	0	0	0	345	41	37
19:00	0	0	0	3	32	110	65	7	0	0	0	0	0	217	42	38
20:00	0	0	0	3	24	82	56	3	**2**	0	0	0	0	170	42	38
21:00	0	0	1	2	23	112	75	1	0	0	0	0	0	214	41	38
22:00	0	0	**2**	0	20	70	42	3	0	0	0	0	0	137	41	38
23:00	0	0	0	1	10	62	32	3	0	0	0	0	0	108	41	38
%	0.0%	0.0%	0.1%	1.1%	13.2%	49.1%	31.9%	4.3%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak			03:00	07:00	09:00	09:00	08:00	08:00	07:00	06:00				09:00		
Vol.			1	3	33	148	118	30	3	1				305		
Midday Peak		12:00	11:00	12:00	14:00	12:00	13:00	14:00						14:00		
Vol.		1	2	8	97	276	159	16						479		
PM Peak			22:00	15:00	18:00	15:00	15:00	15:00	20:00					15:00		
Vol.			2	7	70	251	136	20	2					475		

% iles	
15th Percentile :	33 MPH
50th Percentile :	37 MPH
85th Percentile :	42 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	34-43 MPH
Number in Pace :	4235
Percent in Pace :	74.8%
Number of Vehicles > 40 MPH :	1741
Percent of Vehicles > 40 MPH :	30.7%
Mean Speed(Average) :	38 MPH

PRECISION
D A T A
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Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/03/1																
3	0	0	0	0	4	23	11	6	0	0	0	0	0	44	43	39
01:00	0	0	0	0	1	5	9	0	0	0	0	0	0	15	42	40
02:00	0	0	0	0	1	2	6	1	0	0	0	0	0	10	43	41
03:00	0	0	0	0	0	1	4	2	0	0	0	0	0	7	44	43
04:00	0	0	**1**	0	2	3	4	0	0	1	0	0	0	11	41	38
05:00	0	0	0	1	1	10	11	4	0	1	0	0	0	28	44	41
06:00	0	0	0	0	1	25	39	11	**2**	0	0	0	0	78	44	41
07:00	0	0	0	2	5	66	65	17	1	**2**	0	0	0	158	43	40
08:00	0	0	0	0	10	57	76	16	1	0	0	0	0	160	44	40
09:00	0	0	1	**4**	**29**	**83**	**88**	**24**	2	0	0	0	0	**231**	43	39
10:00	0	0	1	4	61	179	85	10	0	0	0	0	0	340	41	37
11:00	**1**	0	0	2	40	147	116	**18**	**1**	0	0	0	0	325	42	39
12 PM	0	0	**1**	**6**	61	223	**138**	18	1	0	0	0	0	**448**	42	38
13:00	0	0	0	6	50	**230**	136	15	0	0	0	0	0	437	42	38
14:00	0	0	0	6	**62**	217	122	13	0	0	0	0	0	420	42	38
15:00	0	0	0	**13**	**67**	188	**125**	**19**	0	0	0	0	0	412	42	38
16:00	0	0	1	3	63	**220**	117	14	0	0	0	0	0	**418**	41	38
17:00	0	0	0	4	35	161	106	9	0	0	0	0	0	315	42	38
18:00	0	0	**2**	0	35	159	73	4	0	0	0	0	0	273	41	38
19:00	0	0	2	2	24	132	48	5	**1**	0	0	0	0	214	41	38
20:00	**1**	0	0	4	26	84	42	2	0	0	0	0	0	159	41	37
21:00	0	0	0	0	17	54	23	4	1	0	0	0	0	99	41	38
22:00	0	0	0	0	6	23	16	3	0	0	0	0	0	48	42	39
23:00	0	0	0	0	5	7	9	3	0	0	0	0	0	24	43	39
%	0.0%	0.0%	0.2%	1.2%	13.0%	49.2%	31.4%	4.7%	0.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak			04:00	09:00	09:00	09:00	09:00	09:00	06:00	07:00				09:00		
Vol.			1	4	29	83	88	24	2	2				231		
Midday Peak	11:00		12:00	12:00	14:00	13:00	12:00	11:00	11:00					12:00		
Vol.	1		1	6	62	230	138	18	1					448		
PM Peak	20:00		18:00	15:00	15:00	16:00	15:00	15:00	19:00					16:00		
Vol.	1		2	13	67	220	125	19	1					418		

% iles	
15th Percentile :	33 MPH
50th Percentile :	37 MPH
85th Percentile :	42 MPH
95th Percentile :	45 MPH

Stats	
10 MPH Pace Speed :	34-43 MPH
Number in Pace :	3477
Percent in Pace :	74.4%
Number of Vehicles > 40 MPH :	1440
Percent of Vehicles > 40 MPH :	30.8%
Mean Speed(Average) :	38 MPH

PRECISION
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Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/04/1																
3	0	0	0	0	2	6	5	2	0	0	0	0	0	15	43	39
01:00	0	0	0	0	1	2	3	0	0	0	0	0	0	6	41	39
02:00	0	0	0	0	1	1	1	0	0	0	0	0	0	3	*	37
03:00	0	0	0	0	3	1	1	1	1	0	0	0	0	7	32	39
04:00	0	0	0	0	0	6	11	5	0	0	0	0	0	22	45	42
05:00	0	0	0	3	12	61	71	26	2	0	0	0	0	175	44	40
06:00	0	0	0	0	49	228	193	**32**	2	0	0	0	0	504	43	39
07:00	**1**	0	0	8	92	**373**	**203**	21	**4**	0	0	0	0	**702**	42	38
08:00	0	0	0	**11**	**109**	371	137	9	0	**1**	0	0	0	638	40	37
09:00	0	0	0	3	32	212	163	16	0	0	0	0	0	426	42	39
10:00	0	0	0	2	50	172	107	13	0	0	0	0	0	344	42	38
11:00	0	**1**	**1**	6	80	183	105	12	**1**	0	0	0	0	389	41	37
12 PM	0	0	0	**9**	96	216	100	14	0	0	0	0	0	435	41	37
13:00	0	0	0	2	81	251	131	9	0	**1**	0	0	0	475	41	38
14:00	0	0	1	3	**104**	**274**	**134**	**15**	1	0	0	0	0	**532**	41	38
15:00	**1**	0	0	5	89	315	**164**	13	1	0	0	0	0	588	41	38
16:00	0	0	0	9	135	417	162	13	**2**	0	0	0	0	738	41	37
17:00	0	**4**	**12**	**51**	210	**455**	116	6	0	0	0	0	0	**854**	39	36
18:00	0	0	5	15	**235**	313	53	4	0	0	0	0	0	625	38	35
19:00	0	0	1	7	75	173	73	7	0	0	0	0	0	336	41	37
20:00	0	0	0	0	23	106	51	**15**	0	0	0	0	0	195	42	38
21:00	0	0	0	0	33	90	38	10	0	0	0	0	0	171	41	38
22:00	0	0	0	0	11	41	21	9	0	0	0	0	0	82	43	39
23:00	0	0	1	1	1	19	18	3	0	0	0	0	0	43	42	39
%	0.0%	0.1%	0.3%	1.6%	18.4%	51.6%	24.8%	3.1%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00			08:00	08:00	07:00	07:00	06:00	07:00	08:00				07:00		
Vol.	1			11	109	373	203	32	4	1				702		
Midday Peak		11:00	11:00	12:00	14:00	14:00	14:00	14:00	11:00	13:00				14:00		
Vol.		1	1	9	104	274	134	15	1	1				532		
PM Peak	15:00	17:00	17:00	17:00	18:00	17:00	15:00	20:00	16:00					17:00		
Vol.	1	4	12	51	235	455	164	15	2					854		

% iles	
15th Percentile :	32 MPH
50th Percentile :	36 MPH
85th Percentile :	41 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	33-42 MPH
Number in Pace :	6129
Percent in Pace :	73.8%
Number of Vehicles > 40 MPH :	2008
Percent of Vehicles > 40 MPH :	24.2%
Mean Speed(Average) :	37 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
02/26/1																
3	0	0	0	0	1	3	3	6	1	0	0	0	0	14	47	43
01:00	0	0	0	0	0	0	2	1	2	0	0	0	0	5	*	47
02:00	0	0	0	0	0	0	3	1	1	**1**	0	0	0	6	42	47
03:00	0	0	0	0	0	2	2	1	2	0	0	0	0	7	*	44
04:00	0	0	0	0	2	6	12	8	1	1	0	0	0	30	46	43
05:00	0	0	0	3	6	22	40	28	6	0	0	0	0	105	47	42
06:00	0	0	0	2	13	114	178	**64**	**7**	0	0	0	0	378	45	41
07:00	0	0	2	6	58	320	**290**	62	1	0	0	0	0	739	43	39
08:00	**13**	**17**	**43**	**73**	**148**	**438**	172	15	1	0	0	0	0	**920**	40	35
09:00	0	0	0	1	90	303	212	18	0	0	0	0	0	624	42	38
10:00	0	0	1	19	35	168	167	34	4	0	0	0	0	428	43	39
11:00	0	0	0	0	33	**173**	171	44	**3**	0	0	0	0	424	43	40
12 PM	0	0	0	5	19	133	191	50	3	0	0	0	0	401	44	40
13:00	0	**2**	0	**13**	22	138	183	52	2	0	0	0	0	412	44	40
14:00	0	0	0	0	**34**	147	**233**	**55**	0	0	0	0	0	**469**	44	40
15:00	0	0	0	**3**	**37**	197	**322**	**85**	3	0	0	0	0	**647**	44	41
16:00	0	0	0	0	9	203	287	62	**4**	0	0	0	0	565	44	41
17:00	0	0	**1**	0	24	**214**	256	63	0	0	**1**	0	**1**	560	44	40
18:00	0	0	0	1	34	155	166	57	3	0	0	0	0	416	44	40
19:00	0	0	0	0	21	83	115	37	4	0	0	0	0	260	44	40
20:00	0	0	0	0	13	37	90	29	3	0	0	0	0	172	45	41
21:00	0	0	0	0	1	23	44	15	3	**1**	0	0	0	87	46	42
22:00	0	0	0	0	1	14	33	16	2	0	0	0	0	66	46	42
23:00	0	0	0	0	1	17	19	10	0	0	0	0	0	47	45	41
%	0.2%	0.2%	0.6%	1.6%	7.7%	37.4%	41.0%	10.4%	0.7%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	07:00	06:00	06:00	02:00				08:00		
Vol.	13	17	43	73	148	438	290	64	7	1				920		
Midday Peak		13:00		13:00	14:00	11:00	14:00	14:00	11:00					14:00		
Vol.		2		13	34	173	233	55	3					469		
PM Peak			17:00	15:00	15:00	17:00	15:00	15:00	16:00	21:00	17:00		17:00	15:00		
Vol.			1	3	37	214	322	85	4	1	1		1	647		

% iles	15th Percentile :	34 MPH
	50th Percentile :	39 MPH
	85th Percentile :	43 MPH
	95th Percentile :	46 MPH

Stats	10 MPH Pace Speed :	35-44 MPH
	Number in Pace :	5525
	Percent in Pace :	71.0%
	Number of Vehicles > 40 MPH :	3406
	Percent of Vehicles > 40 MPH :	43.8%
	Mean Speed(Average) :	39 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
02/27/1																
3	0	0	0	0	1	0	8	11	**13**	**4**	**1**	0	0	38	54	49
01:00	0	0	0	0	0	1	6	5	0	0	0	0	0	12	47	44
02:00	0	0	0	0	2	1	6	1	0	0	0	0	0	10	43	40
03:00	0	0	0	0	0	3	7	1	0	1	0	0	0	12	43	42
04:00	0	0	0	0	1	11	11	4	0	0	0	0	0	27	44	40
05:00	0	0	0	0	4	32	36	19	2	0	0	0	0	93	45	41
06:00	0	0	1	2	12	129	164	**37**	2	0	0	0	0	347	44	40
07:00	1	4	10	28	106	404	213	22	0	0	0	0	0	788	41	37
08:00	**9**	**15**	**40**	**49**	**201**	**446**	151	23	1	0	0	0	0	**935**	40	35
09:00	0	2	1	12	47	289	**238**	25	0	0	0	0	0	614	42	39
10:00	0	0	0	14	25	114	160	27	2	0	0	0	0	342	43	39
11:00	0	0	0	0	14	156	164	**36**	2	0	0	0	0	372	43	40
12 PM	0	**1**	0	0	14	148	**167**	27	1	0	0	0	0	358	43	40
13:00	0	0	0	0	13	113	162	29	**3**	0	0	0	0	320	43	40
14:00	**1**	0	0	**1**	**46**	**217**	145	19	3	0	0	0	0	**432**	42	39
15:00	**3**	**13**	**39**	**38**	**167**	142	37	4	0	0	0	0	0	443	38	32
16:00	1	0	22	6	60	206	**189**	**30**	0	0	0	0	0	**514**	42	38
17:00	1	0	0	9	87	**227**	135	24	**4**	0	0	0	0	487	42	38
18:00	0	0	4	23	99	173	76	9	0	0	0	0	0	384	40	36
19:00	0	0	0	4	35	99	80	19	3	0	0	0	0	240	43	39
20:00	0	1	0	1	10	81	45	18	0	0	0	0	0	156	43	39
21:00	0	0	0	0	5	31	46	11	1	0	0	0	0	94	44	41
22:00	0	0	0	1	3	19	27	8	0	**1**	0	0	0	59	44	41
23:00	0	0	0	0	0	8	20	9	2	0	0	0	0	39	46	43
%	0.2%	0.5%	1.6%	2.6%	13.4%	42.9%	32.2%	5.9%	0.5%	0.1%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	09:00	06:00	00:00	00:00	00:00			08:00		
Vol.	9	15	40	49	201	446	238	37	13	4	1			935		
Midday Peak	14:00	12:00		14:00	14:00	14:00	12:00	11:00	13:00					14:00		
Vol.	1	1		1	46	217	167	36	3					432		
PM Peak	15:00	15:00	15:00	15:00	15:00	17:00	16:00	16:00	17:00	22:00				16:00		
Vol.	3	13	39	38	167	227	189	30	4	1				514		

% iles	
15th Percentile :	32 MPH
50th Percentile :	37 MPH
85th Percentile :	42 MPH
95th Percentile :	45 MPH

Stats	
10 MPH Pace Speed :	34-43 MPH
Number in Pace :	4896
Percent in Pace :	68.8%
Number of Vehicles > 40 MPH :	2319
Percent of Vehicles > 40 MPH :	32.6%
Mean Speed(Average) :	38 MPH

PRECISION
D A T A
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Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
02/28/1																
3	0	0	0	0	1	4	5	2	1	**1**	0	0	0	14	44	42
01:00	0	0	0	0	1	0	3	2	0	0	0	0	0	6	43	42
02:00	0	0	0	0	0	4	5	5	1	1	0	0	0	16	47	44
03:00	0	0	0	0	0	1	6	1	2	0	0	0	0	10	43	44
04:00	0	0	0	0	0	5	10	8	1	0	0	0	0	24	46	43
05:00	0	0	0	0	7	20	34	36	5	0	0	0	0	102	47	43
06:00	0	0	0	0	3	78	187	**66**	**10**	0	0	0	0	344	45	42
07:00	3	1	**5**	**21**	61	331	345	40	1	0	0	0	0	808	42	39
08:00	**6**	**8**	5	16	**66**	**378**	**371**	47	1	0	0	0	0	**898**	42	38
09:00	1	2	3	8	31	206	283	55	3	0	0	0	0	592	43	40
10:00	0	0	1	1	11	111	196	64	3	0	0	0	0	387	45	41
11:00	0	0	**4**	**2**	14	121	218	49	**9**	0	0	0	0	417	44	41
12 PM	0	0	2	1	**18**	**149**	205	54	5	0	0	0	0	434	44	40
13:00	0	**1**	0	0	12	106	230	55	4	**1**	0	0	0	409	44	41
14:00	**1**	0	0	1	15	114	**235**	**70**	7	0	0	0	0	**443**	45	41
15:00	0	0	0	**6**	**38**	**227**	**340**	58	5	**2**	0	0	0	**676**	43	40
16:00	**5**	0	**2**	4	25	182	307	**86**	3	0	0	0	0	614	44	40
17:00	0	0	0	1	12	145	258	85	**6**	0	0	0	0	507	45	41
18:00	0	0	0	2	28	175	172	32	3	0	0	0	0	412	43	40
19:00	0	0	0	0	14	84	125	55	2	0	0	0	0	280	45	41
20:00	0	0	0	1	8	49	72	30	6	0	0	0	0	166	45	41
21:00	0	0	0	0	4	28	68	16	1	1	0	0	0	118	44	41
22:00	0	0	0	0	2	24	36	16	4	2	0	0	0	84	46	42
23:00	0	0	0	0	1	16	21	17	2	1	0	0	0	58	46	43
%	0.2%	0.2%	0.3%	0.8%	4.8%	32.7%	47.7%	12.1%	1.1%	0.1%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	07:00	07:00	08:00	08:00	08:00	06:00	06:00	00:00				08:00		
Vol.	6	8	5	21	66	378	371	66	10	1				898		
Midday Peak	14:00	13:00	11:00	11:00	12:00	12:00	14:00	14:00	11:00	13:00				14:00		
Vol.	1	1	4	2	18	149	235	70	9	1				443		
PM Peak	16:00		16:00	15:00	15:00	15:00	15:00	16:00	17:00	15:00				15:00		
Vol.	5		2	6	38	227	340	86	6	2				676		

% iles	
15th Percentile :	35 MPH
50th Percentile :	40 MPH
85th Percentile :	44 MPH
95th Percentile :	47 MPH

Stats	
10 MPH Pace Speed :	36-45 MPH
Number in Pace :	5757
Percent in Pace :	73.6%
Number of Vehicles > 40 MPH :	3973
Percent of Vehicles > 40 MPH :	50.8%
Mean Speed(Average) :	40 MPH

PRECISION
D A T A
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Massachusetts Avenue (Route 2A)
east of Marrett Street
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133213 A Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/01/1																
3	0	0	0	1	0	2	6	4	0	0	0	0	0	13	46	42
01:00	0	0	0	0	0	1	6	4	4	0	0	0	0	15	50	46
02:00	0	0	0	0	0	3	4	4	0	0	0	**1**	0	12	46	44
03:00	0	0	0	0	1	0	3	2	1	**1**	0	0	0	8	43	45
04:00	0	0	0	0	1	6	12	11	1	0	0	0	0	31	47	43
05:00	0	0	0	0	3	14	32	27	**12**	1	**1**	0	0	90	49	44
06:00	0	0	0	10	17	86	161	55	9	0	0	0	0	338	45	41
07:00	1	1	1	12	56	**314**	301	49	2	0	0	0	0	737	43	39
08:00	**12**	**6**	**23**	**31**	**87**	295	**313**	47	4	0	0	0	0	**818**	42	37
09:00	0	0	0	0	27	182	284	**59**	3	0	0	0	0	555	44	40
10:00	0	0	0	0	8	106	221	81	3	1	0	0	0	420	45	42
11:00	0	0	0	1	22	**160**	239	45	2	0	0	0	0	469	43	40
12 PM	0	0	0	**3**	12	130	211	70	**8**	0	0	0	0	434	45	41
13:00	0	0	0	1	17	95	220	47	5	0	0	0	0	385	44	41
14:00	0	0	0	1	**25**	142	**246**	**92**	6	0	0	0	0	**512**	45	41
15:00	0	0	0	2	28	155	**327**	**109**	**7**	0	0	0	0	**628**	45	41
16:00	**1**	**3**	**4**	3	24	**223**	240	65	7	**1**	0	0	0	571	44	40
17:00	0	0	0	2	**33**	204	198	56	1	0	0	0	0	494	44	40
18:00	0	0	0	1	19	160	195	54	4	0	0	0	0	433	44	40
19:00	0	0	0	**4**	21	75	110	42	5	0	0	0	0	257	45	41
20:00	0	0	0	0	1	39	63	20	3	0	0	0	0	126	45	41
21:00	0	0	0	0	2	42	51	26	5	0	0	0	0	126	46	42
22:00	0	0	0	0	0	20	38	20	0	1	0	0	0	79	46	42
23:00	0	0	0	0	0	14	37	19	4	0	0	0	0	74	46	43
%	0.2%	0.1%	0.4%	0.9%	5.3%	32.4%	46.1%	13.2%	1.3%	0.1%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	08:00	08:00	07:00	08:00	09:00	05:00	03:00	05:00	02:00		08:00		
Vol.	12	6	23	31	87	314	313	59	12	1	1	1		818		
Midday Peak				12:00	14:00	11:00	14:00	14:00	12:00					14:00		
Vol.				3	25	160	246	92	8					512		
PM Peak	16:00	16:00	16:00	19:00	17:00	16:00	15:00	15:00	15:00	16:00				15:00		
Vol.	1	3	4	4	33	223	327	109	7	1				628		

% iles		
	15th Percentile :	35 MPH
	50th Percentile :	40 MPH
	85th Percentile :	44 MPH
	95th Percentile :	47 MPH

Stats		
	10 MPH Pace Speed :	36-45 MPH
	Number in Pace :	5501
	Percent in Pace :	72.1%
	Number of Vehicles > 40 MPH :	3876
	Percent of Vehicles > 40 MPH :	50.8%
	Mean Speed(Average) :	40 MPH

PRECISION
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133213 A Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/02/1																
3	0	0	0	**1**	0	9	13	8	1	0	**1**	0	0	33	46	42
01:00	0	0	0	0	0	2	6	1	0	0	0	0	0	9	43	41
02:00	0	0	0	0	0	3	1	4	1	0	0	0	0	9	47	44
03:00	0	0	0	0	0	1	3	1	0	0	0	0	0	5	42	42
04:00	0	0	0	0	0	0	8	3	4	1	0	0	0	16	51	46
05:00	0	0	0	0	0	0	14	11	3	1	1	0	0	30	48	46
06:00	0	0	0	0	1	11	39	24	**14**	1	0	0	0	90	49	44
07:00	0	0	**1**	1	2	24	76	49	6	**2**	0	0	0	161	47	43
08:00	0	0	0	0	3	39	135	57	9	0	0	0	0	243	46	43
09:00	0	0	0	0	**8**	**93**	**154**	**58**	3	0	0	0	0	**316**	45	41
10:00	0	0	0	1	10	104	208	70	7	0	0	0	0	400	45	41
11:00	**1**	0	0	7	20	**144**	232	44	1	0	0	0	0	449	44	40
12 PM	0	0	0	2	17	116	208	**74**	**6**	**1**	0	0	0	424	45	41
13:00	0	0	**1**	4	10	108	**244**	61	4	1	0	0	0	433	44	41
14:00	0	0	0	**9**	**38**	142	205	55	3	0	0	0	0	**452**	44	40
15:00	0	0	0	2	**18**	**147**	220	47	3	0	0	0	0	**437**	44	40
16:00	0	0	0	1	14	87	**231**	**74**	2	0	0	0	0	409	45	42
17:00	0	0	0	1	9	105	193	39	8	0	0	0	0	355	44	41
18:00	0	0	0	**4**	6	80	130	36	5	0	0	0	0	261	44	41
19:00	0	0	0	0	5	31	86	45	**9**	0	0	0	0	176	47	43
20:00	0	0	0	0	3	14	48	24	4	0	0	0	0	93	46	43
21:00	0	0	0	0	5	37	42	29	1	**2**	0	0	0	116	46	42
22:00	0	0	0	1	4	23	33	22	1	1	0	0	0	85	46	42
23:00	0	0	0	1	1	17	38	21	2	0	0	0	0	80	46	42
%	0.0%	0.0%	0.0%	0.7%	3.4%	26.3%	50.5%	16.9%	1.9%	0.2%	0.0%	0.0%	0.0%			
AM Peak			07:00	00:00	09:00	09:00	09:00	09:00	06:00	07:00	00:00			09:00		
Vol.			1	1	8	93	154	58	14	2	1			316		
Midday Peak	11:00		13:00	14:00	14:00	11:00	13:00	12:00	12:00	12:00				14:00		
Vol.	1		1	9	38	144	244	74	6	1				452		
PM Peak				18:00	15:00	15:00	16:00	16:00	19:00	21:00				15:00		
Vol.				4	18	147	231	74	9	2				437		

% iles		
	15th Percentile :	36 MPH
	50th Percentile :	40 MPH
	85th Percentile :	45 MPH
	95th Percentile :	48 MPH

Stats		
	10 MPH Pace Speed :	37-46 MPH
	Number in Pace :	3711
	Percent in Pace :	73.0%
	Number of Vehicles > 40 MPH :	2970
	Percent of Vehicles > 40 MPH :	58.4%
	Mean Speed(Average) :	41 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/03/1																
3	0	0	0	0	0	6	12	7	2	0	0	0	0	27	47	43
01:00	0	0	0	0	1	3	9	4	1	0	0	0	0	18	46	42
02:00	0	0	0	0	0	1	3	1	0	0	**1**	0	0	6	42	45
03:00	0	0	0	0	0	1	1	1	1	0	0	0	0	4	*	44
04:00	0	0	0	0	0	2	1	2	1	0	0	0	0	6	*	44
05:00	0	0	0	**1**	0	0	6	6	1	0	1	0	0	15	48	45
06:00	0	0	0	0	2	7	18	20	6	0	0	0	0	53	48	44
07:00	0	0	0	0	0	12	33	35	**10**	0	0	0	0	90	48	44
08:00	0	0	0	0	**11**	38	89	53	3	0	0	0	0	194	46	42
09:00	0	0	0	0	2	**46**	**131**	**57**	6	**1**	0	0	0	**243**	46	42
10:00	0	0	0	0	5	79	178	70	4	1	0	0	0	337	45	42
11:00	0	0	0	0	3	81	153	**99**	8	0	0	0	0	344	46	42
12 PM	0	0	0	0	5	88	212	82	**10**	1	0	0	0	398	46	42
13:00	0	0	0	0	6	121	**213**	54	3	**2**	0	0	0	**399**	44	41
14:00	0	0	0	**1**	**13**	**122**	199	55	2	0	**1**	0	0	393	44	41
15:00	0	0	0	**3**	**31**	**137**	**205**	46	2	0	0	0	0	**424**	44	40
16:00	0	0	0	0	23	131	173	51	2	0	0	0	0	380	44	40
17:00	0	0	0	1	6	69	128	**68**	4	0	0	0	0	276	46	42
18:00	0	**8**	**2**	0	2	65	98	22	4	**1**	0	0	0	202	44	39
19:00	0	0	0	0	4	30	77	36	**6**	0	0	0	0	153	46	42
20:00	0	0	0	0	4	31	45	11	1	0	0	0	0	92	44	41
21:00	0	0	0	0	6	20	29	12	3	1	0	0	0	71	45	41
22:00	0	0	0	0	4	7	17	8	4	1	0	0	0	41	48	42
23:00	0	0	0	1	3	5	9	9	4	0	0	0	0	31	48	42
%	0.0%	0.2%	0.0%	0.2%	3.1%	26.3%	48.6%	19.3%	2.1%	0.2%	0.1%	0.0%	0.0%			
AM Peak				05:00	08:00	09:00	09:00	09:00	07:00	09:00	02:00			09:00		
Vol.				1	11	46	131	57	10	1	1			243		
Midday Peak				14:00	14:00	14:00	13:00	11:00	12:00	13:00	14:00			13:00		
Vol.				1	13	122	213	99	10	2	1			399		
PM Peak		18:00	18:00	15:00	15:00	15:00	15:00	17:00	19:00	18:00				15:00		
Vol.		8	2	3	31	137	205	68	6	1				424		

% iles	15th Percentile :	36 MPH
	50th Percentile :	41 MPH
	85th Percentile :	45 MPH
	95th Percentile :	48 MPH

Stats	10 MPH Pace Speed :	37-46 MPH
	Number in Pace :	3021
	Percent in Pace :	72.0%
	Number of Vehicles > 40 MPH :	2499
	Percent of Vehicles > 40 MPH :	59.6%
	Mean Speed(Average) :	41 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

133213 A Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/04/1																
3	0	0	0	0	1	1	4	1	0	0	0	0	0	7	43	41
01:00	0	0	0	0	0	2	3	2	0	0	0	0	0	7	43	42
02:00	0	0	0	0	0	0	2	2	1	0	0	0	0	5	*	46
03:00	0	0	0	0	0	1	2	4	1	0	0	0	0	8	48	45
04:00	0	0	0	0	0	6	8	13	4	0	0	0	0	31	49	44
05:00	0	0	0	0	0	19	36	35	**13**	**1**	0	0	0	104	49	44
06:00	0	0	0	0	9	90	186	**74**	3	1	0	0	0	363	45	42
07:00	0	**2**	2	8	58	**344**	**308**	48	2	0	0	0	0	772	43	39
08:00	**5**	1	**16**	**55**	**158**	344	274	40	2	0	0	0	0	**895**	42	37
09:00	0	0	0	2	24	182	248	70	1	0	0	0	0	527	44	40
10:00	0	1	3	1	6	73	223	54	10	1	0	0	0	372	45	42
11:00	0	0	**1**	**6**	18	94	162	81	**7**	0	0	0	0	369	45	41
12 PM	0	0	0	0	12	108	178	55	7	0	0	0	0	360	45	41
13:00	0	0	1	4	12	103	162	52	4	**1**	0	0	0	339	45	41
14:00	0	0	0	2	**26**	**112**	**182**	**93**	7	1	0	0	0	**423**	46	41
15:00	**1**	0	0	0	12	**205**	**335**	72	5	**1**	0	0	0	**631**	44	41
16:00	0	**1**	0	2	18	165	270	**79**	4	0	0	0	0	539	44	41
17:00	0	0	0	**3**	21	181	265	66	5	0	0	0	0	541	44	41
18:00	0	0	0	3	**37**	155	155	42	1	0	0	0	0	393	43	40
19:00	0	0	0	0	13	96	107	27	1	1	0	0	0	245	43	40
20:00	0	0	0	0	5	49	65	17	4	1	0	0	0	141	44	41
21:00	0	0	0	1	2	17	48	24	**7**	0	0	0	0	99	47	43
22:00	0	0	**1**	0	1	15	25	15	1	0	0	0	0	58	46	42
23:00	0	0	0	0	0	8	18	15	3	0	0	0	0	44	47	43
%	0.1%	0.1%	0.3%	1.2%	6.0%	32.6%	44.9%	13.5%	1.3%	0.1%	0.0%	0.0%	0.0%			
AM Peak	08:00	07:00	08:00	08:00	08:00	07:00	07:00	06:00	05:00	05:00				08:00		
Vol.	5	2	16	55	158	344	308	74	13	1				895		
Midday Peak			11:00	11:00	14:00	14:00	14:00	14:00	11:00	13:00				14:00		
Vol.			1	6	26	112	182	93	7	1				423		
PM Peak	15:00	16:00	22:00	17:00	18:00	15:00	15:00	16:00	21:00	15:00				15:00		
Vol.	1	1	1	3	37	205	335	79	7	1				631		

% iles	
15th Percentile :	34 MPH
50th Percentile :	40 MPH
85th Percentile :	44 MPH
95th Percentile :	47 MPH

Stats	
10 MPH Pace Speed :	36-45 MPH
Number in Pace :	5185
Percent in Pace :	71.3%
Number of Vehicles > 40 MPH :	3656
Percent of Vehicles > 40 MPH :	50.3%
Mean Speed(Average) :	40 MPH

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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133213 A Volume
Site Code: TBA

Start	WB				EB				Combined				26-Feb-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	5		117		5		98		10		215		
12:15	5		122		3		111		8		233		
12:30	3		124		2		102		5		226		
12:45	0	13	116	479	4	14	90	401	4	27	206	880	
01:00	3		124		1		106		4		230		
01:15	3		125		2		98		5		223		
01:30	1		104		1		111		2		215		
01:45	2	9	117	470	1	5	97	412	3	14	214	882	
02:00	3		115		2		98		5		213		
02:15	1		131		1		121		2		252		
02:30	2		139		2		128		4		267		
02:45	3	9	140	525	1	6	122	469	4	15	262	994	
03:00	2		152		0		178		2		330		
03:15	6		140		2		154		8		294		
03:30	1		140		3		162		4		302		
03:45	4	13	154	586	2	7	153	647	6	20	307	1233	
04:00	3		206		2		133		5		339		
04:15	8		175		7		146		15		321		
04:30	2		171		12		138		14		309		
04:45	7	20	188	740	9	30	148	565	16	50	336	1305	
05:00	17		236		13		143		30		379		
05:15	18		226		17		137		35		363		
05:30	33		203		38		149		71		352		
05:45	83	151	190	855	37	105	131	560	120	256	321	1415	
06:00	80		215		79		100		159		315		
06:15	112		184		72		126		184		310		
06:30	145		164		109		102		254		266		
06:45	145	482	118	681	118	378	88	416	263	860	206	1097	
07:00	186		110		148		66		334		176		
07:15	217		84		179		86		396		170		
07:30	189		77		201		51		390		128		
07:45	208	800	95	366	211	739	57	260	419	1539	152	626	
08:00	161		79		220		48		381		127		
08:15	135		61		258		59		393		120		
08:30	157		51		233		34		390		85		
08:45	174	627	55	246	209	920	31	172	383	1547	86	418	
09:00	146		59		196		28		342		87		
09:15	158		33		163		25		321		58		
09:30	136		50		139		14		275		64		
09:45	134	574	44	186	126	624	20	87	260	1198	64	273	
10:00	96		30		127		27		223		57		
10:15	86		22		118		16		204		38		
10:30	86		28		78		16		164		44		
10:45	84	352	23	103	105	428	7	66	189	780	30	169	
11:00	89		10		94		19		183		29		
11:15	85		17		117		12		202		29		
11:30	117		11		112		13		229		24		
11:45	111	402	9	47	101	424	3	47	212	826	12	94	
Total	3452		5284		3680		4102		7132		9386		
Percent	48.4%		56.3%		51.6%		43.7%						
Day Total		8736				7782				16518			
Peak	07:00		05:00		07:45		03:00		07:15		04:45		
Vol.	800		855		922		647		1586		1430		
P.H.F.	0.922		0.906		0.893		0.909		0.946		0.943		

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 A Volume
Site Code: TBA

Start	WB				EB				Combined				27-Feb-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	7		101		3		99		10		200		
12:15	1		97		2		73		3		170		
12:30	4		93		27		95		31		188		
12:45	4	16	107	398	6	38	91	358	10	54	198	756	
01:00	2		122		3		75		5		197		
01:15	3		108		2		89		5		197		
01:30	1		99		7		66		8		165		
01:45	2	8	92	421	0	12	90	320	2	20	182	741	
02:00	1		101		4		104		5		205		
02:15	1		114		2		99		3		213		
02:30	2		124		2		126		4		250		
02:45	2	6	119	458	2	10	103	432	4	16	222	890	
03:00	3		115		4		144		7		259		
03:15	3		75		2		103		5		178		
03:30	3		12		5		82		8		94		
03:45	6	15	108	310	1	12	114	443	7	27	222	753	
04:00	3		161		2		87		5		248		
04:15	6		164		8		147		14		311		
04:30	3		195		6		145		9		340		
04:45	10	22	192	712	11	27	135	514	21	49	327	1226	
05:00	14		213		13		127		27		340		
05:15	19		246		15		130		34		376		
05:30	45		216		30		111		75		327		
05:45	62	140	184	859	35	93	119	487	97	233	303	1346	
06:00	59		224		52		109		111		333		
06:15	112		207		61		97		173		304		
06:30	126		184		99		84		225		268		
06:45	158	455	133	748	135	347	94	384	293	802	227	1132	
07:00	174		101		165		72		339		173		
07:15	180		69		193		55		373		124		
07:30	190		73		197		64		387		137		
07:45	183	727	75	318	233	788	49	240	416	1515	124	558	
08:00	160		83		234		52		394		135		
08:15	155		68		221		34		376		102		
08:30	142		76		243		27		385		103		
08:45	151	608	42	269	237	935	43	156	388	1543	85	425	
09:00	145		61		181		22		326		83		
09:15	129		60		178		24		307		84		
09:30	137		35		141		27		278		62		
09:45	142	553	45	201	114	614	21	94	256	1167	66	295	
10:00	92		25		86		21		178		46		
10:15	95		21		89		12		184		33		
10:30	80		21		77		14		157		35		
10:45	91	358	9	76	90	342	12	59	181	700	21	135	
11:00	74		10		93		17		167		27		
11:15	87		8		87		11		174		19		
11:30	87		9		104		9		191		18		
11:45	113	361	4	31	88	372	2	39	201	733	6	70	
Total	3269		4801		3590		3526		6859		8327		
Percent	47.7%		57.7%		52.3%		42.3%						
Day Total		8070				7116				15186			
Peak	07:00		05:15		08:00		04:15		07:30		04:30		
Vol.	727		870		935		554		1573		1383		
P.H.F.	0.957		0.884		0.962		0.942		0.945		0.920		

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
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133213 A Volume
Site Code: TBA

Start	WB				EB				Combined				28-Feb-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	9		129		4		114		13		243		
12:15	9		120		4		109		13		229		
12:30	3		125		3		116		6		241		
12:45	3	24	122	496	3	14	95	434	6	38	217	930	
01:00	5		97		1		92		6		189		
01:15	4		119		2		113		6		232		
01:30	2		135		2		95		4		230		
01:45	2	13	111	462	1	6	109	409	3	19	220	871	
02:00	1		148		5		97		6		245		
02:15	4		129		4		107		8		236		
02:30	3		122		5		125		8		247		
02:45	1	9	152	551	2	16	114	443	3	25	266	994	
03:00	2		146		2		199		4		345		
03:15	3		160		1		161		4		321		
03:30	2		166		3		157		5		323		
03:45	3	10	165	637	4	10	159	676	7	20	324	1313	
04:00	4		214		3		156		7		370		
04:15	2		212		6		149		8		361		
04:30	4		202		9		166		13		368		
04:45	13	23	210	838	6	24	143	614	19	47	353	1452	
05:00	16		228		9		123		25		351		
05:15	20		199		17		147		37		346		
05:30	49		236		27		124		76		360		
05:45	74	159	208	871	49	102	113	507	123	261	321	1378	
06:00	73		165		58		121		131		286		
06:15	104		190		66		98		170		288		
06:30	156		154		97		90		253		244		
06:45	177	510	127	636	123	344	103	412	300	854	230	1048	
07:00	192		111		164		86		356		197		
07:15	193		112		177		79		370		191		
07:30	213		90		222		66		435		156		
07:45	165	763	83	396	245	808	49	280	410	1571	132	676	
08:00	158		67		232		54		390		121		
08:15	184		76		252		55		436		131		
08:30	165		69		225		29		390		98		
08:45	163	670	63	275	189	898	28	166	352	1568	91	441	
09:00	144		54		171		42		315		96		
09:15	134		62		158		19		292		81		
09:30	125		48		138		36		263		84		
09:45	112	515	36	200	125	592	21	118	237	1107	57	318	
10:00	89		39		93		29		182		68		
10:15	84		28		113		23		197		51		
10:30	75		25		101		12		176		37		
10:45	96	344	21	113	80	387	20	84	176	731	41	197	
11:00	103		16		74		20		177		36		
11:15	85		17		91		19		176		36		
11:30	80		12		124		9		204		21		
11:45	118	386	11	56	128	417	10	58	246	803	21	114	
Total	3426		5531		3618		4201		7044		9732		
Percent	48.6%		56.8%		51.4%		43.2%						
Day Total		8957				7819				16776			
Peak	06:45		04:45		07:45		03:00		07:30		04:00		
Vol.	775		873		954		676		1671		1452		
P.H.F.	0.910		0.925		0.946		0.849		0.958		0.981		

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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133213 A Volume
Site Code: TBA

Start	WB				EB				Combined				01-Mar-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Fri
12:00	14		113		4		97		18		210		
12:15	8		109		0		89		8		198		
12:30	1		120		5		117		6		237		
12:45	1	24	128	470	4	13	131	434	5	37	259	904	
01:00	2		142		7		106		9		248		
01:15	2		101		3		88		5		189		
01:30	2		117		5		103		7		220		
01:45	4	10	117	477	0	15	88	385	4	25	205	862	
02:00	1		131		2		111		3		242		
02:15	3		150		2		109		5		259		
02:30	3		130		1		157		4		287		
02:45	3	10	145	556	7	12	135	512	10	22	280	1068	
03:00	0		145		1		193		1		338		
03:15	0		163		1		158		1		321		
03:30	6		159		2		140		8		299		
03:45	3	9	186	653	4	8	137	628	7	17	323	1281	
04:00	5		180		4		139		9		319		
04:15	8		164		11		152		19		316		
04:30	7		205		9		147		16		352		
04:45	6	26	188	737	7	31	133	571	13	57	321	1308	
05:00	12		218		9		135		21		353		
05:15	22		190		20		113		42		303		
05:30	35		196		25		132		60		328		
05:45	72	141	175	779	36	90	114	494	108	231	289	1273	
06:00	70		199		45		114		115		313		
06:15	115		161		73		105		188		266		
06:30	140		143		105		93		245		236		
06:45	137	462	112	615	115	338	121	433	252	800	233	1048	
07:00	182		98		149		87		331		185		
07:15	170		77		185		67		355		144		
07:30	194		84		189		57		383		141		
07:45	205	751	68	327	214	737	46	257	419	1488	114	584	
08:00	158		63		237		38		395		101		
08:15	170		54		211		29		381		83		
08:30	128		52		208		27		336		79		
08:45	153	609	52	221	162	818	32	126	315	1427	84	347	
09:00	142		57		132		43		274		100		
09:15	106		55		158		30		264		85		
09:30	118		43		136		22		254		65		
09:45	123	489	43	198	129	555	31	126	252	1044	74	324	
10:00	106		45		106		20		212		65		
10:15	102		80		104		25		206		105		
10:30	97		51		116		18		213		69		
10:45	110	415	28	204	94	420	16	79	204	835	44	283	
11:00	79		28		100		15		179		43		
11:15	107		18		122		21		229		39		
11:30	90		16		124		24		214		40		
11:45	130	406	15	77	123	469	14	74	253	875	29	151	
Total	3352		5314		3506		4119		6858		9433		
Percent	48.9%		56.3%		51.1%		43.7%						
Day Total		8666				7625				16291			
Peak	07:00		04:30		07:45		02:30		07:30		04:15		
Vol.	751		801		870		643		1578		1342		
P.H.F.	0.916		0.919		0.918		0.833		0.942		0.950		

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 A Volume
Site Code: TBA

Start	WB				EB				Combined				02-Mar-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sat
12:00	10		104		15		100		25		204		
12:15	11		118		6		113		17		231		
12:30	7		121		3		101		10		222		
12:45	5	33	127	470	9	33	110	424	14	66	237	894	
01:00	4		121		3		119		7		240		
01:15	4		109		2		113		6		222		
01:30	8		122		2		101		10		223		
01:45	6	22	120	472	2	9	100	433	8	31	220	905	
02:00	1		127		2		105		3		232		
02:15	3		131		3		121		6		252		
02:30	2		124		1		121		3		245		
02:45	0	6	97	479	3	9	105	452	3	15	202	931	
03:00	1		108		0		123		1		231		
03:15	2		117		2		123		4		240		
03:30	3		127		1		99		4		226		
03:45	6	12	123	475	2	5	92	437	8	17	215	912	
04:00	1		97		3		113		4		210		
04:15	1		106		6		102		7		208		
04:30	4		105		4		107		8		212		
04:45	4	10	103	411	3	16	87	409	7	26	190	820	
05:00	5		84		3		110		8		194		
05:15	5		98		6		95		11		193		
05:30	13		81		4		69		17		150		
05:45	13	36	100	363	17	30	81	355	30	66	181	718	
06:00	20		91		13		69		33		160		
06:15	26		86		18		65		44		151		
06:30	39		78		26		63		65		141		
06:45	44	129	90	345	33	90	64	261	77	219	154	606	
07:00	42		56		29		55		71		111		
07:15	59		65		39		32		98		97		
07:30	63		56		39		40		102		96		
07:45	60	224	40	217	54	161	49	176	114	385	89	393	
08:00	45		50		36		32		81		82		
08:15	71		44		55		20		126		64		
08:30	74		44		57		20		131		64		
08:45	77	267	32	170	95	243	21	93	172	510	53	263	
09:00	53		58		68		15		121		73		
09:15	81		62		82		42		163		104		
09:30	79		53		69		26		148		79		
09:45	92	305	41	214	97	316	33	116	189	621	74	330	
10:00	73		44		95		30		168		74		
10:15	69		27		86		25		155		52		
10:30	94		27		104		17		198		44		
10:45	108	344	39	137	115	400	13	85	223	744	52	222	
11:00	103		42		100		24		203		66		
11:15	106		35		102		23		208		58		
11:30	95		15		117		17		212		32		
11:45	111	415	16	108	130	449	16	80	241	864	32	188	
Total	1803		3861		1761		3321		3564		7182		
Percent	50.6%		53.8%		49.4%		46.2%						
Day Total		5664				5082				10746			
Peak	11:00		01:45		11:00		02:30		11:00		01:45		
Vol.	415		502		449		472		864		949		
P.H.F.	0.935		0.958		0.863		0.959		0.896		0.941		

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 A Volume
Site Code: TBA

Start	WB				EB				Combined				03-Mar-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sun
12:00	13		86		11		87		24		173		
12:15	8		111		8		86		16		197		
12:30	15		137		4		111		19		248		
12:45	8	44	114	448	4	27	114	398	12	71	228	846	
01:00	3		105		6		102		9		207		
01:15	5		107		5		92		10		199		
01:30	4		98		0		102		4		200		
01:45	3	15	127	437	7	18	103	399	10	33	230	836	
02:00	3		99		4		114		7		213		
02:15	1		101		2		85		3		186		
02:30	4		112		0		87		4		199		
02:45	2	10	108	420	0	6	107	393	2	16	215	813	
03:00	4		100		3		104		7		204		
03:15	0		103		0		112		0		215		
03:30	2		101		1		116		3		217		
03:45	1	7	108	412	0	4	92	424	1	11	200	836	
04:00	3		115		0		83		3		198		
04:15	2		116		3		110		5		226		
04:30	0		97		3		103		3		200		
04:45	6	11	90	418	0	6	84	380	6	17	174	798	
05:00	0		67		3		65		3		132		
05:15	3		101		4		71		7		172		
05:30	10		79		2		72		12		151		
05:45	15	28	68	315	6	15	68	276	21	43	136	591	
06:00	9		59		12		50		21		109		
06:15	18		64		8		56		26		120		
06:30	29		70		17		44		46		114		
06:45	22	78	80	273	16	53	52	202	38	131	132	475	
07:00	36		69		22		33		58		102		
07:15	49		55		12		47		61		102		
07:30	37		45		30		37		67		82		
07:45	36	158	45	214	26	90	36	153	62	248	81	367	
08:00	30		51		27		24		57		75		
08:15	40		45		26		23		66		68		
08:30	41		28		52		28		93		56		
08:45	49	160	35	159	89	194	17	92	138	354	52	251	
09:00	40		34		69		25		109		59		
09:15	52		29		59		22		111		51		
09:30	77		18		48		13		125		31		
09:45	62	231	18	99	67	243	11	71	129	474	29	170	
10:00	65		16		76		8		141		24		
10:15	76		7		84		16		160		23		
10:30	84		15		88		11		172		26		
10:45	115	340	10	48	89	337	6	41	204	677	16	89	
11:00	85		6		85		16		170		22		
11:15	86		12		87		5		173		17		
11:30	78		2		89		6		167		8		
11:45	76	325	4	24	83	344	4	31	159	669	8	55	
Total	1407		3267		1337		2860		2744		6127		
Percent	51.3%		53.3%		48.7%		46.7%						
Day Total		4674				4197				8871			
Peak	10:30		00:15		10:45		02:45		10:30		00:30		
Vol.	370		467		350		439		719		882		
P.H.F.	0.804		0.852		0.983		0.946		0.881		0.889		

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
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133213 A Volume
Site Code: TBA

Start	WB				EB				Combined				04-Mar-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Mon
12:00	9		90		2		98		11		188		
12:15	3		122		1		103		4		225		
12:30	2		110		3		82		5		192		
12:45	1	15	113	435	1	7	77	360	2	22	190	795	
01:00	3		130		0		74		3		204		
01:15	1		135		5		92		6		227		
01:30	1		97		0		88		1		185		
01:45	1	6	113	475	2	7	85	339	3	13	198	814	
02:00	2		116		1		85		3		201		
02:15	0		130		2		82		2		212		
02:30	0		134		1		143		1		277		
02:45	1	3	152	532	1	5	113	423	2	8	265	955	
03:00	1		154		1		168		2		322		
03:15	1		129		2		158		3		287		
03:30	1		143		2		158		3		301		
03:45	4	7	162	588	3	8	147	631	7	15	309	1219	
04:00	5		173		6		133		11		306		
04:15	6		165		7		138		13		303		
04:30	7		178		6		139		13		317		
04:45	4	22	222	738	12	31	129	539	16	53	351	1277	
05:00	30		203		10		150		40		353		
05:15	26		239		19		135		45		374		
05:30	46		229		39		130		85		359		
05:45	73	175	183	854	36	104	126	541	109	279	309	1395	
06:00	72		173		49		109		121		282		
06:15	101		163		83		103		184		266		
06:30	144		156		88		93		232		249		
06:45	187	504	133	625	143	363	88	393	330	867	221	1018	
07:00	184		116		150		73		334		189		
07:15	163		89		196		84		359		173		
07:30	161		74		217		50		378		124		
07:45	194	702	57	336	209	772	38	245	403	1474	95	581	
08:00	184		58		236		49		420		107		
08:15	168		53		248		38		416		91		
08:30	140		47		216		19		356		66		
08:45	146	638	37	195	195	895	35	141	341	1533	72	336	
09:00	112		48		160		24		272		72		
09:15	121		49		144		24		265		73		
09:30	106		44		117		21		223		65		
09:45	87	426	30	171	106	527	30	99	193	953	60	270	
10:00	91		30		100		17		191		47		
10:15	93		22		96		17		189		39		
10:30	83		13		85		11		168		24		
10:45	77	344	17	82	91	372	13	58	168	716	30	140	
11:00	88		14		105		13		193		27		
11:15	106		11		95		11		201		22		
11:30	92		5		88		12		180		17		
11:45	103	389	13	43	81	369	8	44	184	758	21	87	
Total	3231		5074		3460		3813		6691		8887		
Percent	48.3%		57.1%		51.7%		42.9%						
Day Total		8305				7273				15578			
Peak	07:30		04:45		07:30		03:00		07:30		04:45		
Vol.	707		893		910		631		1617		1437		
P.H.F.	0.911		0.934		0.917		0.939		0.963		0.961		

Massachusetts Avenue (Route 2A)
east of Marrett Street
City, State: Lexington, MA
Client: Toole Design/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 A Volume
Site Code: TBA

Start	26-Feb-13		27-Feb-13		28-Feb-13		01-Mar-13		02-Mar-13		03-Mar-13		04-Mar-13		Week Average	
Time	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	13	14	16	38	24	14	24	13	33	33	44	27	15	7	24	21
01:00	9	5	8	12	13	6	10	15	22	9	15	18	6	7	12	10
02:00	9	6	6	10	9	16	10	12	6	9	10	6	3	5	8	9
03:00	13	7	15	12	10	10	9	8	12	5	7	4	7	8	10	8
04:00	20	30	22	27	23	24	26	31	10	16	11	6	22	31	19	24
05:00	151	105	140	93	159	102	141	90	36	30	28	15	175	104	119	77
06:00	482	378	455	347	510	344	462	338	129	90	78	53	504	363	374	273
07:00	**800**	739	**727**	788	**763**	808	**751**	737	224	161	158	90	**702**	772	**589**	585
08:00	627	**920**	608	**935**	670	**898**	609	**818**	267	243	160	194	638	**895**	511	**700**
09:00	574	624	553	614	515	592	489	555	305	316	231	243	426	527	442	496
10:00	352	428	358	342	344	387	415	420	344	400	**340**	337	344	372	357	384
11:00	402	424	361	372	386	417	406	469	**415**	**449**	325	**344**	389	369	383	406
12:00 PM	479	401	398	358	496	434	470	434	470	424	**448**	398	435	360	457	401
01:00	470	412	421	320	462	409	477	385	472	433	437	399	475	339	459	385
02:00	525	469	458	432	551	443	556	512	**479**	**452**	420	393	532	423	503	446
03:00	586	**647**	310	443	637	**676**	653	**628**	475	437	412	**424**	588	**631**	523	**555**
04:00	740	565	712	**514**	838	614	737	571	411	409	418	380	738	539	656	513
05:00	**855**	560	**859**	487	**871**	507	**779**	494	363	355	315	276	**854**	541	**699**	460
06:00	681	416	748	384	636	412	615	433	345	261	273	202	625	393	560	357
07:00	366	260	318	240	396	280	327	257	217	176	214	153	336	245	311	230
08:00	246	172	269	156	275	166	221	126	170	93	159	92	195	141	219	135
09:00	186	87	201	94	200	118	198	126	214	116	99	71	171	99	181	102
10:00	103	66	76	59	113	84	204	79	137	85	48	41	82	58	109	67
11:00	47	47	31	39	56	58	77	74	108	80	24	31	43	44	55	53
Total	8736	7782	8070	7116	8957	7819	8666	7625	5664	5082	4674	4197	8305	7273	7580	6697
Day	16518		15186		16776		16291		10746		8871		15578		14277	
AM Peak	07:00	08:00	07:00	08:00	07:00	08:00	07:00	08:00	11:00	11:00	10:00	11:00	07:00	08:00	07:00	08:00
Vol.	800	920	727	935	763	898	751	818	415	449	340	344	702	895	589	700
PM Peak	17:00	15:00	17:00	16:00	17:00	15:00	17:00	15:00	14:00	14:00	12:00	15:00	17:00	15:00	17:00	15:00
Vol.	855	647	859	514	871	676	779	628	479	452	448	424	854	631	699	555

Comb. Total	16518		15186		16776		16291		10746		8871		15578		14277	

ADT ADT 14,281 AADT 14,281

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

NB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/13/1														
2	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	1	3	0	0	0	0	0	0	0	0	0	0	0	4
05:00	0	8	1	0	0	1	0	0	0	0	0	0	0	10
06:00	0	62	7	0	0	0	0	0	0	0	0	0	0	69
07:00	0	155	11	2	3	0	0	1	0	0	0	0	0	172
08:00	0	225	21	0	0	3	0	1	0	0	0	0	0	250
09:00	0	117	22	1	1	0	0	0	0	0	0	0	0	141
10:00	0	53	5	1	3	1	0	2	0	0	0	0	0	65
11:00	0	44	4	1	1	0	0	2	0	0	0	0	0	52
12 PM	0	72	15	0	3	0	0	0	0	0	0	0	0	90
13:00	0	50	10	0	1	0	0	0	0	0	0	0	0	61
14:00	0	54	12	1	4	1	0	0	0	0	0	0	0	72
15:00	1	115	27	2	3	0	0	1	0	0	0	0	0	149
16:00	0	185	28	1	3	1	0	0	0	0	0	0	0	218
17:00	0	178	15	0	1	1	0	0	0	0	0	0	0	195
18:00	0	142	13	0	0	0	0	0	0	0	0	0	0	155
19:00	0	55	7	0	1	0	0	0	0	0	0	0	0	63
20:00	0	42	2	0	1	0	0	0	0	0	0	0	0	45
21:00	0	35	0	0	0	0	0	0	0	0	0	0	0	35
22:00	0	14	1	0	0	0	0	0	0	0	0	0	0	15
23:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
Total	2	1617	201	9	25	8	0	7	0	0	0	0	0	1869
Percent	0.1%	86.5%	10.8%	0.5%	1.3%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	04:00	08:00	09:00	07:00	07:00	08:00		10:00						08:00
Vol.	1	225	22	2	3	3		2						250
PM Peak	15:00	16:00	16:00	15:00	14:00	14:00		15:00						16:00
Vol.	1	185	28	2	4	1		1						218

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

NB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/14/1														
2	0	5	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	1	4	0	0	0	0	0	0	0	0	0	0	0	5
05:00	0	6	0	0	0	0	0	0	1	0	0	0	0	7
06:00	0	46	10	0	1	0	0	0	0	0	0	0	0	57
07:00	1	174	20	1	3	1	0	0	0	0	0	0	0	200
08:00	1	243	26	0	2	0	0	1	0	0	0	0	0	273
09:00	0	123	19	1	0	1	0	1	0	0	0	0	0	145
10:00	0	75	19	1	4	0	0	0	0	0	0	0	0	99
11:00	1	73	16	0	1	0	0	0	0	0	0	0	0	91
12 PM	0	108	28	3	4	1	0	1	0	0	0	0	0	145
13:00	1	102	18	2	3	1	0	2	0	0	0	0	0	129
14:00	1	111	20	0	0	0	0	0	0	0	0	0	0	132
15:00	0	123	27	0	3	1	0	0	0	0	0	0	0	154
16:00	0	170	27	0	2	0	0	1	0	0	0	0	0	200
17:00	0	186	29	0	2	0	0	0	0	0	0	0	0	217
18:00	1	135	18	0	1	0	0	0	0	0	0	0	0	155
19:00	0	49	7	0	0	0	0	0	0	0	0	0	0	56
20:00	0	43	3	0	0	0	0	0	0	0	0	0	0	46
21:00	0	30	3	0	0	0	0	0	0	0	0	0	0	33
22:00	0	19	4	0	0	0	0	0	0	0	0	0	0	23
23:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
Total	7	1836	295	8	26	5	0	6	1	0	0	0	0	2184
Percent	0.3%	84.1%	13.5%	0.4%	1.2%	0.2%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	04:00	08:00	08:00	07:00	10:00	07:00		08:00	05:00					08:00
Vol.	1	243	26	1	4	1		1	1					273
PM Peak	13:00	17:00	17:00	12:00	12:00	12:00		13:00						17:00
Vol.	1	186	29	3	4	1		2						217

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

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Office: 508.481.3999 Fax: 508.545.1234
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123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/15/1														
2	0	5	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	1	3	0	0	0	0	0	0	0	0	0	0	0	4
05:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
06:00	0	61	10	0	1	0	0	0	0	0	0	0	0	72
07:00	1	153	13	2	2	0	0	0	1	0	0	0	0	172
08:00	3	201	27	3	1	0	0	0	0	1	0	0	0	236
09:00	0	101	18	0	0	0	0	0	0	0	0	0	0	119
10:00	0	71	12	1	2	0	0	0	0	0	0	0	0	86
11:00	0	62	10	0	0	0	0	0	0	0	0	0	0	72
12 PM	0	82	17	0	1	1	0	0	0	0	0	0	0	101
13:00	0	60	6	0	1	0	0	0	0	0	0	0	0	67
14:00	0	63	16	1	4	0	0	0	0	0	0	0	0	84
15:00	0	115	28	3	1	0	0	0	0	0	0	0	0	147
16:00	0	166	30	0	5	1	0	0	0	0	0	0	0	202
17:00	0	178	24	0	0	1	0	2	0	0	0	0	0	205
18:00	0	124	17	0	1	1	0	0	0	0	0	0	0	143
19:00	0	55	3	0	0	0	0	0	0	0	0	0	0	58
20:00	0	37	4	0	1	0	0	0	0	0	0	0	0	42
21:00	0	23	3	0	0	0	0	0	0	0	0	0	0	26
22:00	0	25	1	0	0	0	0	0	0	0	0	0	0	26
23:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
Total	5	1606	240	10	20	4	0	2	1	1	0	0	0	1889
Percent	0.3%	85.0%	12.7%	0.5%	1.1%	0.2%	0.0%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	08:00	07:00				07:00	08:00				08:00
Vol.	3	201	27	3	2				1	1				236
PM Peak		17:00	16:00	15:00	16:00	12:00		17:00						17:00
Vol.		178	30	3	5	1		2						205

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

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123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/16/1														
2	0	5	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	0	2	0	0	0	0	0	0	0	0	0	0	2
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
06:00	0	43	10	0	0	0	0	0	0	0	0	0	0	53
07:00	0	150	14	2	3	0	0	0	1	0	0	0	0	170
08:00	4	214	27	0	1	0	0	0	0	0	0	0	0	246
09:00	0	91	13	0	2	0	0	1	0	0	0	0	0	107
10:00	1	66	9	1	0	0	0	1	0	0	0	0	0	78
11:00	0	60	6	0	2	1	0	0	0	0	0	0	0	69
12 PM	0	67	12	0	1	0	0	1	0	0	0	0	0	81
13:00	3	60	10	0	4	0	0	0	0	0	0	0	0	77
14:00	0	86	13	1	1	0	0	0	0	0	0	0	0	101
15:00	0	115	19	3	2	1	0	0	0	0	0	0	0	140
16:00	1	159	20	0	5	1	0	0	0	0	0	0	0	186
17:00	1	206	13	0	2	0	0	0	0	0	0	0	0	222
18:00	0	166	15	0	2	0	0	0	0	0	0	0	0	183
19:00	0	41	1	0	1	0	0	0	0	0	0	0	0	43
20:00	0	20	6	0	0	0	0	0	0	0	0	0	0	26
21:00	0	23	0	0	0	0	0	0	0	0	0	0	0	23
22:00	0	26	2	0	0	0	0	0	0	0	0	0	0	28
23:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
Total	10	1620	195	7	26	3	0	3	1	0	0	0	0	1865
Percent	0.5%	86.9%	10.5%	0.4%	1.4%	0.2%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	07:00	07:00	11:00		09:00	07:00					08:00
Vol.	4	214	27	2	3	1		1	1					246
PM Peak	13:00	17:00	16:00	15:00	16:00	15:00		12:00						17:00
Vol.	3	206	20	3	5	1		1						222

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

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123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/17/1														
2	0	11	0	0	0	0	0	0	0	0	0	0	0	11
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
06:00	1	9	1	0	0	0	0	0	0	0	0	0	0	11
07:00	0	27	3	0	1	0	0	0	0	0	0	0	0	31
08:00	2	70	9	0	1	0	0	0	0	0	0	0	0	82
09:00	1	116	14	0	1	0	0	0	0	0	0	0	0	132
10:00	0	107	14	0	1	0	0	0	0	0	0	0	0	122
11:00	0	117	15	0	0	0	0	0	0	0	0	0	0	132
12 PM	0	127	7	0	2	0	0	0	0	0	0	0	0	136
13:00	6	122	12	0	3	0	0	0	0	0	0	0	0	143
14:00	4	130	19	0	1	0	0	0	0	0	0	0	0	154
15:00	0	94	14	0	1	0	0	0	0	0	0	0	0	109
16:00	0	52	7	0	0	0	0	0	0	0	0	0	0	59
17:00	0	62	2	0	0	0	0	1	0	0	0	0	0	65
18:00	0	39	8	0	0	0	0	0	0	0	0	0	0	47
19:00	0	19	0	0	0	0	0	0	0	0	0	0	0	19
20:00	0	14	3	0	0	0	0	0	0	0	0	0	0	17
21:00	0	18	1	0	0	0	0	0	0	0	0	0	0	19
22:00	0	19	1	0	0	0	0	0	0	0	0	0	0	20
23:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
Total	14	1172	132	0	11	0	0	1	0	0	0	0	0	1330
Percent	1.1%	88.1%	9.9%	0.0%	0.8%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	11:00		07:00									09:00
Vol.	2	117	15		1									132
PM Peak	13:00	14:00	14:00		13:00			17:00						14:00
Vol.	6	130	19		3			1						154

PRECISION
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Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Class
Site Code: TBA

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/18/1														
2	0	7	2	0	0	0	0	0	0	0	0	0	0	9
01:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
02:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
06:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
07:00	0	16	2	0	0	0	0	0	0	0	0	0	0	18
08:00	0	33	3	0	0	0	0	0	0	0	0	0	0	36
09:00	0	36	5	0	0	0	0	0	0	0	0	0	0	41
10:00	3	47	4	0	2	0	0	0	0	0	0	0	0	56
11:00	3	41	3	0	0	1	0	0	0	0	0	0	0	48
12 PM	1	68	10	0	0	0	0	0	0	0	0	0	0	79
13:00	5	63	9	0	0	0	0	0	0	0	0	0	0	77
14:00	3	67	8	0	0	0	0	1	0	0	0	0	0	79
15:00	2	53	12	0	0	0	0	0	0	0	0	0	0	67
16:00	0	56	8	0	1	0	0	0	0	0	0	0	0	65
17:00	0	40	7	0	2	0	0	0	0	0	0	0	0	49
18:00	0	23	3	0	2	0	0	0	0	0	0	0	0	28
19:00	0	21	3	0	0	0	0	0	0	0	0	0	0	24
20:00	0	18	2	0	0	0	0	0	0	0	0	0	0	20
21:00	0	10	2	0	0	0	0	0	0	0	0	0	0	12
22:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
23:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
Total	17	633	89	0	7	1	0	1	0	0	0	0	0	748
Percent	2.3%	84.6%	11.9%	0.0%	0.9%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	09:00		10:00	11:00								10:00
Vol.	3	47	5		2	1								56
PM Peak	13:00	12:00	15:00		17:00			14:00						12:00
Vol.	5	68	12		2			1						79

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

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123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/1														
2	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	1	1	1	0	0	0	0	0	0	0	0	0	0	3
05:00	0	10	2	0	0	0	0	0	0	0	0	0	0	12
06:00	0	50	7	0	2	0	0	0	0	0	0	0	0	59
07:00	2	158	10	3	4	0	0	1	0	1	0	0	0	179
08:00	1	239	24	0	2	0	0	0	0	0	0	0	0	266
09:00	0	82	21	0	1	2	0	0	0	0	0	0	0	106
10:00	0	62	9	0	2	0	0	0	0	0	0	0	0	73
11:00	0	43	12	0	2	0	0	0	0	0	0	0	0	57
12 PM	1	57	17	0	2	0	0	0	1	0	0	0	0	78
13:00	2	45	13	0	4	0	0	0	0	0	0	0	0	64
14:00	0	47	11	0	1	0	0	0	0	0	0	0	0	59
15:00	1	113	33	4	4	0	0	0	0	0	0	0	0	155
16:00	0	153	35	0	4	0	0	0	0	0	0	0	0	192
17:00	0	167	19	0	1	0	0	0	0	0	0	0	0	187
18:00	0	115	18	0	0	0	0	0	0	0	0	0	0	133
19:00	0	52	4	0	2	0	0	0	0	0	0	0	0	58
20:00	0	32	8	0	0	0	0	0	0	0	0	0	0	40
21:00	0	12	3	0	0	0	0	0	0	0	0	0	0	15
22:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
23:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Total	8	1458	248	7	31	2	0	1	1	1	0	0	0	1757
Percent	0.5%	83.0%	14.1%	0.4%	1.8%	0.1%	0.0%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	08:00	07:00	07:00	09:00		07:00		07:00				08:00
Vol.	2	239	24	3	4	2		1		1				266
PM Peak	13:00	17:00	16:00	15:00	13:00				12:00					16:00
Vol.	2	167	35	4	4				1					192
Total		9942	1400	41	146	23	0	21	4	2	0	0	0	11642

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

SB

PRECISION
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123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/13/1														
2	0	4	0	0	0	0	0	0	0	0	0	0	0	4
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
05:00	0	13	4	0	2	0	0	0	0	0	0	0	0	19
06:00	0	99	19	0	1	0	0	0	0	0	0	0	0	119
07:00	1	278	39	1	5	0	0	0	0	0	0	0	0	324
08:00	0	263	34	0	1	0	0	0	0	0	0	0	0	298
09:00	0	139	19	1	2	0	0	3	0	0	0	0	0	164
10:00	0	52	8	2	5	0	0	0	0	0	0	0	0	67
11:00	0	64	20	0	0	0	0	0	0	0	0	0	0	84
12 PM	0	54	14	0	0	0	0	0	0	0	0	0	0	68
13:00	0	44	9	0	3	1	0	1	0	0	0	0	0	58
14:00	0	93	17	2	3	0	0	2	0	0	0	0	0	117
15:00	0	204	33	2	2	1	0	0	0	0	0	0	0	242
16:00	1	321	35	0	2	0	0	0	0	0	0	0	0	359
17:00	1	358	33	0	0	0	0	0	0	0	0	0	0	392
18:00	0	196	29	0	1	0	0	0	0	0	0	0	0	226
19:00	0	77	8	1	0	0	0	0	0	0	0	0	0	86
20:00	0	27	3	0	0	0	0	0	0	0	0	0	0	30
21:00	0	35	1	0	1	0	0	0	0	0	0	0	0	37
22:00	1	11	2	0	0	0	0	0	0	0	0	0	0	14
23:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Total	4	2339	329	9	28	2	0	6	0	0	0	0	0	2717
Percent	0.1%	86.1%	12.1%	0.3%	1.0%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	10:00	07:00			09:00						07:00
Vol.	1	278	39	2	5			3						324
PM Peak	16:00	17:00	16:00	14:00	13:00	13:00		14:00						17:00
Vol.	1	358	35	2	3	1		2						392

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

SB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/14/1														
2	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
05:00	0	15	2	0	1	0	0	0	0	0	0	0	0	18
06:00	0	89	17	0	2	0	0	0	0	0	0	0	0	108
07:00	1	273	51	2	7	0	0	0	0	0	0	0	0	334
08:00	1	273	45	0	2	0	0	1	0	0	0	0	0	322
09:00	1	151	28	1	3	0	0	0	0	0	0	0	0	184
10:00	0	78	22	0	2	0	0	1	0	0	0	0	0	103
11:00	0	73	28	1	1	0	0	0	0	0	0	0	0	103
12 PM	1	111	26	1	1	0	0	0	0	0	0	0	0	140
13:00	1	127	23	2	0	0	0	1	0	0	0	0	0	154
14:00	0	94	30	1	2	0	0	0	0	0	0	0	0	127
15:00	2	204	24	0	2	0	0	0	0	0	0	0	0	232
16:00	2	258	30	2	2	0	0	1	0	0	0	0	0	295
17:00	0	328	29	0	2	0	0	0	0	0	0	0	0	359
18:00	1	204	35	0	1	0	0	0	0	0	0	0	0	241
19:00	0	83	11	0	0	0	0	0	0	0	0	0	0	94
20:00	0	38	3	0	0	0	0	0	0	0	0	0	0	41
21:00	0	18	1	0	0	0	0	0	0	0	0	0	0	19
22:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
23:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Total	10	2436	409	10	28	0	0	4	0	0	0	0	0	2897
Percent	0.3%	84.1%	14.1%	0.3%	1.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	07:00			08:00						07:00
Vol.	1	273	51	2	7			1						334
PM Peak	15:00	17:00	18:00	13:00	14:00			13:00						17:00
Vol.	2	328	35	2	2			1						359

Bedford Road
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123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/15/1														
2	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
05:00	0	18	3	0	1	0	0	0	0	0	0	0	0	22
06:00	0	92	18	0	2	0	0	0	0	0	0	0	0	112
07:00	0	307	36	2	6	0	0	0	0	0	0	0	0	351
08:00	0	247	40	0	6	0	0	1	0	0	0	0	0	294
09:00	0	111	20	1	2	0	0	0	0	0	0	0	0	134
10:00	0	62	14	1	1	0	0	0	0	0	0	0	0	78
11:00	0	62	16	0	2	0	0	0	0	0	0	0	0	80
12 PM	0	75	16	1	1	0	0	2	0	0	0	0	0	95
13:00	0	56	13	0	3	0	0	0	0	0	0	0	0	72
14:00	0	81	16	2	3	0	0	1	0	0	0	0	0	103
15:00	0	180	28	3	5	0	0	0	0	0	0	0	0	216
16:00	0	299	37	0	4	0	0	0	0	0	0	0	0	340
17:00	1	322	32	0	2	0	0	0	0	0	0	0	0	357
18:00	0	185	25	1	0	0	0	0	0	0	0	0	0	211
19:00	0	57	7	0	1	0	0	0	0	0	0	0	0	65
20:00	0	31	5	0	0	0	0	0	0	0	0	0	0	36
21:00	0	30	5	0	0	0	0	0	0	0	0	0	0	35
22:00	0	11	1	0	0	0	0	0	0	0	0	0	0	12
23:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	2231	333	11	39	0	0	4	0	0	0	0	0	2619
Percent	0.0%	85.2%	12.7%	0.4%	1.5%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		07:00	08:00	07:00	07:00			08:00						07:00
Vol.		307	40	2	6			1						351
PM Peak	17:00	17:00	16:00	15:00	15:00			12:00						17:00
Vol.	1	322	37	3	5			2						357

Bedford Road
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123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/16/1														
2	0	4	1	0	0	0	0	0	0	0	0	0	0	5
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	2	0	0	0	0	0	0	0	0	0	0	2
04:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
05:00	0	16	5	0	1	0	0	0	0	0	0	0	0	22
06:00	0	89	16	0	3	0	0	0	0	0	0	0	0	108
07:00	0	275	37	1	4	0	0	0	0	0	0	0	0	317
08:00	1	222	32	0	7	0	0	0	1	0	0	0	0	263
09:00	0	90	18	2	2	0	0	0	0	0	0	0	0	112
10:00	0	64	12	1	0	0	0	0	0	0	0	0	0	77
11:00	0	76	11	1	2	0	0	0	0	0	0	0	0	90
12 PM	0	73	11	0	1	1	0	0	0	0	0	0	0	86
13:00	2	60	12	0	2	0	0	1	0	0	0	0	0	77
14:00	0	85	13	0	2	0	0	1	0	0	0	0	0	101
15:00	0	217	17	2	2	0	0	0	0	0	0	0	0	238
16:00	0	257	29	0	2	0	0	1	0	0	0	0	0	289
17:00	0	267	24	0	0	0	0	1	0	0	0	0	0	292
18:00	1	95	17	0	2	0	0	0	0	0	0	0	0	115
19:00	0	44	6	0	1	0	0	0	0	0	0	0	0	51
20:00	0	33	4	0	0	0	0	0	0	0	0	0	0	37
21:00	1	24	2	0	0	0	0	0	0	0	0	0	0	27
22:00	0	18	1	0	0	0	0	0	0	0	0	0	0	19
23:00	0	11	2	0	0	0	0	0	0	0	0	0	0	13
Total	5	2025	273	7	31	1	0	4	1	0	0	0	0	2347
Percent	0.2%	86.3%	11.6%	0.3%	1.3%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	09:00	08:00				08:00					07:00
Vol.	1	275	37	2	7				1					317
PM Peak	13:00	17:00	16:00	15:00	13:00	12:00		13:00						17:00
Vol.	2	267	29	2	2	1		1						292

Bedford Road
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123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/17/1														
2	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	2	0	0	1	0	0	0	0	0	0	0	0	3
06:00	0	10	2	0	0	0	0	0	0	0	0	0	0	12
07:00	0	32	7	0	0	0	0	0	0	0	0	0	0	39
08:00	0	53	12	0	3	0	0	1	0	0	0	0	0	69
09:00	0	106	18	0	2	0	0	0	0	0	0	0	0	126
10:00	0	96	16	0	0	0	0	1	0	0	0	0	0	113
11:00	1	111	14	0	3	0	0	0	0	0	0	0	0	129
12 PM	0	119	15	0	0	0	0	0	0	0	0	0	0	134
13:00	2	111	19	0	2	0	0	0	0	0	0	0	0	134
14:00	0	101	18	0	0	0	0	0	0	0	0	0	0	119
15:00	0	104	14	0	3	0	0	0	0	0	0	0	0	121
16:00	0	73	11	0	0	0	0	0	0	0	0	0	0	84
17:00	0	58	8	0	0	0	0	0	0	0	0	0	0	66
18:00	0	36	3	2	0	0	0	0	0	0	0	0	0	41
19:00	0	36	5	0	0	0	0	0	0	0	0	0	0	41
20:00	0	23	5	0	0	0	0	0	0	0	0	0	0	28
21:00	0	23	3	0	0	0	0	0	0	0	0	0	0	26
22:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
23:00	1	13	1	0	0	0	0	0	0	0	0	0	0	15
Total	4	1122	173	2	14	0	0	2	0	0	0	0	0	1317
Percent	0.3%	85.2%	13.1%	0.2%	1.1%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	09:00		08:00			08:00						11:00
Vol.	1	111	18		3			1						129
PM Peak	13:00	12:00	13:00	18:00	15:00									12:00
Vol.	2	119	19	2	3									134

Bedford Road
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123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/18/1														
2	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
06:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
07:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
08:00	0	20	3	0	1	0	0	0	0	0	0	0	0	24
09:00	0	39	5	0	1	0	0	0	0	0	0	0	0	45
10:00	0	57	11	0	0	0	0	0	0	0	0	0	0	68
11:00	1	52	9	0	0	0	0	0	0	0	0	0	0	62
12 PM	0	73	7	0	4	0	0	0	0	0	0	0	0	84
13:00	1	80	13	0	1	0	0	0	0	0	0	0	0	95
14:00	0	61	13	0	2	0	0	0	0	0	0	0	0	76
15:00	0	61	10	0	1	0	0	0	0	0	0	0	0	72
16:00	0	57	13	0	1	0	0	0	0	0	0	0	0	71
17:00	2	36	5	0	0	0	0	0	0	0	0	0	0	43
18:00	0	29	6	0	0	0	0	0	0	0	0	0	0	35
19:00	0	25	5	0	0	0	0	0	0	0	0	0	0	30
20:00	0	21	2	0	0	0	0	0	0	0	0	0	0	23
21:00	1	17	0	0	0	0	0	0	0	0	0	0	0	18
22:00	0	6	0	0	1	0	0	0	0	0	0	0	0	7
23:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	5	667	106	0	12	0	0	0	0	0	0	0	0	790
Percent	0.6%	84.4%	13.4%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	10:00	10:00		08:00									10:00
Vol.	1	57	11		1									68
PM Peak	17:00	13:00	13:00		12:00									13:00
Vol.	2	80	13		4									95

Bedford Road
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123082 B Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/1														
2	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	2	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
05:00	0	19	1	0	2	0	0	0	0	0	0	0	0	22
06:00	0	91	13	0	2	0	0	0	0	0	0	0	0	106
07:00	1	295	39	1	5	0	0	1	0	0	0	0	0	342
08:00	0	243	51	0	5	1	0	0	3	0	0	0	0	303
09:00	0	125	25	1	4	0	0	0	1	0	0	0	0	156
10:00	1	53	7	0	1	0	0	0	0	0	0	0	0	62
11:00	0	59	18	0	2	2	0	0	0	0	0	0	0	81
12 PM	1	79	15	0	4	0	0	0	0	0	0	0	0	99
13:00	0	74	10	0	3	1	0	0	1	0	0	0	0	89
14:00	0	80	22	1	5	1	2	0	0	0	0	0	0	111
15:00	0	180	25	1	7	0	0	1	0	0	0	0	0	214
16:00	1	243	49	1	2	0	0	1	0	0	0	0	0	297
17:00	3	281	34	1	2	0	0	0	0	0	0	0	0	321
18:00	2	221	28	0	3	0	0	0	0	0	0	0	0	254
19:00	0	71	12	0	2	0	0	0	0	0	0	0	0	85
20:00	0	37	2	0	0	0	0	0	0	0	0	0	0	39
21:00	0	20	2	0	0	0	0	0	0	0	0	0	0	22
22:00	0	8	4	0	1	0	0	0	0	0	0	0	0	13
23:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
Total	9	2190	361	6	50	5	2	3	5	0	0	0	0	2631
Percent	0.3%	83.2%	13.7%	0.2%	1.9%	0.2%	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	08:00	07:00	07:00	11:00		07:00	08:00					07:00
Vol.	1	295	51	1	5	2		1	3					342
PM Peak	17:00	17:00	16:00	14:00	15:00	13:00	14:00	15:00	13:00					17:00
Vol.	3	281	49	1	7	1	2	1	1					321
Total		13010	1984	45	202	8	2	23	6	0	0	0	0	15318

PRECISION
D A T A
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Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/13/1																
2	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
01:00	0	0	0	0	0	0	0	0	0	**1**	0	0	0	1	*	57
02:00	0	0	0	0	0	0	0	1	0	0	0	0	0	1	*	47
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	1	2	1	0	0	0	0	0	0	0	4	*	32
05:00	0	0	**1**	1	3	2	2	1	0	0	0	0	0	10	33	35
06:00	0	0	0	1	19	43	5	1	0	0	0	0	0	69	39	36
07:00	0	0	1	8	76	75	12	0	0	0	0	0	0	172	38	35
08:00	0	0	1	**18**	**103**	**101**	**24**	**3**	0	0	0	0	0	**250**	38	35
09:00	0	0	0	7	68	54	12	0	0	0	0	0	0	141	38	35
10:00	0	0	1	2	20	31	11	0	0	0	0	0	0	65	39	36
11:00	0	**5**	**2**	2	5	29	9	0	0	0	0	0	0	52	39	33
12 PM	0	0	1	**5**	**31**	**43**	8	**2**	0	0	0	0	0	**90**	38	35
13:00	0	0	0	2	17	31	**11**	0	0	0	0	0	0	61	40	36
14:00	0	1	0	5	24	31	9	2	0	0	0	0	0	72	39	35
15:00	0	0	2	5	60	64	**17**	1	0	0	0	0	0	149	38	35
16:00	0	**1**	1	18	**113**	**74**	10	1	0	0	0	0	0	**218**	37	34
17:00	0	0	**4**	**28**	97	61	3	2	0	0	0	0	0	195	36	33
18:00	0	0	1	18	78	54	3	1	0	0	0	0	0	155	37	33
19:00	0	0	0	3	21	31	6	2	0	0	0	0	0	63	39	36
20:00	0	0	0	1	13	23	5	**3**	0	0	0	0	0	45	40	37
21:00	0	0	0	1	10	18	6	0	0	0	0	0	0	35	39	36
22:00	0	0	0	0	3	6	5	1	0	0	0	0	0	15	42	38
23:00	0	1	0	0	1	0	3	0	0	0	0	0	0	5	41	33
%	0.0%	0.4%	0.8%	6.7%	40.9%	41.3%	8.6%	1.1%	0.0%	0.1%	0.0%	0.0%	0.0%			
AM Peak			05:00	08:00	08:00	08:00	08:00	08:00		01:00				08:00		
Vol.			1	18	103	101	24	3		1				250		
Midday Peak		11:00	11:00	12:00	12:00	12:00	13:00	12:00						12:00		
Vol.		5	2	5	31	43	11	2						90		
PM Peak		16:00	17:00	17:00	16:00	16:00	15:00	20:00						16:00		
Vol.		1	4	28	113	74	17	3						218		

% iles

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

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 1384
Percent in Pace : 74.1%
Number of Vehicles > 35 MPH : 799
Percent of Vehicles > 35 MPH : 42.7%
Mean Speed(Average) : 35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/14/1																
2	0	0	0	0	1	2	2	0	0	0	0	0	0	5	*	38
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	2	1	1	1	0	0	0	0	0	0	5	*	33
05:00	0	0	1	1	2	2	1	0	0	0	0	0	0	7	*	33
06:00	0	0	0	2	17	28	9	1	0	0	0	0	0	57	40	36
07:00	0	0	**3**	**23**	66	80	26	**2**	0	0	0	0	0	200	39	35
08:00	0	0	0	18	**92**	**131**	**30**	2	0	0	0	0	0	**273**	39	35
09:00	0	0	0	8	71	54	12	0	0	0	0	0	0	145	38	34
10:00	0	0	0	4	23	52	18	2	0	0	0	0	0	99	40	37
11:00	0	**1**	**1**	4	32	35	14	**4**	0	0	0	0	0	91	40	35
12 PM	0	0	1	4	34	**82**	**24**	0	0	0	0	0	0	**145**	40	36
13:00	0	0	0	**6**	**53**	53	17	0	0	0	0	0	0	129	39	35
14:00	0	1	0	5	46	66	12	2	0	0	0	0	0	132	39	35
15:00	0	0	0	6	36	89	19	**4**	0	0	0	0	0	154	39	36
16:00	0	0	0	9	67	**96**	**26**	2	0	0	0	0	0	200	39	36
17:00	0	0	**3**	**24**	**81**	92	16	1	0	0	0	0	0	**217**	38	34
18:00	0	0	1	4	65	66	16	3	0	0	0	0	0	155	39	35
19:00	0	0	0	4	22	19	7	3	**1**	0	0	0	0	56	40	36
20:00	0	0	0	0	19	21	5	1	0	0	0	0	0	46	39	36
21:00	0	0	0	0	7	19	5	2	0	0	0	0	0	33	41	37
22:00	0	**1**	0	0	6	7	4	4	1	0	0	0	0	23	46	38
23:00	0	0	0	0	1	6	3	1	1	0	0	0	0	12	41	40
%	0.0%	0.1%	0.5%	5.7%	34.0%	45.8%	12.2%	1.6%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak			07:00	07:00	08:00	08:00	08:00	07:00						08:00		
Vol.			3	23	92	131	30	2						273		
Midday Peak		11:00	11:00	13:00	13:00	12:00	12:00	11:00						12:00		
Vol.		1	1	6	53	82	24	4						145		
PM Peak		22:00	17:00	17:00	17:00	16:00	16:00	15:00	19:00					17:00		
Vol.		1	3	24	81	96	26	4	1					217		

% iles

15th Percentile : 30 MPH
50th Percentile : 35 MPH
85th Percentile : 39 MPH
95th Percentile : 42 MPH

Stats

10 MPH Pace Speed : 31-40 MPH
Number in Pace : 1593
Percent in Pace : 72.9%
Number of Vehicles > 35 MPH : 1094
Percent of Vehicles > 35 MPH : 50.1%
Mean Speed(Average) : 35 MPH

PRECISION
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Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/15/1																
2	0	0	0	0	1	1	2	1	0	0	0	0	0	5	*	40
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
03:00	0	0	0	0	0	0	0	1	0	0	0	0	0	1	*	47
04:00	0	0	0	0	2	2	0	0	0	0	0	0	0	4	*	34
05:00	0	0	0	1	3	4	1	0	0	0	0	0	0	9	37	35
06:00	0	0	**1**	**6**	17	42	6	0	0	0	0	0	0	72	38	35
07:00	0	0	1	6	50	81	**32**	2	0	0	0	0	0	172	40	36
08:00	0	0	1	6	**70**	**133**	25	0	0	0	0	0	**1**	**236**	39	36
09:00	0	0	0	2	24	69	19	**5**	0	0	0	0	0	119	40	37
10:00	0	0	3	4	15	40	20	4	0	0	0	0	0	86	41	37
11:00	0	0	**1**	1	8	41	16	**5**	0	0	0	0	0	72	42	38
12 PM	0	0	0	**4**	**26**	**56**	14	0	**1**	0	0	0	0	**101**	39	36
13:00	0	0	0	1	18	32	13	2	1	0	0	0	0	67	40	37
14:00	0	0	0	1	23	39	**19**	2	0	0	0	0	0	84	40	37
15:00	0	0	**3**	6	47	59	**32**	0	0	0	0	0	0	147	40	36
16:00	0	**3**	0	11	61	**99**	25	**3**	0	0	0	0	0	202	39	35
17:00	0	0	1	**22**	**89**	73	17	3	0	0	0	0	0	**205**	38	34
18:00	0	0	0	7	39	77	19	1	0	0	0	0	0	143	39	36
19:00	0	0	0	1	15	33	8	0	0	**1**	0	0	0	58	39	37
20:00	0	0	0	3	11	20	7	1	0	0	0	0	0	42	40	36
21:00	0	0	0	0	3	15	7	1	0	0	0	0	0	26	41	38
22:00	0	0	0	0	9	11	6	0	0	0	0	0	0	26	40	36
23:00	0	0	0	0	1	5	2	3	0	0	0	0	0	11	45	40
%	0.0%	0.2%	0.6%	4.3%	28.2%	49.4%	15.4%	1.8%	0.1%	0.1%	0.0%	0.0%	0.1%			
AM Peak			06:00	06:00	08:00	08:00	07:00	09:00					08:00	08:00		
Vol.			1	6	70	133	32	5					1	236		
Midday Peak			11:00	12:00	12:00	12:00	14:00	11:00	12:00					12:00		
Vol.			1	4	26	56	19	5	1					101		
PM Peak		16:00	15:00	17:00	17:00	16:00	15:00	16:00		19:00				17:00		
Vol.		3	3	22	89	99	32	3		1				205		

% iles	
15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	1372
Percent in Pace :	72.7%
Number of Vehicles > 35 MPH :	1057
Percent of Vehicles > 35 MPH :	56.0%
Mean Speed(Average) :	36 MPH

PRECISION
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Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/16/1																
2	0	0	0	0	0	1	4	0	0	0	0	0	0	5	42	41
01:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
02:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	*	32
03:00	0	0	0	0	1	1	1	0	0	0	0	0	0	3	*	37
04:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
05:00	0	0	0	1	1	2	8	2	0	0	0	0	0	14	44	40
06:00	0	0	0	3	16	22	12	0	0	0	0	0	0	53	40	36
07:00	0	0	0	**12**	55	83	**16**	**3**	**1**	0	0	0	0	170	39	35
08:00	0	0	**2**	11	**112**	**106**	15	0	0	0	0	0	0	**246**	38	34
09:00	0	0	0	6	37	53	10	1	0	0	0	0	0	107	39	35
10:00	0	0	1	7	19	39	10	2	0	0	0	0	0	78	39	36
11:00	0	0	0	**9**	15	33	9	**3**	0	0	0	0	0	69	40	36
12 PM	0	0	1	5	35	32	7	1	0	0	0	0	0	81	38	35
13:00	0	**1**	**2**	1	24	34	13	2	0	0	0	0	0	77	40	36
14:00	0	0	0	2	**40**	**41**	**15**	3	0	0	0	0	0	**101**	40	36
15:00	0	0	1	13	38	58	**26**	**4**	0	0	0	0	0	140	40	36
16:00	0	0	0	13	71	**86**	15	1	0	0	0	0	0	186	38	35
17:00	**1**	0	**5**	**34**	**84**	86	12	0	0	0	0	0	0	**222**	37	33
18:00	0	0	1	12	68	85	16	1	0	0	0	0	0	183	38	35
19:00	0	0	0	2	7	25	7	2	0	0	0	0	0	43	40	37
20:00	0	0	0	0	9	10	4	3	0	0	0	0	0	26	42	37
21:00	0	0	0	1	9	11	1	0	**1**	0	0	0	0	23	37	35
22:00	0	0	0	1	5	10	8	3	1	0	0	0	0	28	43	39
23:00	0	0	0	0	2	1	1	0	0	0	0	0	0	4	*	36
%	0.1%	0.1%	0.7%	7.1%	35.0%	44.0%	11.3%	1.7%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak			08:00	07:00	08:00	08:00	07:00	07:00	07:00					08:00		
Vol.			2	12	112	106	16	3	1					246		
Midday Peak		13:00	13:00	11:00	14:00	14:00	14:00	11:00						14:00		
Vol.		1	2	9	40	41	15	3						101		
PM Peak	17:00		17:00	17:00	17:00	16:00	15:00	15:00	21:00					17:00		
Vol.	1		5	34	84	86	26	4	1					222		

% iles	
15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	39 MPH
95th Percentile :	42 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	1339
Percent in Pace :	71.8%
Number of Vehicles > 35 MPH :	893
Percent of Vehicles > 35 MPH :	47.9%
Mean Speed(Average) :	35 MPH

PRECISION
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Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/17/1																
2	0	0	0	0	4	6	1	0	0	0	0	0	0	11	38	36
01:00	0	0	**1**	0	2	0	0	0	0	0	0	0	0	3	*	29
02:00	0	0	0	0	0	1	0	1	0	0	0	0	0	2	*	42
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1	*	42
05:00	0	0	0	1	2	1	0	0	0	0	0	0	0	4	*	32
06:00	**1**	0	0	0	2	6	2	0	0	0	0	0	0	11	39	33
07:00	0	0	0	1	10	12	6	**2**	0	0	0	0	0	31	41	37
08:00	0	0	0	1	38	34	**9**	0	0	0	0	0	0	82	38	35
09:00	0	0	0	**6**	**52**	**64**	9	0	**1**	0	0	0	0	**132**	38	35
10:00	0	0	1	1	50	57	13	0	0	0	0	0	0	122	39	35
11:00	0	0	1	8	55	53	**15**	0	0	0	0	0	0	132	39	35
12 PM	0	0	0	6	**64**	59	6	**1**	0	0	0	0	0	136	37	35
13:00	0	**4**	1	**13**	56	60	9	0	0	0	0	0	0	143	38	33
14:00	0	0	**8**	11	63	**64**	8	0	0	0	0	0	0	**154**	37	34
15:00	0	0	1	7	**49**	**42**	8	2	0	0	0	0	0	**109**	38	35
16:00	0	0	1	3	24	20	7	**4**	0	0	0	0	0	59	40	35
17:00	0	**1**	**2**	**9**	24	21	8	0	0	0	0	0	0	65	39	33
18:00	0	0	0	2	10	20	**11**	4	0	0	0	0	0	47	42	38
19:00	0	0	0	0	6	10	2	1	0	0	0	0	0	19	38	36
20:00	0	0	0	0	5	8	3	1	0	0	0	0	0	17	40	37
21:00	0	0	0	0	6	7	5	1	0	0	0	0	0	19	42	37
22:00	0	0	0	2	6	11	0	1	0	0	0	0	0	20	37	35
23:00	0	0	0	1	3	5	2	0	0	0	0	0	0	11	39	36
%	0.1%	0.4%	1.2%	5.4%	39.9%	42.2%	9.4%	1.4%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00		01:00	09:00	09:00	09:00	08:00	07:00	09:00					09:00		
Vol.	1		1	6	52	64	9	2	1					132		
Midday Peak		13:00	14:00	13:00	12:00	14:00	11:00	12:00						14:00		
Vol.		4	8	13	64	64	15	1						154		
PM Peak		17:00	17:00	17:00	15:00	15:00	18:00	16:00						15:00		
Vol.		1	2	9	49	42	11	4						109		

% iles	
15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	38 MPH
95th Percentile :	42 MPH

Stats	
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	982
Percent in Pace :	73.8%
Number of Vehicles > 35 MPH :	590
Percent of Vehicles > 35 MPH :	44.4%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
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Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/18/1																
2	0	0	0	0	2	3	4	0	0	0	0	0	0	9	41	38
01:00	0	0	0	0	0	3	2	0	0	0	0	0	0	5	38	39
02:00	0	0	0	0	1	2	1	0	0	0	0	0	0	4	*	37
03:00	0	0	0	0	2	1	0	1	0	0	0	0	0	4	*	37
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
06:00	0	0	0	**1**	2	5	1	1	0	0	0	0	0	10	38	37
07:00	0	0	0	1	1	4	**9**	**3**	0	0	0	0	0	18	44	40
08:00	0	0	**1**	1	**8**	21	4	1	0	0	0	0	0	36	39	36
09:00	0	0	1	0	8	**24**	7	0	**1**	0	0	0	0	**41**	40	37
10:00	1	0	4	3	10	24	14	0	0	0	0	0	0	56	41	35
11:00	0	0	**4**	0	17	23	1	**2**	0	**1**	0	0	0	48	37	35
12 PM	0	**1**	2	1	**21**	34	**19**	1	0	0	0	0	0	**79**	41	36
13:00	0	1	4	1	12	**40**	18	1	0	0	0	0	0	77	41	36
14:00	0	0	1	**4**	18	38	17	0	**1**	0	0	0	0	79	40	36
15:00	0	0	**1**	**3**	**18**	32	**12**	1	0	0	0	0	0	**67**	40	36
16:00	0	0	0	2	18	**34**	10	1	0	0	0	0	0	65	40	36
17:00	0	0	0	2	18	21	5	**3**	0	0	0	0	0	49	40	36
18:00	0	0	1	1	2	17	7	0	0	0	0	0	0	28	41	37
19:00	0	0	0	0	7	9	5	2	**1**	0	0	0	0	24	42	38
20:00	0	0	0	0	6	10	3	1	0	0	0	0	0	20	40	37
21:00	0	0	0	0	3	5	2	1	1	0	0	0	0	12	39	39
22:00	0	0	0	1	1	3	2	1	0	0	0	0	0	8	38	38
23:00	0	0	0	0	2	3	2	1	0	0	0	0	0	8	38	38
%	0.1%	0.3%	2.5%	2.8%	23.8%	47.6%	19.4%	2.8%	0.5%	0.1%	0.0%	0.0%	0.0%			
AM Peak			08:00	06:00	08:00	09:00	07:00	07:00	09:00					09:00		
Vol.			1	1	8	24	9	3	1					41		
Midday Peak		12:00	11:00	14:00	12:00	13:00	12:00	11:00	14:00	11:00				12:00		
Vol.		1	4	4	21	40	19	2	1	1				79		
PM Peak			15:00	15:00	15:00	16:00	15:00	17:00	19:00					15:00		
Vol.			1	3	18	34	12	3	1					67		

% iles	
15th Percentile :	31 MPH
50th Percentile :	36 MPH
85th Percentile :	41 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	32-41 MPH
Number in Pace :	520
Percent in Pace :	69.5%
Number of Vehicles > 35 MPH :	448
Percent of Vehicles > 35 MPH :	59.8%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/19/1																
2	0	0	0	0	0	2	1	0	0	0	0	0	0	3	*	39
01:00	0	0	0	0	1	2	0	0	0	0	0	0	0	3	*	35
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	2	1	0	0	0	0	0	0	3	*	39
05:00	0	0	0	1	4	5	2	0	0	0	0	0	0	12	39	35
06:00	0	0	0	1	16	31	10	0	**1**	0	0	0	0	59	40	37
07:00	**1**	0	0	11	65	77	**21**	**4**	0	0	0	0	0	179	39	35
08:00	0	0	0	**14**	**92**	**137**	19	3	1	0	0	0	0	**266**	38	35
09:00	0	0	0	1	29	56	19	1	0	0	0	0	0	106	40	37
10:00	0	0	1	2	14	43	9	4	0	0	0	0	0	73	40	37
11:00	0	0	0	**3**	8	28	**17**	1	0	0	0	0	0	57	41	37
12 PM	0	0	0	3	**23**	**36**	14	1	0	**1**	0	0	0	**78**	40	36
13:00	0	**1**	**1**	2	20	25	10	**4**	0	1	0	0	0	64	41	36
14:00	0	0	1	3	11	32	12	0	0	0	0	0	0	59	40	36
15:00	0	0	**7**	5	34	78	**26**	4	**1**	0	0	0	0	155	40	36
16:00	0	**1**	7	13	70	**87**	13	1	0	0	0	0	0	**192**	38	34
17:00	0	0	0	**14**	**90**	66	16	1	0	0	0	0	0	187	38	34
18:00	0	0	0	4	47	69	8	5	0	0	0	0	0	133	38	36
19:00	0	0	0	4	17	23	8	**6**	0	0	0	0	0	58	41	37
20:00	0	0	0	0	4	25	8	3	0	0	0	0	0	40	41	38
21:00	0	0	0	0	3	8	4	0	0	0	0	0	0	15	41	37
22:00	0	1	0	1	2	7	1	0	0	0	0	0	0	12	38	33
23:00	0	0	0	0	1	1	1	0	0	0	0	0	0	3	*	37
%	0.1%	0.2%	1.0%	4.7%	31.4%	47.8%	12.5%	2.2%	0.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00			08:00	08:00	08:00	07:00	07:00	06:00					08:00		
Vol.	1			14	92	137	21	4	1					266		
Midday Peak		13:00	13:00	11:00	12:00	12:00	11:00	13:00		12:00				12:00		
Vol.		1	1	3	23	36	17	4		1				78		
PM Peak		16:00	15:00	17:00	17:00	16:00	15:00	19:00	15:00					16:00		
Vol.		1	7	14	90	87	26	6	1					192		

% iles

15th Percentile : 30 MPH
50th Percentile : 35 MPH
85th Percentile : 39 MPH
95th Percentile : 43 MPH

Stats

10 MPH Pace Speed : 31-40 MPH
Number in Pace : 1280
Percent in Pace : 72.9%
Number of Vehicles > 35 MPH : 922
Percent of Vehicles > 35 MPH : 52.5%
Mean Speed(Average) : 36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/13/1																
2	0	0	0	0	2	2	0	0	0	0	0	0	0	4	*	34
01:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	*	32
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
04:00	0	0	0	0	1	2	0	0	0	0	0	0	0	3	*	35
05:00	0	0	0	1	5	12	1	0	0	0	0	0	0	19	38	35
06:00	0	0	0	2	17	74	23	3	0	0	0	0	0	119	40	37
07:00	**5**	**4**	**2**	**7**	**102**	**174**	26	**4**	0	0	0	0	0	**324**	38	35
08:00	0	1	2	7	87	167	**31**	3	0	0	0	0	0	298	39	36
09:00	0	0	1	1	55	88	18	1	0	0	0	0	0	164	39	36
10:00	0	0	0	5	23	32	7	0	0	0	0	0	0	67	38	35
11:00	0	**1**	**2**	3	36	37	5	0	0	0	0	0	0	84	38	34
12 PM	0	0	1	4	17	35	9	2	0	0	0	0	0	68	39	36
13:00	0	0	0	6	21	27	4	0	0	0	0	0	0	58	38	35
14:00	0	0	0	**8**	**39**	**50**	**15**	**5**	0	0	0	0	0	**117**	40	36
15:00	**1**	**3**	2	9	89	103	**32**	3	0	0	0	0	0	242	39	35
16:00	0	1	0	21	179	128	27	3	0	0	0	0	0	359	38	34
17:00	0	0	0	**38**	**194**	**131**	24	**5**	0	0	0	0	0	**392**	38	34
18:00	0	0	**5**	13	83	94	25	5	**1**	0	0	0	0	226	39	35
19:00	0	0	0	5	35	33	13	0	0	0	0	0	0	86	39	35
20:00	0	0	0	6	13	7	4	0	0	0	0	0	0	30	38	34
21:00	0	0	1	3	9	20	3	1	0	0	0	0	0	37	38	35
22:00	0	0	0	0	4	4	6	0	0	0	0	0	0	14	41	38
23:00	0	0	0	0	0	3	0	0	0	0	0	0	0	3	36	37
%	0.2%	0.4%	0.6%	5.1%	37.3%	45.0%	10.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	07:00	07:00	07:00	08:00	07:00						07:00		
Vol.	5	4	2	7	102	174	31	4						324		
Midday Peak		11:00	11:00	14:00	14:00	14:00	14:00	14:00						14:00		
Vol.		1	2	8	39	50	15	5						117		
PM Peak	15:00	15:00	18:00	17:00	17:00	17:00	15:00	17:00	18:00					17:00		
Vol.	1	3	5	38	194	131	32	5	1					392		

% iles	
15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	39 MPH
95th Percentile :	42 MPH

Stats	
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	2011
Percent in Pace :	74.0%
Number of Vehicles > 35 MPH :	1275
Percent of Vehicles > 35 MPH :	46.9%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/14/1																
2	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	2	1	0	0	0	0	0	0	0	0	3	*	29
05:00	0	0	0	1	8	7	2	0	0	0	0	0	0	18	38	35
06:00	0	0	0	3	29	55	19	2	0	0	0	0	0	108	40	36
07:00	0	**2**	**3**	**8**	75	**192**	**51**	2	1	0	0	0	0	**334**	39	36
08:00	0	0	0	8	**95**	163	51	**5**	0	0	0	0	0	322	40	36
09:00	0	0	0	6	58	93	22	3	**2**	0	0	0	0	184	39	36
10:00	0	1	0	2	35	53	12	0	0	0	0	0	0	103	39	35
11:00	0	0	0	5	36	49	13	0	0	0	0	0	0	103	39	35
12 PM	0	0	1	7	51	59	**20**	**2**	0	0	0	0	0	140	39	35
13:00	0	**1**	0	6	**56**	**71**	18	2	0	0	0	0	0	**154**	39	35
14:00	0	0	**2**	**10**	43	59	12	1	0	0	0	0	0	127	38	35
15:00	0	0	1	13	74	111	29	4	0	0	0	0	0	232	39	36
16:00	0	0	0	6	92	**160**	31	**6**	0	0	0	0	0	295	39	36
17:00	0	**1**	**2**	**35**	**131**	159	28	2	1	0	0	0	0	**359**	38	35
18:00	0	1	0	4	63	129	**38**	3	**2**	0	**1**	0	0	241	40	37
19:00	0	1	1	12	27	40	13	0	0	0	0	0	0	94	39	34
20:00	0	0	0	1	12	22	4	0	2	0	0	0	0	41	39	37
21:00	0	0	0	0	5	10	3	1	0	0	0	0	0	19	40	37
22:00	0	0	0	0	3	7	5	1	0	0	0	0	0	16	42	38
23:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	*	32
%	0.0%	0.2%	0.3%	4.5%	31.0%	49.7%	12.8%	1.2%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak		07:00	07:00	07:00	08:00	07:00	07:00	08:00	09:00					07:00		
Vol.		2	3	8	95	192	51	5	2					334		
Midday Peak		13:00	14:00	14:00	13:00	13:00	12:00	12:00						13:00		
Vol.		1	2	10	56	71	20	2						154		
PM Peak		17:00	17:00	17:00	17:00	16:00	18:00	16:00	18:00		18:00			17:00		
Vol.		1	2	35	131	160	38	6	2		1			359		

% iles	
15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	39 MPH
95th Percentile :	42 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	2156
Percent in Pace :	74.4%
Number of Vehicles > 35 MPH :	1542
Percent of Vehicles > 35 MPH :	53.2%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/15/1																
2	0	0	0	0	2	1	0	0	0	0	0	0	0	3	*	34
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	*	32
05:00	0	0	0	0	5	13	4	0	0	0	0	0	0	22	39	37
06:00	0	0	0	1	29	61	20	1	0	0	0	0	0	112	40	37
07:00	**4**	0	**3**	**10**	**76**	**192**	**61**	**5**	0	0	0	0	0	**351**	40	36
08:00	0	**1**	0	5	72	166	48	1	**1**	0	0	0	0	294	40	36
09:00	0	0	0	3	24	71	35	1	0	0	0	0	0	134	41	37
10:00	0	0	2	4	24	33	11	4	0	0	0	0	0	78	40	36
11:00	0	**1**	0	3	20	44	12	0	0	0	0	0	0	80	39	36
12 PM	0	0	1	7	**30**	44	12	0	**1**	0	0	0	0	95	39	35
13:00	0	1	**2**	6	16	31	14	**2**	0	0	0	0	0	72	40	35
14:00	0	0	2	**8**	29	**45**	**19**	0	0	0	0	0	0	**103**	40	35
15:00	0	0	**3**	8	73	95	33	**4**	0	0	0	0	0	216	39	36
16:00	0	0	0	6	114	**171**	**49**	0	0	0	0	0	0	340	39	36
17:00	0	0	1	**12**	**155**	155	32	2	0	0	0	0	0	**357**	38	35
18:00	0	0	0	5	62	111	29	4	0	0	0	0	0	211	39	36
19:00	0	0	1	4	15	36	8	1	0	0	0	0	0	65	39	36
20:00	0	0	0	1	10	19	5	1	0	0	0	0	0	36	40	36
21:00	0	0	0	1	9	18	7	0	0	0	0	0	0	35	40	36
22:00	0	0	1	3	2	4	1	1	0	0	0	0	0	12	37	34
23:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
%	0.2%	0.1%	0.6%	3.3%	29.4%	50.0%	15.3%	1.0%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	07:00	07:00	07:00	07:00	07:00	07:00	08:00					07:00		
Vol.	4	1	3	10	76	192	61	5	1					351		
Midday Peak		11:00	13:00	14:00	12:00	14:00	14:00	13:00	12:00					14:00		
Vol.		1	2	8	30	45	19	2	1					103		
PM Peak			15:00	17:00	17:00	16:00	16:00	15:00						17:00		
Vol.			3	12	155	171	49	4						357		

% iles

15th Percentile : 30 MPH
50th Percentile : 35 MPH
85th Percentile : 39 MPH
95th Percentile : 42 MPH

Stats

10 MPH Pace Speed : 31-40 MPH
Number in Pace : 1939
Percent in Pace : 74.0%
Number of Vehicles > 35 MPH : 1453
Percent of Vehicles > 35 MPH : 55.5%
Mean Speed(Average) : 36 MPH

PRECISION
D A T A
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Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/16/1																
2	0	0	0	1	1	2	1	0	0	0	0	0	0	5	*	35
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	1	0	0	0	0	0	1	*	47
03:00	0	0	0	0	0	0	0	2	0	0	0	0	0	2	*	47
04:00	0	0	0	0	0	2	3	0	0	0	0	0	0	5	41	40
05:00	0	0	0	1	9	9	3	0	0	0	0	0	0	22	38	35
06:00	0	0	0	0	25	62	18	3	0	0	0	0	0	108	40	37
07:00	**3**	**3**	**3**	6	**89**	**160**	**47**	**6**	0	0	0	0	0	**317**	39	35
08:00	0	1	0	**12**	74	146	27	3	0	0	0	0	0	263	39	36
09:00	0	0	0	8	28	56	18	2	0	0	0	0	0	112	40	36
10:00	0	0	0	5	26	39	7	0	0	0	0	0	0	77	38	35
11:00	0	0	0	6	36	38	9	**1**	0	0	0	0	0	90	38	35
12 PM	0	0	**2**	6	31	40	7	0	0	0	0	0	0	86	38	35
13:00	0	**1**	1	3	**41**	21	**10**	0	0	0	0	0	0	77	38	34
14:00	0	0	0	**12**	28	**55**	5	1	0	0	0	0	0	**101**	38	35
15:00	**1**	**1**	**3**	9	65	124	32	2	**1**	0	0	0	0	238	39	36
16:00	0	0	1	**19**	90	138	**40**	1	0	0	0	0	0	289	39	35
17:00	0	0	0	5	**108**	**140**	35	**4**	0	0	0	0	0	**292**	39	36
18:00	0	1	1	5	40	50	16	2	0	0	0	0	0	115	39	35
19:00	0	0	0	3	17	25	6	0	0	0	0	0	0	51	39	35
20:00	0	0	1	2	13	14	7	0	0	0	0	0	0	37	40	35
21:00	0	0	0	4	12	8	2	1	0	0	0	0	0	27	37	34
22:00	0	0	0	3	4	9	0	3	0	0	0	0	0	19	38	36
23:00	0	0	0	3	4	5	1	0	0	0	0	0	0	13	37	34
%	0.2%	0.3%	0.5%	4.8%	31.6%	48.7%	12.5%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	08:00	07:00	07:00	07:00	07:00						07:00		
Vol.	3	3	3	12	89	160	47	6						317		
Midday Peak		13:00	12:00	14:00	13:00	14:00	13:00	11:00						14:00		
Vol.		1	2	12	41	55	10	1						101		
PM Peak	15:00	15:00	15:00	16:00	17:00	17:00	16:00	17:00	15:00					17:00		
Vol.	1	1	3	19	108	140	40	4	1					292		

% iles	
15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	39 MPH
95th Percentile :	42 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	1731
Percent in Pace :	73.8%
Number of Vehicles > 35 MPH :	1222
Percent of Vehicles > 35 MPH :	52.1%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/17/1																
2	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
01:00	0	0	**1**	0	1	0	1	0	0	0	0	0	0	3	*	32
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
04:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
05:00	0	0	0	0	2	1	0	0	0	0	0	0	0	3	*	34
06:00	0	0	0	0	8	2	2	0	0	0	0	0	0	12	34	35
07:00	0	0	0	0	17	19	3	0	0	0	0	0	0	39	38	35
08:00	0	0	0	2	27	24	**15**	1	0	0	0	0	0	69	40	36
09:00	0	0	1	**7**	**49**	**56**	11	**2**	0	0	0	0	0	**126**	38	35
10:00	0	0	0	3	49	47	14	0	0	0	0	0	0	113	39	35
11:00	0	0	0	6	52	54	16	**1**	0	0	0	0	0	129	39	35
12 PM	0	0	**2**	**12**	**58**	52	9	0	**1**	0	0	0	0	**134**	38	34
13:00	0	**1**	2	9	42	**60**	**19**	1	0	0	0	0	0	134	39	35
14:00	0	0	0	10	46	49	14	0	0	0	0	0	0	119	39	35
15:00	0	0	**2**	**17**	**51**	**47**	4	0	0	0	0	0	0	**121**	37	33
16:00	0	0	0	8	28	42	6	0	0	0	0	0	0	84	38	35
17:00	0	0	0	2	22	31	**10**	**1**	0	0	0	0	0	66	40	36
18:00	0	0	0	3	15	16	7	0	0	0	0	0	0	41	40	35
19:00	0	0	0	2	16	16	7	0	0	0	0	0	0	41	40	35
20:00	0	0	0	1	14	7	5	1	0	0	0	0	0	28	40	35
21:00	0	0	0	0	11	13	2	0	0	0	0	0	0	26	38	35
22:00	0	0	0	0	3	5	2	0	0	0	0	0	0	10	39	37
23:00	0	0	0	1	4	9	1	0	0	0	0	0	0	15	38	35
%	0.0%	0.1%	0.6%	6.3%	39.3%	41.9%	11.2%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak			01:00	09:00	09:00	09:00	08:00	09:00						09:00		
Vol.			1	7	49	56	15	2						126		
Midday Peak		13:00	12:00	12:00	12:00	13:00	13:00	11:00	12:00					12:00		
Vol.		1	2	12	58	60	19	1	1					134		
PM Peak			15:00	15:00	15:00	15:00	17:00	17:00						15:00		
Vol.			2	17	51	47	10	1						121		

% iles	
15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	39 MPH
95th Percentile :	42 MPH

Stats	
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	968
Percent in Pace :	73.5%
Number of Vehicles > 35 MPH :	596
Percent of Vehicles > 35 MPH :	45.3%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/18/1																
2	0	0	0	0	3	0	0	0	0	0	0	0	0	3	31	32
01:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1	*	42
02:00	0	0	0	0	0	0	0	**1**	0	0	0	0	0	1	*	47
03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	2	1	0	0	0	0	0	0	0	3	*	34
06:00	0	0	0	**2**	6	3	0	0	0	0	0	0	0	11	35	32
07:00	0	0	0	0	3	10	3	0	0	0	0	0	0	16	39	37
08:00	0	0	0	2	7	12	2	1	0	0	0	0	0	24	38	36
09:00	0	0	0	0	**21**	**19**	**5**	0	0	0	0	0	0	**45**	39	35
10:00	0	0	0	0	19	33	15	1	0	0	0	0	0	68	40	37
11:00	0	0	**1**	**6**	22	25	6	1	**1**	0	0	0	0	62	39	35
12 PM	0	0	0	3	18	**46**	**15**	2	0	0	0	0	0	84	40	37
13:00	0	0	0	4	**35**	41	11	**3**	1	0	0	0	0	**95**	39	36
14:00	0	0	1	4	19	36	15	1	0	0	0	0	0	76	40	36
15:00	0	**1**	0	**1**	19	**37**	**12**	1	**1**	0	0	0	0	**72**	40	36
16:00	0	0	0	1	**26**	31	12	1	0	0	0	0	0	71	40	36
17:00	0	0	0	1	12	23	5	1	1	0	0	0	0	43	39	37
18:00	0	0	0	0	11	14	9	1	0	0	0	0	0	35	41	37
19:00	0	0	0	1	12	12	3	**2**	0	0	0	0	0	30	39	36
20:00	0	0	**1**	1	6	12	3	0	0	0	0	0	0	23	39	35
21:00	0	0	0	1	11	5	1	0	0	0	0	0	0	18	37	34
22:00	0	0	1	0	2	4	0	0	0	0	0	0	0	7	37	33
23:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
%	0.0%	0.1%	0.5%	3.4%	32.2%	46.3%	14.9%	2.0%	0.5%	0.0%	0.0%	0.0%	0.0%			
AM Peak				06:00	09:00	09:00	09:00	02:00						09:00		
Vol.				2	21	19	5	1						45		
Midday Peak			11:00	11:00	13:00	12:00	12:00	13:00	11:00					13:00		
Vol.			1	6	35	46	15	3	1					95		
PM Peak		15:00	20:00	15:00	16:00	15:00	15:00	19:00	15:00					15:00		
Vol.		1	1	1	26	37	12	2	1					72		

% iles	
15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	573
Percent in Pace :	72.5%
Number of Vehicles > 35 MPH :	426
Percent of Vehicles > 35 MPH :	53.9%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
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Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 B Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/19/1																
2	0	0	0	0	1	2	0	0	0	0	0	0	0	3	*	35
01:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
02:00	0	0	0	0	0	0	1	1	0	0	0	0	0	2	*	44
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	1	2	1	0	0	0	0	0	0	4	*	37
05:00	0	0	0	1	4	12	5	0	0	0	0	0	0	22	40	37
06:00	0	0	0	6	25	50	23	2	0	0	0	0	0	106	40	37
07:00	0	0	**7**	10	**94**	**184**	45	2	0	0	0	0	0	**342**	39	36
08:00	0	0	0	**17**	89	146	**48**	3	0	0	0	0	0	303	39	36
09:00	0	0	0	3	29	82	35	**7**	0	0	0	0	0	156	41	37
10:00	0	0	0	5	16	29	12	0	0	0	0	0	0	62	40	36
11:00	0	0	**2**	8	24	29	**17**	0	**1**	0	0	0	0	81	40	35
12 PM	0	0	1	3	26	55	14	0	0	0	0	0	0	99	39	36
13:00	0	0	1	**11**	**32**	31	11	**3**	0	0	0	0	0	89	39	35
14:00	0	**1**	0	7	31	**57**	14	1	0	0	0	0	0	**111**	39	35
15:00	0	0	0	11	46	111	40	**5**	1	0	0	0	0	214	40	37
16:00	0	**3**	**2**	12	93	138	44	3	**2**	0	0	0	0	297	39	36
17:00	0	0	0	**13**	**94**	**171**	38	5	0	0	0	0	0	**321**	39	36
18:00	0	0	2	7	56	128	**56**	4	1	0	0	0	0	254	41	37
19:00	0	0	0	2	23	33	21	4	1	0	**1**	0	0	85	42	38
20:00	0	1	0	1	10	19	7	1	0	0	0	0	0	39	40	36
21:00	0	0	1	2	6	9	3	1	0	0	0	0	0	22	40	35
22:00	0	0	0	0	5	6	2	0	0	0	0	0	0	13	39	36
23:00	0	0	0	0	3	1	0	0	0	0	0	0	0	4	32	33
%	0.0%	0.2%	0.6%	4.5%	26.9%	49.3%	16.6%	1.6%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak			07:00	08:00	07:00	07:00	08:00	09:00						07:00		
Vol.			7	17	94	184	48	7						342		
Midday Peak		14:00	11:00	13:00	13:00	14:00	11:00	13:00	11:00					14:00		
Vol.		1	2	11	32	57	17	3	1					111		
PM Peak		16:00	16:00	17:00	17:00	17:00	18:00	15:00	16:00		19:00			17:00		
Vol.		3	2	13	94	171	56	5	2		1			321		

% iles	
15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH

Stats	
10 MPH Pace Speed :	32-41 MPH
Number in Pace :	1894
Percent in Pace :	72.0%
Number of Vehicles > 35 MPH :	1498
Percent of Vehicles > 35 MPH :	56.9%
Mean Speed(Average) :	36 MPH

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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123082 B Volume
Site Code: TBA

Start	13-Nov-12		14-Nov-12		15-Nov-12		16-Nov-12		17-Nov-12		18-Nov-12		19-Nov-12		Week Average	
Time	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	1	4	5	2	5	3	5	5	11	1	9	3	3	3	6	3
01:00	1	2	0	0	0	0	2	0	3	3	5	1	3	2	2	1
02:00	1	0	0	0	1	0	2	1	2	0	4	1	0	2	1	1
03:00	0	1	0	0	1	0	3	2	0	2	4	1	0	0	1	1
04:00	4	3	5	3	4	2	2	5	1	1	0	0	3	4	3	3
05:00	10	19	7	18	9	22	14	22	4	3	1	3	12	22	8	16
06:00	69	119	57	108	72	112	53	108	11	12	10	11	59	106	47	82
07:00	172	**324**	200	**334**	172	**351**	170	**317**	31	39	18	16	179	**342**	135	**246**
08:00	**250**	298	**273**	322	**236**	294	**246**	263	82	69	36	24	**266**	303	**198**	225
09:00	141	164	145	184	119	134	107	112	**132**	126	41	45	106	156	113	132
10:00	65	67	99	103	86	78	78	77	122	113	**56**	**68**	73	62	83	81
11:00	52	84	91	103	72	80	69	90	132	**129**	48	62	57	81	74	90
12:00 PM	90	68	145	140	101	95	81	86	136	**134**	**79**	84	78	99	101	101
01:00	61	58	129	154	67	72	77	77	143	134	77	**95**	64	89	88	97
02:00	72	117	132	127	84	103	101	101	**154**	119	79	76	59	111	97	108
03:00	149	242	154	232	147	216	140	238	109	121	67	72	155	214	132	191
04:00	**218**	359	200	295	202	340	186	289	59	84	65	71	**192**	297	160	248
05:00	195	**392**	**217**	**359**	**205**	**357**	**222**	**292**	65	66	49	43	187	**321**	**163**	**261**
06:00	155	226	155	241	143	211	183	115	47	41	28	35	133	254	121	160
07:00	63	86	56	94	58	65	43	51	19	41	24	30	58	85	46	65
08:00	45	30	46	41	42	36	26	37	17	28	20	23	40	39	34	33
09:00	35	37	33	19	26	35	23	27	19	26	12	18	15	22	23	26
10:00	15	14	23	16	26	12	28	19	20	10	8	7	12	13	19	13
11:00	5	3	12	2	11	1	4	13	11	15	8	1	3	4	8	6
Total	1869	2717	2184	2897	1889	2619	1865	2347	1330	1317	748	790	1757	2631	1663	2190
Day	4586		5081		4508		4212		2647		1538		4388		3853	
AM Peak	08:00	07:00	08:00	07:00	08:00	07:00	08:00	07:00	09:00	11:00	10:00	10:00	08:00	07:00	08:00	07:00
Vol.	250	324	273	334	236	351	246	317	132	129	56	68	266	342	198	246
PM Peak	16:00	17:00	17:00	17:00	17:00	17:00	17:00	17:00	14:00	12:00	12:00	13:00	16:00	17:00	17:00	17:00
Vol.	218	392	217	359	205	357	222	292	154	134	79	95	192	321	163	261

Comb. Total	4586	5081	4508	4212	2647	1538	4388	3853

ADT ADT 3,851 AADT 3,851

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
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123082 B Volume
Site Code: TBA

Start	NB				SB				Combined				13-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	1		25		2		21		3		46		
12:15	0		22		2		19		2		41		
12:30	0		21		0		15		0		36		
12:45	0	1	22	90	0	4	13	68	0	5	35	158	
01:00	0		23		1		15		1		38		
01:15	0		6		0		10		0		16		
01:30	1		19		0		20		1		39		
01:45	0	1	13	61	1	2	13	58	1	3	26	119	
02:00	0		12		0		22		0		34		
02:15	1		15		0		23		1		38		
02:30	0		20		0		32		0		52		
02:45	0	1	25	72	0	0	40	117	0	1	65	189	
03:00	0		26		0		75		0		101		
03:15	0		39		0		36		0		75		
03:30	0		35		0		61		0		96		
03:45	0	0	49	149	1	1	70	242	1	1	119	391	
04:00	1		56		0		83		1		139		
04:15	0		55		2		101		2		156		
04:30	1		54		0		101		1		155		
04:45	2	4	53	218	1	3	74	359	3	7	127	577	
05:00	0		47		0		106		0		153		
05:15	1		43		4		99		5		142		
05:30	3		43		4		107		7		150		
05:45	6	10	62	195	11	19	80	392	17	29	142	587	
06:00	4		59		8		71		12		130		
06:15	16		47		20		64		36		111		
06:30	15		25		38		50		53		75		
06:45	34	69	24	155	53	119	41	226	87	188	65	381	
07:00	29		18		68		43		97		61		
07:15	30		18		72		13		102		31		
07:30	50		9		87		12		137		21		
07:45	63	172	18	63	97	324	18	86	160	496	36	149	
08:00	58		10		84		10		142		20		
08:15	61		13		74		11		135		24		
08:30	66		11		69		6		135		17		
08:45	65	250	11	45	71	298	3	30	136	548	14	75	
09:00	56		14		49		7		105		21		
09:15	36		7		51		13		87		20		
09:30	24		7		36		10		60		17		
09:45	25	141	7	35	28	164	7	37	53	305	14	72	
10:00	22		4		24		5		46		9		
10:15	17		8		19		4		36		12		
10:30	11		1		13		3		24		4		
10:45	15	65	2	15	11	67	2	14	26	132	4	29	
11:00	14		2		15		1		29		3		
11:15	9		1		17		1		26		2		
11:30	14		1		25		0		39		1		
11:45	15	52	1	5	27	84	1	3	42	136	2	8	
Total	766		1103		1085		1632		1851		2735		
Percent	41.4%		40.3%		58.6%		59.7%						
Day Total		1869				2717				4586			
Peak	08:00		04:00		07:30		05:00		07:30		04:15		
Vol.	250		218		342		392		574		591		
P.H.F.	0.947		0.973		0.881		0.916		0.897		0.947		

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 B Volume
Site Code: TBA

Start	NB				SB				Combined				14-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	2		34		0		42		2		76		
12:15	1		35		0		31		1		66		
12:30	1		40		1		31		2		71		
12:45	1	5	36	145	1	2	36	140	2	7	72	285	
01:00	0		30		0		22		0		52		
01:15	0		35		0		56		0		91		
01:30	0		37		0		45		0		82		
01:45	0	0	27	129	0	0	31	154	0	0	58	283	
02:00	0		34		0		21		0		55		
02:15	0		30		0		26		0		56		
02:30	0		27		0		44		0		71		
02:45	0	0	41	132	0	0	36	127	0	0	77	259	
03:00	0		34		0		62		0		96		
03:15	0		46		0		67		0		113		
03:30	0		28		0		51		0		79		
03:45	0	0	46	154	0	0	52	232	0	0	98	386	
04:00	0		44		0		76		0		120		
04:15	1		63		2		62		3		125		
04:30	3		45		1		71		4		116		
04:45	1	5	48	200	0	3	86	295	1	8	134	495	
05:00	2		65		1		84		3		149		
05:15	1		49		4		116		5		165		
05:30	2		54		4		79		6		133		
05:45	2	7	49	217	9	18	80	359	11	25	129	576	
06:00	7		55		12		80		19		135		
06:15	13		39		20		61		33		100		
06:30	13		29		30		58		43		87		
06:45	24	57	32	155	46	108	42	241	70	165	74	396	
07:00	27		12		66		44		93		56		
07:15	48		13		86		17		134		30		
07:30	70		16		88		17		158		33		
07:45	55	200	15	56	94	334	16	94	149	534	31	150	
08:00	69		13		82		13		151		26		
08:15	68		10		79		12		147		22		
08:30	71		11		78		10		149		21		
08:45	65	273	12	46	83	322	6	41	148	595	18	87	
09:00	36		8		67		7		103		15		
09:15	33		14		53		9		86		23		
09:30	47		5		42		2		89		7		
09:45	29	145	6	33	22	184	1	19	51	329	7	52	
10:00	30		4		28		6		58		10		
10:15	19		4		34		4		53		8		
10:30	26		5		16		5		42		10		
10:45	24	99	10	23	25	103	1	16	49	202	11	39	
11:00	17		4		12		0		29		4		
11:15	26		4		28		1		54		5		
11:30	30		2		27		1		57		3		
11:45	18	91	2	12	36	103	0	2	54	194	2	14	
Total	882		1302		1177		1720		2059		3022		
Percent	42.8%		43.1%		57.2%		56.9%						
Day Total		2184				2897				5081			
Peak	08:00		04:15		07:15		04:45		07:30		04:45		
Vol.	273		221		350		365		605		581		
P.H.F.	0.961		0.850		0.931		0.787		0.957		0.880		

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 B Volume
Site Code: TBA

Start	NB				SB				Combined				15-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	2		20		3		25		5		45		
12:15	0		19		0		25		0		44		
12:30	2		32		0		20		2		52		
12:45	1	5	30	101	0	3	25	95	1	8	55	196	
01:00	0		16		0		21		0		37		
01:15	0		16		0		15		0		31		
01:30	0		15		0		17		0		32		
01:45	0	0	20	67	0	0	19	72	0	0	39	139	
02:00	0		17		0		21		0		38		
02:15	1		16		0		32		1		48		
02:30	0		18		0		22		0		40		
02:45	0	1	33	84	0	0	28	103	0	1	61	187	
03:00	0		40		0		67		0		107		
03:15	1		41		0		37		1		78		
03:30	0		21		0		51		0		72		
03:45	0	1	45	147	0	0	61	216	0	1	106	363	
04:00	0		51		0		89		0		140		
04:15	0		42		2		82		2		124		
04:30	1		45		0		83		1		128		
04:45	3	4	64	202	0	2	86	340	3	6	150	542	
05:00	2		41		2		99		4		140		
05:15	0		64		4		83		4		147		
05:30	2		56		9		83		11		139		
05:45	5	9	44	205	7	22	92	357	12	31	136	562	
06:00	5		40		11		84		16		124		
06:15	16		47		20		51		36		98		
06:30	22		33		26		51		48		84		
06:45	29	72	23	143	55	112	25	211	84	184	48	354	
07:00	22		14		86		31		108		45		
07:15	43		19		81		21		124		40		
07:30	44		13		77		7		121		20		
07:45	63	172	12	58	107	351	6	65	170	523	18	123	
08:00	51		7		94		10		145		17		
08:15	75		12		60		6		135		18		
08:30	67		14		81		9		148		23		
08:45	43	236	9	42	59	294	11	36	102	530	20	78	
09:00	42		9		55		9		97		18		
09:15	24		6		38		14		62		20		
09:30	27		7		21		5		48		12		
09:45	26	119	4	26	20	134	7	35	46	253	11	61	
10:00	16		7		23		2		39		9		
10:15	19		4		17		5		36		9		
10:30	27		6		19		5		46		11		
10:45	24	86	9	26	19	78	0	12	43	164	9	38	
11:00	15		7		9		0		24		7		
11:15	18		0		26		1		44		1		
11:30	17		2		18		0		35		2		
11:45	22	72	2	11	27	80	0	1	49	152	2	12	
Total	777		1112		1076		1543		1853		2655		
Percent	41.9%		41.9%		58.1%		58.1%						
Day Total		1889				2619				4508			
Peak	07:45		04:45		07:15		05:00		07:45		04:45		
Vol.	256		225		359		357		598		576		
P.H.F.	0.853		0.879		0.839		0.902		0.879		0.960		

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 B Volume
Site Code: TBA

Start	NB				SB				Combined				16-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Fri
12:00	0		12		1		24		1		36		
12:15	1		21		1		26		2		47		
12:30	2		31		1		19		3		50		
12:45	2	5	17	81	2	5	17	86	4	10	34	167	
01:00	1		19		0		16		1		35		
01:15	0		22		0		27		0		49		
01:30	1		15		0		18		1		33		
01:45	0	2	21	77	0	0	16	77	0	2	37	154	
02:00	0		24		0		17		0		41		
02:15	0		27		0		24		0		51		
02:30	1		21		1		36		2		57		
02:45	1	2	29	101	0	1	24	101	1	3	53	202	
03:00	0		37		2		72		2		109		
03:15	2		36		0		65		2		101		
03:30	0		35		0		58		0		93		
03:45	1	3	32	140	0	2	43	238	1	5	75	378	
04:00	0		46		0		56		0		102		
04:15	1		53		2		54		3		107		
04:30	1		44		2		89		3		133		
04:45	0	2	43	186	1	5	90	289	1	7	133	475	
05:00	2		56		1		94		3		150		
05:15	4		55		3		81		7		136		
05:30	3		60		6		66		9		126		
05:45	5	14	51	222	12	22	51	292	17	36	102	514	
06:00	7		49		12		32		19		81		
06:15	10		65		15		38		25		103		
06:30	14		41		31		31		45		72		
06:45	22	53	28	183	50	108	14	115	72	161	42	298	
07:00	32		16		60		25		92		41		
07:15	39		13		70		10		109		23		
07:30	45		8		81		10		126		18		
07:45	54	170	6	43	106	317	6	51	160	487	12	94	
08:00	54		4		75		15		129		19		
08:15	57		8		65		10		122		18		
08:30	76		8		70		6		146		14		
08:45	59	246	6	26	53	263	6	37	112	509	12	63	
09:00	40		4		35		8		75		12		
09:15	20		7		35		4		55		11		
09:30	26		5		25		11		51		16		
09:45	21	107	7	23	17	112	4	27	38	219	11	50	
10:00	27		4		22		3		49		7		
10:15	13		6		21		7		34		13		
10:30	26		9		17		3		43		12		
10:45	12	78	9	28	17	77	6	19	29	155	15	47	
11:00	22		1		18		2		40		3		
11:15	18		2		21		7		39		9		
11:30	16		0		23		3		39		3		
11:45	13	69	1	4	28	90	1	13	41	159	2	17	
Total	751		1114		1002		1345		1753		2459		
Percent	42.8%		45.3%		57.2%		54.7%						
Day Total		1865				2347				4212			
Peak	08:00		05:30		07:15		04:30		07:45		04:30		
Vol.	246		225		332		354		557		552		
P.H.F.	0.809		0.865		0.783		0.941		0.870		0.920		

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 B Volume
Site Code: TBA

Start	NB				SB				Combined				17-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sat
12:00	5		33		0		34		5		67		
12:15	3		39		1		29		4		68		
12:30	1		31		0		36		1		67		
12:45	2	11	33	136	0	1	35	134	2	12	68	270	
01:00	1		35		1		31		2		66		
01:15	0		36		0		34		0		70		
01:30	2		36		2		40		4		76		
01:45	0	3	36	143	0	3	29	134	0	6	65	277	
02:00	1		38		0		34		1		72		
02:15	0		37		0		30		0		67		
02:30	0		33		0		23		0		56		
02:45	1	2	46	154	0	0	32	119	1	2	78	273	
03:00	0		32		1		41		1		73		
03:15	0		39		0		29		0		68		
03:30	0		20		0		32		0		52		
03:45	0	0	18	109	1	2	19	121	1	2	37	230	
04:00	0		18		0		22		0		40		
04:15	1		12		0		22		1		34		
04:30	0		15		0		22		0		37		
04:45	0	1	14	59	1	1	18	84	1	2	32	143	
05:00	1		16		0		17		1		33		
05:15	2		18		0		19		2		37		
05:30	1		17		0		16		1		33		
05:45	0	4	14	65	3	3	14	66	3	7	28	131	
06:00	1		12		1		13		2		25		
06:15	3		14		4		9		7		23		
06:30	3		10		4		10		7		20		
06:45	4	11	11	47	3	12	9	41	7	23	20	88	
07:00	5		5		4		13		9		18		
07:15	6		7		6		7		12		14		
07:30	8		6		16		11		24		17		
07:45	12	31	1	19	13	39	10	41	25	70	11	60	
08:00	13		8		13		5		26		13		
08:15	23		1		14		11		37		12		
08:30	19		7		18		9		37		16		
08:45	27	82	1	17	24	69	3	28	51	151	4	45	
09:00	32		7		21		4		53		11		
09:15	28		6		32		12		60		18		
09:30	39		4		30		6		69		10		
09:45	33	132	2	19	43	126	4	26	76	258	6	45	
10:00	31		3		25		5		56		8		
10:15	28		7		33		0		61		7		
10:30	33		7		30		1		63		8		
10:45	30	122	3	20	25	113	4	10	55	235	7	30	
11:00	31		3		29		4		60		7		
11:15	38		2		43		3		81		5		
11:30	30		5		33		5		63		10		
11:45	33	132	1	11	24	129	3	15	57	261	4	26	
Total	531		799		498		819		1029		1618		
Percent	51.6%		49.4%		48.4%		50.6%						
Day Total		1330				1317				2647			
Peak	09:00		02:00		09:30		00:45		09:30		01:15		
Vol.	132		154		131		140		262		283		
P.H.F.	0.846		0.837		0.762		0.875		0.862		0.931		

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 B Volume
Site Code: TBA

Start	NB				SB				Combined				18-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sun
12:00	3		19		1		16		4		35		
12:15	5		17		1		19		6		36		
12:30	0		26		0		28		0		54		
12:45	1	9	17	79	1	3	21	84	2	12	38	163	
01:00	2		26		0		22		2		48		
01:15	1		14		0		30		1		44		
01:30	1		18		0		22		1		40		
01:45	1	5	19	77	1	1	21	95	2	6	40	172	
02:00	3		17		0		16		3		33		
02:15	0		19		0		22		0		41		
02:30	1		27		0		18		1		45		
02:45	0	4	16	79	1	1	20	76	1	5	36	155	
03:00	1		14		0		17		1		31		
03:15	1		14		0		22		1		36		
03:30	1		21		0		18		1		39		
03:45	1	4	18	67	1	1	15	72	2	5	33	139	
04:00	0		18		0		17		0		35		
04:15	0		18		0		16		0		34		
04:30	0		18		0		17		0		35		
04:45	0	0	11	65	0	0	21	71	0	0	32	136	
05:00	0		15		0		19		0		34		
05:15	1		10		0		7		1		17		
05:30	0		12		1		9		1		21		
05:45	0	1	12	49	2	3	8	43	2	4	20	92	
06:00	2		8		0		11		2		19		
06:15	1		8		5		7		6		15		
06:30	0		7		5		12		5		19		
06:45	7	10	5	28	1	11	5	35	8	21	10	63	
07:00	5		5		2		9		7		14		
07:15	4		6		9		6		13		12		
07:30	4		7		4		8		8		15		
07:45	5	18	6	24	1	16	7	30	6	34	13	54	
08:00	4		9		3		10		7		19		
08:15	6		3		5		4		11		7		
08:30	7		3		6		5		13		8		
08:45	19	36	5	20	10	24	4	23	29	60	9	43	
09:00	12		4		11		5		23		9		
09:15	12		5		11		5		23		10		
09:30	7		2		10		5		17		7		
09:45	10	41	1	12	13	45	3	18	23	86	4	30	
10:00	8		2		15		4		23		6		
10:15	11		2		21		1		32		3		
10:30	13		2		15		0		28		2		
10:45	24	56	2	8	17	68	2	7	41	124	4	15	
11:00	15		5		14		0		29		5		
11:15	10		0		25		0		35		0		
11:30	6		1		7		0		13		1		
11:45	17	48	2	8	16	62	1	1	33	110	3	9	
Total	232		516		235		555		467		1071		
Percent	49.7%		48.2%		50.3%		51.8%						
Day Total		748				790				1538			
Peak	10:15		00:15		10:30		00:30		10:30		00:30		
Vol.	63		86		71		101		133		184		
P.H.F.	0.656		0.827		0.710		0.842		0.811		0.852		

Bedford Road
south of N.Great Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 B Volume
Site Code: TBA

Start	NB				SB				Combined				19-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Mon
12:00	1		23		2		26		3		49		
12:15	0		18		1		27		1		45		
12:30	1		20		0		20		1		40		
12:45	1	3	17	78	0	3	26	99	1	6	43	177	
01:00	0		22		1		32		1		54		
01:15	3		13		1		17		4		30		
01:30	0		10		0		21		0		31		
01:45	0	3	19	64	0	2	19	89	0	5	38	153	
02:00	0		9		0		19		0		28		
02:15	0		20		0		29		0		49		
02:30	0		12		0		34		0		46		
02:45	0	0	18	59	2	2	29	111	2	2	47	170	
03:00	0		37		0		72		0		109		
03:15	0		43		0		41		0		84		
03:30	0		38		0		57		0		95		
03:45	0	0	37	155	0	0	44	214	0	0	81	369	
04:00	1		43		0		65		1		108		
04:15	0		50		2		59		2		109		
04:30	1		47		1		80		2		127		
04:45	1	3	52	192	1	4	93	297	2	7	145	489	
05:00	2		48		2		85		4		133		
05:15	3		40		5		76		8		116		
05:30	3		44		8		93		11		137		
05:45	4	12	55	187	7	22	67	321	11	34	122	508	
06:00	9		30		13		87		22		117		
06:15	11		57		24		57		35		114		
06:30	8		24		28		69		36		93		
06:45	31	59	22	133	41	106	41	254	72	165	63	387	
07:00	22		22		67		31		89		53		
07:15	40		16		81		33		121		49		
07:30	51		14		93		13		144		27		
07:45	66	179	6	58	101	342	8	85	167	521	14	143	
08:00	63		10		87		16		150		26		
08:15	61		8		76		10		137		18		
08:30	77		15		76		8		153		23		
08:45	65	266	7	40	64	303	5	39	129	569	12	79	
09:00	38		3		69		5		107		8		
09:15	23		3		42		9		65		12		
09:30	24		5		23		6		47		11		
09:45	21	106	4	15	22	156	2	22	43	262	6	37	
10:00	24		4		20		3		44		7		
10:15	13		3		11		4		24		7		
10:30	24		4		19		3		43		7		
10:45	12	73	1	12	12	62	3	13	24	135	4	25	
11:00	17		2		12		3		29		5		
11:15	11		0		17		1		28		1		
11:30	8		1		25		0		33		1		
11:45	21	57	0	3	27	81	0	4	48	138	0	7	
Total	761		996		1083		1548		1844		2544		
Percent	41.3%		39.2%		58.7%		60.8%						
Day Total		1757				2631				4388			
Peak	07:45		04:15		07:15		04:45		07:45		04:45		
Vol.	267		197		362		347		607		531		
P.H.F.	0.867		0.947		0.896		0.933		0.909		0.916		

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

WB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/13/1														
2	0	19	1	0	0	0	0	0	0	0	0	0	0	20
01:00	0	5	1	0	0	0	0	0	0	1	0	0	0	7
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
04:00	0	5	0	0	0	0	0	0	0	1	0	0	0	6
05:00	0	36	12	5	0	0	0	1	0	0	0	0	0	54
06:00	1	125	30	2	3	2	0	0	0	0	0	0	0	163
07:00	1	239	27	1	3	4	0	0	2	0	0	0	0	277
08:00	0	246	31	1	4	4	0	1	1	0	0	0	0	288
09:00	2	205	26	1	6	4	0	3	2	0	0	0	0	249
10:00	0	157	24	3	5	5	0	1	2	0	0	0	0	197
11:00	0	162	28	2	3	1	0	4	0	1	0	0	0	201
12 PM	1	179	29	0	8	2	0	1	2	0	0	0	0	222
13:00	1	209	30	1	5	2	0	1	3	0	0	0	0	252
14:00	0	310	36	9	3	2	0	3	2	0	0	0	0	365
15:00	0	418	59	1	13	1	0	1	1	0	0	0	0	494
16:00	3	457	50	3	6	1	0	2	1	0	0	0	0	523
17:00	3	434	44	1	0	1	0	2	0	0	0	0	0	485
18:00	1	525	21	0	3	0	0	1	0	0	0	0	0	551
19:00	1	233	18	0	0	0	0	0	0	0	0	0	0	252
20:00	0	153	4	0	3	0	0	0	0	0	0	0	0	160
21:00	0	111	2	0	1	0	0	0	0	0	0	0	0	114
22:00	0	57	2	0	0	0	0	0	0	0	0	0	0	59
23:00	0	40	3	0	0	0	0	0	0	0	0	0	0	43
Total	14	4328	479	30	66	29	0	21	16	3	0	0	0	4986
Percent	0.3%	86.8%	9.6%	0.6%	1.3%	0.6%	0.0%	0.4%	0.3%	0.1%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	08:00	05:00	09:00	10:00		11:00	07:00	01:00				08:00
Vol.	2	246	31	5	6	5		4	2	1				288
PM Peak	16:00	18:00	15:00	14:00	15:00	12:00		14:00	13:00					18:00
Vol.	3	525	59	9	13	2		3	3					551

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Class
Site Code: TBA

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/14/1														
2	0	9	0	0	0	0	0	0	0	0	0	0	0	9
01:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
04:00	0	7	3	0	0	0	0	0	0	0	0	0	0	10
05:00	0	37	11	7	1	0	0	1	0	0	0	0	0	57
06:00	0	119	26	3	8	2	0	3	0	0	0	0	0	161
07:00	1	252	25	3	6	1	0	1	1	0	0	0	0	290
08:00	6	254	37	0	6	0	0	1	1	1	0	0	0	306
09:00	3	196	25	0	5	5	0	1	0	0	0	0	0	235
10:00	0	158	37	2	6	4	0	1	0	0	0	0	0	208
11:00	2	167	35	4	8	3	0	1	3	0	0	0	0	223
12 PM	0	224	31	5	4	3	1	1	2	0	0	0	0	271
13:00	2	221	40	0	12	2	0	4	0	0	0	0	0	281
14:00	0	269	47	9	5	4	0	0	2	0	0	0	0	336
15:00	1	358	59	0	10	1	0	4	1	0	0	0	0	434
16:00	0	472	49	3	6	1	0	1	2	0	0	0	0	534
17:00	1	448	54	0	3	3	0	2	0	0	0	0	0	511
18:00	2	497	35	0	1	0	0	3	0	0	0	0	0	538
19:00	2	288	27	0	5	0	0	0	0	0	0	0	0	322
20:00	1	152	18	0	1	0	0	0	1	0	0	0	0	173
21:00	0	146	9	0	0	0	0	0	0	0	0	0	0	155
22:00	0	89	2	0	0	0	0	0	0	0	0	0	0	91
23:00	0	34	2	0	0	0	0	0	0	0	0	0	0	36
Total	21	4415	575	36	87	29	1	24	13	1	0	0	0	5202
Percent	0.4%	84.9%	11.1%	0.7%	1.7%	0.6%	0.0%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	05:00	06:00	09:00		06:00	11:00	08:00				08:00
Vol.	6	254	37	7	8	5		3	3	1				306
PM Peak	13:00	18:00	15:00	14:00	13:00	14:00	12:00	13:00	12:00					18:00
Vol.	2	497	59	9	12	4	1	4	2					538

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

WB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/15/1														
2	0	7	1	0	0	0	0	0	0	1	0	0	0	9
01:00	0	7	2	0	0	0	0	0	0	0	0	0	0	9
02:00	0	4	0	0	0	0	0	0	1	0	0	0	0	5
03:00	0	9	2	0	1	0	0	0	0	1	0	0	0	13
04:00	0	6	3	0	2	0	0	0	1	0	0	0	0	12
05:00	0	32	16	7	0	0	0	0	1	0	0	0	0	56
06:00	4	120	27	2	4	1	0	1	1	0	0	0	0	160
07:00	3	266	23	0	10	2	0	2	2	0	0	0	0	308
08:00	3	227	34	5	7	3	1	1	3	0	0	0	0	284
09:00	0	202	36	2	8	4	0	2	2	0	0	0	0	256
10:00	0	159	23	3	6	2	0	0	3	0	0	0	0	196
11:00	1	190	34	3	5	3	1	1	3	0	0	0	0	241
12 PM	0	222	42	2	10	4	2	2	1	1	0	0	0	286
13:00	0	236	38	2	4	4	0	3	3	0	0	0	0	290
14:00	3	266	58	8	12	4	0	2	3	0	0	0	0	356
15:00	2	367	63	4	6	2	0	1	1	0	0	0	0	446
16:00	1	462	54	0	9	0	0	1	3	0	0	0	0	530
17:00	5	513	40	3	4	1	0	1	0	0	0	0	0	567
18:00	5	440	20	1	3	2	0	0	0	0	0	0	0	471
19:00	1	207	20	1	1	0	0	0	0	0	0	0	0	230
20:00	0	179	12	0	2	0	0	0	0	0	0	0	0	193
21:00	0	129	3	0	1	0	0	0	0	0	0	0	0	133
22:00	0	57	4	0	0	0	0	0	0	0	0	0	0	61
23:00	0	37	6	0	0	0	0	0	0	0	0	0	0	43
Total	28	4344	561	43	95	32	4	17	28	3	0	0	0	5155
Percent	0.5%	84.3%	10.9%	0.8%	1.8%	0.6%	0.1%	0.3%	0.5%	0.1%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	09:00	05:00	07:00	09:00	08:00	07:00	08:00	00:00				07:00
Vol.	4	266	36	7	10	4	1	2	3	1				308
PM Peak	17:00	17:00	15:00	14:00	14:00	12:00	12:00	13:00	13:00	12:00				17:00
Vol.	5	513	63	8	12	4	2	3	3	1				567

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

WB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/16/1														
2	0	18	2	0	1	0	0	0	0	0	0	0	0	21
01:00	0	5	3	0	0	0	0	0	0	0	0	0	0	8
02:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
03:00	0	7	1	0	0	1	0	0	0	0	0	0	0	9
04:00	0	8	0	1	0	0	0	0	0	0	0	0	0	9
05:00	0	30	10	5	1	0	0	1	3	0	0	0	0	50
06:00	1	115	30	2	9	2	0	1	0	0	0	0	0	160
07:00	1	236	30	1	11	0	0	2	2	0	0	0	0	283
08:00	2	228	36	2	10	4	0	2	1	0	0	0	0	285
09:00	0	182	25	1	4	2	0	0	2	0	0	0	0	216
10:00	3	181	27	2	6	1	0	2	3	0	0	0	0	225
11:00	1	215	31	0	11	1	0	1	1	1	0	0	0	262
12 PM	0	217	37	1	6	8	0	1	1	0	0	0	0	271
13:00	2	232	37	2	6	7	0	2	6	0	0	0	0	294
14:00	2	325	50	8	6	3	0	4	0	1	0	0	0	399
15:00	1	425	57	2	6	5	0	3	2	0	0	0	0	501
16:00	1	413	58	1	10	4	0	2	2	0	0	0	0	491
17:00	1	493	37	0	3	0	0	1	1	0	0	0	0	536
18:00	1	358	23	0	4	0	0	0	0	1	0	0	0	387
19:00	0	180	9	0	0	3	0	0	0	0	0	0	0	192
20:00	1	125	12	0	0	0	0	0	0	0	0	0	0	138
21:00	0	107	9	0	0	0	0	0	0	1	0	0	0	117
22:00	2	109	5	0	2	1	0	0	0	0	0	0	0	119
23:00	1	64	5	0	0	0	0	0	0	1	0	0	0	71
Total	20	4277	535	28	96	42	0	22	24	5	0	0	0	5049
Percent	0.4%	84.7%	10.6%	0.6%	1.9%	0.8%	0.0%	0.4%	0.5%	0.1%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	08:00	05:00	07:00	08:00		07:00	05:00	11:00				08:00
Vol.	3	236	36	5	11	4		2	3	1				285
PM Peak	13:00	17:00	16:00	14:00	16:00	12:00		14:00	13:00	14:00				17:00
Vol.	2	493	58	8	10	8		4	6	1				536

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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Email: datarequests@pdillc.com

123082 C Class
Site Code: TBA

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/17/1														
2	0	24	2	0	1	0	0	0	0	0	0	0	0	27
01:00	0	9	3	0	0	0	0	0	0	1	0	0	0	13
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
04:00	0	14	1	1	1	0	0	0	0	0	0	0	0	17
05:00	0	11	2	1	0	0	0	0	0	1	0	0	0	15
06:00	0	54	8	1	2	1	0	0	0	0	0	0	0	66
07:00	1	67	5	0	4	3	0	1	1	0	0	0	1	83
08:00	0	122	14	1	1	2	0	0	3	0	0	0	0	143
09:00	1	171	23	1	5	1	0	0	1	0	0	0	0	203
10:00	1	187	23	1	2	1	0	2	1	1	0	0	0	219
11:00	2	215	19	0	9	1	0	4	0	1	0	0	0	251
12 PM	2	247	21	1	7	2	0	0	2	0	0	0	0	282
13:00	1	247	18	0	6	0	0	0	1	0	0	0	0	273
14:00	0	281	27	0	6	0	1	2	1	0	0	0	0	318
15:00	1	273	21	0	4	1	0	1	0	0	0	0	0	301
16:00	1	284	29	0	0	1	0	1	1	0	0	0	0	317
17:00	0	217	17	0	0	0	0	0	1	0	0	0	0	235
18:00	1	152	14	0	1	0	0	0	0	0	0	0	0	168
19:00	0	117	7	0	0	0	0	0	0	0	0	0	0	124
20:00	0	115	6	0	1	0	0	0	0	0	0	0	0	122
21:00	0	102	7	0	0	0	0	0	0	0	0	0	0	109
22:00	0	96	10	0	0	0	0	0	0	0	0	0	0	106
23:00	0	63	6	0	0	0	0	0	0	0	0	0	0	69
Total	11	3080	284	7	50	13	1	11	12	4	0	0	1	3474
Percent	0.3%	88.7%	8.2%	0.2%	1.4%	0.4%	0.0%	0.3%	0.3%	0.1%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	09:00	04:00	11:00	07:00		11:00	08:00	01:00			07:00	11:00
Vol.	2	215	23	1	9	3		4	3	1			1	251
PM Peak	12:00	16:00	16:00	12:00	12:00	12:00	14:00	14:00	12:00					14:00
Vol.	2	284	29	1	7	2	1	2	2					318

PRECISION
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Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 C Class
Site Code: TBA

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/18/1														
2	0	29	4	0	0	0	0	0	0	0	0	0	0	33
01:00	0	18	1	0	0	0	0	0	0	0	0	0	0	19
02:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
03:00	0	3	0	0	1	0	0	0	0	0	0	0	0	4
04:00	0	1	2	0	0	0	0	0	0	0	0	0	0	3
05:00	0	3	6	0	0	0	0	0	0	0	0	0	0	9
06:00	0	34	5	0	1	0	0	0	0	0	0	0	0	40
07:00	0	45	6	0	0	0	0	0	0	0	0	0	0	51
08:00	0	78	5	0	0	0	0	0	0	0	0	0	0	83
09:00	1	115	7	1	3	0	0	0	0	1	0	0	0	128
10:00	1	151	14	0	1	1	0	0	1	0	0	0	0	169
11:00	2	177	12	0	2	0	0	0	0	1	0	0	0	194
12 PM	4	223	15	0	1	0	0	0	0	0	0	0	0	243
13:00	1	242	13	0	1	0	0	0	0	0	0	0	0	257
14:00	0	241	16	0	0	0	0	2	0	0	0	0	0	259
15:00	0	244	15	0	0	0	0	0	0	0	0	0	0	259
16:00	1	267	10	0	0	0	0	0	0	0	0	0	0	278
17:00	0	140	7	0	1	0	0	1	0	0	0	0	0	149
18:00	0	150	13	0	0	0	0	0	0	1	0	0	0	164
19:00	0	107	11	0	2	1	0	0	0	0	0	0	0	121
20:00	0	81	6	0	0	0	0	0	0	0	0	0	0	87
21:00	0	53	1	0	0	0	0	0	1	0	0	0	0	55
22:00	0	33	2	0	0	0	0	0	0	0	0	0	0	35
23:00	0	27	4	0	0	0	0	0	0	0	0	0	0	31
Total	10	2469	176	1	13	2	0	3	2	3	0	0	0	2679
Percent	0.4%	92.2%	6.6%	0.0%	0.5%	0.1%	0.0%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	10:00	09:00	09:00	10:00			10:00	09:00				11:00
Vol.	2	177	14	1	3	1			1	1				194
PM Peak	12:00	16:00	14:00		19:00	19:00		14:00	21:00	18:00				16:00
Vol.	4	267	16		2	1		2	1	1				278

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Class
Site Code: TBA

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/1														
2	0	12	0	0	0	0	0	0	0	0	0	0	0	12
01:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
02:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
03:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
04:00	0	3	3	0	1	0	0	0	0	0	0	0	0	7
05:00	1	25	12	6	0	0	0	0	1	0	0	0	0	45
06:00	0	121	29	3	8	3	0	1	1	0	0	0	0	166
07:00	0	243	30	1	6	3	2	2	2	0	0	0	0	289
08:00	4	231	33	3	8	8	1	3	3	0	0	0	0	294
09:00	0	177	32	1	9	6	2	1	2	0	0	0	0	230
10:00	0	132	23	8	11	4	1	0	5	0	0	0	0	184
11:00	0	152	34	2	5	5	1	3	1	1	0	0	0	204
12 PM	1	193	21	1	5	1	1	4	2	0	0	0	0	229
13:00	0	198	30	1	5	6	0	2	3	1	0	0	0	246
14:00	1	272	52	9	10	4	1	1	1	0	0	0	0	351
15:00	2	369	55	2	15	0	1	2	1	0	0	0	0	447
16:00	3	465	49	2	4	0	0	3	1	0	0	0	0	527
17:00	4	532	31	1	3	0	0	0	0	0	0	0	0	571
18:00	1	401	29	0	0	0	0	1	0	0	0	0	0	432
19:00	0	275	16	1	1	0	0	0	0	0	0	0	0	293
20:00	0	134	11	0	2	0	0	0	0	0	0	0	0	147
21:00	0	107	10	0	0	0	0	0	0	1	0	0	0	118
22:00	0	52	6	0	1	0	0	0	0	0	0	0	0	59
23:00	0	40	3	0	0	0	0	0	1	0	0	0	0	44
Total	17	4153	510	41	94	40	10	23	24	3	0	0	0	4915
Percent	0.3%	84.5%	10.4%	0.8%	1.9%	0.8%	0.2%	0.5%	0.5%	0.1%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	11:00	10:00	10:00	08:00	07:00	08:00	10:00	11:00				08:00
Vol.	4	243	34	8	11	8	2	3	5	1				294
PM Peak	17:00	17:00	15:00	14:00	15:00	13:00	12:00	12:00	13:00	13:00				17:00
Vol.	4	532	55	9	15	6	1	4	3	1				571
Total		27066	3120	186	501	187	16	121	119	22	0	0	1	31460

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Class
Site Code: TBA

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/13/1														
2	0	8	0	0	1	0	0	0	0	0	0	0	0	9
01:00	0	1	0	0	0	0	0	0	1	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	5	1	0	0	0	0	0	0	1	0	0	0	7
04:00	0	17	3	0	1	0	0	0	1	0	0	0	0	22
05:00	0	107	18	0	3	2	0	0	2	0	0	0	0	132
06:00	1	235	48	2	8	2	0	2	0	0	0	0	0	298
07:00	1	367	56	7	3	3	1	2	1	0	0	0	0	441
08:00	3	392	81	4	16	1	3	4	0	0	0	0	0	504
09:00	0	273	53	2	12	1	2	0	2	0	0	0	0	345
10:00	0	232	59	1	14	2	1	0	1	0	0	0	0	310
11:00	0	146	43	3	13	1	0	1	2	0	0	0	0	209
12 PM	0	140	46	2	7	0	1	0	1	0	0	0	0	197
13:00	0	109	39	2	8	2	1	1	0	0	0	0	0	162
14:00	0	136	45	2	6	2	0	1	2	0	0	0	0	194
15:00	0	185	51	2	7	1	0	0	0	0	0	0	0	246
16:00	1	193	37	5	7	0	0	0	0	0	0	0	0	243
17:00	2	190	32	1	5	0	0	0	0	0	0	0	0	230
18:00	0	206	33	0	4	0	0	0	0	0	0	0	0	243
19:00	0	116	11	1	0	0	0	1	0	0	0	0	0	129
20:00	0	57	12	0	0	0	0	0	0	0	0	0	0	69
21:00	0	37	11	0	2	0	0	0	0	0	0	0	0	50
22:00	0	26	3	0	0	0	0	0	0	0	0	0	0	29
23:00	0	20	5	0	0	0	0	0	0	0	0	0	0	25
Total	8	3198	687	34	117	17	9	12	13	1	0	0	0	4096
Percent	0.2%	78.1%	16.8%	0.8%	2.9%	0.4%	0.2%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	07:00	08:00	07:00	08:00	08:00	05:00	03:00				08:00
Vol.	3	392	81	7	16	3	3	4	2	1				504
PM Peak	17:00	18:00	15:00	16:00	13:00	13:00	12:00	13:00	14:00					15:00
Vol.	2	206	51	5	8	2	1	1	2					246

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

EB

PRECISION
D A T A
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P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/14/1														
2	0	3	1	0	0	0	0	0	0	0	0	0	0	4
01:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
02:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
03:00	0	4	1	1	0	0	0	0	0	0	0	0	0	6
04:00	0	16	9	0	1	0	0	0	0	0	0	0	0	26
05:00	0	96	18	0	7	1	0	0	1	0	0	0	0	123
06:00	2	213	58	1	26	4	0	2	2	0	0	0	0	308
07:00	1	376	59	6	16	3	0	2	3	0	0	0	0	466
08:00	0	486	72	1	14	2	1	2	0	1	0	0	0	579
09:00	1	400	72	8	19	1	2	2	3	0	0	0	0	508
10:00	2	212	41	2	8	2	1	0	0	0	0	0	0	268
11:00	0	186	44	0	6	2	1	0	1	0	0	0	0	240
12 PM	0	165	41	7	8	1	0	5	2	0	0	0	0	229
13:00	1	161	42	4	8	2	0	3	1	0	0	0	0	222
14:00	2	202	42	5	3	0	0	1	0	0	0	0	0	255
15:00	0	196	43	4	15	0	0	0	0	0	0	0	0	258
16:00	1	207	53	4	6	1	0	4	0	0	0	0	0	276
17:00	1	227	34	0	8	2	0	3	1	0	0	0	0	276
18:00	0	169	40	1	4	1	0	1	0	0	0	0	0	216
19:00	0	108	15	0	0	0	0	0	0	0	0	0	0	123
20:00	0	71	11	0	2	0	0	0	0	0	0	0	0	84
21:00	0	54	7	0	1	0	0	0	0	0	0	0	0	62
22:00	0	34	5	1	0	0	0	1	0	0	0	0	0	41
23:00	0	11	4	0	0	0	0	0	0	0	0	0	0	15
Total	11	3601	715	45	152	22	5	26	14	1	0	0	0	4592
Percent	0.2%	78.4%	15.6%	1.0%	3.3%	0.5%	0.1%	0.6%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	08:00	09:00	06:00	06:00	09:00	06:00	07:00	08:00				08:00
Vol.	2	486	72	8	26	4	2	2	3	1				579
PM Peak	14:00	17:00	16:00	12:00	15:00	13:00		12:00	12:00					16:00
Vol.	2	227	53	7	15	2		5	2					276

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

EB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/15/1														
2	0	7	2	0	2	0	0	0	0	0	0	0	0	11
01:00	0	3	1	0	1	0	0	0	0	0	0	0	0	5
02:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
03:00	0	4	0	0	1	0	0	0	1	0	0	0	0	6
04:00	0	19	7	0	0	0	0	0	0	1	0	0	0	27
05:00	0	99	18	0	6	0	0	0	2	0	0	0	0	125
06:00	1	205	58	2	18	5	0	3	2	0	0	0	0	294
07:00	1	342	53	8	9	1	0	1	1	0	0	0	0	416
08:00	1	497	67	3	14	3	1	1	1	0	0	0	0	588
09:00	0	323	55	0	7	2	1	1	0	1	1	0	0	391
10:00	0	204	32	2	7	3	1	0	2	0	0	0	0	251
11:00	0	196	49	5	2	1	0	1	2	0	0	0	0	256
12 PM	0	194	47	0	4	1	0	1	0	0	0	0	0	247
13:00	0	160	37	2	6	0	1	0	0	0	0	0	0	206
14:00	3	188	52	7	6	2	0	1	1	0	0	0	0	260
15:00	2	203	51	8	8	0	0	1	2	0	0	0	0	275
16:00	1	221	53	4	5	1	0	1	0	0	0	0	0	286
17:00	1	244	45	0	3	0	0	0	0	0	0	0	0	293
18:00	3	217	26	2	4	0	0	1	0	0	0	0	0	253
19:00	0	117	12	0	1	0	0	0	0	0	0	0	0	130
20:00	0	63	15	0	2	1	0	0	1	0	0	0	0	82
21:00	0	53	10	0	0	0	0	0	0	0	0	0	0	63
22:00	0	37	8	0	2	0	0	0	0	0	0	0	0	47
23:00	0	15	6	0	0	0	0	0	0	0	0	0	0	21
Total	13	3615	706	43	108	20	4	12	15	2	1	0	0	4539
Percent	0.3%	79.6%	15.6%	0.9%	2.4%	0.4%	0.1%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	08:00	07:00	06:00	06:00	08:00	06:00	05:00	04:00	09:00			08:00
Vol.	1	497	67	8	18	5	1	3	2	1	1			588
PM Peak	14:00	17:00	16:00	15:00	15:00	14:00	13:00	12:00	15:00					17:00
Vol.	3	244	53	8	8	2	1	1	2					293

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

123082 C Class
Site Code: TBA

EB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/16/1														
2	0	11	3	0	0	0	0	0	0	0	0	0	0	14
01:00	0	2	0	0	1	0	0	0	0	0	0	0	0	3
02:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
03:00	0	4	2	0	2	0	0	0	0	0	0	0	0	8
04:00	0	22	5	0	0	0	0	0	1	0	0	0	0	28
05:00	1	91	22	0	3	1	0	0	2	0	0	0	0	120
06:00	1	215	56	2	11	3	0	1	1	0	0	0	0	290
07:00	0	362	62	8	12	1	0	0	2	0	0	0	0	447
08:00	2	436	55	3	12	0	0	3	2	0	0	0	0	513
09:00	0	292	43	4	7	3	0	1	1	0	0	0	0	351
10:00	0	221	54	4	9	2	1	0	1	0	0	0	0	292
11:00	1	178	36	4	7	3	0	0	2	0	0	0	0	231
12 PM	0	205	43	4	7	0	1	2	3	0	0	0	0	265
13:00	0	158	38	2	12	1	0	1	1	0	0	0	0	213
14:00	0	185	40	2	12	0	0	1	2	0	0	0	0	242
15:00	1	233	51	6	4	1	2	2	0	0	0	0	0	300
16:00	1	216	41	3	7	2	0	0	0	0	0	0	0	270
17:00	0	237	40	0	4	1	0	1	0	0	0	0	0	283
18:00	2	207	43	1	6	0	0	0	2	0	0	0	0	261
19:00	0	95	25	0	1	0	0	0	0	0	0	0	0	121
20:00	0	49	9	0	1	0	0	0	0	0	0	0	0	59
21:00	0	46	8	0	1	0	0	0	0	1	0	0	0	56
22:00	1	40	3	0	0	1	0	0	0	0	0	0	0	45
23:00	0	33	4	0	0	0	0	0	0	0	0	0	0	37
Total	10	3541	684	43	119	19	4	12	20	1	0	0	0	4453
Percent	0.2%	79.5%	15.4%	1.0%	2.7%	0.4%	0.1%	0.3%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	07:00	07:00	07:00	06:00	10:00	08:00	05:00					08:00
Vol.	2	436	62	8	12	3	1	3	2					513
PM Peak	18:00	17:00	15:00	15:00	13:00	16:00	15:00	12:00	12:00	21:00				15:00
Vol.	2	237	51	6	12	2	2	2	3	1				300

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

EB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/17/1														
2	0	8	5	0	0	0	0	0	1	0	0	0	0	14
01:00	0	9	0	0	1	0	0	0	0	0	0	0	0	10
02:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
03:00	0	2	2	0	1	0	0	0	2	0	0	0	0	7
04:00	0	3	3	0	0	0	0	0	0	0	0	0	0	6
05:00	0	22	5	0	0	0	0	0	0	0	0	0	0	27
06:00	0	53	12	0	7	0	0	0	2	0	0	0	0	74
07:00	0	97	26	0	6	1	1	1	3	0	0	0	0	135
08:00	0	142	33	1	8	1	0	2	1	0	0	0	0	188
09:00	2	167	31	0	6	4	0	2	1	0	0	0	0	213
10:00	1	203	25	2	5	1	0	1	0	0	0	0	0	238
11:00	0	208	52	1	5	1	0	0	0	0	0	0	0	267
12 PM	1	218	44	0	8	0	0	1	1	0	0	0	0	273
13:00	1	183	48	1	3	0	0	1	0	0	1	0	0	238
14:00	1	227	44	0	7	0	0	1	0	0	0	0	0	280
15:00	1	202	43	2	4	0	0	0	0	0	0	0	0	252
16:00	2	173	29	0	4	0	0	2	0	0	0	0	0	210
17:00	3	155	30	0	1	0	0	0	0	0	0	0	0	189
18:00	0	134	15	0	2	0	0	1	0	0	0	0	0	152
19:00	0	66	24	0	3	0	0	0	0	0	0	0	0	93
20:00	0	60	10	0	1	0	0	0	0	0	0	0	0	71
21:00	0	39	8	0	1	0	0	0	0	0	0	0	0	48
22:00	0	40	10	0	1	0	0	0	0	0	0	0	0	51
23:00	0	35	4	0	2	0	0	0	0	0	0	0	0	41
Total	12	2452	504	7	76	8	1	12	11	0	1	0	0	3084
Percent	0.4%	79.5%	16.3%	0.2%	2.5%	0.3%	0.0%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	11:00	10:00	08:00	09:00	07:00	08:00	07:00					11:00
Vol.	2	208	52	2	8	4	1	2	3					267
PM Peak	17:00	14:00	13:00	15:00	12:00			16:00	12:00		13:00			14:00
Vol.	3	227	48	2	8			2	1		1			280

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

EB

PRECISION
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Office: 508.481.3999 Fax: 508.545.1234
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123082 C Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/18/1														
2	0	14	5	0	0	0	0	0	0	0	0	0	0	19
01:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
04:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
05:00	0	12	2	0	0	0	0	0	2	0	0	0	0	16
06:00	0	33	3	0	1	0	0	0	0	1	0	0	0	38
07:00	0	49	11	0	0	0	0	0	0	0	0	0	0	60
08:00	0	111	26	0	2	0	0	0	0	0	0	0	0	139
09:00	0	144	25	1	1	0	0	0	0	0	0	0	0	171
10:00	0	170	34	0	3	0	0	0	0	0	0	0	0	207
11:00	0	169	28	1	2	0	0	0	0	0	0	0	0	200
12 PM	3	198	33	0	0	0	0	1	1	0	0	0	0	236
13:00	1	172	46	0	1	0	0	0	0	0	0	0	0	220
14:00	1	195	27	0	3	1	0	0	0	0	0	0	0	227
15:00	2	186	31	0	2	0	0	1	0	0	0	0	0	222
16:00	0	146	34	0	3	1	0	0	0	0	0	0	0	184
17:00	0	114	17	0	3	0	0	0	0	0	0	0	0	134
18:00	0	77	12	0	2	0	0	1	0	0	0	0	0	92
19:00	1	40	12	0	1	0	0	0	0	0	0	0	0	54
20:00	0	54	4	0	0	1	0	0	0	0	0	0	0	59
21:00	0	32	5	0	0	0	0	0	0	0	0	0	0	37
22:00	0	30	4	0	0	0	0	0	0	0	0	0	0	34
23:00	1	6	3	0	3	0	0	0	0	0	0	0	0	13
Total	9	1973	368	2	27	3	0	3	3	1	0	0	0	2389
Percent	0.4%	82.6%	15.4%	0.1%	1.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak		10:00	10:00	09:00	10:00				05:00	06:00				10:00
Vol.		170	34	1	3				2	1				207
PM Peak	12:00	12:00	13:00		14:00	14:00		12:00	12:00					12:00
Vol.	3	198	46		3	1		1	1					236

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

EB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/1														
2	0	2	3	0	1	0	0	0	0	0	0	0	0	6
01:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
04:00	0	14	5	0	1	0	0	0	1	0	0	0	0	21
05:00	0	83	24	0	7	0	0	0	2	0	0	0	0	116
06:00	1	217	53	4	12	2	3	1	0	0	0	0	0	293
07:00	1	355	63	6	12	2	0	1	2	0	0	0	0	442
08:00	1	492	73	1	17	2	2	5	3	0	0	0	0	596
09:00	0	341	52	1	5	0	1	0	0	1	0	0	0	401
10:00	0	188	36	1	14	7	3	0	0	0	0	0	0	249
11:00	0	140	45	3	13	5	1	0	2	0	0	0	0	209
12 PM	2	171	41	1	5	3	2	1	3	0	0	0	0	229
13:00	1	132	38	3	6	2	3	1	0	0	0	0	0	186
14:00	1	174	41	1	9	3	0	3	1	0	0	0	0	233
15:00	0	199	55	6	14	3	0	2	0	0	0	0	0	279
16:00	6	185	49	3	7	1	0	2	0	0	0	0	0	253
17:00	3	216	43	0	9	0	0	1	1	0	0	0	0	273
18:00	1	168	31	1	4	0	0	0	0	0	0	0	0	205
19:00	0	107	12	0	1	1	0	0	0	0	0	0	0	121
20:00	0	54	10	0	0	0	1	0	0	0	0	0	0	65
21:00	0	43	8	0	3	0	0	0	0	0	0	0	0	54
22:00	0	33	3	0	1	0	0	0	0	0	0	0	0	37
23:00	0	24	7	0	0	0	0	0	0	0	0	0	0	31
Total	17	3347	695	31	141	31	16	17	15	1	0	0	0	4311
Percent	0.4%	77.6%	16.1%	0.7%	3.3%	0.7%	0.4%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	08:00	07:00	08:00	10:00	06:00	08:00	08:00	09:00				08:00
Vol.	1	492	73	6	17	7	3	5	3	1				596
PM Peak	16:00	17:00	15:00	15:00	15:00	12:00	13:00	14:00	12:00					15:00
Vol.	6	216	55	6	14	3	3	3	3					279
Total		21727	4359	205	740	120	39	94	91	7	2	0	0	27464

PRECISION
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Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 C Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/13/1																
2	0	0	0	0	1	9	8	2	0	0	0	0	0	20	43	40
01:00	0	0	0	0	1	0	3	1	2	0	0	0	0	7	42	44
02:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
03:00	0	0	0	0	0	0	1	0	1	0	0	0	0	2	*	47
04:00	0	0	0	0	0	2	1	2	0	0	**1**	0	0	6	*	45
05:00	0	0	0	1	2	9	29	11	2	0	0	0	0	54	45	42
06:00	0	0	0	2	6	40	85	26	**4**	0	0	0	0	163	45	41
07:00	0	2	2	3	14	109	118	**28**	1	0	0	0	0	277	43	39
08:00	0	0	0	3	**25**	**129**	**119**	11	1	0	0	0	0	**288**	42	39
09:00	0	**3**	**3**	**5**	18	118	91	11	0	0	0	0	0	249	42	38
10:00	0	0	2	5	8	88	75	18	1	0	0	0	0	197	43	39
11:00	0	0	0	**3**	12	54	97	**30**	**5**	0	0	0	0	201	45	41
12 PM	0	**3**	2	3	16	80	87	28	3	0	0	0	0	222	44	39
13:00	0	0	0	0	**17**	114	98	22	0	**1**	0	0	0	252	43	40
14:00	0	0	**8**	0	14	**171**	**150**	21	1	0	0	0	0	**365**	43	39
15:00	2	3	6	1	34	222	**203**	**22**	1	0	0	0	0	494	42	39
16:00	39	**24**	**55**	**80**	90	163	68	4	0	0	0	0	0	523	38	29
17:00	**58**	9	33	10	65	219	79	10	2	0	0	0	0	485	39	30
18:00	1	1	5	21	**93**	**282**	133	15	0	0	0	0	0	**551**	41	37
19:00	3	1	2	1	17	112	99	17	0	0	0	0	0	252	43	38
20:00	0	0	1	1	7	61	74	15	1	0	0	0	0	160	43	40
21:00	0	0	1	2	7	52	40	11	0	**1**	0	0	0	114	43	39
22:00	0	0	0	0	1	14	38	4	2	0	0	0	0	59	44	41
23:00	0	0	0	0	0	17	15	7	**3**	1	0	0	0	43	46	42
%	2.1%	0.9%	2.4%	2.8%	9.0%	41.4%	34.3%	6.3%	0.6%	0.1%	0.0%	0.0%	0.0%			
AM Peak		09:00	09:00	09:00	08:00	08:00	08:00	07:00	06:00		04:00			08:00		
Vol.		3	3	5	25	129	119	28	4		1			288		
Midday Peak		12:00	14:00	11:00	13:00	14:00	14:00	11:00	11:00	13:00				14:00		
Vol.		3	8	3	17	171	150	30	5	1				365		
PM Peak	17:00	16:00	16:00	16:00	18:00	18:00	15:00	15:00	23:00	21:00				18:00		
Vol.	58	24	55	80	93	282	203	22	3	1				551		

% iles	
15th Percentile :	31 MPH
50th Percentile :	37 MPH
85th Percentile :	42 MPH
95th Percentile :	45 MPH

Stats	
10 MPH Pace Speed :	35-44 MPH
Number in Pace :	3352
Percent in Pace :	67.2%
Number of Vehicles > 40 MPH :	1701
Percent of Vehicles > 40 MPH :	34.1%
Mean Speed(Average) :	37 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 C Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/14/1																
2	0	0	0	0	0	2	5	2	0	0	0	0	0	9	44	42
01:00	0	0	0	0	0	2	4	2	0	0	0	0	0	8	43	42
02:00	0	0	0	0	0	4	0	0	1	**1**	0	0	0	6	37	43
03:00	0	0	0	0	1	3	2	1	0	0	0	0	0	7	38	39
04:00	0	0	0	0	0	1	6	3	0	0	0	0	0	10	45	43
05:00	0	0	0	0	0	11	30	12	4	0	0	0	0	57	46	43
06:00	0	0	1	0	7	33	66	43	**10**	1	0	0	0	161	47	42
07:00	0	**3**	3	5	5	54	**143**	**67**	8	1	0	0	**1**	290	46	42
08:00	**4**	1	**4**	6	12	**96**	132	44	7	0	0	0	0	**306**	44	40
09:00	0	3	4	**10**	**18**	85	97	17	1	0	0	0	0	235	43	38
10:00	2	2	0	1	8	78	96	21	0	0	0	0	0	208	43	39
11:00	0	1	0	2	17	89	96	18	0	0	0	0	0	223	43	39
12 PM	0	2	**4**	3	12	87	131	31	0	**1**	0	0	0	271	44	40
13:00	0	0	0	0	18	77	143	37	**5**	1	0	0	0	281	44	41
14:00	**1**	**5**	3	**6**	**27**	**109**	**144**	**38**	3	0	0	0	0	**336**	44	39
15:00	0	0	**2**	4	25	147	210	45	1	0	0	0	0	434	44	40
16:00	0	0	2	6	31	169	**266**	**60**	0	0	0	0	0	534	44	40
17:00	0	0	1	**19**	**71**	233	159	27	1	0	0	0	0	511	42	38
18:00	0	0	0	2	56	**269**	179	28	**4**	0	0	0	0	**538**	42	39
19:00	0	0	0	1	13	97	153	57	1	0	0	0	0	322	45	41
20:00	0	0	0	0	1	46	94	31	0	**1**	0	0	0	173	45	42
21:00	0	0	0	0	1	33	84	32	4	1	0	0	0	155	45	42
22:00	0	0	0	1	0	19	51	17	2	0	**1**	0	0	91	45	42
23:00	0	0	0	1	0	1	21	10	2	1	0	0	0	36	47	44
%	0.1%	0.3%	0.5%	1.3%	6.2%	33.5%	44.4%	12.4%	1.0%	0.2%	0.0%	0.0%	0.0%			
AM Peak	08:00	07:00	08:00	09:00	09:00	08:00	07:00	07:00	06:00	02:00			07:00	08:00		
Vol.	4	3	4	10	18	96	143	67	10	1			1	306		
Midday Peak	14:00	14:00	12:00	14:00	14:00	14:00	14:00	14:00	13:00	12:00				14:00		
Vol.	1	5	4	6	27	109	144	38	5	1				336		
PM Peak			15:00	17:00	17:00	18:00	16:00	16:00	18:00	20:00	22:00			18:00		
Vol.			2	19	71	269	266	60	4	1	1			538		

% iles

15th Percentile : 34 MPH
50th Percentile : 39 MPH
85th Percentile : 44 MPH
95th Percentile : 47 MPH

Stats

10 MPH Pace Speed : 36-45 MPH
Number in Pace : 3703
Percent in Pace : 71.2%
Number of Vehicles > 40 MPH : 2526
Percent of Vehicles > 40 MPH : 48.6%
Mean Speed(Average) : 40 MPH

PRECISION
D A T A
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Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 C Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/15/1																
2	0	0	0	0	0	2	5	1	1	0	0	0	0	9	43	43
01:00	0	0	0	0	0	2	5	2	0	0	0	0	0	9	44	42
02:00	0	0	0	0	1	2	1	1	0	0	0	0	0	5	*	39
03:00	0	0	0	0	0	5	5	2	1	0	0	0	0	13	44	42
04:00	0	0	0	0	1	3	4	3	1	0	0	0	0	12	46	42
05:00	0	0	0	0	0	10	23	20	2	**1**	0	0	0	56	47	44
06:00	0	0	1	1	2	25	81	**46**	**4**	0	0	0	0	160	46	43
07:00	**2**	3	3	17	**52**	115	**94**	20	2	0	0	0	0	**308**	42	37
08:00	1	**5**	**7**	**28**	51	**127**	52	12	1	0	0	0	0	284	41	35
09:00	1	1	4	3	38	95	89	25	0	0	0	0	0	256	43	38
10:00	4	2	3	13	37	68	60	8	1	0	0	0	0	196	42	36
11:00	0	1	4	7	18	111	85	15	0	0	0	0	0	241	42	38
12 PM	1	1	2	11	30	104	**124**	12	1	0	0	0	0	286	42	38
13:00	0	0	5	10	38	110	103	**22**	**2**	0	0	0	0	290	43	38
14:00	**5**	**2**	**6**	**30**	**89**	**118**	101	4	1	0	0	0	0	**356**	41	35
15:00	3	**8**	**47**	**61**	**114**	153	58	2	0	0	0	0	0	446	39	33
16:00	0	2	6	4	36	228	**212**	**38**	3	**1**	0	0	0	530	43	39
17:00	**6**	4	4	18	57	**270**	179	25	**4**	0	0	0	0	**567**	42	37
18:00	0	1	1	0	42	191	197	35	4	0	0	0	0	471	43	39
19:00	0	0	0	0	7	70	121	31	1	0	0	0	0	230	44	41
20:00	0	0	0	1	3	68	84	33	3	1	0	0	0	193	45	41
21:00	0	0	0	0	2	36	69	25	1	0	0	0	0	133	45	42
22:00	0	0	0	1	1	18	26	14	0	1	0	0	0	61	46	42
23:00	0	0	0	0	0	11	15	14	3	0	0	0	0	43	47	43
%	0.4%	0.6%	1.8%	4.0%	12.0%	37.7%	34.8%	8.0%	0.7%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	08:00	08:00	07:00	08:00	07:00	06:00	06:00	05:00				07:00		
Vol.	2	5	7	28	52	127	94	46	4	1				308		
Midday Peak	14:00	14:00	14:00	14:00	14:00	14:00	12:00	13:00	13:00					14:00		
Vol.	5	2	6	30	89	118	124	22	2					356		
PM Peak	17:00	15:00	15:00	15:00	15:00	17:00	16:00	16:00	17:00	16:00				17:00		
Vol.	6	8	47	61	114	270	212	38	4	1				567		

% iles	
15th Percentile :	32 MPH
50th Percentile :	38 MPH
85th Percentile :	43 MPH
95th Percentile :	46 MPH

Stats	
10 MPH Pace Speed :	35-44 MPH
Number in Pace :	3390
Percent in Pace :	65.8%
Number of Vehicles > 40 MPH :	1879
Percent of Vehicles > 40 MPH :	36.5%
Mean Speed(Average) :	38 MPH

PRECISION
D A T A
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Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 C Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/16/1																
2	0	0	0	0	3	6	8	4	0	0	0	0	0	21	45	40
01:00	0	0	0	0	1	1	3	2	0	**1**	0	0	0	8	43	43
02:00	0	0	0	0	0	1	4	0	0	0	0	0	0	5	42	41
03:00	0	0	0	0	1	1	5	2	0	0	0	0	0	9	44	41
04:00	0	0	0	0	0	0	3	5	1	0	0	0	0	9	48	46
05:00	0	0	0	0	0	7	24	18	0	1	0	0	0	50	46	43
06:00	0	1	**2**	0	3	32	77	**39**	**6**	0	0	0	0	160	46	42
07:00	0	**2**	0	**3**	14	**109**	115	35	4	1	0	0	0	283	44	40
08:00	0	0	0	0	**25**	93	**143**	21	3	0	0	0	0	**285**	43	40
09:00	0	2	1	3	8	59	111	32	0	0	0	0	0	216	44	40
10:00	0	1	2	3	15	88	86	28	2	0	0	0	0	225	44	40
11:00	0	0	**2**	2	19	96	124	18	1	0	0	0	0	262	43	40
12 PM	0	**1**	0	5	20	116	106	21	**2**	0	0	0	0	271	43	39
13:00	0	1	2	**6**	23	124	115	**22**	1	0	0	0	0	294	43	39
14:00	0	1	2	4	**36**	**159**	**177**	18	2	0	0	0	0	**399**	43	39
15:00	**1**	**2**	**5**	**21**	59	238	149	23	3	0	0	0	0	501	42	38
16:00	0	0	4	5	45	190	**215**	28	**4**	0	0	0	0	491	43	39
17:00	0	1	2	5	**73**	**243**	183	28	1	0	0	0	0	**536**	42	38
18:00	1	0	0	8	38	152	160	27	0	0	**1**	0	0	387	43	39
19:00	0	0	0	0	2	44	101	**41**	4	0	0	0	0	192	45	42
20:00	0	0	0	2	5	40	70	18	3	0	0	0	0	138	44	41
21:00	0	0	1	2	3	29	59	21	1	**1**	0	0	0	117	45	41
22:00	0	0	0	1	4	24	65	23	2	0	0	0	0	119	45	42
23:00	0	0	0	2	5	22	31	10	1	0	0	0	0	71	44	40
%	0.0%	0.2%	0.5%	1.4%	8.0%	37.1%	42.3%	9.6%	0.8%	0.1%	0.0%	0.0%	0.0%			
AM Peak		07:00	06:00	07:00	08:00	07:00	08:00	06:00	06:00	01:00				08:00		
Vol.		2	2	3	25	109	143	39	6	1				285		
Midday Peak		12:00	11:00	13:00	14:00	14:00	14:00	13:00	12:00					14:00		
Vol.		1	2	6	36	159	177	22	2					399		
PM Peak	15:00	15:00	15:00	15:00	17:00	17:00	16:00	19:00	16:00	21:00	18:00			17:00		
Vol.	1	2	5	21	73	243	215	41	4	1	1			536		

% iles

15th Percentile : 34 MPH
50th Percentile : 39 MPH
85th Percentile : 43 MPH
95th Percentile : 46 MPH

Stats

10 MPH Pace Speed : 35-44 MPH
Number in Pace : 3628
Percent in Pace : 71.9%
Number of Vehicles > 40 MPH : 2224
Percent of Vehicles > 40 MPH : 44.0%
Mean Speed(Average) : 40 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 C Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/17/1																
2	0	0	0	0	1	5	10	9	2	0	0	0	0	27	47	43
01:00	0	0	0	0	1	3	5	4	0	0	0	0	0	13	46	42
02:00	0	**1**	0	**1**	0	1	3	0	0	0	0	0	0	6	41	33
03:00	0	0	0	0	0	2	2	3	0	0	0	0	0	7	46	43
04:00	0	0	0	0	1	0	8	5	2	**1**	0	0	0	17	48	45
05:00	0	0	0	0	0	2	8	3	2	0	0	0	0	15	47	44
06:00	0	0	0	0	2	17	24	19	**3**	0	**1**	0	0	66	47	43
07:00	0	0	**1**	0	4	20	41	14	3	0	0	0	0	83	45	41
08:00	0	0	0	0	4	41	73	22	3	0	0	0	0	143	44	41
09:00	0	1	1	1	**10**	**53**	**100**	**34**	3	0	0	0	0	**203**	45	41
10:00	0	0	0	5	11	82	88	30	3	0	0	0	0	219	44	40
11:00	0	0	0	3	14	80	118	**34**	2	0	0	0	0	251	44	40
12 PM	0	**1**	0	**7**	11	91	**143**	27	2	0	0	0	0	282	43	40
13:00	0	0	1	1	15	96	134	26	0	0	0	0	0	273	43	40
14:00	0	1	**2**	3	**23**	**126**	135	24	**4**	0	0	0	0	**318**	43	39
15:00	0	0	1	**2**	9	**113**	152	22	2	0	0	0	0	301	43	40
16:00	0	0	**3**	1	**21**	91	**155**	**43**	3	0	0	0	0	**317**	44	40
17:00	0	0	0	1	15	85	109	25	0	0	0	0	0	235	43	40
18:00	0	0	0	2	3	51	89	21	2	0	0	0	0	168	44	41
19:00	0	**1**	0	1	6	24	63	28	1	0	0	0	0	124	45	41
20:00	0	1	0	1	1	40	57	18	**4**	0	0	0	0	122	45	41
21:00	0	0	0	0	6	29	55	17	2	0	0	0	0	109	44	41
22:00	0	0	0	2	3	25	60	15	1	0	0	0	0	106	44	41
23:00	0	0	0	0	3	20	30	14	2	0	0	0	0	69	45	41
%	0.0%	0.2%	0.3%	0.9%	4.7%	31.6%	47.8%	13.2%	1.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak		02:00	07:00	02:00	09:00	09:00	09:00	09:00	06:00	04:00	06:00			09:00		
Vol.		1	1	1	10	53	100	34	3	1	1			203		
Midday Peak		12:00	14:00	12:00	14:00	14:00	12:00	11:00	14:00					14:00		
Vol.		1	2	7	23	126	143	34	4					318		
PM Peak		19:00	16:00	15:00	16:00	15:00	16:00	16:00	20:00					16:00		
Vol.		1	3	2	21	113	155	43	4					317		

% iles	
15th Percentile :	35 MPH
50th Percentile :	40 MPH
85th Percentile :	44 MPH
95th Percentile :	47 MPH

Stats	
10 MPH Pace Speed :	36-45 MPH
Number in Pace :	2543
Percent in Pace :	73.2%
Number of Vehicles > 40 MPH :	1810
Percent of Vehicles > 40 MPH :	52.1%
Mean Speed(Average) :	40 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 C Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/18/1																
2	0	0	0	**1**	1	11	14	5	1	0	0	0	0	33	45	41
01:00	0	0	0	1	0	5	9	4	0	0	0	0	0	19	45	41
02:00	0	0	0	0	0	2	1	4	1	0	0	0	0	8	48	45
03:00	0	0	0	0	0	0	2	2	0	0	0	0	0	4	*	44
04:00	0	0	0	0	0	2	1	0	0	0	0	0	0	3	*	39
05:00	0	0	0	0	0	0	5	3	1	0	0	0	0	9	46	45
06:00	0	0	0	0	4	4	17	11	4	0	0	0	0	40	48	43
07:00	0	**1**	0	1	2	8	22	11	3	**3**	0	0	0	51	49	42
08:00	0	0	0	0	1	15	40	21	6	0	0	0	0	83	47	43
09:00	0	0	**2**	0	**5**	**18**	**56**	**38**	**9**	0	0	0	0	**128**	47	43
10:00	1	0	0	0	2	32	82	45	7	0	0	0	0	169	46	42
11:00	**1**	0	**4**	0	8	51	83	43	4	0	0	0	0	194	46	41
12 PM	0	0	1	1	2	**56**	120	57	**6**	0	0	0	0	243	46	42
13:00	0	0	0	1	6	51	130	**63**	6	0	0	0	0	257	46	42
14:00	0	0	1	**2**	**9**	44	**134**	63	6	0	0	0	0	**259**	46	42
15:00	0	0	**1**	3	6	53	**137**	**56**	3	0	0	0	0	259	45	42
16:00	0	0	0	**5**	**16**	**82**	137	32	**6**	0	0	0	0	**278**	44	40
17:00	0	0	0	0	7	49	72	18	3	0	0	0	0	149	44	41
18:00	0	0	0	0	3	44	99	16	1	**1**	0	0	0	164	44	41
19:00	0	0	0	1	2	27	75	12	4	0	0	0	0	121	44	41
20:00	0	**1**	1	1	2	14	51	16	1	0	0	0	0	87	45	41
21:00	0	0	0	0	0	16	27	10	2	0	0	0	0	55	45	42
22:00	0	0	0	0	0	7	16	12	0	0	0	0	0	35	46	43
23:00	0	0	0	1	0	7	16	5	1	1	0	0	0	31	45	42
%	0.1%	0.1%	0.4%	0.7%	2.8%	22.3%	50.2%	20.4%	2.8%	0.2%	0.0%	0.0%	0.0%			
AM Peak		07:00	09:00	00:00	09:00	09:00	09:00	09:00	09:00	07:00				09:00		
Vol.		1	2	1	5	18	56	38	9	3				128		
Midday Peak	11:00		11:00	14:00	14:00	12:00	14:00	13:00	12:00					14:00		
Vol.	1		4	2	9	56	134	63	6					259		
PM Peak		20:00	15:00	16:00	16:00	16:00	15:00	15:00	16:00	18:00				16:00		
Vol.		1	1	5	16	82	137	56	6	1				278		

% iles	
15th Percentile :	36 MPH
50th Percentile :	41 MPH
85th Percentile :	46 MPH
95th Percentile :	49 MPH

Stats	
10 MPH Pace Speed :	37-46 MPH
Number in Pace :	1922
Percent in Pace :	71.7%
Number of Vehicles > 40 MPH :	1672
Percent of Vehicles > 40 MPH :	62.4%
Mean Speed(Average) :	42 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 C Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/19/1																
2	0	0	0	0	1	2	3	6	0	0	0	0	0	12	47	43
01:00	0	0	0	0	0	2	1	6	0	0	0	0	0	9	48	44
02:00	0	0	0	0	0	0	4	0	0	0	0	0	0	4	42	42
03:00	0	0	0	0	0	1	1	4	1	0	0	0	0	7	48	46
04:00	0	0	0	0	0	0	2	2	3	0	0	0	0	7	51	48
05:00	0	0	0	0	0	6	21	13	5	0	0	0	0	45	48	44
06:00	0	0	1	1	5	18	76	54	**11**	0	0	0	0	166	47	43
07:00	0	0	1	**3**	**10**	85	123	**59**	8	0	0	0	0	289	46	41
08:00	0	**3**	1	0	7	**97**	**144**	34	8	0	0	0	0	**294**	44	40
09:00	**1**	1	**2**	0	4	55	120	43	4	0	0	0	0	230	45	41
10:00	0	1	1	1	4	31	95	47	4	0	0	0	0	184	46	42
11:00	0	0	0	1	9	47	104	39	4	0	0	0	0	204	45	41
12 PM	0	0	1	1	7	54	110	51	5	0	0	0	0	229	46	42
13:00	0	0	**4**	**2**	4	66	127	40	2	**1**	0	0	0	246	44	41
14:00	0	0	1	2	**14**	**86**	**185**	**56**	**7**	0	0	0	0	**351**	45	41
15:00	0	0	0	2	18	145	212	**67**	2	1	0	0	0	447	44	41
16:00	**2**	1	0	**8**	**40**	187	**233**	48	**6**	**2**	0	0	0	527	43	40
17:00	0	**2**	**3**	0	40	**271**	211	42	2	0	0	0	0	**571**	43	39
18:00	0	1	0	5	23	183	189	28	3	0	0	0	0	432	43	39
19:00	0	0	0	5	13	103	130	37	4	1	0	0	0	293	44	40
20:00	0	0	0	2	8	35	71	30	1	0	0	0	0	147	45	41
21:00	0	0	0	0	2	23	64	26	3	0	0	0	0	118	45	42
22:00	0	0	0	0	2	20	24	9	3	1	0	0	0	59	46	41
23:00	0	0	0	0	2	13	14	10	4	1	0	0	0	44	48	42
%	0.1%	0.2%	0.3%	0.7%	4.3%	31.1%	46.1%	15.3%	1.8%	0.1%	0.0%	0.0%	0.0%			
AM Peak	09:00	08:00	09:00	07:00	07:00	08:00	08:00	07:00	06:00					08:00		
Vol.	1	3	2	3	10	97	144	59	11					294		
Midday Peak			13:00	13:00	14:00	14:00	14:00	14:00	14:00	13:00				14:00		
Vol.			4	2	14	86	185	56	7	1				351		
PM Peak	16:00	17:00	17:00	16:00	16:00	17:00	16:00	15:00	16:00	16:00				17:00		
Vol.	2	2	3	8	40	271	233	67	6	2				571		

% iles	
15th Percentile :	35 MPH
50th Percentile :	40 MPH
85th Percentile :	45 MPH
95th Percentile :	48 MPH

Stats	
10 MPH Pace Speed :	36-45 MPH
Number in Pace :	3520
Percent in Pace :	71.6%
Number of Vehicles > 40 MPH :	2626
Percent of Vehicles > 40 MPH :	53.4%
Mean Speed(Average) :	41 MPH

PRECISION
D A T A
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Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 C Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/13/1																
2	0	0	0	0	0	2	4	2	1	0	0	0	0	9	43	43
01:00	0	0	0	0	0	0	0	1	1	0	0	0	0	2	*	49
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	1	2	2	1	1	0	0	0	7	*	46
04:00	0	0	0	0	1	2	7	7	5	0	0	0	0	22	51	45
05:00	0	0	1	0	2	9	51	55	14	0	0	0	0	132	48	44
06:00	0	0	1	8	15	48	117	**90**	17	2	0	0	0	298	47	42
07:00	0	0	0	4	37	133	179	77	11	0	0	0	0	441	45	41
08:00	0	0	0	3	**43**	**145**	**201**	90	19	3	0	0	0	**504**	45	41
09:00	**1**	**2**	**2**	**9**	21	73	126	74	**31**	**5**	**1**	0	0	345	48	42
10:00	0	0	0	2	11	44	126	98	28	1	0	0	0	310	48	43
11:00	0	0	0	0	1	12	73	**100**	16	**7**	0	0	0	**209**	49	45
12 PM	0	0	**3**	**3**	3	21	72	75	15	4	**1**	0	0	197	48	44
13:00	0	0	1	0	7	17	52	58	**20**	7	0	0	0	162	49	45
14:00	0	0	1	0	**9**	**37**	**78**	61	7	1	0	0	0	194	47	42
15:00	0	0	1	4	8	67	98	**51**	**15**	**2**	0	0	0	**246**	46	42
16:00	0	**3**	22	**7**	**36**	71	72	25	7	0	0	0	0	243	44	37
17:00	**3**	0	**26**	3	27	**84**	62	23	1	1	0	0	0	230	43	36
18:00	0	1	3	1	9	62	**108**	49	10	0	0	0	0	243	46	41
19:00	0	3	1	7	9	21	43	38	6	1	0	0	0	129	47	41
20:00	0	0	1	0	1	8	29	23	7	0	0	0	0	69	48	44
21:00	0	0	0	0	3	9	23	12	3	0	0	0	0	50	46	42
22:00	0	0	0	0	0	0	2	15	10	2	0	0	0	29	52	49
23:00	0	0	0	0	0	0	10	8	6	1	0	0	0	25	51	47
%	0.1%	0.2%	1.5%	1.2%	5.9%	21.1%	37.5%	25.2%	6.1%	0.9%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	09:00	09:00	08:00	08:00	08:00	06:00	09:00	09:00	09:00			08:00		
Vol.	1	2	2	9	43	145	201	90	31	5	1			504		
Midday Peak			12:00	12:00	14:00	14:00	14:00	11:00	13:00	11:00	12:00			11:00		
Vol.			3	3	9	37	78	100	20	7	1			209		
PM Peak	17:00	16:00	17:00	16:00	16:00	17:00	18:00	15:00	15:00	15:00				15:00		
Vol.	3	3	26	7	36	84	108	51	15	2				246		

% iles	
15th Percentile :	35 MPH
50th Percentile :	41 MPH
85th Percentile :	47 MPH
95th Percentile :	50 MPH

Stats	
10 MPH Pace Speed :	38-47 MPH
Number in Pace :	2497
Percent in Pace :	61.0%
Number of Vehicles > 40 MPH :	2522
Percent of Vehicles > 40 MPH :	61.6%
Mean Speed(Average) :	42 MPH

PRECISION
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Bypass Road
west of Lexington Road (Route 2A)
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123082 C Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/14/1																
2	0	0	0	0	0	0	1	2	1	0	0	0	0	4	*	47
01:00	0	0	0	0	0	0	0	2	1	0	0	0	0	3	*	49
02:00	0	0	0	0	0	1	0	2	1	0	0	0	0	4	*	46
03:00	0	0	0	0	0	1	4	0	0	1	0	0	0	6	42	44
04:00	0	0	0	0	0	2	3	11	10	0	0	0	0	26	52	48
05:00	0	0	1	0	0	0	26	66	23	6	**1**	0	0	123	51	47
06:00	0	0	1	0	3	16	111	**123**	**47**	**7**	0	0	0	308	50	45
07:00	0	0	4	2	19	110	**209**	89	30	3	0	0	0	466	46	42
08:00	0	0	**10**	**17**	**81**	175	208	71	15	1	0	**1**	0	**579**	44	39
09:00	0	**1**	1	6	46	**181**	181	85	7	0	0	0	0	508	45	40
10:00	0	0	0	0	16	65	109	65	13	0	0	0	0	268	47	42
11:00	0	0	1	1	12	57	103	56	9	**1**	0	0	0	240	46	42
12 PM	**2**	**3**	3	**2**	11	33	106	**64**	5	0	0	0	0	229	46	41
13:00	1	1	0	0	5	58	88	58	**10**	0	**1**	0	0	222	47	42
14:00	0	1	**4**	2	**13**	**82**	**107**	40	6	0	0	0	0	**255**	45	40
15:00	0	0	2	**2**	10	56	**119**	57	11	1	0	0	0	258	46	42
16:00	0	**1**	**4**	2	**19**	**67**	99	72	8	4	0	0	0	**276**	46	41
17:00	0	0	1	2	16	55	111	**80**	10	1	0	0	0	276	47	42
18:00	0	0	1	0	5	52	84	57	12	3	**2**	0	0	216	47	43
19:00	0	0	0	0	2	21	57	38	4	1	0	0	0	123	47	43
20:00	0	0	0	0	0	7	25	33	**16**	3	0	0	0	84	50	46
21:00	0	0	0	0	1	10	13	21	10	**7**	0	0	0	62	53	46
22:00	0	0	0	0	1	3	12	19	6	0	0	0	0	41	49	45
23:00	0	0	0	0	0	0	5	5	3	1	1	0	0	15	50	48
%	0.1%	0.2%	0.7%	0.8%	5.7%	22.9%	38.8%	24.3%	5.6%	0.9%	0.1%	0.0%	0.0%			
AM Peak		09:00	08:00	08:00	08:00	09:00	07:00	06:00	06:00	06:00	05:00	08:00		08:00		
Vol.		1	10	17	81	181	209	123	47	7	1	1		579		
Midday Peak	12:00	12:00	14:00	12:00	14:00	14:00	14:00	12:00	13:00	11:00	13:00			14:00		
Vol.	2	3	4	2	13	82	107	64	10	1	1			255		
PM Peak		16:00	16:00	15:00	16:00	16:00	15:00	17:00	20:00	21:00	18:00			16:00		
Vol.		1	4	2	19	67	119	80	16	7	2			276		

% iles	
15th Percentile :	35 MPH
50th Percentile :	41 MPH
85th Percentile :	47 MPH
95th Percentile :	50 MPH

Stats	
10 MPH Pace Speed :	38-47 MPH
Number in Pace :	2868
Percent in Pace :	62.5%
Number of Vehicles > 40 MPH :	2812
Percent of Vehicles > 40 MPH :	61.2%
Mean Speed(Average) :	42 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 C Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/15/1																
2	0	0	0	0	0	0	2	5	2	2	0	0	0	11	49	49
01:00	0	0	0	0	0	1	1	2	1	0	0	0	0	5	*	45
02:00	0	0	0	0	0	2	1	1	2	0	0	0	0	6	*	44
03:00	0	0	0	0	0	0	1	4	1	0	0	0	0	6	48	47
04:00	0	0	0	0	0	0	7	11	7	2	0	0	0	27	51	48
05:00	0	1	0	0	0	6	9	59	**43**	**5**	**1**	0	**1**	125	52	48
06:00	1	2	4	0	2	32	120	**95**	36	2	0	0	0	294	49	44
07:00	**4**	3	8	33	68	108	129	59	3	1	0	0	0	416	44	38
08:00	2	**6**	**51**	**45**	**119**	**190**	129	45	1	0	0	0	0	**588**	42	35
09:00	1	2	8	15	54	145	**138**	25	2	1	0	0	0	391	42	38
10:00	2	2	5	4	20	76	103	33	6	0	0	0	0	251	44	39
11:00	0	1	0	2	26	70	103	**51**	3	0	0	0	0	256	45	40
12 PM	0	1	1	0	9	**78**	**113**	41	3	**1**	0	0	0	247	45	41
13:00	0	0	1	0	9	51	98	41	**6**	0	0	0	0	206	45	42
14:00	**3**	**14**	**32**	**32**	**76**	57	35	11	0	0	0	0	0	**260**	40	31
15:00	**5**	**26**	**49**	**57**	**87**	38	11	2	0	0	0	0	0	275	34	28
16:00	0	5	6	1	20	67	**129**	46	11	1	0	0	0	286	45	40
17:00	0	0	1	2	20	77	102	**75**	**15**	1	0	0	0	**293**	47	42
18:00	0	1	1	0	20	**91**	85	49	6	0	0	0	0	253	45	40
19:00	0	0	0	0	3	18	60	40	6	2	**1**	0	0	130	47	43
20:00	0	0	0	1	4	11	26	26	9	**5**	0	0	0	82	50	44
21:00	0	0	0	0	0	3	24	29	4	3	0	0	0	63	49	45
22:00	0	0	0	4	0	6	17	12	7	1	0	0	0	47	49	43
23:00	0	0	0	0	0	1	8	10	2	0	0	0	0	21	48	45
%	0.4%	1.4%	3.7%	4.3%	11.8%	24.9%	32.0%	17.0%	3.9%	0.6%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	08:00	08:00	08:00	08:00	09:00	06:00	05:00	05:00	05:00		05:00	08:00		
Vol.	4	6	51	45	119	190	138	95	43	5	1		1	588		
Midday Peak	14:00	14:00	14:00	14:00	14:00	12:00	12:00	11:00	13:00	12:00				14:00		
Vol.	3	14	32	32	76	78	113	51	6	1				260		
PM Peak	15:00	15:00	15:00	15:00	15:00	18:00	16:00	17:00	17:00	20:00	19:00			17:00		
Vol.	5	26	49	57	87	91	129	75	15	5	1			293		

% iles

15th Percentile : 30 MPH
50th Percentile : 39 MPH
85th Percentile : 45 MPH
95th Percentile : 49 MPH

Stats

10 MPH Pace Speed : 36-45 MPH
Number in Pace : 2433
Percent in Pace : 53.6%
Number of Vehicles > 40 MPH : 2104
Percent of Vehicles > 40 MPH : 46.4%
Mean Speed(Average) : 39 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 C Speed
Site Code: TBA

EB

Start	1	15	20	25	30	35	40	45	50	55	60	65	70	Total	85th	Ave
Time	14	19	24	29	34	39	44	49	54	59	64	69	9999		% ile	Speed
11/16/1																
2	0	0	0	0	0	1	3	8	2	0	0	0	0	14	49	46
01:00	0	0	0	0	0	1	0	2	0	0	0	0	0	3	*	44
02:00	0	0	0	0	0	1	0	0	3	0	0	0	0	4	51	48
03:00	0	0	0	0	0	0	3	3	2	0	0	0	0	8	47	46
04:00	0	0	0	0	1	1	8	10	5	2	**1**	0	0	28	52	47
05:00	0	0	1	0	0	0	16	57	**35**	**9**	0	**2**	0	120	52	49
06:00	0	0	0	0	7	45	105	**111**	19	3	0	0	0	290	48	44
07:00	0	0	**2**	0	16	128	181	107	12	1	0	0	0	447	46	42
08:00	0	0	2	3	36	**151**	**219**	84	17	1	0	0	0	**513**	45	41
09:00	**2**	0	2	**9**	**38**	119	118	51	11	1	0	0	0	351	45	39
10:00	0	0	1	6	33	88	110	49	4	1	0	0	0	292	45	40
11:00	**1**	**1**	0	1	10	61	92	53	**11**	1	0	0	0	231	46	41
12 PM	1	0	**2**	**4**	**23**	67	**117**	43	7	1	0	0	0	**265**	45	40
13:00	0	1	1	1	20	46	84	50	8	**2**	0	0	0	213	46	41
14:00	0	0	1	1	5	**73**	102	**58**	2	0	0	0	0	242	46	41
15:00	**1**	1	2	**6**	22	74	108	**79**	7	0	0	0	0	**300**	46	41
16:00	0	1	0	4	22	**88**	106	38	8	**3**	0	0	0	270	45	40
17:00	0	0	0	3	**24**	84	102	52	16	1	**1**	0	0	283	46	41
18:00	0	**3**	**9**	4	5	48	**118**	57	16	1	0	0	0	261	47	41
19:00	0	0	0	0	0	7	49	45	**18**	1	1	0	0	121	49	45
20:00	0	0	0	0	0	4	27	16	11	1	0	0	0	59	50	45
21:00	0	0	0	1	1	5	18	18	11	2	0	0	0	56	50	45
22:00	0	0	0	1	1	3	16	18	4	2	0	0	0	45	49	45
23:00	0	0	0	0	0	6	12	12	4	2	1	0	0	37	50	45

%	0.1%	0.2%	0.5%	1.0%	5.9%	24.7%	38.5%	22.9%	5.2%	0.8%	0.1%	0.0%	0.0%		
AM Peak	09:00		07:00	09:00	09:00	08:00	08:00	06:00	05:00	05:00	04:00	05:00		08:00	
Vol.	2		2	9	38	151	219	111	35	9	1	2		513	
Midday Peak	11:00	11:00	12:00	12:00	12:00	14:00	12:00	14:00	11:00	13:00				12:00	
Vol.	1	1	2	4	23	73	117	58	11	2				265	
PM Peak	15:00	18:00	18:00	15:00	17:00	16:00	18:00	15:00	19:00	16:00	17:00			15:00	
Vol.	1	3	9	6	24	88	118	79	18	3	1			300	

% iles		
15th Percentile :	35 MPH	
50th Percentile :	41 MPH	
85th Percentile :	47 MPH	
95th Percentile :	50 MPH	

Stats		
10 MPH Pace Speed :	37-46 MPH	
Number in Pace :	2779	
Percent in Pace :	62.4%	
Number of Vehicles > 40 MPH :	2637	
Percent of Vehicles > 40 MPH :	59.2%	
Mean Speed(Average) :	42 MPH	

PRECISION
D A T A
INDUSTRIES, LLC
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Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

123082 C Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/17/1																
2	0	0	0	0	0	3	7	3	1	0	0	0	0	14	46	43
01:00	0	0	0	0	0	2	2	5	1	0	0	0	0	10	48	45
02:00	0	0	0	0	0	0	3	1	1	2	0	0	0	7	42	48
03:00	0	0	0	0	0	1	1	4	1	0	0	0	0	7	48	46
04:00	0	0	0	0	0	0	0	3	2	1	0	0	0	6	48	50
05:00	0	0	**1**	0	0	1	3	10	9	2	**1**	0	0	27	52	48
06:00	0	0	1	**3**	0	5	16	23	**24**	2	0	0	0	74	51	46
07:00	0	0	0	1	**1**	9	44	60	18	2	0	0	0	135	49	45
08:00	0	0	0	0	1	10	78	**81**	15	**3**	0	0	0	188	48	45
09:00	0	**1**	0	0	1	**37**	**93**	65	15	1	0	0	0	**213**	47	43
10:00	0	1	0	4	4	22	106	83	17	0	1	0	0	238	48	43
11:00	0	0	0	2	0	34	117	**95**	**18**	1	0	0	0	267	48	44
12 PM	0	**1**	**1**	**5**	4	38	**142**	67	11	**3**	**1**	0	0	273	47	43
13:00	0	0	0	1	**5**	29	115	70	15	3	0	0	0	238	47	43
14:00	0	0	1	1	4	**57**	127	82	7	0	1	0	0	**280**	46	43
15:00	0	0	0	2	1	**35**	**118**	**79**	16	1	0	0	0	**252**	47	43
16:00	0	**1**	0	0	0	28	100	56	**23**	2	0	0	0	210	48	44
17:00	0	0	**1**	**6**	**2**	30	80	58	10	2	0	0	0	189	47	43
18:00	0	0	1	0	2	23	72	35	18	1	0	0	0	152	48	43
19:00	0	0	1	1	0	9	35	29	12	**6**	0	0	0	93	50	45
20:00	0	1	1	1	2	4	24	29	6	3	0	0	0	71	49	44
21:00	0	0	0	0	1	8	14	19	6	0	0	0	0	48	48	44
22:00	0	0	0	0	0	7	19	17	6	2	0	0	0	51	49	45
23:00	0	0	0	0	0	4	13	13	9	2	0	0	0	41	51	46
%	0.0%	0.2%	0.3%	0.9%	0.9%	12.8%	43.1%	32.0%	8.5%	1.3%	0.1%	0.0%	0.0%			
AM Peak		09:00	05:00	06:00	07:00	09:00	09:00	08:00	06:00	08:00	05:00			09:00		
Vol.		1	1	3	1	37	93	81	24	3	1			213		
Midday Peak		12:00	12:00	12:00	13:00	14:00	12:00	11:00	11:00	12:00	12:00			14:00		
Vol.		1	1	5	5	57	142	95	18	3	1			280		
PM Peak		16:00	17:00	17:00	17:00	15:00	15:00	15:00	16:00	19:00				15:00		
Vol.		1	1	6	2	35	118	79	23	6				252		

% iles	
15th Percentile :	38 MPH
50th Percentile :	43 MPH
85th Percentile :	48 MPH
95th Percentile :	51 MPH

Stats	
10 MPH Pace Speed :	39-48 MPH
Number in Pace :	2130
Percent in Pace :	69.1%
Number of Vehicles > 40 MPH :	2315
Percent of Vehicles > 40 MPH :	75.1%
Mean Speed(Average) :	44 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
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123082 C Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/18/1																
2	0	0	0	0	**1**	5	3	7	2	1	0	0	0	19	48	44
01:00	0	0	0	0	1	1	3	3	2	1	0	0	0	11	47	45
02:00	0	0	0	0	0	2	1	3	0	0	0	0	0	6	46	43
03:00	0	0	0	0	0	0	1	2	1	0	0	0	0	4	*	47
04:00	0	0	0	0	0	0	2	1	3	0	0	0	0	6	51	48
05:00	0	0	0	0	0	2	7	4	2	1	0	0	0	16	48	45
06:00	0	0	0	0	1	0	12	18	5	2	0	0	0	38	50	46
07:00	0	0	**1**	0	1	6	11	23	12	**6**	0	0	0	60	52	46
08:00	0	0	1	0	0	**8**	45	63	17	4	0	**1**	0	139	49	46
09:00	0	0	0	0	0	6	**49**	**90**	**23**	2	**1**	0	0	**171**	49	46
10:00	0	0	0	0	0	11	74	91	26	4	1	0	0	207	49	46
11:00	0	0	**4**	**1**	**2**	11	80	73	25	**4**	0	0	0	200	49	45
12 PM	0	0	0	1	1	17	78	**103**	**33**	2	**1**	0	0	**236**	49	45
13:00	0	0	0	1	1	16	80	99	20	2	1	0	0	220	48	45
14:00	0	0	0	0	0	**24**	**101**	70	29	3	0	0	0	227	49	44
15:00	0	0	0	**1**	**5**	**31**	87	**79**	**15**	4	0	0	0	**222**	48	44
16:00	0	0	**1**	0	4	13	**89**	60	9	**7**	0	**1**	0	184	48	44
17:00	0	0	1	1	3	27	54	36	11	0	**1**	0	0	134	47	43
18:00	0	0	0	0	2	5	40	31	12	2	0	0	0	92	49	45
19:00	0	0	0	0	0	6	16	20	10	2	0	0	0	54	50	46
20:00	0	0	0	0	0	4	21	24	8	2	0	0	0	59	49	46
21:00	0	0	0	0	0	1	8	25	1	1	1	0	0	37	48	46
22:00	0	0	0	0	2	1	12	9	9	1	0	0	0	34	51	46
23:00	0	0	0	0	0	0	3	6	4	0	0	0	0	13	51	47
%	0.0%	0.0%	0.3%	0.2%	1.0%	8.2%	36.7%	39.3%	11.7%	2.1%	0.3%	0.1%	0.0%			
AM Peak			07:00		00:00	08:00	09:00	09:00	09:00	07:00	09:00	08:00		09:00		
Vol.			1		1	8	49	90	23	6	1	1		171		
Midday Peak			11:00	11:00	11:00	14:00	14:00	12:00	12:00	11:00	12:00			12:00		
Vol.			4	1	2	24	101	103	33	4	1			236		
PM Peak			16:00	15:00	15:00	15:00	16:00	15:00	15:00	16:00	17:00	16:00		15:00		
Vol.			1	1	5	31	89	79	15	7	1	1		222		

% iles

15th Percentile :	39 MPH
50th Percentile :	44 MPH
85th Percentile :	49 MPH
95th Percentile :	53 MPH

Stats

10 MPH Pace Speed :	40-49 MPH
Number in Pace :	1657
Percent in Pace :	69.4%
Number of Vehicles > 40 MPH :	1952
Percent of Vehicles > 40 MPH :	81.7%
Mean Speed(Average) :	45 MPH

PRECISION
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Bypass Road
west of Lexington Road (Route 2A)
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123082 C Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/19/1																
2	0	0	0	0	0	0	1	4	1	0	0	0	0	6	48	47
01:00	0	0	0	0	0	1	0	2	0	2	0	0	0	5	*	49
02:00	0	0	0	0	0	0	0	0	1	0	0	0	0	1	*	52
03:00	0	0	0	0	0	0	1	3	2	0	0	0	0	6	48	48
04:00	0	0	0	0	0	1	6	11	2	1	0	0	0	21	48	46
05:00	0	0	1	0	0	2	17	64	28	**4**	0	0	0	116	51	47
06:00	0	0	0	0	4	35	114	**106**	**33**	1	0	0	0	293	48	44
07:00	0	0	1	**4**	22	109	193	94	18	1	0	0	0	442	46	42
08:00	0	0	**2**	4	**45**	**202**	**233**	96	13	1	0	0	0	**596**	45	40
09:00	0	**1**	0	0	21	88	169	101	20	1	0	0	0	401	47	42
10:00	0	0	1	1	1	33	106	88	19	0	0	0	0	249	48	44
11:00	0	0	**1**	0	2	**40**	82	67	16	1	0	0	0	209	48	43
12 PM	0	0	1	1	**16**	33	80	**84**	12	**2**	0	0	0	229	47	43
13:00	**1**	0	1	1	5	32	78	58	9	1	0	0	0	186	47	42
14:00	0	**1**	1	**7**	8	33	**86**	79	**17**	1	0	0	0	**233**	48	43
15:00	0	**3**	**5**	**5**	**19**	63	**117**	57	10	0	0	0	0	**279**	46	41
16:00	0	0	2	0	13	58	106	57	**17**	0	0	0	0	253	47	42
17:00	0	1	1	1	9	**69**	106	**72**	14	0	0	0	0	273	47	42
18:00	0	0	0	4	7	48	79	55	9	**2**	0	**1**	0	205	47	42
19:00	0	0	0	1	8	8	38	50	13	2	**1**	0	0	121	49	44
20:00	0	0	0	0	2	9	21	24	8	1	0	0	0	65	49	44
21:00	0	0	0	0	1	0	20	23	10	0	0	0	0	54	50	46
22:00	0	0	0	0	0	5	11	13	8	0	0	0	0	37	50	45
23:00	0	0	1	0	1	1	12	7	9	0	0	0	0	31	51	45
%	0.0%	0.1%	0.4%	0.7%	4.3%	20.2%	38.9%	28.2%	6.7%	0.5%	0.0%	0.0%	0.0%			
AM Peak		09:00	08:00	07:00	08:00	08:00	08:00	06:00	06:00	05:00				08:00		
Vol.		1	2	4	45	202	233	106	33	4				596		
Midday Peak	13:00	14:00	11:00	14:00	12:00	11:00	14:00	12:00	14:00	12:00				14:00		
Vol.	1	1	1	7	16	40	86	84	17	2				233		
PM Peak		15:00	15:00	15:00	15:00	17:00	15:00	17:00	16:00	18:00	19:00	18:00		15:00		
Vol.		3	5	5	19	69	117	72	17	2	1	1		279		

% iles	
15th Percentile :	36 MPH
50th Percentile :	42 MPH
85th Percentile :	47 MPH
95th Percentile :	50 MPH

Stats	
10 MPH Pace Speed :	38-47 MPH
Number in Pace :	2751
Percent in Pace :	63.8%
Number of Vehicles > 40 MPH :	2833
Percent of Vehicles > 40 MPH :	65.7%
Mean Speed(Average) :	42 MPH

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Volume
Site Code: TBA

Start	13-Nov-12		14-Nov-12		15-Nov-12		16-Nov-12		17-Nov-12		18-Nov-12		19-Nov-12		Week Average	
Time	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	20	9	9	4	9	11	21	14	27	14	33	19	12	6	19	11
01:00	7	2	8	3	9	5	8	3	13	10	19	11	9	5	10	6
02:00	2	0	6	4	5	6	5	4	6	7	8	6	4	1	5	4
03:00	2	7	7	6	13	6	9	8	7	7	4	4	7	6	7	6
04:00	6	22	10	26	12	27	9	28	17	6	3	6	7	21	9	19
05:00	54	132	57	123	56	125	50	120	15	27	9	16	45	116	41	94
06:00	163	298	161	308	160	294	160	290	66	74	40	38	166	293	131	228
07:00	277	441	290	466	**308**	416	283	447	83	135	51	60	289	442	226	344
08:00	**288**	**504**	**306**	**579**	284	**588**	**285**	**513**	143	188	83	139	**294**	**596**	**240**	**444**
09:00	249	345	235	508	256	391	216	351	203	213	128	171	230	401	217	340
10:00	197	310	208	268	196	251	225	292	219	238	169	**207**	184	249	200	259
11:00	201	209	223	240	241	256	262	231	**251**	**267**	**194**	200	204	209	225	230
12:00 PM	222	197	271	229	286	247	271	265	282	273	243	**236**	229	229	258	239
01:00	252	162	281	222	290	206	294	213	273	238	257	220	246	186	270	207
02:00	365	194	336	255	356	260	399	242	**318**	**280**	259	227	351	233	341	242
03:00	494	**246**	434	258	446	275	501	**300**	301	252	259	222	447	**279**	412	**262**
04:00	523	243	534	**276**	530	286	491	270	317	210	**278**	184	527	253	**457**	246
05:00	485	230	511	276	**567**	**293**	**536**	283	235	189	149	134	**571**	273	436	240
06:00	**551**	243	**538**	216	471	253	387	261	168	152	164	92	432	205	387	203
07:00	252	129	322	123	230	130	192	121	124	93	121	54	293	121	219	110
08:00	160	69	173	84	193	82	138	59	122	71	87	59	147	65	146	70
09:00	114	50	155	62	133	63	117	56	109	48	55	37	118	54	114	53
10:00	59	29	91	41	61	47	119	45	106	51	35	34	59	37	76	41
11:00	43	25	36	15	43	21	71	37	69	41	31	13	44	31	48	26
Total	4986	4096	5202	4592	5155	4539	5049	4453	3474	3084	2679	2389	4915	4311	4494	3924
Day	9082		9794		9694		9502		6558		5068		9226		8418	
AM Peak	08:00	08:00	08:00	08:00	07:00	08:00	08:00	08:00	11:00	11:00	11:00	10:00	08:00	08:00	08:00	08:00
Vol.	288	504	306	579	308	588	285	513	251	267	194	207	294	596	240	444
PM Peak	18:00	15:00	18:00	16:00	17:00	17:00	17:00	15:00	14:00	14:00	16:00	12:00	17:00	15:00	16:00	15:00
Vol.	551	246	538	276	567	293	536	300	318	280	278	236	571	279	457	262

Comb. Total	9082	9794	9694	9502	6558	5068	9226	8418

ADT ADT 8,418 AADT 8,418

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Volume
Site Code: TBA

Start	WB				EB				Combined				13-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	4		53		3		48		7		101		
12:15	12		57		2		48		14		105		
12:30	1		47		3		58		4		105		
12:45	3	20	65	222	1	9	43	197	4	29	108	419	
01:00	3		54		0		33		3		87		
01:15	0		67		1		45		1		112		
01:30	2		60		0		44		2		104		
01:45	2	7	71	252	1	2	40	162	3	9	111	414	
02:00	1		80		0		44		1		124		
02:15	0		71		0		69		0		140		
02:30	0		120		0		36		0		156		
02:45	1	2	94	365	0	0	45	194	1	2	139	559	
03:00	0		107		1		55		1		162		
03:15	1		117		2		72		3		189		
03:30	1		129		2		50		3		179		
03:45	0	2	141	494	2	7	69	246	2	9	210	740	
04:00	2		134		4		55		6		189		
04:15	2		150		5		71		7		221		
04:30	1		132		3		60		4		192		
04:45	1	6	107	523	10	22	57	243	11	28	164	766	
05:00	11		97		16		38		27		135		
05:15	10		112		16		64		26		176		
05:30	13		131		43		61		56		192		
05:45	20	54	145	485	57	132	67	230	77	186	212	715	
06:00	27		152		70		65		97		217		
06:15	40		158		56		55		96		213		
06:30	37		109		94		57		131		166		
06:45	59	163	132	551	78	298	66	243	137	461	198	794	
07:00	66		109		101		45		167		154		
07:15	71		53		114		26		185		79		
07:30	62		48		116		35		178		83		
07:45	78	277	42	252	110	441	23	129	188	718	65	381	
08:00	73		46		125		20		198		66		
08:15	62		41		130		19		192		60		
08:30	64		35		144		15		208		50		
08:45	89	288	38	160	105	504	15	69	194	792	53	229	
09:00	68		37		130		18		198		55		
09:15	69		36		88		18		157		54		
09:30	54		20		59		6		113		26		
09:45	58	249	21	114	68	345	8	50	126	594	29	164	
10:00	64		17		90		5		154		22		
10:15	45		17		88		11		133		28		
10:30	39		12		58		4		97		16		
10:45	49	197	13	59	74	310	9	29	123	507	22	88	
11:00	52		17		45		10		97		27		
11:15	54		7		62		5		116		12		
11:30	40		11		54		6		94		17		
11:45	55	201	8	43	48	209	4	25	103	410	12	68	
Total	1466		3520		2279		1817		3745		5337		
Percent	39.1%		66.0%		60.9%		34.0%						
Day Total		4986				4096				9082			
Peak	08:30		05:30		07:45		05:15		08:00		05:30		
Vol.	290		586		509		257		792		834		
P.H.F.	0.815		0.927		0.884		0.905		0.952		0.943		

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Volume
Site Code: TBA

Start	WB				EB				Combined				14-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	3		47		1		61		4		108		
12:15	2		86		1		59		3		145		
12:30	2		77		2		48		4		125		
12:45	2	9	61	271	0	4	61	229	2	13	122	500	
01:00	4		80		1		53		5		133		
01:15	0		62		0		57		0		119		
01:30	3		71		1		56		4		127		
01:45	1	8	68	281	1	3	56	222	2	11	124	503	
02:00	2		68		1		52		3		120		
02:15	1		80		2		61		3		141		
02:30	1		113		0		63		1		176		
02:45	2	6	75	336	1	4	79	255	3	10	154	591	
03:00	2		96		2		62		4		158		
03:15	0		106		1		64		1		170		
03:30	3		123		1		79		4		202		
03:45	2	7	109	434	2	6	53	258	4	13	162	692	
04:00	0		112		6		76		6		188		
04:15	4		130		1		72		5		202		
04:30	2		138		5		79		7		217		
04:45	4	10	154	534	14	26	49	276	18	36	203	810	
05:00	9		140		10		69		19		209		
05:15	10		116		22		70		32		186		
05:30	14		143		37		71		51		214		
05:45	24	57	112	511	54	123	66	276	78	180	178	787	
06:00	28		138		64		60		92		198		
06:15	43		129		79		60		122		189		
06:30	36		130		68		50		104		180		
06:45	54	161	141	538	97	308	46	216	151	469	187	754	
07:00	67		129		100		41		167		170		
07:15	71		94		116		31		187		125		
07:30	60		39		125		27		185		66		
07:45	92	290	60	322	125	466	24	123	217	756	84	445	
08:00	68		47		132		13		200		60		
08:15	69		54		148		29		217		83		
08:30	88		35		153		33		241		68		
08:45	81	306	37	173	146	579	9	84	227	885	46	257	
09:00	66		45		126		17		192		62		
09:15	64		47		147		12		211		59		
09:30	58		34		126		16		184		50		
09:45	47	235	29	155	109	508	17	62	156	743	46	217	
10:00	33		24		63		13		96		37		
10:15	47		30		67		15		114		45		
10:30	64		18		80		7		144		25		
10:45	64	208	19	91	58	268	6	41	122	476	25	132	
11:00	58		10		63		7		121		17		
11:15	52		8		58		3		110		11		
11:30	55		9		60		4		115		13		
11:45	58	223	9	36	59	240	1	15	117	463	10	51	
Total	1520		3682		2535		2057		4055		5739		
Percent	37.5%		64.2%		62.5%		35.8%						
Day Total		5202				4592				9794			
Peak	07:45		04:15		08:00		02:45		08:00		04:15		
Vol.	317		562		579		284		885		831		
P.H.F.	0.861		0.912		0.946		0.899		0.918		0.957		

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Volume
Site Code: TBA

Start	WB				EB				Combined				15-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	1		66		3		59		4		125		
12:15	2		63		5		52		7		115		
12:30	2		75		0		69		2		144		
12:45	4	9	82	286	3	11	67	247	7	20	149	533	
01:00	2		69		1		52		3		121		
01:15	3		64		1		45		4		109		
01:30	1		70		2		52		3		122		
01:45	3	9	87	290	1	5	57	206	4	14	144	496	
02:00	3		81		4		68		7		149		
02:15	1		84		0		62		1		146		
02:30	1		99		1		60		2		159		
02:45	0	5	92	356	1	6	70	260	1	11	162	616	
03:00	4		104		2		56		6		160		
03:15	2		95		1		78		3		173		
03:30	2		116		0		82		2		198		
03:45	5	13	131	446	3	6	59	275	8	19	190	721	
04:00	4		120		2		66		6		186		
04:15	2		147		5		71		7		218		
04:30	1		127		9		81		10		208		
04:45	5	12	136	530	11	27	68	286	16	39	204	816	
05:00	7		152		12		69		19		221		
05:15	13		137		25		75		38		212		
05:30	10		151		34		75		44		226		
05:45	26	56	127	567	54	125	74	293	80	181	201	860	
06:00	22		133		53		70		75		203		
06:15	42		138		79		62		121		200		
06:30	44		109		75		60		119		169		
06:45	52	160	91	471	87	294	61	253	139	454	152	724	
07:00	66		83		93		38		159		121		
07:15	63		54		106		33		169		87		
07:30	74		49		120		34		194		83		
07:45	105	308	44	230	97	416	25	130	202	724	69	360	
08:00	65		50		151		22		216		72		
08:15	64		44		168		27		232		71		
08:30	82		54		127		20		209		74		
08:45	73	284	45	193	142	588	13	82	215	872	58	275	
09:00	61		34		124		22		185		56		
09:15	65		34		88		16		153		50		
09:30	81		41		69		11		150		52		
09:45	49	256	24	133	110	391	14	63	159	647	38	196	
10:00	50		19		51		8		101		27		
10:15	48		12		73		12		121		24		
10:30	41		16		61		11		102		27		
10:45	57	196	14	61	66	251	16	47	123	447	30	108	
11:00	52		17		64		4		116		21		
11:15	55		10		69		11		124		21		
11:30	62		7		57		5		119		12		
11:45	72	241	9	43	66	256	1	21	138	497	10	64	
Total	1549		3606		2376		2163		3925		5769		
Percent	39.5%		62.5%		60.5%		37.5%						
Day Total		5155				4539				9694			
Peak	07:45		04:45		08:00		05:15		08:00		04:45		
Vol.	316		576		588		294		872		863		
P.H.F.	0.752		0.947		0.875		0.980		0.940		0.955		

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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123082 C Volume
Site Code: TBA

Start		WB				EB				Combined			16-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Fri
12:00	11		59		4		66		15		125		
12:15	7		54		2		62		9		116		
12:30	2		86		4		62		6		148		
12:45	1	21	72	271	4	14	75	265	5	35	147	536	
01:00	2		75		1		59		3		134		
01:15	1		70		0		45		1		115		
01:30	2		71		2		64		4		135		
01:45	3	8	78	294	0	3	45	213	3	11	123	507	
02:00	1		85		1		64		2		149		
02:15	3		86		1		57		4		143		
02:30	0		123		1		58		1		181		
02:45	1	5	105	399	1	4	63	242	2	9	168	641	
03:00	2		136		2		68		4		204		
03:15	4		131		2		63		6		194		
03:30	1		117		2		84		3		201		
03:45	2	9	117	501	2	8	85	300	4	17	202	801	
04:00	3		112		6		79		9		191		
04:15	2		120		3		64		5		184		
04:30	1		131		6		55		7		186		
04:45	3	9	128	491	13	28	72	270	16	37	200	761	
05:00	9		123		15		69		24		192		
05:15	9		146		19		74		28		220		
05:30	12		147		32		69		44		216		
05:45	20	50	120	536	54	120	71	283	74	170	191	819	
06:00	29		133		42		72		71		205		
06:15	35		98		73		74		108		172		
06:30	45		97		85		61		130		158		
06:45	51	160	59	387	90	290	54	261	141	450	113	648	
07:00	59		56		106		36		165		92		
07:15	70		45		101		26		171		71		
07:30	75		47		119		35		194		82		
07:45	79	283	44	192	121	447	24	121	200	730	68	313	
08:00	65		41		141		16		206		57		
08:15	77		35		119		12		196		47		
08:30	74		30		145		13		219		43		
08:45	69	285	32	138	108	513	18	59	177	798	50	197	
09:00	51		26		94		15		145		41		
09:15	46		30		98		10		144		40		
09:30	61		32		67		12		128		44		
09:45	58	216	29	117	92	351	19	56	150	567	48	173	
10:00	38		40		71		14		109		54		
10:15	58		33		81		13		139		46		
10:30	57		23		66		8		123		31		
10:45	72	225	23	119	74	292	10	45	146	517	33	164	
11:00	71		23		64		12		135		35		
11:15	65		28		56		11		121		39		
11:30	62		12		60		7		122		19		
11:45	64	262	8	71	51	231	7	37	115	493	15	108	
Total	1533		3516		2301		2152		3834		5668		
Percent	40.0%		62.0%		60.0%		38.0%						
Day Total		5049				4453				9502			
Peak	07:30		05:15		07:45		03:30		07:45		05:15		
Vol.	296		546		526		312		821		832		
P.H.F.	0.937		0.929		0.907		0.918		0.937		0.945		

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

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INDUSTRIES, LLC
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123082 C Volume
Site Code: TBA

Start	WB				EB				Combined				17-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sat
12:00	7		65		4		66		11		131		
12:15	4		76		7		58		11		134		
12:30	8		63		1		66		9		129		
12:45	8	27	78	282	2	14	83	273	10	41	161	555	
01:00	7		57		2		53		9		110		
01:15	2		65		3		66		5		131		
01:30	2		77		3		60		5		137		
01:45	2	13	74	273	2	10	59	238	4	23	133	511	
02:00	3		79		3		72		6		151		
02:15	1		86		2		65		3		151		
02:30	1		71		0		66		1		137		
02:45	1	6	82	318	2	7	77	280	3	13	159	598	
03:00	2		73		1		64		3		137		
03:15	2		75		4		69		6		144		
03:30	1		75		2		63		3		138		
03:45	2	7	78	301	0	7	56	252	2	14	134	553	
04:00	3		66		3		53		6		119		
04:15	4		83		1		50		5		133		
04:30	3		97		0		54		3		151		
04:45	7	17	71	317	2	6	53	210	9	23	124	527	
05:00	2		84		3		51		5		135		
05:15	5		54		5		39		10		93		
05:30	3		47		10		55		13		102		
05:45	5	15	50	235	9	27	44	189	14	42	94	424	
06:00	12		61		10		42		22		103		
06:15	21		40		17		35		38		75		
06:30	14		43		21		46		35		89		
06:45	19	66	24	168	26	74	29	152	45	140	53	320	
07:00	14		31		24		38		38		69		
07:15	17		43		34		24		51		67		
07:30	26		23		38		21		64		44		
07:45	26	83	27	124	39	135	10	93	65	218	37	217	
08:00	32		31		39		19		71		50		
08:15	29		36		34		15		63		51		
08:30	38		27		46		16		84		43		
08:45	44	143	28	122	69	188	21	71	113	331	49	193	
09:00	48		27		41		12		89		39		
09:15	31		30		63		10		94		40		
09:30	65		25		56		12		121		37		
09:45	59	203	27	109	53	213	14	48	112	416	41	157	
10:00	75		21		70		12		145		33		
10:15	36		28		55		11		91		39		
10:30	61		31		58		14		119		45		
10:45	47	219	26	106	55	238	14	51	102	457	40	157	
11:00	46		20		65		12		111		32		
11:15	46		16		67		4		113		20		
11:30	82		20		69		7		151		27		
11:45	77	251	13	69	66	267	18	41	143	518	31	110	
Total	1050		2424		1186		1898		2236		4322		
Percent	47.0%		56.1%		53.0%		43.9%						
Day Total		3474				3084				6558			
Peak	11:00		04:15		11:00		02:00		11:00		02:00		
Vol.	251		335		267		280		518		598		
P.H.F.	0.765		0.863		0.967		0.843		0.858		0.940		

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Volume
Site Code: TBA

Start	WB				EB				Combined				18-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sun
12:00	6		46		5		63		11		109		
12:15	8		57		6		52		14		109		
12:30	12		70		4		61		16		131		
12:45	7	33	70	243	4	19	60	236	11	52	130	479	
01:00	8		74		5		68		13		142		
01:15	9		61		6		47		15		108		
01:30	2		71		0		60		2		131		
01:45	0	19	51	257	0	11	45	220	0	30	96	477	
02:00	3		62		3		63		6		125		
02:15	3		68		1		52		4		120		
02:30	2		69		1		57		3		126		
02:45	0	8	60	259	1	6	55	227	1	14	115	486	
03:00	0		63		1		55		1		118		
03:15	1		63		0		49		1		112		
03:30	2		70		3		54		5		124		
03:45	1	4	63	259	0	4	64	222	1	8	127	481	
04:00	2		91		1		53		3		144		
04:15	0		57		2		37		2		94		
04:30	1		60		3		49		4		109		
04:45	0	3	70	278	0	6	45	184	0	9	115	462	
05:00	1		49		3		25		4		74		
05:15	4		43		1		47		5		90		
05:30	2		23		7		30		9		53		
05:45	2	9	34	149	5	16	32	134	7	25	66	283	
06:00	7		39		1		26		8		65		
06:15	9		48		6		25		15		73		
06:30	14		47		15		25		29		72		
06:45	10	40	30	164	16	38	16	92	26	78	46	256	
07:00	10		28		16		10		26		38		
07:15	11		41		14		9		25		50		
07:30	14		27		15		12		29		39		
07:45	16	51	25	121	15	60	23	54	31	111	48	175	
08:00	19		23		15		15		34		38		
08:15	15		22		18		14		33		36		
08:30	24		11		59		15		83		26		
08:45	25	83	31	87	47	139	15	59	72	222	46	146	
09:00	27		10		55		12		82		22		
09:15	33		11		44		8		77		19		
09:30	44		14		37		8		81		22		
09:45	24	128	20	55	35	171	9	37	59	299	29	92	
10:00	38		15		43		10		81		25		
10:15	41		8		44		9		85		17		
10:30	43		4		55		11		98		15		
10:45	47	169	8	35	65	207	4	34	112	376	12	69	
11:00	50		11		54		5		104		16		
11:15	42		11		50		3		92		14		
11:30	48		3		48		2		96		5		
11:45	54	194	6	31	48	200	3	13	102	394	9	44	
Total	741		1938		877		1512		1618		3450		
Percent	45.8%		56.2%		54.2%		43.8%						
Day Total		2679				2389				5068			
Peak	11:00		03:15		10:30		00:15		10:30		00:15		
Vol.	194		287		224		241		406		512		
P.H.F.	0.898		0.788		0.862		0.886		0.906		0.901		

Bypass Road
west of Lexington Road (Route 2A)
City, State: Lincoln, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 C Volume
Site Code: TBA

Start		WB				EB				Combined			19-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Mon
12:00	9		51		3		45		12		96		
12:15	1		57		2		48		3		105		
12:30	1		54		0		67		1		121		
12:45	1	12	67	229	1	6	69	229	2	18	136	458	
01:00	3		52		2		44		5		96		
01:15	2		65		1		45		3		110		
01:30	1		59		1		44		2		103		
01:45	3	9	70	246	1	5	53	186	4	14	123	432	
02:00	1		68		0		57		1		125		
02:15	1		85		1		62		2		147		
02:30	2		102		0		46		2		148		
02:45	0	4	96	351	0	1	68	233	0	5	164	584	
03:00	3		98		1		66		4		164		
03:15	0		110		3		85		3		195		
03:30	3		122		1		48		4		170		
03:45	1	7	117	447	1	6	80	279	2	13	197	726	
04:00	2		131		2		53		4		184		
04:15	1		114		3		68		4		182		
04:30	0		122		3		71		3		193		
04:45	4	7	160	527	13	21	61	253	17	28	221	780	
05:00	2		128		13		69		15		197		
05:15	6		162		22		70		28		232		
05:30	18		133		28		77		46		210		
05:45	19	45	148	571	53	116	57	273	72	161	205	844	
06:00	34		134		56		53		90		187		
06:15	29		109		71		63		100		172		
06:30	49		93		70		38		119		131		
06:45	54	166	96	432	96	293	51	205	150	459	147	637	
07:00	66		112		76		43		142		155		
07:15	67		93		117		37		184		130		
07:30	78		42		118		26		196		68		
07:45	78	289	46	293	131	442	15	121	209	731	61	414	
08:00	70		36		152		17		222		53		
08:15	86		33		140		22		226		55		
08:30	69		43		167		14		236		57		
08:45	69	294	35	147	137	596	12	65	206	890	47	212	
09:00	62		43		127		24		189		67		
09:15	64		33		113		10		177		43		
09:30	54		21		90		10		144		31		
09:45	50	230	21	118	71	401	10	54	121	631	31	172	
10:00	39		21		71		12		110		33		
10:15	39		18		72		8		111		26		
10:30	58		9		46		9		104		18		
10:45	48	184	11	59	60	249	8	37	108	433	19	96	
11:00	39		18		52		11		91		29		
11:15	57		10		36		7		93		17		
11:30	58		10		62		5		120		15		
11:45	50	204	6	44	59	209	8	31	109	413	14	75	
Total	1451		3464		2345		1966		3796		5430		
Percent	38.2%		63.8%		61.8%		36.2%						
Day Total		4915				4311				9226			
Peak	07:30		04:45		08:00		03:00		07:45		04:45		
Vol.	312		583		596		279		893		860		
P.H.F.	0.907		0.900		0.892		0.821		0.946		0.927		

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

SB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/13/1														
2	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
05:00	0	15	8	0	3	0	0	0	0	0	0	0	0	26
06:00	0	98	26	0	6	0	0	2	0	0	0	0	0	132
07:00	1	306	46	6	8	0	0	0	0	0	0	0	0	367
08:00	0	274	37	0	6	0	0	0	0	0	0	0	0	317
09:00	0	168	37	2	7	0	0	1	0	0	0	0	0	215
10:00	0	60	20	0	8	2	0	1	0	0	0	0	0	91
11:00	0	54	13	0	5	0	0	1	0	0	0	0	0	73
12 PM	1	76	22	0	3	0	0	0	0	0	0	0	0	102
13:00	0	74	11	2	3	0	0	0	0	0	0	0	0	90
14:00	0	76	24	3	8	0	0	1	0	0	0	0	0	112
15:00	1	99	31	1	5	0	0	0	0	0	0	0	0	137
16:00	1	117	22	0	2	1	0	0	0	0	0	0	0	143
17:00	1	120	21	0	1	0	0	0	0	0	0	0	0	143
18:00	0	88	20	0	1	0	0	0	0	0	0	0	0	109
19:00	0	57	8	0	0	0	0	0	0	0	0	0	0	65
20:00	0	28	3	0	1	0	0	0	0	0	0	0	0	32
21:00	0	24	1	0	2	0	0	0	0	0	0	0	0	27
22:00	0	10	2	0	0	0	0	0	0	0	0	0	0	12
23:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
Total	5	1758	354	14	69	3	0	6	0	0	0	0	0	2209
Percent	0.2%	79.6%	16.0%	0.6%	3.1%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	07:00	10:00		06:00						07:00
Vol.	1	306	46	6	8	2		2						367
PM Peak	12:00	17:00	15:00	14:00	14:00	16:00		14:00						16:00
Vol.	1	120	31	3	8	1		1						143

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

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123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/14/1														
2	0	3	0	0	1	0	0	0	0	0	0	0	0	4
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
05:00	0	16	6	0	2	0	0	1	0	0	0	0	0	25
06:00	0	105	30	1	9	0	0	0	0	0	0	0	0	145
07:00	1	321	55	5	18	1	0	1	0	0	0	0	0	402
08:00	1	289	52	3	12	0	0	1	0	0	0	0	0	358
09:00	2	136	36	1	6	0	0	2	1	0	0	0	0	184
10:00	2	71	23	1	6	3	0	0	0	0	0	0	0	106
11:00	1	70	26	2	3	0	0	0	0	0	0	0	0	102
12 PM	1	84	25	0	2	0	0	2	0	0	0	0	0	114
13:00	1	79	30	3	4	0	0	1	0	0	0	0	0	118
14:00	0	99	22	2	5	0	0	1	0	0	0	0	0	129
15:00	2	97	35	4	4	0	0	1	0	0	0	0	0	143
16:00	1	112	21	0	3	1	0	0	0	0	0	0	0	138
17:00	0	119	26	0	3	0	0	0	0	0	0	0	0	148
18:00	0	107	21	0	3	1	0	0	0	0	0	0	0	132
19:00	1	39	10	0	3	0	0	0	0	0	0	0	0	53
20:00	0	27	8	0	0	0	0	0	0	0	0	0	0	35
21:00	0	22	0	0	0	0	0	0	0	0	0	0	0	22
22:00	0	10	5	0	0	0	0	0	0	0	0	0	0	15
23:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
Total	13	1821	433	22	84	6	0	10	1	0	0	0	0	2390
Percent	0.5%	76.2%	18.1%	0.9%	3.5%	0.3%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	07:00	07:00	07:00	10:00		09:00	09:00					07:00
Vol.	2	321	55	5	18	3		2	1					402
PM Peak	15:00	17:00	15:00	15:00	14:00	16:00		12:00						17:00
Vol.	2	119	35	4	5	1		2						148

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

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Office: 508.481.3999 Fax: 508.545.1234
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123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/15/1														
2	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	4	0	0	2	0	0	0	0	0	0	0	0	6
05:00	0	15	4	0	1	0	0	0	0	0	0	0	0	20
06:00	0	108	34	1	10	0	0	0	0	0	0	0	0	153
07:00	0	326	51	4	10	0	0	2	0	0	0	0	0	393
08:00	1	279	65	1	12	1	0	0	0	0	0	0	0	359
09:00	1	133	40	2	10	0	0	1	0	0	0	0	0	187
10:00	0	68	24	1	8	0	0	0	0	0	0	0	0	101
11:00	1	74	16	0	3	0	0	0	0	0	0	0	0	94
12 PM	2	97	28	0	7	0	0	1	1	0	0	0	0	136
13:00	1	83	21	1	5	0	0	0	0	0	0	0	0	111
14:00	0	81	16	3	3	0	0	0	0	0	0	0	0	103
15:00	0	110	40	5	3	0	0	0	0	0	0	0	0	158
16:00	1	103	24	1	4	0	0	0	0	0	0	0	0	133
17:00	1	141	25	0	3	3	0	0	0	0	0	0	0	173
18:00	2	113	21	1	3	0	0	0	0	0	0	0	0	140
19:00	0	54	8	0	2	0	0	0	0	0	0	0	0	64
20:00	0	30	4	0	0	0	0	0	0	0	0	0	0	34
21:00	0	19	7	0	1	0	0	0	0	0	0	0	0	27
22:00	0	14	1	0	0	0	0	0	0	0	0	0	0	15
23:00	0	7	2	0	0	0	0	0	0	0	0	0	0	9
Total	10	1862	431	20	87	4	0	4	1	0	0	0	0	2419
Percent	0.4%	77.0%	17.8%	0.8%	3.6%	0.2%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	08:00	07:00	08:00	08:00		07:00						07:00
Vol.	1	326	65	4	12	1		2						393
PM Peak	12:00	17:00	15:00	15:00	12:00	17:00		12:00	12:00					17:00
Vol.	2	141	40	5	7	3		1	1					173

Old Bedford Road
south of Bedford Street (Route 62)
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123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/16/1														
2	0	2	2	0	0	0	0	0	0	0	0	0	0	4
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	6	2	0	1	0	0	0	0	0	0	0	0	9
05:00	0	21	7	0	2	0	0	0	0	0	0	0	0	30
06:00	0	105	30	0	9	0	0	1	0	0	0	0	0	145
07:00	0	295	50	3	11	0	0	0	1	0	0	0	0	360
08:00	2	231	50	1	9	0	0	2	0	0	0	0	0	295
09:00	0	119	26	2	6	0	0	3	0	0	0	0	0	156
10:00	1	90	19	1	6	0	1	1	0	0	0	0	0	119
11:00	2	75	18	1	2	1	2	0	0	0	0	0	0	101
12 PM	4	77	18	0	5	1	0	0	0	0	0	0	0	105
13:00	2	90	17	2	7	0	0	1	0	0	0	0	0	119
14:00	0	79	24	2	3	1	0	3	0	0	0	0	0	112
15:00	0	111	33	2	2	0	0	0	1	0	0	0	0	149
16:00	0	100	31	1	5	0	0	0	0	0	0	0	0	137
17:00	2	115	21	1	3	1	0	0	0	0	0	0	0	143
18:00	1	76	13	0	1	0	0	0	0	0	0	0	0	91
19:00	0	39	0	0	0	0	0	0	0	0	0	0	0	39
20:00	0	31	8	0	1	0	0	0	0	0	0	0	0	40
21:00	0	19	3	0	1	0	0	0	0	0	0	0	0	23
22:00	0	19	1	0	0	0	0	0	0	0	0	0	0	20
23:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Total	14	1706	373	16	74	4	3	11	2	0	0	0	0	2203
Percent	0.6%	77.4%	16.9%	0.7%	3.4%	0.2%	0.1%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	07:00	07:00	11:00	11:00	09:00	07:00					07:00
Vol.	2	295	50	3	11	1	2	3	1					360
PM Peak	12:00	17:00	15:00	13:00	13:00	12:00		14:00	15:00					15:00
Vol.	4	115	33	2	7	1		3	1					149

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

SB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/17/1														
2	0	4	1	0	0	0	0	0	0	0	0	0	0	5
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	1	1	0	1	0	0	0	0	0	0	0	0	3
05:00	0	3	3	0	1	0	0	0	0	0	0	0	0	7
06:00	0	10	9	0	0	0	0	0	0	0	0	0	0	19
07:00	0	36	12	0	6	0	0	0	0	0	0	0	0	54
08:00	0	56	17	0	3	0	0	0	0	0	0	0	0	76
09:00	1	95	21	0	3	1	0	0	0	0	0	0	0	121
10:00	3	96	21	0	6	0	0	0	0	0	0	0	0	126
11:00	5	80	19	0	2	0	0	0	0	0	0	0	0	106
12 PM	3	120	14	0	3	1	0	0	0	0	0	0	0	141
13:00	8	89	23	0	2	0	0	0	0	0	0	0	0	122
14:00	3	96	15	0	2	0	0	0	0	0	0	0	0	116
15:00	3	98	18	0	1	0	0	0	0	0	0	0	0	120
16:00	2	93	17	0	4	1	0	2	0	0	0	0	0	119
17:00	0	64	12	0	2	0	0	0	0	0	0	0	0	78
18:00	1	51	8	0	0	0	0	0	0	0	0	0	0	60
19:00	0	24	12	0	1	0	0	0	0	0	0	0	0	37
20:00	0	30	5	0	0	0	0	0	0	0	0	0	0	35
21:00	0	19	5	0	1	0	0	0	0	0	0	0	0	25
22:00	0	19	5	0	0	0	0	0	0	0	0	0	0	24
23:00	0	14	3	0	0	0	0	0	0	0	0	0	0	17
Total	29	1101	242	0	38	3	0	2	0	0	0	0	0	1415
Percent	2.0%	77.8%	17.1%	0.0%	2.7%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	10:00	09:00		07:00	09:00								10:00
Vol.	5	96	21		6	1								126
PM Peak	13:00	12:00	13:00		16:00	12:00		16:00						12:00
Vol.	8	120	23		4	1		2						141

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123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/18/1														
2	0	10	0	0	1	0	0	0	0	0	0	0	0	11
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
06:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
07:00	0	20	6	0	3	0	0	0	0	0	0	0	0	29
08:00	0	51	11	0	0	0	0	0	0	0	0	0	0	62
09:00	1	48	11	0	2	0	0	0	0	0	0	0	0	62
10:00	3	79	18	0	3	0	0	0	0	0	0	0	0	103
11:00	4	78	19	0	1	0	0	0	0	0	0	0	0	102
12 PM	4	95	24	0	6	0	0	0	0	0	0	0	0	129
13:00	5	109	21	0	4	0	0	0	0	0	0	0	0	139
14:00	3	95	19	0	4	0	0	0	0	0	0	0	0	121
15:00	3	92	8	0	2	0	0	0	0	0	0	0	0	105
16:00	1	75	13	0	1	0	0	0	0	0	0	0	0	90
17:00	0	42	9	0	2	0	0	1	0	0	0	0	0	54
18:00	0	47	10	0	1	0	0	0	0	0	0	0	0	58
19:00	0	27	18	0	1	0	0	0	0	0	0	0	0	46
20:00	0	23	2	0	0	0	0	0	0	0	0	0	0	25
21:00	0	8	4	0	0	0	0	0	0	0	0	0	0	12
22:00	0	10	3	0	2	0	0	0	0	0	0	0	0	15
23:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
Total	24	924	201	0	33	0	0	1	0	0	0	0	0	1183
Percent	2.0%	78.1%	17.0%	0.0%	2.8%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	10:00	11:00		07:00									10:00
Vol.	4	79	19		3									103
PM Peak	13:00	13:00	12:00		12:00			17:00						13:00
Vol.	5	109	24		6			1						139

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123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/1														
2	0	3	2	0	0	0	0	0	0	0	0	0	0	5
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	4	0	0	1	0	0	0	0	0	0	0	0	5
05:00	0	18	5	0	2	0	0	0	0	0	0	0	0	25
06:00	0	101	30	0	11	0	0	0	0	0	0	0	0	142
07:00	1	305	47	4	13	0	0	0	0	0	0	0	0	370
08:00	0	291	58	4	12	2	0	0	3	0	0	0	0	370
09:00	4	155	38	1	12	0	0	4	1	0	0	0	0	215
10:00	3	70	17	0	2	0	0	1	0	0	0	0	0	93
11:00	0	56	18	0	6	0	0	0	0	0	0	0	0	80
12 PM	1	86	16	0	5	0	0	1	0	0	0	0	0	109
13:00	2	90	25	2	9	1	0	1	0	0	0	0	0	130
14:00	0	82	32	2	5	0	0	0	0	0	0	0	0	121
15:00	1	90	34	4	8	0	0	2	0	0	0	0	0	139
16:00	2	103	26	1	1	0	0	0	0	0	0	0	0	133
17:00	0	110	21	1	0	0	0	0	0	0	0	0	0	132
18:00	1	90	16	0	3	0	0	0	0	0	0	0	0	110
19:00	0	47	3	0	2	0	0	0	0	0	0	0	0	52
20:00	0	20	4	0	0	0	0	0	0	0	0	0	0	24
21:00	0	12	8	0	1	0	0	0	0	0	0	0	0	21
22:00	0	15	1	0	1	0	0	0	0	0	0	0	0	17
23:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
Total	15	1759	401	19	94	3	0	9	4	0	0	0	0	2304
Percent	0.7%	76.3%	17.4%	0.8%	4.1%	0.1%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	08:00	07:00	07:00	08:00		09:00	08:00					07:00
Vol.	4	305	58	4	13	2		4	3					370
PM Peak	13:00	17:00	15:00	15:00	13:00	13:00		15:00						15:00
Vol.	2	110	34	4	9	1		2						139
Total		10931	2435	91	479	23	3	43	8	0	0	0	0	14123

Old Bedford Road
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/13/1														
2	0	1	1	0	0	0	0	0	0	0	0	0	0	2
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
05:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
06:00	0	24	5	1	1	0	0	0	0	0	0	0	0	31
07:00	0	107	20	1	2	0	0	1	0	0	0	0	0	131
08:00	0	156	32	0	2	0	0	0	0	0	0	0	0	190
09:00	1	83	18	0	2	0	0	0	0	0	0	0	0	104
10:00	0	62	24	0	5	1	0	1	0	0	0	0	0	93
11:00	0	103	26	0	1	0	0	1	0	0	0	0	0	131
12 PM	0	89	19	1	2	0	0	0	0	0	0	0	0	111
13:00	0	87	16	1	3	0	0	0	0	0	0	0	0	107
14:00	0	105	26	1	5	0	0	0	0	0	0	0	0	137
15:00	0	231	51	0	4	0	0	1	0	0	0	0	0	287
16:00	0	374	60	1	6	0	0	2	0	0	0	0	0	443
17:00	2	426	54	1	3	0	0	0	0	0	0	0	0	486
18:00	0	204	36	0	3	0	0	0	0	0	0	0	0	243
19:00	0	90	11	0	0	0	0	0	0	0	0	0	0	101
20:00	0	55	8	0	0	0	0	0	0	0	0	0	0	63
21:00	0	42	7	0	0	0	0	0	0	0	0	0	0	49
22:00	0	26	3	0	0	0	0	0	0	0	0	0	0	29
23:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
Total	3	2282	420	7	39	1	0	6	0	0	0	0	0	2758
Percent	0.1%	82.7%	15.2%	0.3%	1.4%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	08:00	06:00	10:00	10:00		07:00						08:00
Vol.	1	156	32	1	5	1		1						190
PM Peak	17:00	17:00	16:00	12:00	16:00			16:00						17:00
Vol.	2	426	60	1	6			2						486

Old Bedford Road
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123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/14/1														
2	0	3	1	0	0	0	0	0	0	0	0	0	0	4
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
05:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
06:00	0	31	6	1	1	0	0	0	0	0	0	0	0	39
07:00	0	97	22	1	2	1	0	0	1	0	0	0	0	124
08:00	0	159	38	3	5	0	0	0	0	0	0	0	0	205
09:00	0	86	32	1	3	0	0	0	2	0	0	0	0	124
10:00	0	65	18	0	3	2	0	0	0	0	0	0	0	88
11:00	2	97	21	1	4	1	0	0	0	0	0	0	0	126
12 PM	0	124	18	1	5	0	0	2	0	0	0	0	0	150
13:00	1	91	20	0	3	0	0	0	0	0	0	0	0	115
14:00	0	121	26	2	2	0	0	1	0	0	0	0	0	152
15:00	1	231	52	1	7	0	0	0	0	0	0	0	0	292
16:00	0	391	64	1	1	0	0	1	0	0	0	0	0	458
17:00	7	428	68	1	3	1	0	2	0	0	0	0	0	510
18:00	2	216	26	0	4	0	0	0	0	0	0	0	0	248
19:00	0	74	13	0	0	0	0	0	0	0	0	0	0	87
20:00	0	56	5	0	0	0	0	0	0	0	0	0	0	61
21:00	0	61	5	0	0	0	0	0	0	0	0	0	0	66
22:00	0	34	6	0	0	0	0	0	0	0	0	0	0	40
23:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
Total	13	2385	447	13	43	5	0	6	3	0	0	0	0	2915
Percent	0.4%	81.8%	15.3%	0.4%	1.5%	0.2%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	08:00	08:00	08:00	08:00	10:00			09:00					08:00
Vol.	2	159	38	3	5	2			2					205
PM Peak	17:00	17:00	17:00	14:00	15:00	17:00		12:00						17:00
Vol.	7	428	68	2	7	1		2						510

Old Bedford Road
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123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/15/1														
2	0	7	0	0	1	0	0	0	0	0	0	0	0	8
01:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
04:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
05:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
06:00	0	29	4	1	1	0	0	0	1	0	0	0	0	36
07:00	0	101	19	0	1	0	0	0	0	0	0	0	0	121
08:00	1	139	27	3	7	2	0	1	0	0	0	0	0	180
09:00	0	66	22	0	1	1	0	0	0	0	0	0	0	90
10:00	0	69	14	0	1	1	0	0	0	0	0	0	0	85
11:00	0	105	21	0	5	0	0	0	0	0	0	0	0	131
12 PM	0	134	19	1	1	0	0	0	0	0	0	0	0	155
13:00	0	88	9	2	3	0	0	1	0	0	0	0	0	103
14:00	0	164	32	2	3	0	0	1	0	0	0	0	0	202
15:00	1	243	48	3	4	0	0	3	0	0	0	0	0	302
16:00	1	391	72	0	6	2	0	0	0	0	0	0	0	472
17:00	8	425	69	1	6	0	0	1	0	0	0	0	0	510
18:00	4	246	26	0	0	0	0	1	0	0	0	0	0	277
19:00	0	101	7	0	1	0	0	0	0	0	0	0	0	109
20:00	0	73	5	0	2	0	0	0	0	0	0	0	0	80
21:00	0	38	5	0	1	0	0	0	0	0	0	0	0	44
22:00	0	31	3	0	1	0	0	0	0	0	0	0	0	35
23:00	0	20	4	0	1	0	0	0	0	0	0	0	0	25
Total	15	2485	410	13	46	6	0	8	1	0	0	0	0	2984
Percent	0.5%	83.3%	13.7%	0.4%	1.5%	0.2%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00		08:00	06:00					08:00
Vol.	1	139	27	3	7	2		1	1					180
PM Peak	17:00	17:00	16:00	15:00	16:00	16:00		15:00						17:00
Vol.	8	425	72	3	6	2		3						510

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

NB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/16/1														
2	0	10	0	0	0	0	0	0	0	0	0	0	0	10
01:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	5	3	0	0	0	0	0	0	0	0	0	0	8
05:00	0	5	3	0	0	0	0	0	0	0	0	0	0	8
06:00	0	29	3	1	0	1	0	0	1	0	0	0	0	35
07:00	0	97	21	2	1	1	0	0	0	0	0	0	0	122
08:00	1	146	29	1	3	0	0	0	0	0	0	0	0	180
09:00	0	73	23	2	3	0	0	0	0	0	0	0	0	101
10:00	1	82	12	1	1	1	0	1	1	0	0	0	0	100
11:00	0	104	17	1	3	1	0	0	0	0	0	0	0	126
12 PM	1	126	30	0	2	1	0	0	0	0	0	0	0	160
13:00	2	114	21	0	5	0	0	1	0	0	0	0	0	143
14:00	1	143	33	1	7	1	0	1	0	0	0	0	0	187
15:00	0	252	73	2	2	0	0	0	0	0	0	0	0	329
16:00	0	359	66	0	8	0	0	2	1	0	0	0	0	436
17:00	2	331	55	0	3	0	0	1	0	0	0	0	0	392
18:00	0	209	28	0	1	1	0	0	0	0	0	0	0	239
19:00	0	57	8	0	1	0	0	0	0	0	0	0	0	66
20:00	0	36	6	0	0	0	0	0	0	0	0	0	0	42
21:00	0	40	3	0	1	0	0	0	0	0	0	0	0	44
22:00	0	45	4	0	0	0	0	0	0	0	0	0	0	49
23:00	0	18	1	0	0	0	0	0	0	0	0	0	0	19
Total	8	2285	440	11	41	7	0	6	3	0	0	0	0	2801
Percent	0.3%	81.6%	15.7%	0.4%	1.5%	0.2%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	07:00	08:00	06:00		10:00	06:00					08:00
Vol.	1	146	29	2	3	1		1	1					180
PM Peak	13:00	16:00	15:00	15:00	16:00	12:00		16:00	16:00					16:00
Vol.	2	359	73	2	8	1		2	1					436

Old Bedford Road
south of Bedford Street (Route 62)
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P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/17/1														
2	0	13	0	0	0	0	0	0	0	0	0	0	0	13
01:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
02:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
06:00	0	12	3	0	0	0	0	0	0	0	0	0	0	15
07:00	0	15	3	1	0	0	0	1	0	0	0	0	0	20
08:00	1	39	9	2	1	1	0	0	0	0	0	0	0	53
09:00	1	77	15	0	3	0	0	0	0	0	0	0	0	96
10:00	2	115	16	0	3	0	0	0	0	0	0	0	0	136
11:00	5	107	24	0	3	0	0	0	0	0	0	0	0	139
12 PM	5	153	22	0	4	0	0	0	0	0	0	0	0	184
13:00	2	112	30	0	3	0	0	1	0	0	0	0	0	148
14:00	0	112	22	0	2	0	0	2	0	0	0	0	0	138
15:00	0	120	32	0	3	0	0	0	0	0	0	0	0	155
16:00	3	94	19	0	1	0	0	0	0	0	0	0	0	117
17:00	0	82	16	0	2	0	0	1	1	0	0	0	0	102
18:00	0	75	13	0	0	0	0	0	0	0	0	0	0	88
19:00	0	45	7	0	0	0	0	0	0	0	0	0	0	52
20:00	0	28	8	0	0	0	0	0	0	0	0	0	0	36
21:00	0	28	3	0	1	0	0	0	0	0	0	0	0	32
22:00	0	39	2	0	0	0	0	0	0	0	0	0	0	41
23:00	0	32	3	0	0	0	0	0	0	0	0	0	0	35
Total	19	1311	249	3	26	1	0	5	1	0	0	0	0	1615
Percent	1.2%	81.2%	15.4%	0.2%	1.6%	0.1%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	10:00	11:00	08:00	09:00	08:00		07:00						11:00
Vol.	5	115	24	2	3	1		1						139
PM Peak	12:00	12:00	15:00		12:00			14:00	17:00					12:00
Vol.	5	153	32		4			2	1					184

PRECISION
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Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 D Class
Site Code: TBA

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/18/1														
2	0	8	0	0	1	0	0	0	0	0	0	0	0	9
01:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
02:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
05:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
06:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
07:00	0	18	7	0	2	0	0	0	0	0	0	0	0	27
08:00	0	32	11	0	0	0	0	1	0	0	0	0	0	44
09:00	0	55	8	0	1	0	0	0	0	0	0	0	0	64
10:00	3	67	16	0	0	0	0	0	0	0	0	0	0	86
11:00	1	92	9	0	0	0	0	0	0	0	0	0	0	102
12 PM	3	124	18	1	0	0	0	0	0	0	0	0	0	146
13:00	1	113	15	0	0	0	0	0	0	0	0	0	0	129
14:00	4	105	24	0	0	0	0	0	0	0	0	0	0	133
15:00	0	107	17	0	0	0	0	0	0	0	0	0	0	124
16:00	0	118	13	0	2	0	0	0	0	0	0	0	0	133
17:00	0	72	20	0	2	0	0	0	0	0	0	0	0	94
18:00	0	41	9	0	1	0	0	0	0	0	0	0	0	51
19:00	0	31	3	0	0	0	0	0	0	0	0	0	0	34
20:00	0	40	8	0	0	0	0	0	0	0	0	0	0	48
21:00	0	21	2	0	0	0	0	0	0	0	0	0	0	23
22:00	0	7	2	0	0	0	0	0	0	0	0	0	0	9
23:00	0	12	3	0	0	0	0	0	0	0	0	0	0	15
Total	12	1085	187	1	9	0	0	1	0	0	0	0	0	1295
Percent	0.9%	83.8%	14.4%	0.1%	0.7%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	10:00		07:00			08:00						11:00
Vol.	3	92	16		2			1						102
PM Peak	14:00	12:00	14:00	12:00	16:00									12:00
Vol.	4	124	24	1	2									146

Old Bedford Road
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123082 D Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/1														
2	0	3	0	0	1	0	0	0	0	0	0	0	0	4
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
06:00	2	23	3	0	2	0	0	0	0	0	0	0	0	30
07:00	2	95	22	1	1	0	0	0	0	0	0	0	0	121
08:00	0	143	37	2	1	0	0	0	0	0	0	0	0	183
09:00	0	72	21	1	1	0	0	0	2	0	0	0	0	97
10:00	0	73	16	0	5	1	0	0	1	0	0	0	0	96
11:00	0	91	20	1	3	0	0	0	0	0	0	0	0	115
12 PM	1	112	28	0	2	2	0	0	0	0	0	0	0	145
13:00	1	106	27	0	6	0	0	0	0	0	0	0	0	140
14:00	0	115	32	2	3	1	0	1	0	0	0	0	0	154
15:00	0	222	54	1	8	0	0	1	0	0	0	0	0	286
16:00	1	360	57	0	2	2	0	2	1	0	0	0	0	425
17:00	3	400	73	2	3	0	0	2	0	0	0	0	0	483
18:00	0	200	25	1	2	0	0	0	0	0	0	0	0	228
19:00	0	78	8	0	0	0	0	0	0	0	0	0	0	86
20:00	0	52	7	0	1	1	0	0	0	0	0	0	0	61
21:00	0	33	4	0	0	0	0	0	0	0	0	0	0	37
22:00	0	19	4	0	0	0	0	0	0	0	0	0	0	23
23:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
Total	10	2216	442	11	41	7	0	6	4	0	0	0	0	2737
Percent	0.4%	81.0%	16.1%	0.4%	1.5%	0.3%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	08:00	08:00	10:00	10:00			09:00					08:00
Vol.	2	143	37	2	5	1			2					183
PM Peak	17:00	17:00	17:00	14:00	15:00	12:00		16:00	16:00					17:00
Vol.	3	400	73	2	8	2		2	1					483
Total		14049	2595	59	245	27	0	38	12	0	0	0	0	17105

PRECISION
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Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 D Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/13/1																
2	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
01:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	*	32
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1	*	42
04:00	0	0	0	0	3	1	0	0	0	0	0	0	0	4	32	33
05:00	0	0	0	3	8	12	3	0	0	0	0	0	0	26	38	35
06:00	0	0	0	6	61	52	12	1	0	0	0	0	0	132	38	35
07:00	0	**1**	**9**	11	**134**	**182**	**28**	1	**1**	0	0	0	0	**367**	38	35
08:00	0	0	6	**21**	121	141	26	1	1	0	0	0	0	317	38	35
09:00	0	0	0	6	72	112	23	**2**	0	0	0	0	0	215	39	36
10:00	0	0	0	3	40	33	14	1	0	0	0	0	0	91	39	35
11:00	0	0	**2**	6	34	25	5	1	0	0	0	0	0	73	38	34
12 PM	0	**1**	0	**10**	37	**44**	10	0	0	0	0	0	0	102	38	34
13:00	**1**	0	0	9	26	44	10	0	0	0	0	0	0	90	39	35
14:00	0	0	2	10	**41**	44	**13**	**2**	0	0	0	0	0	**112**	39	35
15:00	0	0	**5**	15	41	**63**	8	**5**	0	0	0	0	0	137	38	35
16:00	0	0	0	13	68	52	**9**	1	0	0	0	0	0	**143**	38	34
17:00	**1**	0	3	**22**	**73**	39	5	0	0	0	0	0	0	143	36	32
18:00	0	0	1	22	49	31	6	0	0	0	0	0	0	109	37	33
19:00	0	0	0	8	33	19	4	0	**1**	0	0	0	0	65	37	34
20:00	0	0	1	4	15	11	1	0	0	0	0	0	0	32	37	33
21:00	0	0	0	5	12	8	2	0	0	0	0	0	0	27	37	33
22:00	0	0	1	2	4	3	2	0	0	0	0	0	0	12	37	33
23:00	0	0	0	1	2	3	1	0	0	0	0	0	0	7	37	35
%	0.1%	0.1%	1.4%	8.0%	39.7%	41.6%	8.3%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak		07:00	07:00	08:00	07:00	07:00	07:00	09:00	07:00					07:00		
Vol.		1	9	21	134	182	28	2	1					367		
Midday Peak	13:00	12:00	11:00	12:00	14:00	12:00	14:00	14:00						14:00		
Vol.	1	1	2	10	41	44	13	2						112		
PM Peak	17:00		15:00	17:00	17:00	15:00	16:00	15:00	19:00					16:00		
Vol.	1		5	22	73	63	9	5	1					143		

% iles

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

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 1623
Percent in Pace : 73.5%
Number of Vehicles > 35 MPH : 934
Percent of Vehicles > 35 MPH : 42.3%
Mean Speed(Average) : 34 MPH

PRECISION
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City, State: Concord, MA
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123082 D Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/14/1																
2	0	0	0	1	1	2	0	0	0	0	0	0	0	4	*	33
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
03:00	0	0	0	0	1	0	1	0	0	0	0	0	0	2	*	37
04:00	0	0	0	0	2	4	0	0	0	0	0	0	0	6	37	35
05:00	0	1	1	1	11	10	1	0	0	0	0	0	0	25	37	33
06:00	**1**	**2**	**3**	9	53	56	16	4	**1**	0	0	0	0	145	39	34
07:00	1	1	0	15	**142**	**191**	**43**	**7**	1	**1**	0	0	0	**402**	39	35
08:00	0	1	2	**18**	123	167	43	3	1	0	0	0	0	358	39	35
09:00	0	1	1	9	40	111	19	2	1	0	0	0	0	184	39	36
10:00	0	2	1	9	38	38	15	3	0	0	0	0	0	106	39	35
11:00	**1**	0	0	7	38	44	11	1	0	0	0	0	0	102	39	35
12 PM	0	**3**	1	3	28	51	**28**	0	0	0	0	0	0	114	40	36
13:00	0	0	**3**	**10**	28	**56**	17	**4**	0	0	0	0	0	118	40	36
14:00	0	0	1	8	**53**	56	11	0	0	0	0	0	0	**129**	38	35
15:00	0	0	3	12	56	52	**19**	**1**	0	0	0	0	0	143	39	35
16:00	**1**	0	0	15	49	**57**	15	1	0	0	0	0	0	138	38	34
17:00	0	0	**7**	**24**	**74**	38	3	0	**1**	0	**1**	0	0	**148**	36	33
18:00	0	0	0	9	65	44	13	1	0	0	0	0	0	132	38	34
19:00	1	0	0	4	20	21	6	1	0	0	0	0	0	53	39	34
20:00	0	0	0	2	18	13	2	0	0	0	0	0	0	35	37	34
21:00	0	0	0	2	8	8	3	1	0	0	0	0	0	22	39	35
22:00	0	0	0	0	5	7	2	1	0	0	0	0	0	15	39	37
23:00	0	0	0	0	2	3	3	0	0	0	0	0	0	8	40	38
%	0.2%	0.5%	1.0%	6.6%	35.8%	43.1%	11.3%	1.3%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	06:00	06:00	08:00	07:00	07:00	07:00	07:00	06:00	07:00				07:00		
Vol.	1	2	3	18	142	191	43	7	1	1				402		
Midday Peak	11:00	12:00	13:00	13:00	14:00	13:00	12:00	13:00						14:00		
Vol.	1	3	3	10	53	56	28	4						129		
PM Peak	16:00		17:00	17:00	17:00	16:00	15:00	15:00	17:00		17:00			17:00		
Vol.	1		7	24	74	57	19	1	1		1			148		

% iles	
15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	39 MPH
95th Percentile :	42 MPH

Stats	
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1704
Percent in Pace :	71.3%
Number of Vehicles > 35 MPH :	1121
Percent of Vehicles > 35 MPH :	46.9%
Mean Speed(Average) :	35 MPH

PRECISION
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123082 D Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/15/1																
2	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	4	0	2	0	0	0	0	0	0	6	32	35
05:00	0	0	0	0	8	8	3	0	1	0	0	0	0	20	39	36
06:00	0	0	1	8	46	80	16	2	0	0	0	0	0	153	39	36
07:00	**1**	0	0	**17**	**127**	**202**	**41**	**3**	**2**	0	0	0	0	**393**	39	36
08:00	1	0	**10**	16	124	163	41	3	1	0	0	0	0	359	39	35
09:00	0	**1**	1	10	50	98	26	1	0	0	0	0	0	187	39	36
10:00	0	0	1	5	32	46	13	4	0	0	0	0	0	101	40	36
11:00	0	1	0	3	35	44	8	**2**	**1**	0	0	0	0	94	38	35
12 PM	**1**	1	3	**11**	**51**	52	**16**	1	0	0	0	0	0	**136**	39	34
13:00	0	1	**4**	6	32	**56**	10	1	1	0	0	0	0	111	39	35
14:00	0	**2**	0	6	36	43	16	0	0	0	0	0	0	103	39	35
15:00	0	0	2	16	48	**73**	**15**	**4**	0	0	0	0	0	158	39	35
16:00	0	0	2	16	59	49	6	1	0	0	0	0	0	133	37	34
17:00	0	**1**	**5**	**25**	**87**	50	5	0	0	0	0	0	0	**173**	36	33
18:00	0	1	2	22	62	44	8	1	0	0	0	0	0	140	37	33
19:00	0	0	0	4	21	29	9	0	**1**	0	0	0	0	64	39	36
20:00	0	1	0	3	16	13	1	0	0	0	0	0	0	34	37	33
21:00	0	0	0	6	7	12	1	1	0	0	0	0	0	27	38	34
22:00	0	0	1	0	4	6	4	0	0	0	0	0	0	15	41	36
23:00	0	0	0	1	4	2	1	1	0	0	0	0	0	9	34	35
%	0.1%	0.4%	1.3%	7.2%	35.3%	44.3%	10.0%	1.0%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	09:00	08:00	07:00	07:00	07:00	07:00	07:00	07:00					07:00		
Vol.	1	1	10	17	127	202	41	3	2					393		
Midday Peak	12:00	14:00	13:00	12:00	12:00	13:00	12:00	11:00	11:00					12:00		
Vol.	1	2	4	11	51	56	16	2	1					136		
PM Peak		17:00	17:00	17:00	17:00	15:00	15:00	15:00	19:00					17:00		
Vol.		1	5	25	87	73	15	4	1					173		

% iles	15th Percentile :	29 MPH
	50th Percentile :	34 MPH
	85th Percentile :	39 MPH
	95th Percentile :	42 MPH

Stats	10 MPH Pace Speed :	30-39 MPH
	Number in Pace :	1740
	Percent in Pace :	71.9%
	Number of Vehicles > 35 MPH :	1120
	Percent of Vehicles > 35 MPH :	46.3%
	Mean Speed(Average) :	35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 D Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/16/1																
2	0	0	0	0	3	1	0	0	0	0	0	0	0	4	32	33
01:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2	*	29
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	1	4	3	1	0	0	0	0	0	0	9	36	34
05:00	0	0	**1**	1	13	12	2	1	0	0	0	0	0	30	37	35
06:00	0	0	0	3	47	74	19	1	**1**	0	0	0	0	145	39	36
07:00	0	0	0	12	**147**	**156**	**40**	**4**	1	0	0	0	0	**360**	39	35
08:00	**3**	**4**	1	**15**	87	143	38	4	0	0	0	0	0	295	39	35
09:00	1	0	1	5	51	72	24	2	0	0	0	0	0	156	39	36
10:00	0	0	1	12	38	49	17	2	0	0	0	0	0	119	39	35
11:00	**1**	2	0	7	30	45	**14**	2	0	0	0	0	0	101	39	35
12 PM	1	**4**	**4**	5	41	39	10	1	0	0	0	0	0	105	38	33
13:00	1	2	1	13	**53**	34	11	**4**	0	0	0	0	0	**119**	38	33
14:00	0	1	3	**18**	33	**51**	6	0	0	0	0	0	0	112	38	34
15:00	**1**	**1**	**3**	11	59	**56**	**15**	**3**	0	0	0	0	0	**149**	39	34
16:00	0	0	3	13	61	49	10	1	0	0	0	0	0	137	38	34
17:00	0	0	2	**16**	**72**	38	13	2	0	0	0	0	0	143	38	34
18:00	1	0	0	9	36	32	11	2	0	0	0	0	0	91	39	34
19:00	0	1	0	3	19	13	3	0	0	0	0	0	0	39	37	33
20:00	1	0	0	6	16	16	1	0	0	0	0	0	0	40	37	32
21:00	0	0	0	5	11	4	3	0	0	0	0	0	0	23	38	33
22:00	0	0	1	0	6	10	3	0	0	0	0	0	0	20	39	36
23:00	0	0	0	0	2	1	0	0	0	0	0	0	0	3	*	34
%	0.5%	0.7%	1.0%	7.1%	37.7%	40.8%	10.9%	1.3%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	05:00	08:00	07:00	07:00	07:00	07:00	06:00					07:00		
Vol.	3	4	1	15	147	156	40	4	1					360		
Midday Peak	11:00	12:00	12:00	14:00	13:00	14:00	11:00	13:00						13:00		
Vol.	1	4	4	18	53	51	14	4						119		
PM Peak	15:00	15:00	15:00	17:00	17:00	15:00	15:00	15:00						15:00		
Vol.	1	1	3	16	72	56	15	3						149		

% iles	
15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	39 MPH
95th Percentile :	42 MPH

Stats	
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1558
Percent in Pace :	70.7%
Number of Vehicles > 35 MPH :	981
Percent of Vehicles > 35 MPH :	44.5%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 D Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/17/1																
2	0	0	0	0	1	3	1	0	0	0	0	0	0	5	37	37
01:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
03:00	0	0	0	0	0	1	1	0	0	0	0	0	0	2	*	39
04:00	0	0	0	0	1	1	1	0	0	0	0	0	0	3	*	37
05:00	0	0	0	0	4	2	0	1	0	0	0	0	0	7	34	36
06:00	0	0	0	1	8	6	3	1	0	0	0	0	0	19	40	36
07:00	0	1	0	5	9	**28**	8	1	**2**	0	0	0	0	54	39	36
08:00	1	1	3	2	24	27	**13**	**5**	0	0	0	0	0	76	41	35
09:00	**3**	**10**	**20**	**41**	**35**	10	2	0	0	0	0	0	0	**121**	33	26
10:00	0	6	22	35	44	17	2	0	0	0	0	0	0	126	34	29
11:00	0	7	**34**	35	27	3	0	0	0	0	0	0	0	106	31	26
12 PM	**3**	**10**	26	**36**	59	6	1	0	0	0	0	0	0	**141**	32	27
13:00	0	8	15	33	51	12	3	0	0	0	0	0	0	122	34	29
14:00	0	2	3	7	**63**	**34**	**6**	**1**	0	0	0	0	0	116	37	33
15:00	**1**	**2**	3	4	**49**	48	**12**	0	**1**	0	0	0	0	**120**	38	34
16:00	0	2	**4**	**14**	33	**55**	8	**3**	0	0	0	0	0	119	38	34
17:00	0	0	1	9	32	28	6	2	0	0	0	0	0	78	38	34
18:00	0	1	1	8	19	22	7	2	0	0	0	0	0	60	39	34
19:00	0	0	0	1	20	12	4	0	0	0	0	0	0	37	38	35
20:00	0	0	1	4	10	15	5	0	0	0	0	0	0	35	39	35
21:00	0	0	2	3	12	6	2	0	0	0	0	0	0	25	37	33
22:00	1	0	0	2	8	8	5	0	0	0	0	0	0	24	40	34
23:00	0	0	1	2	10	4	0	0	0	0	0	0	0	17	35	32
%	0.6%	3.5%	9.6%	17.2%	36.7%	24.6%	6.4%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	09:00	09:00	09:00	07:00	08:00	08:00	07:00					09:00		
Vol.	3	10	20	41	35	28	13	5	2					121		
Midday Peak	12:00	12:00	11:00	12:00	14:00	14:00	14:00	14:00						12:00		
Vol.	3	10	34	36	63	34	6	1						141		
PM Peak	15:00	15:00	16:00	16:00	15:00	16:00	15:00	16:00	15:00					15:00		
Vol.	1	2	4	14	49	55	12	3	1					120		

% iles	
15th Percentile :	23 MPH
50th Percentile :	31 MPH
85th Percentile :	37 MPH
95th Percentile :	41 MPH

Stats	
10 MPH Pace Speed :	28-37 MPH
Number in Pace :	808
Percent in Pace :	57.1%
Number of Vehicles > 35 MPH :	386
Percent of Vehicles > 35 MPH :	27.3%
Mean Speed(Average) :	31 MPH

PRECISION
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Client: Toole Design Group/ C. Fink

123082 D Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/18/1																
2	0	0	0	3	6	1	1	0	0	0	0	0	0	11	33	32
01:00	0	0	0	0	2	2	0	0	0	0	0	0	0	4	*	34
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	1	1	0	0	**1**	0	0	0	3	*	45
04:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
05:00	0	0	0	0	1	0	1	0	0	0	0	0	0	2	*	37
06:00	0	0	0	2	0	4	2	0	0	0	0	0	0	8	39	36
07:00	0	0	**2**	3	7	12	4	**1**	0	0	0	0	0	29	39	35
08:00	0	0	1	2	**19**	**29**	**11**	0	0	0	0	0	0	**62**	40	36
09:00	**1**	**1**	0	**4**	17	28	11	0	0	0	0	0	0	62	40	35
10:00	0	4	0	7	36	45	9	1	1	0	0	0	0	103	38	34
11:00	0	3	**2**	9	32	48	8	0	0	0	0	0	0	102	38	34
12 PM	**1**	**4**	1	7	**54**	50	12	0	0	0	0	0	0	129	38	33
13:00	1	4	2	8	35	**73**	14	**2**	0	0	0	0	0	**139**	39	34
14:00	0	3	0	**11**	39	50	**16**	2	0	0	0	0	0	121	39	35
15:00	**1**	**1**	**3**	**16**	37	**39**	8	0	0	0	0	0	0	**105**	38	33
16:00	0	1	0	7	**48**	22	**11**	1	0	0	0	0	0	90	38	34
17:00	0	1	2	4	27	14	5	1	0	0	0	0	0	54	38	33
18:00	0	0	0	7	27	18	5	1	0	0	0	0	0	58	38	34
19:00	0	0	1	3	8	23	8	**3**	0	0	0	0	0	46	41	37
20:00	0	0	0	2	11	11	0	1	0	0	0	0	0	25	37	34
21:00	0	0	0	1	6	4	0	1	0	0	0	0	0	12	36	35
22:00	0	0	0	1	7	7	0	0	0	0	0	0	0	15	38	34
23:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
%	0.3%	1.9%	1.2%	8.2%	35.5%	40.8%	10.7%	1.2%	0.1%	0.1%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	07:00	09:00	08:00	08:00	08:00	07:00		03:00				08:00		
Vol.	1	1	2	4	19	29	11	1		1				62		
Midday Peak	12:00	12:00	11:00	14:00	12:00	13:00	14:00	13:00						13:00		
Vol.	1	4	2	11	54	73	16	2						139		
PM Peak	15:00	15:00	15:00	15:00	16:00	15:00	16:00	19:00						15:00		
Vol.	1	1	3	16	48	39	11	3						105		

% iles

15th Percentile : 28 MPH
50th Percentile : 34 MPH
85th Percentile : 39 MPH
95th Percentile : 42 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 812
Percent in Pace : 68.6%
Number of Vehicles > 35 MPH : 521
Percent of Vehicles > 35 MPH : 44.0%
Mean Speed(Average) : 34 MPH

PRECISION
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123082 D Speed
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/19/1																
2	0	0	0	0	3	2	0	0	0	0	0	0	0	5	33	34
01:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
04:00	0	0	0	1	2	1	1	0	0	0	0	0	0	5	*	34
05:00	0	0	1	0	8	14	2	0	0	0	0	0	0	25	38	35
06:00	0	0	1	8	54	62	15	2	0	0	0	0	0	142	39	35
07:00	0	0	**5**	**22**	131	160	**49**	2	**1**	0	0	0	0	**370**	39	35
08:00	0	**2**	2	14	**138**	**174**	36	**3**	1	0	0	0	0	370	39	35
09:00	**1**	2	0	12	54	109	36	1	0	0	0	0	0	215	40	36
10:00	1	2	1	10	25	38	14	1	1	0	0	0	0	93	39	34
11:00	0	0	0	4	28	37	11	0	0	0	0	0	0	80	39	35
12 PM	0	**1**	0	**9**	45	44	9	**1**	0	0	0	0	0	109	38	34
13:00	0	1	**2**	8	**57**	47	15	0	0	0	0	0	0	**130**	38	34
14:00	0	0	0	7	34	**61**	**17**	0	**1**	0	0	**1**	0	121	39	36
15:00	0	**1**	1	12	61	51	**12**	1	0	0	0	0	0	**139**	38	34
16:00	0	0	**2**	10	54	**60**	6	1	0	0	0	0	0	133	38	34
17:00	0	0	0	**28**	**63**	33	6	1	**1**	0	0	0	0	132	36	33
18:00	**1**	1	0	13	44	44	4	**3**	0	0	0	0	0	110	38	34
19:00	0	0	0	2	17	29	4	0	0	0	0	0	0	52	38	35
20:00	0	0	0	2	13	4	4	0	1	0	0	0	0	24	39	35
21:00	0	0	0	2	12	5	2	0	0	0	0	0	0	21	38	34
22:00	0	0	0	2	6	5	4	0	0	0	0	0	0	17	40	35
23:00	1	0	1	0	3	1	2	0	0	0	0	0	0	8	31	29
%	0.2%	0.4%	0.7%	7.2%	37.0%	42.6%	10.8%	0.7%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	08:00	07:00	07:00	08:00	08:00	07:00	08:00	07:00					07:00		
Vol.	1	2	5	22	138	174	49	3	1					370		
Midday Peak		12:00	13:00	12:00	13:00	14:00	14:00	12:00	14:00			14:00		13:00		
Vol.		1	2	9	57	61	17	1	1			1		130		
PM Peak	18:00	15:00	16:00	17:00	17:00	16:00	15:00	18:00	17:00					15:00		
Vol.	1	1	2	28	63	60	12	3	1					139		

% iles	
15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	39 MPH
95th Percentile :	42 MPH

Stats	
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1659
Percent in Pace :	72.0%
Number of Vehicles > 35 MPH :	1049
Percent of Vehicles > 35 MPH :	45.5%
Mean Speed(Average) :	35 MPH

PRECISION
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City, State: Concord, MA
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123082 D Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/13/1																
2	0	0	0	0	0	2	0	0	0	0	0	0	0	2	*	37
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	1	0	2	2	1	0	0	0	0	0	6	*	39
05:00	0	0	0	1	1	3	1	0	0	0	0	0	0	6	37	35
06:00	0	0	**2**	**5**	11	13	0	0	0	0	0	0	0	31	37	33
07:00	**2**	0	2	4	53	60	8	**2**	0	0	0	0	0	131	38	34
08:00	0	0	0	4	**70**	**91**	**23**	2	0	0	0	0	0	**190**	39	36
09:00	0	0	0	3	34	54	12	1	0	0	0	0	0	104	39	36
10:00	0	0	5	9	26	39	14	0	0	0	0	0	0	93	39	35
11:00	0	0	**2**	4	50	54	**18**	**3**	0	0	0	0	0	131	39	35
12 PM	0	0	0	1	44	51	12	3	0	0	0	0	0	111	39	36
13:00	0	0	1	**7**	40	46	10	2	**1**	0	0	0	0	107	38	35
14:00	0	0	1	4	**55**	**64**	11	2	0	0	0	0	0	**137**	38	35
15:00	0	0	3	24	95	**132**	**31**	2	0	0	0	0	0	287	39	35
16:00	0	0	10	99	**220**	108	6	0	0	0	0	0	0	443	36	32
17:00	**6**	**14**	**50**	**138**	215	59	4	0	0	0	0	0	0	**486**	34	29
18:00	0	0	1	37	139	59	7	0	0	0	0	0	0	243	36	33
19:00	0	0	0	11	46	29	15	0	0	0	0	0	0	101	39	34
20:00	0	0	0	7	23	25	5	**3**	0	0	0	0	0	63	39	35
21:00	0	0	0	5	15	24	3	2	0	0	0	0	0	49	38	35
22:00	0	0	0	2	9	14	3	1	0	0	0	0	0	29	38	36
23:00	0	0	0	2	3	3	0	0	0	0	0	0	0	8	35	33
%	0.3%	0.5%	2.8%	13.3%	41.7%	33.8%	6.7%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00		06:00	06:00	08:00	08:00	08:00	07:00						08:00		
Vol.	2		2	5	70	91	23	2						190		
Midday Peak			11:00	13:00	14:00	14:00	11:00	11:00	13:00					14:00		
Vol.			2	7	55	64	18	3	1					137		
PM Peak	17:00	17:00	17:00	17:00	16:00	15:00	15:00	20:00						17:00		
Vol.	6	14	50	138	220	132	31	3						486		

% iles	
15th Percentile :	27 MPH
50th Percentile :	32 MPH
85th Percentile :	38 MPH
95th Percentile :	40 MPH

Stats	
10 MPH Pace Speed :	29-38 MPH
Number in Pace :	1898
Percent in Pace :	68.8%
Number of Vehicles > 35 MPH :	960
Percent of Vehicles > 35 MPH :	34.8%
Mean Speed(Average) :	33 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 D Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/14/1																
2	0	0	0	0	3	1	0	0	0	0	0	0	0	4	32	33
01:00	0	0	0	0	0	1	1	0	0	0	0	0	0	2	*	39
02:00	0	0	0	0	1	0	1	0	0	0	0	0	0	2	*	37
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	1	3	0	**1**	0	0	0	0	0	5	36	38
05:00	0	0	0	1	3	2	0	0	0	0	0	0	0	6	33	33
06:00	0	**1**	1	5	9	20	2	1	0	0	0	0	0	39	38	34
07:00	0	0	0	**7**	44	58	15	0	0	0	0	0	0	124	39	35
08:00	0	0	**3**	7	**71**	**108**	**16**	0	0	0	0	0	0	**205**	38	35
09:00	0	0	1	4	51	58	8	1	**1**	0	0	0	0	124	38	35
10:00	0	0	0	4	17	54	13	0	0	0	0	0	0	88	39	36
11:00	**1**	**2**	0	4	47	58	13	1	0	0	0	0	0	126	39	35
12 PM	0	0	1	**14**	58	**65**	10	**2**	0	0	0	0	0	150	38	34
13:00	0	0	1	3	33	60	**16**	2	0	0	0	0	0	115	39	36
14:00	0	2	**2**	4	**67**	60	14	2	**1**	0	0	0	0	**152**	38	35
15:00	0	2	3	29	127	107	**19**	**4**	**1**	0	0	0	0	292	38	34
16:00	0	0	8	60	229	**143**	17	1	0	0	0	0	0	458	37	33
17:00	**26**	**9**	**57**	**117**	**236**	62	3	0	0	0	0	0	0	**510**	34	28
18:00	0	0	2	39	124	74	9	0	0	0	0	0	0	248	37	33
19:00	0	0	0	13	36	29	9	0	0	0	0	0	0	87	38	34
20:00	0	0	0	6	31	15	7	2	0	0	0	0	0	61	39	34
21:00	1	0	1	4	29	26	4	0	1	0	0	0	0	66	38	34
22:00	0	0	1	5	13	17	4	0	0	0	0	0	0	40	38	34
23:00	0	0	0	2	6	2	0	1	0	0	0	0	0	11	34	33
%	1.0%	0.5%	2.8%	11.3%	42.4%	35.1%	6.2%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak		06:00	08:00	07:00	08:00	08:00	08:00	04:00	09:00					08:00		
Vol.		1	3	7	71	108	16	1	1					205		
Midday Peak	11:00	11:00	14:00	12:00	14:00	12:00	13:00	12:00	14:00					14:00		
Vol.	1	2	2	14	67	65	16	2	1					152		
PM Peak	17:00	17:00	17:00	17:00	17:00	16:00	15:00	15:00	15:00					17:00		
Vol.	26	9	57	117	236	143	19	4	1					510		

% iles	
15th Percentile :	27 MPH
50th Percentile :	33 MPH
85th Percentile :	37 MPH
95th Percentile :	40 MPH

Stats	
10 MPH Pace Speed :	29-38 MPH
Number in Pace :	2031
Percent in Pace :	69.7%
Number of Vehicles > 35 MPH :	1020
Percent of Vehicles > 35 MPH :	35.0%
Mean Speed(Average) :	33 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 D Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/15/1																
2	0	0	0	0	5	3	0	0	0	0	0	0	0	8	35	34
01:00	0	0	0	0	0	4	0	0	0	0	0	0	0	4	37	37
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
03:00	0	0	0	1	1	1	0	0	0	0	0	0	0	3	*	32
04:00	0	0	0	0	0	2	1	0	**1**	0	0	0	0	4	*	42
05:00	0	0	0	2	3	2	0	0	0	0	0	0	0	7	33	32
06:00	0	0	1	6	7	20	2	0	0	0	0	0	0	36	38	34
07:00	0	0	0	6	40	58	16	1	0	0	0	0	0	121	39	36
08:00	**1**	0	**2**	**9**	**58**	**82**	**25**	**2**	1	0	0	0	0	**180**	39	35
09:00	0	0	0	5	30	44	11	0	0	0	0	0	0	90	39	35
10:00	0	2	1	4	31	32	14	1	0	0	0	0	0	85	40	35
11:00	0	0	**3**	2	33	75	16	**2**	0	0	0	0	0	131	39	36
12 PM	0	0	0	10	38	**79**	**26**	2	0	0	0	0	0	155	39	36
13:00	0	0	1	2	25	55	19	1	0	0	0	0	0	103	40	36
14:00	**2**	**3**	2	**19**	**81**	76	17	2	0	0	0	0	0	**202**	38	34
15:00	0	1	3	51	140	92	**13**	**2**	0	0	0	0	0	302	37	33
16:00	0	0	9	105	**247**	**103**	7	1	0	0	0	0	0	472	35	32
17:00	**21**	**15**	**56**	**114**	228	72	4	0	0	0	0	0	0	**510**	34	28
18:00	0	0	5	37	146	81	8	0	0	0	0	0	0	277	36	33
19:00	0	0	0	10	34	53	12	0	0	0	0	0	0	109	38	35
20:00	0	0	1	7	45	21	6	0	0	0	0	0	0	80	37	34
21:00	0	0	0	2	14	21	7	0	0	0	0	0	0	44	39	36
22:00	0	0	0	2	15	14	3	1	0	0	0	0	0	35	38	35
23:00	0	0	1	2	10	9	3	0	0	0	0	0	0	25	38	34
%	0.8%	0.7%	2.8%	13.3%	41.3%	33.5%	7.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00		08:00	08:00	08:00	08:00	08:00	08:00	04:00					08:00		
Vol.	1		2	9	58	82	25	2	1					180		
Midday Peak	14:00	14:00	11:00	14:00	14:00	12:00	12:00	11:00						14:00		
Vol.	2	3	3	19	81	79	26	2						202		
PM Peak	17:00	17:00	17:00	17:00	16:00	16:00	15:00	15:00						17:00		
Vol.	21	15	56	114	247	103	13	2						510		

% iles	
15th Percentile :	27 MPH
50th Percentile :	32 MPH
85th Percentile :	38 MPH
95th Percentile :	40 MPH

Stats	
10 MPH Pace Speed :	29-38 MPH
Number in Pace :	2027
Percent in Pace :	67.9%
Number of Vehicles > 35 MPH :	1026
Percent of Vehicles > 35 MPH :	34.4%
Mean Speed(Average) :	33 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Email: datarequests@pdillc.com

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 D Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/16/1																
2	0	0	0	1	1	4	4	0	0	0	0	0	0	10	41	38
01:00	0	0	0	0	2	0	0	1	0	0	0	0	0	3	*	37
02:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
03:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1	*	42
04:00	0	0	0	1	1	5	0	0	**1**	0	0	0	0	8	38	37
05:00	0	0	0	3	3	2	0	0	0	0	0	0	0	8	32	31
06:00	0	**1**	0	**6**	6	18	4	0	0	0	0	0	0	35	39	34
07:00	0	0	0	2	34	71	13	**2**	0	0	0	0	0	122	39	36
08:00	0	0	0	6	**67**	**80**	**24**	2	1	0	0	0	0	**180**	39	36
09:00	0	0	**2**	5	37	45	11	1	0	0	0	0	0	101	39	35
10:00	1	4	1	3	32	43	15	1	0	0	0	0	0	100	39	34
11:00	0	0	1	5	37	58	23	**2**	0	0	0	0	0	126	40	36
12 PM	0	1	1	**9**	46	**83**	18	2	0	0	0	0	0	160	39	35
13:00	0	2	**3**	5	56	59	16	2	0	0	0	0	0	143	39	35
14:00	0	**3**	2	9	**71**	76	**25**	1	0	0	0	0	0	**187**	39	35
15:00	0	0	5	15	118	**160**	**28**	**3**	0	0	0	0	0	329	38	35
16:00	0	0	3	67	**235**	117	14	0	0	0	0	0	0	**436**	36	33
17:00	**3**	**6**	**14**	**74**	197	90	8	0	0	0	0	0	0	392	36	31
18:00	1	0	2	33	123	74	6	0	0	0	0	0	0	239	36	33
19:00	2	0	0	5	24	28	6	1	0	0	0	0	0	66	38	34
20:00	0	0	0	3	18	18	3	0	0	0	0	0	0	42	37	34
21:00	0	0	1	3	23	15	2	0	0	0	0	0	0	44	36	34
22:00	0	0	0	3	20	24	2	0	0	0	0	0	0	49	37	35
23:00	0	0	0	1	8	8	2	0	0	0	0	0	0	19	38	35
%	0.2%	0.6%	1.2%	9.2%	41.4%	38.5%	8.0%	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak		06:00	09:00	06:00	08:00	08:00	08:00	07:00	04:00					08:00		
Vol.		1	2	6	67	80	24	2	1					180		
Midday Peak		14:00	13:00	12:00	14:00	12:00	14:00	11:00						14:00		
Vol.		3	3	9	71	83	25	2						187		
PM Peak	17:00	17:00	17:00	17:00	16:00	15:00	15:00	15:00						16:00		
Vol.	3	6	14	74	235	160	28	3						436		

% iles	
15th Percentile :	28 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH

Stats	
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	2018
Percent in Pace :	72.0%
Number of Vehicles > 35 MPH :	1106
Percent of Vehicles > 35 MPH :	39.5%
Mean Speed(Average) :	34 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 D Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/17/1																
2	0	0	1	2	7	3	0	0	0	0	0	0	0	13	35	32
01:00	0	0	0	1	3	1	0	1	0	0	0	0	0	6	32	35
02:00	0	**1**	0	0	0	1	2	1	0	0	0	0	0	5	*	35
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	2	0	0	0	0	0	0	0	2	*	37
05:00	0	0	0	0	0	0	2	0	0	0	0	0	0	2	*	42
06:00	0	0	0	1	7	3	4	0	0	0	0	0	0	15	40	35
07:00	0	0	0	2	3	11	2	**2**	0	0	0	0	0	20	38	37
08:00	**1**	0	**2**	4	15	25	**6**	0	0	0	0	0	0	53	39	34
09:00	1	1	0	**18**	**38**	**32**	6	0	0	0	0	0	0	**96**	37	33
10:00	1	1	4	22	54	47	6	1	0	0	0	0	0	136	37	33
11:00	**1**	**7**	**4**	24	60	31	**9**	**3**	0	0	0	0	0	139	37	31
12 PM	0	2	2	**40**	**94**	40	5	0	**1**	0	0	0	0	**184**	36	32
13:00	1	1	3	23	67	45	8	0	0	0	0	0	0	148	37	33
14:00	0	2	2	19	46	**59**	8	2	0	0	0	0	0	138	38	34
15:00	0	0	2	9	**61**	**67**	**16**	0	0	0	0	0	0	**155**	38	35
16:00	0	**3**	2	2	49	43	15	**3**	0	0	0	0	0	117	39	35
17:00	0	0	2	**11**	49	29	10	1	0	0	0	0	0	102	38	34
18:00	0	0	0	4	43	34	6	1	0	0	0	0	0	88	38	35
19:00	0	0	**3**	5	22	18	4	0	0	0	0	0	0	52	37	33
20:00	0	0	1	4	16	9	5	1	0	0	0	0	0	36	39	34
21:00	0	0	0	6	7	14	5	0	0	0	0	0	0	32	39	35
22:00	0	0	0	6	17	15	2	0	**1**	0	0	0	0	41	37	34
23:00	0	0	1	1	14	15	2	1	1	0	0	0	0	35	37	35
%	0.3%	1.1%	1.8%	12.6%	41.6%	33.7%	7.6%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	02:00	08:00	09:00	09:00	09:00	08:00	07:00						09:00		
Vol.	1	1	2	18	38	32	6	2						96		
Midday Peak	11:00	11:00	11:00	12:00	12:00	14:00	11:00	11:00	12:00					12:00		
Vol.	1	7	4	40	94	59	9	3	1					184		
PM Peak		16:00	19:00	17:00	15:00	15:00	15:00	16:00	22:00					15:00		
Vol.		3	3	11	61	67	16	3	1					155		

% iles

15th Percentile :	27 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH

Stats

10 MPH Pace Speed :	29-38 MPH
Number in Pace :	1104
Percent in Pace :	68.4%
Number of Vehicles > 35 MPH :	579
Percent of Vehicles > 35 MPH :	35.8%
Mean Speed(Average) :	33 MPH

PRECISION
D A T A
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Old Bedford Road
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123082 D Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/18/1																
2	0	0	0	0	2	6	1	0	0	0	0	0	0	9	38	36
01:00	0	0	0	1	4	1	0	0	0	0	0	0	0	6	33	32
02:00	0	0	0	1	1	2	0	0	0	0	0	0	0	4	*	33
03:00	0	0	0	0	2	0	0	0	**1**	**1**	0	0	0	4	*	43
04:00	0	0	0	0	0	0	1	1	0	0	0	0	0	2	*	44
05:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
06:00	0	0	0	0	1	4	0	0	1	0	0	0	0	6	37	39
07:00	0	0	**1**	0	10	9	5	**2**	0	0	0	0	0	27	42	36
08:00	0	0	0	1	12	21	**9**	1	0	0	0	0	0	44	40	37
09:00	0	0	1	**2**	**23**	**29**	8	1	0	0	0	0	0	**64**	39	35
10:00	0	2	3	0	14	48	17	2	0	0	0	0	0	86	40	36
11:00	**1**	1	**4**	3	28	51	13	1	0	0	0	0	0	102	39	35
12 PM	0	**2**	2	**9**	38	66	**27**	**2**	0	0	0	0	0	**146**	40	36
13:00	0	2	0	7	36	**71**	12	1	0	0	0	0	0	129	39	35
14:00	1	0	0	9	**41**	65	16	1	0	0	0	0	0	133	39	35
15:00	0	0	0	6	45	58	**14**	1	0	0	0	0	0	124	39	35
16:00	**1**	0	1	7	**55**	**60**	6	**3**	0	0	0	0	0	**133**	38	34
17:00	0	0	**2**	**9**	37	37	9	0	0	0	0	0	0	94	38	34
18:00	0	0	0	6	17	19	8	1	0	0	0	0	0	51	39	35
19:00	1	0	2	1	10	14	6	0	0	0	0	0	0	34	39	34
20:00	0	0	1	3	20	21	3	0	0	0	0	0	0	48	38	34
21:00	1	0	0	1	4	10	4	3	0	0	0	0	0	23	43	36
22:00	0	0	0	1	4	4	0	0	0	0	0	0	0	9	36	34
23:00	0	0	0	0	3	6	4	0	**2**	0	0	0	0	15	41	39
%	0.4%	0.5%	1.3%	5.2%	31.5%	46.6%	12.6%	1.5%	0.3%	0.1%	0.0%	0.0%	0.0%			
AM Peak			07:00	09:00	09:00	09:00	08:00	07:00	03:00	03:00				09:00		
Vol.			1	2	23	29	9	2	1	1				64		
Midday Peak	11:00	12:00	11:00	12:00	14:00	13:00	12:00	12:00						12:00		
Vol.	1	2	4	9	41	71	27	2						146		
PM Peak	16:00		17:00	17:00	16:00	16:00	15:00	16:00	23:00					16:00		
Vol.	1		2	9	55	60	14	3	2					133		

% iles	
15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	39 MPH
95th Percentile :	42 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	926
Percent in Pace :	71.5%
Number of Vehicles > 35 MPH :	659
Percent of Vehicles > 35 MPH :	50.9%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 D Speed
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/19/1																
2	0	0	0	0	1	1	2	0	0	0	0	0	0	4	*	38
01:00	0	0	0	1	0	2	0	0	0	0	0	0	0	3	*	34
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1	*	42
04:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1	*	42
05:00	0	0	0	1	3	3	0	0	0	0	0	0	0	7	35	33
06:00	0	0	**1**	1	8	16	3	1	0	0	0	0	0	30	39	36
07:00	0	0	1	**9**	40	50	20	1	0	0	0	0	0	121	39	35
08:00	0	**1**	1	6	**58**	**86**	**26**	**4**	0	0	0	0	**1**	**183**	40	36
09:00	0	0	0	1	37	44	13	2	0	0	0	0	0	97	39	36
10:00	0	1	1	4	22	51	14	3	0	0	0	0	0	96	39	36
11:00	0	0	1	5	42	54	12	1	0	0	0	0	0	115	39	35
12 PM	**1**	**1**	0	**12**	42	69	**17**	**3**	0	0	0	0	0	145	39	35
13:00	1	0	**4**	11	41	68	15	0	0	0	0	0	0	140	39	35
14:00	0	0	2	6	**53**	**79**	14	0	0	0	0	0	0	**154**	38	35
15:00	0	0	0	8	97	141	**36**	**4**	0	0	0	0	0	286	39	36
16:00	0	0	0	38	218	**152**	16	1	0	0	0	0	0	425	37	34
17:00	**2**	**2**	**20**	**159**	**240**	56	4	0	0	0	0	0	0	**483**	34	30
18:00	1	0	2	18	117	83	6	1	0	0	0	0	0	228	37	33
19:00	0	0	1	9	34	31	9	2	0	0	0	0	0	86	39	35
20:00	1	0	0	3	20	29	8	0	0	0	0	0	0	61	39	35
21:00	0	0	0	7	16	14	0	0	0	0	0	0	0	37	37	33
22:00	0	0	0	5	8	5	4	1	0	0	0	0	0	23	40	34
23:00	0	0	0	3	4	4	0	0	0	0	0	0	0	11	36	32
%	0.2%	0.2%	1.2%	11.2%	40.2%	37.9%	8.1%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		08:00	06:00	07:00	08:00	08:00	08:00	08:00					08:00	08:00		
Vol.		1	1	9	58	86	26	4					1	183		
Midday Peak	12:00	12:00	13:00	12:00	14:00	14:00	12:00	12:00						14:00		
Vol.	1	1	4	12	53	79	17	3						154		
PM Peak	17:00	17:00	17:00	17:00	17:00	16:00	15:00	15:00						17:00		
Vol.	2	2	20	159	240	152	36	4						483		

% iles	
15th Percentile :	28 MPH
50th Percentile :	33 MPH
85th Percentile :	38 MPH
95th Percentile :	41 MPH

Stats	
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1941
Percent in Pace :	70.9%
Number of Vehicles > 35 MPH :	1075
Percent of Vehicles > 35 MPH :	39.3%
Mean Speed(Average) :	34 MPH

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 D Volume
Site Code: TBA

Start	13-Nov-12		14-Nov-12		15-Nov-12		16-Nov-12		17-Nov-12		18-Nov-12		19-Nov-12		Week Average	
Time	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB
12:00 AM	2	2	4	4	2	8	4	10	5	13	11	9	5	4	5	7
01:00	2	0	0	2	0	4	2	3	1	6	4	6	1	3	1	3
02:00	0	0	1	2	1	1	1	1	1	5	0	4	1	0	1	2
03:00	1	0	2	0	0	3	0	1	2	0	3	4	1	1	1	1
04:00	4	6	6	5	6	4	9	8	3	2	1	2	5	1	5	4
05:00	26	6	25	6	20	7	30	8	7	2	2	2	25	7	19	5
06:00	132	31	145	39	153	36	145	35	19	15	8	6	142	30	106	27
07:00	**367**	131	**402**	124	**393**	121	**360**	122	54	20	29	27	**370**	121	**282**	95
08:00	317	**190**	358	**205**	359	**180**	295	**180**	76	53	62	44	370	**183**	262	**148**
09:00	215	104	184	124	187	90	156	101	121	96	62	64	215	97	163	97
10:00	91	93	106	88	101	85	119	100	**126**	136	**103**	86	93	96	106	98
11:00	73	131	102	126	94	131	101	126	106	**139**	102	**102**	80	115	94	124
12:00 PM	102	111	114	150	136	155	105	160	**141**	**184**	129	**146**	109	145	119	150
01:00	90	107	118	115	111	103	119	143	122	148	**139**	129	130	140	118	126
02:00	112	137	129	152	103	202	112	187	116	138	121	133	121	154	116	158
03:00	137	287	143	292	158	302	**149**	329	120	155	105	124	**139**	286	**136**	254
04:00	**143**	443	138	458	133	472	137	**436**	119	117	90	133	133	425	128	355
05:00	143	**486**	**148**	**510**	**173**	**510**	143	392	78	102	54	94	132	**483**	124	**368**
06:00	109	243	132	248	140	277	91	239	60	88	58	51	110	228	100	196
07:00	65	101	53	87	64	109	39	66	37	52	46	34	52	86	51	76
08:00	32	63	35	61	34	80	40	42	35	36	25	48	24	61	32	56
09:00	27	49	22	66	27	44	23	44	25	32	12	23	21	37	22	42
10:00	12	29	15	40	15	35	20	49	24	41	15	9	17	23	17	32
11:00	7	8	8	11	9	25	3	19	17	35	2	15	8	11	8	18
Total	2209	2758	2390	2915	2419	2984	2203	2801	1415	1615	1183	1295	2304	2737	2016	2442
Day	4967		5305		5403		5004		3030		2478		5041		4458	
AM Peak	07:00	08:00	07:00	08:00	07:00	08:00	07:00	08:00	10:00	11:00	10:00	11:00	07:00	08:00	07:00	08:00
Vol.	367	190	402	205	393	180	360	180	126	139	103	102	370	183	282	148
PM Peak	16:00	17:00	17:00	17:00	17:00	17:00	15:00	16:00	12:00	12:00	13:00	12:00	15:00	17:00	15:00	17:00
Vol.	143	486	148	510	173	510	149	436	141	184	139	146	139	483	136	368

Comb. Total	4967	5305	5403	5004	3030	2478	5041	4458

ADT ADT 4,461 AADT 4,461

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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123082 D Volume
Site Code: TBA

Start	SB				NB				Combined				13-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	1		26		1		25		2		51		
12:15	0		26		1		27		1		53		
12:30	0		26		0		35		0		61		
12:45	1	2	24	102	0	2	24	111	1	4	48	213	
01:00	0		25		0		23		0		48		
01:15	0		23		0		30		0		53		
01:30	1		22		0		23		1		45		
01:45	1	2	20	90	0	0	31	107	1	2	51	197	
02:00	0		34		0		29		0		63		
02:15	0		18		0		35		0		53		
02:30	0		31		0		32		0		63		
02:45	0	0	29	112	0	0	41	137	0	0	70	249	
03:00	0		31		0		71		0		102		
03:15	0		29		0		60		0		89		
03:30	0		36		0		74		0		110		
03:45	1	1	41	137	0	0	82	287	1	1	123	424	
04:00	0		39		1		105		1		144		
04:15	1		38		1		89		2		127		
04:30	2		28		1		124		3		152		
04:45	1	4	38	143	3	6	125	443	4	10	163	586	
05:00	1		40		0		120		1		160		
05:15	6		38		2		142		8		180		
05:30	5		36		0		109		5		145		
05:45	14	26	29	143	4	6	115	486	18	32	144	629	
06:00	10		29		4		81		14		110		
06:15	24		30		3		62		27		92		
06:30	42		29		8		61		50		90		
06:45	56	132	21	109	16	31	39	243	72	163	60	352	
07:00	87		22		18		39		105		61		
07:15	82		17		25		21		107		38		
07:30	97		12		40		18		137		30		
07:45	101	367	14	65	48	131	23	101	149	498	37	166	
08:00	76		9		38		17		114		26		
08:15	86		6		53		19		139		25		
08:30	79		10		43		12		122		22		
08:45	76	317	7	32	56	190	15	63	132	507	22	95	
09:00	77		8		38		17		115		25		
09:15	65		8		20		13		85		21		
09:30	47		6		16		11		63		17		
09:45	26	215	5	27	30	104	8	49	56	319	13	76	
10:00	32		2		16		12		48		14		
10:15	25		3		21		4		46		7		
10:30	20		3		18		9		38		12		
10:45	14	91	4	12	38	93	4	29	52	184	8	41	
11:00	14		2		27		2		41		4		
11:15	11		3		30		3		41		6		
11:30	31		1		36		1		67		2		
11:45	17	73	1	7	38	131	2	8	55	204	3	15	
Total	1230		979		694		2064		1924		3043		
Percent	63.9%		32.2%		36.1%		67.8%						
Day Total		2209				2758				4967			
Peak	07:00		03:30		08:00		04:30		07:30		04:30		
Vol.	367		154		190		511		539		655		
P.H.F.	0.908		0.939		0.848		0.900		0.904		0.910		

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 D Volume
Site Code: TBA

Start	SB				NB				Combined				14-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	2		25		2		37		4		62		
12:15	1		24		1		32		2		56		
12:30	0		38		0		47		0		85		
12:45	1	4	27	114	1	4	34	150	2	8	61	264	
01:00	0		28		0		26		0		54		
01:15	0		29		0		30		0		59		
01:30	0		34		1		31		1		65		
01:45	0	0	27	118	1	2	28	115	1	2	55	233	
02:00	0		26		0		28		0		54		
02:15	1		29		1		33		2		62		
02:30	0		31		0		39		0		70		
02:45	0	1	43	129	1	2	52	152	1	3	95	281	
03:00	0		35		0		86		0		121		
03:15	0		43		0		52		0		95		
03:30	0		35		0		68		0		103		
03:45	2	2	30	143	0	0	86	292	2	2	116	435	
04:00	0		36		1		84		1		120		
04:15	1		31		0		107		1		138		
04:30	2		40		3		127		5		167		
04:45	3	6	31	138	1	5	140	458	4	11	171	596	
05:00	0		47		0		140		0		187		
05:15	6		35		3		143		9		178		
05:30	9		32		1		129		10		161		
05:45	10	25	34	148	2	6	98	510	12	31	132	658	
06:00	16		39		7		85		23		124		
06:15	36		33		0		64		36		97		
06:30	27		33		12		52		39		85		
06:45	66	145	27	132	20	39	47	248	86	184	74	380	
07:00	96		20		26		38		122		58		
07:15	93		17		40		21		133		38		
07:30	99		10		26		10		125		20		
07:45	114	402	6	53	32	124	18	87	146	526	24	140	
08:00	95		9		37		17		132		26		
08:15	80		10		63		13		143		23		
08:30	93		12		54		20		147		32		
08:45	90	358	4	35	51	205	11	61	141	563	15	96	
09:00	64		6		38		15		102		21		
09:15	50		8		32		21		82		29		
09:30	41		5		27		15		68		20		
09:45	29	184	3	22	27	124	15	66	56	308	18	88	
10:00	26		2		29		10		55		12		
10:15	32		3		19		10		51		13		
10:30	24		6		21		9		45		15		
10:45	24	106	4	15	19	88	11	40	43	194	15	55	
11:00	22		1		26		5		48		6		
11:15	26		2		33		4		59		6		
11:30	24		3		30		2		54		5		
11:45	30	102	2	8	37	126	0	11	67	228	2	19	
Total	1335		1055		725		2190		2060		3245		
Percent	64.8%		32.5%		35.2%		67.5%						
Day Total		2390				2915				5305			
Peak	07:00		02:45		08:15		04:45		07:45		04:30		
Vol.	402		156		206		552		568		703		
P.H.F.	0.882		0.907		0.817		0.965		0.966		0.940		

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
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INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
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123082 D Volume
Site Code: TBA

Start	SB				NB				Combined				15-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	1		33		3		37		4		70		
12:15	1		36		0		39		1		75		
12:30	0		32		2		40		2		72		
12:45	0	2	35	136	3	8	39	155	3	10	74	291	
01:00	0		25		2		26		2		51		
01:15	0		35		0		25		0		60		
01:30	0		23		0		32		0		55		
01:45	0	0	28	111	2	4	20	103	2	4	48	214	
02:00	1		21		1		37		2		58		
02:15	0		23		0		49		0		72		
02:30	0		35		0		61		0		96		
02:45	0	1	24	103	0	1	55	202	0	2	79	305	
03:00	0		42		1		100		1		142		
03:15	0		37		0		50		0		87		
03:30	0		48		2		71		2		119		
03:45	0	0	31	158	0	3	81	302	0	3	112	460	
04:00	1		28		1		102		2		130		
04:15	2		34		1		123		3		157		
04:30	1		25		1		109		2		134		
04:45	2	6	46	133	1	4	138	472	3	10	184	605	
05:00	1		47		2		127		3		174		
05:15	4		34		1		144		5		178		
05:30	7		48		2		134		9		182		
05:45	8	20	44	173	2	7	105	510	10	27	149	683	
06:00	14		46		3		99		17		145		
06:15	35		44		6		82		41		126		
06:30	37		24		6		68		43		92		
06:45	67	153	26	140	21	36	28	277	88	189	54	417	
07:00	86		30		18		26		104		56		
07:15	103		16		30		36		133		52		
07:30	103		11		37		26		140		37		
07:45	101	393	7	64	36	121	21	109	137	514	28	173	
08:00	77		10		34		23		111		33		
08:15	103		8		61		17		164		25		
08:30	95		7		43		22		138		29		
08:45	84	359	9	34	42	180	18	80	126	539	27	114	
09:00	77		8		29		14		106		22		
09:15	51		11		14		9		65		20		
09:30	41		3		23		10		64		13		
09:45	18	187	5	27	24	90	11	44	42	277	16	71	
10:00	25		4		22		2		47		6		
10:15	26		1		17		6		43		7		
10:30	25		7		19		10		44		17		
10:45	25	101	3	15	27	85	17	35	52	186	20	50	
11:00	22		1		30		12		52		13		
11:15	21		3		37		6		58		9		
11:30	24		3		29		4		53		7		
11:45	27	94	2	9	35	131	3	25	62	225	5	34	
Total	1316		1103		670		2314		1986		3417		
Percent	66.3%		32.3%		33.7%		67.7%						
Day Total		2419				2984				5403			
Peak	07:00		05:30		08:00		04:45		07:30		04:45		
Vol.	393		182		180		543		552		718		
P.H.F.	0.954		0.948		0.738		0.943		0.841		0.976		

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 D Volume
Site Code: TBA

Start	SB				NB				Combined				16-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Fri
12:00	1		20		4		37		5		57		
12:15	1		29		1		42		2		71		
12:30	2		30		1		42		3		72		
12:45	0	4	26	105	4	10	39	160	4	14	65	265	
01:00	0		22		2		40		2		62		
01:15	1		33		0		37		1		70		
01:30	0		39		1		26		1		65		
01:45	1	2	25	119	0	3	40	143	1	5	65	262	
02:00	1		32		1		36		2		68		
02:15	0		30		0		47		0		77		
02:30	0		25		0		42		0		67		
02:45	0	1	25	112	0	1	62	187	0	2	87	299	
03:00	0		34		1		96		1		130		
03:15	0		41		0		80		0		121		
03:30	0		42		0		82		0		124		
03:45	0	0	32	149	0	1	71	329	0	1	103	478	
04:00	1		25		3		98		4		123		
04:15	4		32		1		111		5		143		
04:30	2		43		1		114		3		157		
04:45	2	9	37	137	3	8	113	436	5	17	150	573	
05:00	2		39		1		109		3		148		
05:15	7		34		2		105		9		139		
05:30	6		33		1		99		7		132		
05:45	15	30	37	143	4	8	79	392	19	38	116	535	
06:00	18		36		3		77		21		113		
06:15	25		30		1		65		26		95		
06:30	43		9		8		55		51		64		
06:45	59	145	16	91	23	35	42	239	82	180	58	330	
07:00	85		8		17		24		102		32		
07:15	100		11		35		16		135		27		
07:30	73		10		32		16		105		26		
07:45	102	360	10	39	38	122	10	66	140	482	20	105	
08:00	77		14		34		13		111		27		
08:15	86		11		44		6		130		17		
08:30	71		7		51		15		122		22		
08:45	61	295	8	40	51	180	8	42	112	475	16	82	
09:00	49		7		32		11		81		18		
09:15	47		5		27		8		74		13		
09:30	31		6		21		16		52		22		
09:45	29	156	5	23	21	101	9	44	50	257	14	67	
10:00	30		3		19		13		49		16		
10:15	29		3		24		7		53		10		
10:30	33		10		27		15		60		25		
10:45	27	119	4	20	30	100	14	49	57	219	18	69	
11:00	25		0		23		12		48		12		
11:15	19		2		26		4		45		6		
11:30	26		0		37		2		63		2		
11:45	31	101	1	3	40	126	1	19	71	227	2	22	
Total	1222		981		695		2106		1917		3087		
Percent	63.7%		31.8%		36.3%		68.2%						
Day Total		2203				2801				5004			
Peak	07:00		04:30		08:00		04:15		07:45		04:15		
Vol.	360		153		180		447		503		598		
P.H.F.	0.882		0.890		0.882		0.980		0.898		0.952		

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 D Volume
Site Code: TBA

Start	SB				NB				Combined				17-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sat
12:00	1		30		6		66		7		96		
12:15	1		39		1		31		2		70		
12:30	1		33		3		31		4		64		
12:45	2	5	39	141	3	13	56	184	5	18	95	325	
01:00	1		31		2		38		3		69		
01:15	0		25		3		33		3		58		
01:30	0		29		0		37		0		66		
01:45	0	1	37	122	1	6	40	148	1	7	77	270	
02:00	0		29		1		25		1		54		
02:15	0		32		2		28		2		60		
02:30	0		28		1		40		1		68		
02:45	1	1	27	116	1	5	45	138	2	6	72	254	
03:00	0		24		0		41		0		65		
03:15	0		34		0		41		0		75		
03:30	0		34		0		33		0		67		
03:45	2	2	28	120	0	0	40	155	2	2	68	275	
04:00	1		41		0		26		1		67		
04:15	0		31		1		34		1		65		
04:30	1		17		1		25		2		42		
04:45	1	3	30	119	0	2	32	117	1	5	62	236	
05:00	0		23		0		31		0		54		
05:15	1		20		0		24		1		44		
05:30	4		20		1		23		5		43		
05:45	2	7	15	78	1	2	24	102	3	9	39	180	
06:00	3		19		1		27		4		46		
06:15	4		14		2		21		6		35		
06:30	5		12		3		22		8		34		
06:45	7	19	15	60	9	15	18	88	16	34	33	148	
07:00	9		11		4		15		13		26		
07:15	13		12		2		16		15		28		
07:30	17		5		5		12		22		17		
07:45	15	54	9	37	9	20	9	52	24	74	18	89	
08:00	18		11		12		14		30		25		
08:15	17		8		10		10		27		18		
08:30	15		7		15		2		30		9		
08:45	26	76	9	35	16	53	10	36	42	129	19	71	
09:00	22		6		20		10		42		16		
09:15	21		9		27		8		48		17		
09:30	37		5		25		6		62		11		
09:45	41	121	5	25	24	96	8	32	65	217	13	57	
10:00	33		8		17		8		50		16		
10:15	24		3		32		9		56		12		
10:30	36		10		42		12		78		22		
10:45	33	126	3	24	45	136	12	41	78	262	15	65	
11:00	24		7		38		15		62		22		
11:15	30		4		37		9		67		13		
11:30	28		2		34		5		62		7		
11:45	24	106	4	17	30	139	6	35	54	245	10	52	
Total	521		894		487		1128		1008		2022		
Percent	51.7%		44.2%		48.3%		55.8%						
Day Total		1415				1615				3030			
Peak	09:30		00:15		10:30		12:00		10:30		12:00		
Vol.	135		142		162		184		285		325		
P.H.F.	0.823		0.910		0.900		0.697		0.913		0.846		

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 D Volume
Site Code: TBA

Start	SB				NB				Combined				18-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sun
12:00	2		29		4		31		6		60		
12:15	2		24		4		42		6		66		
12:30	3		37		1		42		4		79		
12:45	4	11	39	129	0	9	31	146	4	20	70	275	
01:00	1		31		3		32		4		63		
01:15	1		40		2		28		3		68		
01:30	1		35		0		35		1		70		
01:45	1	4	33	139	1	6	34	129	2	10	67	268	
02:00	0		38		2		36		2		74		
02:15	0		30		0		28		0		58		
02:30	0		27		1		31		1		58		
02:45	0	0	26	121	1	4	38	133	1	4	64	254	
03:00	2		25		1		25		3		50		
03:15	0		32		2		34		2		66		
03:30	0		19		0		35		0		54		
03:45	1	3	29	105	1	4	30	124	2	7	59	229	
04:00	1		19		0		37		1		56		
04:15	0		28		1		36		1		64		
04:30	0		20		1		36		1		56		
04:45	0	1	23	90	0	2	24	133	0	3	47	223	
05:00	0		22		2		25		2		47		
05:15	0		12		0		24		0		36		
05:30	0		14		0		14		0		28		
05:45	2	2	6	54	0	2	31	94	2	4	37	148	
06:00	1		21		0		13		1		34		
06:15	2		12		0		15		2		27		
06:30	2		20		0		10		2		30		
06:45	3	8	5	58	6	6	13	51	9	14	18	109	
07:00	6		17		5		11		11		28		
07:15	6		11		7		7		13		18		
07:30	9		9		4		12		13		21		
07:45	8	29	9	46	11	27	4	34	19	56	13	80	
08:00	10		6		7		15		17		21		
08:15	14		9		8		12		22		21		
08:30	25		4		12		13		37		17		
08:45	13	62	6	25	17	44	8	48	30	106	14	73	
09:00	18		4		16		7		34		11		
09:15	13		4		16		7		29		11		
09:30	19		3		18		4		37		7		
09:45	12	62	1	12	14	64	5	23	26	126	6	35	
10:00	28		9		22		1		50		10		
10:15	26		5		17		2		43		7		
10:30	25		0		29		4		54		4		
10:45	24	103	1	15	18	86	2	9	42	189	3	24	
11:00	17		0		32		8		49		8		
11:15	29		0		20		3		49		3		
11:30	26		2		27		2		53		4		
11:45	30	102	0	2	23	102	2	15	53	204	2	17	
Total	387		796		356		939		743		1735		
Percent	52.1%		45.9%		47.9%		54.1%						
Day Total		1183				1295				2478			
Peak	10:00		00:30		11:00		00:15		11:00		00:30		
Vol.	103		147		102		147		204		280		
P.H.F.	0.920		0.919		0.797		0.875		0.962		0.886		

Old Bedford Road
south of Bedford Street (Route 62)
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
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INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
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123082 D Volume
Site Code: TBA

Start	SB				NB				Combined				19-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Mon
12:00	1		30		3		36		4		66		
12:15	1		29		0		36		1		65		
12:30	2		31		1		35		3		66		
12:45	1	5	19	109	0	4	38	145	1	9	57	254	
01:00	0		32		1		31		1		63		
01:15	1		32		0		38		1		70		
01:30	0		33		1		34		1		67		
01:45	0	1	33	130	1	3	37	140	1	4	70	270	
02:00	0		23		0		26		0		49		
02:15	1		29		0		39		1		68		
02:30	0		30		0		47		0		77		
02:45	0	1	39	121	0	0	42	154	0	1	81	275	
03:00	0		35		0		85		0		120		
03:15	0		37		0		60		0		97		
03:30	0		31		1		72		1		103		
03:45	1	1	36	139	0	1	69	286	1	2	105	425	
04:00	1		37		0		112		1		149		
04:15	1		32		0		94		1		126		
04:30	1		32		1		113		2		145		
04:45	2	5	32	133	0	1	106	425	2	6	138	558	
05:00	2		41		1		150		3		191		
05:15	8		34		3		124		11		158		
05:30	4		28		2		115		6		143		
05:45	11	25	29	132	1	7	94	483	12	32	123	615	
06:00	19		45		3		73		22		118		
06:15	23		26		5		67		28		93		
06:30	37		27		7		58		44		85		
06:45	63	142	12	110	15	30	30	228	78	172	42	338	
07:00	78		21		19		25		97		46		
07:15	95		14		25		22		120		36		
07:30	101		7		38		24		139		31		
07:45	96	370	10	52	39	121	15	86	135	491	25	138	
08:00	97		8		34		19		131		27		
08:15	94		7		45		14		139		21		
08:30	92		5		57		18		149		23		
08:45	87	370	4	24	47	183	10	61	134	553	14	85	
09:00	87		9		36		11		123		20		
09:15	47		6		21		10		68		16		
09:30	40		1		15		5		55		6		
09:45	41	215	5	21	25	97	11	37	66	312	16	58	
10:00	24		6		17		4		41		10		
10:15	20		4		26		9		46		13		
10:30	25		2		22		7		47		9		
10:45	24	93	5	17	31	96	3	23	55	189	8	40	
11:00	25		5		26		7		51		12		
11:15	12		2		27		2		39		4		
11:30	23		0		27		1		50		1		
11:45	20	80	1	8	35	115	1	11	55	195	2	19	
Total	1308		996		658		2079		1966		3075		
Percent	66.5%		32.4%		33.5%		67.6%						
Day Total		2304				2737				5041			
Peak	07:15		02:45		08:15		04:45		07:45		04:30		
Vol.	389		142		185		495		554		632		
P.H.F.	0.963		0.910		0.811		0.825		0.930		0.827		

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

EB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/13/1														
2	0	1	1	0	0	0	0	0	0	0	0	0	0	2
01:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
03:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
04:00	1	5	0	1	0	0	0	0	0	0	0	0	0	7
05:00	0	41	8	0	3	0	0	0	0	0	0	0	0	52
06:00	0	122	29	2	4	1	0	1	0	0	0	0	0	159
07:00	0	308	50	5	6	0	0	0	1	0	0	0	0	370
08:00	0	379	58	0	7	2	0	3	0	0	0	0	0	449
09:00	0	266	51	3	5	0	0	1	2	0	0	0	0	328
10:00	0	152	34	0	9	0	1	0	1	0	0	0	0	197
11:00	0	140	40	0	8	0	0	1	1	0	0	0	0	190
12 PM	0	140	35	2	3	1	0	0	0	0	0	0	0	181
13:00	0	130	30	2	11	1	0	0	1	0	0	0	0	175
14:00	0	157	45	0	6	1	0	0	1	0	0	0	0	210
15:00	0	171	57	2	4	1	0	0	0	0	0	0	0	235
16:00	0	186	43	0	9	0	0	0	0	0	0	0	0	238
17:00	1	206	25	1	5	3	0	0	0	0	0	0	0	241
18:00	0	157	23	0	3	0	0	0	0	0	0	0	0	183
19:00	1	92	12	0	1	0	0	0	0	0	0	0	0	106
20:00	0	65	13	0	0	0	0	0	0	0	0	0	0	78
21:00	0	38	6	0	1	0	0	0	0	0	0	0	0	45
22:00	0	29	1	0	2	0	0	0	0	0	0	0	0	32
23:00	0	20	3	0	0	0	0	0	0	0	0	0	0	23
Total	3	2814	565	18	88	10	1	6	7	0	0	0	0	3512
Percent	0.1%	80.1%	16.1%	0.5%	2.5%	0.3%	0.0%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	04:00	08:00	08:00	07:00	10:00	08:00	10:00	08:00	09:00					08:00
Vol.	1	379	58	5	9	2	1	3	2					449
PM Peak	17:00	17:00	15:00	12:00	13:00	17:00			13:00					17:00
Vol.	1	206	57	2	11	3			1					241

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

EB

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123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/14/1														
2	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
04:00	0	4	1	1	0	0	0	0	0	0	0	0	0	6
05:00	2	43	7	1	3	0	0	0	0	0	0	0	0	56
06:00	0	112	31	1	11	0	0	0	0	0	0	0	0	155
07:00	3	341	47	3	8	1	0	1	0	0	0	0	0	404
08:00	1	386	58	2	9	0	0	0	0	0	0	0	0	456
09:00	0	255	46	1	7	0	0	1	0	0	0	0	0	310
10:00	1	128	43	0	6	2	0	1	0	0	0	0	0	181
11:00	0	158	33	2	12	2	0	0	1	0	0	0	0	208
12 PM	1	171	37	3	11	0	0	2	0	0	0	0	0	225
13:00	1	138	40	3	7	0	0	1	1	0	0	0	0	191
14:00	0	153	37	1	4	0	0	0	0	0	0	0	0	195
15:00	2	156	42	3	9	0	1	2	0	0	0	0	0	215
16:00	1	191	43	0	12	2	0	1	0	0	0	0	0	250
17:00	0	212	36	1	2	1	0	0	0	0	0	0	0	252
18:00	1	149	22	0	4	0	0	0	0	0	0	0	0	176
19:00	0	95	12	0	4	0	0	0	0	0	0	0	0	111
20:00	0	67	14	0	2	0	0	0	0	0	0	0	0	83
21:00	0	60	6	0	1	0	0	0	0	0	0	0	0	67
22:00	0	29	4	0	0	0	0	0	0	0	0	0	0	33
23:00	0	19	4	0	0	0	0	0	0	0	0	0	0	23
Total	13	2877	563	22	113	8	1	9	2	0	0	0	0	3608
Percent	0.4%	79.7%	15.6%	0.6%	3.1%	0.2%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	08:00	07:00	11:00	10:00		07:00	11:00					08:00
Vol.	3	386	58	3	12	2		1	1					456
PM Peak	15:00	17:00	16:00	12:00	16:00	16:00	15:00	12:00	13:00					17:00
Vol.	2	212	43	3	12	2	1	2	1					252

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

EB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/15/1														
2	0	5	1	0	0	0	0	0	0	0	0	0	0	6
01:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
02:00	0	2	0	0	1	0	0	0	0	0	0	0	0	3
03:00	0	2	0	1	0	0	0	0	0	0	0	0	0	3
04:00	0	7	0	0	0	0	0	0	1	0	0	0	0	8
05:00	0	43	6	1	4	0	0	0	0	0	0	0	0	54
06:00	0	135	35	3	9	1	0	0	0	0	0	0	0	183
07:00	0	341	53	2	9	0	0	0	1	0	0	0	0	406
08:00	1	362	80	3	7	2	0	0	1	0	0	0	0	456
09:00	0	222	48	0	15	1	0	0	3	0	0	0	0	289
10:00	0	167	37	3	8	0	0	1	0	0	0	0	0	216
11:00	0	138	40	0	16	0	0	0	1	0	0	0	0	195
12 PM	1	142	37	3	10	0	0	1	0	0	0	0	0	194
13:00	0	149	35	0	14	0	0	0	1	0	0	0	0	199
14:00	1	146	29	2	5	0	0	0	1	0	0	0	0	184
15:00	0	192	48	2	8	1	0	0	0	0	0	0	0	251
16:00	0	180	40	0	8	1	0	0	0	0	0	0	0	229
17:00	0	223	49	1	5	1	0	0	0	0	0	0	0	279
18:00	0	151	26	0	4	0	0	0	0	0	0	0	0	181
19:00	0	92	15	0	2	0	0	0	0	0	0	0	0	109
20:00	0	72	9	1	1	0	0	0	0	0	0	0	0	83
21:00	0	52	13	0	0	0	0	0	1	0	0	0	0	66
22:00	0	28	8	0	0	1	0	0	0	0	0	0	0	37
23:00	0	27	8	0	0	0	0	0	0	0	0	0	0	35
Total	3	2885	617	22	126	8	0	2	10	0	0	0	0	3673
Percent	0.1%	78.5%	16.8%	0.6%	3.4%	0.2%	0.0%	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	06:00	11:00	08:00		10:00	09:00					08:00
Vol.	1	362	80	3	16	2		1	3					456
PM Peak	12:00	17:00	17:00	12:00	13:00	15:00		12:00	13:00					17:00
Vol.	1	223	49	3	14	1		1	1					279

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

EB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/16/1														
2	0	11	0	0	0	0	0	0	0	0	0	0	0	11
01:00	0	8	0	0	1	0	0	0	0	0	0	0	0	9
02:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2
03:00	0	1	1	1	0	0	0	0	0	0	0	0	0	3
04:00	0	7	1	0	1	0	0	0	0	0	0	0	0	9
05:00	2	35	4	0	4	0	0	0	0	0	0	0	0	45
06:00	1	116	24	1	8	0	0	3	0	0	0	0	0	153
07:00	1	349	39	2	9	0	0	1	1	0	0	0	0	402
08:00	2	320	51	3	11	0	0	0	0	0	0	0	0	387
09:00	0	204	41	1	8	0	0	3	0	0	0	0	0	257
10:00	0	136	30	0	12	0	0	2	0	0	0	0	0	180
11:00	0	142	36	1	10	1	0	0	0	0	0	0	0	190
12 PM	0	158	34	1	7	2	0	1	0	0	0	0	0	203
13:00	1	150	30	3	7	0	0	0	0	0	0	0	0	191
14:00	0	134	42	1	8	0	0	2	0	0	0	0	0	187
15:00	1	208	46	2	11	2	0	0	0	0	0	0	0	270
16:00	1	198	42	2	7	0	0	1	0	0	0	0	0	251
17:00	0	211	38	0	8	1	0	1	0	0	0	0	0	259
18:00	0	178	18	0	5	1	0	0	0	0	0	0	0	202
19:00	0	109	15	0	2	0	0	0	0	0	0	0	0	126
20:00	0	61	10	0	1	0	0	0	1	0	0	0	0	73
21:00	0	33	9	0	1	0	0	0	0	0	0	0	0	43
22:00	0	53	7	0	1	0	0	1	0	0	0	0	0	62
23:00	0	25	3	0	1	0	0	0	0	0	0	0	0	29
Total	9	2847	522	18	124	7	0	15	2	0	0	0	0	3544
Percent	0.3%	80.3%	14.7%	0.5%	3.5%	0.2%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	07:00	08:00	08:00	10:00	11:00		06:00	07:00					07:00
Vol.	2	349	51	3	12	1		3	1					402
PM Peak	13:00	17:00	15:00	13:00	15:00	12:00		14:00	20:00					15:00
Vol.	1	211	46	3	11	2		2	1					270

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

EB

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Email: datarequests@pdillc.com

123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/17/1														
2	0	13	3	0	0	0	0	0	0	0	0	0	0	16
01:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	3	1	1	1	0	0	0	0	0	0	0	0	6
04:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
05:00	0	16	1	1	2	0	0	0	0	0	0	0	0	20
06:00	0	25	7	0	2	0	0	0	0	0	0	0	0	34
07:00	0	48	19	0	8	0	0	1	0	0	0	0	0	76
08:00	0	98	25	0	9	1	0	0	0	0	0	0	0	133
09:00	0	119	29	0	9	0	0	0	0	0	0	0	0	157
10:00	3	179	29	0	7	1	0	1	0	0	0	0	0	220
11:00	4	150	36	1	12	1	0	0	0	0	0	0	0	204
12 PM	8	204	32	0	4	0	0	0	0	0	0	0	0	248
13:00	5	190	29	0	6	1	0	0	0	0	0	0	0	231
14:00	7	215	40	2	9	0	0	1	0	0	0	0	0	274
15:00	7	163	30	0	10	0	0	0	0	0	0	0	0	210
16:00	3	126	27	0	2	0	0	0	0	0	0	0	0	158
17:00	0	140	27	0	5	1	0	0	0	0	0	0	0	173
18:00	0	119	15	1	2	0	0	0	0	0	0	0	0	137
19:00	0	65	10	0	0	0	0	0	0	0	0	0	0	75
20:00	0	50	9	0	0	0	0	0	0	0	0	0	0	59
21:00	0	57	7	0	1	0	0	0	0	0	0	0	0	65
22:00	0	57	7	0	1	0	0	0	0	0	0	0	0	65
23:00	0	40	2	0	0	0	0	0	0	0	0	0	0	42
Total	37	2089	386	6	90	5	0	3	0	0	0	0	0	2616
Percent	1.4%	79.9%	14.8%	0.2%	3.4%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	10:00	11:00	03:00	11:00	08:00		07:00						10:00
Vol.	4	179	36	1	12	1		1						220
PM Peak	12:00	14:00	14:00	14:00	15:00	13:00		14:00						14:00
Vol.	8	215	40	2	10	1		1						274

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

EB

PRECISION
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Email: datarequests@pdillc.com

123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/18/1														
2	0	18	1	0	0	0	0	0	0	0	0	0	0	19
01:00	0	2	3	0	2	0	0	0	0	0	0	0	0	7
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	2	0	0	1	0	0	0	0	0	0	0	0	3
05:00	0	14	2	0	0	0	0	0	0	0	0	0	0	16
06:00	1	17	4	0	2	0	0	0	0	0	0	0	0	24
07:00	0	48	9	0	1	0	0	0	0	0	0	0	0	58
08:00	0	69	11	0	3	0	0	0	0	0	0	0	0	83
09:00	1	78	21	0	3	0	0	0	0	0	0	0	0	103
10:00	3	112	27	0	4	0	0	0	0	0	0	0	0	146
11:00	4	121	17	0	1	4	0	0	0	0	0	0	0	147
12 PM	2	191	24	0	0	0	0	0	0	0	0	0	0	217
13:00	5	190	24	0	2	0	0	0	0	0	0	0	0	221
14:00	5	148	22	0	0	0	0	1	0	0	0	0	0	176
15:00	4	187	19	1	3	0	0	1	0	0	0	0	0	215
16:00	1	140	21	0	4	0	0	0	0	0	0	0	0	166
17:00	0	93	12	0	3	0	0	0	0	0	0	0	0	108
18:00	0	85	12	0	1	0	0	0	0	0	0	0	0	98
19:00	0	63	11	0	4	0	0	0	0	0	0	0	0	78
20:00	0	49	10	0	4	0	0	0	0	0	0	0	0	63
21:00	0	32	9	0	0	0	0	0	0	0	0	0	0	41
22:00	0	20	2	0	1	0	0	0	0	0	0	0	0	23
23:00	0	25	2	0	0	0	0	0	0	0	0	0	0	27
Total	26	1708	263	1	39	4	0	2	0	0	0	0	0	2043
Percent	1.3%	83.6%	12.9%	0.0%	1.9%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	10:00		10:00	11:00								11:00
Vol.	4	121	27		4	4								147
PM Peak	13:00	12:00	12:00	15:00	16:00			14:00						13:00
Vol.	5	191	24	1	4			1						221

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

EB

PRECISION
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INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/1														
2	0	9	0	0	0	0	0	0	0	0	0	0	0	9
01:00	0	4	3	0	0	0	0	0	0	0	0	0	0	7
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	11	0	0	1	0	0	0	0	0	0	0	0	12
05:00	0	33	7	1	4	0	0	0	0	0	0	0	0	45
06:00	1	125	26	2	8	1	0	1	0	0	0	0	0	164
07:00	2	319	46	4	19	0	0	2	0	0	0	0	0	392
08:00	1	387	66	3	11	0	0	1	1	0	0	0	0	470
09:00	0	224	47	1	8	0	0	2	0	0	0	0	0	282
10:00	0	123	39	2	5	2	0	1	0	0	0	0	0	172
11:00	0	126	42	0	8	0	0	1	0	0	0	0	0	177
12 PM	1	126	37	1	9	2	0	1	0	0	0	0	0	177
13:00	1	146	33	0	5	1	0	1	0	0	0	0	0	187
14:00	0	143	41	1	14	0	0	1	0	0	0	0	0	200
15:00	0	174	32	2	10	2	0	3	1	0	0	0	0	224
16:00	1	188	43	1	14	0	0	2	2	0	0	0	0	251
17:00	1	198	31	0	4	1	0	1	0	0	0	0	0	236
18:00	1	142	32	0	3	0	0	0	0	0	0	0	0	178
19:00	1	94	19	0	2	0	0	0	0	0	0	0	0	116
20:00	0	49	4	0	1	0	0	0	0	0	0	0	0	54
21:00	0	55	11	0	0	0	0	0	0	0	0	0	0	66
22:00	0	39	5	0	1	0	0	0	0	0	0	0	0	45
23:00	0	17	5	0	0	0	0	0	0	0	0	0	0	22
Total	10	2735	569	18	127	9	0	17	4	0	0	0	0	3489
Percent	0.3%	78.4%	16.3%	0.5%	3.6%	0.3%	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	08:00	07:00	07:00	10:00		07:00	08:00					08:00
Vol.	2	387	66	4	19	2		2	1					470
PM Peak	12:00	17:00	16:00	15:00	14:00	12:00		15:00	16:00					16:00
Vol.	1	198	43	2	14	2		3	2					251
Total		17955	3485	105	707	51	2	54	25	0	0	0	0	22485

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

WB

PRECISION
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INDUSTRIES, LLC
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Email: datarequests@pdillc.com

123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/13/1														
2	0	4	2	0	0	0	0	0	0	0	0	0	0	6
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	3	0	1	0	0	0	0	0	0	0	0	0	4
04:00	0	2	3	0	0	1	0	0	0	0	0	0	0	6
05:00	0	26	6	1	0	1	0	0	0	0	0	0	0	34
06:00	0	91	22	1	3	1	0	0	0	0	0	0	0	118
07:00	1	188	47	2	8	0	0	1	0	0	0	0	0	247
08:00	0	215	47	3	3	0	0	0	1	0	0	0	0	269
09:00	1	181	38	1	4	2	0	1	2	0	0	0	0	230
10:00	1	159	44	0	9	0	0	0	1	0	0	0	0	214
11:00	0	152	39	0	5	1	0	0	1	0	0	0	0	198
12 PM	0	138	40	1	2	0	0	0	0	0	0	0	0	181
13:00	0	167	40	0	5	0	0	0	1	0	0	0	0	213
14:00	0	206	48	1	6	0	0	0	0	0	0	0	0	261
15:00	1	265	62	1	3	1	0	2	0	0	0	0	0	335
16:00	0	431	70	0	3	1	0	1	0	0	0	0	0	506
17:00	3	556	59	1	3	0	0	0	0	0	0	0	0	622
18:00	1	399	51	0	5	0	0	1	0	0	0	0	0	457
19:00	0	179	26	0	1	0	0	0	0	0	0	0	0	206
20:00	0	107	6	0	0	0	0	0	0	0	0	0	0	113
21:00	0	63	5	0	0	0	0	0	0	0	0	0	0	68
22:00	0	29	0	0	0	0	0	0	0	0	0	0	0	29
23:00	0	14	3	0	0	0	0	0	0	0	0	0	0	17
Total	8	3578	658	13	60	8	0	6	6	0	0	0	0	4337
Percent	0.2%	82.5%	15.2%	0.3%	1.4%	0.2%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	07:00	08:00	10:00	09:00		07:00	09:00					08:00
Vol.	1	215	47	3	9	2		1	2					269
PM Peak	17:00	17:00	16:00	12:00	14:00	15:00		15:00	13:00					17:00
Vol.	3	556	70	1	6	1		2	1					622

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

WB

PRECISION
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Email: datarequests@pdillc.com

123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/14/1														
2	0	11	0	0	0	0	0	0	0	0	0	0	0	11
01:00	0	3	0	0	1	0	0	0	0	0	0	0	0	4
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	5	0	1	0	0	0	0	0	0	0	0	0	6
04:00	0	4	3	0	0	0	0	0	0	0	0	0	0	7
05:00	0	29	7	0	1	0	0	0	0	0	0	0	0	37
06:00	0	98	13	0	1	0	0	0	0	0	0	0	0	112
07:00	0	163	37	3	4	2	0	0	0	0	0	0	0	209
08:00	2	240	55	3	5	1	0	1	1	0	0	0	0	308
09:00	1	178	32	0	5	1	0	1	1	0	0	0	0	219
10:00	0	138	29	1	10	3	0	2	1	0	0	0	0	184
11:00	0	171	32	2	4	0	0	0	2	0	0	0	0	211
12 PM	0	174	43	1	9	1	0	0	0	0	0	0	0	228
13:00	1	194	26	3	5	0	0	0	0	0	0	0	0	229
14:00	0	206	37	2	8	1	0	4	0	0	0	0	0	258
15:00	0	277	65	0	4	3	0	1	0	0	0	0	0	350
16:00	0	433	58	1	3	2	0	0	0	0	0	0	0	497
17:00	2	539	51	1	0	0	0	1	0	0	0	0	0	594
18:00	0	357	31	0	2	0	0	0	0	0	0	0	0	390
19:00	0	190	28	0	0	0	0	0	0	0	0	0	0	218
20:00	0	101	13	0	2	0	0	0	0	0	0	0	0	116
21:00	1	64	8	0	0	0	0	0	0	0	0	0	0	73
22:00	0	34	2	0	0	0	0	0	0	0	0	0	0	36
23:00	0	24	1	0	0	0	0	0	0	0	0	0	0	25
Total	7	3634	571	18	64	14	0	10	5	0	0	0	0	4323
Percent	0.2%	84.1%	13.2%	0.4%	1.5%	0.3%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	07:00	10:00	10:00		10:00	11:00					08:00
Vol.	2	240	55	3	10	3		2	2					308
PM Peak	17:00	17:00	15:00	13:00	12:00	15:00		14:00						17:00
Vol.	2	539	65	3	9	3		4						594

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

WB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/15/1														
2	0	6	1	0	0	0	0	0	0	0	0	0	0	7
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
03:00	0	4	2	1	0	0	0	0	0	0	0	0	0	7
04:00	0	1	0	0	1	0	0	0	0	0	0	0	0	2
05:00	0	14	14	0	0	0	0	0	0	0	0	0	0	28
06:00	0	93	19	2	5	3	0	0	0	0	0	0	0	122
07:00	0	184	45	2	10	0	0	0	1	0	0	0	0	242
08:00	1	180	63	1	7	1	0	0	0	0	0	0	0	253
09:00	0	168	53	1	3	1	0	1	2	0	0	0	0	229
10:00	0	135	45	2	4	0	0	0	1	0	0	0	0	187
11:00	0	153	39	4	7	0	0	0	1	0	0	0	0	204
12 PM	0	169	32	1	8	0	0	0	0	0	0	0	0	210
13:00	0	181	31	2	6	0	0	0	1	0	0	0	0	221
14:00	0	238	38	1	6	0	0	0	0	0	0	0	0	283
15:00	1	281	62	1	3	2	0	1	0	0	0	0	0	351
16:00	1	450	72	0	4	1	0	1	0	0	0	0	0	529
17:00	3	508	53	1	5	1	0	0	0	0	0	0	0	571
18:00	2	387	51	0	0	1	0	1	0	0	0	0	0	442
19:00	0	172	17	1	1	0	0	0	0	0	0	0	0	191
20:00	0	111	16	0	0	0	0	0	0	0	0	0	0	127
21:00	0	86	10	0	2	0	0	0	1	0	0	0	0	99
22:00	0	39	2	0	0	0	0	0	0	0	0	0	0	41
23:00	0	18	3	0	0	0	0	0	0	0	0	0	0	21
Total	8	3585	668	20	72	10	0	4	7	0	0	0	0	4374
Percent	0.2%	82.0%	15.3%	0.5%	1.6%	0.2%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	08:00	11:00	07:00	06:00		09:00	09:00					08:00
Vol.	1	184	63	4	10	3		1	2					253
PM Peak	17:00	17:00	16:00	13:00	12:00	15:00		15:00	13:00					17:00
Vol.	3	508	72	2	8	2		1	1					571

Bedford Street (Route 62)
west of Old Bedford Street
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Office: 508.481.3999 Fax: 508.545.1234
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123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/16/1														
2	0	12	1	0	0	0	0	0	0	0	0	0	0	13
01:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	5	0	1	0	0	0	0	0	0	0	0	0	6
04:00	0	0	1	0	1	0	0	0	0	0	0	0	0	2
05:00	0	22	7	0	2	1	0	0	0	0	0	0	0	32
06:00	1	96	18	1	2	0	0	0	0	0	0	0	0	118
07:00	1	167	37	0	8	3	0	0	0	0	0	0	0	216
08:00	1	202	52	4	5	2	0	0	0	0	0	0	0	266
09:00	1	141	38	0	4	3	0	1	0	0	0	0	0	188
10:00	0	141	38	3	2	1	0	1	0	0	0	0	0	186
11:00	0	174	33	1	5	3	0	1	0	0	0	0	0	217
12 PM	0	189	41	1	8	2	0	0	0	0	0	0	0	241
13:00	1	190	31	1	5	0	0	1	0	0	0	0	0	229
14:00	0	212	47	2	7	1	0	0	0	0	0	0	0	269
15:00	3	310	63	0	5	0	0	0	0	0	0	0	0	381
16:00	0	396	57	0	5	1	0	4	0	0	0	0	0	463
17:00	1	468	60	0	2	1	0	0	0	0	0	0	0	532
18:00	2	275	33	0	2	0	0	1	0	0	0	0	0	313
19:00	0	147	11	0	1	0	0	0	0	0	0	0	0	159
20:00	0	91	13	0	1	0	0	0	0	0	0	0	0	105
21:00	0	66	5	0	0	0	0	0	0	0	0	0	0	71
22:00	0	65	4	0	1	0	0	0	0	0	0	0	0	70
23:00	0	25	4	0	1	0	0	0	0	0	0	0	0	30
Total	11	3398	595	14	67	18	0	9	0	0	0	0	0	4112
Percent	0.3%	82.6%	14.5%	0.3%	1.6%	0.4%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	08:00	08:00	08:00	07:00	07:00		09:00						08:00
Vol.	1	202	52	4	8	3		1						266
PM Peak	15:00	17:00	15:00	14:00	12:00	12:00		16:00						17:00
Vol.	3	468	63	2	8	2		4						532

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

WB

PRECISION
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Email: datarequests@pdillc.com

123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/17/1														
2	0	22	1	0	1	0	0	0	0	0	0	0	0	24
01:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
02:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
03:00	0	2	0	1	0	0	0	0	0	0	0	0	0	3
04:00	0	5	1	0	2	0	0	0	0	0	0	0	0	8
05:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
06:00	0	42	7	0	1	0	0	1	0	0	0	0	0	51
07:00	0	62	17	0	2	0	0	0	0	0	0	0	0	81
08:00	0	89	26	0	8	0	0	0	1	0	0	0	0	124
09:00	0	147	34	0	5	1	0	0	0	0	0	0	0	187
10:00	0	168	29	0	3	0	0	1	0	0	0	0	0	201
11:00	3	205	42	1	7	1	0	1	0	0	0	0	0	260
12 PM	3	197	29	1	0	2	0	1	1	0	0	0	0	234
13:00	1	211	23	0	4	0	0	1	0	0	0	0	0	240
14:00	4	209	31	0	2	0	0	0	0	0	0	0	0	246
15:00	1	286	39	3	9	2	0	0	0	0	0	0	0	340
16:00	2	244	33	0	2	0	0	0	0	0	0	0	0	281
17:00	0	149	12	1	2	0	0	1	0	0	0	0	0	165
18:00	0	140	21	1	0	0	0	0	0	0	0	0	0	162
19:00	1	95	17	0	0	0	0	1	0	0	0	0	0	114
20:00	0	92	14	0	3	0	0	0	0	0	0	0	0	109
21:00	0	66	7	0	1	0	0	0	0	0	0	0	0	74
22:00	0	55	3	0	0	0	0	0	0	0	0	0	0	58
23:00	0	34	2	0	0	0	0	0	0	0	0	0	0	36
Total	15	2537	391	8	52	6	0	7	2	0	0	0	0	3018
Percent	0.5%	84.1%	13.0%	0.3%	1.7%	0.2%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00	03:00	08:00	09:00		06:00	08:00					11:00
Vol.	3	205	42	1	8	1		1	1					260
PM Peak	14:00	15:00	15:00	15:00	15:00	12:00		12:00	12:00					15:00
Vol.	4	286	39	3	9	2		1	1					340

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

WB

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123082 E Class
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/18/1														
2	0	15	0	0	1	0	0	0	0	0	0	0	0	16
01:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
06:00	0	19	7	0	0	0	0	0	0	0	0	0	0	26
07:00	0	43	11	0	1	1	0	0	0	0	0	0	0	56
08:00	1	76	10	0	0	0	0	0	0	0	0	0	0	87
09:00	0	113	20	0	0	0	0	0	0	0	0	0	0	133
10:00	1	111	19	0	1	0	0	0	0	0	0	0	0	132
11:00	0	178	19	0	2	0	0	1	0	0	0	0	0	200
12 PM	0	170	26	0	0	0	0	0	0	0	0	0	0	196
13:00	3	186	24	0	0	1	0	0	0	0	0	0	0	214
14:00	2	221	23	0	2	0	0	0	0	0	0	0	0	248
15:00	1	220	23	0	2	0	0	1	0	0	0	0	0	247
16:00	0	188	27	0	2	0	0	0	0	0	0	0	0	217
17:00	0	112	16	0	1	0	0	1	0	0	0	0	0	130
18:00	0	115	21	0	1	0	0	0	0	0	0	0	0	137
19:00	0	76	13	0	3	0	0	0	0	0	0	0	0	92
20:00	0	85	7	0	0	0	0	0	0	0	0	0	0	92
21:00	0	45	3	0	0	0	0	0	0	0	0	0	0	48
22:00	0	17	1	0	0	0	0	0	0	0	0	0	0	18
23:00	0	15	0	0	0	0	0	0	0	0	0	0	0	15
Total	8	2029	270	0	16	2	0	3	0	0	0	0	0	2328
Percent	0.3%	87.2%	11.6%	0.0%	0.7%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	09:00		11:00	07:00		11:00						11:00
Vol.	1	178	20		2	1		1						200
PM Peak	13:00	14:00	16:00		19:00	13:00		15:00						14:00
Vol.	3	221	27		3	1		1						248

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
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123082 E Class
Site Code: TBA

WB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/1														
2	0	12	0	0	0	0	0	0	0	0	0	0	0	12
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	2	0	0	0	1	0	0	0	0	0	0	0	3
03:00	0	1	1	1	0	0	0	0	0	0	0	0	0	3
04:00	0	8	4	0	1	0	0	0	0	0	0	0	0	13
05:00	0	18	7	0	1	0	0	0	0	0	0	0	0	26
06:00	0	88	17	0	3	3	0	0	0	0	0	0	0	111
07:00	0	164	40	2	4	1	0	0	0	0	0	0	0	211
08:00	0	198	55	2	7	1	0	2	1	0	0	0	0	266
09:00	1	171	49	1	6	0	0	2	0	0	0	0	0	230
10:00	0	139	44	2	6	2	0	0	0	0	0	0	0	193
11:00	0	156	27	1	7	3	0	1	0	0	0	0	0	195
12 PM	1	164	54	0	10	2	0	4	0	0	0	0	0	235
13:00	0	174	35	0	4	1	0	2	0	0	0	0	0	216
14:00	2	229	47	0	7	0	0	0	0	0	0	0	0	285
15:00	1	292	81	1	7	0	0	1	1	0	0	0	0	384
16:00	1	419	61	0	2	2	0	1	0	0	0	0	0	486
17:00	2	530	63	1	5	0	0	1	0	0	0	0	0	602
18:00	0	352	39	0	5	1	0	1	1	0	0	0	0	399
19:00	0	193	24	0	0	0	0	0	0	0	0	0	0	217
20:00	0	95	12	0	0	1	0	0	0	0	0	0	0	108
21:00	0	52	11	0	0	0	0	0	0	0	0	0	0	63
22:00	0	36	3	0	0	0	0	0	0	0	0	0	0	39
23:00	0	19	0	0	0	0	0	0	0	0	0	0	0	19
Total	8	3512	674	11	75	18	0	15	3	0	0	0	0	4316
Percent	0.2%	81.4%	15.6%	0.3%	1.7%	0.4%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	08:00	07:00	08:00	06:00		08:00	08:00					08:00
Vol.	1	198	55	2	7	3		2	1					266
PM Peak	14:00	17:00	15:00	15:00	12:00	12:00		12:00	15:00					17:00
Vol.	2	530	81	1	10	2		4	1					602
Total		22273	3827	84	406	76	0	54	23	0	0	0	0	26808

PRECISION
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Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/13/1																
2	0	0	0	0	1	0	1	0	0	0	0	0	0	2	*	37
01:00	0	0	0	0	1	2	5	0	0	0	0	0	0	8	42	39
02:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1	*	42
03:00	0	0	0	0	0	0	1	1	0	0	0	0	0	2	*	44
04:00	0	0	0	1	0	3	2	1	0	0	0	0	0	7	38	38
05:00	0	0	0	0	5	28	16	2	0	**1**	0	0	0	52	42	39
06:00	0	0	2	3	43	86	19	6	0	0	0	0	0	159	39	36
07:00	**16**	2	7	11	71	194	63	6	**1**	0	0	0	0	371	40	34
08:00	7	**30**	**20**	**15**	**79**	**206**	**86**	7	0	0	0	0	0	**450**	40	33
09:00	0	1	4	8	68	168	71	**8**	0	0	0	0	0	328	41	37
10:00	0	0	2	9	39	95	48	4	0	0	0	0	0	197	41	37
11:00	1	**3**	2	8	34	85	**52**	5	0	0	0	0	0	190	41	36
12 PM	0	0	4	6	38	92	38	2	**1**	0	0	0	0	181	40	37
13:00	0	0	3	**13**	35	93	24	**6**	1	0	0	0	0	175	40	36
14:00	**5**	3	**5**	11	**43**	**105**	34	4	0	0	0	0	0	**210**	40	35
15:00	0	0	1	7	66	**112**	**42**	**7**	0	0	0	0	0	235	40	36
16:00	0	2	4	12	**91**	108	19	2	0	0	0	0	0	238	38	35
17:00	**6**	**5**	**8**	12	85	109	15	1	0	0	0	0	0	**241**	38	33
18:00	1	2	2	3	67	87	18	3	0	0	0	0	0	183	39	35
19:00	0	1	2	**13**	30	45	12	3	0	0	0	0	0	106	39	35
20:00	0	0	1	2	16	41	14	4	0	0	0	0	0	78	41	37
21:00	0	0	0	4	9	19	10	3	0	0	0	0	0	45	41	37
22:00	0	0	0	3	9	16	3	1	0	0	0	0	0	32	39	35
23:00	0	0	0	0	3	7	7	4	**2**	0	0	0	0	23	47	41
%	1.0%	1.4%	1.9%	4.0%	23.7%	48.4%	17.1%	2.3%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	08:00	08:00	08:00	08:00	08:00	08:00	09:00	07:00	05:00				08:00		
Vol.	16	30	20	15	79	206	86	8	1	1				450		
Midday Peak	14:00	11:00	14:00	13:00	14:00	14:00	11:00	13:00	12:00					14:00		
Vol.	5	3	5	13	43	105	52	6	1					210		
PM Peak	17:00	17:00	17:00	19:00	16:00	15:00	15:00	15:00	23:00					17:00		
Vol.	6	5	8	13	91	112	42	7	2					241		

% iles

15th Percentile : 29 MPH
50th Percentile : 35 MPH
85th Percentile : 40 MPH
95th Percentile : 43 MPH

Stats

10 MPH Pace Speed : 32-41 MPH
Number in Pace : 2407
Percent in Pace : 68.5%
Number of Vehicles > 35 MPH : 1985
Percent of Vehicles > 35 MPH : 56.5%
Mean Speed(Average) : 35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/14/1																
2	0	0	0	0	0	1	2	0	0	0	0	0	0	3	*	40
01:00	0	0	0	0	0	0	6	0	0	0	0	0	0	6	43	42
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
04:00	0	0	0	0	1	2	0	3	0	0	0	0	0	6	46	41
05:00	0	0	0	0	4	24	22	5	0	**1**	0	0	0	56	43	40
06:00	0	0	0	6	22	89	33	5	0	0	0	0	0	155	41	37
07:00	**9**	**10**	**20**	11	46	**211**	86	**11**	0	0	0	0	0	404	40	35
08:00	0	3	11	**37**	**75**	203	**119**	8	0	0	0	0	0	**456**	41	36
09:00	2	3	6	15	35	159	86	4	0	0	0	0	0	310	41	37
10:00	0	1	4	6	36	97	32	4	1	0	0	0	0	181	40	36
11:00	1	**7**	**6**	**11**	35	**98**	47	3	0	0	0	0	0	208	40	35
12 PM	0	0	1	10	45	91	**69**	**8**	**1**	0	0	0	0	**225**	42	37
13:00	0	2	3	5	**46**	84	45	5	1	0	0	0	0	191	41	36
14:00	**3**	0	5	11	42	84	46	4	1	0	0	0	0	196	41	36
15:00	**7**	**8**	**13**	**34**	56	74	21	2	0	0	0	0	0	215	38	31
16:00	0	1	3	7	67	118	**46**	**7**	**1**	0	0	0	0	250	40	36
17:00	1	4	3	14	**71**	**140**	17	2	0	0	0	0	0	**252**	38	35
18:00	1	3	2	8	49	89	20	3	0	**1**	0	0	0	176	39	35
19:00	0	0	3	8	27	53	20	0	0	0	0	0	0	111	40	36
20:00	0	1	0	1	15	45	20	1	0	0	0	0	0	83	41	37
21:00	0	0	0	1	16	30	17	3	0	0	0	0	0	67	41	37
22:00	0	0	0	1	3	17	9	2	1	0	0	0	0	33	42	39
23:00	0	0	0	1	3	11	4	3	1	0	0	0	0	23	44	39
%	0.7%	1.2%	2.2%	5.2%	19.3%	47.7%	21.3%	2.3%	0.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	08:00	08:00	07:00	08:00	07:00		05:00				08:00		
Vol.	9	10	20	37	75	211	119	11		1				456		
Midday Peak	14:00	11:00	11:00	11:00	13:00	11:00	12:00	12:00	12:00					12:00		
Vol.	3	7	6	11	46	98	69	8	1					225		
PM Peak	15:00	15:00	15:00	15:00	17:00	17:00	16:00	16:00	16:00	18:00				17:00		
Vol.	7	8	13	34	71	140	46	7	1	1				252		

% iles	
15th Percentile :	30 MPH
50th Percentile :	36 MPH
85th Percentile :	41 MPH
95th Percentile :	43 MPH

Stats	
10 MPH Pace Speed :	33-42 MPH
Number in Pace :	2433
Percent in Pace :	67.4%
Number of Vehicles > 35 MPH :	2172
Percent of Vehicles > 35 MPH :	60.2%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
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Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/15/1																
2	0	0	0	0	1	1	3	1	0	0	0	0	0	6	42	40
01:00	0	0	0	0	0	3	2	1	**1**	0	0	0	0	7	38	42
02:00	0	0	0	0	0	0	0	2	1	0	0	0	0	3	*	49
03:00	0	0	0	0	2	0	0	1	0	0	0	0	0	3	*	37
04:00	0	0	0	0	2	2	1	3	0	0	0	0	0	8	46	40
05:00	0	0	0	0	2	27	24	1	0	0	0	0	0	54	42	39
06:00	0	0	1	6	39	97	36	3	0	**1**	0	0	0	183	40	37
07:00	**3**	1	2	**30**	90	179	**94**	**7**	0	0	0	0	0	406	41	36
08:00	2	0	6	22	**112**	**225**	85	4	0	0	0	0	0	**456**	40	36
09:00	1	**3**	**9**	6	79	146	44	1	0	0	0	0	0	289	39	35
10:00	0	1	6	7	22	133	44	3	0	0	0	0	0	216	40	37
11:00	0	**5**	4	9	36	89	49	2	1	0	0	0	0	195	41	36
12 PM	0	2	2	5	26	**95**	**54**	**8**	**2**	0	0	0	0	194	42	38
13:00	0	0	5	**11**	**54**	85	43	1	0	0	0	0	0	**199**	40	36
14:00	**1**	3	**6**	9	38	95	28	4	0	0	0	0	0	184	40	35
15:00	**2**	4	**16**	**24**	34	**136**	30	5	0	0	0	0	0	251	39	34
16:00	0	0	2	7	62	109	**47**	2	0	0	0	0	0	229	40	36
17:00	2	**6**	10	7	**85**	136	33	0	0	0	0	0	0	**279**	39	34
18:00	0	1	3	13	26	112	22	3	**1**	0	0	0	0	181	39	36
19:00	0	0	1	5	16	63	20	4	0	0	0	0	0	109	40	37
20:00	0	0	1	4	16	48	11	2	0	0	0	**1**	0	83	39	36
21:00	0	0	0	3	21	29	11	2	0	0	0	0	0	66	40	36
22:00	0	0	0	1	7	20	8	1	0	0	0	0	0	37	40	37
23:00	0	0	0	1	3	17	6	**7**	1	0	0	0	0	35	45	40
%	0.3%	0.7%	2.0%	4.6%	21.0%	50.3%	18.9%	1.9%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	09:00	09:00	07:00	08:00	08:00	07:00	07:00	01:00	06:00				08:00		
Vol.	3	3	9	30	112	225	94	7	1	1				456		
Midday Peak	14:00	11:00	14:00	13:00	13:00	12:00	12:00	12:00	12:00					13:00		
Vol.	1	5	6	11	54	95	54	8	2					199		
PM Peak	15:00	17:00	15:00	15:00	17:00	15:00	16:00	23:00	18:00			20:00		17:00		
Vol.	2	6	16	24	85	136	47	7	1			1		279		

% iles	
15th Percentile :	30 MPH
50th Percentile :	36 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH

Stats	
10 MPH Pace Speed :	32-41 MPH
Number in Pace :	2575
Percent in Pace :	70.1%
Number of Vehicles > 35 MPH :	2194
Percent of Vehicles > 35 MPH :	59.7%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
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Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/16/1																
2	0	0	0	0	2	2	5	2	0	0	0	0	0	11	44	40
01:00	0	0	0	0	3	3	3	0	0	0	0	0	0	9	40	37
02:00	0	0	0	0	0	1	1	0	0	0	0	0	0	2	*	39
03:00	0	0	0	0	0	3	0	0	0	0	0	0	0	3	36	37
04:00	0	0	0	2	0	3	1	2	**1**	0	0	0	0	9	37	39
05:00	0	0	0	2	1	11	26	4	0	**1**	0	0	0	45	44	41
06:00	2	1	0	2	32	86	28	2	0	0	0	0	0	153	40	36
07:00	**4**	**15**	**9**	5	70	**231**	61	7	0	0	0	0	0	**402**	40	35
08:00	0	2	2	**36**	**83**	196	**66**	3	0	0	0	0	0	388	40	36
09:00	4	2	4	9	57	122	48	**11**	0	0	0	0	0	257	41	36
10:00	0	0	5	16	33	80	40	6	0	0	0	0	0	180	41	36
11:00	0	**2**	3	6	**39**	89	43	7	1	0	0	0	0	190	41	37
12 PM	0	0	**8**	**15**	28	**92**	**51**	7	**2**	0	0	0	0	**203**	41	37
13:00	0	2	3	11	37	82	45	**11**	1	0	0	0	0	192	42	37
14:00	**2**	1	3	10	33	84	46	7	1	0	0	0	0	187	41	36
15:00	**2**	**6**	**15**	**32**	68	90	**50**	**6**	0	0	**1**	0	0	**270**	40	34
16:00	0	1	4	15	63	130	36	3	0	0	0	0	0	252	39	36
17:00	0	1	7	14	**78**	**132**	24	3	0	0	0	0	0	259	38	35
18:00	0	1	2	3	41	119	36	0	0	0	0	0	0	202	40	36
19:00	0	2	5	7	17	63	29	2	1	0	0	0	0	126	41	36
20:00	0	0	2	1	18	38	13	1	0	0	0	0	0	73	40	36
21:00	0	0	0	5	5	26	7	0	0	0	0	0	0	43	39	36
22:00	0	0	0	4	11	22	21	2	**2**	0	0	0	0	62	42	38
23:00	0	0	0	2	4	9	11	2	0	**1**	0	0	0	29	42	39
%	0.4%	1.0%	2.0%	5.6%	20.4%	48.3%	19.5%	2.5%	0.3%	0.1%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	08:00	08:00	07:00	08:00	09:00	04:00	05:00				07:00		
Vol.	4	15	9	36	83	231	66	11	1	1				402		
Midday Peak	14:00	11:00	12:00	12:00	11:00	12:00	12:00	13:00	12:00					12:00		
Vol.	2	2	8	15	39	92	51	11	2					203		
PM Peak	15:00	15:00	15:00	15:00	17:00	17:00	15:00	15:00	22:00	23:00	15:00			15:00		
Vol.	2	6	15	32	78	132	50	6	2	1	1			270		

% iles		
	15th Percentile :	30 MPH
	50th Percentile :	36 MPH
	85th Percentile :	40 MPH
	95th Percentile :	43 MPH

Stats		
	10 MPH Pace Speed :	32-41 MPH
	Number in Pace :	2405
	Percent in Pace :	67.8%
	Number of Vehicles > 35 MPH :	2106
	Percent of Vehicles > 35 MPH :	59.4%
	Mean Speed(Average) :	36 MPH

PRECISION
D A T A
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Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/17/1																
2	0	0	0	0	5	8	2	1	0	0	0	0	0	16	39	37
01:00	0	0	0	1	2	3	1	0	0	0	0	0	0	7	37	35
02:00	0	0	0	0	0	0	2	0	0	0	0	0	0	2	*	42
03:00	0	0	0	1	2	2	1	0	0	0	0	0	0	6	*	34
04:00	0	0	0	0	0	1	2	1	0	0	0	0	0	4	*	42
05:00	0	0	0	0	2	8	7	3	0	0	0	0	0	20	44	40
06:00	0	0	1	1	3	9	17	3	0	0	0	0	0	34	43	39
07:00	0	0	0	0	13	40	17	6	0	0	0	0	0	76	42	38
08:00	0	0	1	4	19	61	**38**	**10**	0	0	0	0	0	133	42	38
09:00	0	0	**7**	**9**	**35**	**74**	26	6	0	0	0	0	0	**157**	40	36
10:00	2	4	4	34	73	77	25	1	0	0	0	0	0	220	38	33
11:00	0	4	7	20	40	86	45	3	0	0	0	0	0	205	40	35
12 PM	2	4	5	19	56	**106**	43	**14**	0	0	0	0	0	249	41	35
13:00	0	1	4	23	42	104	**49**	7	**1**	0	0	0	0	231	41	36
14:00	**6**	**8**	**16**	**36**	**70**	96	35	7	0	0	0	0	0	**274**	39	33
15:00	0	**6**	**8**	**23**	48	**88**	**29**	**8**	0	0	0	0	0	**210**	40	34
16:00	0	1	2	7	**52**	66	25	5	0	0	0	0	0	158	40	36
17:00	0	1	3	13	46	87	22	1	0	0	0	0	0	173	39	35
18:00	0	0	0	22	26	61	27	1	0	0	0	0	0	137	40	36
19:00	0	1	0	1	20	41	11	1	0	0	0	0	0	75	39	36
20:00	0	0	0	1	15	26	13	4	0	0	0	0	0	59	42	37
21:00	0	0	1	2	16	37	7	2	0	0	0	0	0	65	39	36
22:00	0	0	1	2	25	26	11	0	0	0	0	0	0	65	39	35
23:00	0	0	0	4	6	17	8	3	**4**	0	0	0	0	42	46	38
%	0.4%	1.1%	2.3%	8.5%	23.5%	42.9%	17.7%	3.3%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak			09:00	09:00	09:00	09:00	08:00	08:00						09:00		
Vol.			7	9	35	74	38	10						157		
Midday Peak	14:00	14:00	14:00	14:00	14:00	12:00	13:00	12:00	13:00					14:00		
Vol.	6	8	16	36	70	106	49	14	1					274		
PM Peak		15:00	15:00	15:00	16:00	15:00	15:00	15:00	23:00					15:00		
Vol.		6	8	23	52	88	29	8	4					210		

% iles	
15th Percentile :	29 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	32-41 MPH
Number in Pace :	1665
Percent in Pace :	63.6%
Number of Vehicles > 35 MPH :	1422
Percent of Vehicles > 35 MPH :	54.3%
Mean Speed(Average) :	35 MPH

PRECISION
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Bedford Street (Route 62)
west of Old Bedford Street
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123082 E Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/18/1																
2	0	0	0	1	2	10	4	0	1	**1**	0	0	0	19	40	39
01:00	0	0	0	1	0	2	2	2	0	0	0	0	0	7	*	40
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
03:00	0	0	1	0	0	1	1	0	0	0	0	0	0	3	*	34
04:00	0	0	0	0	0	1	1	1	0	0	0	0	0	3	*	42
05:00	0	0	1	0	2	4	5	4	0	0	0	0	0	16	45	40
06:00	0	0	0	2	3	7	9	2	1	0	0	0	0	24	42	39
07:00	0	0	2	1	11	17	15	**9**	**2**	1	0	0	0	58	45	39
08:00	0	0	1	**8**	8	**37**	26	2	1	0	0	0	0	83	41	37
09:00	0	**1**	**3**	8	**16**	35	**33**	7	0	0	0	0	0	**103**	42	37
10:00	0	3	7	16	31	52	29	9	0	0	0	0	0	147	41	35
11:00	0	3	3	13	25	66	34	3	**2**	0	0	0	0	149	41	36
12 PM	**1**	2	10	24	**41**	84	**48**	**6**	0	**1**	0	0	0	217	41	35
13:00	1	**6**	9	**33**	38	**98**	34	2	1	0	0	0	0	**222**	39	34
14:00	1	5	**13**	15	33	75	28	5	0	0	**1**	0	0	176	40	34
15:00	0	**3**	**8**	**37**	**49**	**83**	**35**	1	0	0	0	0	0	**216**	39	34
16:00	0	0	1	8	42	82	28	**5**	0	0	0	0	0	166	40	36
17:00	0	3	4	6	26	46	21	2	0	0	0	0	0	108	40	35
18:00	0	0	1	8	16	47	20	5	0	**1**	0	0	0	98	41	37
19:00	0	1	0	6	15	34	17	4	1	0	0	0	0	78	41	37
20:00	0	0	2	6	7	36	9	3	0	0	0	0	0	63	40	36
21:00	0	0	0	0	6	19	14	1	1	0	0	0	0	41	42	39
22:00	0	0	1	1	6	11	3	1	0	0	0	0	0	23	39	36
23:00	0	0	0	1	0	6	12	5	**3**	0	0	0	0	27	48	42
%	0.1%	1.3%	3.3%	9.6%	18.4%	41.7%	20.9%	3.9%	0.6%	0.2%	0.0%	0.0%	0.0%			
AM Peak		09:00	09:00	08:00	09:00	08:00	09:00	07:00	07:00	00:00				09:00		
Vol.		1	3	8	16	37	33	9	2	1				103		
Midday Peak	12:00	13:00	14:00	13:00	12:00	13:00	12:00	12:00	11:00	12:00	14:00			13:00		
Vol.	1	6	13	33	41	98	48	6	2	1	1			222		
PM Peak		15:00	15:00	15:00	15:00	15:00	15:00	16:00	23:00	18:00				15:00		
Vol.		3	8	37	49	83	35	5	3	1				216		

% iles

15th Percentile : 28 MPH
50th Percentile : 36 MPH
85th Percentile : 41 MPH
95th Percentile : 44 MPH

Stats

10 MPH Pace Speed : 33-42 MPH
Number in Pace : 1251
Percent in Pace : 61.1%
Number of Vehicles > 35 MPH : 1179
Percent of Vehicles > 35 MPH : 57.6%
Mean Speed(Average) : 36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

EB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/19/1																
2	0	0	0	0	0	2	5	2	0	0	0	0	0	9	44	42
01:00	0	0	0	0	1	3	3	0	0	0	0	0	0	7	40	38
02:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	*	32
03:00	0	0	0	0	0	0	1	0	0	0	0	0	0	1	*	42
04:00	0	0	0	1	2	5	2	2	0	0	0	0	0	12	39	38
05:00	0	0	0	0	1	17	22	5	0	0	0	0	0	45	44	40
06:00	1	0	2	8	14	108	29	2	0	0	0	0	0	164	40	37
07:00	**10**	**5**	**7**	16	**96**	186	66	**6**	0	0	0	0	0	392	40	34
08:00	0	0	2	**33**	83	**232**	**112**	6	**2**	0	0	0	0	**470**	41	37
09:00	0	1	7	12	40	148	68	5	1	0	0	0	0	282	41	37
10:00	0	1	6	10	48	61	41	4	0	0	1	0	0	172	41	36
11:00	0	1	**8**	8	25	88	43	4	0	0	0	0	0	177	41	36
12 PM	1	1	1	7	35	**94**	32	6	0	0	0	0	0	177	40	36
13:00	0	1	5	**13**	27	89	46	5	**1**	0	0	0	0	187	41	37
14:00	**3**	**2**	6	8	**40**	79	**54**	**7**	1	0	0	0	0	**200**	41	36
15:00	0	1	2	**16**	55	89	**55**	**6**	0	0	0	0	0	224	41	36
16:00	0	2	6	11	62	**137**	31	2	0	0	0	0	0	**251**	39	35
17:00	**4**	**9**	**7**	16	**65**	100	35	0	0	0	0	0	0	236	39	33
18:00	0	0	0	9	50	99	18	2	0	0	0	0	0	178	39	36
19:00	0	0	2	3	33	57	19	2	0	0	0	0	0	116	40	36
20:00	0	0	1	2	12	28	10	1	0	0	0	0	0	54	40	36
21:00	0	0	2	5	10	35	12	2	0	0	0	0	0	66	40	36
22:00	0	0	0	3	5	11	23	2	1	0	0	0	0	45	42	39
23:00	0	0	0	0	0	11	8	1	**2**	0	0	0	0	22	42	41
%	0.5%	0.7%	1.8%	5.2%	20.2%	48.1%	21.1%	2.1%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	08:00	07:00	08:00	08:00	07:00	08:00					08:00		
Vol.	10	5	7	33	96	232	112	6	2					470		
Midday Peak	14:00	14:00	11:00	13:00	14:00	12:00	14:00	14:00	13:00					14:00		
Vol.	3	2	8	13	40	94	54	7	1					200		
PM Peak	17:00	17:00	17:00	15:00	17:00	16:00	15:00	15:00	23:00					16:00		
Vol.	4	9	7	16	65	137	55	6	2					251		

% iles

15th Percentile : 30 MPH
50th Percentile : 36 MPH
85th Percentile : 40 MPH
95th Percentile : 43 MPH

Stats

10 MPH Pace Speed : 33-42 MPH
Number in Pace : 2385
Percent in Pace : 68.4%
Number of Vehicles > 35 MPH : 2105
Percent of Vehicles > 35 MPH : 60.3%
Mean Speed(Average) : 36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/13/1																
2	0	0	0	0	1	4	0	1	0	0	0	0	0	6	37	38
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
02:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2	*	29
03:00	0	0	0	0	1	1	2	0	0	0	0	0	0	4	*	38
04:00	0	0	0	0	2	2	0	2	0	0	0	0	0	6	*	39
05:00	0	1	2	0	5	13	8	5	0	0	0	0	0	34	44	37
06:00	0	0	1	9	15	64	26	2	**1**	0	0	0	0	118	40	37
07:00	**1**	**2**	**11**	**12**	46	130	37	**8**	0	0	0	0	0	247	40	36
08:00	0	0	10	6	**49**	**136**	**62**	5	0	**1**	0	0	0	**269**	41	37
09:00	0	1	1	12	42	128	43	2	0	1	0	0	0	230	40	36
10:00	0	0	4	9	37	126	31	7	0	0	0	0	0	214	40	36
11:00	0	0	6	14	26	110	39	3	0	0	0	0	0	198	40	36
12 PM	**1**	**1**	0	1	20	99	**55**	4	0	0	0	0	0	181	41	38
13:00	1	1	2	4	43	**111**	43	**8**	0	0	0	0	0	213	41	37
14:00	0	1	**7**	**24**	**78**	104	39	8	0	0	0	0	0	**261**	40	35
15:00	**1**	**1**	3	29	94	160	**41**	**6**	0	0	0	0	0	335	39	35
16:00	0	0	2	34	219	**227**	24	0	0	0	0	0	0	506	38	34
17:00	0	0	**12**	**90**	**337**	173	10	1	0	0	0	0	0	**623**	36	33
18:00	0	0	1	41	220	179	16	0	0	0	0	0	0	457	37	34
19:00	0	0	4	19	75	95	13	0	0	0	0	0	0	206	38	34
20:00	0	1	0	4	37	53	17	1	0	0	0	0	0	113	39	36
21:00	0	0	1	4	15	38	10	0	0	0	0	0	0	68	39	36
22:00	0	0	1	0	9	13	4	2	0	0	0	0	0	29	40	36
23:00	0	0	0	0	4	7	4	2	0	0	0	0	0	17	42	38
%	0.1%	0.2%	1.6%	7.2%	31.7%	45.5%	12.1%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	07:00	08:00	08:00	08:00	07:00	06:00	08:00				08:00		
Vol.	1	2	11	12	49	136	62	8	1	1				269		
Midday Peak	12:00	12:00	14:00	14:00	14:00	13:00	12:00	13:00						14:00		
Vol.	1	1	7	24	78	111	55	8						261		
PM Peak	15:00	15:00	17:00	17:00	17:00	16:00	15:00	15:00						17:00		
Vol.	1	1	12	90	337	227	41	6						623		

% iles	
15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	39 MPH
95th Percentile :	42 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	3074
Percent in Pace :	70.9%
Number of Vehicles > 35 MPH :	2145
Percent of Vehicles > 35 MPH :	49.4%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/14/1																
2	0	0	0	0	2	5	3	1	0	0	0	0	0	11	41	38
01:00	0	0	0	0	1	1	2	0	0	0	0	0	0	4	*	38
02:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
03:00	0	0	0	0	2	2	1	0	1	0	0	0	0	6	*	39
04:00	0	0	0	0	5	2	0	0	0	0	0	0	0	7	34	33
05:00	**1**	0	1	0	5	14	13	2	1	0	0	0	0	37	42	37
06:00	0	0	0	6	12	58	32	4	0	0	0	0	0	112	41	38
07:00	0	0	5	5	21	117	55	5	1	0	0	0	0	209	41	38
08:00	0	**3**	**13**	**13**	**47**	**158**	**65**	**9**	0	0	0	0	0	**308**	41	36
09:00	0	0	3	2	22	125	57	8	**2**	0	0	0	0	219	41	38
10:00	0	0	4	8	36	86	43	7	0	0	0	0	0	184	41	37
11:00	0	**1**	2	9	24	115	53	7	0	0	0	0	0	211	41	37
12 PM	0	0	2	5	**53**	101	55	**12**	0	0	0	0	0	228	41	37
13:00	0	0	**7**	5	19	122	**73**	3	0	0	0	0	0	229	41	38
14:00	0	1	2	**10**	49	**141**	52	3	0	0	0	0	0	**258**	40	37
15:00	0	**8**	**31**	**50**	85	132	42	2	0	0	0	0	0	350	39	33
16:00	**1**	4	5	30	145	**256**	**50**	**6**	0	0	0	0	0	497	39	35
17:00	0	2	7	44	**271**	246	24	0	0	0	0	0	0	**594**	37	34
18:00	0	0	0	14	144	198	31	3	0	0	0	0	0	390	38	35
19:00	0	0	3	19	89	91	16	0	0	0	0	0	0	218	38	34
20:00	0	0	0	4	32	61	17	2	0	0	0	0	0	116	39	36
21:00	0	2	2	4	20	27	15	3	0	0	0	0	0	73	41	35
22:00	0	0	1	1	6	19	9	0	0	0	0	0	0	36	40	37
23:00	0	0	0	2	2	12	5	4	0	0	0	0	0	25	44	38
%	0.0%	0.5%	2.0%	5.3%	25.3%	48.3%	16.5%	1.9%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	05:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	09:00					08:00		
Vol.	1	3	13	13	47	158	65	9	2					308		
Midday Peak		11:00	13:00	14:00	12:00	14:00	13:00	12:00						14:00		
Vol.		1	7	10	53	141	73	12						258		
PM Peak	16:00	15:00	15:00	15:00	17:00	16:00	16:00	16:00						17:00		
Vol.	1	8	31	50	271	256	50	6						594		

% iles	
15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH

Stats	
10 MPH Pace Speed :	32-41 MPH
Number in Pace :	3022
Percent in Pace :	69.9%
Number of Vehicles > 35 MPH :	2424
Percent of Vehicles > 35 MPH :	56.1%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/15/1																
2	0	0	0	1	3	1	1	1	0	0	0	0	0	7	32	36
01:00	0	0	0	0	1	1	1	0	0	0	0	0	0	3	*	37
02:00	0	0	1	0	0	2	1	0	0	0	0	0	0	4	*	35
03:00	0	0	0	0	3	4	0	0	0	0	0	0	0	7	36	35
04:00	0	0	0	0	0	0	2	0	0	0	0	0	0	2	*	42
05:00	0	0	2	0	3	11	9	2	**1**	0	0	0	0	28	42	38
06:00	0	0	1	2	15	66	32	**6**	0	0	0	0	0	122	41	38
07:00	0	1	2	7	48	116	**64**	4	0	0	0	0	0	242	41	37
08:00	0	**2**	3	**10**	**56**	**134**	43	6	0	0	0	0	0	**254**	40	36
09:00	0	0	**4**	7	52	126	36	4	0	0	0	0	0	229	40	36
10:00	0	0	5	4	28	95	49	5	1	0	0	0	0	187	41	37
11:00	0	0	3	5	27	107	58	4	0	0	0	0	0	204	41	37
12 PM	0	0	3	6	30	98	65	5	**3**	0	0	0	0	210	42	38
13:00	0	0	4	5	25	108	**69**	**10**	0	0	0	0	0	221	42	38
14:00	**1**	0	**7**	**11**	**58**	**137**	63	6	0	0	0	0	0	**283**	41	36
15:00	**4**	**3**	**7**	16	97	162	56	**6**	0	0	0	0	0	351	40	35
16:00	0	1	5	21	228	209	**62**	3	0	0	0	0	0	529	39	35
17:00	0	0	6	44	**260**	**236**	24	1	0	0	0	0	0	**571**	37	34
18:00	0	1	1	**46**	199	163	30	2	0	0	0	0	0	442	38	34
19:00	0	0	2	7	65	92	23	2	0	0	0	0	0	191	39	35
20:00	0	0	5	2	34	69	15	2	0	0	0	0	0	127	39	36
21:00	0	1	0	7	26	49	14	0	**2**	0	0	0	0	99	39	36
22:00	0	0	0	3	8	22	7	1	0	0	0	0	0	41	40	36
23:00	0	0	0	2	6	8	5	0	0	0	0	0	0	21	41	36
%	0.1%	0.2%	1.4%	4.7%	29.1%	46.1%	16.7%	1.6%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak		08:00	09:00	08:00	08:00	08:00	07:00	06:00	05:00					08:00		
Vol.		2	4	10	56	134	64	6	1					254		
Midday Peak	14:00		14:00	14:00	14:00	14:00	13:00	13:00	12:00					14:00		
Vol.	1		7	11	58	137	69	10	3					283		
PM Peak	15:00	15:00	15:00	18:00	17:00	17:00	16:00	15:00	21:00					17:00		
Vol.	4	3	7	46	260	236	62	6	2					571		

% iles	
15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	3080
Percent in Pace :	70.4%
Number of Vehicles > 35 MPH :	2385
Percent of Vehicles > 35 MPH :	54.5%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
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Bedford Street (Route 62)
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Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/16/1																
2	0	0	0	0	3	5	5	0	0	0	0	0	0	13	42	38
01:00	0	0	0	0	1	1	0	1	0	0	0	0	0	3	*	39
02:00	0	0	0	0	0	1	0	0	1	0	0	0	0	2	*	45
03:00	0	0	0	0	3	2	0	1	0	0	0	0	0	6	33	36
04:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
05:00	0	0	3	0	3	15	7	3	1	0	0	0	0	32	43	38
06:00	0	0	0	3	19	67	25	4	0	0	0	0	0	118	41	37
07:00	0	0	0	8	29	114	60	5	0	0	0	0	0	216	41	38
08:00	0	**2**	**6**	**10**	**47**	**138**	59	4	0	0	0	0	0	**266**	40	36
09:00	**2**	0	3	10	25	75	**62**	**9**	**2**	0	0	0	0	188	42	37
10:00	0	0	3	5	31	92	47	7	1	0	0	0	0	186	41	37
11:00	0	0	**5**	11	22	112	64	3	0	0	0	0	0	217	41	37
12 PM	0	1	5	5	41	108	**72**	**9**	0	0	0	0	0	241	42	37
13:00	0	0	1	4	**67**	100	52	5	0	0	0	0	0	229	41	37
14:00	0	**6**	3	**24**	46	**127**	55	8	0	0	0	0	0	**269**	40	36
15:00	**1**	**3**	**11**	13	106	183	**55**	**9**	0	0	0	0	0	381	40	35
16:00	0	1	5	**46**	185	188	37	1	0	0	0	0	0	463	38	34
17:00	0	0	3	37	**262**	**211**	18	1	0	0	0	0	0	**532**	37	34
18:00	0	0	2	13	122	149	25	3	0	0	0	0	0	314	38	35
19:00	0	0	1	9	55	72	18	4	0	0	0	0	0	159	39	35
20:00	0	0	0	5	30	50	17	2	**1**	0	0	0	0	105	40	36
21:00	0	0	0	3	26	30	12	0	0	0	0	0	0	71	39	36
22:00	0	1	0	11	20	26	9	3	0	0	0	0	0	70	39	35
23:00	0	0	0	2	8	11	9	0	0	0	0	0	0	30	41	36
%	0.1%	0.3%	1.2%	5.3%	28.0%	45.7%	17.2%	2.0%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	08:00	08:00	08:00	08:00	08:00	09:00	09:00	09:00					08:00		
Vol.	2	2	6	10	47	138	62	9	2					266		
Midday Peak		14:00	11:00	14:00	13:00	14:00	12:00	12:00						14:00		
Vol.		6	5	24	67	127	72	9						269		
PM Peak	15:00	15:00	15:00	16:00	17:00	17:00	15:00	15:00	20:00					17:00		
Vol.	1	3	11	46	262	211	55	9	1					532		

% iles	
15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	2851
Percent in Pace :	69.3%
Number of Vehicles > 35 MPH :	2264
Percent of Vehicles > 35 MPH :	55.1%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
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west of Old Bedford Street
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Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/17/1																
2	0	0	0	1	5	10	7	1	0	0	0	0	0	24	41	37
01:00	0	0	0	0	2	1	2	0	0	0	0	0	0	5	*	37
02:00	0	0	0	1	4	0	2	0	0	0	0	0	0	7	32	34
03:00	0	0	0	0	1	1	1	0	0	0	0	0	0	3	*	37
04:00	0	0	0	0	2	4	1	1	0	0	0	0	0	8	38	38
05:00	0	0	0	0	0	2	3	3	0	0	0	0	0	8	45	43
06:00	0	0	2	2	7	21	16	2	**1**	0	0	0	0	51	42	38
07:00	0	**1**	1	1	7	36	30	**5**	0	0	0	0	0	81	43	38
08:00	0	1	2	3	23	52	**40**	3	0	0	0	0	0	124	42	37
09:00	**2**	0	**5**	**12**	**42**	**98**	23	5	0	0	0	0	0	**187**	39	35
10:00	4	4	11	10	84	69	18	0	1	0	0	0	0	201	38	33
11:00	0	0	**9**	13	**68**	**120**	44	7	0	0	0	0	0	**261**	40	36
12 PM	**1**	**1**	5	14	48	102	**54**	**9**	0	0	0	0	0	234	41	36
13:00	0	0	6	13	55	107	54	5	0	0	0	0	0	240	41	36
14:00	0	0	6	**23**	57	115	39	6	0	0	0	0	0	246	40	36
15:00	0	0	**11**	**28**	**91**	**165**	**43**	2	0	0	0	0	0	**340**	39	35
16:00	0	1	11	20	78	127	35	**8**	**1**	0	0	0	0	281	39	35
17:00	0	0	3	7	44	83	27	1	0	0	0	0	0	165	39	36
18:00	0	0	1	13	64	65	17	1	1	0	0	0	0	162	38	35
19:00	0	**3**	0	4	42	55	10	0	0	0	0	0	0	114	38	34
20:00	0	0	0	2	32	51	19	5	0	0	0	0	0	109	41	37
21:00	0	0	4	6	23	28	11	1	1	0	0	0	0	74	39	35
22:00	0	0	0	3	21	28	5	1	0	0	0	0	0	58	39	35
23:00	0	0	0	2	11	17	5	1	0	0	0	0	0	36	40	36
%	0.2%	0.4%	2.6%	5.9%	26.9%	44.9%	16.8%	2.2%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	07:00	09:00	09:00	09:00	09:00	08:00	07:00	06:00					09:00		
Vol.	2	1	5	12	42	98	40	5	1					187		
Midday Peak	12:00	12:00	11:00	14:00	11:00	11:00	12:00	12:00						11:00		
Vol.	1	1	9	23	68	120	54	9						261		
PM Peak		19:00	15:00	15:00	15:00	15:00	15:00	16:00	16:00					15:00		
Vol.		3	11	28	91	165	43	8	1					340		

% iles

15th Percentile : 29 MPH
50th Percentile : 35 MPH
85th Percentile : 40 MPH
95th Percentile : 43 MPH

Stats

10 MPH Pace Speed : 31-40 MPH
Number in Pace : 2041
Percent in Pace : 67.6%
Number of Vehicles > 35 MPH : 1636
Percent of Vehicles > 35 MPH : 54.2%
Mean Speed(Average) : 36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/18/1																
2	0	0	0	0	4	6	3	3	0	0	0	0	0	16	44	39
01:00	0	0	0	1	2	5	2	0	0	0	0	0	0	10	39	36
02:00	0	0	0	0	1	1	1	0	0	0	0	0	0	3	*	37
03:00	0	0	0	0	2	2	1	0	0	0	0	0	0	5	*	36
04:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
05:00	0	0	0	0	0	2	1	1	0	0	0	0	0	4	*	41
06:00	0	0	0	1	4	8	10	3	0	0	0	0	0	26	43	39
07:00	0	0	**5**	4	11	17	17	2	0	0	0	0	0	56	42	36
08:00	0	0	4	2	6	37	27	**9**	**2**	0	0	0	0	87	43	39
09:00	0	0	4	**12**	**17**	**53**	**38**	9	1	0	0	0	0	**134**	42	37
10:00	0	0	6	7	22	56	35	4	2	0	0	0	0	132	42	37
11:00	0	1	9	11	34	95	44	**6**	0	0	0	0	0	200	41	36
12 PM	0	**2**	13	14	30	85	48	4	0	0	0	0	0	196	41	36
13:00	0	0	6	**22**	30	102	**52**	1	**1**	0	0	0	0	214	40	36
14:00	0	0	**14**	16	**47**	**115**	50	6	0	0	0	0	0	**248**	40	36
15:00	0	**3**	10	**24**	57	**113**	**38**	2	0	0	0	0	0	**247**	39	35
16:00	0	1	**15**	14	**77**	86	21	2	1	0	0	0	0	217	38	34
17:00	0	1	4	10	26	67	20	2	0	0	0	0	0	130	39	35
18:00	0	0	1	10	45	61	18	2	0	0	0	0	0	137	39	35
19:00	0	0	0	10	20	48	13	1	0	0	0	0	0	92	39	36
20:00	0	0	2	4	27	36	20	1	**2**	0	0	0	0	92	40	36
21:00	0	1	0	2	13	25	5	1	1	0	0	0	0	48	39	36
22:00	0	0	0	1	6	8	3	0	0	0	0	0	0	18	39	36
23:00	0	0	0	0	1	8	3	**3**	0	0	0	0	0	15	44	40
%	0.0%	0.4%	4.0%	7.1%	20.7%	44.5%	20.2%	2.7%	0.4%	0.0%	0.0%	0.0%	0.0%			
AM Peak			07:00	09:00	09:00	09:00	09:00	08:00	08:00					09:00		
Vol.			5	12	17	53	38	9	2					134		
Midday Peak		12:00	14:00	13:00	14:00	14:00	13:00	11:00	13:00					14:00		
Vol.		2	14	22	47	115	52	6	1					248		
PM Peak		15:00	16:00	15:00	16:00	15:00	15:00	23:00	20:00					15:00		
Vol.		3	15	24	77	113	38	3	2					247		

% iles	
15th Percentile :	29 MPH
50th Percentile :	35 MPH
85th Percentile :	41 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	32-41 MPH
Number in Pace :	1512
Percent in Pace :	64.9%
Number of Vehicles > 35 MPH :	1347
Percent of Vehicles > 35 MPH :	57.8%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
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Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

123082 E Speed
Site Code: TBA

WB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/19/1																
2	0	0	0	0	2	4	3	3	0	0	0	0	0	12	44	40
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	3	0	0	0	0	0	0	0	3	36	37
03:00	0	0	0	0	1	1	0	1	0	0	0	0	0	3	*	39
04:00	0	0	1	1	2	5	3	1	0	0	0	0	0	13	41	36
05:00	0	0	2	0	1	13	8	1	**1**	0	0	0	0	26	41	38
06:00	0	0	0	3	12	59	31	**6**	0	0	0	0	0	111	42	38
07:00	0	0	**3**	13	27	105	58	5	0	0	0	0	0	211	41	37
08:00	0	1	3	**14**	**34**	**142**	**68**	5	0	0	0	0	0	**267**	41	37
09:00	0	**2**	3	7	32	129	51	5	1	0	0	0	0	230	41	37
10:00	0	0	2	7	48	87	47	2	0	0	0	0	0	193	41	37
11:00	0	0	4	4	32	119	33	3	0	0	0	0	0	195	40	37
12 PM	0	0	**8**	5	39	120	58	5	0	0	0	0	0	235	41	37
13:00	0	**1**	2	4	33	105	**59**	**11**	**1**	0	0	0	0	216	42	38
14:00	0	1	3	**8**	**57**	**155**	53	8	0	0	0	0	0	**285**	40	37
15:00	**2**	0	5	19	92	184	**77**	**4**	**2**	0	0	0	0	385	40	36
16:00	2	0	6	13	166	**249**	48	2	0	0	0	0	0	486	39	35
17:00	0	0	6	**45**	**304**	223	22	2	0	0	0	0	0	**602**	37	34
18:00	0	**1**	**7**	33	149	181	28	0	0	0	0	0	0	399	38	34
19:00	0	0	1	6	50	127	30	3	0	0	0	0	0	217	39	36
20:00	0	0	1	2	26	54	22	3	0	0	0	0	0	108	40	37
21:00	0	1	0	4	8	36	13	1	0	0	0	0	0	63	41	36
22:00	0	0	0	1	10	14	11	3	0	0	0	0	0	39	42	38
23:00	0	0	0	0	1	7	9	2	0	0	0	0	0	19	43	40
%	0.1%	0.2%	1.3%	4.4%	26.1%	49.1%	17.0%	1.8%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak		09:00	07:00	08:00	08:00	08:00	08:00	06:00	05:00					08:00		
Vol.		2	3	14	34	142	68	6	1					267		
Midday Peak		13:00	12:00	14:00	14:00	14:00	13:00	13:00	13:00					14:00		
Vol.		1	8	8	57	155	59	11	1					285		
PM Peak	15:00	18:00	18:00	17:00	17:00	16:00	15:00	15:00	15:00					17:00		
Vol.	2	1	7	45	304	249	77	4	2					602		

% iles

15th Percentile : 30 MPH
50th Percentile : 35 MPH
85th Percentile : 40 MPH
95th Percentile : 43 MPH

Stats

10 MPH Pace Speed : 32-41 MPH
Number in Pace : 3086
Percent in Pace : 71.5%
Number of Vehicles > 35 MPH : 2467
Percent of Vehicles > 35 MPH : 57.1%
Mean Speed(Average) : 36 MPH

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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123082 E Volume
Site Code: TBA

Start	13-Nov-12		14-Nov-12		15-Nov-12		16-Nov-12		17-Nov-12		18-Nov-12		19-Nov-12		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	2	6	3	11	6	7	11	13	16	24	19	16	9	12	9	13
01:00	8	1	6	4	7	3	9	3	7	5	7	10	7	0	7	4
02:00	1	2	1	1	3	4	2	2	2	7	1	3	2	3	2	3
03:00	2	4	1	6	3	7	3	6	6	3	3	5	1	3	3	5
04:00	7	6	6	7	8	2	9	2	4	8	3	2	12	13	7	6
05:00	52	34	56	37	54	28	45	32	20	8	16	4	45	26	41	24
06:00	159	118	155	112	183	122	153	118	34	51	24	26	164	111	125	94
07:00	371	247	404	209	406	242	**402**	216	76	81	58	56	392	211	301	180
08:00	**450**	**269**	**456**	**308**	**456**	**254**	388	**266**	133	124	83	87	**470**	**267**	**348**	**225**
09:00	328	230	310	219	289	229	257	188	157	187	103	134	282	230	247	202
10:00	197	214	181	184	216	187	180	186	**220**	201	147	132	172	193	188	185
11:00	190	198	208	211	195	204	190	217	205	**261**	**149**	**200**	177	195	188	212
12:00 PM	181	181	225	228	194	210	203	241	249	234	217	196	177	235	207	218
01:00	175	213	191	229	199	221	192	229	231	240	**222**	214	187	216	200	223
02:00	210	261	196	258	184	283	187	269	**274**	246	176	**248**	200	285	204	264
03:00	235	335	215	350	251	351	**270**	381	210	**340**	216	247	224	385	**232**	341
04:00	238	506	250	497	229	529	252	463	158	281	166	217	**251**	486	221	426
05:00	**241**	**623**	**252**	**594**	**279**	**571**	259	**532**	173	165	108	130	236	**602**	221	**460**
06:00	183	457	176	390	181	442	202	314	137	162	98	137	178	399	165	329
07:00	106	206	111	218	109	191	126	159	75	114	78	92	116	217	103	171
08:00	78	113	83	116	83	127	73	105	59	109	63	92	54	108	70	110
09:00	45	68	67	73	66	99	43	71	65	74	41	48	66	63	56	71
10:00	32	29	33	36	37	41	62	70	65	58	23	18	45	39	42	42
11:00	23	17	23	25	35	21	29	30	42	36	27	15	22	19	29	23
Total	3514	4338	3609	4323	3673	4375	3547	4113	2618	3019	2048	2329	3489	4318	3216	3831
Day	7852		7932		8048		7660		5637		4377		7807		7047	
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	07:00	08:00	10:00	11:00	11:00	11:00	08:00	08:00	08:00	08:00
Vol.	450	269	456	308	456	254	402	266	220	261	149	200	470	267	348	225
PM Peak	17:00	17:00	17:00	17:00	17:00	17:00	15:00	17:00	14:00	15:00	13:00	14:00	16:00	17:00	15:00	17:00
Vol.	241	623	252	594	279	571	270	532	274	340	222	248	251	602	232	460

Comb. Total	7852	7932	8048	7660	5637	4377	7807	7047

ADT ADT 7,045 AADT 7,045

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
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123082 E Volume
Site Code: TBA

Start	EB				WB				Combined				13-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	1		44		2		53		3		97		
12:15	0		39		3		40		3		79		
12:30	0		46		1		47		1		93		
12:45	1	2	52	181	0	6	41	181	1	8	93	362	
01:00	0		43		0		43		0		86		
01:15	4		46		1		55		5		101		
01:30	2		41		0		61		2		102		
01:45	2	8	45	175	0	1	54	213	2	9	99	388	
02:00	0		49		0		57		0		106		
02:15	0		43		0		55		0		98		
02:30	0		66		0		73		0		139		
02:45	1	1	52	210	2	2	76	261	3	3	128	471	
03:00	0		46		1		81		1		127		
03:15	1		58		1		74		2		132		
03:30	0		62		2		94		2		156		
03:45	1	2	69	235	0	4	86	335	1	6	155	570	
04:00	2		53		2		96		4		149		
04:15	1		68		0		121		1		189		
04:30	0		63		2		131		2		194		
04:45	4	7	54	238	2	6	158	506	6	13	212	744	
05:00	4		52		3		153		7		205		
05:15	10		80		4		169		14		249		
05:30	15		49		13		168		28		217		
05:45	23	52	60	241	14	34	133	623	37	86	193	864	
06:00	25		62		18		136		43		198		
06:15	28		56		26		120		54		176		
06:30	44		35		32		100		76		135		
06:45	62	159	30	183	42	118	101	457	104	277	131	640	
07:00	79		29		58		76		137		105		
07:15	79		22		55		49		134		71		
07:30	91		35		57		42		148		77		
07:45	122	371	20	106	77	247	39	206	199	618	59	312	
08:00	122		12		69		31		191		43		
08:15	118		22		59		27		177		49		
08:30	105		27		75		28		180		55		
08:45	105	450	17	78	66	269	27	113	171	719	44	191	
09:00	114		8		70		21		184		29		
09:15	68		8		47		19		115		27		
09:30	76		22		52		18		128		40		
09:45	70	328	7	45	61	230	10	68	131	558	17	113	
10:00	55		11		53		12		108		23		
10:15	55		14		48		6		103		20		
10:30	51		4		47		6		98		10		
10:45	36	197	3	32	66	214	5	29	102	411	8	61	
11:00	46		9		50		6		96		15		
11:15	44		5		45		3		89		8		
11:30	50		7		55		3		105		10		
11:45	50	190	2	23	48	198	5	17	98	388	7	40	
Total	1767		1747		1329		3009		3096		4756		
Percent	57.1%		36.7%		42.9%		63.3%						
Day Total		3514				4338				7852			
Peak	07:45		03:45		07:45		04:45		07:45		04:45		
Vol.	467		253		280		648		747		883		
P.H.F.	0.957		0.917		0.909		0.959		0.938		0.887		

Bedford Street (Route 62)
west of Old Bedford Street
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123082 E Volume
Site Code: TBA

Start	EB				WB				Combined				14-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	2		45		5		49		7		94		
12:15	1		66		5		57		6		123		
12:30	0		51		1		68		1		119		
12:45	0	3	63	225	0	11	54	228	0	14	117	453	
01:00	1		50		1		40		2		90		
01:15	2		44		1		69		3		113		
01:30	3		51		0		67		3		118		
01:45	0	6	46	191	2	4	53	229	2	10	99	420	
02:00	1		36		1		59		2		95		
02:15	0		51		0		58		0		109		
02:30	0		50		0		77		0		127		
02:45	0	1	59	196	0	1	64	258	0	2	123	454	
03:00	0		58		1		70		1		128		
03:15	0		54		1		101		1		155		
03:30	0		53		4		75		4		128		
03:45	1	1	50	215	0	6	104	350	1	7	154	565	
04:00	4		60		0		102		4		162		
04:15	0		63		0		124		0		187		
04:30	0		56		2		133		2		189		
04:45	2	6	71	250	5	7	138	497	7	13	209	747	
05:00	2		65		2		139		4		204		
05:15	12		74		8		161		20		235		
05:30	16		58		14		156		30		214		
05:45	26	56	55	252	13	37	138	594	39	93	193	846	
06:00	18		48		16		112		34		160		
06:15	33		58		21		109		54		167		
06:30	40		36		32		99		72		135		
06:45	64	155	34	176	43	112	70	390	107	267	104	566	
07:00	97		36		43		79		140		115		
07:15	85		26		48		67		133		93		
07:30	95		25		45		34		140		59		
07:45	127	404	24	111	73	209	38	218	200	613	62	329	
08:00	105		25		59		33		164		58		
08:15	101		15		83		35		184		50		
08:30	118		22		88		22		206		44		
08:45	132	456	21	83	78	308	26	116	210	764	47	199	
09:00	111		16		52		15		163		31		
09:15	75		10		70		18		145		28		
09:30	64		17		54		22		118		39		
09:45	60	310	24	67	43	219	18	73	103	529	42	140	
10:00	49		11		42		13		91		24		
10:15	51		9		42		10		93		19		
10:30	41		6		61		9		102		15		
10:45	40	181	7	33	39	184	4	36	79	365	11	69	
11:00	50		6		35		11		85		17		
11:15	57		6		55		7		112		13		
11:30	43		4		60		5		103		9		
11:45	58	208	7	23	61	211	2	25	119	419	9	48	
Total	1787		1822		1309		3014		3096		4836		
Percent	57.7%		37.7%		42.3%		62.3%						
Day Total		3609				4323				7932			
Peak	08:15		04:45		08:00		04:45		08:00		04:45		
Vol.	462		268		308		594		764		862		
P.H.F.	0.875		0.905		0.875		0.922		0.910		0.917		

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 E Volume
Site Code: TBA

Start	EB				WB				Combined				15-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	2		48		4		54		6		102		
12:15	1		44		1		34		2		78		
12:30	2		49		2		53		4		102		
12:45	1	6	53	194	0	7	69	210	1	13	122	404	
01:00	1		46		0		41		1		87		
01:15	3		49		0		59		3		108		
01:30	1		49		1		60		2		109		
01:45	2	7	55	199	2	3	61	221	4	10	116	420	
02:00	1		42		2		63		3		105		
02:15	0		42		0		68		0		110		
02:30	0		49		2		76		2		125		
02:45	2	3	51	184	0	4	76	283	2	7	127	467	
03:00	0		72		1		104		1		176		
03:15	0		53		0		78		0		131		
03:30	0		49		4		82		4		131		
03:45	3	3	77	251	2	7	87	351	5	10	164	602	
04:00	3		52		0		141		3		193		
04:15	1		56		1		118		2		174		
04:30	1		58		0		123		1		181		
04:45	3	8	63	229	1	2	147	529	4	10	210	758	
05:00	3		84		1		150		4		234		
05:15	13		75		5		166		18		241		
05:30	10		67		10		149		20		216		
05:45	28	54	53	279	12	28	106	571	40	82	159	850	
06:00	24		48		16		138		40		186		
06:15	32		62		22		124		54		186		
06:30	47		44		43		102		90		146		
06:45	80	183	27	181	41	122	78	442	121	305	105	623	
07:00	79		28		61		58		140		86		
07:15	108		28		52		61		160		89		
07:30	113		32		50		39		163		71		
07:45	106	406	21	109	79	242	33	191	185	648	54	300	
08:00	112		16		58		32		170		48		
08:15	111		22		68		39		179		61		
08:30	128		24		70		27		198		51		
08:45	105	456	21	83	58	254	29	127	163	710	50	210	
09:00	93		18		69		30		162		48		
09:15	60		19		63		25		123		44		
09:30	65		16		58		29		123		45		
09:45	71	289	13	66	39	229	15	99	110	518	28	165	
10:00	55		12		45		15		100		27		
10:15	58		12		49		6		107		18		
10:30	50		10		53		6		103		16		
10:45	53	216	3	37	40	187	14	41	93	403	17	78	
11:00	43		13		44		6		87		19		
11:15	48		11		54		2		102		13		
11:30	66		4		49		8		115		12		
11:45	38	195	7	35	57	204	5	21	95	399	12	56	
Total	1826		1847		1289		3086		3115		4933		
Percent	58.6%		37.4%		41.4%		62.6%						
Day Total		3673				4375				8048			
Peak	07:45		04:45		07:45		04:45		07:45		04:45		
Vol.	457		289		275		612		732		901		
P.H.F.	0.893		0.860		0.870		0.922		0.924		0.935		

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 E Volume
Site Code: TBA

Start	EB				WB				Combined				16-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Fri
12:00	5		50		7		42		12		92		
12:15	2		49		2		59		4		108		
12:30	4		44		1		70		5		114		
12:45	0	11	60	203	3	13	70	241	3	24	130	444	
01:00	1		42		0		43		1		85		
01:15	6		52		2		68		8		120		
01:30	1		51		1		66		2		117		
01:45	1	9	47	192	0	3	52	229	1	12	99	421	
02:00	0		36		1		54		1		90		
02:15	1		54		1		69		2		123		
02:30	1		46		0		63		1		109		
02:45	0	2	51	187	0	2	83	269	0	4	134	456	
03:00	0		67		4		95		4		162		
03:15	0		71		0		99		0		170		
03:30	1		71		1		96		2		167		
03:45	2	3	61	270	1	6	91	381	3	9	152	651	
04:00	4		58		0		104		4		162		
04:15	0		61		0		117		0		178		
04:30	2		58		1		105		3		163		
04:45	3	9	75	252	1	2	137	463	4	11	212	715	
05:00	2		63		2		156		4		219		
05:15	8		72		8		125		16		197		
05:30	13		69		12		134		25		203		
05:45	22	45	55	259	10	32	117	532	32	77	172	791	
06:00	24		61		18		104		42		165		
06:15	27		56		21		91		48		147		
06:30	35		45		38		67		73		112		
06:45	67	153	40	202	41	118	52	314	108	271	92	516	
07:00	78		37		49		53		127		90		
07:15	86		34		35		41		121		75		
07:30	109		32		59		35		168		67		
07:45	129	402	23	126	73	216	30	159	202	618	53	285	
08:00	97		24		64		20		161		44		
08:15	107		17		62		30		169		47		
08:30	104		15		75		33		179		48		
08:45	80	388	17	73	65	266	22	105	145	654	39	178	
09:00	69		9		62		15		131		24		
09:15	70		9		39		13		109		22		
09:30	61		12		57		27		118		39		
09:45	57	257	13	43	30	188	16	71	87	445	29	114	
10:00	50		16		35		15		85		31		
10:15	47		14		42		23		89		37		
10:30	40		25		45		20		85		45		
10:45	43	180	7	62	64	186	12	70	107	366	19	132	
11:00	60		8		46		7		106		15		
11:15	38		10		58		10		96		20		
11:30	45		7		58		8		103		15		
11:45	47	190	4	29	55	217	5	30	102	407	9	59	
Total	1649		1898		1249		2864		2898		4762		
Percent	56.9%		39.9%		43.1%		60.1%						
Day Total		3547				4113				7660			
Peak	07:30		04:45		07:45		04:45		07:45		04:45		
Vol.	442		279		274		552		711		831		
P.H.F.	0.857		0.930		0.913		0.885		0.880		0.949		

Bedford Street (Route 62)
west of Old Bedford Street
City, State: Concord, MA
Client: Toole Design Group/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

123082 E Volume
Site Code: TBA

Start	EB				WB				Combined				17-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sat
12:00	5		56		5		63		10		119		
12:15	4		68		10		64		14		132		
12:30	1		61		3		53		4		114		
12:45	6	16	64	249	6	24	54	234	12	40	118	483	
01:00	5		51		1		57		6		108		
01:15	0		66		2		63		2		129		
01:30	2		48		1		62		3		110		
01:45	0	7	66	231	1	5	58	240	1	12	124	471	
02:00	0		59		2		66		2		125		
02:15	1		66		3		56		4		122		
02:30	1		71		1		55		2		126		
02:45	0	2	78	274	1	7	69	246	1	9	147	520	
03:00	4		56		2		62		6		118		
03:15	1		64		0		78		1		142		
03:30	0		40		1		69		1		109		
03:45	1	6	50	210	0	3	131	340	1	9	181	550	
04:00	2		41		2		95		4		136		
04:15	0		37		2		64		2		101		
04:30	1		31		1		62		2		93		
04:45	1	4	49	158	3	8	60	281	4	12	109	439	
05:00	1		40		2		49		3		89		
05:15	3		61		1		42		4		103		
05:30	6		28		3		39		9		67		
05:45	10	20	44	173	2	8	35	165	12	28	79	338	
06:00	4		44		4		47		8		91		
06:15	5		30		13		39		18		69		
06:30	8		30		14		36		22		66		
06:45	17	34	33	137	20	51	40	162	37	85	73	299	
07:00	16		17		18		29		34		46		
07:15	17		24		8		32		25		56		
07:30	21		16		21		27		42		43		
07:45	22	76	18	75	34	81	26	114	56	157	44	189	
08:00	20		18		22		26		42		44		
08:15	34		21		19		37		53		58		
08:30	36		6		40		27		76		33		
08:45	43	133	14	59	43	124	19	109	86	257	33	168	
09:00	21		16		39		20		60		36		
09:15	48		15		36		20		84		35		
09:30	47		19		52		22		99		41		
09:45	41	157	15	65	60	187	12	74	101	344	27	139	
10:00	53		12		53		16		106		28		
10:15	38		15		50		15		88		30		
10:30	66		20		48		14		114		34		
10:45	63	220	18	65	50	201	13	58	113	421	31	123	
11:00	52		14		68		12		120		26		
11:15	49		10		70		12		119		22		
11:30	51		12		60		6		111		18		
11:45	53	205	6	42	63	261	6	36	116	466	12	78	
Total	880		1738		960		2059		1840		3797		
Percent	47.8%		45.8%		52.2%		54.2%						
Day Total		2618				3019				5637			
Peak	10:30		02:00		11:00		03:15		10:30		03:15		
Vol.	230		274		261		373		466		568		
P.H.F.	0.871		0.878		0.932		0.712		0.971		0.785		

Bedford Street (Route 62)
west of Old Bedford Street
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Office: 508.481.3999 Fax: 508.545.1234
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123082 E Volume
Site Code: TBA

Start	EB				WB				Combined				18-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sun
12:00	7		47		10		37		17		84		
12:15	5		48		5		63		10		111		
12:30	3		40		1		51		4		91		
12:45	4	19	82	217	0	16	45	196	4	35	127	413	
01:00	0		47		3		53		3		100		
01:15	3		57		2		48		5		105		
01:30	2		48		3		54		5		102		
01:45	2	7	70	222	2	10	59	214	4	17	129	436	
02:00	0		55		1		63		1		118		
02:15	0		39		0		58		0		97		
02:30	1		37		2		58		3		95		
02:45	0	1	45	176	0	3	69	248	0	4	114	424	
03:00	2		53		1		49		3		102		
03:15	0		52		3		55		3		107		
03:30	0		59		1		82		1		141		
03:45	1	3	52	216	0	5	61	247	1	8	113	463	
04:00	1		51		1		62		2		113		
04:15	0		45		1		68		1		113		
04:30	1		37		0		40		1		77		
04:45	1	3	33	166	0	2	47	217	1	5	80	383	
05:00	3		28		2		44		5		72		
05:15	2		24		1		30		3		54		
05:30	1		23		0		24		1		47		
05:45	10	16	33	108	1	4	32	130	11	20	65	238	
06:00	5		33		1		37		6		70		
06:15	2		30		4		40		6		70		
06:30	8		24		8		33		16		57		
06:45	9	24	11	98	13	26	27	137	22	50	38	235	
07:00	16		24		13		29		29		53		
07:15	12		19		10		16		22		35		
07:30	14		20		15		21		29		41		
07:45	16	58	15	78	18	56	26	92	34	114	41	170	
08:00	13		22		16		25		29		47		
08:15	13		9		25		27		38		36		
08:30	31		18		21		20		52		38		
08:45	26	83	14	63	25	87	20	92	51	170	34	155	
09:00	26		19		24		12		50		31		
09:15	14		11		31		13		45		24		
09:30	29		5		39		11		68		16		
09:45	34	103	6	41	40	134	12	48	74	237	18	89	
10:00	41		8		30		6		71		14		
10:15	34		5		27		5		61		10		
10:30	40		7		39		3		79		10		
10:45	32	147	3	23	36	132	4	18	68	279	7	41	
11:00	40		9		40		6		80		15		
11:15	25		7		45		5		70		12		
11:30	38		5		52		2		90		7		
11:45	46	149	6	27	63	200	2	15	109	349	8	42	
Total	613		1435		675		1654		1288		3089		
Percent	47.6%		46.5%		52.4%		53.5%						
Day Total		2048				2329				4377			
Peak	09:45		00:45		11:00		03:30		11:00		03:30		
Vol.	149		234		200		273		349		480		
P.H.F.	0.909		0.713		0.794		0.832		0.800		0.851		

Bedford Street (Route 62)
west of Old Bedford Street
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123082 E Volume
Site Code: TBA

Start	EB				WB				Combined				19-Nov-12
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Mon
12:00	2		31		3		71		5		102		
12:15	5		40		5		50		10		90		
12:30	2		56		3		44		5		100		
12:45	0	9	50	177	1	12	70	235	1	21	120	412	
01:00	3		58		0		54		3		112		
01:15	1		44		0		41		1		85		
01:30	0		50		0		62		0		112		
01:45	3	7	35	187	0	0	59	216	3	7	94	403	
02:00	1		43		0		54		1		97		
02:15	1		53		1		57		2		110		
02:30	0		48		0		85		0		133		
02:45	0	2	56	200	2	3	89	285	2	5	145	485	
03:00	1		57		2		98		3		155		
03:15	0		63		0		109		0		172		
03:30	0		47		0		88		0		135		
03:45	0	1	57	224	1	3	90	385	1	4	147	609	
04:00	4		57		2		114		6		171		
04:15	2		62		2		107		4		169		
04:30	3		65		4		127		7		192		
04:45	3	12	67	251	5	13	138	486	8	25	205	737	
05:00	4		61		1		156		5		217		
05:15	9		67		7		171		16		238		
05:30	13		56		11		153		24		209		
05:45	19	45	52	236	7	26	122	602	26	71	174	838	
06:00	22		42		13		115		35		157		
06:15	33		56		26		103		59		159		
06:30	42		49		36		103		78		152		
06:45	67	164	31	178	36	111	78	399	103	275	109	577	
07:00	86		40		43		88		129		128		
07:15	82		33		38		64		120		97		
07:30	107		27		58		29		165		56		
07:45	117	392	16	116	72	211	36	217	189	603	52	333	
08:00	125		14		57		32		182		46		
08:15	121		9		66		18		187		27		
08:30	116		11		83		33		199		44		
08:45	108	470	20	54	61	267	25	108	169	737	45	162	
09:00	96		24		69		19		165		43		
09:15	74		14		51		22		125		36		
09:30	54		11		54		10		108		21		
09:45	58	282	17	66	56	230	12	63	114	512	29	129	
10:00	53		13		40		14		93		27		
10:15	42		13		36		9		78		22		
10:30	44		10		56		8		100		18		
10:45	33	172	9	45	61	193	8	39	94	365	17	84	
11:00	48		11		51		7		99		18		
11:15	40		3		41		6		81		9		
11:30	44		4		54		6		98		10		
11:45	45	177	4	22	49	195	0	19	94	372	4	41	
Total	1733		1756		1264		3054		2997		4810		
Percent	57.8%		36.5%		42.2%		63.5%						
Day Total		3489				4318				7807			
Peak	07:45		04:30		08:15		04:45		07:45		04:45		
Vol.	479		260		279		618		757		869		
P.H.F.	0.958		0.970		0.840		0.904		0.951		0.913		

Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

NB

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 B CLASS
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/26/1														
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	7	3	0	0	0	0	0	0	0	0	0	0	10
05:00	0	26	4	0	0	0	0	0	0	1	0	0	0	31
06:00	0	78	17	2	1	1	0	1	0	0	0	0	0	100
07:00	0	127	20	2	2	0	0	0	0	0	0	0	0	151
08:00	0	61	13	2	3	0	0	0	0	0	0	0	0	79
09:00	0	59	13	1	2	0	0	1	1	0	0	0	0	77
10:00	0	48	11	1	2	0	0	2	0	1	0	0	0	65
11:00	0	67	12	1	2	0	0	0	0	0	0	0	0	82
12 PM	0	56	10	1	1	0	0	2	0	0	0	0	0	70
13:00	0	53	5	2	0	1	0	0	0	0	0	0	0	61
14:00	0	46	9	1	0	0	0	0	0	0	0	0	0	56
15:00	1	54	4	1	3	0	0	0	0	0	0	0	0	63
16:00	0	17	1	2	0	0	0	0	0	0	0	0	0	20
17:00	0	23	2	2	1	0	0	0	0	0	0	0	0	28
18:00	0	16	5	2	0	0	0	0	0	0	0	0	0	23
19:00	0	6	3	1	0	0	0	0	0	0	0	0	0	10
20:00	0	8	3	0	0	0	0	0	0	0	0	0	0	11
21:00	0	4	2	1	0	0	0	0	0	0	0	0	0	7
22:00	0	4	3	0	0	0	0	0	0	0	0	0	0	7
23:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Total	1	770	141	22	17	2	0	6	1	2	0	0	0	962
Percent	0.1%	80.0%	14.7%	2.3%	1.8%	0.2%	0.0%	0.6%	0.1%	0.2%	0.0%	0.0%	0.0%	
AM Peak		07:00	07:00	06:00	08:00	06:00		10:00	09:00	05:00				07:00
Vol.		127	20	2	3	1		2	1	1				151
PM Peak	15:00	12:00	12:00	13:00	15:00	13:00		12:00						12:00
Vol.	1	56	10	2	3	1		2						70

Hanscom Drive
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133213 B CLASS
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/27/1														
3	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
04:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
05:00	0	20	4	0	0	0	0	0	0	1	0	0	0	25
06:00	0	65	10	2	1	0	0	0	0	0	0	0	0	78
07:00	0	108	12	2	1	0	0	0	0	0	0	0	0	123
08:00	0	53	16	2	2	0	0	0	0	0	0	0	0	73
09:00	0	54	12	1	2	0	0	1	0	0	0	0	0	70
10:00	0	38	6	1	0	0	0	0	1	0	0	0	0	46
11:00	0	51	5	1	1	1	0	0	0	0	0	0	0	59
12 PM	0	37	5	1	2	0	0	0	0	1	0	0	0	46
13:00	0	44	10	1	1	1	0	1	0	1	0	0	0	59
14:00	0	43	8	1	1	0	0	0	0	0	0	0	0	53
15:00	0	43	9	0	1	0	0	0	0	0	0	0	0	53
16:00	0	25	5	2	0	0	0	0	0	0	0	0	0	32
17:00	0	16	6	2	1	0	0	0	0	0	0	0	0	25
18:00	0	17	8	2	0	0	0	0	0	0	0	0	0	27
19:00	0	11	2	1	0	0	0	0	0	0	0	0	0	14
20:00	0	6	4	0	0	0	0	0	0	0	0	0	0	10
21:00	0	4	2	1	0	0	0	0	0	0	0	0	0	7
22:00	0	4	0	1	0	0	0	0	0	0	0	0	0	5
23:00	0	0	3	0	0	0	0	0	0	0	0	0	0	3
Total	0	652	131	21	13	2	0	2	1	3	0	0	0	825
Percent	0.0%	79.0%	15.9%	2.5%	1.6%	0.2%	0.0%	0.2%	0.1%	0.4%	0.0%	0.0%	0.0%	
AM Peak		07:00	08:00	06:00	08:00	11:00		09:00	10:00	05:00				07:00
Vol.		108	16	2	2	1		1	1	1				123
PM Peak		13:00	13:00	16:00	12:00	13:00		13:00		12:00				13:00
Vol.		44	10	2	2	1		1		1				59

Hanscom Drive
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133213 B CLASS
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/28/1														
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
05:00	0	32	4	0	2	0	0	0	0	1	0	0	0	39
06:00	0	74	14	2	0	0	0	0	0	0	0	0	0	90
07:00	0	132	15	2	3	1	0	0	0	0	0	0	0	153
08:00	0	72	10	2	2	0	0	0	0	0	0	0	0	86
09:00	0	51	10	2	3	0	0	1	0	0	0	0	0	67
10:00	0	40	9	1	1	1	0	0	0	0	0	0	0	52
11:00	0	60	14	2	3	0	0	0	0	0	0	0	0	79
12 PM	0	48	11	2	3	0	0	0	0	0	0	0	0	64
13:00	0	46	11	1	1	1	0	0	0	0	0	0	0	60
14:00	0	60	10	1	1	0	0	0	0	1	0	0	0	73
15:00	0	59	5	1	1	0	0	0	0	0	0	0	0	66
16:00	0	17	7	2	2	0	0	0	0	0	0	0	0	28
17:00	0	22	6	2	1	0	0	0	0	0	0	0	0	31
18:00	0	16	1	2	0	0	0	0	0	0	0	0	0	19
19:00	0	15	5	1	0	0	0	0	0	0	0	0	0	21
20:00	0	8	3	0	0	0	0	0	0	0	0	0	0	11
21:00	0	3	3	2	0	0	0	0	0	0	0	0	0	8
22:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
23:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
Total	0	781	139	25	23	3	0	1	0	2	0	0	0	974
Percent	0.0%	80.2%	14.3%	2.6%	2.4%	0.3%	0.0%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	
AM Peak		07:00	07:00	06:00	07:00	07:00		09:00		05:00				07:00
Vol.		132	15	2	3	1		1		1				153
PM Peak		14:00	12:00	12:00	12:00	13:00				14:00				14:00
Vol.		60	11	2	3	1				1				73

Hanscom Drive
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133213 B CLASS
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/01/1														
3	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	9	2	0	0	0	0	1	0	0	0	0	0	12
05:00	0	23	5	0	0	0	0	0	0	0	0	0	0	28
06:00	0	70	10	2	2	0	0	0	0	0	0	0	0	84
07:00	1	115	16	2	1	0	0	0	0	0	0	0	0	135
08:00	0	77	14	2	3	0	0	0	0	0	0	0	0	96
09:00	0	60	13	2	3	0	0	1	0	0	0	0	0	79
10:00	0	39	14	1	2	0	0	1	0	1	0	0	0	58
11:00	0	60	10	1	3	0	0	0	0	0	0	0	0	74
12 PM	0	48	13	1	2	1	0	0	0	1	0	0	0	66
13:00	0	56	15	1	0	1	0	0	0	0	0	0	0	73
14:00	0	44	2	1	0	0	0	1	0	0	0	0	0	48
15:00	0	42	5	1	2	0	0	0	0	0	0	0	0	50
16:00	0	19	6	2	0	0	0	0	0	0	0	0	0	27
17:00	0	18	5	2	1	0	0	0	0	0	0	0	0	26
18:00	0	11	2	2	0	0	0	0	0	0	0	0	0	15
19:00	0	5	1	1	1	0	0	0	0	0	0	0	0	8
20:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
21:00	0	8	1	1	0	0	0	0	0	0	0	0	0	10
22:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
23:00	1	4	0	0	0	0	0	0	0	0	0	0	0	5
Total	2	729	136	22	20	2	0	4	0	2	0	0	0	917
Percent	0.2%	79.5%	14.8%	2.4%	2.2%	0.2%	0.0%	0.4%	0.0%	0.2%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	06:00	08:00			04:00		10:00				07:00
Vol.	1	115	16	2	3			1		1				135
PM Peak	23:00	13:00	13:00	16:00	12:00	12:00		14:00		12:00				13:00
Vol.	1	56	15	2	2	1		1		1				73

Hanscom Drive
north of Vandenberg Drive
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133213 B CLASS
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/02/1														
3	0	2	1	0	0	0	0	0	0	0	0	0	0	3
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
05:00	0	10	2	0	0	0	0	0	0	1	0	0	0	13
06:00	0	23	4	0	0	0	0	0	0	0	0	0	0	27
07:00	0	33	3	1	1	0	0	0	0	1	0	0	0	39
08:00	0	24	5	2	1	0	0	0	0	1	0	0	0	33
09:00	0	46	5	2	2	0	0	0	0	1	0	0	0	56
10:00	0	33	1	2	1	0	0	0	0	0	0	0	0	37
11:00	0	39	1	1	0	0	0	0	0	0	0	0	0	41
12 PM	0	39	6	1	0	0	0	0	0	0	0	0	0	46
13:00	0	27	2	2	0	0	0	0	0	0	0	0	0	31
14:00	0	42	4	2	0	0	0	0	0	0	0	0	0	48
15:00	0	16	1	2	0	0	0	0	0	0	0	0	0	19
16:00	0	17	4	3	0	0	0	0	0	0	0	0	0	24
17:00	0	13	3	2	1	0	0	0	0	0	0	0	0	19
18:00	0	5	3	2	0	0	0	0	0	0	0	0	0	10
19:00	0	7	2	2	0	0	0	0	0	0	0	0	0	11
20:00	0	5	1	1	0	0	0	0	0	0	0	0	0	7
21:00	0	2	3	0	0	0	0	0	0	0	0	0	0	5
22:00	0	1	5	0	0	0	0	0	0	0	0	0	0	6
23:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
Total	0	392	58	25	6	0	0	0	0	4	0	0	0	485
Percent	0.0%	80.8%	12.0%	5.2%	1.2%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	
AM Peak		09:00	08:00	08:00	09:00					05:00				09:00
Vol.		46	5	2	2					1				56
PM Peak		14:00	12:00	16:00	17:00									14:00
Vol.		42	6	3	1									48

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133213 B CLASS
Site Code: TBA

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/03/1														
3	0	2	2	0	0	0	0	0	0	0	0	0	0	4
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
02:00	0	1	0	0	1	0	0	0	0	0	0	0	0	2
03:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
05:00	0	11	4	0	0	0	0	0	0	0	0	0	0	15
06:00	0	11	5	0	0	0	0	0	1	0	0	0	0	17
07:00	0	19	4	0	1	0	0	0	0	1	0	0	0	25
08:00	0	14	5	0	0	0	0	0	0	0	0	0	0	19
09:00	0	19	5	0	1	0	0	0	0	0	0	0	0	25
10:00	0	21	0	0	0	0	0	0	0	0	0	0	0	21
11:00	0	17	7	0	0	0	0	0	0	0	0	0	0	24
12 PM	0	20	4	0	0	0	0	0	0	0	0	0	0	24
13:00	0	27	3	0	0	0	0	0	0	0	0	0	0	30
14:00	0	32	3	0	0	0	0	0	0	0	0	0	0	35
15:00	0	12	3	0	1	0	0	0	0	0	0	0	0	16
16:00	0	12	3	0	0	0	0	0	0	0	0	0	0	15
17:00	0	15	10	0	0	0	0	0	0	0	0	0	0	25
18:00	0	13	1	0	0	0	0	0	0	0	0	0	0	14
19:00	0	18	5	1	1	0	0	0	0	0	0	0	0	25
20:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
21:00	0	7	2	0	1	0	0	0	0	0	0	0	0	10
22:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
23:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	290	69	1	7	0	0	0	1	1	0	0	0	369
Percent	0.0%	78.6%	18.7%	0.3%	1.9%	0.0%	0.0%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	
AM Peak		10:00	11:00		01:00				06:00	07:00				07:00
Vol.		21	7		1				1	1				25
PM Peak		14:00	17:00	19:00	15:00									14:00
Vol.		32	10	1	1									35

Hanscom Drive
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133213 B CLASS
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/04/1														
3	0	2	1	0	0	0	0	0	0	0	0	0	0	3
01:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	12	0	0	0	0	0	0	0	0	0	0	0	12
05:00	0	42	8	0	0	0	0	0	0	0	0	0	0	50
06:00	0	74	11	2	0	0	0	0	0	0	0	0	0	87
07:00	0	118	22	2	2	1	0	0	1	0	0	0	0	146
08:00	0	55	11	2	3	0	0	0	0	0	0	0	0	71
09:00	0	65	12	1	3	0	0	1	0	0	0	0	0	82
10:00	0	52	10	1	4	2	0	0	0	2	0	0	0	71
11:00	0	50	10	1	3	1	0	0	0	0	0	0	0	65
12 PM	0	64	16	1	2	2	0	0	0	0	0	0	0	85
13:00	0	60	7	2	2	0	0	0	0	0	0	0	0	71
14:00	0	75	9	1	0	0	0	0	0	0	0	0	0	85
15:00	0	48	5	1	0	0	0	0	0	0	0	0	0	54
16:00	0	31	4	2	2	0	0	0	0	0	0	0	0	39
17:00	0	22	3	2	1	0	0	0	0	0	0	0	0	28
18:00	0	14	6	2	0	0	0	0	0	0	0	0	0	22
19:00	0	7	3	1	0	0	0	0	0	0	0	0	0	11
20:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
21:00	0	5	5	1	1	0	0	0	0	0	0	0	0	12
22:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
23:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	812	147	22	23	6	0	1	1	2	0	0	0	1014
Percent	0.0%	80.1%	14.5%	2.2%	2.3%	0.6%	0.0%	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%	
AM Peak		07:00	07:00	06:00	10:00	10:00		09:00	07:00	10:00				07:00
Vol.		118	22	2	4	2		1	1	2				146
PM Peak		14:00	12:00	13:00	12:00	12:00								12:00
Vol.		75	16	2	2	2								85
Total		4426	821	138	109	15	0	14	4	16	0	0	0	5546

Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

SB

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INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 B CLASS
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/26/1														
3	0	5	1	0	0	0	0	0	0	0	0	0	0	6
01:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
05:00	0	18	4	0	1	0	0	0	0	0	0	0	0	23
06:00	0	17	9	2	1	0	0	0	0	0	0	0	0	29
07:00	0	27	7	2	3	0	0	0	1	0	0	0	0	40
08:00	0	12	6	2	3	0	0	0	0	0	0	0	0	23
09:00	0	18	12	1	2	0	0	1	1	0	0	0	0	35
10:00	0	31	8	1	0	0	0	0	0	0	0	0	0	40
11:00	0	73	11	1	2	0	0	2	0	0	0	0	0	89
12 PM	0	45	11	1	0	0	0	1	1	0	0	0	0	59
13:00	0	49	7	3	1	0	0	1	0	0	0	0	0	61
14:00	0	59	14	0	0	1	0	0	0	0	0	0	0	74
15:00	0	155	14	2	1	0	0	0	0	0	0	0	0	172
16:00	0	61	13	2	1	0	0	0	0	0	0	0	0	77
17:00	0	67	6	2	0	0	0	0	0	0	0	0	0	75
18:00	0	42	5	2	1	0	0	0	0	0	0	0	0	50
19:00	0	32	5	1	0	0	0	0	0	0	0	0	0	38
20:00	0	18	3	0	0	0	0	0	0	0	0	0	0	21
21:00	0	17	4	0	0	0	0	0	0	0	0	0	0	21
22:00	0	10	1	1	0	0	0	0	0	0	0	0	0	12
23:00	0	15	1	0	0	0	0	0	0	0	0	0	0	16
Total	0	778	144	23	16	1	0	5	3	0	0	0	0	970
Percent	0.0%	80.2%	14.8%	2.4%	1.6%	0.1%	0.0%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	09:00	06:00	07:00			11:00	07:00					11:00
Vol.		73	12	2	3			2	1					89
PM Peak		15:00	14:00	13:00	13:00	14:00		12:00	12:00					15:00
Vol.		155	14	3	1	1		1	1					172

Hanscom Drive
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133213 B CLASS
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/27/1														
3	0	22	8	0	1	0	0	0	0	0	0	0	0	31
01:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
02:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	1	2	0	0	0	0	0	0	0	0	0	0	3
05:00	0	1	2	0	0	0	0	0	0	0	0	0	0	3
06:00	0	4	2	2	1	0	0	0	0	0	0	0	0	9
07:00	0	22	4	2	1	0	0	0	1	0	0	0	0	30
08:00	0	16	3	2	3	0	0	0	0	0	0	0	0	24
09:00	0	11	11	1	2	0	0	0	0	0	0	0	0	25
10:00	0	27	3	1	0	0	0	1	0	0	0	0	0	32
11:00	0	54	6	1	1	1	0	0	1	0	0	0	0	64
12 PM	0	34	8	1	2	0	0	0	0	0	0	0	0	45
13:00	0	28	10	1	0	0	0	1	0	1	0	0	0	41
14:00	1	61	11	0	1	0	0	0	0	1	0	0	0	75
15:00	0	140	16	1	1	0	0	0	0	0	0	0	0	158
16:00	0	62	13	2	0	0	0	0	0	0	0	0	0	77
17:00	0	52	10	2	0	0	0	0	0	0	0	0	0	64
18:00	0	45	17	2	1	0	0	0	0	0	0	0	0	65
19:00	0	31	7	1	0	0	0	0	0	0	0	0	0	39
20:00	0	16	4	0	0	0	0	0	0	0	0	0	0	20
21:00	0	13	5	0	0	0	0	0	0	0	0	0	0	18
22:00	0	7	4	1	0	0	0	0	0	0	0	0	0	12
23:00	0	17	2	0	0	0	0	0	0	0	0	0	0	19
Total	1	676	151	20	14	1	0	2	2	2	0	0	0	869
Percent	0.1%	77.8%	17.4%	2.3%	1.6%	0.1%	0.0%	0.2%	0.2%	0.2%	0.0%	0.0%	0.0%	
AM Peak		11:00	09:00	06:00	08:00	11:00		10:00	07:00					11:00
Vol.		54	11	2	3	1		1	1					64
PM Peak	14:00	15:00	18:00	16:00	12:00			13:00		13:00				15:00
Vol.	1	140	17	2	2			1		1				158

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133213 B CLASS
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
02/28/1														
3	0	2	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	1	0	1	0	0	0	0	0	0	0	0	0	2
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	2	4	0	1	0	0	0	0	0	0	0	0	7
06:00	0	11	4	2	0	1	0	0	0	0	0	0	0	18
07:00	0	31	5	2	1	1	0	1	1	0	0	0	0	42
08:00	0	13	3	1	3	0	0	0	0	0	0	0	0	20
09:00	0	19	8	2	1	0	0	0	0	0	0	0	0	30
10:00	0	19	6	2	3	1	0	1	0	0	0	0	0	32
11:00	0	78	16	1	2	0	0	1	0	0	0	0	0	98
12 PM	0	31	14	2	2	0	0	0	0	0	0	0	0	49
13:00	0	40	4	2	2	1	0	0	0	0	0	0	0	49
14:00	0	70	13	1	1	0	0	0	0	0	0	0	0	85
15:00	0	150	30	1	3	0	0	0	1	0	0	0	0	185
16:00	0	79	22	2	2	0	0	0	0	0	0	0	0	105
17:00	0	60	8	2	0	0	0	1	0	0	0	0	0	71
18:00	0	47	6	2	1	0	0	0	0	0	0	0	0	56
19:00	0	24	6	1	1	0	0	0	0	0	0	0	0	32
20:00	0	34	2	0	1	0	0	0	0	0	0	0	0	37
21:00	0	19	5	0	0	0	0	0	0	0	0	0	0	24
22:00	0	13	6	1	0	0	0	0	0	0	0	0	0	20
23:00	0	20	3	0	0	0	0	0	0	0	0	0	0	23
Total	0	772	165	25	24	4	0	4	2	0	0	0	0	996
Percent	0.0%	77.5%	16.6%	2.5%	2.4%	0.4%	0.0%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	11:00	06:00	08:00	06:00		07:00	07:00					11:00
Vol.		78	16	2	3	1		1	1					98
PM Peak		15:00	15:00	12:00	15:00	13:00		17:00	15:00					15:00
Vol.		150	30	2	3	1		1	1					185

Hanscom Drive
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133213 B CLASS
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/01/1														
3	0	9	0	1	0	0	0	0	0	0	0	0	0	10
01:00	0	11	2	0	0	0	0	0	0	0	0	0	0	13
02:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
05:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
06:00	0	6	3	2	1	0	0	0	0	0	0	0	0	12
07:00	0	24	7	2	1	0	0	0	0	0	0	0	0	34
08:00	0	10	2	2	2	0	0	0	0	0	0	0	0	16
09:00	0	23	10	1	2	0	0	1	0	0	0	0	0	37
10:00	0	36	10	2	2	0	0	1	0	0	0	0	0	51
11:00	0	73	14	1	4	0	0	1	0	0	0	0	0	93
12 PM	0	43	14	1	1	0	0	0	1	0	0	0	0	60
13:00	0	36	15	1	2	0	0	0	1	0	0	0	0	55
14:00	0	64	12	1	0	1	0	0	0	0	0	0	0	78
15:00	0	134	17	1	2	0	0	1	0	0	0	0	0	155
16:00	0	58	16	2	0	0	0	0	0	0	0	0	0	76
17:00	0	53	8	2	0	0	0	0	0	0	0	0	0	63
18:00	0	23	6	2	2	0	0	0	0	0	0	0	0	33
19:00	0	20	4	1	1	0	0	0	0	0	0	0	0	26
20:00	0	12	3	0	0	0	0	0	0	0	0	0	0	15
21:00	0	16	0	0	0	0	0	0	0	0	0	0	0	16
22:00	0	13	1	1	0	0	0	0	0	0	0	0	0	15
23:00	0	16	0	0	0	0	0	0	0	0	0	0	0	16
Total	0	688	149	23	20	1	0	4	2	0	0	0	0	887
Percent	0.0%	77.6%	16.8%	2.6%	2.3%	0.1%	0.0%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	11:00	06:00	11:00			09:00						11:00
Vol.		73	14	2	4			1						93
PM Peak		15:00	15:00	16:00	13:00	14:00		15:00	12:00					15:00
Vol.		134	17	2	2	1		1	1					155

Hanscom Drive
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133213 B CLASS
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/02/1														
3	0	12	1	0	0	0	0	0	0	0	0	0	0	13
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
06:00	0	7	3	0	0	0	0	0	0	0	0	0	0	10
07:00	0	6	2	1	0	0	0	0	1	0	0	0	0	10
08:00	0	6	3	2	0	0	0	0	0	1	0	0	0	12
09:00	0	14	3	2	2	0	0	0	0	0	0	0	0	21
10:00	0	22	3	2	0	0	0	0	2	0	0	0	0	29
11:00	0	28	4	1	1	0	0	0	0	0	0	0	0	34
12 PM	0	41	6	1	0	0	0	0	0	0	0	0	0	48
13:00	0	19	4	2	0	0	0	0	0	0	0	0	0	25
14:00	0	54	8	2	0	0	0	0	0	0	0	0	0	64
15:00	0	34	5	2	2	0	0	0	0	0	0	0	0	43
16:00	0	29	6	2	0	0	0	0	0	0	0	0	0	37
17:00	1	28	4	3	2	0	0	0	0	0	0	0	0	38
18:00	0	16	8	2	1	0	0	0	0	0	0	0	0	27
19:00	0	17	8	2	2	0	0	0	0	0	0	0	0	29
20:00	0	9	3	1	0	0	0	0	0	0	0	0	0	13
21:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
22:00	0	5	4	0	0	0	0	0	0	0	0	0	0	9
23:00	0	18	1	0	0	0	0	0	0	0	0	0	0	19
Total	1	374	80	25	10	0	0	0	3	1	0	0	0	494
Percent	0.2%	75.7%	16.2%	5.1%	2.0%	0.0%	0.0%	0.0%	0.6%	0.2%	0.0%	0.0%	0.0%	
AM Peak		11:00	11:00	08:00	09:00				10:00	08:00				11:00
Vol.		28	4	2	2				2	1				34
PM Peak	17:00	14:00	14:00	17:00	15:00									14:00
Vol.	1	54	8	3	2									64

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133213 B CLASS
Site Code: TBA

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/03/1														
3	0	4	0	0	0	0	0	0	0	0	0	0	0	4
01:00	0	2	1	0	0	0	0	0	0	0	0	0	0	3
02:00	0	1	3	0	0	0	0	0	0	0	0	0	0	4
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
05:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
06:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
07:00	0	4	3	0	1	0	0	0	1	0	0	0	0	9
08:00	0	9	2	0	1	0	0	0	1	0	0	0	0	13
09:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
10:00	0	20	0	0	0	0	0	0	0	0	0	0	0	20
11:00	0	19	3	0	0	0	0	0	0	0	0	0	0	22
12 PM	0	17	4	0	0	0	0	0	0	0	0	0	0	21
13:00	0	11	3	0	0	0	0	0	0	0	0	0	0	14
14:00	0	37	11	0	1	0	0	0	0	0	0	0	0	49
15:00	0	31	4	0	0	0	0	0	0	0	0	0	0	35
16:00	0	25	4	0	0	0	0	0	0	0	0	0	0	29
17:00	0	24	7	0	1	0	0	0	0	0	0	0	0	32
18:00	0	22	8	0	0	0	0	0	0	0	0	0	0	30
19:00	0	28	7	1	0	0	0	0	0	0	0	0	0	36
20:00	0	13	5	0	0	0	0	0	0	0	0	0	0	18
21:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
22:00	0	11	2	0	0	0	0	0	0	0	0	0	0	13
23:00	0	10	2	0	0	0	0	0	0	0	0	0	0	12
Total	0	314	79	1	4	0	0	0	2	0	0	0	0	400
Percent	0.0%	78.5%	19.8%	0.3%	1.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	
AM Peak		10:00	02:00		07:00				07:00					11:00
Vol.		20	3		1				1					22
PM Peak		14:00	14:00	19:00	14:00									14:00
Vol.		37	11	1	1									49

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133213 B CLASS
Site Code: TBA

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/04/1														
3	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
05:00	0	6	3	0	0	0	0	0	0	0	0	0	0	9
06:00	0	9	1	2	1	0	0	0	0	0	0	0	0	13
07:00	0	36	7	1	1	1	0	0	0	0	0	0	0	46
08:00	0	10	7	2	4	1	0	0	0	0	0	0	0	24
09:00	0	17	5	1	2	0	0	1	0	0	0	0	0	26
10:00	0	29	12	1	6	0	0	0	0	0	0	0	0	48
11:00	0	59	11	1	2	1	0	0	1	0	0	0	0	75
12 PM	0	41	12	1	1	2	0	0	1	0	0	0	0	58
13:00	0	43	9	1	2	1	0	0	1	0	0	0	0	57
14:00	0	53	9	2	2	0	0	0	0	0	0	0	0	66
15:00	0	151	17	1	0	0	0	0	0	0	0	0	0	169
16:00	0	68	8	2	0	0	0	0	0	0	0	0	0	78
17:00	0	55	14	3	1	0	0	0	0	0	0	0	0	73
18:00	0	47	9	2	1	0	0	0	0	0	0	0	0	59
19:00	0	26	7	1	0	0	0	0	0	0	0	0	0	34
20:00	0	21	6	0	0	0	0	0	0	0	0	0	0	27
21:00	0	14	3	0	1	0	0	0	0	0	0	0	0	18
22:00	0	4	2	1	0	0	0	0	0	0	0	0	0	7
23:00	0	14	5	0	0	0	0	0	0	0	0	0	0	19
Total	0	718	149	22	24	6	0	1	3	0	0	0	0	923
Percent	0.0%	77.8%	16.1%	2.4%	2.6%	0.7%	0.0%	0.1%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	10:00	06:00	10:00	07:00		09:00	11:00					11:00
Vol.		59	12	2	6	1		1	1					75
PM Peak		15:00	15:00	17:00	13:00	12:00			12:00					15:00
Vol.		151	17	3	2	2			1					169
Total		4320	917	139	112	13	0	16	17	3	0	0	0	5539

PRECISION
D A T A
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Email: datarequests@pdillc.com

Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

133213 B SPEED
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
02/26/1																
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
02:00	0	0	0	1	1	0	1	0	0	0	0	0	0	3	*	34
03:00	0	0	0	0	3	0	2	0	0	0	0	0	0	5	31	36
04:00	0	0	0	0	0	4	3	3	0	0	0	0	0	10	45	42
05:00	0	0	**2**	1	11	9	5	2	1	0	0	0	0	31	41	36
06:00	0	0	1	7	29	39	19	3	1	**1**	0	0	0	100	41	36
07:00	0	1	1	0	**45**	**57**	**39**	**6**	**2**	0	0	0	0	**151**	42	37
08:00	0	1	2	4	28	33	8	2	1	0	0	0	0	79	39	35
09:00	0	**2**	2	**13**	28	21	11	0	0	0	0	0	0	77	39	33
10:00	0	2	4	4	19	29	6	0	1	0	0	0	0	65	38	34
11:00	0	**1**	**1**	**11**	**34**	26	8	1	0	0	0	0	0	**82**	38	34
12 PM	0	0	1	9	19	**30**	**10**	0	**1**	0	0	0	0	70	39	35
13:00	0	0	1	9	19	24	8	0	0	0	0	0	0	61	39	34
14:00	0	0	0	2	21	20	10	**3**	0	0	0	0	0	56	41	36
15:00	0	0	**2**	5	**24**	**23**	**6**	**2**	**1**	0	0	0	0	**63**	39	35
16:00	0	0	1	3	4	10	2	0	0	0	0	0	0	20	38	34
17:00	0	0	0	**6**	6	13	3	0	0	0	0	0	0	28	38	34
18:00	0	0	0	2	9	7	4	1	0	0	0	0	0	23	40	35
19:00	0	**1**	0	1	4	2	2	0	0	0	0	0	0	10	34	32
20:00	0	0	0	0	5	1	3	2	0	0	0	0	0	11	42	38
21:00	0	0	0	0	2	2	1	1	0	**1**	0	0	0	7	*	41
22:00	0	0	0	0	3	2	2	0	0	0	0	0	0	7	33	36
23:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
%	0.0%	0.8%	1.9%	8.2%	32.7%	36.7%	15.9%	2.7%	0.8%	0.2%	0.0%	0.0%	0.0%			
AM Peak		09:00	05:00	09:00	07:00	07:00	07:00	07:00	07:00	06:00				07:00		
Vol.		2	2	13	45	57	39	6	2	1				151		
Midday Peak		11:00	11:00	11:00	11:00	12:00	12:00	14:00	12:00					11:00		
Vol.		1	1	11	34	30	10	3	1					82		
PM Peak		19:00	15:00	17:00	15:00	15:00	15:00	15:00	15:00	21:00				15:00		
Vol.		1	2	6	24	23	6	2	1	1				63		

% iles	
15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	40 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	616
Percent in Pace :	64.0%
Number of Vehicles > 35 MPH :	468
Percent of Vehicles > 35 MPH :	48.6%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
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Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

133213 B SPEED
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
02/27/1																
3	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
01:00	0	0	0	0	0	2	0	0	0	0	0	0	0	2	*	37
02:00	0	0	0	0	0	0	1	1	0	0	0	0	0	2	*	44
03:00	0	0	0	0	2	1	0	1	0	0	0	0	0	4	*	37
04:00	0	0	0	0	2	3	2	1	0	0	0	0	0	8	38	38
05:00	0	**1**	0	1	2	8	10	3	0	0	0	0	0	25	43	38
06:00	0	0	0	3	24	32	11	3	**4**	**1**	0	0	0	78	43	37
07:00	0	0	**2**	4	**34**	**50**	**23**	**8**	2	0	0	0	0	**123**	41	37
08:00	0	1	1	**8**	26	24	13	0	0	0	0	0	0	73	40	34
09:00	0	0	0	5	23	27	13	1	1	0	0	0	0	70	40	36
10:00	0	0	2	4	16	17	7	0	0	0	0	0	0	46	39	35
11:00	**1**	0	0	6	17	18	**13**	2	**1**	0	**1**	0	0	**59**	41	36
12 PM	0	0	0	6	15	15	6	**3**	1	0	0	0	0	46	41	36
13:00	0	0	**1**	**9**	**23**	17	7	2	0	0	0	0	0	59	39	34
14:00	0	0	0	5	15	**24**	8	1	0	0	0	0	0	53	39	36
15:00	0	0	0	3	**15**	**26**	**7**	**2**	0	0	0	0	0	**53**	39	36
16:00	0	0	0	**5**	13	8	6	0	0	0	0	0	0	32	39	34
17:00	0	0	1	4	10	8	2	0	0	0	0	0	0	25	37	33
18:00	0	0	0	3	11	7	5	0	0	0	**1**	0	0	27	40	36
19:00	0	0	0	1	4	6	3	0	0	0	0	0	0	14	40	36
20:00	0	0	0	0	3	4	1	2	0	0	0	0	0	10	37	38
21:00	0	0	1	0	2	3	1	0	0	0	0	0	0	7	37	34
22:00	0	0	**3**	0	0	1	1	0	0	0	0	0	0	5	21	29
23:00	0	0	0	0	0	1	1	1	0	0	0	0	0	3	*	42
%	0.1%	0.2%	1.3%	8.1%	31.2%	36.7%	17.1%	3.8%	1.1%	0.1%	0.2%	0.0%	0.0%			
AM Peak		05:00	07:00	08:00	07:00	07:00	07:00	07:00	06:00	06:00				07:00		
Vol.		1	2	8	34	50	23	8	4	1				123		
Midday Peak	11:00		13:00	13:00	13:00	14:00	11:00	12:00	11:00		11:00			11:00		
Vol.	1		1	9	23	24	13	3	1		1			59		
PM Peak			22:00	16:00	15:00	15:00	15:00	15:00			18:00			15:00		
Vol.			3	5	15	26	7	2			1			53		

% iles	
15th Percentile :	29 MPH
50th Percentile :	35 MPH
85th Percentile :	41 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	522
Percent in Pace :	63.3%
Number of Vehicles > 35 MPH :	424
Percent of Vehicles > 35 MPH :	51.4%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
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Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

133213 B SPEED
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
02/28/1																
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
03:00	0	0	0	0	1	0	1	2	0	0	0	0	0	4	*	42
04:00	0	0	0	0	2	2	4	0	0	0	0	0	0	8	42	38
05:00	0	0	**4**	3	10	13	6	2	1	0	0	0	0	39	40	35
06:00	0	0	0	5	30	35	17	3	0	0	0	0	0	90	40	36
07:00	0	0	0	**7**	**37**	**63**	**39**	4	**2**	**1**	0	0	0	**153**	41	37
08:00	0	**2**	1	5	15	36	21	**5**	0	1	0	0	0	86	42	37
09:00	0	0	0	5	24	26	12	0	0	0	0	0	0	67	39	35
10:00	0	0	1	9	20	15	5	2	0	0	0	0	0	52	39	34
11:00	**1**	0	**2**	7	**26**	28	**14**	1	0	0	0	0	0	**79**	40	34
12 PM	0	0	0	**8**	20	20	14	**2**	0	0	0	0	0	64	40	36
13:00	0	0	0	2	17	28	12	1	0	0	0	0	0	60	40	36
14:00	0	**2**	0	7	20	**31**	11	2	0	0	0	0	0	73	39	35
15:00	0	0	0	6	**17**	**27**	**11**	**5**	0	0	0	0	0	**66**	41	36
16:00	0	0	0	3	11	8	6	0	0	0	0	0	0	28	39	35
17:00	0	0	0	1	6	12	9	2	**1**	0	0	0	0	31	42	38
18:00	0	0	**1**	**7**	7	3	1	0	0	0	0	0	0	19	35	31
19:00	0	0	0	0	5	14	2	0	0	0	0	0	0	21	38	36
20:00	0	0	1	0	2	4	1	2	1	0	0	0	0	11	38	38
21:00	0	0	0	0	3	4	1	0	0	0	0	0	0	8	37	36
22:00	0	0	0	1	2	3	2	0	1	0	0	0	0	9	38	38
23:00	0	0	0	1	3	0	1	0	0	0	0	0	0	5	31	33
%	0.1%	0.4%	1.0%	7.9%	28.6%	38.2%	19.5%	3.4%	0.6%	0.2%	0.0%	0.0%	0.0%			
AM Peak		08:00	05:00	07:00	07:00	07:00	07:00	08:00	07:00	07:00				07:00		
Vol.		2	4	7	37	63	39	5	2	1				153		
Midday Peak	11:00	14:00	11:00	12:00	11:00	14:00	11:00	12:00						11:00		
Vol.	1	2	2	8	26	31	14	2						79		
PM Peak			18:00	18:00	15:00	15:00	15:00	15:00	17:00					15:00		
Vol.			1	7	17	27	11	5	1					66		

% iles	
15th Percentile :	29 MPH
50th Percentile :	35 MPH
85th Percentile :	41 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	616
Percent in Pace :	63.2%
Number of Vehicles > 35 MPH :	523
Percent of Vehicles > 35 MPH :	53.7%
Mean Speed(Average) :	36 MPH

PRECISION
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133213 B SPEED
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NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/01/1																
3	0	0	0	0	0	1	1	0	0	0	0	0	0	2	*	39
01:00	0	0	0	1	2	0	0	0	0	0	0	0	0	3	*	30
02:00	0	0	0	0	0	1	2	1	0	0	0	0	0	4	*	42
03:00	0	0	0	0	0	2	0	2	0	0	0	0	0	4	*	42
04:00	0	0	0	2	4	2	2	2	0	0	0	0	0	12	33	36
05:00	0	0	0	2	9	13	3	1	0	0	0	0	0	28	39	36
06:00	0	0	0	3	30	36	12	2	**1**	0	0	0	0	84	39	36
07:00	0	**1**	**3**	**12**	**37**	**50**	**21**	**10**	1	0	0	0	0	**135**	41	36
08:00	0	0	1	2	33	38	15	6	1	0	0	0	0	96	41	36
09:00	0	0	1	7	29	28	13	1	0	0	0	0	0	79	40	35
10:00	0	2	1	12	14	19	8	2	0	0	0	0	0	58	39	33
11:00	**1**	0	**3**	**13**	20	20	8	**8**	1	0	0	0	0	**74**	43	34
12 PM	0	0	2	12	17	25	**9**	1	0	0	0	0	0	66	39	34
13:00	0	0	1	6	**22**	**31**	7	2	**3**	**1**	0	0	0	73	40	36
14:00	0	0	0	5	15	21	4	2	0	1	0	0	0	48	39	36
15:00	0	0	0	**5**	**23**	**10**	**8**	**4**	0	0	0	0	0	**50**	41	35
16:00	0	0	**1**	2	8	10	5	1	0	0	0	0	0	27	41	36
17:00	0	0	1	2	9	9	1	4	0	0	0	0	0	26	44	36
18:00	0	0	0	2	6	3	4	0	0	0	0	0	0	15	40	35
19:00	0	0	0	0	5	2	1	0	0	0	0	0	0	8	34	35
20:00	0	0	0	2	1	1	0	0	0	0	0	0	0	4	*	31
21:00	0	0	1	1	5	2	1	0	0	0	0	0	0	10	34	33
22:00	0	0	0	0	1	4	1	0	0	0	0	0	0	6	38	37
23:00	0	0	0	1	3	1	0	0	0	0	0	0	0	5	32	32
%	0.1%	0.3%	1.6%	10.0%	32.0%	35.9%	13.7%	5.3%	0.8%	0.2%	0.0%	0.0%	0.0%			
AM Peak		07:00	07:00	07:00	07:00	07:00	07:00	07:00	06:00					07:00		
Vol.		1	3	12	37	50	21	10	1					135		
Midday Peak	11:00		11:00	11:00	13:00	13:00	12:00	11:00	13:00	13:00				11:00		
Vol.	1		3	13	22	31	9	8	3	1				74		
PM Peak			16:00	15:00	15:00	15:00	15:00	15:00						15:00		
Vol.			1	5	23	10	8	4						50		

% iles

15th Percentile : 29 MPH
50th Percentile : 34 MPH
85th Percentile : 40 MPH
95th Percentile : 45 MPH

Stats

10 MPH Pace Speed : 30-39 MPH
Number in Pace : 572
Percent in Pace : 62.4%
Number of Vehicles > 35 MPH : 445
Percent of Vehicles > 35 MPH : 48.5%
Mean Speed(Average) : 35 MPH

PRECISION
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NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/02/1																
3	0	0	0	0	0	2	1	0	0	0	0	0	0	3	*	39
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	2	1	1	0	0	0	0	0	0	4	*	36
04:00	0	0	0	0	2	1	0	0	0	0	0	0	0	3	*	34
05:00	0	1	0	0	1	9	2	0	0	0	0	0	0	13	39	35
06:00	0	0	0	2	8	10	5	**2**	0	0	0	0	0	27	41	36
07:00	0	0	**1**	**5**	12	14	5	2	0	0	0	0	0	39	40	35
08:00	0	0	0	2	6	14	**10**	1	0	0	0	0	0	33	42	37
09:00	**1**	**2**	1	3	**19**	**22**	7	1	0	0	0	0	0	**56**	39	33
10:00	0	0	0	7	8	15	5	2	0	0	0	0	0	37	40	35
11:00	0	0	0	**7**	13	16	3	1	**1**	0	0	0	0	41	38	35
12 PM	0	0	**2**	5	12	15	**8**	**4**	0	0	0	0	0	46	41	36
13:00	0	0	0	7	8	11	4	1	0	0	0	0	0	31	39	34
14:00	0	0	1	5	**17**	**21**	4	0	0	0	0	0	0	**48**	38	34
15:00	0	0	0	**4**	6	3	3	**2**	**1**	0	0	0	0	19	41	36
16:00	0	0	**1**	4	5	**8**	**4**	2	0	0	0	0	0	**24**	41	35
17:00	0	0	0	4	**8**	7	0	0	0	0	0	0	0	19	37	33
18:00	0	0	0	1	6	2	1	0	0	0	0	0	0	10	34	34
19:00	0	**1**	0	1	5	3	1	0	0	0	0	0	0	11	35	32
20:00	0	0	0	1	1	4	1	0	0	0	0	0	0	7	38	36
21:00	0	0	0	0	2	2	1	0	0	0	0	0	0	5	*	36
22:00	0	0	0	0	3	2	1	0	0	0	0	0	0	6	33	35
23:00	0	0	0	0	2	0	1	0	0	0	0	0	0	3	*	35
%	0.2%	0.8%	1.2%	12.0%	30.1%	37.5%	14.0%	3.7%	0.4%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	07:00	07:00	09:00	09:00	08:00	06:00						09:00		
Vol.	1	2	1	5	19	22	10	2						56		
Midday Peak			12:00	11:00	14:00	14:00	12:00	12:00	11:00					14:00		
Vol.			2	7	17	21	8	4	1					48		
PM Peak		19:00	16:00	15:00	17:00	16:00	16:00	15:00	15:00					16:00		
Vol.		1	1	4	8	8	4	2	1					24		

% iles	
15th Percentile :	28 MPH
50th Percentile :	34 MPH
85th Percentile :	40 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	303
Percent in Pace :	62.5%
Number of Vehicles > 35 MPH :	231
Percent of Vehicles > 35 MPH :	47.6%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

133213 B SPEED
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/03/1																
3	0	0	0	0	1	2	1	0	0	0	0	0	0	4	*	37
01:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	*	37
02:00	0	0	0	0	0	1	1	0	0	0	0	0	0	2	*	39
03:00	0	0	0	0	1	0	2	0	0	0	0	0	0	3	*	39
04:00	0	0	0	0	1	3	1	0	0	0	0	0	0	5	37	37
05:00	0	0	0	0	4	3	**5**	1	**2**	0	0	0	0	15	42	40
06:00	0	0	0	**2**	4	**9**	0	2	0	0	0	0	0	17	37	36
07:00	0	0	0	1	6	8	4	**4**	1	**1**	0	0	0	**25**	45	39
08:00	0	0	0	2	5	6	3	2	0	1	0	0	0	19	41	38
09:00	0	0	0	1	**10**	8	5	1	0	0	0	0	0	25	41	36
10:00	0	0	0	4	5	9	2	0	0	1	0	0	0	21	38	35
11:00	0	0	0	2	**12**	7	3	0	0	0	0	0	0	24	38	34
12 PM	0	0	0	2	12	6	4	0	0	0	0	0	0	24	39	35
13:00	0	0	0	1	11	12	5	1	0	0	0	0	0	30	40	36
14:00	0	0	0	**4**	9	**13**	**7**	**2**	0	0	0	0	0	**35**	41	36
15:00	0	0	0	3	5	3	3	0	**2**	0	0	0	0	16	39	36
16:00	0	0	**1**	3	4	5	0	2	0	0	0	0	0	15	36	34
17:00	0	0	0	**5**	**11**	**7**	0	2	0	0	0	0	0	**25**	36	34
18:00	0	0	0	2	7	5	0	0	0	0	0	0	0	14	37	33
19:00	0	0	0	2	8	6	**5**	**4**	0	0	0	0	0	25	44	37
20:00	0	0	0	1	6	0	0	0	1	0	0	0	0	8	33	34
21:00	0	0	1	0	2	5	1	0	1	0	0	0	0	10	38	37
22:00	0	0	1	1	0	2	0	0	0	0	0	0	0	4	*	31
23:00	0	0	0	1	0	1	0	0	0	0	0	0	0	2	*	32
%	0.0%	0.0%	0.8%	10.0%	33.6%	33.1%	14.1%	5.7%	1.9%	0.8%	0.0%	0.0%	0.0%			
AM Peak				06:00	09:00	06:00	05:00	07:00	05:00	07:00				07:00		
Vol.				2	10	9	5	4	2	1				25		
Midday Peak				14:00	11:00	14:00	14:00	14:00						14:00		
Vol.				4	12	13	7	2						35		
PM Peak			16:00	17:00	17:00	17:00	19:00	19:00	15:00					17:00		
Vol.			1	5	11	7	5	4	2					25		

% iles	15th Percentile :	29 MPH
	50th Percentile :	34 MPH
	85th Percentile :	41 MPH
	95th Percentile :	46 MPH

Stats	10 MPH Pace Speed :	30-39 MPH
	Number in Pace :	227
	Percent in Pace :	61.5%
	Number of Vehicles > 35 MPH :	181
	Percent of Vehicles > 35 MPH :	49.0%
	Mean Speed(Average) :	36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

133213 B SPEED
Site Code: TBA

NB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/04/1																
3	0	0	0	1	2	0	0	0	0	0	0	0	0	3	*	30
01:00	0	0	0	0	0	2	0	0	0	0	0	0	0	2	*	37
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	1	1	0	1	0	0	0	0	0	0	3	*	34
04:00	0	0	0	1	2	7	2	0	0	0	0	0	0	12	39	36
05:00	0	0	0	2	15	21	7	4	0	0	0	0	**1**	50	41	37
06:00	0	0	0	7	24	38	16	1	1	0	0	0	0	87	40	36
07:00	0	0	**5**	5	**36**	**60**	**28**	**10**	**2**	0	0	0	0	**146**	42	37
08:00	**1**	0	0	4	21	32	9	3	0	**1**	0	0	0	71	40	36
09:00	0	0	1	**10**	31	25	13	2	0	0	0	0	0	82	39	35
10:00	0	0	3	5	24	30	7	2	0	0	0	0	0	71	38	35
11:00	0	**1**	**2**	6	24	28	3	1	0	0	0	0	0	65	38	34
12 PM	0	1	0	8	**34**	30	11	1	0	0	0	0	0	**85**	39	34
13:00	0	0	1	6	21	25	**13**	3	0	**1**	**1**	0	0	71	40	36
14:00	0	0	1	**12**	20	**31**	12	**9**	0	0	0	0	0	85	42	36
15:00	0	0	**2**	**8**	15	**23**	**6**	0	0	0	0	0	0	**54**	39	34
16:00	0	0	0	7	**16**	12	2	**1**	**1**	0	0	0	0	39	37	34
17:00	0	0	1	1	11	10	4	1	0	0	0	0	0	28	40	35
18:00	0	0	0	1	14	5	1	0	1	0	0	0	0	22	37	34
19:00	0	0	0	0	6	3	2	0	0	0	0	0	0	11	37	35
20:00	0	0	0	2	2	3	1	0	0	0	0	0	0	8	37	34
21:00	0	0	1	1	7	3	0	0	0	0	0	0	0	12	35	32
22:00	0	0	0	0	3	1	0	0	0	0	0	0	0	4	32	33
23:00	0	0	0	1	1	1	0	0	0	0	0	0	0	3	*	32
%	0.1%	0.2%	1.7%	8.8%	32.5%	38.5%	13.6%	3.7%	0.5%	0.2%	0.1%	0.0%	0.1%			
AM Peak	08:00		07:00	09:00	07:00	07:00	07:00	07:00	07:00	08:00			05:00	07:00		
Vol.	1		5	10	36	60	28	10	2	1			1	146		
Midday Peak		11:00	11:00	14:00	12:00	14:00	13:00	14:00		13:00	13:00			12:00		
Vol.		1	2	12	34	31	13	9		1	1			85		
PM Peak			15:00	15:00	16:00	15:00	15:00	16:00	16:00					15:00		
Vol.			2	8	16	23	6	1	1					54		

% iles	
15th Percentile :	29 MPH
50th Percentile :	34 MPH
85th Percentile :	40 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	661
Percent in Pace :	65.3%
Number of Vehicles > 35 MPH :	493
Percent of Vehicles > 35 MPH :	48.6%
Mean Speed(Average) :	35 MPH

PRECISION
D A T A
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Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

133213 B SPEED
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
02/26/1																
3	0	0	0	0	3	3	0	0	0	0	0	0	0	6	36	34
01:00	0	0	0	0	1	2	0	0	0	0	0	0	0	3	*	35
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
03:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
04:00	0	0	0	1	0	2	0	0	0	0	0	0	0	3	*	34
05:00	0	0	0	2	3	7	**8**	**3**	0	0	0	0	0	23	43	39
06:00	0	0	1	5	9	**8**	6	0	0	0	0	0	0	29	39	34
07:00	**1**	0	0	8	**17**	8	4	1	0	0	**1**	0	0	**40**	38	33
08:00	0	0	0	**9**	7	5	0	0	**2**	0	0	0	0	23	36	33
09:00	0	0	**6**	6	11	8	3	0	0	0	0	**1**	0	35	37	32
10:00	0	0	1	7	14	14	4	0	0	0	0	0	0	40	38	34
11:00	0	0	**3**	**16**	**24**	**27**	13	**5**	**1**	0	0	0	0	**89**	41	35
12 PM	0	0	0	13	24	18	2	2	0	0	0	0	0	59	36	33
13:00	0	**3**	2	13	16	22	3	1	1	0	0	0	0	61	37	32
14:00	**1**	0	1	6	18	26	**16**	5	0	0	**1**	0	0	74	42	36
15:00	0	1	**3**	**22**	**67**	**51**	**21**	**5**	**1**	**1**	0	0	0	**172**	39	34
16:00	0	0	1	11	33	19	11	2	0	0	0	0	0	77	39	34
17:00	0	0	2	13	24	25	7	1	1	1	**1**	0	0	75	38	35
18:00	0	0	1	3	12	24	7	3	0	0	0	0	0	50	40	36
19:00	0	**2**	0	4	11	14	5	1	0	0	1	0	0	38	40	34
20:00	0	0	0	3	5	5	7	1	0	0	0	0	0	21	42	37
21:00	0	0	0	3	5	9	3	1	0	0	0	0	0	21	40	36
22:00	0	0	0	0	2	5	5	0	0	0	0	0	0	12	42	38
23:00	0	0	1	0	4	9	2	0	0	0	0	0	0	16	38	35
%	0.2%	0.6%	2.3%	15.1%	32.1%	32.2%	13.1%	3.2%	0.6%	0.2%	0.4%	0.1%	0.0%			
AM Peak	07:00		09:00	08:00	07:00	06:00	05:00	05:00	08:00		07:00	09:00		07:00		
Vol.	1		6	9	17	8	8	3	2		1	1		40		
Midday Peak	14:00	13:00	11:00	11:00	11:00	11:00	14:00	11:00	11:00		14:00			11:00		
Vol.	1	3	3	16	24	27	16	5	1		1			89		
PM Peak		19:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	17:00			15:00		
Vol.		2	3	22	67	51	21	5	1	1	1			172		

% iles	
15th Percentile :	27 MPH
50th Percentile :	33 MPH
85th Percentile :	40 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	579
Percent in Pace :	59.7%
Number of Vehicles > 35 MPH :	418
Percent of Vehicles > 35 MPH :	43.1%
Mean Speed(Average) :	34 MPH

PRECISION
D A T A
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P.O. Box 301 Berlin, MA 01503
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Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

133213 B SPEED
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
02/27/1																
3	0	0	0	0	2	**10**	**15**	1	**3**	0	0	0	0	**31**	43	41
01:00	0	0	0	1	3	2	1	0	0	0	0	0	0	7	33	34
02:00	0	0	0	0	2	1	3	1	0	0	0	0	0	7	42	39
03:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
04:00	0	0	0	1	0	2	0	0	0	0	0	0	0	3	*	34
05:00	0	0	0	1	0	1	0	1	0	0	0	0	0	3	*	37
06:00	0	0	0	1	5	2	0	1	0	0	0	0	0	9	34	34
07:00	0	0	0	4	**11**	9	1	**4**	1	0	0	0	0	30	44	36
08:00	0	0	0	**10**	8	5	1	0	0	0	0	0	0	24	36	31
09:00	0	0	0	4	10	9	1	1	0	0	0	0	0	25	37	34
10:00	0	0	2	3	15	7	2	3	0	0	0	0	0	32	39	34
11:00	0	0	**3**	**12**	**21**	14	12	**2**	0	0	0	0	0	64	40	34
12 PM	0	0	2	7	16	14	5	1	0	0	0	0	0	45	39	34
13:00	0	**1**	1	6	10	13	10	0	0	0	0	0	0	41	41	34
14:00	**1**	0	0	9	19	**30**	**14**	2	0	0	0	0	0	**75**	40	35
15:00	0	**1**	**7**	**17**	**57**	**52**	**18**	**5**	**1**	0	0	0	0	**158**	39	34
16:00	0	0	0	13	28	22	11	3	0	0	0	0	0	77	40	35
17:00	0	0	2	6	22	20	13	1	0	0	0	0	0	64	40	35
18:00	0	0	1	15	17	18	11	3	0	0	0	0	0	65	40	34
19:00	0	0	1	4	13	16	4	0	0	0	**1**	0	0	39	38	35
20:00	0	0	0	3	6	9	2	0	0	0	0	0	0	20	38	34
21:00	0	1	0	3	3	9	2	0	0	0	0	0	0	18	38	33
22:00	0	0	1	0	2	5	4	0	0	0	0	0	0	12	41	37
23:00	0	0	0	3	5	10	0	1	0	0	0	0	0	19	37	35
%	0.1%	0.3%	2.3%	14.3%	31.6%	32.2%	15.0%	3.5%	0.6%	0.0%	0.1%	0.0%	0.0%			
AM Peak				08:00	07:00	00:00	00:00	07:00	00:00					00:00		
Vol.				10	11	10	15	4	3					31		
Midday Peak	14:00	13:00	11:00	11:00	11:00	14:00	14:00	11:00						14:00		
Vol.	1	1	3	12	21	30	14	2						75		
PM Peak		15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00		19:00			15:00		
Vol.		1	7	17	57	52	18	5	1		1			158		

% iles		
	15th Percentile :	28 MPH
	50th Percentile :	34 MPH
	85th Percentile :	40 MPH
	95th Percentile :	44 MPH

Stats		
	10 MPH Pace Speed :	30-39 MPH
	Number in Pace :	518
	Percent in Pace :	59.6%
	Number of Vehicles > 35 MPH :	389
	Percent of Vehicles > 35 MPH :	44.7%
	Mean Speed(Average) :	35 MPH

PRECISION
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133213 B SPEED
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
02/28/1																
3	0	0	0	0	0	2	0	0	0	0	0	0	0	2	*	37
01:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	*	32
02:00	0	0	0	0	1	3	2	0	0	0	0	0	0	6	38	38
03:00	0	0	0	0	0	1	0	**1**	0	0	0	0	0	2	*	42
04:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1	*	27
05:00	0	0	0	0	0	4	2	1	0	0	0	0	0	7	39	40
06:00	0	0	**1**	2	9	3	2	1	0	0	0	0	0	18	36	34
07:00	0	0	1	3	**20**	**12**	6	0	0	0	0	0	0	**42**	39	34
08:00	0	0	0	1	10	5	**4**	0	0	0	0	0	0	20	40	35
09:00	0	0	0	**4**	8	8	**7**	0	**1**	**1**	**1**	0	0	30	40	38
10:00	0	1	0	7	10	8	4	0	1	1	0	0	0	32	38	34
11:00	0	0	1	**8**	**26**	**38**	21	1	**3**	0	0	0	0	**98**	41	36
12 PM	0	0	1	5	10	21	12	0	0	0	0	0	0	49	40	36
13:00	0	0	**2**	5	10	19	8	4	1	0	0	0	0	49	41	36
14:00	0	0	0	7	21	28	**23**	**5**	0	**1**	0	0	0	85	42	37
15:00	0	0	**2**	7	**57**	**76**	**36**	5	0	**1**	**1**	0	0	**185**	40	36
16:00	0	0	1	**9**	31	43	18	2	**1**	0	0	0	0	105	40	36
17:00	0	0	0	7	15	28	15	**6**	0	0	0	0	0	71	42	37
18:00	0	0	1	2	20	22	8	3	0	0	0	0	0	56	40	36
19:00	0	0	0	2	14	10	5	1	0	0	0	0	0	32	40	35
20:00	0	0	0	3	8	18	7	0	1	0	0	0	0	37	40	36
21:00	0	0	0	1	8	8	6	1	0	0	0	0	0	24	41	37
22:00	0	0	1	1	5	9	4	0	0	0	0	0	0	20	40	36
23:00	0	0	0	0	5	15	3	0	0	0	0	0	0	23	39	37
%	0.0%	0.1%	1.1%	7.5%	29.1%	38.3%	19.4%	3.1%	0.8%	0.4%	0.2%	0.0%	0.0%			
AM Peak			06:00	09:00	07:00	07:00	09:00	03:00	09:00	09:00	09:00			07:00		
Vol.			1	4	20	12	7	1	1	1	1			42		
Midday Peak			13:00	11:00	11:00	11:00	14:00	14:00	11:00	14:00				11:00		
Vol.			2	8	26	38	23	5	3	1				98		
PM Peak			15:00	16:00	15:00	15:00	15:00	17:00	16:00	15:00	15:00			15:00		
Vol.			2	9	57	76	36	6	1	1	1			185		

% iles	
15th Percentile :	29 MPH
50th Percentile :	35 MPH
85th Percentile :	41 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	635
Percent in Pace :	63.8%
Number of Vehicles > 35 MPH :	539
Percent of Vehicles > 35 MPH :	54.1%
Mean Speed(Average) :	36 MPH

PRECISION
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Email: datarequests@pdillc.com

Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

133213 B SPEED
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/01/1																
3	0	0	0	1	2	4	1	**1**	**1**	0	0	0	0	10	38	38
01:00	0	0	0	0	5	5	3	0	0	0	0	0	0	13	40	36
02:00	0	0	0	0	0	3	1	0	0	0	0	0	0	4	37	38
03:00	0	0	0	0	0	1	0	1	0	0	0	0	0	2	*	42
04:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2	*	34
05:00	0	0	0	0	3	1	1	0	0	0	0	0	0	5	32	35
06:00	0	0	0	3	6	2	1	0	0	0	0	0	0	12	34	32
07:00	0	**1**	**2**	1	**13**	12	4	1	0	0	0	0	0	34	39	34
08:00	0	0	0	4	5	3	3	1	0	0	0	0	0	16	40	34
09:00	0	0	0	**5**	8	**14**	**8**	1	0	0	**1**	0	0	**37**	40	37
10:00	0	0	0	7	16	21	6	1	0	0	0	0	0	51	39	35
11:00	0	0	1	4	**32**	**35**	15	**4**	0	**1**	**1**	0	0	**93**	40	36
12 PM	0	0	0	**11**	18	18	10	3	0	0	0	0	0	60	40	35
13:00	0	0	1	6	18	21	5	3	**1**	0	0	0	0	55	40	35
14:00	0	0	**3**	5	15	30	**19**	3	1	0	1	**1**	0	78	41	37
15:00	0	**1**	1	**9**	**56**	**62**	**23**	3	0	0	0	0	0	**155**	39	35
16:00	0	0	**2**	4	35	18	12	**5**	0	0	0	0	0	76	41	35
17:00	0	0	1	9	14	28	10	1	0	0	0	0	0	63	40	35
18:00	0	0	0	2	10	15	4	2	0	0	0	0	0	33	40	36
19:00	0	0	0	4	7	10	3	1	**1**	0	0	0	0	26	39	36
20:00	0	0	0	0	2	11	2	0	0	0	0	0	0	15	39	37
21:00	0	0	0	1	3	9	2	1	0	0	0	0	0	16	38	37
22:00	0	0	0	0	4	3	8	0	0	0	0	0	0	15	42	38
23:00	0	0	0	1	4	8	3	0	0	0	0	0	0	16	39	36
%	0.0%	0.2%	1.2%	8.7%	31.2%	37.8%	16.2%	3.6%	0.5%	0.1%	0.3%	0.1%	0.0%			
AM Peak		07:00	07:00	09:00	07:00	09:00	09:00	00:00	00:00		09:00			09:00		
Vol.		1	2	5	13	14	8	1	1		1			37		
Midday Peak			14:00	12:00	11:00	11:00	14:00	11:00	13:00	11:00	11:00	14:00		11:00		
Vol.			3	11	32	35	19	4	1	1	1	1		93		
PM Peak		15:00	16:00	15:00	15:00	15:00	15:00	16:00	19:00					15:00		
Vol.		1	2	9	56	62	23	5	1					155		

% iles	
15th Percentile :	29 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	44 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	569
Percent in Pace :	64.1%
Number of Vehicles > 35 MPH :	450
Percent of Vehicles > 35 MPH :	50.7%
Mean Speed(Average) :	36 MPH

PRECISION
D A T A
INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

133213 B SPEED
Site Code: TBA

SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/02/1																
3	0	0	0	1	**4**	6	2	0	0	0	0	0	0	13	39	35
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	1	1	**1**	0	0	0	0	0	3	*	42
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	2	0	0	0	0	0	0	0	2	*	37
06:00	0	0	0	1	3	4	2	0	0	0	0	0	0	10	38	36
07:00	0	0	0	0	3	3	**3**	1	0	0	0	0	0	10	41	38
08:00	0	0	0	2	3	4	2	1	0	0	0	0	0	12	38	36
09:00	0	0	**1**	**3**	4	**10**	3	0	0	0	0	0	0	**21**	38	35
10:00	1	0	0	1	8	16	1	2	0	0	0	0	0	29	38	34
11:00	0	0	**2**	2	10	10	9	1	0	0	0	0	0	34	41	36
12 PM	0	0	2	3	16	11	7	**8**	**1**	0	0	0	0	48	44	37
13:00	0	0	0	0	10	11	3	1	0	0	0	0	0	25	39	36
14:00	0	0	0	**6**	**20**	**23**	**13**	2	0	0	0	0	0	**64**	40	36
15:00	0	**1**	**2**	3	7	13	**14**	1	**2**	0	0	0	0	**43**	42	37
16:00	0	1	0	3	**13**	**16**	4	0	0	0	0	0	0	37	38	34
17:00	0	0	1	4	11	12	7	**3**	0	0	0	0	0	38	41	36
18:00	0	0	0	**5**	8	5	7	2	0	0	0	0	0	27	42	36
19:00	0	0	0	2	5	13	9	0	0	0	0	0	0	29	41	37
20:00	0	0	0	1	5	2	3	2	0	0	0	0	0	13	42	37
21:00	0	0	0	1	0	3	1	2	0	0	0	0	0	7	37	39
22:00	0	0	0	1	2	4	1	1	0	0	0	0	0	9	38	36
23:00	0	0	0	1	4	9	5	0	0	0	0	0	0	19	41	37
%	0.2%	0.4%	1.6%	8.1%	27.7%	36.0%	19.6%	5.7%	0.6%	0.0%	0.0%	0.0%	0.0%			
AM Peak			09:00	09:00	00:00	09:00	07:00	02:00						09:00		
Vol.			1	3	4	10	3	1						21		
Midday Peak			11:00	14:00	14:00	14:00	14:00	12:00	12:00					14:00		
Vol.			2	6	20	23	13	8	1					64		
PM Peak		15:00	15:00	18:00	16:00	16:00	15:00	17:00	15:00					15:00		
Vol.		1	2	5	13	16	14	3	2					43		

% iles	
15th Percentile :	29 MPH
50th Percentile :	35 MPH
85th Percentile :	41 MPH
95th Percentile :	45 MPH

Stats	
10 MPH Pace Speed :	31-40 MPH
Number in Pace :	299
Percent in Pace :	60.5%
Number of Vehicles > 35 MPH :	268
Percent of Vehicles > 35 MPH :	54.2%
Mean Speed(Average) :	36 MPH

PRECISION
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133213 B SPEED
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SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/03/1																
3	0	0	0	0	1	3	0	0	0	0	0	0	0	4	36	36
01:00	0	0	**1**	0	2	0	0	0	0	0	0	0	0	3	*	29
02:00	0	0	0	0	1	2	1	0	0	0	0	0	0	4	*	37
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	*	32
04:00	0	0	0	0	0	2	**2**	0	0	0	0	0	0	4	*	39
05:00	0	0	0	0	0	2	0	0	0	0	0	0	0	2	*	37
06:00	0	0	0	1	1	2	1	0	0	0	0	0	0	5	*	35
07:00	0	0	1	1	**3**	2	1	**1**	0	0	0	0	0	9	33	34
08:00	0	0	0	**3**	3	**4**	2	1	0	0	0	0	0	**13**	37	35
09:00	0	0	0	0	1	4	2	1	0	0	0	0	0	8	39	39
10:00	0	0	1	3	8	5	1	2	0	0	0	0	0	20	37	34
11:00	0	0	0	**4**	6	5	7	0	0	0	0	0	0	22	42	35
12 PM	0	0	**1**	1	6	7	3	1	**2**	0	0	0	0	21	40	37
13:00	0	0	0	1	4	4	2	3	0	0	0	0	0	14	44	38
14:00	0	**1**	1	3	**12**	**17**	**9**	**5**	1	0	0	0	0	**49**	43	36
15:00	0	0	0	4	**14**	12	3	2	0	0	0	0	0	35	38	35
16:00	0	0	**1**	3	11	8	4	1	**1**	0	0	0	0	29	39	35
17:00	0	0	1	3	10	11	**7**	0	0	0	0	0	0	32	40	35
18:00	0	0	0	**6**	7	14	2	1	0	0	0	0	0	30	38	34
19:00	0	0	0	2	10	**17**	4	**3**	0	0	0	0	0	**36**	41	36
20:00	0	0	0	4	8	6	0	0	0	0	0	0	0	18	36	33
21:00	0	0	0	4	3	6	3	0	0	0	0	0	0	16	39	35
22:00	0	0	0	1	4	3	5	0	0	0	0	0	0	13	41	37
23:00	0	0	0	1	6	2	2	1	0	0	0	0	0	12	34	35
%	0.0%	0.3%	1.8%	11.3%	30.5%	34.5%	15.3%	5.5%	1.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak			01:00	08:00	07:00	08:00	04:00	07:00						08:00		
Vol.			1	3	3	4	2	1						13		
Midday Peak		14:00	12:00	11:00	14:00	14:00	14:00	14:00	12:00					14:00		
Vol.		1	1	4	12	17	9	5	2					49		
PM Peak			16:00	18:00	15:00	19:00	17:00	19:00	16:00					19:00		
Vol.			1	6	14	17	7	3	1					36		

% iles	15th Percentile :	28 MPH
	50th Percentile :	34 MPH
	85th Percentile :	41 MPH
	95th Percentile :	45 MPH

Stats	10 MPH Pace Speed :	31-40 MPH
	Number in Pace :	241
	Percent in Pace :	60.3%
	Number of Vehicles > 35 MPH :	197
	Percent of Vehicles > 35 MPH :	49.1%
	Mean Speed(Average) :	35 MPH

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SB

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
03/04/1																
3	0	0	0	1	1	0	0	1	0	0	0	0	0	3	*	35
01:00	0	0	0	1	4	1	0	0	0	0	0	0	0	6	33	32
02:00	0	0	0	0	0	1	1	0	0	0	0	0	0	2	*	39
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	3	1	2	0	0	0	0	0	0	6	32	36
05:00	0	0	0	1	2	5	1	0	0	0	0	0	0	9	38	35
06:00	0	0	0	5	4	1	2	1	0	0	0	0	0	13	32	33
07:00	0	0	**1**	**6**	**16**	**13**	**6**	**4**	0	0	0	0	0	**46**	41	35
08:00	0	0	0	3	14	3	0	3	0	**1**	0	0	0	24	35	35
09:00	0	0	0	5	13	7	1	0	0	0	0	0	0	26	36	33
10:00	0	0	1	8	16	18	3	2	0	0	0	0	0	48	38	34
11:00	0	0	**4**	8	**22**	**30**	9	2	0	0	0	0	0	**75**	39	35
12 PM	0	**2**	1	2	19	28	2	3	0	**1**	0	0	0	58	38	35
13:00	0	1	2	**12**	17	17	6	2	0	0	0	0	0	57	39	33
14:00	0	0	0	4	17	28	**10**	**5**	**1**	0	**1**	0	0	66	42	37
15:00	0	0	**2**	**13**	**64**	**62**	**25**	3	0	0	0	0	0	**169**	39	35
16:00	0	**1**	2	5	35	30	5	0	0	0	0	0	0	78	38	34
17:00	0	1	1	2	24	27	12	**5**	**1**	0	0	0	0	73	42	36
18:00	0	0	0	8	16	27	6	2	0	0	0	0	0	59	39	35
19:00	0	0	1	3	14	12	3	0	0	**1**	0	0	0	34	38	35
20:00	0	0	0	2	6	15	2	1	1	0	0	0	0	27	38	36
21:00	0	0	0	4	8	4	1	0	0	1	0	0	0	18	36	34
22:00	0	0	0	2	0	4	1	0	0	0	0	0	0	7	38	35
23:00	0	0	0	1	3	12	3	0	0	0	0	0	0	19	39	36
%	0.0%	0.5%	1.6%	10.4%	34.5%	37.5%	10.9%	3.7%	0.3%	0.4%	0.1%	0.0%	0.0%			
AM Peak			07:00	07:00	07:00	07:00	07:00	07:00		08:00				07:00		
Vol.			1	6	16	13	6	4		1				46		
Midday Peak		12:00	11:00	13:00	11:00	11:00	14:00	14:00	14:00	12:00	14:00			11:00		
Vol.		2	4	12	22	30	10	5	1	1	1			75		
PM Peak		16:00	15:00	15:00	15:00	15:00	15:00	17:00	17:00	19:00				15:00		
Vol.		1	2	13	64	62	25	5	1	1				169		

% iles

15th Percentile :	28 MPH
50th Percentile :	34 MPH
85th Percentile :	39 MPH
95th Percentile :	44 MPH

Stats

10 MPH Pace Speed :	30-39 MPH
Number in Pace :	606
Percent in Pace :	65.7%
Number of Vehicles > 35 MPH :	418
Percent of Vehicles > 35 MPH :	45.2%
Mean Speed(Average) :	35 MPH

Hanscom Drive
north of Vandenberg Drive
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PRECISION
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133213 B VOLUME
Site Code: TBA

Start	NB				SB				Combined				26-Feb-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Tue
12:00	0		21		0		19		0		40		
12:15	0		12		2		18		2		30		
12:30	0		15		1		11		1		26		
12:45	0	0	22	70	3	6	11	59	3	6	33	129	
01:00	0		15		0		15		0		30		
01:15	1		12		3		11		4		23		
01:30	0		13		0		15		0		28		
01:45	0	1	21	61	0	3	20	61	0	4	41	122	
02:00	0		14		0		20		0		34		
02:15	0		12		0		9		0		21		
02:30	2		14		0		28		2		42		
02:45	1	3	16	56	1	1	17	74	2	4	33	130	
03:00	1		36		1		105		2		141		
03:15	1		11		1		20		2		31		
03:30	1		7		0		27		1		34		
03:45	2	5	9	63	0	2	20	172	2	7	29	235	
04:00	2		6		2		24		4		30		
04:15	4		2		1		25		5		27		
04:30	2		8		0		12		2		20		
04:45	2	10	4	20	0	3	16	77	2	13	20	97	
05:00	3		8		1		19		4		27		
05:15	1		6		1		23		2		29		
05:30	10		8		2		16		12		24		
05:45	17	31	6	28	19	23	17	75	36	54	23	103	
06:00	14		6		13		17		27		23		
06:15	18		8		3		18		21		26		
06:30	23		5		6		8		29		13		
06:45	45	100	4	23	7	29	7	50	52	129	11	73	
07:00	47		1		11		7		58		8		
07:15	53		5		14		10		67		15		
07:30	34		1		9		7		43		8		
07:45	17	151	3	10	6	40	14	38	23	191	17	48	
08:00	15		4		3		12		18		16		
08:15	22		4		6		7		28		11		
08:30	21		0		6		2		27		2		
08:45	21	79	3	11	8	23	0	21	29	102	3	32	
09:00	21		2		8		9		29		11		
09:15	18		1		10		4		28		5		
09:30	16		1		9		4		25		5		
09:45	22	77	3	7	8	35	4	21	30	112	7	28	
10:00	20		1		12		7		32		8		
10:15	14		2		6		1		20		3		
10:30	17		2		8		3		25		5		
10:45	14	65	2	7	14	40	1	12	28	105	3	19	
11:00	18		0		13		7		31		7		
11:15	16		1		47		5		63		6		
11:30	17		0		15		3		32		3		
11:45	31	82	1	2	14	89	1	16	45	171	2	18	
Total	604		358		294		676		898		1034		
Percent	67.3%		34.6%		32.7%		65.4%						
Day Total		962				970				1932			
Peak	06:45		02:15		10:45		03:00		06:45		02:30		
Vol.	179		78		89		172		220		247		
P.H.F.	0.844		0.542		0.473		0.410		0.821		0.438		

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PRECISION
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133213 B VOLUME
Site Code: TBA

Start	NB				SB				Combined				27-Feb-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Wed
12:00	0		15		1		12		1		27		
12:15	0		11		0		11		0		22		
12:30	0		12		30		9		30		21		
12:45	1	1	8	46	0	31	13	45	1	32	21	91	
01:00	1		17		2		9		3		26		
01:15	0		10		3		7		3		17		
01:30	0		16		2		9		2		25		
01:45	1	2	16	59	0	7	16	41	1	9	32	100	
02:00	0		18		3		21		3		39		
02:15	1		16		3		14		4		30		
02:30	0		11		0		23		0		34		
02:45	1	2	8	53	1	7	17	75	2	9	25	128	
03:00	1		23		0		107		1		130		
03:15	0		6		1		7		1		13		
03:30	2		1		0		23		2		24		
03:45	1	4	23	53	0	1	21	158	1	5	44	211	
04:00	2		14		0		34		2		48		
04:15	0		6		2		18		2		24		
04:30	0		6		0		14		0		20		
04:45	6	8	6	32	1	3	11	77	7	11	17	109	
05:00	0		6		1		18		1		24		
05:15	3		4		0		19		3		23		
05:30	5		7		0		13		5		20		
05:45	17	25	8	25	2	3	14	64	19	28	22	89	
06:00	11		7		2		21		13		28		
06:15	19		8		3		16		22		24		
06:30	20		7		2		13		22		20		
06:45	28	78	5	27	2	9	15	65	30	87	20	92	
07:00	41		3		9		7		50		10		
07:15	43		5		14		12		57		17		
07:30	26		2		6		3		32		5		
07:45	13	123	4	14	1	30	17	39	14	153	21	53	
08:00	14		0		8		8		22		8		
08:15	23		4		4		4		27		8		
08:30	21		5		6		5		27		10		
08:45	15	73	1	10	6	24	3	20	21	97	4	30	
09:00	16		1		4		6		20		7		
09:15	19		1		9		2		28		3		
09:30	17		4		10		6		27		10		
09:45	18	70	1	7	2	25	4	18	20	95	5	25	
10:00	14		1		6		1		20		2		
10:15	11		2		8		1		19		3		
10:30	11		2		8		6		19		8		
10:45	10	46	0	5	10	32	4	12	20	78	4	17	
11:00	5		1		6		11		11		12		
11:15	11		1		37		0		48		1		
11:30	16		0		12		5		28		5		
11:45	27	59	1	3	9	64	3	19	36	123	4	22	
Total	491		334		236		633		727		967		
Percent	67.5%		34.5%		32.5%		65.5%						
Day Total		825				869				1694			
Peak	06:45		01:30		10:45		02:15		06:45		02:15		
Vol.	138		66		65		161		169		219		
P.H.F.	0.802		0.917		0.439		0.376		0.741		0.421		

Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 B VOLUME
Site Code: TBA

Start	NB				SB				Combined				28-Feb-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	0		16		2		8		2		24		
12:15	0		16		0		16		0		32		
12:30	0		12		0		13		0		25		
12:45	0	0	20	64	0	2	12	49	0	2	32	113	
01:00	0		9		1		14		1		23		
01:15	0		14		1		13		1		27		
01:30	0		14		0		10		0		24		
01:45	0	0	23	60	0	2	12	49	0	2	35	109	
02:00	1		21		1		19		2		40		
02:15	0		15		2		15		2		30		
02:30	0		18		3		35		3		53		
02:45	0	1	19	73	0	6	16	85	0	7	35	158	
03:00	1		36		1		109		2		145		
03:15	1		14		0		24		1		38		
03:30	1		9		1		32		2		41		
03:45	1	4	7	66	0	2	20	185	1	6	27	251	
04:00	1		9		1		42		2		51		
04:15	0		7		0		24		0		31		
04:30	1		10		0		24		1		34		
04:45	6	8	2	28	0	1	15	105	6	9	17	133	
05:00	3		9		1		18		4		27		
05:15	2		6		2		18		4		24		
05:30	12		9		0		14		12		23		
05:45	22	39	7	31	4	7	21	71	26	46	28	102	
06:00	10		2		1		15		11		17		
06:15	20		5		4		16		24		21		
06:30	26		4		2		10		28		14		
06:45	34	90	8	19	11	18	15	56	45	108	23	75	
07:00	53		6		10		7		63		13		
07:15	57		5		12		7		69		12		
07:30	23		6		7		11		30		17		
07:45	20	153	4	21	13	42	7	32	33	195	11	53	
08:00	14		3		4		11		18		14		
08:15	31		2		4		12		35		14		
08:30	18		4		7		9		25		13		
08:45	23	86	2	11	5	20	5	37	28	106	7	48	
09:00	13		2		6		7		19		9		
09:15	19		2		8		4		27		6		
09:30	21		1		4		4		25		5		
09:45	14	67	3	8	12	30	9	24	26	97	12	32	
10:00	19		4		8		5		27		9		
10:15	11		1		11		4		22		5		
10:30	9		2		6		5		15		7		
10:45	13	52	2	9	7	32	6	20	20	84	8	29	
11:00	14		4		7		8		21		12		
11:15	20		1		45		8		65		9		
11:30	17		0		25		6		42		6		
11:45	28	79	0	5	21	98	1	23	49	177	1	28	
Total	579		395		260		736		839		1131		
Percent	69.0%		34.9%		31.0%		65.1%						
Day Total		974				996				1970			
Peak	06:30		02:15		11:00		03:00		06:45		02:30		
Vol.	170		88		98		185		207		271		
P.H.F.	0.746		0.611		0.544		0.424		0.750		0.467		

Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

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INDUSTRIES, LLC
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Office: 508.481.3999 Fax: 508.545.1234
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133213 B VOLUME
Site Code: TBA

Start	NB				SB				Combined				01-Mar-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Fri
12:00	1		25		0		16		1		41		
12:15	0		15		1		16		1		31		
12:30	0		16		4		14		4		30		
12:45	1	2	10	66	5	10	14	60	6	12	24	126	
01:00	0		29		3		22		3		51		
01:15	2		11		5		13		7		24		
01:30	0		12		5		7		5		19		
01:45	1	3	21	73	0	13	13	55	1	16	34	128	
02:00	2		18		2		24		4		42		
02:15	0		14		0		10		0		24		
02:30	1		7		1		26		2		33		
02:45	1	4	9	48	1	4	18	78	2	8	27	126	
03:00	0		21		0		97		0		118		
03:15	0		11		0		15		0		26		
03:30	2		9		0		21		2		30		
03:45	2	4	9	50	2	2	22	155	4	6	31	205	
04:00	1		7		0		30		1		37		
04:15	5		6		2		16		7		22		
04:30	2		6		0		19		2		25		
04:45	4	12	8	27	0	2	11	76	4	14	19	103	
05:00	2		7		0		19		2		26		
05:15	2		8		1		14		3		22		
05:30	3		8		0		19		3		27		
05:45	21	28	3	26	4	5	11	63	25	33	14	89	
06:00	12		1		1		11		13		12		
06:15	27		6		2		4		29		10		
06:30	14		3		4		12		18		15		
06:45	31	84	5	15	5	12	6	33	36	96	11	48	
07:00	53		2		11		9		64		11		
07:15	47		4		11		8		58		12		
07:30	23		2		4		4		27		6		
07:45	12	135	0	8	8	34	5	26	20	169	5	34	
08:00	19		0		4		3		23		3		
08:15	27		1		4		3		31		4		
08:30	28		0		2		5		30		5		
08:45	22	96	3	4	6	16	4	15	28	112	7	19	
09:00	20		4		5		4		25		8		
09:15	14		2		5		2		19		4		
09:30	31		2		9		3		40		5		
09:45	14	79	2	10	18	37	7	16	32	116	9	26	
10:00	17		1		8		3		25		4		
10:15	16		1		20		4		36		5		
10:30	13		2		13		5		26		7		
10:45	12	58	2	6	10	51	3	15	22	109	5	21	
11:00	6		2		14		6		20		8		
11:15	18		1		42		3		60		4		
11:30	12		1		18		3		30		4		
11:45	38	74	1	5	19	93	4	16	57	167	5	21	
Total	579		338		279		608		858		946		
Percent	67.5%		35.7%		32.5%		64.3%						
Day Total		917				887				1804			
Peak	06:45		01:00		11:00		02:30		06:45		03:00		
Vol.	154		73		93		156		185		205		
P.H.F.	0.726		0.629		0.554		0.402		0.723		0.434		

Hanscom Drive
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133213 B VOLUME
Site Code: TBA

Start	NB				SB				Combined				02-Mar-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sat
12:00	0		9		6		18		6		27		
12:15	1		9		3		7		4		16		
12:30	2		13		1		12		3		25		
12:45	0	3	15	46	3	13	11	48	3	16	26	94	
01:00	0		4		0		8		0		12		
01:15	0		8		0		3		0		11		
01:30	0		9		0		9		0		18		
01:45	0	0	10	31	0	0	5	25	0	0	15	56	
02:00	0		17		0		19		0		36		
02:15	0		13		1		18		1		31		
02:30	0		6		0		18		0		24		
02:45	0	0	12	48	2	3	9	64	2	3	21	112	
03:00	1		3		0		13		1		16		
03:15	0		3		1		15		1		18		
03:30	1		11		0		13		1		24		
03:45	2	4	2	19	0	1	2	43	2	5	4	62	
04:00	1		4		0		3		1		7		
04:15	0		7		0		11		0		18		
04:30	2		5		0		8		2		13		
04:45	0	3	8	24	0	0	15	37	0	3	23	61	
05:00	0		9		0		15		0		24		
05:15	2		3		0		5		2		8		
05:30	2		4		0		12		2		16		
05:45	9	13	3	19	2	2	6	38	11	15	9	57	
06:00	9		2		4		9		13		11		
06:15	4		3		2		5		6		8		
06:30	7		3		1		6		8		9		
06:45	7	27	2	10	3	10	7	27	10	37	9	37	
07:00	7		3		1		7		8		10		
07:15	9		2		2		8		11		10		
07:30	12		4		5		9		17		13		
07:45	11	39	2	11	2	10	5	29	13	49	7	40	
08:00	4		4		2		5		6		9		
08:15	4		3		2		4		6		7		
08:30	12		0		4		3		16		3		
08:45	13	33	0	7	4	12	1	13	17	45	1	20	
09:00	12		2		3		1		15		3		
09:15	13		1		5		3		18		4		
09:30	13		2		8		2		21		4		
09:45	18	56	0	5	5	21	1	7	23	77	1	12	
10:00	7		2		6		0		13		2		
10:15	7		2		5		2		12		4		
10:30	9		1		11		4		20		5		
10:45	14	37	1	6	7	29	3	9	21	66	4	15	
11:00	11		2		11		10		22		12		
11:15	5		0		1		2		6		2		
11:30	15		1		4		5		19		6		
11:45	10	41	0	3	18	34	2	19	28	75	2	22	
Total	256		229		135		359		391		588		
Percent	65.5%		38.9%		34.5%		61.1%						
Day Total		485				494				979			
Peak	09:00		01:30		10:15		02:00		09:00		02:00		
Vol.	56		49		34		64		77		112		
P.H.F.	0.778		0.721		0.773		0.842		0.837		0.778		

Hanscom Drive
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133213 B VOLUME
Site Code: TBA

Start	NB				SB				Combined				03-Mar-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Sun
12:00	0		7		0		9		0		16		
12:15	2		4		2		7		4		11		
12:30	0		9		1		1		1		10		
12:45	2	4	4	24	1	4	4	21	3	8	8	45	
01:00	0		2		1		3		1		5		
01:15	1		6		1		5		2		11		
01:30	0		11		0		4		0		15		
01:45	0	1	11	30	1	3	2	14	1	4	13	44	
02:00	1		10		2		9		3		19		
02:15	0		11		1		5		1		16		
02:30	1		8		0		22		1		30		
02:45	0	2	6	35	1	4	13	49	1	6	19	84	
03:00	1		6		1		11		2		17		
03:15	0		3		0		11		0		14		
03:30	0		3		0		4		0		7		
03:45	2	3	4	16	0	1	9	35	2	4	13	51	
04:00	0		2		0		6		0		8		
04:15	2		4		2		11		4		15		
04:30	0		6		1		10		1		16		
04:45	3	5	3	15	1	4	2	29	4	9	5	44	
05:00	1		12		0		6		1		18		
05:15	0		6		0		7		0		13		
05:30	5		3		0		13		5		16		
05:45	9	15	4	25	2	2	6	32	11	17	10	57	
06:00	0		3		1		10		1		13		
06:15	2		3		0		5		2		8		
06:30	8		3		0		8		8		11		
06:45	7	17	5	14	4	5	7	30	11	22	12	44	
07:00	9		9		2		14		11		23		
07:15	5		6		0		8		5		14		
07:30	6		6		4		12		10		18		
07:45	5	25	4	25	3	9	2	36	8	34	6	61	
08:00	1		3		5		7		6		10		
08:15	5		1		3		3		8		4		
08:30	5		3		1		2		6		5		
08:45	8	19	1	8	4	13	6	18	12	32	7	26	
09:00	5		2		3		2		8		4		
09:15	2		2		1		4		3		6		
09:30	8		5		3		4		11		9		
09:45	10	25	1	10	1	8	6	16	11	33	7	26	
10:00	4		0		5		1		9		1		
10:15	5		0		4		4		9		4		
10:30	6		2		4		5		10		7		
10:45	6	21	2	4	7	20	3	13	13	41	5	17	
11:00	5		1		3		7		8		8		
11:15	7		0		7		0		14		0		
11:30	5		1		5		3		10		4		
11:45	7	24	0	2	7	22	2	12	14	46	2	14	
Total	161		208		95		305		256		513		
Percent	62.9%		40.5%		37.1%		59.5%						
Day Total		369				400				769			
Peak	06:30		01:30		10:45		02:30		11:00		02:00		
Vol.	29		43		22		57		46		84		
P.H.F.	0.806		0.977		0.786		0.648		0.821		0.700		

Hanscom Drive
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133213 B VOLUME
Site Code: TBA

Start	NB				SB				Combined				04-Mar-13
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Mon
12:00	1		25		1		17		2		42		
12:15	1		17		1		11		2		28		
12:30	1		24		0		15		1		39		
12:45	0	3	19	85	1	3	15	58	1	6	34	143	
01:00	1		21		0		14		1		35		
01:15	1		26		3		16		4		42		
01:30	0		11		0		13		0		24		
01:45	0	2	13	71	3	6	14	57	3	8	27	128	
02:00	0		22		0		13		0		35		
02:15	0		19		2		12		2		31		
02:30	0		19		0		24		0		43		
02:45	0	0	25	85	0	2	17	66	0	2	42	151	
03:00	0		27		0		103		0		130		
03:15	0		9		0		21		0		30		
03:30	0		6		0		29		0		35		
03:45	3	3	12	54	0	0	16	169	3	3	28	223	
04:00	3		8		3		20		6		28		
04:15	2		5		0		18		2		23		
04:30	5		13		1		21		6		34		
04:45	2	12	13	39	2	6	19	78	4	18	32	117	
05:00	8		8		4		25		12		33		
05:15	4		3		1		13		5		16		
05:30	10		11		3		21		13		32		
05:45	28	50	6	28	1	9	14	73	29	59	20	101	
06:00	12		3		3		18		15		21		
06:15	12		4		3		13		15		17		
06:30	33		9		0		18		33		27		
06:45	30	87	6	22	7	13	10	59	37	100	16	81	
07:00	65		5		9		12		74		17		
07:15	48		3		17		10		65		13		
07:30	20		2		9		7		29		9		
07:45	13	146	1	11	11	46	5	34	24	192	6	45	
08:00	15		5		3		14		18		19		
08:15	16		2		8		4		24		6		
08:30	19		0		8		4		27		4		
08:45	21	71	1	8	5	24	5	27	26	95	6	35	
09:00	16		2		4		1		20		3		
09:15	23		3		7		5		30		8		
09:30	18		4		8		6		26		10		
09:45	25	82	3	12	7	26	6	18	32	108	9	30	
10:00	22		1		13		3		35		4		
10:15	19		2		9		1		28		3		
10:30	19		1		10		0		29		1		
10:45	11	71	0	4	16	48	3	7	27	119	3	11	
11:00	10		0		11		5		21		5		
11:15	15		0		32		5		47		5		
11:30	14		1		16		6		30		7		
11:45	26	65	2	3	16	75	3	19	42	140	5	22	
Total	592		422		258		665		850		1087		
Percent	69.6%		38.8%		30.4%		61.2%						
Day Total		1014				923				1937			
Peak	06:30		00:30		10:45		02:45		06:30		02:15		
Vol.	176		90		75		170		209		246		
P.H.F.	0.677		0.865		0.586		0.413		0.706		0.473		

Hanscom Drive
north of Vandenberg Drive
City, State: Bedford, MA
Client: Toole Design/ C. Fink

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

133213 B VOLUME
Site Code: TBA

Start	26-Feb-13		27-Feb-13		28-Feb-13		01-Mar-13		02-Mar-13		03-Mar-13		04-Mar-13		Week Average	
Time	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	0	6	1	31	0	2	2	10	3	13	4	4	3	3	2	10
01:00	1	3	2	7	0	2	3	13	0	0	1	3	2	6	1	5
02:00	3	1	2	7	1	6	4	4	0	3	2	4	0	2	2	4
03:00	5	2	4	1	4	2	4	2	4	1	3	1	3	0	4	1
04:00	10	3	8	3	8	1	12	2	3	0	5	4	12	6	8	3
05:00	31	23	25	3	39	7	28	5	13	2	15	2	50	9	29	7
06:00	100	29	78	9	90	18	84	12	27	10	17	5	87	13	69	14
07:00	**151**	40	**123**	30	**153**	42	**135**	34	39	10	**25**	9	**146**	46	**110**	30
08:00	79	23	73	24	86	20	96	16	33	12	19	13	71	24	65	19
09:00	77	35	70	25	67	30	79	37	**56**	21	25	8	82	26	65	26
10:00	65	40	46	32	52	32	58	51	37	29	21	20	71	48	50	36
11:00	82	**89**	59	**64**	79	**98**	74	**93**	41	**34**	24	**22**	65	**75**	61	**68**
12:00 PM	**70**	59	46	45	64	49	66	60	46	48	24	21	**85**	58	**57**	49
01:00	61	61	**59**	41	60	49	**73**	55	31	25	30	14	71	57	55	43
02:00	56	74	53	75	**73**	85	48	78	**48**	**64**	**35**	**49**	85	66	57	70
03:00	63	**172**	53	**158**	66	**185**	50	**155**	19	43	16	35	54	**169**	46	**131**
04:00	20	77	32	77	28	105	27	76	24	37	15	29	39	78	26	68
05:00	28	75	25	64	31	71	26	63	19	38	25	32	28	73	26	59
06:00	23	50	27	65	19	56	15	33	10	27	14	30	22	59	19	46
07:00	10	38	14	39	21	32	8	26	11	29	25	36	11	34	14	33
08:00	11	21	10	20	11	37	4	15	7	13	8	18	8	27	8	22
09:00	7	21	7	18	8	24	10	16	5	7	10	16	12	18	8	17
10:00	7	12	5	12	9	20	6	15	6	9	4	13	4	7	6	13
11:00	2	16	3	19	5	23	5	16	3	19	2	12	3	19	3	18
Total	962	970	825	869	974	996	917	887	485	494	369	400	1014	923	791	792
Day	1932		1694		1970		1804		979		769		1937		1583	
AM Peak	07:00	11:00	07:00	11:00	07:00	11:00	07:00	11:00	09:00	11:00	07:00	11:00	07:00	11:00	07:00	11:00
Vol.	151	89	123	64	153	98	135	93	56	34	25	22	146	75	110	68
PM Peak	12:00	15:00	13:00	15:00	14:00	15:00	13:00	15:00	14:00	14:00	14:00	14:00	12:00	15:00	12:00	15:00
Vol.	70	172	59	158	73	185	73	155	48	64	35	49	85	169	57	131

Comb. Total	1932	1694	1970	1804	979	769	1937	1583

ADT ADT 1,584 AADT 1,584

Appendix C-4

2012 Vehicle Occupancy Survey

Hanscom Drive AM Vehicle Occupancy Counts

Date: 12/19/2013
Time: 6:00 AM - 9:00 AM
Major Street: N/S: Hanscom Drive
Minor Street: E/W: Old Bedford Road
City, State: Lexington, MA

	Entering Hanscom Drive From South				Exiting Hanscom Drive From South			
Start Time	1	2	3+	Total	1	2	3+	Total
06:00 AM	6	0	0	6	0	0	0	0
06:15 AM	24	2	0	26	2	0	0	2
06:30 AM	16	2	0	18	4	0	0	4
06:45 AM	24	2	0	26	4	0	0	4
07:00 AM	46	3	0	49	9	0	0	9
07:15 AM	60	7	1	68	5	0	0	5
07:30 AM	34	2	0	36	3	0	0	3
07:45 AM	20	2	1	23	5	0	0	5
08:00 AM	8	4	0	12	9	1	0	10
08:15 AM	16	2	0	18	10	0	0	10
08:30 AM	16	2	1	19	8	0	0	8
08:45 AM	13	1	0	14	6	0	0	6

Hanscom Drive PM Vehicle Occupancy Counts

Date: 12/17/2013
Time: 3:00 PM - 6:00 PM
Major Street: N/S: Hanscom Drive
Minor Street: E/W: Old Bedford Road
City, State: Lexington, MA

	Entering Hanscom Drive From South				Exiting Hanscom Drive From North			
Start Time	1	2	3+	Total	1	2	3+	Total
3:00:00 PM	25	1	0	26	81	15	3	99
3:15:00 PM	11	1	0	12	12	3	0	15
3:30:00 PM	4	0	0	4	23	0	0	23
3:45:00 PM	11	1	1	13	21	1	0	22
4:00:00 PM	7	0	0	7	27	0	0	27
4:15:00 PM	4	1	0	5	10	3	0	13
4:30:00 PM	6	0	0	6	17	2	0	19
4:45:00 PM	7	1	0	8	15	1	0	16
5:00:00 PM	7	1	0	8	15	1	0	16
5:15:00 PM	3	1	0	4	10	1	0	11
5:30:00 PM	4	0	0	4	18	1	0	19
5:45:00 PM	4	0	0	4	12	3	0	15

Appendix C-5

SYNCHRO Level of Service Analysis: 2012

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	216	0	0	19	1	137	101	0	3	23	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		230	0		0	0		0	0		230
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.991							0.850
Flt Protected		0.991						0.975			0.996	
Satd. Flow (prot)	0	3548	0	0	3578	0	0	1852	0	0	1690	1615
Flt Permitted		0.991						0.975			0.996	
Satd. Flow (perm)	0	3548	0	0	3578	0	0	1852	0	0	1690	1615
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		592			394			514			456	
Travel Time (s)		13.5			9.0			11.7			10.4	
Peak Hour Factor	0.59	0.79	0.81	0.92	0.59	0.50	0.83	0.66	0.92	0.92	0.64	1.00
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	13%	0%
Adj. Flow (vph)	58	273	0	0	32	2	165	153	0	3	36	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	331	0	0	34	0	0	318	0	0	39	3
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.5%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	34	216	0	0	19	1	137	101	0	3	23	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.59	0.79	0.81	0.92	0.59	0.50	0.83	0.66	0.92	0.92	0.64	1.00
Hourly flow rate (vph)	58	273	0	0	32	2	165	153	0	3	36	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	544	526	36	662	526	153	36			153		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	544	526	36	662	526	153	36			153		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	33	100	100	92	100	90			100		
cM capacity (veh/h)	391	410	1037	163	411	898	1588			1440		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	149	182	21	13	318	39	3
Volume Left	58	0	0	0	165	3	0
Volume Right	0	0	0	2	0	0	3
cSH	402	410	411	450	1588	1440	1700
Volume to Capacity	0.37	0.44	0.05	0.03	0.10	0.00	0.00
Queue Length 95th (ft)	42	56	4	2	9	0	0
Control Delay (s)	19.1	20.6	14.2	13.2	4.3	0.6	0.0
Lane LOS	C	C	B	B	A	A	
Approach Delay (s)	19.9		13.9		4.3	0.6	
Approach LOS	C		B				

Intersection Summary				
Average Delay	11.7			
Intersection Capacity Utilization	36.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	278	821	397	318	106	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.939			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1787	1863	1708	0	1671	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1787	1863	1708	0	1671	1583
Link Speed (mph)		30	30		30	
Link Distance (ft)		753	771		267	
Travel Time (s)		17.1	17.5		6.1	
Peak Hour Factor	0.87	0.95	0.86	0.84	0.80	0.73
Heavy Vehicles (%)	1%	2%	4%	5%	8%	2%
Adj. Flow (vph)	320	864	462	379	133	162
Shared Lane Traffic (%)						
Lane Group Flow (vph)	320	864	841	0	132	162
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 71.6%		ICU Level of Service C	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	278	821	397	318	106	118
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.95	0.86	0.84	0.80	0.73
Hourly flow rate (vph)	320	864	462	379	132	162
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	462				2154	651
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	462				2154	651
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	71				0	66
cM capacity (veh/h)	1105				36	469

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	320	864	840	132	162
Volume Left	320	0	0	132	0
Volume Right	0	0	379	0	162
cSH	1105	1700	1700	36	469
Volume to Capacity	0.29	0.51	0.49	3.69	0.34
Queue Length 95th (ft)	30	0	0	Err	38
Control Delay (s)	9.6	0.0	0.0	Err	16.7
Lane LOS	A			F	C
Approach Delay (s)	2.6		0.0	4513.3	
Approach LOS				F	

Intersection Summary				
Average Delay	574.0			
Intersection Capacity Utilization	71.6%	ICU Level of Service		C
Analysis Period (min)	15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	34	18	143	282	149	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.957		0.913			
Flt Protected	0.967					0.978
Satd. Flow (prot)	1723	0	1723	0	0	1838
Flt Permitted	0.967					0.978
Satd. Flow (perm)	1723	0	1723	0	0	1838
Link Speed (mph)	30		30			30
Link Distance (ft)	634		229			338
Travel Time (s)	14.4		5.2			7.7
Peak Hour Factor	0.65	0.75	0.87	0.94	0.82	0.82
Heavy Vehicles (%)	3%	0%	2%	0%	0%	2%
Adj. Flow (vph)	52	24	164	300	182	226
Shared Lane Traffic (%)						
Lane Group Flow (vph)	76	0	464	0	0	408
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 56.2%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	34	18	143	282	149	185
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.75	0.87	0.94	0.82	0.82
Hourly flow rate (vph)	52	24	164	300	182	226
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	903	314			464	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	903	314			464	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	97			84	
cM capacity (veh/h)	256	731			1108	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	76	464	407
Volume Left	52	0	182
Volume Right	24	300	0
cSH	322	1700	1108
Volume to Capacity	0.24	0.27	0.16
Queue Length 95th (ft)	23	0	15
Control Delay (s)	19.6	0.0	4.9
Lane LOS	C		A
Approach Delay (s)	19.6	0.0	4.9
Approach LOS	C		

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	21	0	0	220	2	30	100	0	3	77	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		230	0		0	0		0	0		230
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998							0.850
Flt Protected		0.988						0.989			0.998	
Satd. Flow (prot)	0	3567	0	0	3603	0	0	1879	0	0	1825	1615
Flt Permitted		0.988						0.989			0.998	
Satd. Flow (perm)	0	3567	0	0	3603	0	0	1879	0	0	1825	1615
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		592			394			514			456	
Travel Time (s)		13.5			9.0			11.7			10.4	
Peak Hour Factor	0.63	0.88	0.66	0.92	0.76	0.50	0.92	0.82	0.82	0.92	0.84	0.50
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	8	24	0	0	289	4	33	122	0	3	92	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	293	0	0	155	0	0	95	8
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 26.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	21	0	0	220	2	30	100	0	3	77	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.63	0.88	0.66	0.92	0.76	0.50	0.92	0.82	0.82	0.92	0.84	0.50
Hourly flow rate (vph)	8	24	0	0	289	4	33	122	0	3	92	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	434	285	92	297	285	122	92			122		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	434	285	92	297	285	122	92			122		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	96	100	100	53	100	98			100		
cM capacity (veh/h)	330	613	971	628	613	935	1516			1478		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	16	16	193	100	155	95	8
Volume Left	8	0	0	0	33	3	0
Volume Right	0	0	0	4	0	0	8
cSH	429	613	613	621	1516	1478	1700
Volume to Capacity	0.04	0.03	0.32	0.16	0.02	0.00	0.00
Queue Length 95th (ft)	3	2	34	14	2	0	0
Control Delay (s)	13.7	11.0	13.6	11.9	1.7	0.3	0.0
Lane LOS	B	B	B	B	A	A	
Approach Delay (s)	12.4		13.0		1.7	0.3	
Approach LOS	B		B				

Intersection Summary				
Average Delay	7.7			
Intersection Capacity Utilization	26.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	89	333	831	162	249	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.973			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1787	1845	1830	0	1787	1599
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1787	1845	1830	0	1787	1599
Link Speed (mph)		30	30		30	
Link Distance (ft)		743	582		267	
Travel Time (s)		16.9	13.2		6.1	
Peak Hour Factor	0.87	0.96	0.95	0.75	0.83	0.89
Heavy Vehicles (%)	1%	3%	1%	1%	1%	1%
Adj. Flow (vph)	102	347	875	216	300	427
Shared Lane Traffic (%)						
Lane Group Flow (vph)	102	347	1091	0	300	427
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 83.8%		ICU Level of Service E	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	89	333	831	162	249	380
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.96	0.95	0.75	0.83	0.89
Hourly flow rate (vph)	102	347	875	216	300	427
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	875				1534	983
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	875				1534	983
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	87				0	0
cM capacity (veh/h)	776				112	303

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	102	347	1091	300	427
Volume Left	102	0	0	300	0
Volume Right	0	0	216	0	427
cSH	776	1700	1700	112	303
Volume to Capacity	0.13	0.20	0.64	2.68	1.41
Queue Length 95th (ft)	11	0	0	690	564
Control Delay (s)	10.3	0.0	0.0	843.3	234.9
Lane LOS	B			F	F
Approach Delay (s)	2.4		0.0	486.0	
Approach LOS				F	

Intersection Summary				
Average Delay	156.3			
Intersection Capacity Utilization	83.8%	ICU Level of Service		E
Analysis Period (min)	15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	133	296	184	70	15	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.907		0.952			
Flt Protected	0.985					0.994
Satd. Flow (prot)	1692	0	1778	0	0	1872
Flt Permitted	0.985					0.994
Satd. Flow (perm)	1692	0	1778	0	0	1872
Link Speed (mph)	30		30			30
Link Distance (ft)	634		229			338
Travel Time (s)	14.4		5.2			7.7
Peak Hour Factor	0.85	0.87	0.72	0.50	0.75	0.90
Heavy Vehicles (%)	1%	0%	1%	3%	0%	1%
Adj. Flow (vph)	156	340	256	140	20	146
Shared Lane Traffic (%)						
Lane Group Flow (vph)	496	0	396	0	0	166
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.7%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	133	296	184	70	15	131
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.87	0.72	0.50	0.75	0.90
Hourly flow rate (vph)	156	340	256	140	20	146
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	511	326			396	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	511	326			396	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	53			98	
cM capacity (veh/h)	515	720			1174	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	497	396	166
Volume Left	156	0	20
Volume Right	340	140	0
cSH	640	1700	1174
Volume to Capacity	0.78	0.23	0.02
Queue Length 95th (ft)	184	0	1
Control Delay (s)	27.3	0.0	1.1
Lane LOS	D		A
Approach Delay (s)	27.3	0.0	1.1
Approach LOS	D		

Intersection Summary			
Average Delay	13.0		
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix C-6

SYNCHRO LOS Analysis: 2020 No Build

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	34	225	0	0	21	0	143	106	0	3	23	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		230	0		0	0		0	0		230
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												0.850
Flt Protected		0.992						0.975			0.996	
Satd. Flow (prot)	0	3552	0	0	3610	0	0	1852	0	0	1690	1615
Flt Permitted		0.992						0.975			0.996	
Satd. Flow (perm)	0	3552	0	0	3610	0	0	1852	0	0	1690	1615
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		592			394			514			456	
Travel Time (s)		13.5			9.0			11.7			10.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.59	0.79	0.81	0.92	0.59	0.50	0.83	0.66	0.92	0.92	0.64	1.00
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	13%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	58	285	0	0	36	0	172	161	0	3	36	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	343	0	0	36	0	0	333	0	0	39	3
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	34	225	0	0	21	0	143	106	0	3	23	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.59	0.79	0.81	0.92	0.59	0.50	0.83	0.66	0.92	0.92	0.64	1.00
Hourly flow rate (vph)	58	285	0	0	36	0	172	161	0	3	36	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	565	548	36	690	548	161	36			161		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	565	548	36	690	548	161	36			161		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	28	100	100	91	100	89			100		
cM capacity (veh/h)	374	396	1037	140	398	890	1588			1431		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	153	190	24	12	333	39	3
Volume Left	58	0	0	0	172	3	0
Volume Right	0	0	0	0	0	0	3
cSH	388	396	398	398	1588	1431	1700
Volume to Capacity	0.39	0.48	0.06	0.03	0.11	0.00	0.00
Queue Length 95th (ft)	46	63	5	2	9	0	0
Control Delay (s)	20.2	22.2	14.6	14.3	4.3	0.6	0.0
Lane LOS	C	C	B	B	A	A	
Approach Delay (s)	21.3		14.5		4.3	0.6	
Approach LOS	C		B				

Intersection Summary				
Average Delay	12.3			
Intersection Capacity Utilization	37.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	289	854	413	453	135	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	75			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.929			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1787	1863	1689	0	1671	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1787	1863	1689	0	1671	1583
Link Speed (mph)		30	30		30	
Link Distance (ft)		753	771		267	
Travel Time (s)		17.1	17.5		6.1	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.95	0.86	0.84	0.80	0.73
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	2%	4%	5%	8%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	332	899	480	539	169	190
Shared Lane Traffic (%)						
Lane Group Flow (vph)	332	899	1019	0	169	190
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 83.0%		ICU Level of Service E	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	289	854	413	453	135	139
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.95	0.86	0.84	0.80	0.73
Hourly flow rate (vph)	332	899	480	539	169	190
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	480				2313	750
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	480				2313	750
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	69				0	54
cM capacity (veh/h)	1087				28	411

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	332	899	1020	169	190
Volume Left	332	0	0	169	0
Volume Right	0	0	539	0	190
cSH	1087	1700	1700	28	411
Volume to Capacity	0.31	0.53	0.60	6.07	0.46
Queue Length 95th (ft)	33	0	0	Err	60
Control Delay (s)	9.8	0.0	0.0	Err	21.1
Lane LOS	A			F	C
Approach Delay (s)	2.6		0.0	4709.2	
Approach LOS				F	

Intersection Summary				
Average Delay	649.3			
Intersection Capacity Utilization	83.0%	ICU Level of Service	E	
Analysis Period (min)	15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	35	19	150	295	156	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.957		0.913			
Flt Protected	0.967					0.978
Satd. Flow (prot)	1723	0	1723	0	0	1838
Flt Permitted	0.967					0.978
Satd. Flow (perm)	1723	0	1723	0	0	1838
Link Speed (mph)	30		30			30
Link Distance (ft)	634		229			338
Travel Time (s)	14.4		5.2			7.7
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.65	0.75	0.87	0.94	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	0%	2%	0%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	54	25	172	314	190	237
Shared Lane Traffic (%)						
Lane Group Flow (vph)	79	0	486	0	0	427
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.2%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	19	150	295	156	194
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.75	0.87	0.94	0.82	0.82
Hourly flow rate (vph)	54	25	172	314	190	237
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	946	329			486	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	946	329			486	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	96			83	
cM capacity (veh/h)	238	717			1087	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	79	486	427
Volume Left	54	0	190
Volume Right	25	314	0
cSH	303	1700	1087
Volume to Capacity	0.26	0.29	0.17
Queue Length 95th (ft)	26	0	16
Control Delay (s)	21.0	0.0	5.0
Lane LOS	C		A
Approach Delay (s)	21.0	0.0	5.0
Approach LOS	C		

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	22	0	0	231	4	104	30	0	3	78	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		230	0		0	0		0	0		230
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.996							0.850
Flt Protected		0.988						0.964			0.998	
Satd. Flow (prot)	0	3567	0	0	3596	0	0	1832	0	0	1825	1615
Flt Permitted		0.988						0.964			0.998	
Satd. Flow (perm)	0	3567	0	0	3596	0	0	1832	0	0	1825	1615
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		592			394			514			456	
Travel Time (s)		13.5			9.0			11.7			10.4	
Peak Hour Factor	0.63	0.88	0.66	0.92	0.76	0.50	0.92	0.82	0.82	0.92	0.84	0.50
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	8	25	0	0	304	8	113	37	0	3	93	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	0	312	0	0	150	0	0	96	8
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.2%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	22	0	0	231	4	104	30	0	3	78	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.63	0.88	0.66	0.92	0.76	0.50	0.92	0.82	0.82	0.92	0.84	0.50
Hourly flow rate (vph)	8	25	0	0	304	8	113	37	0	3	93	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	522	362	93	375	362	37	93			37		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	522	362	93	375	362	37	93			37		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	95	100	100	42	99	93			100		
cM capacity (veh/h)	238	525	970	532	525	1042	1514			1587		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	16	17	203	109	150	96	8
Volume Left	8	0	0	0	113	3	0
Volume Right	0	0	0	8	0	0	8
cSH	331	525	525	545	1514	1587	1700
Volume to Capacity	0.05	0.03	0.39	0.20	0.07	0.00	0.00
Queue Length 95th (ft)	4	2	45	19	6	0	0
Control Delay (s)	16.5	12.1	16.1	13.3	5.9	0.3	0.0
Lane LOS	C	B	C	B	A	A	
Approach Delay (s)	14.2		15.1		5.9	0.2	
Approach LOS	B		C				

Intersection Summary				
Average Delay	10.2			
Intersection Capacity Utilization	27.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	92	341	851	187	367	459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.971			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1787	1845	1827	0	1787	1599
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1787	1845	1827	0	1787	1599
Link Speed (mph)		30	30		30	
Link Distance (ft)		743	582		267	
Travel Time (s)		16.9	13.2		6.1	
Peak Hour Factor	0.87	0.96	0.95	0.75	0.83	0.89
Heavy Vehicles (%)	1%	3%	1%	1%	1%	1%
Adj. Flow (vph)	106	355	896	249	442	516
Shared Lane Traffic (%)						
Lane Group Flow (vph)	106	355	1145	0	442	516
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 91.6%		ICU Level of Service F	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	92	341	851	187	367	459
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.96	0.95	0.75	0.83	0.89
Hourly flow rate (vph)	106	355	896	249	442	516
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	896				1587	1020
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	896				1587	1020
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				0	0
cM capacity (veh/h)	762				103	288

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	106	355	1145	442	516
Volume Left	106	0	0	442	0
Volume Right	0	0	249	0	516
cSH	762	1700	1700	103	288
Volume to Capacity	0.14	0.21	0.67	4.30	1.79
Queue Length 95th (ft)	12	0	0	Err	852
Control Delay (s)	10.5	0.0	0.0	Err	398.6
Lane LOS	B			F	F
Approach Delay (s)	2.4		0.0	4830.1	
Approach LOS				F	

Intersection Summary			
Average Delay	1805.0		
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	139	309	193	73	16	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.908		0.952			
Flt Protected	0.984					0.994
Satd. Flow (prot)	1692	0	1778	0	0	1872
Flt Permitted	0.984					0.994
Satd. Flow (perm)	1692	0	1778	0	0	1872
Link Speed (mph)	30		30			30
Link Distance (ft)	634		229			338
Travel Time (s)	14.4		5.2			7.7
Peak Hour Factor	0.85	0.87	0.72	0.50	0.75	0.90
Heavy Vehicles (%)	1%	0%	1%	3%	0%	1%
Adj. Flow (vph)	164	355	268	146	21	152
Shared Lane Traffic (%)						
Lane Group Flow (vph)	519	0	414	0	0	173
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.0%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	139	309	193	73	16	137
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.87	0.72	0.50	0.75	0.90
Hourly flow rate (vph)	164	355	268	146	21	152
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	536	341			414	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	536	341			414	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	67	50			98	
cM capacity (veh/h)	498	706			1156	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	519	414	174
Volume Left	164	0	21
Volume Right	355	146	0
cSH	624	1700	1156
Volume to Capacity	0.83	0.24	0.02
Queue Length 95th (ft)	221	0	1
Control Delay (s)	32.8	0.0	1.2
Lane LOS	D		A
Approach Delay (s)	32.8	0.0	1.2
Approach LOS	D		

Intersection Summary			
Average Delay	15.6		
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix C-7

SYNCHRO LOS Analysis: 2020 Build

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	225	0	0	21	0	143	138	0	5	33	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		230	0		0	0		0	0		230
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt												0.850
Flt Protected		0.990						0.978			0.996	
Satd. Flow (prot)	0	3546	0	0	3610	0	0	1858	0	0	1692	1615
Flt Permitted		0.990						0.978			0.996	
Satd. Flow (perm)	0	3546	0	0	3610	0	0	1858	0	0	1692	1615
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		592			394			514			456	
Travel Time (s)		13.5			9.0			11.7			10.4	
Peak Hour Factor	0.59	0.79	0.81	0.92	0.59	0.50	0.83	0.66	0.92	0.92	0.64	1.00
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	13%	0%
Adj. Flow (vph)	76	285	0	0	36	0	172	209	0	5	52	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	361	0	0	36	0	0	381	0	0	57	5
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	225	0	0	21	0	143	138	0	5	33	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.59	0.79	0.81	0.92	0.59	0.50	0.83	0.66	0.92	0.92	0.64	1.00
Hourly flow rate (vph)	76	285	0	0	36	0	172	209	0	5	52	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	634	616	52	759	616	209	52			209		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	634	616	52	759	616	209	52			209		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	77	21	100	100	90	100	89			100		
cM capacity (veh/h)	334	361	1016	105	362	836	1567			1374		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	171	190	24	12	381	57	5
Volume Left	76	0	0	0	172	5	0
Volume Right	0	0	0	0	0	0	5
cSH	348	361	362	362	1567	1374	1700
Volume to Capacity	0.49	0.53	0.07	0.03	0.11	0.00	0.00
Queue Length 95th (ft)	65	73	5	3	9	0	0
Control Delay (s)	24.9	25.5	15.6	15.3	3.9	0.8	0.0
Lane LOS	C	D	C	C	A	A	
Approach Delay (s)	25.2		15.5		3.9	0.7	
Approach LOS	D		C				

Intersection Summary				
Average Delay	13.3			
Intersection Capacity Utilization	39.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	304	854	413	470	140	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.927			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1787	1863	1685	0	1671	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1787	1863	1685	0	1671	1583
Link Speed (mph)		30	30		30	
Link Distance (ft)		753	771		267	
Travel Time (s)		17.1	17.5		6.1	
Peak Hour Factor	0.87	0.95	0.86	0.84	0.80	0.73
Heavy Vehicles (%)	1%	2%	4%	5%	8%	2%
Adj. Flow (vph)	349	899	480	560	175	197
Shared Lane Traffic (%)						
Lane Group Flow (vph)	349	899	1040	0	175	197
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 85.1%		ICU Level of Service E	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	304	854	413	470	140	144
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.95	0.86	0.84	0.80	0.73
Hourly flow rate (vph)	349	899	480	560	175	197
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	480				2358	760
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	480				2358	760
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	68				0	51
cM capacity (veh/h)	1087				25	406

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	349	899	1040	175	197
Volume Left	349	0	0	175	0
Volume Right	0	0	560	0	197
cSH	1087	1700	1700	25	406
Volume to Capacity	0.32	0.53	0.61	6.89	0.49
Queue Length 95th (ft)	35	0	0	Err	65
Control Delay (s)	9.9	0.0	0.0	Err	22.0
Lane LOS	A			F	C
Approach Delay (s)	2.8		0.0	4712.2	
Approach LOS				F	

Intersection Summary			
Average Delay	660.7		
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	35	19	150	301	160	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.957		0.912			
Flt Protected	0.967					0.978
Satd. Flow (prot)	1723	0	1721	0	0	1838
Flt Permitted	0.967					0.978
Satd. Flow (perm)	1723	0	1721	0	0	1838
Link Speed (mph)	30		30			30
Link Distance (ft)	634		229			338
Travel Time (s)	14.4		5.2			7.7
Peak Hour Factor	0.65	0.75	0.87	0.94	0.82	0.82
Heavy Vehicles (%)	3%	0%	2%	0%	0%	2%
Adj. Flow (vph)	54	25	172	320	195	237
Shared Lane Traffic (%)						
Lane Group Flow (vph)	79	0	492	0	0	432
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.8%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	19	150	301	160	194
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.75	0.87	0.94	0.82	0.82
Hourly flow rate (vph)	54	25	172	320	195	237
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	959	333			493	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	959	333			493	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	96			82	
cM capacity (veh/h)	233	714			1081	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	79	493	432
Volume Left	54	0	195
Volume Right	25	320	0
cSH	297	1700	1081
Volume to Capacity	0.27	0.29	0.18
Queue Length 95th (ft)	26	0	16
Control Delay (s)	21.5	0.0	5.1
Lane LOS	C		A
Approach Delay (s)	21.5	0.0	5.1
Approach LOS	C		

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	22	0	0	231	4	104	37	0	4	111	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		230	0		0	0		0	0		230
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.996							0.850
Flt Protected		0.986						0.965			0.999	
Satd. Flow (prot)	0	3559	0	0	3596	0	0	1834	0	0	1827	1615
Flt Permitted		0.986						0.965			0.999	
Satd. Flow (perm)	0	3559	0	0	3596	0	0	1834	0	0	1827	1615
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		592			394			514			456	
Travel Time (s)		13.5			9.0			11.7			10.4	
Peak Hour Factor	0.63	0.88	0.66	0.92	0.76	0.50	0.92	0.82	0.82	0.92	0.84	0.50
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	10	25	0	0	304	8	113	45	0	4	132	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	35	0	0	312	0	0	158	0	0	136	10
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.6%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	22	0	0	231	4	104	37	0	4	111	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.63	0.88	0.66	0.92	0.76	0.50	0.92	0.82	0.82	0.92	0.84	0.50
Hourly flow rate (vph)	10	25	0	0	304	8	113	45	0	4	132	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	572	412	132	425	412	45	132			45		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	572	412	132	425	412	45	132			45		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	95	100	100	38	99	92			100		
cM capacity (veh/h)	206	491	923	491	491	1030	1465			1576		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	18	17	203	109	158	136	10
Volume Left	10	0	0	0	113	4	0
Volume Right	0	0	0	8	0	0	10
cSH	282	491	491	510	1465	1576	1700
Volume to Capacity	0.06	0.03	0.41	0.21	0.08	0.00	0.01
Queue Length 95th (ft)	5	3	50	20	6	0	0
Control Delay (s)	18.6	12.6	17.4	14.0	5.6	0.3	0.0
Lane LOS	C	B	C	B	A	A	
Approach Delay (s)	15.7		16.2		5.6	0.2	
Approach LOS	C		C				

Intersection Summary				
Average Delay	10.0			
Intersection Capacity Utilization	27.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	95	341	851	192	381	479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.970			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1787	1845	1825	0	1787	1599
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1787	1845	1825	0	1787	1599
Link Speed (mph)		30	30		30	
Link Distance (ft)		743	582		267	
Travel Time (s)		16.9	13.2		6.1	
Peak Hour Factor	0.87	0.96	0.95	0.75	0.83	0.89
Heavy Vehicles (%)	1%	3%	1%	1%	1%	1%
Adj. Flow (vph)	109	355	896	256	459	538
Shared Lane Traffic (%)						
Lane Group Flow (vph)	109	355	1152	0	459	538
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 92.8%		ICU Level of Service F	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	95	341	851	192	381	479
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.96	0.95	0.75	0.83	0.89
Hourly flow rate (vph)	109	355	896	256	459	538
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	896				1597	1024
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	896				1597	1024
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				0	0
cM capacity (veh/h)	762				101	287

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	109	355	1152	459	538
Volume Left	109	0	0	459	0
Volume Right	0	0	256	0	538
cSH	762	1700	1700	101	287
Volume to Capacity	0.14	0.21	0.68	4.55	1.87
Queue Length 95th (ft)	12	0	0	Err	922
Control Delay (s)	10.5	0.0	0.0	Err	436.3
Lane LOS	B			F	F
Approach Delay (s)	2.5		0.0	4838.1	
Approach LOS				F	

Intersection Summary			
Average Delay	1846.6		
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	139	310	193	73	17	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.908		0.952			
Flt Protected	0.984					0.993
Satd. Flow (prot)	1692	0	1778	0	0	1870
Flt Permitted	0.984					0.993
Satd. Flow (perm)	1692	0	1778	0	0	1870
Link Speed (mph)	30		30			30
Link Distance (ft)	634		229			338
Travel Time (s)	14.4		5.2			7.7
Peak Hour Factor	0.85	0.87	0.72	0.50	0.75	0.90
Heavy Vehicles (%)	1%	0%	1%	3%	0%	1%
Adj. Flow (vph)	164	356	268	146	23	152
Shared Lane Traffic (%)						
Lane Group Flow (vph)	520	0	414	0	0	175
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.9%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	139	310	193	73	17	137
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.87	0.72	0.50	0.75	0.90
Hourly flow rate (vph)	164	356	268	146	23	152
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	539	341			414	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	539	341			414	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	67	50			98	
cM capacity (veh/h)	495	706			1156	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	520	414	175
Volume Left	164	0	23
Volume Right	356	146	0
cSH	623	1700	1156
Volume to Capacity	0.83	0.24	0.02
Queue Length 95th (ft)	223	0	1
Control Delay (s)	33.2	0.0	1.2
Lane LOS	D		A
Approach Delay (s)	33.2	0.0	1.2
Approach LOS	D		

Intersection Summary			
Average Delay	15.8		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix C-8

SYNCHRO LOS Analysis: 2030 No Build

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	719	25	127	641	383	10	30	54	368	54	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	250		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.944			0.922			0.889	
Flt Protected	0.950			0.950				0.995		0.950		
Satd. Flow (prot)	1770	1853	0	1770	1758	0	0	1709	0	1770	1656	0
Flt Permitted	0.062			0.219				0.962		0.678		
Satd. Flow (perm)	115	1853	0	408	1758	0	0	1652	0	1263	1656	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			43			61			131	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1435			667			796			673	
Travel Time (s)		32.6			15.2			18.1			15.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	159	817	28	144	728	435	11	34	61	418	61	175
Shared Lane Traffic (%)												
Lane Group Flow (vph)	159	845	0	144	1163	0	0	106	0	418	236	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	21.0		21.0	21.0		21.0	21.0		21.0	21.0	
Total Split (s)	9.0	74.0	0.0	65.0	65.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0
Total Split (%)	8.2%	67.3%	0.0%	59.1%	59.1%	0.0%	32.7%	32.7%	0.0%	32.7%	32.7%	0.0%
Maximum Green (s)	4.0	69.0		60.0	60.0		31.0	31.0		31.0	31.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	69.0	69.0		60.0	60.0			31.0		31.0	31.0	
Actuated g/C Ratio	0.63	0.63		0.55	0.55			0.28		0.28	0.28	
v/c Ratio	1.20	0.73		0.65	1.19			0.21		1.17	0.42	
Control Delay	164.5	18.6		34.0	120.4			15.4		140.6	16.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	164.5	18.6		34.0	120.4			15.4		140.6	16.6	
LOS	F	B		C	F			B		F	B	

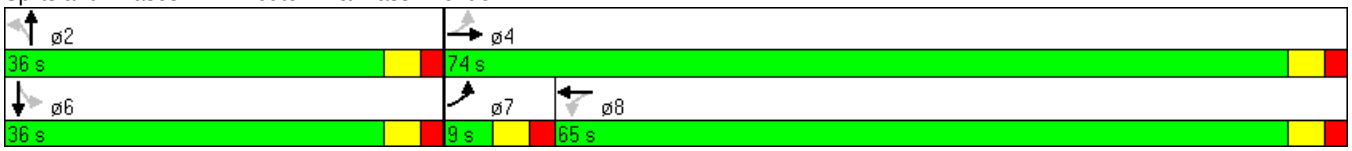
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		41.7			110.9			15.4			95.9	
Approach LOS		D			F			B			F	
Queue Length 50th (ft)	~62	376		68	~983			23		~354	57	
Queue Length 95th (ft)	#162	510		#160	#1197			65		#529	123	
Internal Link Dist (ft)		1355			587			716			593	
Turn Bay Length (ft)	250			250						100		
Base Capacity (vph)	132	1163		223	978			509		356	561	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	1.20	0.73		0.65	1.19			0.21		1.17	0.42	

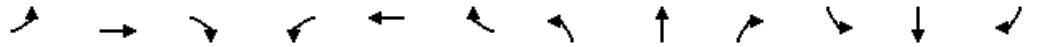
Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.20			
Intersection Signal Delay: 81.8		Intersection LOS: F	
Intersection Capacity Utilization 104.4%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Route 2A & Mass Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	719	25	127	641	383	10	30	54	368	54	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	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	1.00	
Frt	1.00	1.00		1.00	0.94			0.92		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	1853		1770	1758			1709		1770	1656	
Flt Permitted	0.06	1.00		0.22	1.00			0.96		0.68	1.00	
Satd. Flow (perm)	115	1853		408	1758			1653		1262	1656	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	159	817	28	144	728	435	11	34	61	418	61	175
RTOR Reduction (vph)	0	1	0	0	20	0	0	44	0	0	94	0
Lane Group Flow (vph)	159	844	0	144	1143	0	0	62	0	418	142	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	69.0	69.0		60.0	60.0			31.0		31.0	31.0	
Effective Green, g (s)	69.0	69.0		60.0	60.0			31.0		31.0	31.0	
Actuated g/C Ratio	0.63	0.63		0.55	0.55			0.28		0.28	0.28	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	132	1162		223	959			466		356	467	
v/s Ratio Prot	c0.04	0.46			0.65						0.09	
v/s Ratio Perm	c0.71			0.35				0.04		c0.33		
v/c Ratio	1.20	0.73		0.65	1.19			0.13		1.17	0.30	
Uniform Delay, d1	29.9	14.0		17.5	25.0			29.5		39.5	31.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	143.5	2.3		6.3	96.9			0.1		104.0	0.4	
Delay (s)	173.4	16.3		23.8	121.9			29.6		143.5	31.4	
Level of Service	F	B		C	F			C		F	C	
Approach Delay (s)		41.2			111.1			29.6			103.1	
Approach LOS		D			F			C			F	

Intersection Summary			
HCM Average Control Delay	83.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	148	901	819	9	12	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999		0.877	
Flt Protected		0.993			0.996	
Satd. Flow (prot)	0	1850	1861	0	1627	0
Flt Permitted		0.993			0.996	
Satd. Flow (perm)	0	1850	1861	0	1627	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		1525	1435		707	
Travel Time (s)		34.7	32.6		16.1	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	168	1024	931	10	14	143
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1192	941	0	157	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 117.7%		ICU Level of Service H	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	148	901	819	9	12	126
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	168	1024	931	10	14	143
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	941				2296	936
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	941				2296	936
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	77				59	55
cM capacity (veh/h)	729				33	321

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1192	941	157
Volume Left	168	0	14
Volume Right	0	10	143
cSH	729	1700	182
Volume to Capacity	0.23	0.55	0.86
Queue Length 95th (ft)	22	0	156
Control Delay (s)	7.3	0.0	86.1
Lane LOS	A		F
Approach Delay (s)	7.3	0.0	86.1
Approach LOS			F

Intersection Summary			
Average Delay	9.7		
Intersection Capacity Utilization	117.7%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1050	930	1	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1863	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1863	0	1770	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		846	1525		685	
Travel Time (s)		19.2	34.7		15.6	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	1193	1057	1	1	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1193	1058	0	1	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 65.3%		ICU Level of Service C	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	1050	930	1	1	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	1193	1057	1	1	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1058				2251	1057
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1058				2251	1057
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				98	100
cM capacity (veh/h)	658				46	273

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1193	1058	1
Volume Left	0	0	1
Volume Right	0	1	0
cSH	658	1700	46
Volume to Capacity	0.00	0.62	0.02
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	85.7
Lane LOS			F
Approach Delay (s)	0.0	0.0	85.7
Approach LOS			F

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	236	0	0	22	1	150	112	0	3	25	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		230	0		0	0		0	0		230
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.992							0.850
Flt Protected		0.991						0.973			0.996	
Satd. Flow (prot)	0	3548	0	0	3581	0	0	1849	0	0	1692	1615
Flt Permitted		0.991						0.973			0.996	
Satd. Flow (perm)	0	3548	0	0	3581	0	0	1849	0	0	1692	1615
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		592			394			514			456	
Travel Time (s)		13.5			9.0			11.7			10.4	
Peak Hour Factor	0.59	0.80	0.81	0.92	0.59	0.50	0.83	0.80	0.92	0.92	0.80	1.00
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	13%	0%
Adj. Flow (vph)	63	295	0	0	37	2	181	140	0	3	31	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	358	0	0	39	0	0	321	0	0	34	3
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	37	236	0	0	22	1	150	112	0	3	25	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.59	0.80	0.81	0.92	0.59	0.50	0.83	0.80	0.92	0.92	0.80	1.00
Hourly flow rate (vph)	63	295	0	0	37	2	181	140	0	3	31	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	560	539	31	687	539	140	31			140		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	560	539	31	687	539	140	31			140		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	26	100	100	91	100	89			100		
cM capacity (veh/h)	374	399	1043	133	400	913	1594			1456		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	161	197	25	14	321	35	3
Volume Left	63	0	0	0	181	3	0
Volume Right	0	0	0	2	0	0	3
cSH	389	399	400	434	1594	1456	1700
Volume to Capacity	0.41	0.49	0.06	0.03	0.11	0.00	0.00
Queue Length 95th (ft)	50	66	5	3	10	0	0
Control Delay (s)	20.7	22.5	14.6	13.6	4.7	0.7	0.0
Lane LOS	C	C	B	B	A	A	
Approach Delay (s)	21.7		14.2		4.7	0.7	
Approach LOS	C		B				

Intersection Summary				
Average Delay	13.0			
Intersection Capacity Utilization	38.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	304	898	434	470	141	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.929			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1787	1863	1689	0	1671	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1787	1863	1689	0	1671	1583
Link Speed (mph)		30	30		30	
Link Distance (ft)		753	771		267	
Travel Time (s)		17.1	17.5		6.1	
Peak Hour Factor	0.87	0.95	0.86	0.84	0.80	0.73
Heavy Vehicles (%)	1%	2%	4%	5%	8%	2%
Adj. Flow (vph)	349	945	505	560	176	199
Shared Lane Traffic (%)						
Lane Group Flow (vph)	349	945	1065	0	176	199
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 86.3%		ICU Level of Service E	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	304	898	434	470	141	145
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.95	0.86	0.84	0.80	0.73
Hourly flow rate (vph)	349	945	505	560	176	199
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	505				2429	784
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	505				2429	784
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	67				0	49
cM capacity (veh/h)	1065				23	393

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	349	945	1064	176	199
Volume Left	349	0	0	176	0
Volume Right	0	0	560	0	199
cSH	1065	1700	1700	23	393
Volume to Capacity	0.33	0.56	0.63	7.78	0.51
Queue Length 95th (ft)	36	0	0	Err	69
Control Delay (s)	10.0	0.0	0.0	Err	23.2
Lane LOS	B			F	C
Approach Delay (s)	2.7		0.0	4713.3	
Approach LOS				F	

Intersection Summary				
Average Delay	647.6			
Intersection Capacity Utilization	86.3%	ICU Level of Service	E	
Analysis Period (min)	15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	37	20	158	310	164	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.957		0.913			
Flt Protected	0.967					0.978
Satd. Flow (prot)	1723	0	1722	0	0	1838
Flt Permitted	0.967					0.978
Satd. Flow (perm)	1723	0	1722	0	0	1838
Link Speed (mph)	30		30			30
Link Distance (ft)	634		229			338
Travel Time (s)	14.4		5.2			7.7
Peak Hour Factor	0.65	0.75	0.87	0.94	0.82	0.82
Heavy Vehicles (%)	3%	0%	2%	0%	0%	2%
Adj. Flow (vph)	57	27	182	330	200	248
Shared Lane Traffic (%)						
Lane Group Flow (vph)	84	0	512	0	0	448
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 60.4%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	37	20	158	310	164	203
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.75	0.87	0.94	0.82	0.82
Hourly flow rate (vph)	57	27	182	330	200	248
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	994	347			511	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	994	347			511	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	96			81	
cM capacity (veh/h)	220	701			1064	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	84	511	448
Volume Left	57	0	200
Volume Right	27	330	0
cSH	281	1700	1064
Volume to Capacity	0.30	0.30	0.19
Queue Length 95th (ft)	30	0	17
Control Delay (s)	23.1	0.0	5.2
Lane LOS	C		A
Approach Delay (s)	23.1	0.0	5.2
Approach LOS	C		

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	139	601	13	48	729	242	19	82	128	412	48	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	250		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.963			0.925			0.882	
Flt Protected	0.950			0.950				0.996		0.950		
Satd. Flow (prot)	1770	1857	0	1770	1794	0	0	1716	0	1770	1643	0
Flt Permitted	0.051			0.258				0.959		0.500		
Satd. Flow (perm)	95	1857	0	481	1794	0	0	1652	0	931	1643	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			16			48			140	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1435			667			796			673	
Travel Time (s)		32.6			15.2			18.1			15.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	158	683	15	55	828	275	22	93	145	468	55	201
Shared Lane Traffic (%)												
Lane Group Flow (vph)	158	698	0	55	1103	0	0	260	0	468	256	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	21.0		21.0	21.0		21.0	21.0		21.0	21.0	
Total Split (s)	11.0	89.0	0.0	78.0	78.0	0.0	61.0	61.0	0.0	61.0	61.0	0.0
Total Split (%)	7.3%	59.3%	0.0%	52.0%	52.0%	0.0%	40.7%	40.7%	0.0%	40.7%	40.7%	0.0%
Maximum Green (s)	6.0	84.0		73.0	73.0		56.0	56.0		56.0	56.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	84.0	84.0		73.0	73.0			56.0		56.0	56.0	
Actuated g/C Ratio	0.56	0.56		0.49	0.49			0.37		0.37	0.37	
v/c Ratio	1.32	0.67		0.24	1.25			0.40		1.34	0.37	
Control Delay	216.6	27.3		25.8	156.5			30.0		210.6	16.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	216.6	27.3		25.8	156.5			30.0		210.6	16.4	
LOS	F	C		C	F			C		F	B	

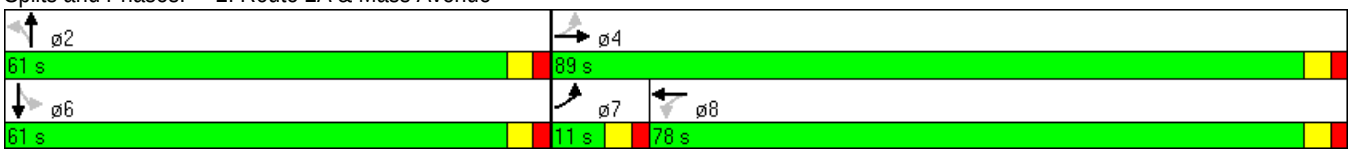
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		62.2			150.3			30.0			141.9	
Approach LOS		E			F			C			F	
Queue Length 50th (ft)	~148	466		31	~1341			152		~597	77	
Queue Length 95th (ft)	#292	588		63	#1553			225		#794	146	
Internal Link Dist (ft)		1355			587			716			593	
Turn Bay Length (ft)	250			250						100		
Base Capacity (vph)	120	1040		234	881			647		348	701	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	1.32	0.67		0.24	1.25			0.40		1.34	0.37	

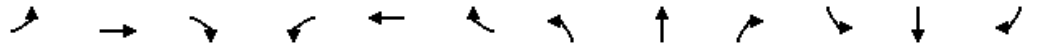
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Natural Cycle: 140			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.34			
Intersection Signal Delay: 112.7		Intersection LOS: F	
Intersection Capacity Utilization 113.5%		ICU Level of Service H	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Route 2A & Mass Avenue





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	139	601	13	48	729	242	19	82	128	412	48	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	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	1.00	
Frt	1.00	1.00		1.00	0.96			0.92		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1857		1770	1793			1715		1770	1643	
Flt Permitted	0.05	1.00		0.26	1.00			0.96		0.50	1.00	
Satd. Flow (perm)	96	1857		481	1793			1652		931	1643	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	158	683	15	55	828	275	22	93	145	468	55	201
RTOR Reduction (vph)	0	0	0	0	8	0	0	30	0	0	88	0
Lane Group Flow (vph)	158	698	0	55	1095	0	0	230	0	468	168	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	84.0	84.0		73.0	73.0			56.0		56.0	56.0	
Effective Green, g (s)	84.0	84.0		73.0	73.0			56.0		56.0	56.0	
Actuated g/C Ratio	0.56	0.56		0.49	0.49			0.37		0.37	0.37	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	121	1040		234	873			617		348	613	
v/s Ratio Prot	c0.05	0.38			0.61						0.10	
v/s Ratio Perm	c0.68			0.11				0.14		c0.50		
v/c Ratio	1.31	0.67		0.24	1.25			0.37		1.34	0.27	
Uniform Delay, d1	42.9	23.3		22.3	38.5			34.2		47.0	32.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	184.9	1.7		0.5	123.7			0.4		173.2	0.2	
Delay (s)	227.7	25.0		22.8	162.2			34.6		220.2	33.1	
Level of Service	F	C		C	F			C		F	C	
Approach Delay (s)		62.4			155.6			34.6			154.1	
Approach LOS		E			F			C			F	

Intersection Summary			
HCM Average Control Delay	118.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	113.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	45	684	898	9	69	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999		0.898	
Flt Protected		0.997			0.988	
Satd. Flow (prot)	0	1857	1861	0	1653	0
Flt Permitted		0.997			0.988	
Satd. Flow (perm)	0	1857	1861	0	1653	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		1525	1435		707	
Travel Time (s)		34.7	32.6		16.1	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	51	777	1020	10	78	245
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	828	1030	0	323	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 96.7%		ICU Level of Service F	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	45	684	898	9	69	216
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	51	777	1020	10	78	245
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1031				1905	1026
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1031				1905	1026
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				0	14
cM capacity (veh/h)	674				70	285

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	828	1031	324
Volume Left	51	0	78
Volume Right	0	10	245
cSH	674	1700	163
Volume to Capacity	0.08	0.61	1.99
Queue Length 95th (ft)	6	0	624
Control Delay (s)	2.1	0.0	511.0
Lane LOS	A		F
Approach Delay (s)	2.1	0.0	511.0
Approach LOS			F

Intersection Summary			
Average Delay	76.6		
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		

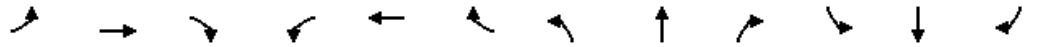
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	721	1069	2	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		846	1525		685	
Travel Time (s)		19.2	34.7		15.6	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	819	1215	2	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	819	1217	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 59.7%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	721	1069	2	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	819	1215	2	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1217				2035	1216
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1217				2035	1216
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				100	100
cM capacity (veh/h)	573				63	221

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	819	1217	0
Volume Left	0	0	0
Volume Right	0	2	0
cSH	573	1700	1700
Volume to Capacity	0.00	0.72	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	23	0	0	243	4	109	30	0	3	203	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		230	0		0	0		0	0		230
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.996							0.850
Flt Protected		0.988						0.963			0.999	
Satd. Flow (prot)	0	3567	0	0	3596	0	0	1830	0	0	1826	1615
Flt Permitted		0.988						0.963			0.999	
Satd. Flow (perm)	0	3567	0	0	3596	0	0	1830	0	0	1826	1615
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		592			394			514			456	
Travel Time (s)		13.5			9.0			11.7			10.4	
Peak Hour Factor	0.63	0.88	0.66	0.92	0.76	0.50	0.92	0.82	0.82	0.92	0.84	0.50
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	8	26	0	0	320	8	118	37	0	3	242	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	34	0	0	328	0	0	155	0	0	245	8
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.3%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	23	0	0	243	4	109	30	0	3	203	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.63	0.88	0.66	0.92	0.76	0.50	0.92	0.82	0.82	0.92	0.84	0.50
Hourly flow rate (vph)	8	26	0	0	320	8	118	37	0	3	242	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	690	522	242	535	522	37	242			37		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	690	522	242	535	522	37	242			37		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	94	100	100	24	99	91			100		
cM capacity (veh/h)	127	420	802	408	420	1042	1337			1587		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	17	17	213	115	155	245	8
Volume Left	8	0	0	0	118	3	0
Volume Right	0	0	0	8	0	0	8
cSH	200	420	420	439	1337	1587	1700
Volume to Capacity	0.08	0.04	0.51	0.26	0.09	0.00	0.00
Queue Length 95th (ft)	7	3	70	26	7	0	0
Control Delay (s)	24.6	13.9	22.0	16.1	6.2	0.1	0.0
Lane LOS	C	B	C	C	A	A	
Approach Delay (s)	19.1		20.0		6.2	0.1	
Approach LOS	C		C				

Intersection Summary				
Average Delay	10.6			
Intersection Capacity Utilization	35.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	96	359	859	195	380	479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.970			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1787	1845	1825	0	1787	1599
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1787	1845	1825	0	1787	1599
Link Speed (mph)		30	30		30	
Link Distance (ft)		743	582		267	
Travel Time (s)		16.9	13.2		6.1	
Peak Hour Factor	0.87	0.96	0.95	0.75	0.83	0.89
Heavy Vehicles (%)	1%	3%	1%	1%	1%	1%
Adj. Flow (vph)	110	374	904	260	458	538
Shared Lane Traffic (%)						
Lane Group Flow (vph)	110	374	1164	0	458	538
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 93.4%		ICU Level of Service F	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	96	359	859	195	380	479
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.96	0.95	0.75	0.83	0.89
Hourly flow rate (vph)	110	374	904	260	458	538
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	904				1629	1034
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	904				1629	1034
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	0
cM capacity (veh/h)	756				96	283

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	110	374	1164	458	538
Volume Left	110	0	0	458	0
Volume Right	0	0	260	0	538
cSH	756	1700	1700	96	283
Volume to Capacity	0.15	0.22	0.68	4.76	1.90
Queue Length 95th (ft)	13	0	0	Err	932
Control Delay (s)	10.6	0.0	0.0	Err	448.3
Lane LOS	B			F	F
Approach Delay (s)	2.4		0.0	4838.3	
Approach LOS				F	

Intersection Summary			
Average Delay	1822.7		
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	147	235	202	77	16	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.918		0.952			
Flt Protected	0.981					0.994
Satd. Flow (prot)	1704	0	1778	0	0	1872
Flt Permitted	0.981					0.994
Satd. Flow (perm)	1704	0	1778	0	0	1872
Link Speed (mph)	30		30			30
Link Distance (ft)	634		229			338
Travel Time (s)	14.4		5.2			7.7
Peak Hour Factor	0.85	0.87	0.72	0.50	0.75	0.90
Heavy Vehicles (%)	1%	0%	1%	3%	0%	1%
Adj. Flow (vph)	173	270	281	154	21	160
Shared Lane Traffic (%)						
Lane Group Flow (vph)	443	0	435	0	0	181
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.2%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	147	235	202	77	16	144
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.87	0.72	0.50	0.75	0.90
Hourly flow rate (vph)	173	270	281	154	21	160
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	560	358			435	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	560	358			435	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	64	61			98	
cM capacity (veh/h)	482	691			1136	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	443	435	181
Volume Left	173	0	21
Volume Right	270	154	0
cSH	591	1700	1136
Volume to Capacity	0.75	0.26	0.02
Queue Length 95th (ft)	165	0	1
Control Delay (s)	27.1	0.0	1.1
Lane LOS	D		A
Approach Delay (s)	27.1	0.0	1.1
Approach LOS	D		

Intersection Summary			
Average Delay	11.5		
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix C-9

SYNCHRO LOS Analysis: 2030 Build

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	736	25	127	681	383	10	30	54	368	54	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	250		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.946			0.922			0.887	
Flt Protected	0.950			0.950				0.995		0.950		
Satd. Flow (prot)	1770	1853	0	1770	1762	0	0	1709	0	1770	1652	0
Flt Permitted	0.062			0.206				0.961		0.678		
Satd. Flow (perm)	115	1853	0	384	1762	0	0	1650	0	1263	1652	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			40			61			139	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1435			667			796			673	
Travel Time (s)		32.6			15.2			18.1			15.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	165	836	28	144	774	435	11	34	61	418	61	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	165	864	0	144	1209	0	0	106	0	418	247	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	21.0		21.0	21.0		21.0	21.0		21.0	21.0	
Total Split (s)	9.0	74.0	0.0	65.0	65.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0
Total Split (%)	8.2%	67.3%	0.0%	59.1%	59.1%	0.0%	32.7%	32.7%	0.0%	32.7%	32.7%	0.0%
Maximum Green (s)	4.0	69.0		60.0	60.0		31.0	31.0		31.0	31.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	69.0	69.0		60.0	60.0			31.0		31.0	31.0	
Actuated g/C Ratio	0.63	0.63		0.55	0.55			0.28		0.28	0.28	
v/c Ratio	1.25	0.74		0.69	1.23			0.21		1.17	0.44	
Control Delay	181.3	19.3		38.6	139.6			15.4		140.6	16.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	181.3	19.3		38.6	139.6			15.4		140.6	16.5	
LOS	F	B		D	F			B		F	B	

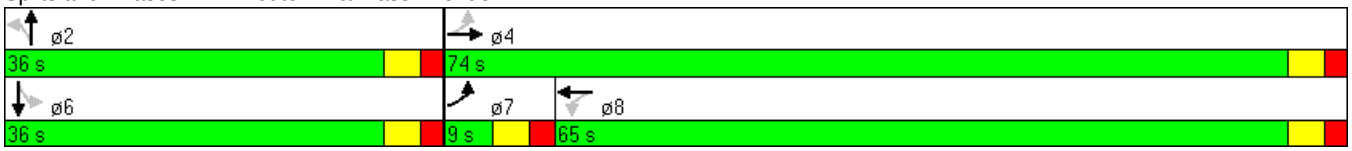
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		45.2			128.9			15.4			94.5	
Approach LOS		D			F			B			F	
Queue Length 50th (ft)	~68	392		70	~1052			23		~354	59	
Queue Length 95th (ft)	#172	531		#179	#1267			65		#529	127	
Internal Link Dist (ft)		1355			587			716			593	
Turn Bay Length (ft)	250			250						100		
Base Capacity (vph)	132	1163		209	979			509		356	565	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	1.25	0.74		0.69	1.23			0.21		1.17	0.44	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.25			
Intersection Signal Delay: 90.5		Intersection LOS: F	
Intersection Capacity Utilization 106.8%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Route 2A & Mass Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	736	25	127	681	383	10	30	54	368	54	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	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	1.00	
Frt	1.00	1.00		1.00	0.95			0.92		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	1854		1770	1762			1709		1770	1652	
Flt Permitted	0.06	1.00		0.21	1.00			0.96		0.68	1.00	
Satd. Flow (perm)	115	1854		384	1762			1652		1262	1652	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	165	836	28	144	774	435	11	34	61	418	61	186
RTOR Reduction (vph)	0	1	0	0	18	0	0	44	0	0	100	0
Lane Group Flow (vph)	165	863	0	144	1191	0	0	62	0	418	147	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	69.0	69.0		60.0	60.0			31.0		31.0	31.0	
Effective Green, g (s)	69.0	69.0		60.0	60.0			31.0		31.0	31.0	
Actuated g/C Ratio	0.63	0.63		0.55	0.55			0.28		0.28	0.28	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	132	1163		209	961			466		356	466	
v/s Ratio Prot	c0.05	0.47			0.68						0.09	
v/s Ratio Perm	c0.74			0.37				0.04		c0.33		
v/c Ratio	1.25	0.74		0.69	1.24			0.13		1.17	0.32	
Uniform Delay, d1	29.9	14.3		18.2	25.0			29.5		39.5	31.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	160.3	2.6		9.1	116.6			0.1		104.0	0.4	
Delay (s)	190.2	16.9		27.3	141.6			29.6		143.5	31.5	
Level of Service	F	B		C	F			C		F	C	
Approach Delay (s)		44.7			129.4			29.6			101.9	
Approach LOS		D			F			C			F	

Intersection Summary			
HCM Average Control Delay	92.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	106.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	148	922	870	9	12	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999		0.877	
Flt Protected		0.993			0.996	
Satd. Flow (prot)	0	1850	1861	0	1627	0
Flt Permitted		0.993			0.996	
Satd. Flow (perm)	0	1850	1861	0	1627	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		1525	1435		707	
Travel Time (s)		34.7	32.6		16.1	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	168	1048	989	10	14	143
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1216	999	0	157	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 121.5%		ICU Level of Service H	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	148	922	870	9	12	126
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	168	1048	989	10	14	143
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	999				2378	994
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	999				2378	994
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	76				53	52
cM capacity (veh/h)	693				29	298

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1216	999	157
Volume Left	168	0	14
Volume Right	0	10	143
cSH	693	1700	164
Volume to Capacity	0.24	0.59	0.96
Queue Length 95th (ft)	24	0	181
Control Delay (s)	8.1	0.0	114.6
Lane LOS	A		F
Approach Delay (s)	8.1	0.0	114.6
Approach LOS			F

Intersection Summary			
Average Delay	11.7		
Intersection Capacity Utilization	121.5%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	1076	990	1	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1863	0	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1863	0	1770	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		846	1525		685	
Travel Time (s)		19.2	34.7		15.6	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	1223	1125	1	1	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1223	1126	0	1	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.6%		ICU Level of Service C	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	1076	990	1	1	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	1223	1125	1	1	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1126				2348	1126
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1126				2348	1126
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				97	100
cM capacity (veh/h)	620				40	249

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1223	1126	1
Volume Left	0	0	1
Volume Right	0	1	0
cSH	620	1700	40
Volume to Capacity	0.00	0.66	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	98.5
Lane LOS			F
Approach Delay (s)	0.0	0.0	98.5
Approach LOS			F

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		66.6%	ICU Level of Service C
Analysis Period (min)		15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	236	0	0	22	1	150	224	0	10	80	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		230	0		0	0		0	0		230
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.992							0.850
Flt Protected		0.985						0.981			0.995	
Satd. Flow (prot)	0	3531	0	0	3581	0	0	1864	0	0	1692	1615
Flt Permitted		0.985						0.981			0.995	
Satd. Flow (perm)	0	3531	0	0	3581	0	0	1864	0	0	1692	1615
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		592			394			514			456	
Travel Time (s)		13.5			9.0			11.7			10.4	
Peak Hour Factor	0.59	0.80	0.81	0.92	0.59	0.50	0.83	0.80	0.92	0.92	0.80	1.00
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	13%	0%
Adj. Flow (vph)	127	295	0	0	37	2	181	280	0	11	100	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	422	0	0	39	0	0	461	0	0	111	10
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.4%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	75	236	0	0	22	1	150	224	0	10	80	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.59	0.80	0.81	0.92	0.59	0.50	0.83	0.80	0.92	0.92	0.80	1.00
Hourly flow rate (vph)	127	295	0	0	37	2	181	280	0	11	100	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	784	763	100	911	763	280	100			280		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	784	763	100	911	763	280	100			280		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	50	0	100	0	87	100	88			99		
cM capacity (veh/h)	255	293	956	0	294	764	1505			1294		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	225	197	25	14	461	111	10
Volume Left	127	0	0	0	181	11	0
Volume Right	0	0	0	2	0	0	10
cSH	270	293	294	321	1505	1294	1700
Volume to Capacity	0.83	0.67	0.08	0.04	0.12	0.01	0.01
Queue Length 95th (ft)	170	112	7	4	10	1	0
Control Delay (s)	61.0	39.3	18.4	16.7	3.7	0.8	0.0
Lane LOS	F	E	C	C	A	A	
Approach Delay (s)	50.9		17.8		3.7	0.8	
Approach LOS	F		C				

Intersection Summary				
Average Delay	23.0			
Intersection Capacity Utilization	45.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	356	898	434	530	167	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.925			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1787	1863	1681	0	1671	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1787	1863	1681	0	1671	1583
Link Speed (mph)		30	30		30	
Link Distance (ft)		753	771		267	
Travel Time (s)		17.1	17.5		6.1	
Peak Hour Factor	0.87	0.95	0.86	0.84	0.80	0.73
Heavy Vehicles (%)	1%	2%	4%	5%	8%	2%
Adj. Flow (vph)	409	945	505	631	209	237
Shared Lane Traffic (%)						
Lane Group Flow (vph)	409	945	1136	0	209	237
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 94.3%		ICU Level of Service F	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	356	898	434	530	167	173
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.95	0.86	0.84	0.80	0.73
Hourly flow rate (vph)	409	945	505	631	209	237
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	505				2584	820
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	505				2584	820
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	62				0	37
cM capacity (veh/h)	1065				16	375

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	409	945	1136	209	237
Volume Left	409	0	0	209	0
Volume Right	0	0	631	0	237
cSH	1065	1700	1700	16	375
Volume to Capacity	0.38	0.56	0.67	12.67	0.63
Queue Length 95th (ft)	46	0	0	Err	104
Control Delay (s)	10.5	0.0	0.0	Err	29.7
Lane LOS	B			F	D
Approach Delay (s)	3.2		0.0	4698.6	
Approach LOS				F	

Intersection Summary				
Average Delay	714.8			
Intersection Capacity Utilization	94.3%	ICU Level of Service	F	
Analysis Period (min)	15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	41	24	158	333	179	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.955		0.911			
Flt Protected	0.968					0.977
Satd. Flow (prot)	1722	0	1719	0	0	1837
Flt Permitted	0.968					0.977
Satd. Flow (perm)	1722	0	1719	0	0	1837
Link Speed (mph)	30		30			30
Link Distance (ft)	634		229			338
Travel Time (s)	14.4		5.2			7.7
Peak Hour Factor	0.65	0.75	0.87	0.94	0.82	0.82
Heavy Vehicles (%)	3%	0%	2%	0%	0%	2%
Adj. Flow (vph)	63	32	182	354	218	248
Shared Lane Traffic (%)						
Lane Group Flow (vph)	95	0	536	0	0	466
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.1%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	41	24	158	333	179	203
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.75	0.87	0.94	0.82	0.82
Hourly flow rate (vph)	63	32	182	354	218	248
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1043	359			536	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1043	359			536	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	68	95			79	
cM capacity (veh/h)	200	690			1042	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	95	536	466
Volume Left	63	0	218
Volume Right	32	354	0
cSH	263	1700	1042
Volume to Capacity	0.36	0.32	0.21
Queue Length 95th (ft)	40	0	20
Control Delay (s)	26.3	0.0	5.6
Lane LOS	D		A
Approach Delay (s)	26.3	0.0	5.6
Approach LOS	D		

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	639	13	48	756	242	19	82	128	412	48	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	250		0	0		0	100		0
Storage Lanes	1		0	1		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.964			0.925			0.881	
Flt Protected	0.950			0.950				0.996		0.950		
Satd. Flow (prot)	1770	1857	0	1770	1796	0	0	1716	0	1770	1641	0
Flt Permitted	0.051			0.225				0.958		0.500		
Satd. Flow (perm)	95	1857	0	419	1796	0	0	1651	0	931	1641	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			15			48			145	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1435			667			796			673	
Travel Time (s)		32.6			15.2			18.1			15.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	169	726	15	55	859	275	22	93	145	468	55	208
Shared Lane Traffic (%)												
Lane Group Flow (vph)	169	741	0	55	1134	0	0	260	0	468	263	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	21.0		21.0	21.0		21.0	21.0		21.0	21.0	
Total Split (s)	11.0	89.0	0.0	78.0	78.0	0.0	61.0	61.0	0.0	61.0	61.0	0.0
Total Split (%)	7.3%	59.3%	0.0%	52.0%	52.0%	0.0%	40.7%	40.7%	0.0%	40.7%	40.7%	0.0%
Maximum Green (s)	6.0	84.0		73.0	73.0		56.0	56.0		56.0	56.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	None		None	None	
Walk Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	84.0	84.0		73.0	73.0			56.0		56.0	56.0	
Actuated g/C Ratio	0.56	0.56		0.49	0.49			0.37		0.37	0.37	
v/c Ratio	1.41	0.71		0.27	1.29			0.40		1.34	0.37	
Control Delay	252.1	28.9		27.3	170.4			30.0		210.6	16.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	252.1	28.9		27.3	170.4			30.0		210.6	16.3	
LOS	F	C		C	F			C		F	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		70.4			163.8			30.0			140.7	
Approach LOS		E			F			C			F	
Queue Length 50th (ft)	~171	513		31	~1405			152		~597	79	
Queue Length 95th (ft)	#319	645		66	#1615			225		#794	149	
Internal Link Dist (ft)		1355			587			716			593	
Turn Bay Length (ft)	250			250						100		
Base Capacity (vph)	120	1040		204	882			646		348	704	
Starvation Cap Reductn	0	0		0	0			0		0	0	
Spillback Cap Reductn	0	0		0	0			0		0	0	
Storage Cap Reductn	0	0		0	0			0		0	0	
Reduced v/c Ratio	1.41	0.71		0.27	1.29			0.40		1.34	0.37	

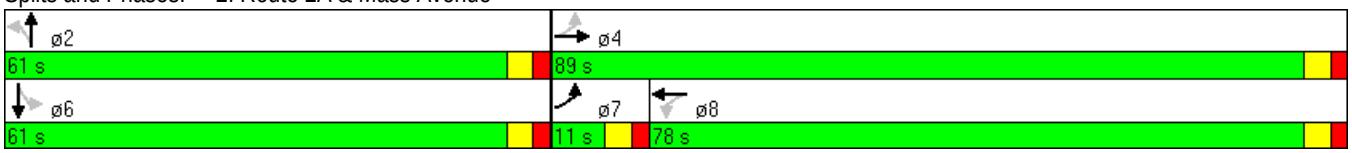
Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.41
Intersection Signal Delay: 119.6 Intersection LOS: F
Intersection Capacity Utilization 115.5% ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Route 2A & Mass Avenue



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	639	13	48	756	242	19	82	128	412	48	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	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	1.00	
Frt	1.00	1.00		1.00	0.96			0.92		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770	1857		1770	1795			1715		1770	1642	
Flt Permitted	0.05	1.00		0.23	1.00			0.96		0.50	1.00	
Satd. Flow (perm)	96	1857		420	1795			1651		931	1642	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	169	726	15	55	859	275	22	93	145	468	55	208
RTOR Reduction (vph)	0	0	0	0	8	0	0	30	0	0	91	0
Lane Group Flow (vph)	169	741	0	55	1126	0	0	230	0	468	172	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	84.0	84.0		73.0	73.0			56.0		56.0	56.0	
Effective Green, g (s)	84.0	84.0		73.0	73.0			56.0		56.0	56.0	
Actuated g/C Ratio	0.56	0.56		0.49	0.49			0.37		0.37	0.37	
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	121	1040		204	874			616		348	613	
v/s Ratio Prot	c0.06	0.40			0.63						0.10	
v/s Ratio Perm	c0.73			0.13				0.14		c0.50		
v/c Ratio	1.40	0.71		0.27	1.29			0.37		1.34	0.28	
Uniform Delay, d1	42.9	24.2		22.7	38.5			34.2		47.0	32.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	220.8	2.3		0.7	138.5			0.4		173.2	0.3	
Delay (s)	263.7	26.5		23.5	177.0			34.6		220.2	33.2	
Level of Service	F	C		C	F			C		F	C	
Approach Delay (s)		70.5			169.9			34.6			152.9	
Approach LOS		E			F			C			F	

Intersection Summary			
HCM Average Control Delay	125.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	115.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	45	734	932	9	69	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999		0.898	
Flt Protected		0.997			0.988	
Satd. Flow (prot)	0	1857	1861	0	1653	0
Flt Permitted		0.997			0.988	
Satd. Flow (perm)	0	1857	1861	0	1653	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		1525	1435		707	
Travel Time (s)		34.7	32.6		16.1	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	51	834	1059	10	78	245
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	885	1069	0	323	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 99.3%		ICU Level of Service F	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	45	734	932	9	69	216
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	51	834	1059	10	78	245
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1069				2001	1064
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1069				2001	1064
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				0	9
cM capacity (veh/h)	652				61	271

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	885	1069	324
Volume Left	51	0	78
Volume Right	0	10	245
cSH	652	1700	147
Volume to Capacity	0.08	0.63	2.20
Queue Length 95th (ft)	6	0	666
Control Delay (s)	2.2	0.0	611.2
Lane LOS	A		F
Approach Delay (s)	2.2	0.0	611.2
Approach LOS			F

Intersection Summary			
Average Delay	87.7		
Intersection Capacity Utilization	99.3%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	772	1110	2	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	0
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		846	1525		685	
Travel Time (s)		19.2	34.7		15.6	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	877	1261	2	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	877	1263	0	0	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 61.9%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	772	1110	2	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	877	1261	2	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1264				2140	1262
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1264				2140	1262
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				100	100
cM capacity (veh/h)	550				54	207

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	877	1264	0
Volume Left	0	0	0
Volume Right	0	2	0
cSH	550	1700	1700
Volume to Capacity	0.00	0.74	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	23	0	0	243	8	109	94	0	8	203	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		230	0		0	0		0	0		230
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.993							0.850
Flt Protected		0.976						0.975			0.998	
Satd. Flow (prot)	0	3523	0	0	3585	0	0	1852	0	0	1826	1615
Flt Permitted		0.976						0.975			0.998	
Satd. Flow (perm)	0	3523	0	0	3585	0	0	1852	0	0	1826	1615
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		592			394			514			456	
Travel Time (s)		13.5			9.0			11.7			10.4	
Peak Hour Factor	0.63	0.88	0.66	0.92	0.76	0.50	0.92	0.82	0.82	0.92	0.84	0.50
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%
Adj. Flow (vph)	25	26	0	0	320	16	118	115	0	9	242	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	51	0	0	336	0	0	233	0	0	251	22
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 45.7%		ICU Level of Service A	
Analysis Period (min) 15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	23	0	0	243	8	109	94	0	8	203	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.63	0.88	0.66	0.92	0.76	0.50	0.92	0.82	0.82	0.92	0.84	0.50
Hourly flow rate (vph)	25	26	0	0	320	16	118	115	0	9	242	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	787	611	242	624	611	115	242			115		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	787	611	242	624	611	115	242			115		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	68	93	100	100	14	98	91			99		
cM capacity (veh/h)	79	373	802	352	373	943	1337			1487		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	34	17	213	123	233	250	22
Volume Left	25	0	0	0	118	9	0
Volume Right	0	0	0	16	0	0	22
cSH	99	373	373	405	1337	1487	1700
Volume to Capacity	0.34	0.05	0.57	0.30	0.09	0.01	0.01
Queue Length 95th (ft)	34	4	85	31	7	0	0
Control Delay (s)	59.3	15.1	26.8	17.7	4.4	0.3	0.0
Lane LOS	F	C	D	C	A	A	
Approach Delay (s)	44.3		23.5		4.4	0.3	
Approach LOS	E		C				

Intersection Summary				
Average Delay	12.6			
Intersection Capacity Utilization	45.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	120	359	859	236	431	552
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25			25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.965			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1787	1845	1815	0	1787	1599
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1787	1845	1815	0	1787	1599
Link Speed (mph)		30	30		30	
Link Distance (ft)		743	582		267	
Travel Time (s)		16.9	13.2		6.1	
Peak Hour Factor	0.87	0.96	0.95	0.75	0.83	0.89
Heavy Vehicles (%)	1%	3%	1%	1%	1%	1%
Adj. Flow (vph)	138	374	904	315	519	620
Shared Lane Traffic (%)						
Lane Group Flow (vph)	138	374	1219	0	519	620
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 100.4%		ICU Level of Service G	
Analysis Period (min) 15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	120	359	859	236	431	552
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.96	0.95	0.75	0.83	0.89
Hourly flow rate (vph)	138	374	904	315	519	620
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	904				1711	1062
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	904				1711	1062
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	82				0	0
cM capacity (veh/h)	756				82	273

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	138	374	1219	519	620
Volume Left	138	0	0	519	0
Volume Right	0	0	315	0	620
cSH	756	1700	1700	82	273
Volume to Capacity	0.18	0.22	0.72	6.34	2.27
Queue Length 95th (ft)	17	0	0	Err	1206
Control Delay (s)	10.8	0.0	0.0	Err	613.3
Lane LOS	B			F	F
Approach Delay (s)	2.9		0.0	4890.4	
Approach LOS				F	

Intersection Summary			
Average Delay	1942.0		
Intersection Capacity Utilization	100.4%	ICU Level of Service	G
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	147	235	202	77	27	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.918		0.952			
Flt Protected	0.981					0.991
Satd. Flow (prot)	1704	0	1778	0	0	1868
Flt Permitted	0.981					0.991
Satd. Flow (perm)	1704	0	1778	0	0	1868
Link Speed (mph)	30		30			30
Link Distance (ft)	634		229			338
Travel Time (s)	14.4		5.2			7.7
Peak Hour Factor	0.85	0.87	0.72	0.50	0.75	0.90
Heavy Vehicles (%)	1%	0%	1%	3%	0%	1%
Adj. Flow (vph)	173	270	281	154	36	160
Shared Lane Traffic (%)						
Lane Group Flow (vph)	443	0	435	0	0	196
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.0%		ICU Level of Service B	
Analysis Period (min) 15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	147	235	202	77	27	144
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.87	0.72	0.50	0.75	0.90
Hourly flow rate (vph)	173	270	281	154	36	160
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	590	358			435	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	590	358			435	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	62	61			97	
cM capacity (veh/h)	457	691			1136	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	443	435	196
Volume Left	173	0	36
Volume Right	270	154	0
cSH	576	1700	1136
Volume to Capacity	0.77	0.26	0.03
Queue Length 95th (ft)	176	0	2
Control Delay (s)	29.0	0.0	1.8
Lane LOS	D		A
Approach Delay (s)	29.0	0.0	1.8
Approach LOS	D		

Intersection Summary			
Average Delay	12.3		
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

Appendix C-10

SYNCHRO Peak Roundabout Analysis: 2030 Build

Intersection	
Intersection Delay, s/veh	11.4
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	422	39	461	121
Demand Flow Rate, veh/h	425	39	461	134
Vehicles Circulating, veh/h	124	588	436	218
Vehicles Exiting, veh/h	218	309	113	409
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.4	6.4	16.1	5.7
Approach LOS	A	A	C	A

Lane	Left	Bypass	Left	Right	Left	Left	Bypass
Designated Moves	LT	R	LT	R	LT	LT	R
Assumed Moves	LT	R	LT	R	LT	LT	R
RT Channelized		Yield					Yield
Lane Util	1.000		0.949	0.051	1.000	1.000	
Critical Headway, s	5.193		5.193	5.193	5.193	5.193	
Entry Flow, veh/h	425	0	37	2	461	124	10
Cap Entry Lane, veh/h	998	1009	628	628	731	909	909
Entry HV Adj Factor	0.993	0.980	1.000	1.000	1.000	0.895	1.000
Flow Entry, veh/h	422	0	37	2	461	111	10
Cap Entry, veh/h	991	989	628	628	731	813	909
V/C Ratio	0.426	0.000	0.059	0.003	0.631	0.136	0.011
Control Delay, s/veh	8.4	3.6	6.4	5.8	16.1	5.8	4.1
LOS	A	A	A	A	C	A	A
95th %tile Queue, veh	2	0	0	0	5	0	0

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	2	2	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	51	336	233	273
Demand Flow Rate, veh/h	51	336	233	283
Vehicles Circulating, veh/h	261	258	60	438
Vehicles Exiting, veh/h	438	35	252	156
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.7	8.1	5.4	9.4
Approach LOS	A	A	A	A

Lane	Left	Bypass	Left	Right	Left	Left	Bypass
Designated Moves	LT	R	LT	R	LT	LT	R
Assumed Moves	LT	R	LT	R	LT	LT	R
RT Channelized		Yield					Yield
Lane Util	1.000		0.952	0.048	1.000	1.000	
Critical Headway, s	5.193		5.193	5.193	5.193	5.193	
Entry Flow, veh/h	51	0	320	16	233	261	22
Cap Entry Lane, veh/h	870	878	873	873	1064	729	729
Entry HV Adj Factor	1.000	1.000	1.000	1.000	1.000	0.963	1.000
Flow Entry, veh/h	51	0	320	16	233	251	22
Cap Entry, veh/h	870	878	873	873	1064	702	729
V/C Ratio	0.059	0.000	0.367	0.018	0.219	0.358	0.030
Control Delay, s/veh	4.7	4.1	8.3	4.3	5.4	9.7	5.2
LOS	A	A	A	A	A	A	A
95th %tile Queue, veh	0	0	2	0	1	2	0

Appendix C-11

2006-2010 MassDOT Crash Worksheets

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Lincoln COUNT DATE :

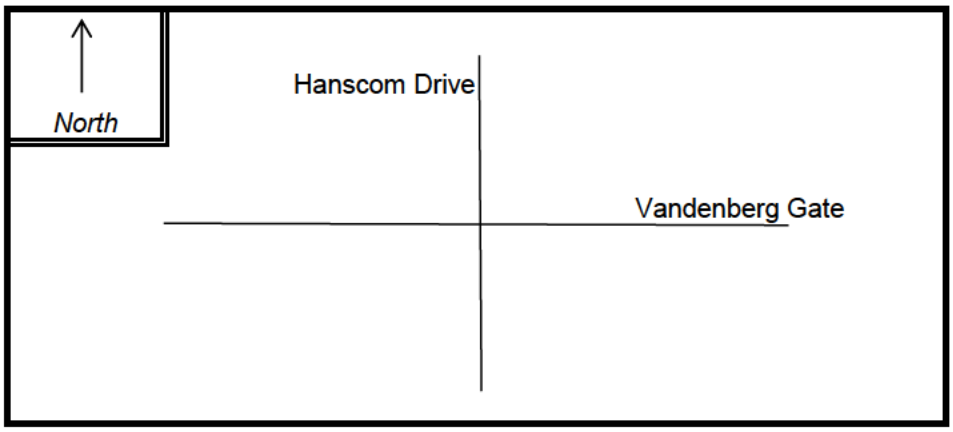
DISTRICT : UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Hanscom Drive

MINOR STREET(S) : Old Bedford Road

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	133	23	365	645		1,166

" K " FACTOR : 0.100 INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : 11,660

TOTAL # OF CRASHES : 2 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : 0.40

CRASH RATE CALCULATION : 0.09 RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date:

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Lincoln COUNT DATE : 2006-2010

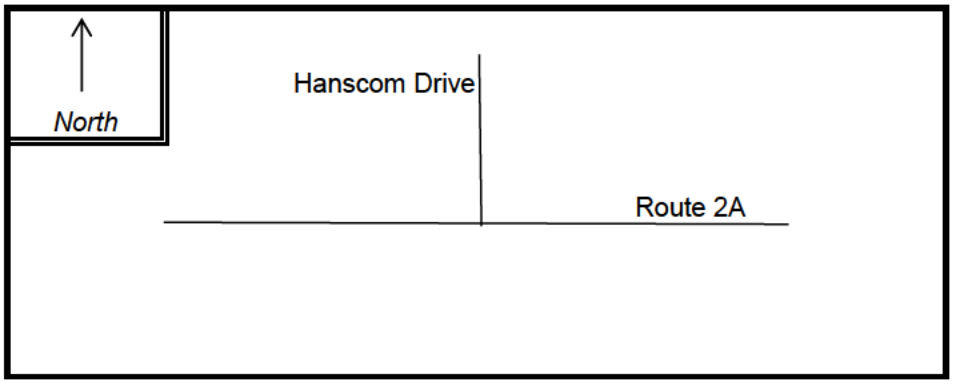
DISTRICT : UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Hanscom Drive

MINOR STREET(S) : Route 2A

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	EB	WB			
PEAK HOURLY VOLUMES (AM/PM) :	251	1,066	768			2,085

" K " FACTOR : 0.100 INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : 20,850

TOTAL # OF CRASHES : 17 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : 3.40

CRASH RATE CALCULATION : 0.45 RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date:

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Concord COUNT DATE : 2006-2010

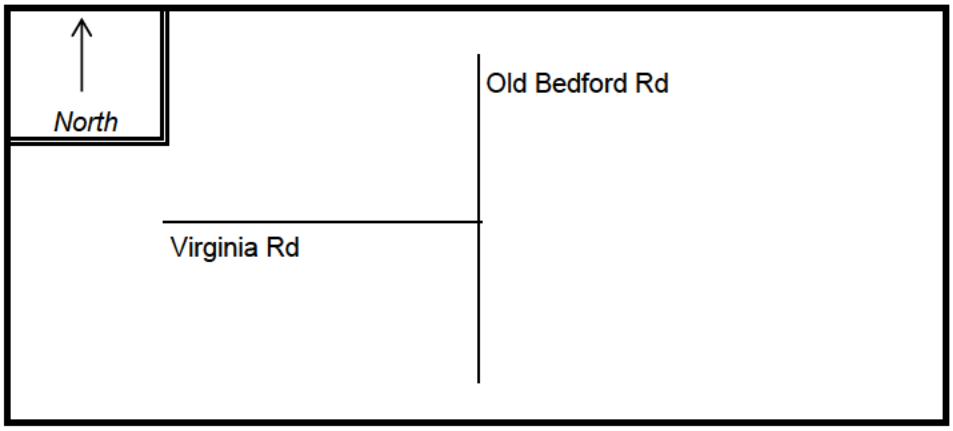
DISTRICT : UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Old Bedford Rd

MINOR STREET(S) : Virginia Road

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	WB	NB			
PEAK HOURLY VOLUMES (AM/PM) :	331	52	401			784

" K " FACTOR : **0.100** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **7,840**

TOTAL # OF CRASHES : 2 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.40**

CRASH RATE CALCULATION : **0.14** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments :

Project Title & Date:

Appendix C-12

Trip Generation Estimates

	Morning Peak Hour			Afternoon Peak Hour		
2005 ESPR Existing Trip Generation						
	In	Out	Total	In	Out	Total
General Aviation	48	16	64	30	46	76
Commercial	5	5	10	4	1	5
Other	62	21	83	41	32	73
TOTAL	**115**	**42**	**157**	**75**	**79**	**154**
2012 ESPR Existing Trip Generation						
	In	Out	Total	In	Out	Total
General Aviation	48	16	64	30	46	76
Commercial	0	0	0	0	0	0
Other	88	13	101	7	38	45
TOTAL	**136**	**29**	**165**	**37**	**84**	**121**
2020 Forecast Trip Generation						
	In	Out	Total	In	Out	Total
General Aviation	48	16	64	30	46	76
Commercial	6	6	12	5	1	6
Other	102	15	117	8	44	52
Museum (50%)	22	5	27	3	29	32
TOTAL	**178**	**42**	**220**	**46**	**120**	**166**
2030 Forecast Trip Generation						
	In	Out	Total	In	Out	Total
General Aviation	55	18	73	34	53	87
Commercial	11	11	22	9	2	11
Other	118	17	135	9	51	60
Museum (100%)	44	10	54	6	58	64
Hotel	59	41	101	58	56	114
TOTAL	**287**	**97**	**385**	**116**	**220**	**336**

Appendix D Noise

Appendix D Noise

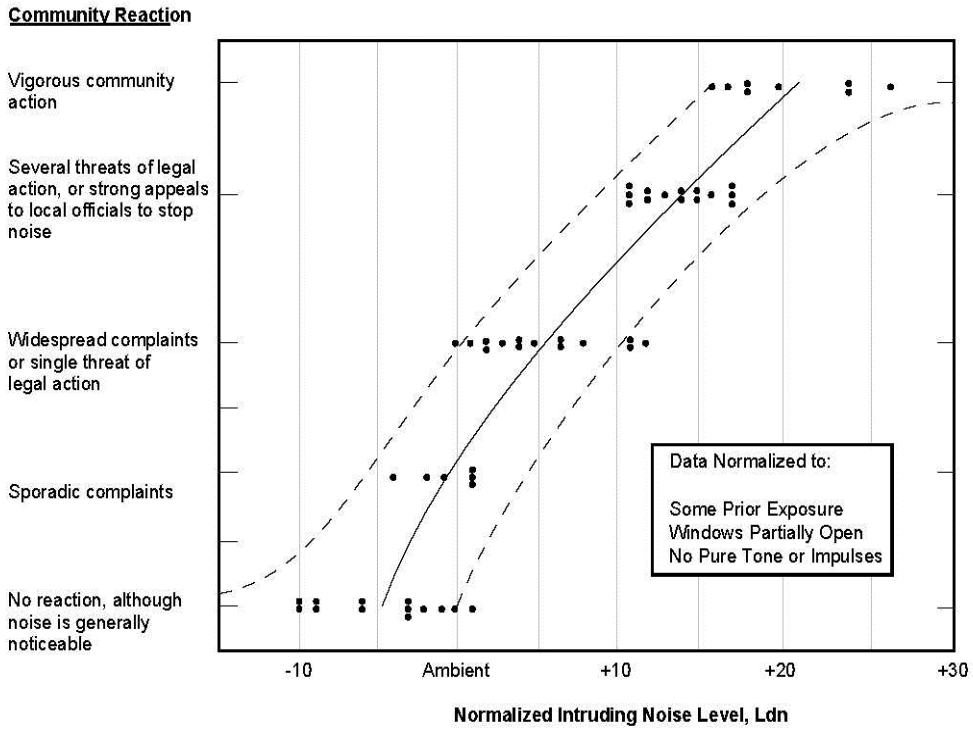


Figure D-1 Community Reaction as a Function of Outdoor Noise Level

D.1 Noise Effects

This section addresses the primary ways people are affected by aircraft noise: annoyance, sleep disturbance, and speech interference.

D.1.1 Annoyance

Social survey data have long made it clear that individual reactions to noise vary widely for a given noise level. Nevertheless, as a group, people's aggregate response to factors such as speech and sleep interference and desire for an acceptable environment is predictable and relates well to measures of cumulative noise exposure such as DNL. A wide variety of responses have been investigated in social survey research. The concept of "percent highly annoyed" in sample populations seems to provide the most consistent response of a community to a particular noise source (see Figure D-1).

The most widely recognized relationship between noise and annoyance – regardless of the noise source– was developed by Schultz in the late 1970s. This relationship or the "Schultz Curve" is shown on the following page (see Figure D-2). Schultz based his analysis on data from 18 surveys conducted worldwide; the curve indicates that at levels as low as DNL 55, approximately five percent of the people will still be highly annoyed, with the percentage increasing more rapidly as exposure increases above

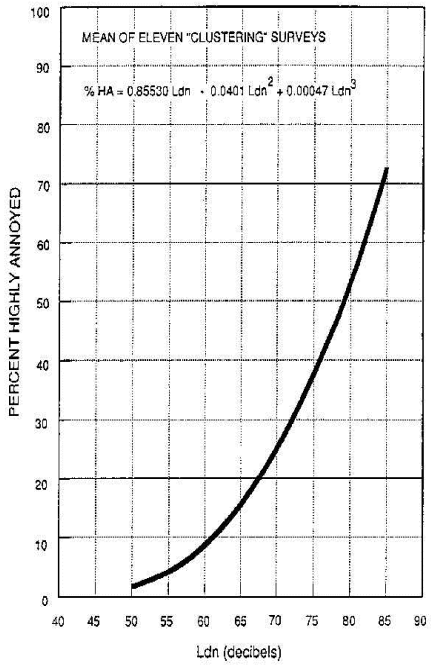
DNL 65[1]. Separate work by the EPA has shown that overall community reaction to a noise environment is also dependent on DNL[2].

The most recent analysis of community annoyance (1989) supports the conclusions set forth by Schultz; that is, that the DNL-%HA relationship presented in the "Schultz curve" is applicable to all transportation noise. This analysis included Schultz' original data (161 points) and added to it data from more recent social surveys (269 points). A logistic regression of the relationship is shown in Figure D-3. This is the preferred relationship for current investigations[3]. The more recent analysis also showed that communities near airports are slightly more willing to describe themselves as annoyed than those near surface transportation noise sources, although there are no statistically significant differences between modes of transportation[4].

D.1.2 Speech Interference

One of the primary effects of aircraft noise is its tendency to drown out or "mask" speech, making it difficult or impossible to carry on a normal conversation without interruption. The sound level of speech decreases as distance between a talker and listener increases. As the level of speech decreases in the presence of background noise, it becomes harder and harder to hear. Figure D-4 presents typical distances between talker and listener for satisfactory outdoor conversations in the presence of different steady A-weighted background noise levels for three degrees of vocal effort: raised, normal, and relaxed[5]. As the background level increases, the talker must raise his/her voice, or the individuals must get closer together to continue their conversation.

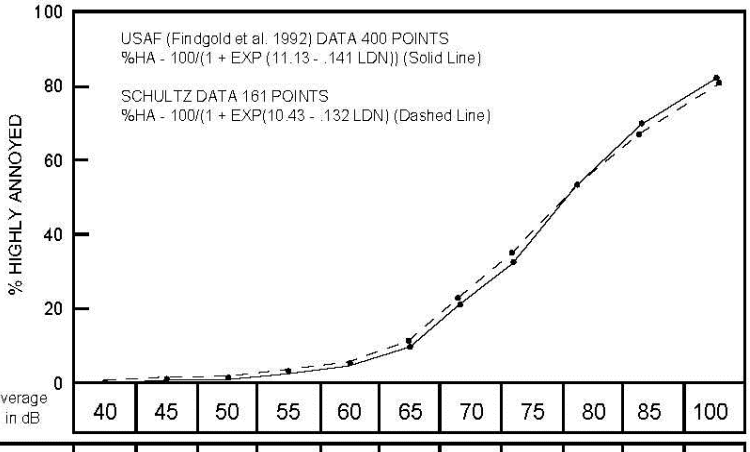
[1]Schultz, T.J., "Synthesis of Social Surveys on Noise Annoyance", Journal of the Acoustical Society of America, Vol. 64, No. 2, August 1978.
[2]Wyle Labs, Community Noise, DOT Report NTID300.3, December, 1971.
[3]FICON 1992. Federal Interagency Committee on Noise, Federal Agency Review of Selected Airport Noise Analysis Issues, August, 1992.
[4]Fidell, S., Barber, D., and Schultz., Updating a Dosage-Effect Relationship for the Prevalence of Annoyance Due to General Transportation Noise, HSD-TR-89-009, Wright-Patterson AFB, Ohio: US Air Force, Noise and Sonic Boom Impact Technology.
[5]United States Environmental Protection Agency, Public Health and Welfare Criteria for Noise, 1973.



Source: Schultz, 1978.

Figure D-2 Percentage of People Highly Annoyed as a Function of Exposure

As indicated in Figure D-4, satisfactory conversation does not always require hearing every word; 95 percent intelligibility is acceptable for many conversations. This is because a few unheard words can be inferred when they occur in a familiar context. However, in relaxed conversation, we have higher expectations of hearing speech and require complete 100 percent intelligibility. Any combination of talker-listener distances and background noise that falls below the bottom line in the figure represents an ideal environment for outdoor speech communication and is considered necessary for acceptable indoor conversation as well.



Day - Night Average Sound Level in dB	40	45	50	55	60	65	70	75	80	85	100
Calculated %HA Points: USAF	0.41	0.831	1.66	3.31	6.48	12.29	22.1	36.47	53.74	70.16	82.64
Calculated %HA Points: SCHULTZ	0.576	1.11	2.12	4.03	7.52	13.59	23.32	37.05	53.25	68.78	81

Source: (USAF, 1992)

Figure D-3 Comparison of Schultz Data (1978) and USAF Data (1992) on Annoyance

One implication of the relationships in the figure is that for typical communication distances of three or four feet (one to one and one-half meters), acceptable outdoor conversations where 95 percent intelligibility is acceptable can be carried on in a normal voice as long as the background noise outdoors is less than about 65 dB(A). If 100 percent intelligibility is desired, the interior background level must be less than about 45 dB(A). If the noise exceeds either of these levels, as might occur when an aircraft passes overhead, intelligibility is lost unless vocal effort is increased or communication distance decreased.

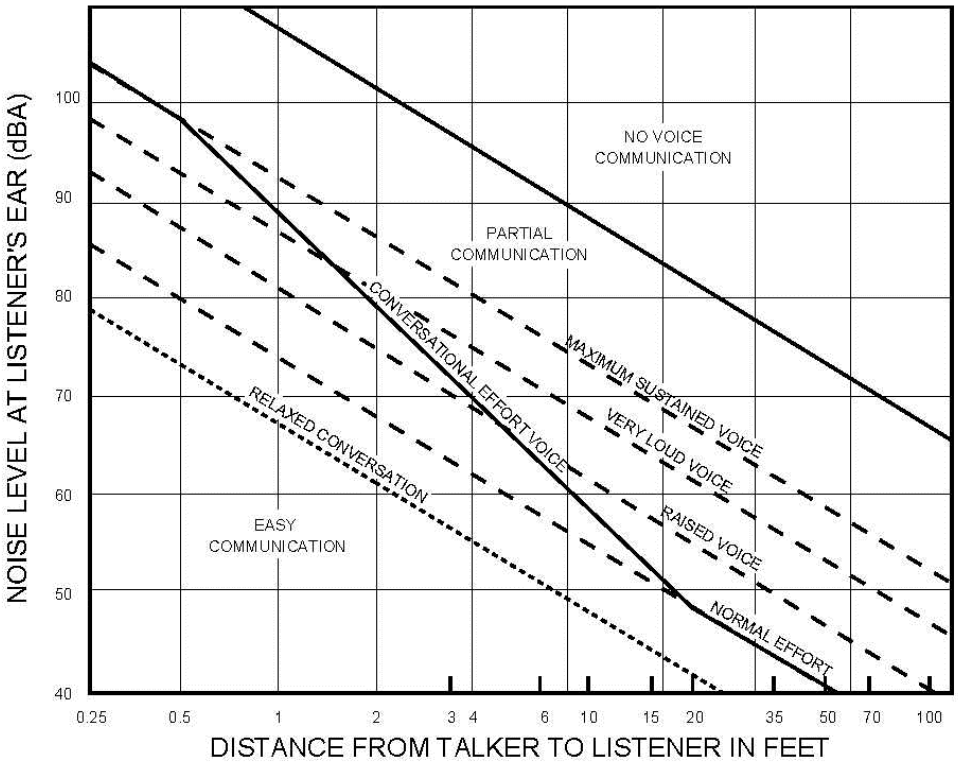
D.1.3 Sleep Interference

The effect of aviation noise on sleep is a long-recognized concern of those interested in addressing the impacts of noise on people. Historical studies of sleep disturbance were conducted mainly in laboratories, using various indicators of response (electroencephalographic recordings, verbal response, button push, etc.). Field studies also were conducted, in which subjects were exposed to noise in their own homes, using real or simulated noise. However, in a 1989 assessment of existing research, Pearsons indicated the need for substantially more work in this area, citing the large discrepancy between laboratory and field studies as a major concern.

In 1992, the Federal Interagency Committee on Noise (FICON) recommended an interim dose-response curve to predict the percent of the exposed population expected to be awakened (percent awakening) as a function of the exposure to single event noise levels expressed in terms of sound exposure level (SEL)[6]. This interim curve was based on the data presented in the 1989 study. The FICON report also recommended continued research into community reactions to aircraft noise, including sleep disturbance.

Since the adoption of FICON's interim curve in 1992, substantial field research in the area of sleep disturbance was conducted, using a variety of test methods, and in a number of locations. The data from these studies show a consistent pattern, with considerably less percent of the exposed population expected to be behaviorally awakened than had been shown with laboratory studies. In 1997, FICAN recommended a new dose-response curve for predicting awakening, based on the results of the field studies described above[7].This curve is presented in Figure D-5.Because the curve represents the upper limit of the data, it should be interpreted as predicting the "maximum percent of the exposed population expected to be behaviorally awakened", or the "maximum % awakened". The dose-response relationship presented here relies on behavioral awakening as the indicator of sleep disturbance; relationships between aircraft noise and other potential sleep disturbance or related health effects responses have not been established by any of these newer studies. This curve should be applied only to long-term residential settings and should not be generalized to include children.

[6]FICON 1992.
[7]FICAN 1997. Federal Interagency Committee on Aviation Noise (FICAN) Effects of Aviation Noise on Awakenings from Sleep, June 1997.



Source: U.S. EPA, 1973

Figure D-4 Distances at Which Ordinary Speech Can be Understood

The finding on the relationship between aircraft noise and sleep disturbance does not call into question the nighttime penalty applied to Day Night Sound Level (DNL). The 10 dB penalty added to noise levels for the period 10:00 p.m. to 7:00 a.m. is intended to account for the increased intrusiveness of noise at night. The ambient is generally lower and more people are at home during this period than at other times of the day. Thus, the opportunities for activity interference are much higher during nighttime, which could lead to greater annoyance.

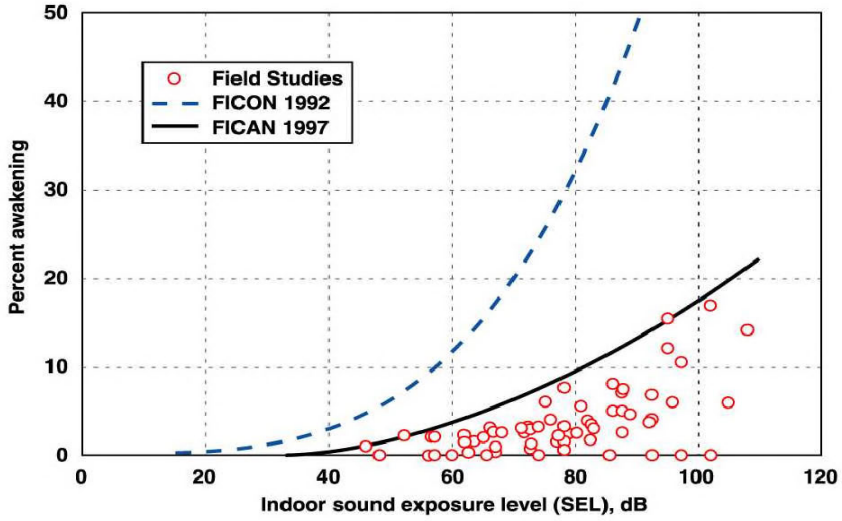


Figure D-5 Recommended Sleep Disturbance Dose-Response Relationship stood

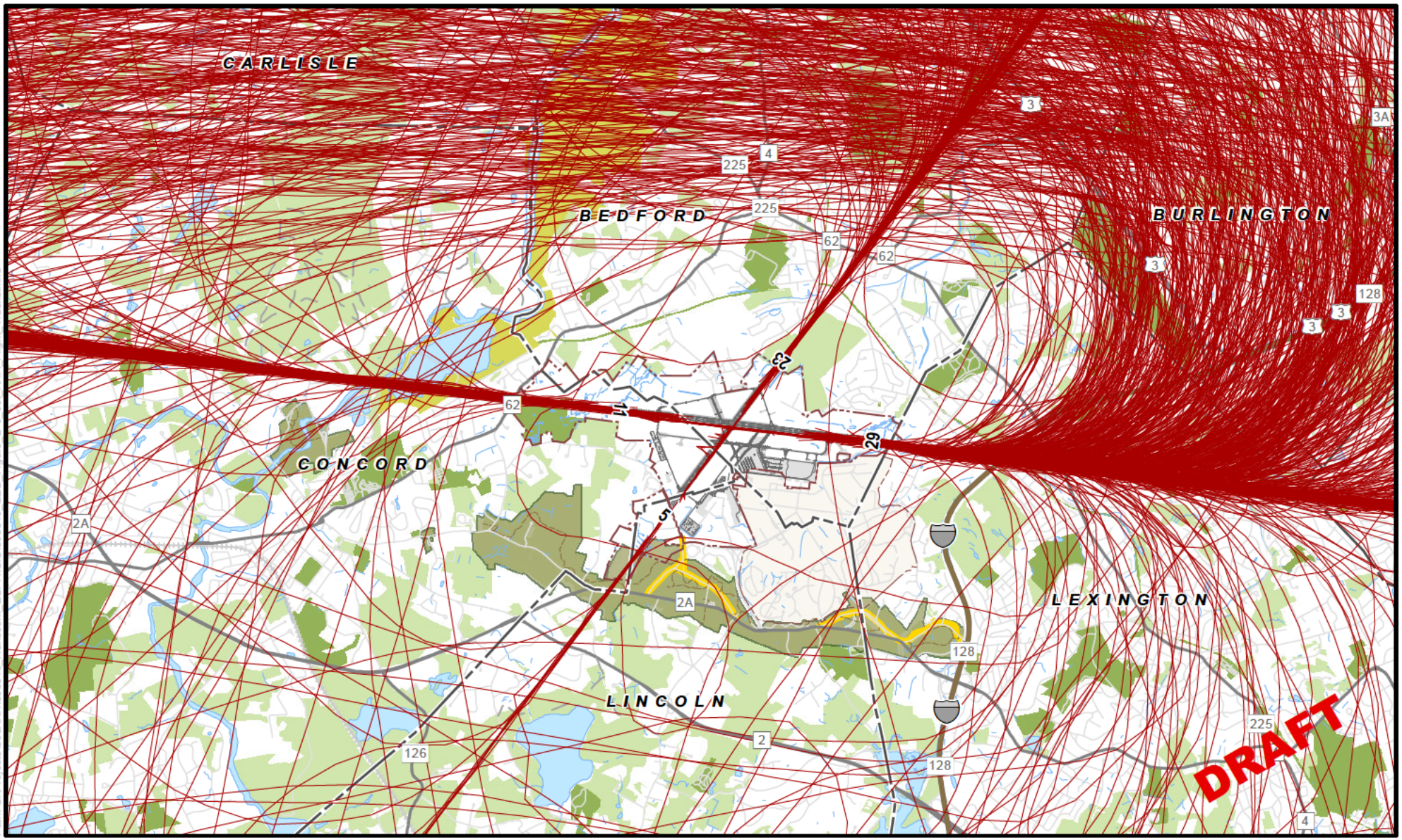
D.2 Noise Prediction Methodology

This section provides supplemental information on the noise prediction methodology described in Chapter 7. It specifically addresses the process used to develop INM flight tracks from radar data.

D.2.1 Flight Tracks

As described in section 7.4.1.2, RealContours was used to prepare the modeling input for INM. This allowed the use of over 70,000 individual radar tracks in the modeling. Figure 7-4 through Figure 7-8 display density plots for all of the flight tracks used in the modeling. The following figures display samples of the flight tracks used in the modeling. For clarity approximately 20% of the tracks used in the modeling are displayed.

Figure D-6 and Figure D-7 present a sample of the arrival and departure tracks for jet aircraft. Figure D-8 and Figure D-9 present representative tracks for arrivals and departures by propeller aircraft, including helicopters. Figure D-10 presents representative radar tracks for piston aircraft touch-and-go operations.



North

0 0.5 1 Miles

Hanscom Field Property Boundary
Hanscom AFB Property Boundary
Municipal Boundary
Jet Arrival Flight Tracks

Historic Road
Interstate
Highway
Road
Trail
Active Rail Service

MNP Boundary
Great Meadows
Open Space Non-protected
Open Space Protected in Perpetuity
Open Water
Stream

massport

Hanscom Field 2012 ESPR

Bedford, Concord, Lexington, Lincoln, Massachusetts

Representative Jet Arrival Flight Tracks

Data Sources: MassGIS (Roads, Rail), March 5, 2013; MassGIS (Bike Tra ls, Tracks and Trails), March 7, 2013; MassGIS (Community Boundaries), March 5, 2013; MassGIS (DEP Wetlands), March 8, 2013; NPS (Park Boundary), March 8, 2013; NPS (Streets and Tra ls), March 8, 2013; MassGIS (Building Footprints), March 7, 2013

Figure **D-6**

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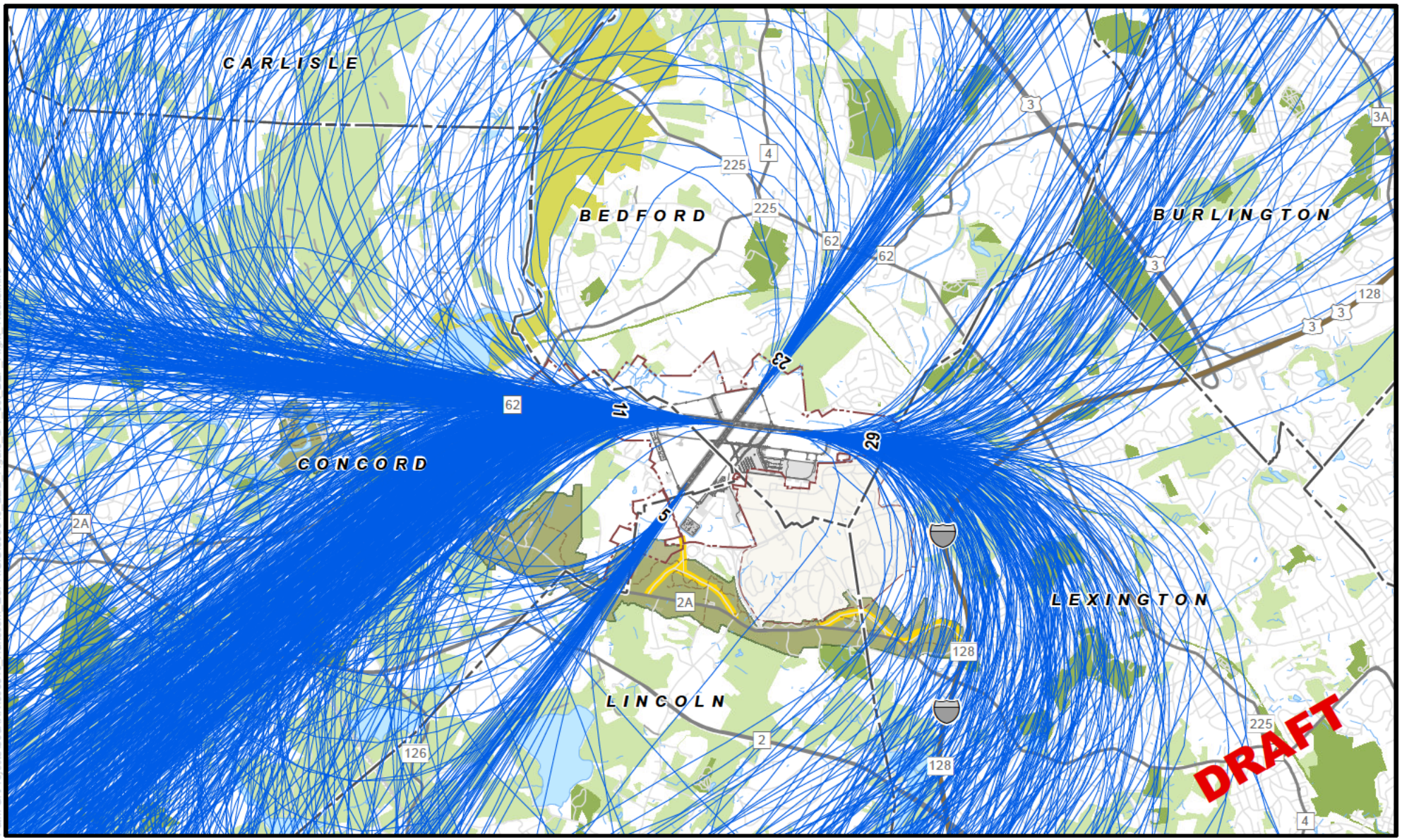
CARLISLE
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CONCORD
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Hanscom Field Property Boundary
Hanscom AFB Property Boundary
Municipal Boundary
Jet Departure Flight Tracks
Historic Road
Interstate
Highway
Road
Trail
Active Rail Service
MNP Boundary
Great Meadows
Open Space Non-protected
Open Space Protected in Perpetuity
Open Water
Stream
massport
Hanscom Field 2012 ESPR
Bedford, Concord, Lexington, Lincoln, Massachusetts
Representative Jet Departure Flight Tracks
Data Sources: MassGIS (Roads, Rail), March 5, 2013; MassGIS (Bike Tra ls, Tracks and Trails), March 7, 2013;
MassGIS (Community Boundaries), March 5, 2013; MassGIS (DEP Wetlands), March 8, 2013;
NPS (Park Boundary), March 8, 2013; NPS (Streets and Tra ls), March 8, 2013; MassGIS (Building Footprints), March 7, 2013
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Figure **D-7**

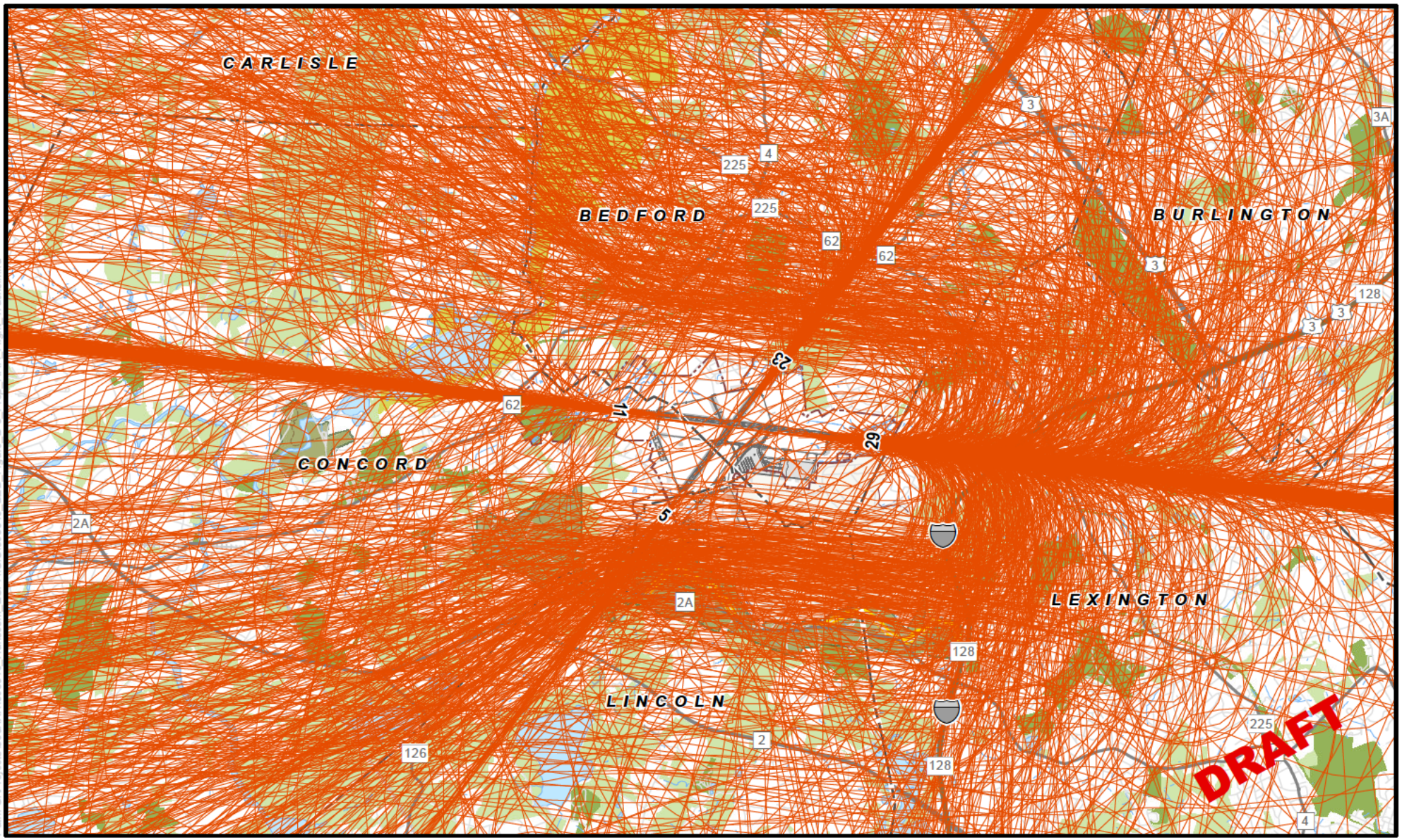

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Figure **D-8**

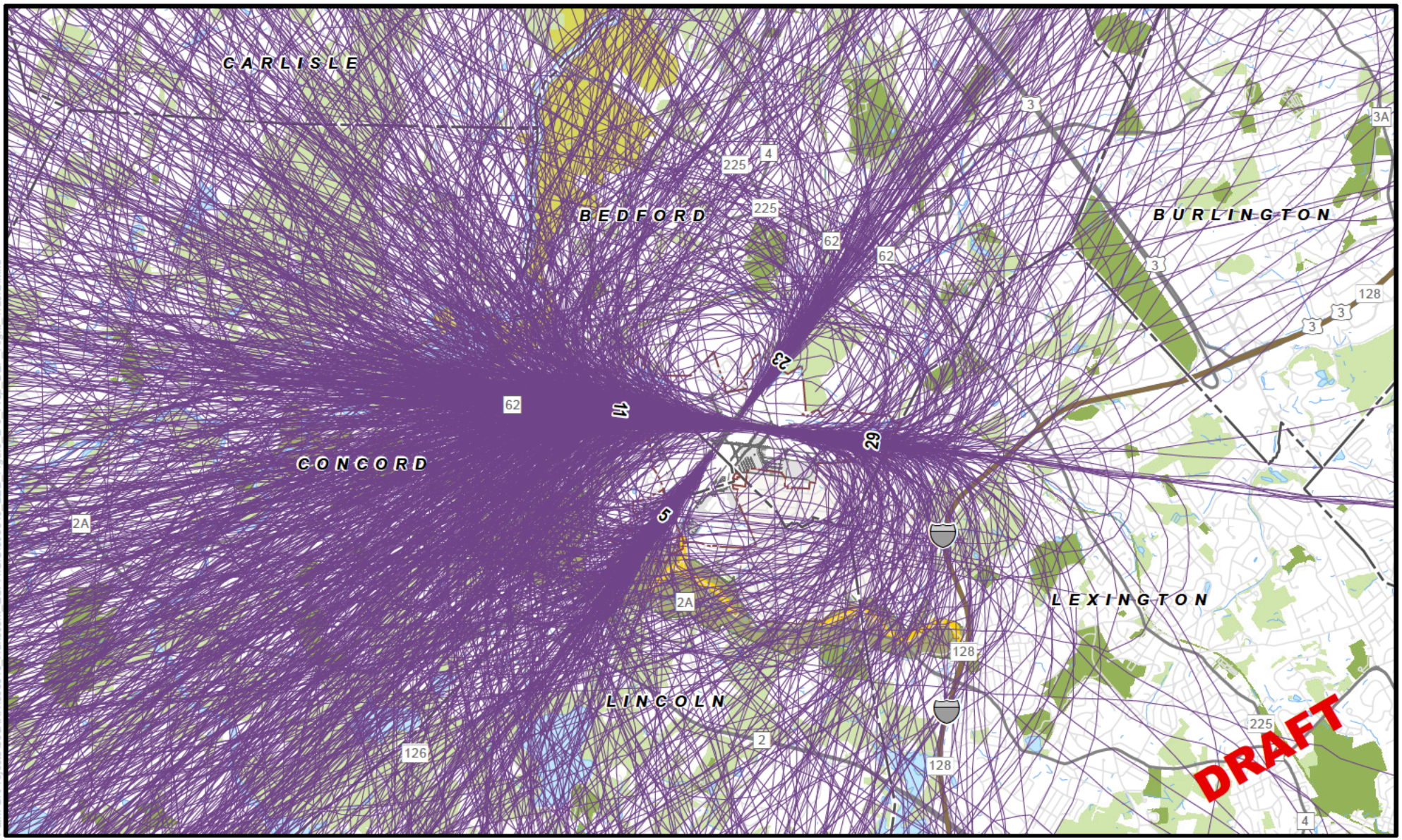

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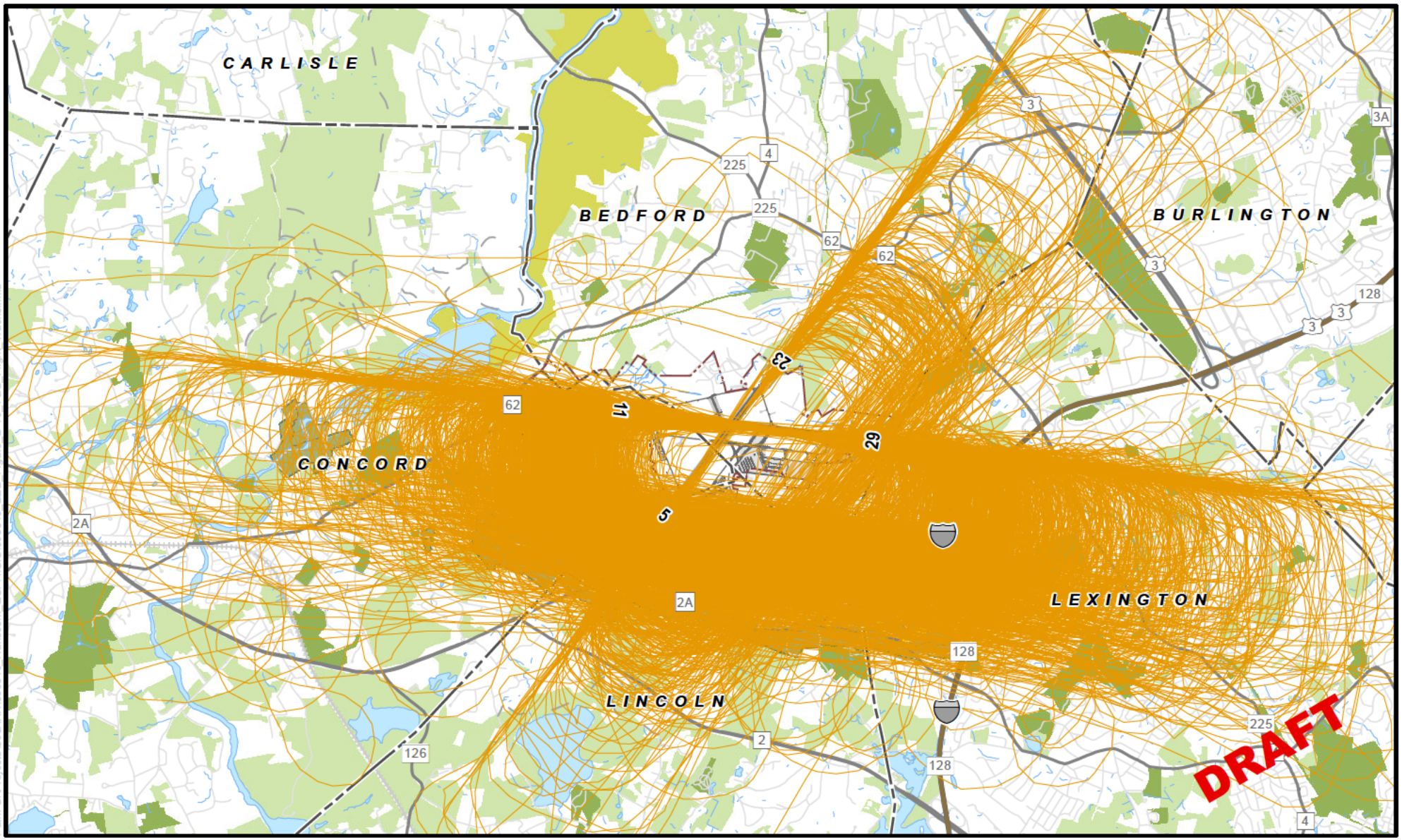
Figure **D-9**


CARLISLE
BEDFORD
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Hanscom Field Property Boundary
Hanscom AFB Property Boundary
Municipal Boundary
Touch and Go Flight Tracks
Historic Road
Interstate
Highway
Road
Trail
Active Rail Service
MNP Boundary
Great Meadows
Open Space Non-protected
Open Space Protected in Perpetuity
Open Water
Stream
massport
Hanscom Field 2012 ESPR
Bedford, Concord, Lexington, Lincoln, Massachusetts
Representative Touch and Go Flight Tracks
Data Sources: MassGIS (Roads, Rail), March 5, 2013; MassGIS (Bike Tra ls, Tracks and Trails), March 7, 2013;
MassGIS (Community Boundaries), March 5, 2013; MassGIS (DEP Wetlands), March 8, 2013;
NPS (Park Boundary), March 8, 2013; NPS (Streets and Tra ls), March 8, 2013; MassGIS (Building Footprints), March 7, 2013
Figure D-10

D.3 Detailed Operations Tables

Table D-1 through present the average daily operations for 2012 and the two future scenarios. The operations are organized by INM aircraft type.

Table D-1 Year 2012 Average Daily Operations

Aircraft Type/Group		INM[1] TYPE	Departures		Arrivals		Total
			Day	Night	Day	Night	
Civil:							
1	Cessna 550, 500	CNA500	0.65	0.03	0.62	0.05	1.36
2	Beechjet 400	MU3001	1.93	0.11	1.94	0.10	4.08
3	Lear 31, 35, 40, 45 ,55 ,60, Hawker Siddely 125-700, -800, - 1000, Sabreliner 65, Falcon 10, Beechcraft Premier 1	LEAR35	5.37	0.32	5.20	0.49	11.39
5	Lear 24, 25, Hawker Siddely 125-400, -600	LEAR25	0.05	0.01	0.05	0.01	0.10
7	Gulfstream III	GIIB	0.09	0.01	0.10	0.00	0.20
8	Gulfstream IV, 450	GIV	3.62	0.28	3.47	0.43	7.80
9	Challenger 600, Falcon 2000, IAI Galaxy, Embraer 135, Dornier 328J	CL600	2.52	0.10	2.45	0.17	5.25
10	Challenger 601, 604, 300, Falcon 200, Canadair RJ	CL601	4.42	0.22	4.13	0.51	9.27
11	Boeing 747, 767, Unknown/Misc. Jets	74710Q	0.01	0.02	0.01	0.01	0.04
14	Douglas DC-9	DC93LW	0.08	0.02	0.07	0.04	0.21
17	Helicopters	SA365N	9.96	0.19	9.92	0.23	20.30
18	Gulfstream I	HS748A	0.00	0.00	0.00	0.00	0.01
19	Dash-6, Beech 350, 1900, Embraer 120	DHC6	2.53	0.02	2.52	0.03	5.10
20	Twin Engine Piston Prop	BEC58P	4.97	0.11	4.97	0.12	10.17
21	Single Engine Piston Prop	SEPMIX[2]	172.08	0.38	171.80	0.67	344.92
22	Westwind/ Astra 1124, 1125	IA1125	0.50	0.03	0.49	0.04	1.06
25	Cessna 650	CIT3	0.16	0.01	0.16	0.01	0.34
26	Falcon 50/900	F10062	1.83	0.08	1.80	0.11	3.83
29	Cessna 441, Beech King Air 90, 100, 200	CNA441	0.93	0.06	0.94	0.05	1.98
30	Saab 340	SF340	0.00	0.00	0.00	0.00	0.01
32	Boeing 727	727EM2	0.00	0.00	0.00	0.00	0.01
33	Piaggio 180, Shorts 330	SD330	0.92	0.04	0.90	0.05	1.91
34	Boeing 737-200	737N17	0.07	0.00	0.05	0.01	0.13
35	Dornier 328, de Havilland DHC-8	DO328	0.02	0.00	0.02	0.00	0.05
36	Airbus 319, 320	A320-211	0.02	0.00	0.02	0.01	0.04
37	Gulfstream V, 550, Global Express	GV	2.00	0.12	1.89	0.23	4.23
39	Gulfstream II	GII	0.03	0.00	0.04	0.00	0.07
40	Cessna 750	CNA750	1.95	0.08	1.89	0.13	4.05
41	Boeing 737-800, 737-400	737800	0.17	0.08	0.14	0.11	0.51
42	Boeing 757	757RR	0.02	0.01	0.02	0.00	0.04
43	Eclipse 500	ECLIPSE500	1.53	0.08	1.45	0.17	3.23
44	Cessna 525	CNA525C	1.11	0.03	1.11	0.03	2.28
45	Cessna 560	CNA560U	1.05	0.02	1.05	0.03	2.16
46	Cessna 560XL	CNA560XL	2.76	0.12	2.73	0.15	5.77
47	Lear 60, Cessna 510, Embraer Phenom	CNA55B	1.04	0.05	1.04	0.05	2.19
48	Cessna 680	CNA680	1.17	0.07	1.17	0.07	2.48
Subtotal Civil Operations			225.57	2.72	224.16	4.13	456.57
Military:							
3	Falcon 200	CL601	0.07	0.00	0.07	0.00	0.15
15	Boeing 707	707QN	0.02	0.00	0.02	0.00	0.05
20	Twin Engine Piston Prop	BEC58P	0.01	0.00	0.01	0.00	0.02
21	Single Engine Piston Prop	SEPMIX	0.20	0.00	0.20	0.00	0.40
Subtotal Military Operations			0.31	0.00	0.30	0.01	0.62

Total Operations:	225.88	2.72	224.46	4.14	457.19
Source: Hanscom EXP System, HMMH					
Notes: 1 INM = Integrated Noise Model 2. SEPMIX = 75% GASEPF, 25% GASEPV					

Table D-2 2020 Forecast Average Daily Operations

Aircraft Type/Group		INM[1] TYPE	Departures		Arrivals		Total
			Day	Night	Day	Night	
Civil:							
1	Cessna 550, 500	CNA500	0.87	0.05	0.85	0.08	1.85
2	Beechjet 400	MU3001	2.72	0.15	2.64	0.24	5.75
3	Lear 31, 35, 40, 45 ,55 ,60, Hawker Siddely 125-700, -800, - 1000, Sabreliner 65, Falcon 10, Beechcraft Premier 1	LEAR35	7.47	0.42	7.24	0.65	15.78
8	Gulfstream IV, 450	GIV	5.32	0.30	5.16	0.46	11.25
9	Challenger 600, Falcon 2000, IAI Galaxy, Embraer 135, Dornier 328J	CL600	3.24	0.18	3.14	0.28	6.85
10	Challenger 601, 604, 300, Falcon 200, Canadair RJ	CL601	6.29	0.36	6.10	0.55	13.29
17	Helicopters	SA365N	10.03	0.20	10.00	0.23	20.45
19	Dash-6, Beech 350, 1900, Embraer 120	DHC6	3.10	0.07	3.08	0.09	6.34
20	Twin Engine Piston Prop	BEC58P	5.17	0.12	5.16	0.12	10.58
21	Single Engine Piston Prop	SEPMIX[2]	160.56	0.35	160.28	0.63	321.82
22	Westwind/ Astra 1124, 1125	IA1125	0.59	0.03	0.57	0.05	1.25
26	Falcon 50/900	F10062	2.40	0.14	2.32	0.21	5.06
29	Cessna 441, Beech King Air 90, 100, 200	CNA441	0.97	0.04	0.96	0.05	2.02
33	Piaggio 180, Shorts 330	SD330	0.96	0.04	0.95	0.05	2.01
37	Gulfstream V, 550, Global Express	GV	2.73	0.15	2.65	0.24	5.77
40	Cessna 750	CNA750	2.84	0.16	2.75	0.25	5.99
41	Boeing 737-800, 737-400	737800	0.47	0.03	0.46	0.04	1.00
43	Eclipse 500	ECLIPSE500	2.06	0.12	1.99	0.18	4.35
44	Cessna 525	CNA525C	1.70	0.10	1.65	0.15	3.60
45	Cessna 560	CNA560U	1.47	0.08	1.43	0.13	3.12
46	Cessna 560XL	CNA560XL	3.87	0.22	3.75	0.34	8.18
47	Lear 60, Cessna 510, Embraer Phenom	CNA55B	1.44	0.08	1.40	0.13	3.05
48	Cessna 680	CNA680	1.77	0.10	1.72	0.15	3.75
Subtotal Civil Operations			228.07	3.48	226.24	5.31	463.10
Military:							
3	Falcon 200	CL601	0.24	0.00	0.24	0.00	0.48
15	Boeing 707	707QN	0.09	0.00	0.09	0.00	0.18
20	Twin Engine Piston Prop	BEC58P	0.04	0.00	0.04	0.00	0.07
21	Single Engine Piston Prop	SEPMIX	0.65	0.00	0.65	0.01	1.31
Subtotal Military Operations			1.02	0.00	1.01	0.01	2.04
Total Operations:			229.09	3.48	227.26	5.32	465.15
Sources: SH&E, HMMH							
Notes: 1 INM = Integrated Noise Model 2. SEPMIX = 75% GASEPF, 25% GASEPV							

Table D-3 2030 Forecast Average Daily Operations

Aircraft Type/Group		INM[1] TYPE	Departures		Arrivals		Total
			Day	Night	Day	Night	
Civil:							
1	Cessna 550, 500	CNA500	1.17	0.07	1.13	0.10	2.47
2	Beechjet 400	MU3001	3.63	0.21	3.52	0.32	7.68
3	Lear 31, 35, 40, 45 ,55 ,60, Hawker Siddely 125-700, -800, - 1000, Sabreliner 65, Falcon 10, Beechcraft Premier 1	LEAR35	9.97	0.56	9.66	0.87	21.07
8	Gulfstream IV, 450	GIV	7.11	0.40	6.89	0.62	15.01
9	Challenger 600, Falcon 2000, IAI Galaxy, Embraer 135, Dornier 328J	CL600	4.33	0.24	4.20	0.38	9.15
10	Challenger 601, 604, 300, Falcon 200, Canadair RJ	CL601	8.40	0.48	8.14	0.73	17.75
17	Helicopters	SA365N	10.03	0.20	10.00	0.23	20.45
19	Dash-6, Beech 350, 1900, Embraer 120	DHC6	4.37	0.79	4.35	0.10	9.60
20	Twin Engine Piston Prop	BEC58P	5.82	0.13	5.82	0.14	11.91
21	Single Engine Piston Prop	SEPMIX[2]	176.29	0.44	175.95	0.78	353.46
22	Westwind/ Astra 1124, 1125	IA1125	0.79	0.04	0.76	0.07	1.67
26	Falcon 50/900	F10062	3.20	0.18	3.10	0.28	6.76
29	Cessna 441, Beech King Air 90, 100, 200	CNA441	1.03	0.04	1.02	0.06	2.15
33	Piaggio 180, Shorts 330	SD330	1.08	0.04	1.07	0.06	2.25
37	Gulfstream V, 550, Global Express	GV	3.65	0.21	3.54	0.32	7.71
40	Cessna 750	CNA750	3.79	0.21	3.67	0.33	8.00
41	Boeing 737-800, 737-400	737800	0.63	0.04	0.61	0.06	1.33
43	Eclipse 500	ECLIPSE500	2.75	0.16	2.66	0.24	5.80
44	Cessna 525	CNA525C	2.27	0.13	2.20	0.20	4.80
45	Cessna 560	CNA560U	1.97	0.11	1.91	0.17	4.16
46	Cessna 560XL	CNA560XL	5.17	0.29	5.01	0.45	10.92
47	Lear 60, Cessna 510, Embraer Phenom	CNA55B	1.92	0.11	1.87	0.17	4.07
48	Cessna 680	CNA680	2.37	0.13	2.29	0.21	5.00
Subtotal Civil Operations			261.74	5.21	259.36	6.87	533.18
Military:							
3	Falcon 200	CL601	0.24	0.00	0.24	0.00	0.48
15	Boeing 707	707QN	0.09	0.00	0.09	0.00	0.18
20	Twin Engine Piston Prop	BEC58P	0.04	0.00	0.04	0.00	0.07
21	Single Engine Piston Prop	SEPMIX	0.65	0.00	0.65	0.01	1.31
Subtotal Military Operations			1.02	0.00	1.01	0.01	2.04
Total Operations:			262.76	5.21	260.38	6.88	535.22
Sources: SH&E, HMMH							
Notes: 1 INM = Integrated Noise Model 2 SEPMIX = 75% GASEPF, 25% GASEPV							

D.4 Analysis of Land Use and Population within DNL Contours

In order to estimate the number of people residing within the noise contours, existing land use maps developed by parcel boundary were obtained from MassGIS and overlaid on 2010 US Census TIGER file maps that depict the smallest enumeration unit; Census block data. Polygons were then created using land use that concentrated populated areas into the residential portion of the census block where people actually live – for example, in some areas, the population is concentrated along the road, rather than over several square miles of open or undeveloped land .

Using Geographic Information Systems (GIS) tools, the noise contours were intersected with these "Residential/Census" data for each DNL noise contour interval. The resultant wholly or partially encompassed Residential/Census areas were then identified; the proportion of total area within the contour level was then computed to determine the estimated residential population and housing unit counts and ascribed to that level.

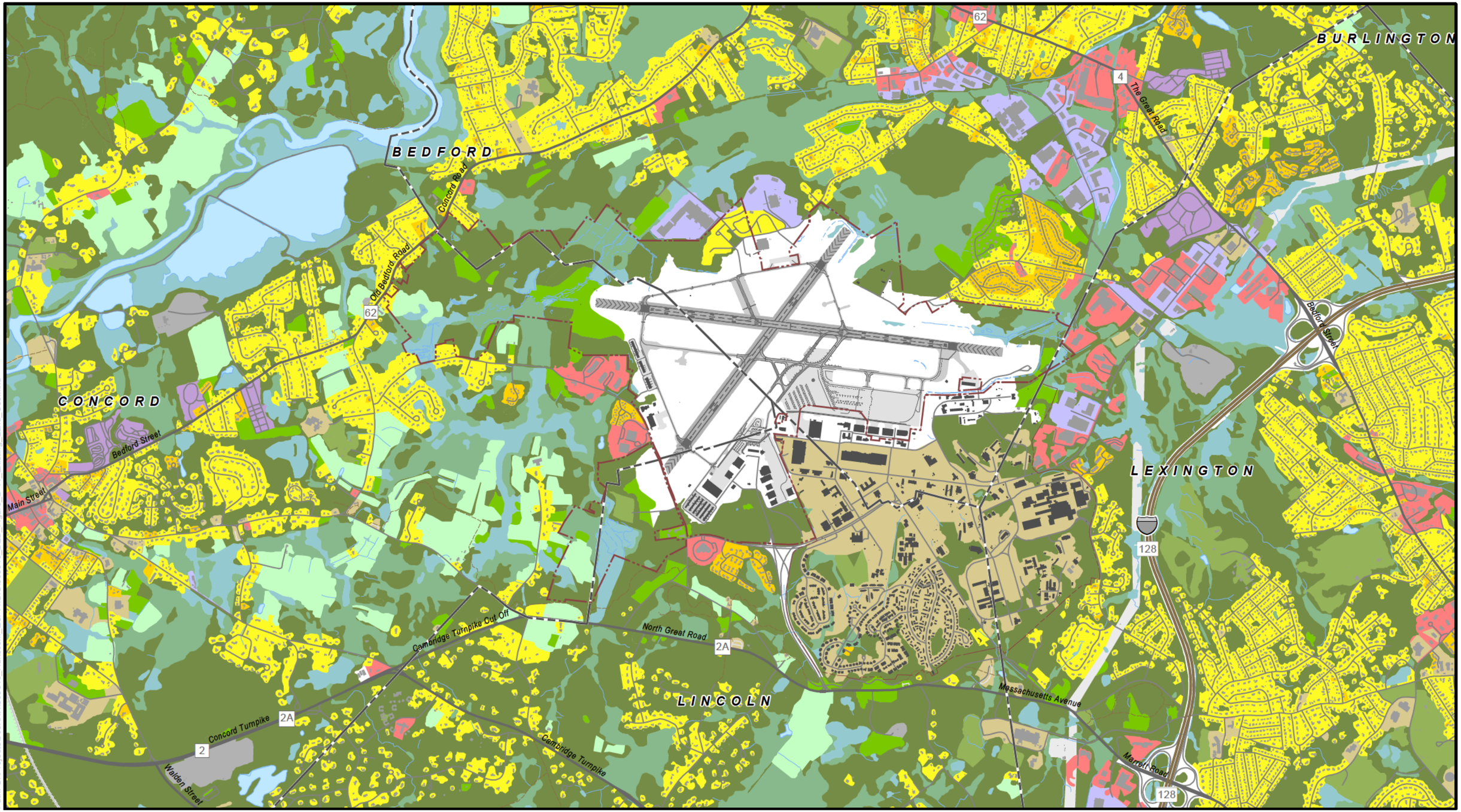
Figures D-11 and D-12 show the land use and census data and the process used for the analysis.

D.5 Time Above at Noise-Sensitive Receptors

Table D-4 through Table D-7 and Table D-8 through Table D-11 present the calculated time above 65 dB and 55 dB values, respectively, for the noise sensitive receptors in 2012 and the 2020 and 2030 scenarios.

D.6 Total Noise Exposure (EXP)

Table D-12 presents detailed total EXP results for 2012 operations and the 2020 and 2030 scenarios, using SELs computed with INM version 7.0c.



Data Sources: MassGIS (Roads, Rail), March 5, 2013; MassGIS (Bike Trails, Tracks and Trails), March 7, 2013; MassGIS (Community Boundaries), March 5, 2013; MassGIS (DEP Wetlands), March 8, 2013; MassGIS (Building Footprints), March 7, 2013; MassGIS (Land Use), Aug 29, 2013;

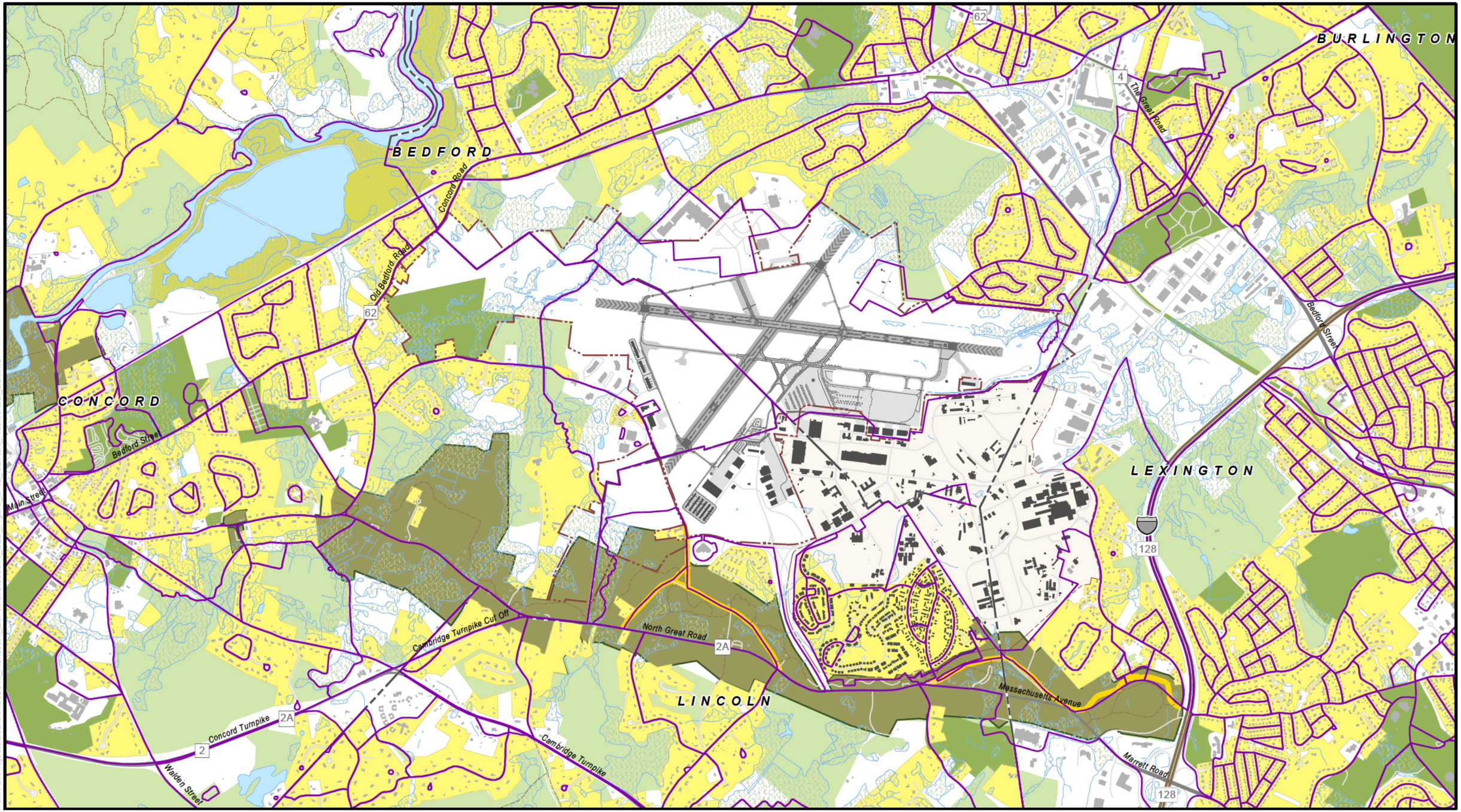
massport

Hanscom Field 2012 ESPR

Bedford, Concord, Lexington, Lincoln, Massachusetts

Existing Land Use

Figure **D-11**



North

0 2,000 4,000 Feet

2010 US Census Block Boundary
Populated Census/Residential Land Use

Hanscom Field Property Boundary
Hanscom AFB Property Boundary
Municipal Boundary

Historic Road
Interstate
Highway
Road
Trail
Active Rail Service

Open Water
Wetland/Marsh
Stream

MNP Boundary
Great Meadows
Open Space Non-protected
Open Space Protected in Perpetuity

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Hanscom Field 2012 ESPR

Bedford, Concord, Lexington, Lincoln, Massachusetts

2010 Census Blocks and Residential Land Use

Figure **D-12**

Data Sources: MassGIS (Roads, Rail), March 5, 2013; MassGIS (Bike Trails, Tracks and Trails), March 7, 2013; MassGIS (Community Boundaries), March 5, 2013; MassGIS (DEP Wetlands), March 8, 2013; MassGIS (Building Footprints), March 7, 2013; US Census Bureau (Census Block Data), May 21, 2013; MassGIS (Parcel Boundaries), Sep 11, 2013;

Path: G:\Projects\305XXX\305540_Hanscom_ESPR\GIS\305540_RED_Figure_D-12_Census_Residential_LU.mxd

Table D-4 Time Above 65 dB at Noise Sensitive Receptors in Bedford (minutes)

Label[1]	2005 Label[2]	Name[3]	Address	2012	2020	2030
HB-1	HB-1	Veterans Administration Medical Center*	200 Springs Rd.	0.5	0.6	0.8
NB-1	NB-1	Bedford Historic District	Great Rd.	1.0	1.1	1.4
NB-2	NB-2	Old Bedford Center Historic District	Great Rd.	1.4	1.6	1.9
NB-3	NB-3	Old Burying Ground	7 Springs Rd.	1.6	1.8	2.2
NB-4	NB-4	Old Town Hall	16 South Rd.	1.8	2.0	2.4
NB-5	NB-5	Bedford Depot Park Historic District	80 Loomis St./120 South Rd.	4.7	5.1	6.0
NB-6	NB-6	Nathaniel Page House	89 Page Rd.	2.3	2.7	3.3
NB-7	NB-7	Christopher Page House	50 Old Billerica Rd.	1.6	1.8	2.3
NB-8	NB-8	Bacon-Gleason-Blodgett Homestead	118 Wilson Rd.	0.7	0.8	1.0
NB-9	NB-9	Historic Wilson Mill-Old Burlington Road Historic Dist.	Old Burlington and Wilson Rds.	0.6	0.8	1.0
NB-10	OB-2	Shawsheen Cemetery **	Shawsheen Rd.	1.2	1.3	1.6
NB-11	-	David Lane House	137 North Rd.	0.5	0.6	0.7
OB-1	OB-1	Old Billerica Road Area ** (NR nomination form in process)	Old Billerica Rd.	1.7	2.0	2.5
PB-1	PB-1	Town Hall *	10 Mudge Way	1.4	1.6	1.9
PB-2	PB-2	Library **	7 Mudge Way	1.1	1.2	1.5
PB-3	PB-3	Bedford School District	11Mudge Way	1.4	1.6	1.9
PB-4	PB-4	Department of Public Works	314 Great Rd.	1.5	1.6	2.0
RB-1	RB-1	The Lutheran Church of the Savior	426 Davis Rd.	3.6	4.3	5.4
RB-2	RB-2	First Baptist Church of Bedford	155 Concord Rd.	0.9	0.9	1.0
RB-3	RB-3	St. Michael's Church	90 Concord Rd.	0.9	0.9	1.0
RB-4	RB-4	Boston Buddha Vararam Temple	125 North Rd.	0.5	0.6	0.8
RB-5	RB-5	The First Church of Christ Congregational/ United Church of Christ *	25 Great Rd.	1.2	1.4	1.7
RB-6	RB-6	The First Parish in Bedford Unitarian Universalist *	75 Great Rd.	1.7	1.9	2.3
RB-7	RB-7	St. Paul's Episcopal Church	100 Pine Hill Rd.	0.5	0.6	0.7
RB-8	RB-8	March for Jesus	54 Summer St.	14.2	14.7	17.1
RB-9	RB-9	Immanuel Baptist Church/ Zion Korean Alliance Church[4]	400 Great Rd.	1.4	1.6	1.9
SB-1	SB-1	Davis School	Davis Rd.	0.5	0.5	0.6
SB-2	SB-2	Bedford High School **	9 Mudge Way	1.1	1.2	1.5
SB-3	SB-3	John Glenn Middle School	99 McMahon Rd.	1.5	1.6	1.9

Source: HMMH

Notes:

1 The first letter of the label indicates the nature of each site: H for hospital, N for sites in the National Register of Historic Places and/or State Register of Historic Places, O for other, P for public facilities, R for religious sites, S for schools Other is the category for sites that town representatives specifically requested be added to the noise receptor list, but do not fit into the other four categories The second letter indicates the town where the site is located: B for Bedford, C for Concord, LX for Lexington, LN for Lincoln

2 The labels have been updated for the 2012ESPR The 2005ESPR labels are provided for reference purposes Blanks indicate new locations that have been added to the 2012ESPR list of noise sensitive receptors

3 Historic districts and cemeteries are evaluated at a central location within the district or cemetery Sites that are not designated as "N" sites are marked with an asterisk (*) if they are listed in the National Register of Historic Places and two asterisks (**) if they are listed in the State Inventory/MACRIS Sites are marked with a (†) if they are only listed in the State Register of Historic Places. Sites marked with a (††) contribute to the Old Bedford Center Historic District.

4 The Immanuel Baptist Church and Zion Korean Alliance Church are at the same address

5. The boundary of the Old Bedford Center Historic District has slightly expanded, he Old Bedford Center Historic District Boundary Extension, since the last study in 2005.

Table D-5 Time Above 65 dB at Noise Sensitive Receptors in Concord (minutes)

Label[1]	2005 Label[2]	Name[3]	Address	2012	2020	2030
NC-1	NC-1	Barrett Farm Historic District†	Barrett's Mill Rd.	0.7	0.9	1.2
NC-2	NC-2	Jonathan Hildreth House	8 Barrett's Mill Rd.	2.7	3.4	4.4
NC-3	NC-3	Joseph Hosmer House	572 Main St.	0.9	1.1	1.4
NC-4	NC-4	Thoreau-Alcott House	255 Main St.	2.1	2.8	3.6
NC-5	NC-5	Hubbardville Historic District†	324-374 Sudbury Rd.	2.9	3.7	4.8
NC-6	NC-6	Hubbard-French Historic District	324-374 Sudbury Rd.	2.9	3.7	4.8
NC-7	NC-7	Deacon Thomas Hubbard/ Judge Henry French House	342 Sudbury Rd.	2.8	3.6	4.6
NC-8	NC-8	Pest House	158 Fairhaven Rd.	2.7	3.4	4.4
NC-9	NC-9	Main Street Historic District†	Main St. between Monument Sq. and Wood St.	3.7	4.6	6.0
NC-10	NC-10	North Bridge-Monument Square Historic District†	Monument St., Liberty St. and Lowell St.	3.3	4.1	5.3
NC-11	NC-11	Wright Tavern	Lexington Rd. & Main St.	3.8	4.8	6.3
NC-12	NC-12	Sleepy Hollow Cemetery	24 Court Ln.	4.3	5.5	7.2
NC-13	NC-13	American Mile Historic District†	Lexington Rd.	4.1	5.3	6.9
NC-14	NC-14	Concord Monument Square-Lexington Road Historic District	Monument Sq. and Lexington Rd.	3.7	4.6	6.1
NC-15	NC-15	Ralph Waldo Emerson House	28 Cambridge Turnpike	4.7	6.0	8.0
NC-16	NC-16	Walden Pond[4]	MA Rte 126 (Main Beach)	1.0	1.2	1.4
NC-17	NC-17	Orchard House	399 Lexington Rd.	5.6	7.0	9.2
NC-18	NC-18	Deacon John Wheeler/ Capt. Jonas Minot Farmhouse	341 Virginia Rd.	36.0	39.0	46.8
NC-19	NC-19	Wheeler-Merriam House	477 Virginia Rd.	36.1	39.3	47.1
NC-20	-	Concord Armory-Concord Veteran's Building	51 Walden St.	3.8	4.8	6.3
NC-21	-	Concord School of Philosophy	391 Lexington Rd.	5.7	7.2	9.4
NC-22	-	Hosmer Homestead	138 Baker Ave.	0.3	0.3	0.4
PC-1	PC-1	Library **	129 Main St.	3.0	3.8	4.9
PC-2	PC-2	Town Hall ††	22 Monument Sq.	3.6	4.5	5.9
PC-3	PC-3	Middlesex County Court House	305 Walden St.	4.3	5.4	7.0
RC-1	RC-1	Trinity Episcopal Church **	81 Elm St.	1.3	1.6	2.0
RC-2	RC-2	Redeemer Presbyterian Church	191 Sudbury Rd.	2.9	3.7	4.8
RC-3	RC-3	New Life Community Church (meeting at the Emerson School Building **)	40 Stow St.	3.4	4.3	5.6
RC-4	RC-4	Trinitarian Congregational Church **	54 Walden St.	3.8	4.8	6.2
RC-5	RC-5	First Church of Christ Scientist††	7 Lowell Rd.	3.3	4.1	5.4
RC-6	RC-6	St. Bernard's Parish††	70 Monument Square	3.5	4.4	5.7
RC-7	RC-7	Christian Science Reading Room	20 Main St.	3.6	4.5	5.9
RC-8	RC-8	First Parish in Concord ††	20 Lexington Rd.	3.9	4.9	6.4
SC-1	SC-1	Nashoba/Brooks School	200 Strawberry Hill Rd.	2.8	3.5	4.5
SC-2	SC-2	Middlesex School**	1400 Lowell Rd.	0.3	0.4	0.5
SC-3	SC-3	Fenn School **	498-516 Monument St.	6.1	7.7	9.9
SC-4	SC-4	Concord Academy **	166 Main St.	2.4	3.2	4.1
SC-5	SC-5	Alcott School	91 Laurel Rd.	4.1	5.2	6.8
SC-6	SC-6	Concord/Carlisle High School	500 Walden Rd.	3.0	3.7	4.8
SC-7	SC-7	Ripley School	120 Meriam Rd.	9.8	12.3	16.0

Source: HMMH

Notes:

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2 The labels have been updated for the 2012ESPR The 2005ESPR labels are provided for reference purposes Blanks indicate new locations that have been added to the 2012ESPR list of noise sensitive receptors The Old Manse and the Wayside (Samuel Whitney House) are included in the Minute Man National Historical Park list of noise sensitive receptors

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4 The Walden Pond State Reservation is located in Concord and Lincoln This site is located at the main beach in Concord

Table D-6 Time Above 65 dB at Noise Sensitive Receptors in Lexington (minutes)

Label[1]	2005 Label[2]	Name[3]	Address	2012	2020	2030
NLX-1	NLX-1	Simonds Tavern	331 Bedford St.	10.2	12.2	15.3
NLX-2	NLX-2	Hancock-Clarke Historic District†	Hancock St.	0.9	1.0	1.2
NLX-3	NLX-3	Hancock-Clarke House	35 Hancock St.	0.8	0.9	1.1
NLX-4	NLX-4	Garrity House	9 Hancock St.	0.9	1.0	1.3
NLX-5	NLX-5	Lexington Green Historic District	Mass. Ave., Harrington Rd. and Bedford St.	0.9	1.1	1.4
NLX-6	NLX-6	Lexington Green	Mass. Ave., Harrington Rd. and Bedford St.	0.9	1.0	1.3
NLX-7	NLX-7	Buckman Tavern	1 Bedford St.	0.9	1.0	1.2
NLX-8	NLX-8	General Samuel Chandler House	8 Goodwin Rd.	0.8	0.9	1.2
NLX-9	NLX-9	Hancock School	33 Forest St.	0.9	1.1	1.3
NLX-10	NLX-10	U.S. Post Office Building	1661 Mass. Ave.	0.5	0.6	0.8
NLX-11	NLX-11	Warren E. Shelburne House	11 Percy Rd.	0.3	0.3	0.4
NLX-12	NLX-12	Munroe Tavern Historic District†	Mass. Ave.	0.2	0.2	0.2
NLX-13	NLX-13	Sanderson House-Munroe Tavern	1314 & 1332 Mass. Ave.	0.2	0.2	0.3
NLX-14	NLX-14	John Mason House	1303 Mass. Ave.	0.2	0.2	0.3
NLX-15	NLX-15	East Village Historical District†	Mass Ave.	0.1	0.1	0.1
NLX-16	-	M.H. Merriam and Company	7-9 Oakland Ave.	0.7	0.8	1.0
OLX-1	OLX-1	Battle Green Historic District**	Worthen Rd., Woburn St., Hastings Rd., Mass. Ave. and B&M Railroad	0.9	1.0	1.3
OLX-2	OLX-2	National Heritage Museum	33 Marrett Rd.	0.1	0.2	0.2
PLX-1	PLX-1	Library **	1874 Mass. Ave.	1.0	1.1	1.4
PLX-2	PLX-2	Town Hall **	1625 Mass. Ave.	0.3	0.4	0.5
PLX-3	PLX-3	Lexington School District Administration **	1557 Massachusetts Ave.	0.4	0.5	0.6
RLX-1	RLX-1	Lexington United Methodist Church/ St. John's Korean United Methodist Church[4]	2600 Massachusetts Ave.	2.0	2.4	3.2
RLX-2	RLX-2	Temple Isaiah	55 Lincoln St.	1.5	1.8	2.3
RLX-3	RLX-3	Grace Chapel of Lexington	59 Worthen Rd.	1.5	1.8	2.2
RLX-4	RLX-4	St. Brigid's Parish *	2001 Mass. Ave.	1.3	1.5	1.9
RLX-5	RLX-5	First Parish-Unitarian Church††	7 Harrington Rd.	1.0	1.2	1.5
RLX-6	RLX-6	Hancock United Church of Christ ††	1912 Mass. Ave.	1.0	1.1	1.4
RLX-7	RLX-7	Church of Our Redeemer	6 Meriam St.	0.8	0.9	1.2
RLX-8	RLX-8	Christian Science Reading Room	10 Muzzy St. #12	0.7	0.9	1.1
RLX-9	RLX-9	Greek Orthodox Church of St. Nichols **	17 Meriam St.	0.7	0.8	1.0
RLX-10	RLX-10	Chabad Center **	9 Burlington St.	5.9	6.9	8.7
RLX-11	RLX-11	Pilgrim Congregational Church	55 Coolidge Ave.	1.1	1.3	1.6
RLX-12	RLX-12	First Baptist Church of Lexington **	1580 Mass. Ave.	0.4	0.5	0.6
RLX-13	RLX-13	Jehovah's Witnesses	196 Woburn St.	0.1	0.1	0.2
RLX-14	RLX-14	Follen Church Society-Unitarian Universalists *	755 Massachusetts Ave.	0.1	0.1	0.1
RLX-15	RLX-15	Countryside Bible Chapel	480 Lowell St.	0.1	0.1	0.1
RLX-16	RLX-16	St. Paul Evangelical Church	451 Lowell St.	0.1	0.1	0.1
SLX-1	SLX-1	Minuteman Regional Vocational High School	758 Marrett Rd.	1.0	1.2	1.4

SLX-2	SLX-2	Maria Hastings School	2618 Mass. Ave.	1.7	2.1	2.8
SLX-3	SLX-3	Methodist Weekday School	2600 Massachusetts Ave.	2.0	2.5	3.2
SLX-4	SLX-4	Community Nursery School	2325 Massachusetts Ave.	2.1	2.5	3.3
SLX-5	SLX-5	Bridge Elementary School**	55 Middleby Rd.	1.0	1.3	1.6
SLX-6	SLX-6	Lexington High School	251 Waltham St.	0.8	0.9	1.2
SLX-7	SLX-7	Jonas Clarke Middle School	17 Stedman Rd.	0.2	0.3	0.3
SLX-8	SLX-8	Estabrook School**	117 Grove St.	1.4	1.7	2.2
SLX-9	SLX-9	Diamond Middle School	99 Hancock St.	5.4	6.4	8.1
SLX-10	SLX-10	Fiske Elementary School	146 Maple St.	0.6	0.6	0.8
SLX-11	SLX-11	Armenian Sisters Academy	20 Pelham Rd.	0.2	0.2	0.3
SLX-12	SLX-12	Harrington Elementary School	148 Maple St.	0.0	0.0	0.1

Source: HMMH

Notes:

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4 The Lexington United Methodist Church and St John's Korean United Methodist Church are at the same address

Table D-7 Time Above 65 dB at Noise Sensitive Receptors in Lincoln (minutes)

Label[1]	2005 Label[2]	Name[3]	Address	2012	2020	2030
NLN-1	NLN-1	Walden Pond[4]	Rte. 126, Walden St., Concord Rd.	0.7	0.8	1.0
NLN-2	NLN-2	Henry Higginson House	44 Baker Farm Rd.	0.9	1.0	1.2
NLN-3	NLN-3	Daniel Brooks House	Brooks Rd.	4.0	4.2	4.9
NLN-4	NLN-4	Lincoln Center Historic District	Bedford Rd. Lincoln Rd., Old Lexington Rd. Sandy Pond Rd. Trapelo Rd. Weston Rd.	0.5	0.5	0.5
NLN-5	NLN-5	Hoar Tavern	268 Cambridge Tpke.	0.7	0.8	0.9
SLN-1	SLN-1	Carroll School	25 Baker Bridge Rd.	0.5	0.6	0.8
SLN-2	SLN-2	Hanscom Middle School	Hanscom AFB	4.0	3.7	4.0
SLN-3	SLN-3	Hanscom Primary School	Hanscom AFB	3.9	3.7	4.0

Source: HMMH

Notes:

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4 The Walden Pond State Reservation is located in Concord and Lincoln This site is in Heywood's Meadow

Table D-8 Time Above 55 dB at Noise Sensitive Receptors in Bedford (minutes)

Label[1]	2005 Label[2]	Name[3]	Address	2012	2020	2030
HB-1	HB-1	Veterans Administration Medical Center*	200 Springs Rd.	7.3	8.2	10.1
NB-1	NB-1	Bedford Historic District	Great Rd.	17.0	17.0	19.4
NB-2	NB-2	Old Bedford Center Historic District	Great Rd.	20.8	20.7	23.6
NB-3	NB-3	Old Burying Ground	7 Springs Rd.	18.9	19.1	21.9
NB-4	NB-4	Old Town Hall	16 South Rd.	22.2	22.1	25.3
NB-5	NB-5	Bedford Depot Park Historic District	80 Loomis St./120 South Rd.	46.4	45.8	51.8
NB-6	NB-6	Nathaniel Page House	89 Page Rd.	15.3	16.3	19.3
NB-7	NB-7	Christopher Page House	50 Old Billerica Rd.	12.5	13.7	16.3
NB-8	NB-8	Bacon-Gleason-Blodgett Homestead	118 Wilson Rd.	8.4	9.4	11.6
NB-9	NB-9	Historic Wilson Mill-Old Burlington Road Historic Dist.	Old Burlington and Wilson Rds.	8.3	9.3	11.5
NB-10	OB-2	Shawsheen Cemetery **	Shawsheen Rd.	27.0	27.5	32.0
NB-11	-	David Lane House	137 North Rd.	7.0	7.6	9.4
OB-1	OB-1	Old Billerica Road Area ** (NR nomination form in process)	Old Billerica Rd	11.9	13.0	15.9
PB-1	PB-1	Town Hall *	10 Mudge Way	24.8	24.3	27.3
PB-2	PB-2	Library **	7 Mudge Way	24.0	23.3	26.2
PB-3	PB-3	Bedford School District	11Mudge Way	26.6	25.9	29.1
PB-4	PB-4	Department of Public Works	314 Great Rd.	27.6	28.0	32.5
RB-1	RB-1	The Lutheran Church of the Savior	426 Davis Rd.	43.1	47.1	57.1
RB-2	RB-2	First Baptist Church of Bedford	155 Concord Rd.	35.1	35.0	40.1
RB-3	RB-3	St. Michael's Church	90 Concord Rd.	25.6	24.8	27.7
RB-4	RB-4	Boston Buddha Vararam Temple	125 North Rd.	7.1	7.9	9.5
RB-5	RB-5	The First Church of Christ Congregational/ United Church of Christ *	25 Great Rd.	21.5	21.2	24.1
RB-6	RB-6	The First Parish in Bedford Unitarian Universalist *	75 Great Rd.	23.4	23.2	26.3
RB-7	RB-7	St. Paul's Episcopal Church	100 Pine Hill Rd.	6.8	7.5	9.2
RB-8	RB-8	March for Jesus	54 Summer St.	84.2	87.9	103.0
RB-9	RB-9	Immanuel Baptist Church/ Zion Korean Alliance Church[4]	400 Great Rd.	31.0	31.6	36.7
SB-1	SB-1	Davis School	Davis Rd.	14.6	14.5	16.5
SB-2	SB-2	Bedford High School **	9 Mudge Way	26.3	25.5	28.3
SB-3	SB-3	John Glenn Middle School	99 McMahon Rd.	38.5	37.0	41.1

Source: HMMH

Notes:

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4 The Immanuel Baptist Church and Zion Korean Alliance Church are at the same address

5. The boundary of the Old Bedford Center Historic District has slightly expanded, the Old Bedford Center Historic District Boundary Extension, since the last study in 2005.

Table D-9 Time Above 55 dB at Noise Sensitive Receptors in Concord (minutes)

Label[1]	2005 Label[2]	Name[3]	Address	2012	2020	2030
NC-1	NC-1	Barrett Farm Historic District†	Barrett's Mill Rd.	11.9	14.1	17.5
NC-2	NC-2	Jonathan Hildreth House	8 Barrett's Mill Rd.	20.9	24.9	31.4
NC-3	NC-3	Joseph Hosmer House	572 Main St.	14.2	16.6	20.9
NC-4	NC-4	Thoreau-Alcott House	255 Main St.	19.6	23.1	29.3
NC-5	NC-5	Hubbardville Historic District†	324-374 Sudbury Rd.	19.0	22.4	28.3
NC-6	NC-6	Hubbard-French Historic District	324-374 Sudbury Rd.	19.0	22.4	28.3
NC-7	NC-7	Deacon Thomas Hubbard/ Judge Henry French House	342 Sudbury Rd.	18.9	22.3	28.3
NC-8	NC-8	Pest House	158 Fairhaven Rd.	18.7	22.0	27.8
NC-9	NC-9	Main Street Historic District†	Main St. between Monument Sq. and Wood St.	24.8	29.2	36.8
NC-10	NC-10	North Bridge-Monument Square Historic District†	Monument St., Liberty St. and Lowell St.	26.7	31.6	39.9
NC-11	NC-11	Wright Tavern	Lexington Rd. & Main St.	24.9	29.4	37.0
NC-12	NC-12	Sleepy Hollow Cemetery	24 Court Ln.	28.3	33.3	42.0
NC-13	NC-13	American Mile Historic District†	Lexington Rd.	25.7	30.3	38.1
NC-14	NC-14	Concord Monument Square-Lexington Road Historic District	Monument Sq. and Lexington Rd.	24.9	29.4	37.0
NC-15	NC-15	Ralph Waldo Emerson House	28 Cambridge Turnpike	26.7	31.4	39.6
NC-16	NC-16	Walden Pond[4]	MA Rte 126 (Main Beach)	13.5	15.1	18.6
NC-17	NC-17	Orchard House	399 Lexington Rd.	32.4	37.5	46.9
NC-18	NC-18	Deacon John Wheeler/ Capt. Jonas Minot Farmhouse	341 Virginia Rd.	162.1	166.2	192.5
NC-19	NC-19	Wheeler-Merriam House	477 Virginia Rd.	170.0	174.0	201.5
NC-20	-	Concord Armory-Concord Veteran's Building	51 Walden St.	24.4	28.7	36.3
NC-21	-	Concord School of Philosophy	391 Lexington Rd.	32.7	37.9	47.3
NC-22	-	Hosmer Homestead	138 Baker Ave.	7.6	8.7	10.7
PC-1	PC-1	Library **	129 Main St.	21.9	25.9	32.7
PC-2	PC-2	Town Hall ††	22 Monument Sq.	25.2	29.7	37.4
PC-3	PC-3	Middlesex County Court House	305 Walden St.	24.1	28.2	35.6
RC-1	RC-1	Trinity Episcopal Church **	81 Elm St.	16.5	19.4	24.5
RC-2	RC-2	Redeemer Presbyterian Church	191 Sudbury Rd.	20.1	23.8	30.1
RC-3	RC-3	New Life Community Church (meeting at the Emerson School Building **)	40 Stow St.	22.2	26.3	33.1
RC-4	RC-4	Trinitarian Congregational Church **	54 Walden St.	23.9	28.1	35.6
RC-5	RC-5	First Church of Christ Scientist††	7 Lowell Rd.	24.3	28.6	36.2
RC-6	RC-6	St. Bernard's Parish††	70 Monument Square	24.6	29.0	36.6
RC-7	RC-7	Christian Science Reading Room	20 Main St.	24.4	28.7	36.3
RC-8	RC-8	First Parish in Concord ††	20 Lexington Rd.	24.9	29.4	37.0
SC-1	SC-1	Nashoba/Brooks School	200 Strawberry Hill Rd.	16.3	19.5	24.5
SC-2	SC-2	Middlesex School**	1400 Lowell Rd.	6.6	7.5	9.3
SC-3	SC-3	Fenn School **	498-516 Monument St.	32.5	38.3	48.1
SC-4	SC-4	Concord Academy **	166 Main St.	20.9	24.7	31.1
SC-5	SC-5	Alcott School	91 Laurel Rd.	22.9	27.0	34.2
SC-6	SC-6	Concord/Carlisle High School	500 Walden Rd.	20.2	23.8	30.0
SC-7	SC-7	Ripley School	120 Meriam Rd.	55.6	62.1	75.7

Source: HMMH

Notes:

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2 The labels have been updated for the 2012ESPR The 2005ESPR labels are provided for reference purposes Blanks indicate new locations that have been added to the 2012ESPR list of noise sensitive receptors The Old Manse and the Wayside (Samuel Whitney House) are included in the Minute Man National Historical Park list of noise sensitive receptors

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4 The Walden Pond State Reservation is located in Concord and Lincoln This site is located at the main beach in Concord

Table D-10 Time Above 55 dB at Noise Sensitive Receptors in Lexington (minutes)

Label[1]	2005 Label[2]	Name[3]	Address	2012	2020	2030
NLX-1	NLX-1	Simonds Tavern	331 Bedford St.	43.9	48.6	58.8
NLX-2	NLX-2	Hancock-Clarke Historic District†	Hancock St.	9.4	9.7	11.6
NLX-3	NLX-3	Hancock-Clarke House	35 Hancock St.	9.1	9.4	11.2
NLX-4	NLX-4	Garrity House	9 Hancock St.	9.3	9.6	11.4
NLX-5	NLX-5	Lexington Green Historic District	Mass. Ave., Harrington Rd. and Bedford St.	9.6	9.9	11.8
NLX-6	NLX-6	Lexington Green	Mass. Ave., Harrington Rd. and Bedford St.	9.3	9.7	11.5
NLX-7	NLX-7	Buckman Tavern	1 Bedford St.	8.8	9.2	10.9
NLX-8	NLX-8	General Samuel Chandler House	8 Goodwin Rd.	8.9	9.3	11.0
NLX-9	NLX-9	Hancock School	33 Forest St.	8.9	9.3	11.2
NLX-10	NLX-10	U.S. Post Office Building	1661 Mass. Ave.	6.2	6.5	7.9
NLX-11	NLX-11	Warren E. Shelburne House	11 Percy Rd.	3.3	3.5	4.3
NLX-12	NLX-12	Munroe Tavern Historic District†	Mass. Ave.	2.0	2.2	2.8
NLX-13	NLX-13	Sanderson House-Munroe Tavern	1314 & 1332 Mass. Ave.	2.7	2.8	3.5
NLX-14	NLX-14	John Mason House	1303 Mass. Ave.	2.9	3.1	3.8
NLX-15	NLX-15	East Village Historical District†	Mass Ave.	1.3	1.5	1.8
NLX-16	-	M.H. Merriam and Company	7-9 Oakland Ave.	7.4	7.6	9.2
OLX-1	OLX-1	Battle Green Historic District**	Worthen Rd., Woburn St., Hastings Rd., Mass. Ave. and B&M Railroad	9.3	9.7	11.5
OLX-2	OLX-2	National Heritage Museum	33 Marrett Rd.	1.7	1.8	2.3
PLX-1	PLX-1	Library **	1874 Mass. Ave.	10.0	10.4	12.3
PLX-2	PLX-2	Town Hall **	1625 Mass. Ave.	4.3	4.5	5.5
PLX-3	PLX-3	Lexington School District Administration **	1557 Massachusetts Ave.	5.2	5.4	6.5
RLX-1	RLX-1	Lexington United Methodist Church/ St. John's Korean United Methodist Church[4]	2600 Massachusetts Ave.	17.3	18.4	21.7
RLX-2	RLX-2	Temple Isaiah	55 Lincoln St.	11.6	12.4	15.1
RLX-3	RLX-3	Grace Chapel of Lexington	59 Worthen Rd.	13.7	14.1	16.6
RLX-4	RLX-4	St. Brigid's Parish *	2001 Mass. Ave.	12.0	12.4	14.7
RLX-5	RLX-5	First Parish-Unitarian Church††	7 Harrington Rd.	10.2	10.6	12.6
RLX-6	RLX-6	Hancock United Church of Christ ††	1912 Mass. Ave.	9.7	10.1	12.0
RLX-7	RLX-7	Church of Our Redeemer	6 Meriam St.	8.6	8.9	10.6
RLX-9	RLX-9	Greek Orthodox Church of St. Nichols **	17 Meriam St.	8.0	8.3	9.8
RLX-10	RLX-10	Chabad Center **	9 Burlington St.	30.8	33.8	40.8
RLX-11	RLX-11	Pilgrim Congregational Church	55 Coolidge Ave.	17.9	19.4	23.1
RLX-12	RLX-12	First Baptist Church of Lexington **	1580 Mass. Ave.	5.2	5.5	6.6
RLX-13	RLX-13	Jehovah's Witnesses	196 Woburn St.	2.2	2.3	2.8
RLX-14	RLX-14	Follen Church Society- Unitarian Universalists *	755 Massachusetts Ave.	0.9	1.0	1.2
RLX-15	RLX-15	Countryside Bible Chapel	480 Lowell St.	2.9	3.0	3.5
RLX-16	RLX-16	St. Paul Evangelical Church	451 Lowell St.	1.9	1.9	2.3
SLX-1	SLX-1	Minuteman Regional Vocational High School	758 Marrett Rd.	17.1	17.6	20.5
SLX-2	SLX-2	Maria Hastings School	2618 Mass. Ave.	14.7	15.8	19.0
SLX-3	SLX-3	Methodist Weekday School	2600 Massachusetts Ave.	17.7	18.7	22.1
SLX-4	SLX-4	Community Nursery School	2325 Massachusetts Ave.	16.2	17.0	20.2
SLX-5	SLX-5	Bridge Elementary School**	55 Middleby Rd.	6.7	7.9	10.1
SLX-6	SLX-6	Lexington High School	251 Waltham St.	6.9	7.6	9.5

SLX-7	SLX-7	Jonas Clarke Middle School	17 Stedman Rd.	2.8	3.2	4.1
SLX-8	SLX-8	Estabrook School**	117 Grove St.	10.3	11.8	14.8
SLX-9	SLX-9	Diamond Middle School	99 Hancock St.	26.8	29.7	36.0
SLX-10	SLX-10	Fiske Elementary School	146 Maple St.	10.5	11.2	13.5
SLX-11	SLX-11	Armenian Sisters Academy	20 Pelham Rd.	2.2	2.4	3.2
SLX-12	SLX-12	Harrington Elementary School	148 Maple St.	0.9	1.0	1.2

Source: HMMH

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4 The Lexington United Methodist Church and St John's Korean United Methodist Church are at the same address

Table D-11 Time Above 55 dB at Noise Sensitive Receptors in Lincoln (minutes)

Label[1]	2005 Label[2]	Name[3]	Address	2012	2020	2030
NLN-1	NLN-1	Walden Pond[4]	Rte. 126, Walden St., Concord Rd.	11.0	12.4	15.3
NLN-2	NLN-2	Henry Higginson House	44 Baker Farm Rd.	10.0	11.0	13.4
NLN-3	NLN-3	Daniel Brooks House	Brooks Rd.	28.7	28.9	32.8
NLN-4	NLN-4	Lincoln Center Historic District	Bedford Rd. Lincoln Rd., Old Lexington Rd. Sandy Pond Rd. Trapelo Rd. Weston Rd.	6.6	6.9	8.2
NLN-5	NLN-5	Hoar Tavern	268 Cambridge Tpke.	6.3	7.0	8.7
SLN-1	SLN-1	Carroll School	25 Baker Bridge Rd.	6.7	7.2	8.7
SLN-2	SLN-2	Hanscom Middle School	Hanscom AFB	93.6	91.1	101.7
SLN-3	SLN-3	Hanscom Primary School	Hanscom AFB	92.6	90.2	100.8

Source: HMMH

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4 The Walden Pond State Reservation is located in Concord and Lincoln This site is in Heywood's Meadow

Table D-12 Total EXP by Aircraft Group

Aircraft Type/Group		INM[1] TYPE	Total Noise Exposure		
			2012	2020	2030
Civil:					
1	Cessna 550, 500	CNA500	88.87	89.16	90.42
2	Beechjet 400	MU3001	97.58	99.19	100.45
3	Lear 31, 35, 40, 45 ,55 ,60, Hawker Siddely 125-700, -800, - 1000, Sabreliner 65, Falcon 10, Beechcraft Premier 1	LEAR35	101.98	103.32	104.58
5	Lear 24, 25, Hawker Siddely 125-400, -600	LEAR25	96.13	0.00	0.00
7	Gulfstream III	GIIB	90.39	0.00	0.00
8	Gulfstream IV, 450	GIV	96.49	97.53	98.79
9	Challenger 600, Falcon 2000, IAI Galaxy, Embraer 135, Dornier 328J	CL600	94.96	96.54	97.80
10	Challenger 601, 604, 300, Falcon 200, Canadair RJ	CL601	97.71	98.99	100.24
11	Boeing 747, 767, Unknown/Miscellaneous Jets	74710Q	92.88	0.00	0.00
14	Douglas DC-9	DC93LW	91.52	0.00	0.00
17	Helicopters	SA365N	99.05	99.09	99.09
18	Gulfstream I	HS748A	70.76	0.00	0.00
19	Dash-6, Beech 350, 1900, Embraer 120	DHC6	96.67	98.14	100.00
20	Twin Engine Piston Prop	BEC58P	94.40	94.57	95.08
21	Single Engine Piston Prop	SEPMIX	104.98	104.68	105.10
22	Westwind/ Astra 1124, 1125	IA1125	90.80	91.46	92.71
25	Cessna 650	CIT3	83.54	0.00	0.00
26	Falcon 50/900	F10062	95.29	96.99	98.24
29	Cessna 441, Beech King Air 90, 100, 200	CNA441	84.65	84.67	84.95
30	Saab 340	SF340	69.51	0.00	0.00
32	Boeing 727	727EM2	88.42	0.00	0.00
33	Piaggio 180, Shorts 330	SD330	89.03	89.18	89.68
34	Boeing 737-200	737N17	87.12	0.00	0.00
35	Dornier 328, de Havilland DHC-8	DO328	78.56	0.00	0.00
36	Airbus 319, 320	A320-211	81.10	0.00	0.00
37	Gulfstream V, 550, Global Express	GV	95.30	96.31	97.57
39	Gulfstream II	GII	88.04	0.00	0.00
40	Cessna 750	CNA750	95.14	97.23	98.49
41	Boeing 737-800, 737-400	737800	95.72	94.14	95.39
42	Boeing 757	757RR	80.50	0.00	0.00
43	Eclipse 500	ECLIPSE500	83.79	84.75	86.00
44	Cessna 525	CNA525C	87.79	90.94	92.20
45	Cessna 560	CNA560U	91.35	93.99	95.25
46	Cessna 560XL	CNA560XL	95.67	97.87	99.13
47	Lear 60, Cessna 510, Embraer Phenom	CNA55B	91.15	93.24	94.50
48	Cessna 680	CNA680	90.32	92.35	93.60
Military:					
3	Falcon 200	CL601	78.08	82.68	82.68
15	Boeing 707	707QN	92.64	95.17	95.17
20	Twin Engine Piston Prop	BEC58P	66.89	72.27	72.27
21	Single Engine Piston Prop	SEPMIX	75.78	80.87	80.87
All civil aircraft except single piston			109.4	110.0	111.2
All civil aircraft			110.7	111.1	112.1

All military aircraft	92.9	95.6	95.6
All civil and military aircraft except single piston	109.5	110.1	111.3
All civil and military aircraft	110.8	111.2	112.2
Source: HMMH			
Notes: 1. INM = Integrated Noise Model 2. SEPMIX = 75% GASEPF, 25% GASEPV			

Appendix E Air Quality

305540 2012 Hanscom ESPR
INM Operation for Air Quality Analysis
2012 Operations
Average Annual Day
bln 9/30/13

Group	Sector	EDMS	Engine Type	Departures		Arrivals		Annual	Annual
				Day	Night	Day	Night	LTOs	TGOs
1	CIV	Cessna 500 citation 1	JT15D-1	0 65	0 03	0 62	0 05	**248**	**0**
2	CIV	Beechjet 400	JT15D-5	1 93	0 11	1 94	0 10	**746**	**0**
3	CIV	Bombadier Learjet 35	TFE731-2-2B	5 37	0 32	5 20	0 49	**2,084**	**0**
3M	MIL	Falcon 200	CF700-2D	0 07	0 00	0 07	0 00	**27**	**0**
5	CIV	Bombadier Learject 25	CJ610-6	0 05	0 01	0 05	0 01	**19**	**0**
7	CIV	Gulfstream -IIB	SPEY MK511	0 09	0 01	0 10	0 00	**36**	**0**
8	CIV	Gulfstreeam IV	TAY-MK611-8	3 62	0 28	3 47	0 43	**1,427**	**0**
9	CIV	Bombadier Challenger 600	ALF 502L-2	2 52	0 10	2 45	0 17	**960**	**0**
10	CIV	Bombadier Challenger 601	CF34-3A	4 42	0 22	4 13	0 51	**1,697**	**0**
11	CIV	Boeing 747-100	CF6-45A	0 01	0 02	0 01	0 01	**8**	**0**
11M	MIL	Desault Falcon 50	TFE731-3	0 00	0 00	0 00	0 00	**0**	**0**
14	CIV	Douglas DC-9	JT8D-7	0 08	0 02	0 07	0 04	**38**	**0**
15M	MIL	Boeing 707 320B	TF33-P-100	0 02	0 00	0 02	0 00	**10**	**0**
17	CIV	Aerospatiale SA-365N Dauphin	250B17B	9 96	0 19	9 92	0 23	**3,715**	**0**
18	CIV	Gulfstream I	Rda 7	0 00	0 00	0 00	0 00	**1**	**0**
19	CIV	De havalland DHC-6-100 Twin Otter	PT6A-20	2 53	0 02	2 52	0 03	**934**	**0**
20	CIV	Cessna 441	TPE331-8	4 97	0 11	4 97	0 12	**1,862**	**0**
20M	MIL	Cessna 441	TPE331-8	0 01	0 00	0 01	0 00	**4**	**0**
22	CIV	Israel IAI-1125 Astra	TFE731-2/2A	0 50	0 03	0 49	0 04	**194**	**0**
25	CIV	Cessna 650 Citation V	TFE731-3	0 16	0 01	0 16	0 01	**62**	**0**
21	CIV	Cessna 150 Series	O-200	172 08	0 38	171 80	0 67	**28,023**	**35,098**
21M	MIL	Cessna 150 Series	O-200	0 20	0 00	0 20	0 00	**73**	**0**
26	CIV	Falcon 50/900	TFE731-3	1 83	0 08	1 80	0 11	**700**	**0**
29	CIV	Beech King Air 90	PT6A-60	0 93	0 06	0 94	0 05	**362**	**0**
30	CIV	Saab 340	CT7-5A2	0 00	0 00	0 00	0 00	**1**	**0**
32	CIV	727-100	JT8D-15	0 00	0 00	0 00	0 00	**1**	**0**
33	CIV	SD 330 Sherpa	PT6A-45	0 92	0 04	0 90	0 05	**350**	**0**
34	CIV	Boeing 737-100 series Freighter	JT8D-17	0 07	0 00	0 05	0 01	**24**	**0**
35	CIV	Dornier 328-100	PW119B	0 02	0 00	0 02	0 00	**9**	**0**
36	CIV	Airbus A320 200 Series	CFM56-5B4/P	0 02	0 00	0 02	0 01	**8**	**0**
37	CIV	Bombadier Global Express	BR700-710A2-20	2 00	0 12	1 89	0 23	**775**	**0**
39	CIV	Gulfstream II	SPEY MK511-8	0 03	0 00	0 04	0 00	**13**	**0**
40	CIV	Cessna 750 Citation X	AE3007C TYPE 2	1 95	0 08	1 89	0 13	**742**	**0**
41	CIV	Boeing 737-800	CFM56-7B27	0 17	0 08	0 14	0 11	**94**	**0**
42	CIV	Boeing 757-200 Series	RB211-535E4	0 02	0 01	0 02	0 00	**8**	**0**
43	CIV	Eclipse 500	PW610F	1 74	0 09	1 66	0 17	**672**	**0**
44	CIV	Cessna 525C Citation Jet	JT15D-1	1 11	0 03	1 11	0 03	**418**	**0**
45	CIV	Cessna 560 Citation V	JT15D-5	1 05	0 02	1 05	0 03	**395**	**0**
46	CIV	Cessna 560 Citation Excel\	JT15D-5	2 76	0 12	2 73	0 15	**1,055**	**0**
47	CIV	Bombadier Learjet 60	TFE731-2/2A	0 83	0 04	0 82	0 05	**320**	**0**
48	CIV	Cessna 680 Citation Soverign	PW306B	1 17	0 07	1 17	0 07	**453**	**0**
				225.88	**2.72**	**224.46**	**4.14**	**48,567.8**	**35,098.0**
				Arrivals	**228.60**	Departures	**228.60**		
						Total	**457.19**		

Note: Groups 21 and 21M are modeled with a mix of single engine piston aircraft: 75% GASEPF and 25% GASEPV

305540 2012 Hanscom ESPR
INM Operation for Air Quality Analysis
2020 Operations
Average Annual Day

Group	Sector	EDMS	Engine Type	Departures		Arrivals		Annual	Annual
				Day	Night	Day	Night	LTOs	TGOs
1	CIV	Cessna 500 citation 1	JT15D-1	0 87	0 05	0 85	0 08	**338**	**0**
2	CIV	Beechjet 400	JT15D-5	2 72	0 15	2 64	0 24	**1,053**	**0**
3	CIV	Bombadier Learjet 35	TFE731-2-2B	7 47	0 42	7 24	0 65	**2,888**	**0**
3M	MIL	Falcon 200	CF700-2D	0 24	0 00	0 24	0 00	**89**	**0**
8	CIV	Gulfstreeam IV	TAY MK611-8	5 32	0 30	5 16	0 46	**2,058**	**0**
9	CIV	Bombadier Challenger 600	ALF 502L-2	3 24	0 18	3 14	0 28	**1,254**	**0**
10	CIV	Bombadier Challenger 601	CF34-3A	6 29	0 36	6 10	0 55	**2,433**	**0**
15M	MIL	Boeing 707 320B	TF33-P-100	0 09	0 00	0 09	0 00	**33**	**0**
17	CIV	Aerospatiale SA-365N Dauphin	250B17B	10 03	0 20	10 00	0 23	**3,743**	**0**
19	CIV	De havalland DHC-6-100 Twin Otter	PT6A-20	3 10	0 07	3 08	0 09	**1,160**	**0**
20	CIV	Cessna 441	TPE331-8	5 17	0 12	5 16	0 12	**1,936**	**0**
20M	MIL	Cessna 441	TPE331-8	0 04	0 00	0 04	0 00	**13**	**0**
22	CIV	Israel IAI-1125 Astra	TFE731-2/2A	0 59	0 03	0 57	0 05	**228**	**0**
21	CIV	Cessna 150 Series	O-200	160 56	0 35	160 28	0 63	**23,795**	**35,098**
21M	MIL	Cessna 150 Series	O-200	0 65	0 00	0 65	0 01	**239**	**0**
26	CIV	Falcon 50/900	TFE731-3	2 40	0 14	2 32	0 21	**927**	**0**
29	CIV	Beech King Air 90	PT6A-60	0 97	0 04	0 96	0 05	**369**	**0**
33	CIV	SD 330 Sherpa	PT6A-45	0 96	0 04	0 95	0 05	**367**	**0**
37	CIV	Bombadier Global Express	BR700-710A2-20	2 73	0 15	2 65	0 24	**1,057**	**0**
40	CIV	Cessna 750 Citation X	AE3007C Type 2	2 84	0 16	2 75	0 25	**1,097**	**0**
41	CIV	Boeing 737-800	CFM56-7B27	0 47	0 03	0 46	0 04	**183**	**0**
43	CIV	Eclipse 500	PW610F	2 32	0 13	2 24	0 20	**896**	**0**
44	CIV	Cessna 525C Citation Jet	JT15D-1	1 70	0 10	1 65	0 15	**658**	**0**
45	CIV	Cessna 560 Citation V	JT15D-5	1 47	0 08	1 43	0 13	**570**	**0**
46	CIV	Cessna 560 Citation Excel\	JT15D-5	3 87	0 22	3 75	0 34	**1,497**	**0**
47	CIV	Bombadier Learjet 60	TFE 731-2/2A	1 18	0 07	1 15	0 10	**457**	**0**
48	CIV	Cessna 680 Citation Soverign	PW306B	1 77	0 10	1 72	0 15	**685**	**0**
				229.09	**3.48**	**227.26**	**5.32**	**50,023.8**	**35,098.0**
				Arrivals	**232.57**	Departures	**232.57**		
						Total	**465.15**		

Note: Groups 21 and 21M are modeled with a mix of single engine piston aircraft: 75% GASEPF and 25% GASEPV

305540 2012 Hanscom ESPR
INM Operation for Air Quality Analysis
2030 Operations
Average Annual Day

Group	Sector	EDMS	Engine Type	Departures		Arrivals		Annual	Annual
				Day	Night	Day	Night	LTOs	TGOs
1	CIV	Cessna 500 citation 1	JT15D-1	1 17	0 07	1 13	0 10	**451**	**0**
2	CIV	Beechjet 400	JT15D-5	3 64	0 21	3 53	0 32	**1,406**	**0**
3	CIV	Bombadier Learjet 35	TFE731-2-2B	10 00	0 57	9 69	0 87	**3,856**	**0**
3M	MIL	Falcon 200	CF700-2D	0 24	0 00	0 24	0 00	**89**	**0**
8	CIV	Gulfstreeam IV	JAYMK611-8	7 13	0 40	6 91	0 62	**2,748**	**0**
9	CIV	Bombadier Challenger 600	ALF502L-2	4 34	0 25	4 21	0 38	**1,674**	**0**
10	CIV	Bombadier Challenger 601	CF34-3A	8 42	0 48	8 16	0 74	**3,248**	**0**
15M	MIL	Boeing 707 320B	TF33-P-100	0 09	0 00	0 09	0 00	**33**	**0**
17	CIV	Aerospatiale SA-365N Dauphin	250B17B	10 06	0 20	10 02	0 23	**3,743**	**0**
19	CIV	De havalland DHC-6-100 Twin Otter	PT6A-20	4 38	0 79	4 36	0 10	**1,757**	**0**
20	CIV	Cessna 441	TPE331-8	5 84	0 13	5 83	0 14	**2,180**	**0**
20M	MIL	Cessna 441	TPE331-8	0 04	0 00	0 04	0 00	**13**	**0**
22	CIV	Israel IAI-1125 Astra	TFE731-2/2A	0 79	0 04	0 77	0 07	**305**	**0**
21	CIV	Cessna 150 Series	O-200	176 78	0 44	176 44	0 78	**29,585**	**35,098**
21M	MIL	Cessna 150 Series	O-200	0 65	0 00	0 65	0 01	**239**	**0**
26	CIV	Falcon 50/900	TFE731-3	3 21	0 18	3 11	0 28	**1,237**	**0**
29	CIV	Beech King Air 90	PT6A-60	1 04	0 04	1 02	0 06	**394**	**0**
33	CIV	SD 330 Sherpa	PT6A-45	1 08	0 04	1 07	0 06	**412**	**0**
37	CIV	Bombadier Global Express	BR700-710A2-20	3 66	0 21	3 54	0 32	**1,410**	**0**
40	CIV	Cessna 750 Citation X	AE3007C TYPE 2	3 80	0 21	3 68	0 33	**1,464**	**0**
41	CIV	Boeing 737-800	CFM56-7B27	0 63	0 04	0 61	0 06	**244**	**0**
43	CIV	Eclipse 500	PW610F	3 10	0 18	3 01	0 27	**1,196**	**0**
44	CIV	Cessna 525C Citation Jet	JT15D-1	2 28	0 13	2 21	0 20	**878**	**0**
45	CIV	Cessna 560 Citation V	JT15D-5	1 97	0 11	1 91	0 17	**761**	**0**
46	CIV	Cessna 560 Citation Excel\	JT15D-5	5 18	0 29	5 02	0 45	**1,999**	**0**
47	CIV	Bombadier Learjet 60	TFE731-2/2A	1 58	0 09	1 53	0 14	**610**	**0**
48	CIV	Cessna 680 Citation Soverign	PW306B	2 37	0 13	2 30	0 21	**915**	**0**
				263.48	**5.22**	**261.09**	**6.90**	**62,848.0**	**35,098.0**
				Arrivals	**268.70**	Departures	**267.99**		
						Total	**536.69**		

Note: Groups 21 and 21M are modeled with a mix of single engine piston aircraft: 75% GASEPF and 25% GASEPV

Hanscom ESPR

2012 Mesoscale Analysis - Hanscom Traffic

							Vehicle Emission Factors 2012					
Link	Distance (miles)	AM Peak	PM Peak	ADT	Daily VMT	Vehicle Speeds (mph)	CO (g/mile)	CO2 (g/mile)	VOC (g/mile)	NOX (g/mile)	PM10 (g/mile)	PM2.5 (g/mile)
Airport Road	0.32	0	0	0	0	30	10.143	561.3	0.329	0.758	0.0358	0.0204
Bedford Road	0.35	12	18	180	63	35	10.15	561.3	0.313	0.751	0.0358	0.0204
Concord Trnpke	0.6	25	22	250	150	40	10.714	561.3	0.303	0.803	0.0358	0.0204
Hanscom Drive	0.65	125	107	1250	812.5	30	10.143	561.3	0.329	0.758	0.0358	0.0204
Hartwell Ave	1.24	10	5	100	124	40	10.714	561.3	0.303	0.803	0.0358	0.0204
Hartwell Road	1.62	0	0	0	0	25	10.294	561.3	0.352	0.785	0.0358	0.0204
Mass Ave	0.36	12	9	120	43.2	35	10.15	561.3	0.313	0.751	0.0358	0.0204
Old Bedford Road 1	0.31	3	2	30	9.3	30	10.143	561.3	0.329	0.758	0.0358	0.0204
Old Bedford Road 2	0.49	37	9	370	181.3	30	10.143	561.3	0.329	0.758	0.0358	0.0204
Old Mass Ave	0.53	10	5	100	53	35	10.15	561.3	0.313	0.751	0.0358	0.0204
Route 2A (1)	0.46	45	16	450	207	40	10.714	561.3	0.303	0.803	0.0358	0.0204
Route 2A (2)	1.67	23	16	230	384.1	40	10.714	561.3	0.303	0.803	0.0358	0.0204
Route 2A (3)	1.08	48	38	480	518.4	40	10.714	561.3	0.303	0.803	0.0358	0.0204
Route 2A (4)	0.23	60	56	600	138	40	10.714	561.3	0.303	0.803	0.0358	0.0204
Route 2A (5)	0.92	125	51	1250	1150	40	10.714	561.3	0.303	0.803	0.0358	0.0204
Route 2A (6)	0.11	65	53	650	71.5	40	10.714	561.3	0.303	0.803	0.0358	0.0204
Route 2A (7)	0.15	55	46	550	82.5	40	10.714	561.3	0.303	0.803	0.0358	0.0204
Route 2A (8)	0.18	43	37	430	77.4	40	10.714	561.3	0.303	0.803	0.0358	0.0204
Route 62 (1)	1.46	0	0	0	0	35	10.15	561.3	0.313	0.751	0.0358	0.0204
Route 62 (2)	1.64	15	9	150	246	35	10.15	561.3	0.313	0.751	0.0358	0.0204
Route 62 (3)	1.12	15	9	150	168	30	10.143	561.3	0.329	0.758	0.0358	0.0204
Route 4/225 (1)	2.1	0	0	0	0	35	10.15	561.3	0.313	0.751	0.0358	0.0204
Route 4/225 (2)	0.56	2	2	20	11.2	40	10.714	561.3	0.303	0.803	0.0358	0.0204
Route 4/225 (3)	0.16	0	0	0	0	25	10.294	561.3	0.352	0.785	0.0358	0.0204
South Road (1)	0.58	0	0	0	0	30	10.143	561.3	0.329	0.758	0.0358	0.0204
South Road (2)	0.85	0	0	0	0	30	10.143	561.3	0.329	0.758	0.0358	0.0204
Virginia Road	2.13	23	9	230	489.9	30	10.143	561.3	0.329	0.758	0.0358	0.0204

1. AM and PM peak volumes are Hanscom Traffic only.
2. ADT based on worst case AM or PM hours which represent approximately 10 percent of daily traffic.
3. Vehicle emissions in kg/yr were based on daily emissions and scaled by 365 days.
4. Total kg/1000 kg were divided by 1,000 for consistency with 2005 ESPR.

Hanscom ESPR

2020 Mesoscale Analysis - Hanscom Traffic

							Vehicle Emission Factors 2020					
Link	Distance (miles)	AM Peak	PM Peak	ADT	Daily VMT	Vehicle Speeds (mph)	CO (g/mile)	CO2 (g/mile)	VOC (g/mile)	NOX (g/mile)	PM10 (g/mile)	PM2.5 (g/mile)
Airport Road	0.32	0	0	0	0	30	8.593	569.37	0.212	0.263	0.0285	0.0137
Bedford Road	0.35	16	24	240	84	35	8.601	569.37	0.2	0.26	0.0285	0.0137
Concord Trnpke	0.6	30	30	300	180	40	8.835	569.37	0.192	0.267	0.0285	0.0137
Hanscom Drive	0.65	167	149	1670	1085.5	30	8.593	569.37	0.212	0.263	0.0285	0.0137
Hartwell Ave	1.24	13	6	130	161.2	40	8.835	569.37	0.192	0.267	0.0285	0.0137
Hartwell Road	1.62	0	0	0	0	25	8.708	569.37	0.229	0.272	0.0285	0.0137
Mass Ave	0.36	16	12	160	57.6	35	8.601	569.37	0.2	0.26	0.0285	0.0137
Old Bedford Road 1	0.31	5	6	60	18.6	30	8.593	569.37	0.212	0.263	0.0285	0.0137
Old Bedford Road 2	0.49	50	11	500	245	30	8.593	569.37	0.212	0.263	0.0285	0.0137
Old Mass Ave	0.53	13	6	130	68.9	35	8.601	569.37	0.2	0.26	0.0285	0.0137
Route 2A (1)	0.46	59	22	590	271.4	40	8.835	569.37	0.192	0.267	0.0285	0.0137
Route 2A (2)	1.67	31	22	310	517.7	40	8.835	569.37	0.192	0.267	0.0285	0.0137
Route 2A (3)	1.08	65	52	650	702	40	8.835	569.37	0.192	0.267	0.0285	0.0137
Route 2A (4)	0.23	81	77	810	186.3	40	8.835	569.37	0.192	0.267	0.0285	0.0137
Route 2A (5)	0.92	87	70	870	800.4	40	8.835	569.37	0.192	0.267	0.0285	0.0137
Route 2A (6)	0.11	87	70	870	95.7	40	8.835	569.37	0.192	0.267	0.0285	0.0137
Route 2A (7)	0.15	73	63	730	109.5	40	8.835	569.37	0.192	0.267	0.0285	0.0137
Route 2A (8)	0.18	57	59	590	106.2	40	8.835	569.37	0.192	0.267	0.0285	0.0137
Route 62 (1)	1.46	0	5	50	73	35	8.601	569.37	0.2	0.26	0.0285	0.0137
Route 62 (2)	1.64	19	11	190	311.6	35	8.601	569.37	0.2	0.26	0.0285	0.0137
Route 62 (3)	1.12	19	11	190	212.8	30	8.593	569.37	0.212	0.263	0.0285	0.0137
Route 4/225 (1)	2.1	3	0	30	63	35	8.601	569.37	0.2	0.26	0.0285	0.0137
Route 4/225 (2)	0.56	0	3	30	16.8	40	8.835	569.37	0.192	0.267	0.0285	0.0137
Route 4/225 (3)	0.16	0	0	0	0	25	8.708	569.37	0.229	0.272	0.0285	0.0137
South Road (1)	0.58	0	0	0	0	30	8.601	569.37	0.212	0.263	0.0285	0.0137
South Road (2)	0.85	0	0	0	0	30	8.601	569.37	0.212	0.263	0.0285	0.0137
Virginia Road	2.13	45	11	450	958.5	30	8.601	569.37	0.212	0.263	0.0285	0.0137

1. AM and PM peak volumes are Hanscom Traffic only.
2. ADT based on worst case AM or PM hours which represent approximately 10 percent of daily traffic.
3. Vehicle emissions in kg/yr were based on daily emissions and scaled by 365 days.
4. Total kg/1000 kg were divided by 1,000 for consistency with 2005 ESPR.

Hanscom ESPR

2030 Mesoscale Analysis - Hanscom Traffic

							Vehicle Emission Factors 2030					
Link	Distance (miles)	AM Peak	PM Peak	ADT	Daily VMT	Vehicle Speeds (mph)	CO (g/mile)	CO2 (g/mile)	VOC (g/mile)	NOX (g/mile)	PM10 (g/mile)	PM2.5 (g/mile)
Airport Road	0.32	0	0	0	0	30	8.313	569.4	0.192	0.166	0.0274	0.0127
Bedford Road	0.35	27	48	480	168	35	8.321	569.4	0.181	0.163	0.0274	0.0127
Concord Trnpke	0.6	62	60	620	372	40	8.548	569.4	0.173	0.168	0.0274	0.0127
Hanscom Drive	0.65	291	296	2960	1924	30	8.313	569.4	0.192	0.166	0.0274	0.0127
Hartwell Ave	1.24	25	13	250	310	40	8.548	569.4	0.173	0.168	0.0274	0.0127
Hartwell Road	1.62	0	0	0	0	25	8.42	569.4	0.208	0.172	0.0274	0.0127
Mass Ave	0.36	27	25	270	97.2	35	8.321	569.4	0.181	0.163	0.0274	0.0127
Old Bedford Road 1	0.31	10	14	140	43.4	30	8.313	569.4	0.192	0.166	0.0274	0.0127
Old Bedford Road 2	0.49	82	27	820	401.8	30	8.313	569.4	0.192	0.166	0.0274	0.0127
Old Mass Ave	0.53	25	13	250	132.5	35	8.321	569.4	0.181	0.163	0.0274	0.0127
Route 2A (1)	0.46	102	44	1020	469.2	40	8.548	569.4	0.173	0.168	0.0274	0.0127
Route 2A (2)	1.67	53	44	530	885.1	40	8.548	569.4	0.173	0.168	0.0274	0.0127
Route 2A (3)	1.08	115	104	1150	1242	40	8.548	569.4	0.173	0.168	0.0274	0.0127
Route 2A (4)	0.23	141	152	1520	349.6	40	8.548	569.4	0.173	0.168	0.0274	0.0127
Route 2A (5)	0.92	151	143	1510	1389.2	40	8.548	569.4	0.173	0.168	0.0274	0.0127
Route 2A (6)	0.11	151	123	1510	166.1	40	8.548	569.4	0.173	0.168	0.0274	0.0127
Route 2A (7)	0.15	100	129	1290	193.5	40	8.548	569.4	0.173	0.168	0.0274	0.0127
Route 2A (8)	0.18	0	11	110	19.8	40	8.548	569.4	0.173	0.168	0.0274	0.0127
Route 62 (1)	1.46	34	27	340	496.4	35	8.321	569.4	0.181	0.163	0.0274	0.0127
Route 62 (2)	1.64	34	27	340	557.6	35	8.321	569.4	0.181	0.163	0.0274	0.0127
Route 62 (3)	1.12	7	0	70	78.4	30	8.313	569.4	0.192	0.166	0.0274	0.0127
Route 4/225 (1)	2.1	0	4	40	84	35	8.321	569.4	0.181	0.163	0.0274	0.0127
Route 4/225 (2)	0.56	0	0	0	0	40	8.548	569.4	0.173	0.168	0.0274	0.0127
Route 4/225 (3)	0.16	0	0	0	0	25	8.42	569.4	0.208	0.172	0.0274	0.0127
South Road (1)	0.58	0	0	0	0	30	8.313	569.4	0.192	0.166	0.0274	0.0127
South Road (2)	0.85	0	0	0	0	30	8.313	569.4	0.192	0.166	0.0274	0.0127
Virginia Road	2.13	83	27	830	1767.9	30	8.313	569.4	0.192	0.166	0.0274	0.0127

1. AM and PM peak volumes are Hanscom Traffic only.
2. ADT based on worst case AM or PM hours which represent approximately 10 percent of daily traffic.
3. Vehicle emissions in kg/yr were based on daily emissions and scaled by 365 days.
4. Total kg/1000 kg were divided by 1,000 for consistency with 2005 ESPR.

Appendix F Wetlands and Rare Species

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

January 31, 2013

Chris McCarthy
CH2M HILL
18 Tremont Street
Suite 700
Boston MA 02108

RE: Project Location: Hanscom Field
Town: BEDFORD, CONCORD, LEXINGTON, LINCOLN
NHESP Tracking No.: 06-19316

To Whom It May Concern:

Thank you for contacting the Natural Heritage and Endangered Species Program ("NHESP") of the MA Division of Fisheries & Wildlife for information regarding state-listed rare species in the vicinity of the above referenced site. Based on the information provided, this project site, or a portion thereof, is located **within** *Priority Habitat 300* (PH 300) as indicated in the *Massachusetts Natural Heritage Atlas* (13th Edition). Our database indicates that the following state-listed rare species have been found in the vicinity of the site:

Scientific name	Common Name	Taxonomic Group	State Status
Bartramia longicauda	Upland Sandpiper	Bird	Endangered
Ammodramus savannarum	Grasshopper Sparrow	Bird	Threatened
Emydoidea blandingii	Blanding's Turtle	Reptile	Threatened
Glyptemys insculpta	Wood Turtle	Reptile	Special Concern

The species listed above are protected under the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the state's Wetlands Protection Act (WPA) (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.00). Fact sheets for most state-listed rare species can be found on our website (www.nhesp.org).

Please note that projects and activities located within Priority and/or Estimated Habitat **must** be reviewed by the NHESP for compliance with the state-listed rare species protection provisions of MESA (321 CMR 10.00) and/or the WPA (310 CMR 10.00).

Wetlands Protection Act (WPA)

If the project site is within Estimated Habitat and a Notice of Intent (NOI) is required, then a copy of the NOI must be submitted to the NHESP so that it is received at the same time as the local conservation commission. If the NHESP determines that the proposed project will adversely affect the actual Resource Area habitat of state-protected wildlife, then the proposed project may not be permitted (310 CMR 10.37, 10.58(4)(b) & 10.59). In such a case, the project proponent may request a consultation with the NHESP to discuss potential project design modifications that would avoid adverse effects to rare wildlife habitat.

Division of Fisheries and Wildlife
Temporary Correspondence: 100 Hartwell Street, Suite 230, West Boylston, MA 01583
Permanent: Field Headquarters, North Drive, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-7890
An Agency of the Department of Fish and Game

A streamlined joint MESA/WPA review process is now available. When filing a Notice of Intent (NOI), the applicant may now file concurrently under the MESA on the same NOI form and qualify for a 30-day streamlined joint review. For a copy of the revised NOI form, please visit the MA Department of Environmental Protection's website: http://www.mass.gov/dep/water/approvals/wpaform3.doc.

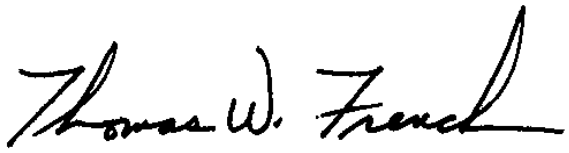
MA Endangered Species Act (MESA)

If the proposed project is located within Priority Habitat and is not exempt from review (see 321 CMR 10.14), then project plans, a fee, and other required materials must be sent to NHESP Regulatory Review to determine whether a probable "take" under the MA Endangered Species Act would occur (321 CMR 10.18). Please note that all proposed and anticipated development must be disclosed, as MESA does not allow project segmentation (321 CMR 10.16). For a MESA filing checklist and additional information please see our website: www.nhesp.org ("Regulatory Review" tab).

We recommend that rare species habitat concerns be addressed during the project design phase prior to submission of a formal MESA filing, as avoidance and minimization of impacts to rare species and their habitats is likely to expedite endangered species regulatory review.

This evaluation is based on the most recent information available in the Natural Heritage database, which is constantly being expanded and updated through ongoing research and inventory. If you have any questions regarding this letter please contact Eve Schluter, Endangered Species Review Biologist, at (508) 389-6346.

Sincerely,



Thomas W. French, Ph.D.
Assistant Director

Massachusetts Natural Heritage Program

Natural Heritage & Endangered Species Program
Division of Fisheries & Wildlife
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MASSACHUSETTS RARE AND ENDANGERED WILDLIFE

UPLAND SANDPIPER

(Bartramia longicauda)

Robbins,C.S., B. Bruun, and H.S. Zim. Birds of North America. Golden Press, New York. 1966.

DESCRIPTION

The Upland Sandpiper is a slender, moderate-sized shorebird with a small head, large, shoe-button eyes, short and thin dark-brown bill, long, thin neck and relatively long tail. Legs are yellowish. It stands about 12 in (30 cm) tall and has a wingspan of 25 to 27 in (64 to 68 cm). The crown is dark brown with a pale buff crown stripe. The rump, upper tail and wings are much darker than the rest of the bird. Calls include a rapid "quip-ip-ip-ip" alarm call, and a long, drawn-out courtship call which has been described as a windy whistle, "whiiiip-whee-ee-oo". The sexes are similar. This species often poses with its wings up raised when alighting on utility poles or fence posts.

ECOLOGY/BEHAVIOR

Habitat in Massachusetts

The Upland Sandpiper inhabits large expanses of open grassy uplands, wet meadows, old fields, and pastures. In Massachusetts it is restricted to open expanses of grassy fields, hay fields, and mown grassy strips adjacent to runways and taxiways of airports and military bases. They need feeding and loafing areas as well as nesting areas. It winters in similar landscapes in South America.

Movement/territory/breeding behavior

The Upland Sandpiper returns to its breeding habitat in Massachusetts mid-April to early May. The birds arrive already paired and usually return to the same area year after year. Their courtship displays include circling flights by individual birds that last 5 to 15 minutes and reach as high as

(continued overleaf)

Range of Bartramia longicauda

● Verified since 1978
○ Reported prior to 1978

Breeding Distribution in Massachusetts by Town

1986

1000 ft (305 m) during which they give their "windy whistle" call. On the ground, the male will raise his tail and run at his mate stopping suddenly. The nest is a grass-lined depression on the ground. It is well concealed by arched grasses making it invisible from above. Four, or occasionally 3 eggs are laid at 26 hour intervals. The eggs are pinkish-buff with fine brown spots. Both sexes incubate the eggs beginning after the clutch is complete. Renesting may occur if the initial clutch is destroyed.

Incubating adults are well-concealed and will tolerate close approach before flushing. The adults are secretive around the nest, approaching it from a distance by walking cautiously through the grass, head held low and squatting lower and lower. Unless flushed, the bird leaves the nest in the same manner. Each bird has a characteristic flushing distance. It becomes less willing to flush as the eggs begin to pip. The adults are very unlikely to abandon the nest even if repeatedly disturbed, but will immediately desert if the eggs are damaged. The chicks are downy and precocial at hatching and leave the nest very soon thereafter. One or both adults care for the chicks, watching for danger as the chicks catch insects and as they sleep. The young reach full size and adult plummage by the time they fledge at 32 to 34 days. The adults do not defend the nest or a nesting territory. They do however, drive other individuals and animals such as ground squirrels, away if they approach the young. This behavior diminishes as the young mature and disappears when the young fledge. After fledging, families and individuals begin to mix and form flocks. The Upland Sandpipers gather in increasingly large flocks in July and begin fall migration from Massachusetts in late July and August.

Feeding behavior

The Upland Sandpipers primarily pursue grasshoppers, crickets, weevils, beetles, ants, spiders, snails and earthworms on the ground. They chase the insects rapidly and even leap into the air in pursuit.

RANGE

The Upland Sandpiper breeds from Maine to central Canada and Alaska, Maryland to Oklahoma and Colorado. It breeds locally in Massachusetts. It winters in similar habitats in South America, particularly on the pampas of northern Argentina and Uruguay.

POPULATION STATUS

The Upland Sandpiper is classified as "Endangered" in Massachusetts. In 1985 a total of 35 to 37 breeding pairs nested at only 7 sites in the state.

European settlement created extensive nesting habitat through the clearing of the forest for agriculture and grazing. The Upland Sandpiper was common in the 1850's and at that time was seen in the thousands. Commercial shooting for food reduced its numbers dramatically. Currently, after having been protected from hunting for over sixty years, it is threatened by loss of habitat to development and succession of open lands to forest. The Upland Sandpiper is experiencing population decline over much of its range, particularly in the midwest and eastern United States.

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Massachusetts Natural Heritage Program

MASSACHUSETTS RARE AND ENDANGERED WILDLIFE

GRASSHOPPER SPARROW

(Ammodramus savannarum)

Robbins, C.S., B. Brunn, and H.S. Zim. Birds of North America. Golden Press, New York. 1966.

DESCRIPTION

The Grasshopper Sparrow is a small sparrow of open fields. It is 4.5 to 5.5 in (11 - 13 cm) long with a narrow short tail. Each feather of the tail tapers to a point giving it a ragged appearence. It has a flat head which slopes directly directly into the bill. The unstreaked throat and breast are bright buff colored. The upperparts have reddish streaks which contrast with the intervening gray. The dark brown crown is divided by a thin cream-colored center stripe. A yellowish spot extends from the bill in front and below the eye. The sexes are similar. The typical song, often mistaken for the song of a grasshopper, consists of two chip notes followed by "tsick tsick tsurrrrr". Breeding birds also sing a complicated song with many squeaky and buzzy notes intermixed in a long phrase.

Simliar Species

Young birds resemble adult Henslow's Sparrows but have dusky brown streaks or spots on the buffy breast and flanks. Adult Grasshopper Sparrows can be distinguished from the Field Sparrow by the latter's pinkish bill, rusty cap and white eye ring. Other species similar in appearance and also found in the same type of habitat include the Vesper Sparrow, Savannah Sparrow and Song Sparrow but Grasshopper Sparrow differs from these by its buffy unstreaked throats and breasts and the yellowish area around the eye. However, its distinctive call best distinguishes it from all other birds.

ECOLOGY/BEHAVIOR

Grasshopper Sparrows eat, sleep and nest on the ground. When flushed, it usually flies up from the grass, flutters rather low and erractically for a short distance and drops into the grass again. On the ground it either hops or runs.

Habitat in Massachusetts

It is found in sandplain grasslands, pastures, hayfields and airfields characterized by bunch grasses (rather than sod forming grasses). It is

(continued overleaf)

Range of Ammondramus savannarum

● Verified since 1978
○ Reported prior to 1978

Breeding Distribution in Massachusetts by Town

1986

also found in open knolls, sandplains within Pine Barrens and coastal heathlands. It requires a patchy grassland habitat with bare ground and bunch grasses such as poverty grass (Danthonia spicata), bluestem (Andropogon spp.) and fescue (Fescue spp). Prefered habitat is characterized by relatively low stem densities and limited accumulation of ground litter. This species is generally absent from fields with over 35% cover in shrubs. Bare ground is especially important, as Grass-hopper Sparrows behave much like field mice in their habit of running along the ground to escape predators and to forage for invertebrates.

Migration

The Grasshopper Sparrows arrive in Massachusetts in late May. The male lays claim to a 1-4 acre exclusive non-overlapping territory by singing the "grasshopper" song all day from a tall weed, fence post, haystack, etc. During the non-breeding season both the male and female sing. Grasshopper Sparrows migrate to the wintering grounds by mid-September.

Breeding habits

Grasshopper Sparrows produce one brood each summer in Massachusetts. The well-hidden nests are walled, domed structures of grasses built at the base of clumps of grass. Only the female incubates the eggs, which take an estimated 12 days to hatch. The usual 3-5 eggs are white with spots or blotches of brown to reddish brown which are concentrated on the larger end of the egg. The young, which are wholly dependent on the mother at hatching, leave the nest after 9 days and follow the parent on the ground until they fledge. If found on the nest, the mother flutters through the grass feigning lameness. Though the male does not care for the young, he does react to predators near the nest. Nests may be parasitized by cowbirds. Breeding activity diminishes by mid-August after which the families disperse.

Feeding Habits

This species is largely insectiverous. Patches of bare ground are critical to this sparrow's foraging behavior as grasshoppers, a primary food item, are most often pursued on or near the ground. Grasshopper Sparrows also feed on spiders, myriapods, snails, earthworms, weed and grass seeds.

RANGE

The Grasshopper Sparrow can be found from New Hampshire to California, and south to South Carolina to Mexico, Cuba, the Bahama's and Guatemala. It winters from southern California, southern Arizona, Oklahoma, Arkansas, Tennessee and North Carolina to El Salvador, and the West Indies.

POPULATION STATUS

The Grasshopper Sparrow is classified as a species of Special Concern in Massachusetts, where it is known to nest at less than 20 sites. Many of the current locations are in fields adjacent to air fields. This sparrow formerly was abundant on Nantucket, Martha's Vineyard and in eastern Massachusetts. Loss of appropriate habitat to land development, changes in agricultural practices (early harvesting and fewer fallow fields) and natural succession (abandoned fields growing up to shrubs and woods) appears to be the primary factor in its decline. Openings created by forest fires once provided habitat but these are now rare.

Natural Heritage
& Endangered Species
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Blanding's Turtle

Emydoidea blandingii

State Status: **Threatened**
Federal Status: None

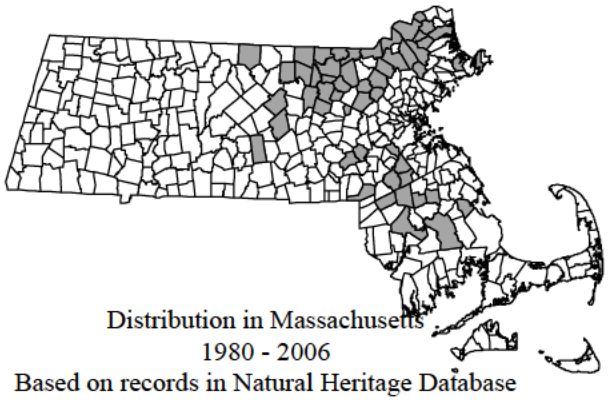
Photo by Susan Speak

DESCRIPTION: The Blanding's Turtle is a mid-sized turtle ranging between 16 and 22 cm (6-9 in.) in shell length. Its high-domed carapace (top shell) is dark and covered with pale yellow flecking. The lower shell (plastron) is yellow with large black blotches on the outer posterior corner of each scute (scale). The plastron is hinged, allowing movement; however, the shell does not close tightly. In older individuals, the entire plastron may be black. The most distinguishing feature is its long, yellow throat and chin, which makes it recognizable at a distance. Males have slightly concave plastrons, females have flat plastrons. The tails of males are thicker and their cloacal opening (the common orifice of the digestive, reproductive and urinary systems) is located beyond the edge of the carapace. Hatchlings have a brown carapace and brown to black plastron, and range between 3.4 and 3.7 cm (1.3-1.5 in.) in length.

SIMILAR SPECIES: This species could be confused with the Eastern Box Turtle (*Terrapene carolina*). The Eastern Box Turtle can have a yellow chin but lacks the yellow throat and neck. Box Turtles are smaller, 10-18 cm (4-7 in.) in shell length. In addition, the Box Turtle has a prominent mid-line ridge (keel) on the carapace, which is absent on Blanding's Turtles. The Blanding's Turtle may also be confused with the Spotted Turtle. However, The Spotted Turtle is much smaller, 3.5-4.5 inches in length and has very distinct round yellow spots.

HABITAT IN MASSACHUSETTS: Blanding's Turtles use a variety of wetland and terrestrial habitat types. Blanding's Turtles have been observed in seasonal pools, marshes, scrub-shrub wetlands and open uplands (Sievert et al. 2003). Habitat use appears to vary according to the individual and the amount of precipitation, with more upland utilization during dry years (Joyal at al. 2001). Wetlands are used for overwintering during their inactive season (Nov-Mar).

RANGE: The Blanding's Turtle is found primarily in the Great Lakes region, extending to Kansas. Several smaller, disjunct populations occur in the East: in southern Nova Scotia, in an arc extending from eastern Massachusetts through southeastern New Hampshire to southern Maine, and in the lower Hudson Valley of New York. These populations (with the exception of those in New Hampshire) are all listed as Threatened or Endangered at the state or provincial level.



Distribution in Massachusetts
1980 - 2006
Based on records in Natural Heritage Database

LIFE CYCLE & BEHAVIOR: Blanding's Turtles overwinter in organic substrate in the deepest parts of marshes, ponds, and occasionally, vernal pools. Some individuals overwinter under hummocks in red maple or highbush blueberry swamps. Upon emergence from overwintering, Blanding's Turtles often leave permanent wetlands and move overland to vernal pools and scrub-shrub swamps, where they feed and mate. It is during the summer months that females estivate in upland forest or along forest/field edges. At night and during periods of hot weather, Blanding's Turtles retreat to "forms". These small terrestrial shelters are found beneath leaf litter, in the grass, under logs or brush located up to 110 m (361 ft) from the nearest wetland. They are called "forms" because when the turtle leaves them, they retain the shape of the turtle's shell.

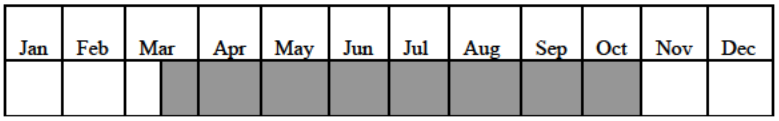
Blanding's Turtles are omnivores, eating both plants and animals. They eat while on land and in the water. The animals Blanding's Turtles are know to eat, either alive or as carrion, consist of Pulmonate snails, crayfish, earthworms, insects, golden shiners, brown bullheads, and other small vertebrates. Vernal pools are an important source of many of these prey items. The plants that Blanding's Turtles have been known to eat include coontail, duckweed, bulrush, and sedge.

Courtship and mating takes place during the spring and early summer and typically occurs in water. Baker and Gillingham (1983) reported that in seminatural conditions male Blanding's Turtles exhibit a variety of behaviors during mating including: chasing, mounting, chinning, gulping, swaying, violent swaying, and snorkeling. Chinning occurs after the male is mounted, if the female moves forward the male will start gulping (taking in water and expelling it over the female's head). Gulping is typically followed by swaying and escalates to violent swaying if the female remains motionless.

Females will remain in wetland or vernal pool habitat until they begin nesting. The majority of nesting occurs in June in open areas with well-drained loamy or sandy soils, such as: dirt roads, powerline right-of-ways, residential lawns, gravel pits and early successional fields. Female Blanding's Turtles reach sexual maturity at 14-20 years of age (Congdon *et al.*, 1993; Congdon and van Loben Sels, 1993) and may travel great distances, often more than 1 km (3280 ft), to find appropriate nesting habitat (Grgurovic and Sievert, 2005). Females typically begin nesting during the daylight and continue the process until after dark.

Blanding's Turtles display temperature-dependent sex determination; eggs incubated below a pivotal temperature that lies between 26.5°C and 30°C (79.7-86°F) produce males, and higher temperatures produce females (Ewert and Nelson 1991). Typical clutch size ranges from 10 to 12 eggs. Hatchlings emerge in the late August and September. The typical size of a hatchling is about 3.5 cm (1.4 in.) and 10 g (0.35 oz).

ACTIVE PERIOD



THREATS: Blanding's Turtles are particularly vulnerable because they travel very long distances during their active season, do not reproduce until late in life (14-20 yrs), and have low nest and juvenile survivorship. These traits make them extremely sensitive to even a 1-2% increase in adult mortality. Roads are the primary cause of adult mortality. Blanding's Turtles travel to multiple wetlands throughout a single year (typically 3-6) and adult females travel to nesting habitats, crossing roads in the process.

As this turtle is relatively difficult to study, it is not known how great a decline this species has experienced. In Massachusetts, few nesting sites are currently known and a variety of factors are attributed to this species' low numbers. Habitat loss, degradation, and fragmentation (i.e. roads) are driven by human activities such as commercial and residential expansion. Other threats include illegal collection, unnaturally inflated rates of predation in suburban and urban areas, agricultural and forestry practices, and natural succession (i.e. loss of nesting habitat).

MANAGEMENT RECOMMENDATIONS:
Using a turtle habitat model developed by UMass and NHESP records, Blanding's Turtle habitat needs to be assessed and prioritized for protection based on the extent, quality, and juxtaposition of habitats and their predicted ability to support self-sustaining populations of Blanding's Turtles. Other considerations should include the size and lack of fragmentation of both wetland and upland habitats and proximity and connectivity to other relatively unfragmented habitats, especially within existing protected open space.

Given limited conservation funds, alternatives to outright purchase of conservation land is an important component to the conservation strategy. These can include Conservation Restrictions (CRs) and Agricultural Preservation Restrictions (APRs). Another method of protecting large blocks of land is through the regulatory process by allowing the building of small or clustered roadside developments in conjunction with the protection of large areas of unimpacted land.

Habitat management and restoration guidelines should be developed and implemented in order to create and/or maintain consistent access to nesting habitat at key sites. This is most practical on state-owned conservation lands (i.e. DFW, DCR). However, educational materials should be made available to guide private land owners on appropriate management practices for Blanding's Turtle habitat.

Alternative wildlife corridor structures should be considered at strategic sites on existing roads. In particular, appropriate wildlife corridor structures should be considered for bridge and culvert upgrade and road-widening projects within Blanding's Turtle Habitat. Efforts should be made to inform Mass Highways of key locations where these measures would be most effective for turtle conservation.

Educational materials are being developed and distributed to the public in reference to the detrimental effects of keeping our native turtles as pets (an illegal activity that reduces reproduction in the population), releasing pet store turtles (which could spread disease), leaving cats and dogs outdoors unattended (particularly during the nesting season), feeding suburban wildlife (which increases numbers of natural predators to turtles), and driving ATVs in nesting areas from June-October. People should be encouraged, when safe to do so, to help Blanding's Turtles cross roads (always in the direction the animal was heading); however turtles should never be transported to "better" locations. They will naturally want to return to their original location and likely need to traverse roads to do so.

Increased law enforcement is needed to protect our wild populations, particularly during the nesting season when poaching is most frequent and ATV use is common and most damaging.

Forestry Conservation Management Practice guidelines should be applied on state and private lands to avoid direct turtle mortality. Seasonal timber harvesting restrictions apply to Blanding's Turtle habitat and to stands with wetlands. Motorized vehicle access to timber harvesting sites in Blanding's Turtle habitat is restricted to times when the Blanding's Turtle is overwintering. Hand felling in wetland areas is required in order to maintain structural integrity of overwintering sites.

Finally, a statewide monitoring program is needed to track long-term population trends in Blanding's Turtles.

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Natural Heritage & Endangered Species Program

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Wood Turtle

Glyptemys insculpta

State Status: **Species of Special Concern**
Federal Status: None

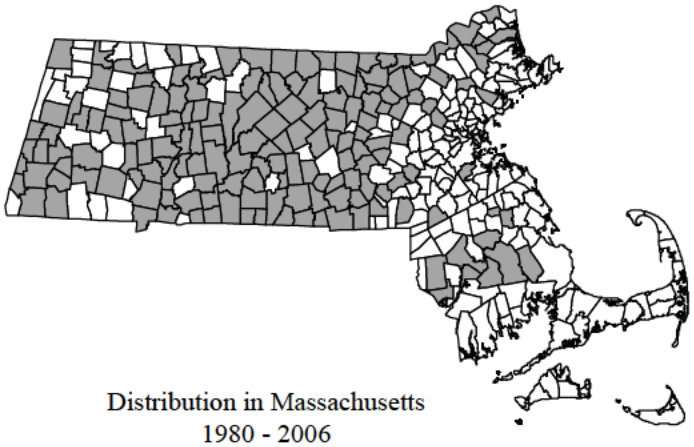
Photo by Mike Jones

DESCRIPTION: The Wood Turtle is a medium-sized turtle (14-20 cm; 5.5-8 in) that can be recognized by its sculpted shell and orange coloration on the legs and neck. The carapace (upper shell) is rough and each scale (scute) rises upwards in an irregularly shaped pyramid of grooves and ridges. The carapace is tan, grayish-brown or brown, has a mid-line ridge (keel) and often has a pattern of black or yellow lines on the larger scutes. The plastron (lower shell) is yellow with oblong dark patches on the outer, posterior corner of each scute. The head is black, but may be speckled with faint yellow spots. The legs, neck, and chin can have orange to reddish coloration. Males have a concave plastron, thick tail, long front claws, and a wider and more robust head than females. Hatchlings have a dull-colored shell that is broad and low, a tail that is almost as long as their carapace and they lack orange coloration on the neck and legs.

SIMILAR SPECIES: The habitat of the Eastern Box Turtle (*Terrapene carolina*) and the Blanding's Turtle (*Emydoidea blandingii*) may overlap that of the Wood Turtle, but neither has the Wood Turtle's pyramidal shell segments. Unlike the Wood Turtle, the Box and Blanding's Turtle have hinged plastrons into which they can withdraw or partially withdraw if threatened. The Northern Diamond-backed Terrapin (*Malaclemys terrapin*) has a shell similar to that of the Wood Turtle. However, its skin is grey and it lives only near brackish water, which the Wood Turtle avoids.

RANGE: The Wood Turtle can be found throughout New England, north to Nova Scotia, west to eastern Minnesota, and south to northern Virginia. The Wood Turtle appears to be widespread in Massachusetts. However, it should be kept in mind that little is known about the status of local populations associated with the majority of these sightings. Most of the towns have fewer than 5 known occurrences.

HABITAT IN MASSACHUSETTS: The preferred habitat of the Wood Turtle is riparian areas. Slower moving mid-sized streams are favored, with sandy bottoms and heavily vegetated stream banks. The stream bottom and muddy banks provide hibernating sites for overwintering, and open areas with sand or gravel substrate near the streams edge are used for nesting. Wood Turtles spend most of the spring and summer in mixed or deciduous forests, fields, hay-fields, riparian wetlands including wet meadows, bogs, and beaver ponds. Then they return to the streams in late summer or early fall to their favored overwintering location.



Distribution in Massachusetts
1980 - 2006
Based on records in Natural Heritage Database

LIFE CYCLE & BEHAVIOR: The Wood Turtle typically spends the winter in flowing rivers and perennial streams. Full-time submersion in the water begins in November, once freezing occurs regularly overnight, and continues until temperatures begin to increase in spring. It may hibernate alone or in large groups in community burrows in muddy banks, stream bottoms, deep pools, instream woody debris, and abandoned muskrat burrows. The Wood Turtle may make underwater movements in the stream during the winter; however, extended periods of activity and emergence from the water do not occur until mid-March or early April.

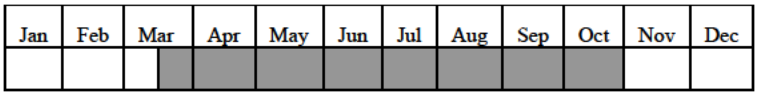
In spring, Wood Turtles are active during the day and are usually encountered within a few hundred meters from the stream banks. They have relatively linear home ranges that can be ½ a mile in length in Massachusetts (M. Jones, unpubl data). They will use emergent logs or grassy, sandy, and muddy banks to soak up the spring sun. During the summer months they feed in early successional fields, hayfields, and forests.

Wood Turtles are opportunistic omnivores; their diet consists of both plant and animal matter that is consumed on land and in the water. The Wood Turtle occasionally exhibits an unusual feeding behavior referred to as "stomping." In its search for food, this species will stomp on the ground alternating its front feet, creating vibrations in the ground resembling rainfall. Earthworms respond, rising to the ground's surface to keep from drowning. Instead of rain, the earthworm is met by the Wood Turtle, and is promptly devoured.

Although the peaks in mating activity occur in the spring and fall, Wood Turtles are known to mate opportunistically throughout their activity period. Males have been observed exhibiting aggressive behavior such as chasing, biting, and butting both during the mating season and at other times. A courtship ritual "dance" typically takes place at the edge of a stream or brook for several hours prior to mating. The dance involves the male and female approaching each other slowly with necks extended and their heads up. Before they actually touch noses, they lower their heads, and swing them from side to side. Copulation usually takes place within the water. Courting adults may produce a very subdued whistle that is rarely heard by observers. A female may mate with multiple individuals over the course of the active season.

In Massachusetts, most nesting occurs over a four-week period, primarily in June. Nesting sites may be a limited resource for Wood Turtles. Females are known to travel long distances in search of appropriate nesting habitat (average straight line distance of 244 m; 800 ft). Once they have arrived at a suitable nesting area, there may be multiple nesting attempts or false nests that occur over the course of several days, prior to laying eggs. They abort attempts when disturbed (e.g. by human activities) early in the process or hit a large rock while digging. Female Wood Turtles lay one clutch a year and often congregate in a good nesting area. Clutch size in Massachusetts averages 7 eggs (Jones, 2004, pers. comm.). Hatchling emergence occurs from August through September. The life span of the adult Wood Turtle is easily 46 years and may reach as much as 100 years.

ACTIVE PERIOD



THREATS: Hatchling and juvenile survival is very low and the time to sexual maturity is long. These characteristics are compensated by adults living a long time and reproducing for many years. Adult survivorship must be very high to sustain a viable population. These characteristics make Wood Turtles vulnerable to human disturbances. Population declines of Wood Turtles has likely been caused by hay-mowing operations, development of wooded stream banks, roadway casualties, incidental collection of specimens for pets, unnaturally inflated rates of predation in suburban and urban areas, forestry and agricultural activities and pollution of streams.

MANAGEMENT RECOMMENDATIONS: Using a turtle habitat model developed by UMass and NHESP records, Wood Turtle habitat needs to be assessed and prioritized for protection based on the extent, quality, and juxtaposition of habitats and their predicted ability to support self-sustaining populations of Wood Turtles. Other considerations should include the size and lack of fragmentation of both riverine and upland habitats and proximity and connectivity to other relatively unfragmented habitats, especially within existing protected open space. This information will be used to direct land acquisition and to target areas for Conservation Restrictions (CRs), Agricultural Preservation Restrictions (APRs) and Landowner Incentive Program (LIP) projects.

Mowing and nest site creation guidelines developed by NHESP should be followed on properties managed for Wood Turtles. These practices will be most practical on state-owned conservation lands. However, these materials are available to town land managers and private landowners.

Alternative wildlife corridor structures should be considered at strategic sites on existing roads. In particular, appropriate wildlife corridor structures should be considered for bridge and culvert upgrade and road-widening projects within or near Wood Turtle habitat. Efforts should be made to inform local regulatory agencies of key locations where these measures would be most effective for Wood Turtle conservation.

Educational materials are being developed and distributed to the public in reference to the detrimental effects of keeping our native Wood Turtles as pets (an illegal activity that reduces reproduction in the population), releasing pet store turtles (which could spread disease), leaving cats and dogs outdoors unattended (particularly during the nesting season), mowing of fields and shrubby areas, feeding suburban wildlife (which increases the number of natural predators to turtles), and driving ATVs in nesting areas from June-October. People should be encouraged, when safe to do so, to help Wood Turtles cross roads (always in the direction the animal was heading); however, turtles should never be transported to "better" locations. They will naturally want to return to their original location and likely need to traverse roads to do so.

Increased law enforcement is needed to protect our wild turtles, particularly during the nesting season when poaching is most frequent and ATV use is common and most damaging.

Forestry Conservation Management Practices should be applied on state and private lands to avoid direct turtle mortality. Seasonal timber harvesting restrictions apply to Wood Turtle habitat and to upland habitat that occurs up to 600 ft (183 m) beyond the stream edge. Motorized vehicle access to timber harvesting sites in Wood Turtle habitat is restricted to times when the Wood Turtle is overwintering. Bridges should be laid down across streams prior to any motorized equipment crossing the stream in order to maintain the structural integrity of overwintering sites.

Finally, a statewide monitoring program is needed to track long-term population trends in Wood Turtles.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087
http://www.fws.gov/newengland

January 22, 2013

Reference: Project — 2012 Hanscom Environmental Status and Planning Report; Location — Bedford, MA

Mr. Christopher J. McCarthy
CH2M Hill
18 Tremont Street, Suite 700
Boston, MA 02108

Dear Mr. McCarthy:

This responds to your recent correspondence requesting information on the presence of federally listed and/or proposed endangered or threatened species in relation to the proposed activity referenced above. These comments are provided in accordance with the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531, *et seq.*).

Based on information currently available to us, no federally listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area. Preparation of a Biological Assessment or further consultation with us under section 7 of the Endangered Species Act is not required. No further Endangered Species Act coordination is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

To obtain updated lists of federally listed or proposed threatened or endangered species and critical habitats, it is not necessary to contact this office. Instead, please visit the Endangered Species Consultation page on the New England Field Office's website:

www.fws.gov/newengland/endangeredspec-consultation.htm (accessed January 2013)

On the website, there is also a link to procedures that may allow you to conclude if habitat for a listed species is present in the project area. If no such habitat exists, then no federally listed species are present in the project area and there is no need to contact us for further consultation. If the above conclusion cannot be reached, further consultation with this office is advised. Information describing the nature and location of the proposed activity that should be provided to us for further informal consultation can be found at the above-referenced site.

Thank you for your coordination. Please contact Brett Hillman of this office at 603-223-2541, extension 34, if we can be of further assistance.

Sincerely yours,

Thomas R. Chapman
Supervisor
New England Field Office

L.G. Hanscom Field
Grassland Management Program

Prepared by:

Massachusetts Port Authority
Environmental Planning and Permitting Unit
Economic Planning and Development Department

January 2004

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Hanscom Field Grassland Management Program

Introduction

L.G. Hanscom Field (BED) is owned and operated by the Massachusetts Port Authority (Massport). The airport is situated on approximately 1,300 acres located in the towns of Bedford, Concord, Lexington and Lincoln, MA (Figure 1). Hanscom Field is primarily a general aviation airport, but also supports limited commercial operations and military flights. The airport consists of two paved runways, Runway 11/29 is 7,001 feet long and Runway 5/23 is 5,106 feet long. In 2003, Hanscom Field supported approximately 200,000 aircraft operations (landings and takeoffs). Nearly one-third of its annual operations are pilot training flights.

This *Grassland Management Program* outlines a series of guidelines for maintenance of portions of the grass infield areas between runways and taxiways at BED as well as selected grassed approach areas. **As noted throughout this document, the goal of grassland management must be carefully balanced with the airport's primary goal of maintaining aviation safety**. It is within the context of aviation safety that this program has been developed. As is discussed below, a key goal of the program is the reduction of wildlife hazards and evidence suggests that properly managed grasslands will support that aviation safety goal.

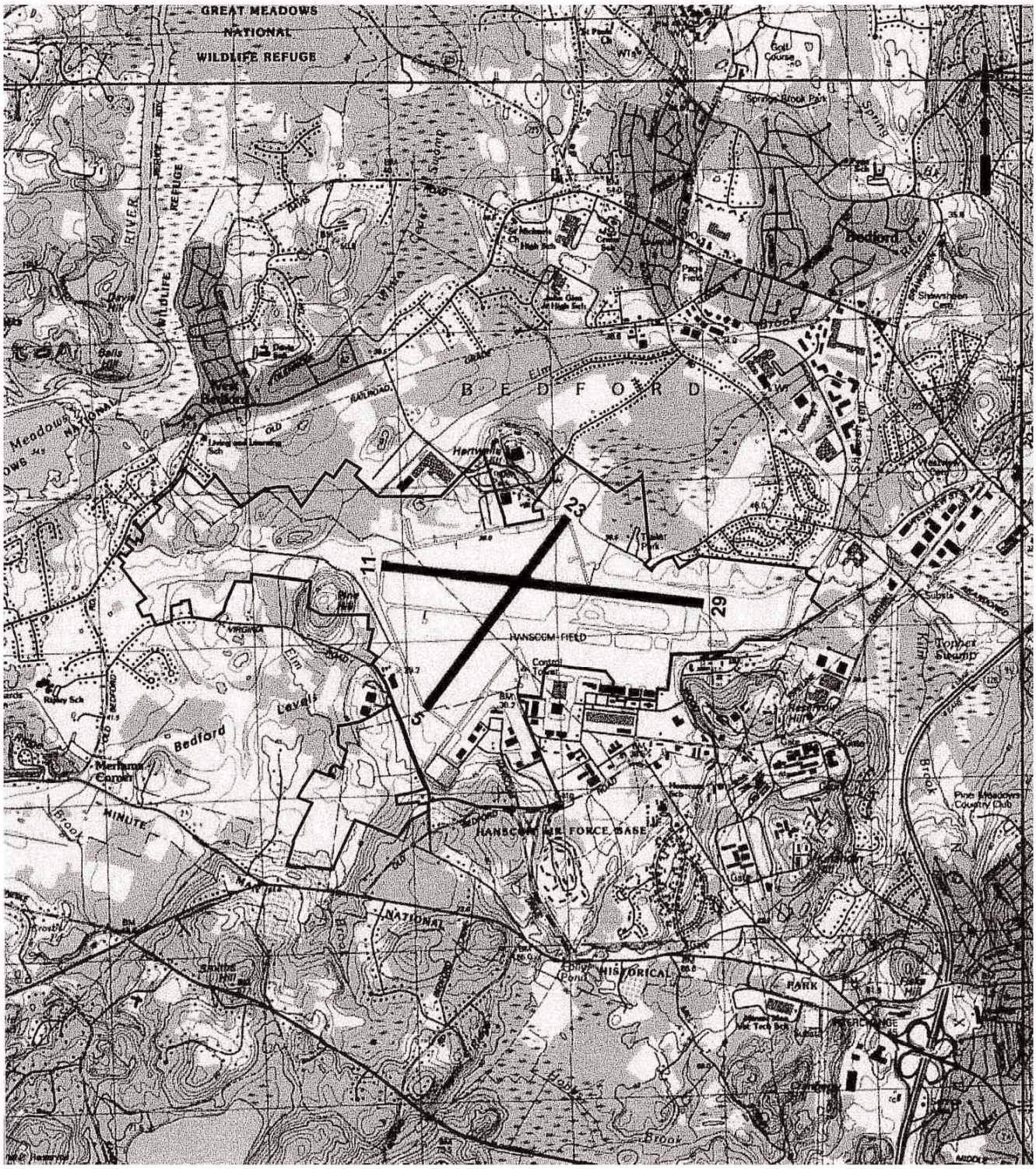
While Massport has taken a lead in the development of this program, finalization of the plan involved coordination with the U.S. Department of Agriculture/Wildlife Services, the Federal Aviation Administration (FAA), MA Natural Heritage and Endangered Species Program and MA Audubon.

Background

Grasslands are a vegetative community that is gradually disappearing in New England; a region that once supported vast natural and managed grasslands. This change is a result of natural succession, development, and the decline in farming. Many of the region's larger grasslands have historically supported large and diverse wildlife populations. As a result of the incremental loss of grasslands, many of these species are now at-risk.

Many airports maintain extensive grass infield areas between runways and taxiways; hence, airports often unintentionally provide some of the best, and last, grassland habitat in the region. This relationship can be a significant aviation safety concern, however, when there is an increase of the risk, frequency and potential severity of wildlife-aircraft collisions.

Similar to other airports in the Northeast, Hanscom Field has provided habitat for a number of grassland birds, several of which have been designated by the MA Natural Heritage and Endangered Species Program (NHESP) as threatened (T) or



Grassland Management Program - Hanscom Field **Figure 1**
Site Locus

Source: USGS Quadrangle Maps for Billerica (1987), Reading (1987), Maynard (1987) and Boston North (1985)

January 2004

endangered (E). These include the grasshopper sparrow (T) (*Ammodramus savannarum)* and the upland sandpiper (E) (*Bartramia longicauda)*. Hanscom Field has also been observed to support other grassland bird species considered to be in decline, but not specifically protected by state or federal regulation.

Regulatory Context

Based upon information included in the NHESP *Massachusetts Natural Heritage Atlas (11th Edition, July 2003)*, substantial portions of Hanscom Field are identified as "Priority Habitats of Rare Species" (Figure 2). Certain activities within the habitats of rare species are subject to the MA Endangered Species Act (MESA) of 1990 and its implementing regulations of 1992 (MGL Chapter 131A).

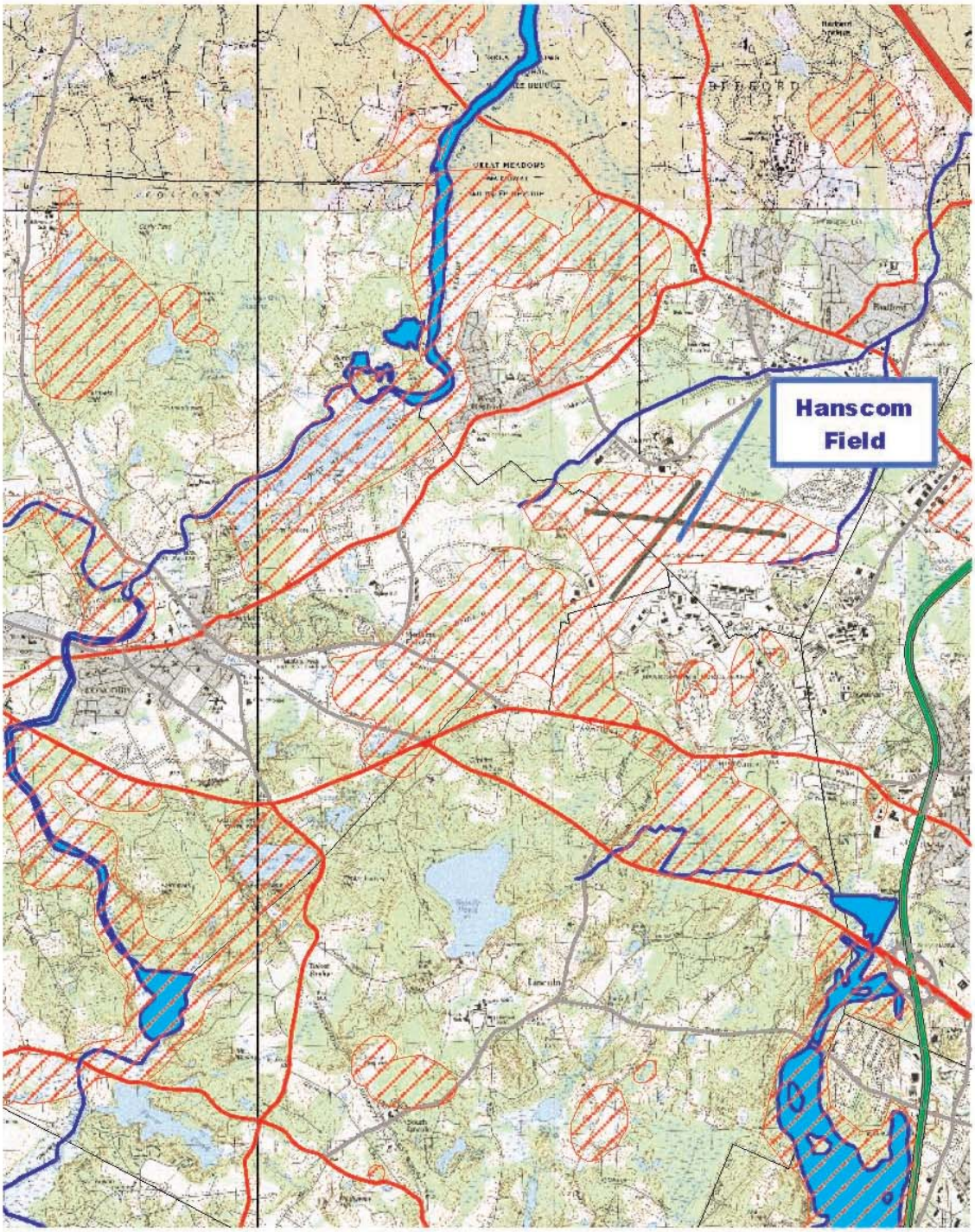
Within the context of MESA, species are listed as endangered, threatened or special concern species. **Endangered** (E) species are "native species which are in danger of extinction throughout all or part of their range, or which are in danger of extirpation from Massachusetts, as documented by biological research and inventory." **Threatened** (T) species are "native species which are likely to become endangered in the foreseeable future, or which are declining or rare as determined by biological research and inventory." **Special Concern** (SC) species are "native species which have been documented by biological research or inventory to have suffered a decline that could threaten the species if allowed to continue unchecked, or which occur in such small numbers or with such restricted distribution or specialized habitat requirements that they could easily become threatened within Massachusetts."

As stated above, Hanscom Field has been documented to support grasshopper sparrow (T) (*Ammodramus savannarum)* and the upland sandpiper (E) (*Bartramia longicauda)*. No avian species of special concern (SC) are reported to exist at Hanscom Field.

In 1996, a series of grassland management recommendations were implemented at Hanscom Field together with a limited haying operation. While the management strategies were noted to result in an increase in grassland birds, the program was suspended in 1999 due to a dramatic increase in bird strikes (notably barn swallows) at Hanscom.

Recently, in addition to requirements pursuant to MESA, there has been ongoing interest by the Conservation Commissions of the Hanscom Area Towns, through the recent 2002 – 2006 Vegetation Management Plan (VMP) process, to establish a more formalized *Grassland Management Program* for Hanscom Field.

The grassland management recommendations described herein have been developed with consideration of the Federal Aviation Administration (FAA) Advisory Circular 150/5200-33, *Hazardous Wildlife Attractants on or near Airports*, which states that "**caution should be exercised to ensure that land use practices on or near airports do not enhance the attractiveness of the area to hazardous wildlife**."



Grassland Management Plan - Hanscom Field Figure 2
NHESP Priority Habitats (PH) of Rare Species

Source: NHESP Heritage Atlas (11th Edition, July 2003)

Grassland Management Program Goals and Objectives

The goal of this program is to provide safe operating conditions at Hanscom Field and the conservation of listed grassland bird species. In this manner, the grassland management program strives to maintain appropriate habitat that is adequately and safely separated from airport operations. Field evidence suggests that properly managed grasslands can, in fact, reduce bird hazards at airports. According to MA Audubon guidance found at http://www.massaudubon.org/Birds_&_Beyond/Grassland_Birds/large.html#burning:

> *"Mowing is essential in grasslands surrounding airfields to prevent growth of woody vegetation and comply with airport safety regulations. However, mowing can be manipulated to reduce mowing costs and benefit grassland birds. Ground-nesting birds found nesting at airfields should not pose a threat to aircraft because of their small size and low direct flight; in addition, managing for these species by leaving some areas unmowed during the summer can help discourage large flocking birds that prefer fields of very short grass, such as gulls, crows, and Canada geese, and are more likely to damage aircraft."*

Based upon information developed for the Hanscom Field Vegetation Management Plan 2002-2006, resources available through NHESP, MA Audubon and other sources, a set of grassland management techniques have been developed for Hanscom Field, with the specific goal of managing grasslands at Hanscom primarily for Grasshopper sparrows and upland sandpiper as well as other declining grassland bird species.

It is anticipated that the recommendations included herein will be used as ***guidelines*** for grassland management at Hanscom Field. The plan has been developed to be flexible enough to allow for the proper management of target hazardous wildlife species without compromising aviation safety. Particular attention will also be paid to the effect that higher grass heights could have on attracting other hazardous wildlife species such as deer, turkey, pheasant, swallows (flocks), raptors, coyote, and fox.

If after implementation of these recommendations there is a documented increase in hazardous wildlife, bird strikes or other safety issues, the plan will be ***immediately*** modified. However, NHESP will be notified of any modification of this plan and the process will involve timely notification of the Hanscom town conservation commissions.

Draft Grassland Management Recommendations

The following section outlines a series of grassland management guidelines for implementation at L.G. Hanscom Field (BED) in the towns of Bedford, Concord and Lincoln, MA [*Note: there are no grassland areas at BED within the Town of Lexington*]. The management of grassland areas on the airport property will be conducted where such management is compatible with airport operations, and does not result in the attraction of wildlife species that are known to be aviation hazards. While the focus of this plan is the careful management of grasslands in close

proximity to airport operating surfaces, the guidelines are also intended to cover selected airport grasslands outside of the fenced airfield areas. Figure 3 illustrates the general limits of grassland management areas.

These guidelines will be followed until such time that conditions change at BED or there are indications of increased bird strike hazards or other potential compromises to aviation safety. In the event field conditions necessitate revision of the plan, modification will be implemented *immediately* to reduce the aviation safety risk. Changes to the plan will be forwarded to the MA Natural Heritage and Endangered Species Program (NHESP) and the Hanscom town conservation commissions.

1. **Conduct annual pre-breeding season review of grassland management procedures and protected grassland birds identification** (upland sandpiper and grasshopper sparrow) **with operations staff.**

2. **Develop an annual mowing schedule** that would maintain managed grassland areas at a height of 6-15 inches.

3. **Develop a plan of the managed areas** The plan shall clearly designate managed areas. Where feasible, the areas shall be separated on the plan using existing, observable features in the field such as signage, hangars, pavement intersections, etc. By using such identifiers on the plan, mowing personnel can more easily identify the different mowing areas in the field. Mowing areas may be adjusted annually based on weather conditions.

4. **Mow Runway and Taxiway Safety Areas prior to May 1,** when feasible, to avoid conflicts with breeding. [*Runway and Taxiway Safety Areas are rectangular areas centered on the runway or taxiway centerlines that include both the runway/taxiway and shoulders. These safety areas are typically level turfed areas that are capable of supporting maintenance and rescue equipment and the occasional passage of an aircraft without causing major damage to the aircraft.*]

5. **Maintain mowed strips along runways (250-feet from runway centerlines) and taxiways (85-feet from taxiway centerlines)** throughout the breeding season to discourage birds from nesting in these areas. Maintenance of the safety areas to the ground elevation is necessary throughout the year to comply with FAA Part 139 certification criteria. The safety areas include all areas immediately adjacent to paved surfaces. Where these adjacent areas are less than 50 feet in width, they will not be included in this management program.

   Most grassland birds prefer the presence of a range of grass heights within the habitat area. By mowing the airport safety areas throughout the growing season, nesting is discouraged. A spring season mowing of these areas prior to nest building activities will discourage nesting in safety areas. By completing an early season mowing, the breeding pairs will opt for the adjacent undisturbed habitat management areas, thus confining the nesting away from the airport operations.

Figure 3 Hanscom Field Grassland Management Program Areas

(11x17 COLOR MAP INSERT OF MOWING AREAS)

6. **Restrict mowing during the breeding (nesting and brood-rearing) season**. (May 1 to July 31) on designated portions of airfield not directly adjacent to runways and taxiways. (Figure 3). Late July typically represents the end of the brood season for most grassland birds, including those species which commonly produce a second brood such as grasshopper sparrow.

7. **Conduct pre-mowing field reconnaissance to observe and mark locations of nesting birds** in "critical areas" [see safety area recommendation #4] along runways and taxiways. Mark and maintain 50-foot diameter unmowed buffer around identified nesting areas until birds have fledged. Avoid mowing marked areas until birds have fledged.

8. **Inspect grassland management areas for young prior to mowing**. The August 1st date is to be used as a guide for the onset of mowing of the protected areas. A general inspection of the management unit should be completed by Massport Operations staff to inspect for active nests. Outside agencies such as USDA and or MA Audubon may also be invited to participate in these activities In the event active nests are identified at this time, mark and maintain 50-foot diameter unmowed buffer around identified nesting areas until birds have fledged. Avoid mowing marked areas until birds have fledged. A reinspection scheduled shall be developed to determine when mowing can resume.

9. **Avoid, as practical, activities on grassland portions of airfield and approach areas** not directly adjacent to runways and taxiways during the breeding season (May 1 to July 31). This would include activities such as parking.

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LAURENCE G. HANSCOM FIELD

2009-2013 VEGETATION MANAGEMENT PLAN

November 2008 Update

Stantec

massport

L.G. HANSCOM FIELD - VEGETATION MANAGEMENT PLAN

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PREFACE

This document is an update to the Vegetation Management Plan for L.G. Hanscom Field. A vegetation management plan (VMP) provides a strategy to be employed by airport operators for prioritizing removal of vegetation which currently penetrates protection zones, and for preventing other vegetation from penetrating protection zones in the future so as to avoid repetitive, large --scale removal projects. Vegetation removal in wetlands at public use airports is regulated by the Massachusetts Wetlands Protection Act (310 CMR 10.00). Within these regulations are provisions for several types of "limited projects," one of which is specifically for the purpose of removing vegetation penetrations from protected airspace (310 CMR 10.24(7)(c)(5) and 10.53(3)(n)). These limited project provisions were enacted as part of the Wetlands Protection Act in January 1994, with the latest revision effective October 6, 1997. A guidance document for conservation commssions relative to VMPs and the Massachusetts Wetlands Protection Act was prepared by the Massachusetts Aeronautics Commission, Massport, the Federal Aviation Administration and the Department of Environmental Protection in 2004. This document, entitled "Vegetation Management at Airports; a Guidance Document to Conservation Commissions" contains important information on the purpose and need for VMPs, the selection of removal and maintenance methods, effects of removal on wetland functions and values, and a discussion of VMPs relative to the Massachusetts Wetlands Protection Act Regulations. It is available at http://www.massaeronautics.org/downloads/macfiles/AirportVMPConsCommGuidanceDoc03-24-04.pdf.

The limited project provisions were the result of a Generic Environmental Impact Report (EOEA No. 8978) produced by the Massachusetts Aeronautics Commission (MAC) and the Massachusetts Port Authority (Massport) which was finalized on August 31, 1993. The Certificate for this GEIR was issued on October 15, 1993. As a follow-up to the GEIR and the limited project provisions, the MAC, Massport and the Massachusetts Department of Environmental Protection (DEP) prepared and submitted an update to the 1993 GEIR in November 1999 titled "*GEIR Update/Expanded GENF - Airport Vegetation Management.*" This GENF (Generic Environmental Notification Form) was a requirement of the 1993 Certificate and served as a progress report on vegetation management projects sponsored by the MAC and Massport that had occurred in Massachusetts to date. A second GEIR Update and Expanded GENF was prepared by MAC and Massport in June 2006 providing another progress report on the statewide VMP process.

The existing limited project provisions of the Massachusetts Wetlands Protection Act require that Notices of Intent filed for vegetation removal projects at public use airports include a five-year vegetation management plan (VMP) with the following elements:

a. purpose and goals statement,
b. identification of airport protective zones,
c. identification of proposed vegetation management areas within the protective zones,
d. identification and prioritization of future vegetation removal projects.

Based on recommendations from the 1993 GEIR and the 1999 and 2006 GENFs, vegetation management plans, or VMPs, have been increasingly expanded to include comprehensive background information that is collected and analyzed during their development. In addition,

an open, public planning process was added to the VMP development, which is conducted prior to the submission of a Notice of Intent for a specific vegetation removal project identified in the VMP. This open, public planning process uses several forums for notification, disseminating information, and for receiving input from the general public and from other interested agencies.

L.G. Hanscom Field (Hanscom) is owned and operated by the Massachusetts Port Authority (Massport). Penetrations to Federal Aviation Administration (FAA) protected airspace exist at Hanscom. This VMP serves as a guide to effectively and responsibly manage their removal and to deter the development of new obstructions while protecting the environment. The VMP will allow Massport to comply with FAA airspace regulations, orders and advisory circulars regarding navigational aids, approach light systems and published approach procedures at Hanscom in accordance with the Wetlands Protection Act. The Limited Project provisions state that airport vegetation removal projects "shall not include the construction of new airport facilities or the expansion or relocation of existing airport uses." This vegetation management plan totally complies with this stipulation. The VMP, all associated permitting (through the Notice of Intent process) and vegetation removal and management will not alter the current permitted operation of the airport or enable larger or louder or more aircraft to use the airport.

It is important to understand that the VMP does not serve as a permit to remove vegetation from wetlands. It is a guidance and strategy document that includes all vegetated areas in and around the airport that may be subject to any vegetation management in relation to protected airspace. It is a comprehensive document to be used by the owners of an airport, the sponsors of any vegetation removal project, and those involved with preparing and effecting any vegetation removal at the airport, whether in uplands or wetlands. It is also an important element of the Notice of Intent when a specific project moves to the permitting phase for work in wetlands. Where this VMP provides general management techniques for various vegetated areas of the airport, the Notice of Intent for a specific removal project will address the more detailed information necessary regarding removal techniques and site access restrictions.

In accordance with the Massachusetts Wetlands Protection Act, this VMP provides guidance for a five-year period. As it is updated, the document will continue to include the subsequent five-year period and builds upon information learned and from proven successes from the previous period. A committed maintenance program is part of this five-year plan. The evolution of the VMP is to be based on results of vegetation removal and management efforts, findings of monitoring efforts, changes in available management techniques, changes in site conditions, changes in environmental regulations and practices, and renewed obstruction analysis.

CHAPTER 1: INTRODUCTION

In 2002, Massport prepared a Vegetation Management Plan (VMP) to guide the maintenance of protected airspace at L.G. Hanscom Field. The VMP served as a guide for current and future vegetation removal projects conducted at the airport. This overall guidance document provides necessary background information for each permitting and maintenance cycle that will occur on an approximately 5-year basis as updates to the airspace analysis and project environmental permitting are completed. Upon completion of each cycle, this VMP will be updated to reflect changes in site conditions, lessons learned from previous removal projects, and changes in regulations. The majority of the VMP information will remain per the original document.

This revision is the 2008 Update of the Vegetation Management Plan for L.G. Hanscom Field. It is the first update to the original VMP completed in 2002 and reflects information obtained and lessons learned as a result of the initial removal project and associated maintenance program implemented from 2003 through 2007. Updates are made to the VMP when each new five-year plan is developed. Massport will provide copies of the updated document to the four abutting towns' conservation commissions as part of the permitting process. The Conservation Commission meetings will provide opportunities for the public to review the revisions and ask questions of Massport officials.

A. Purpose and Goals

The purpose of the VMP for L. G. Hanscom Field is to comply with FAA regulations and Massachusetts General Laws regarding protected airspace. Specifically, vegetation removal and management must be undertaken to comply with the following:

Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*;
FAA Advisory Circular 150/5300-13, *Airport Design*;
FAA Order 6750.16B, *Siting Criteria for Instrument Landing Systems*;
FAA Order 8260.3B, *United States Standards for Terminal Instrument Procedures (TERPS).*

In addition to the above-referenced standards, the following standards were reviewed with respect to protected airspace:

1. FAA Order 6850.2A, Chapter 2, regarding approach lighting clearance criteria;
2. FAA Order 6850.2A, Chapter 3, regarding Visual Approach Slope Indicator criteria;
3. FAA Advisory Circular 50/5345-28D, Precision Approach Path Indicator criteria.

These standards are for systems ancillary to instrument landing systems covered under FAA Order 6750.16B.

The goal of the 2008 Update to the VMP for L. G. Hanscom Field is to maintain airport safety in accordance with FAA requirements through the removal of vegetation that currently penetrates or is expected to penetrate protected airspace in and around the airport, and to create low-growing vegetative communities within critical areas to facilitate long-term management of the areas. A secondary goal is to minimize the extent and magnitude of future removal projects. To that end, this VMP will serve as a guide for vegetation removal and management practices that

will minimize the potential for adverse impacts to the environment. It also provides suggestions to adequately mitigate for such impacts. While the VMP is a guide for the current and future vegetation removal projects at the airport, individual permit applications under the Massachusetts Wetlands Protection Act may need to be prepared for specific removal projects. Details regarding wetland impacts, project access routes, staging areas, etc., will be described in the permit applications for each project.

Performed in concert with an obstruction analysis which identified vegetation heights based on aerial photogrammetry, this VMP is the result of a comprehensive and exhaustive environmental review of the entire airfield landscape. The development of a pre-established set of vegetation management techniques tailored to specific areas of the airfield will allow Massport to maintain L.G. Hanscom Field in an efficient and environmentally responsible manner.

B. Setting

Hanscom Field is located in the Towns of Bedford, Concord, Lexington, and Lincoln, Massachusetts (see **U.S.G.S. Site Locus, Figure 1-1**). The facility comprises approximately 1,300 acres of land north of Route 2A and west of Route 128. Topographically, the airport is located within a broad, level plain with intermittent low hills to the south and east. Two perennial stream valleys extend through the property. Elm Brook flows from south to north in the approach to Runway 11, and the Shawsheen River flows from south to north in the approach to Runway 29. Kiln Brook, a perennial tributary to the Shawsheen River, flows from east to west within the approach of Runway 29. Although VMP work will occur within the watershed of this brook; it is not located on airport property.

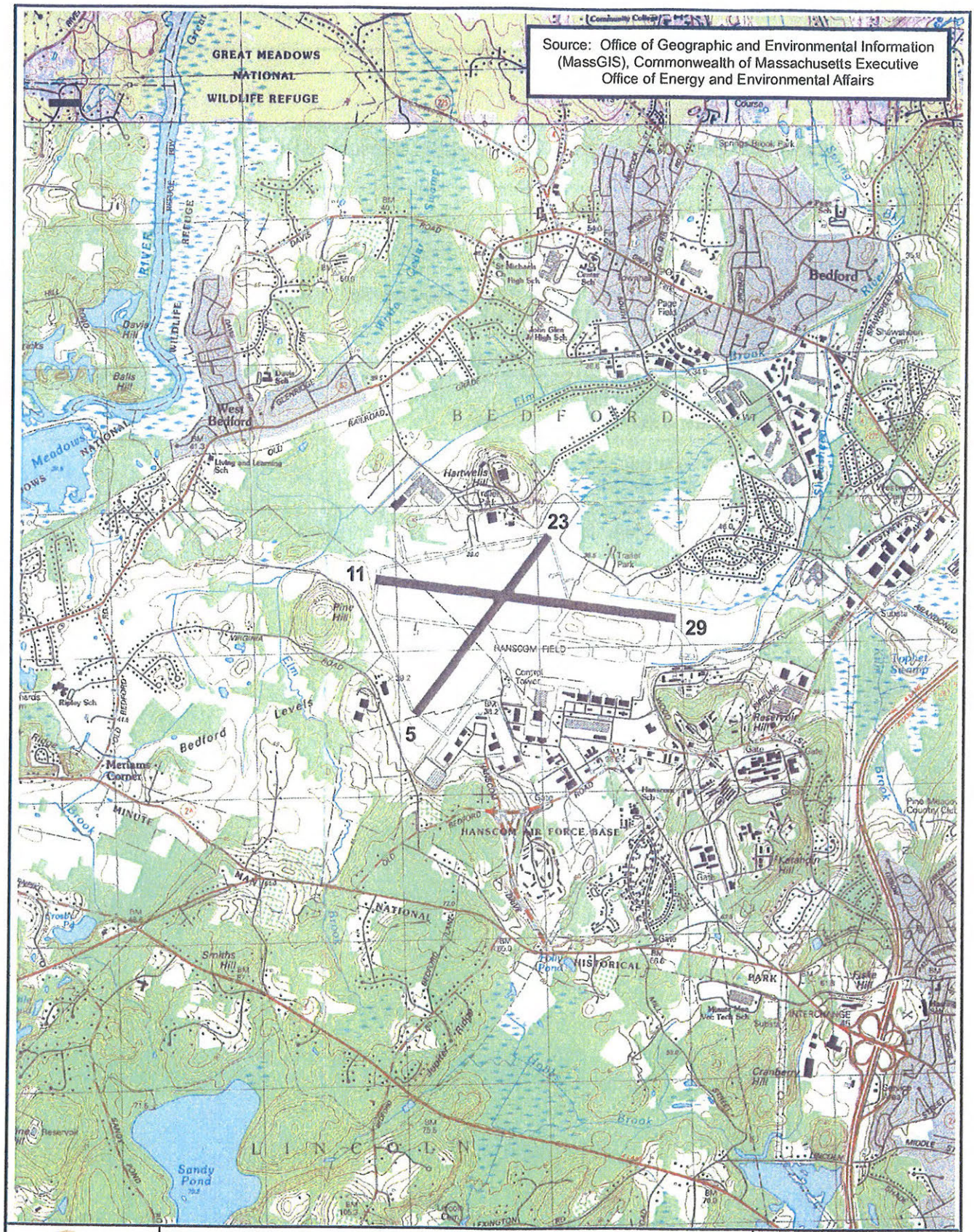
The airport consists of two paved runways. Runway 11-29 is 7,001 feet long and 150 feet wide, and Runway 5-23 is 5,106 feet long and 150 feet wide.

South of the airport, and entirely outside of the VMP project limits, is Minuteman National Historical Park. North of the airport and directly off of the Runway 23 end is the Jordan Conservation Area and the Hartwell Town Forest; two properties owned by the Town of Bedford for conservation and recreation purposes. Airspace management could involve both Bedford properties as discussed in this VMP.

C. General Information

General Information Summary for the 2002-2022 L.G. Hanscom Field VMP:

Airport Name	L.G. Hanscom Field
Airport Location	Bedford, Concord, Lexington, Lincoln - Massachusetts
Contact Person	Mr. Tom Ennis, Senior Project Manager/Senior Planner Telephone: (617) 568-3546
Airport Owner	Massachusetts Port Authority (Massport)
Owner Address	One Harborside Drive East Boston, MA 02128-2909
Airport Director	Ms. Barbara Patzner Massport Civil Air Terminal 200 Hanscom Drive Bedford, MA 01730 Telephone: (781) 869-8000


Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs
GREAT MEADOWS NATIONAL WILDLIFE REFUGE
BEDFORD
LINCOLN
HANSCOM FIELD
HANSCOM AIR FORCE BASE
23
11
29
5
Bedford
West Bedford
Hartwells Hill
Pine Hill
Merlins Corner
Smiths Hill
Sandy Pond
Reservoir Hill
Ketaholdin Hill
Fiske Hill
Cranberry Hill
Davis Hill
Balls Hill
Control Tower
Trailer Park
Page Field
Ripley Sch
Davis Sch
Hanscom Sch
Pine Meadow Country Club
Stantec
Northampton, Massachusetts
Tel (413) 584-4776
www.stantec.com
L.G. HANSCOM FIELD
VEGETATION MANAGEMENT PLAN
SITE LOCUS
FIGURE 1-1
BEDFORD
MASSACHUSETTS
Project No. 195210330
Proj. Mgr. SGL
Scale 1" = 3000'
Date SEPT. 2008
A

CHAPTER 2: AIRPORT PROTECTION ZONES

A. FAA Protected Airspace

The FAA has defined numerous protected airspace "surfaces," or protection zones, in and around airports. The surfaces important to vegetation management at L. G. Hanscom Field are as follows:

1. *Primary Surface* - a surface longitudinally centered on each runway and extending 200 feet beyond each runway end. For Runway 5-23, this surface is 500 feet wide. For Runway 11-29, which has a precision instrument approach landing system, the primary surface is 1,000 feet wide. The elevation of this surface at any given location is the same as the nearest point on the centerline of the runway. Any object, including vegetation, which is within the primary surface and is at a higher elevation than the runway centerline, is a penetration of navigable airspace.

2. *Approach Surfaces* - sloping areas beginning at the limits of the primary surface at each runway end and extending outward and upward. The surface widens at a prescribed angle as it extends outward. The slope depends on the type of navigation instruments present for each particular runway approach. The approach slopes for Runway 11-29 and Runway 23 are 34:1, meaning the surface rises one foot in elevation for each 34 feet outward from the end of the primary surface. The approach slope for Runway 5 is 20:1. Within the approach surface areas of Runway 11-29 are *approach light planes*, which are 400 feet wide and 2,500 feet long beginning at the runway thresholds. Vegetation within the approach light planes must be maintained below the elevations of the approach lights to ensure that pilots have an unobstructed view of the lights when landing. The slopes of the approach light planes are 50:1.

3. *Transitional Surfaces* - sloping areas extending outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces.

4. *Missed Approach Surface* – sloping areas of varying degree utilized for landing during instrument flight rule (IFR) conditions. If a pilot does not visually locate the landing runway when an established "minimum" elevation and distance from the runway is achieved, the attempted landing must be aborted and a missed approach must be flown.

Figure 2-1 shows the areas of the primary, approach, and transitional surfaces at L.G. Hanscom Field. **Figure 2-2** shows a three-dimensional view of the approach surface and the approach light plane at the Runway 11 end. **Figure 2-3** shows graphics of typical precision missed approach surfaces from FAA Order 8620.3B, *U.S. Standard for Terminal Procedures (TERPS)*. These areas are the basis for the vegetation management areas that have been defined in this VMP. Runway designations and threshold locations have not changed from previous projects, nor will they change as a result of any vegetation management proposed in this VMP.

B. Identification of Airspace Obstructions

Prior to the development of each VMP update, Massport completes an extensive analysis of the existing obstructions at L.G.Hanscom Field using aerial photogrammetry (obtained in 2007) to determine object heights and ground elevations. The photogrammetry data included the elevations of the ground surface, structures, vegetative canopy height, and in sparsely vegetated areas, individual trees. The photogrammetry data is compared to three dimensional computer modeling of the primary, approach, transitional and missed approach surfaces at the airport based upon existing runway lengths, widths, approach categories, and navigational aid types and locations. The model assigns elevations to all of the protected airspace surfaces and compares them to the identified object elevations. Where vegetation is sparse, individual tree heights were identified from the aerial photogrammetry. Where the cover is dense, it is not feasible to determine the height of each stem. In these areas, the tallest point is determined within a 50 foot by 50 foot grid. Field analysis is then used to supplement this data to determine whether an identified penetration represents one or more actual trees, saplings and/or shrubs.

The photogrammetry data used for the VMP update was collected in June 2007. Copies of the VMP update will be provided to the four towns' libraries and conservation commissions.

The comparison of elevations between the protected airspace surfaces and vegetation around L.G. Hanscom Field allows for a determination of the location and extent of penetrations to these surfaces. A two-dimensional point plot of the analysis is prepared to show all points that are currently penetrating the protected airspace as well as those that are within ten feet below each individual surface. (**Figure 2-4** shows an example of a portion of a point plot from the airspace analysis from the 2007 photogrammetry data.) Tables are then generated to describe the type of penetration (i.e. vegetation, pole, building), the elevation of the top of the object in feet above mean sea level, the ground elevation, and the elevation of the object with respect to the protected airspace surface. Woody vegetation within ten feet below protected airspace is expected to become a penetration within five years and so is included in each removal project. After five years, it is recommended that the vegetation management plan be updated with new aerial photogrammetry point data.

Through careful comparison of the penetration data with the various vegetation species and cover types, it is possible to determine the extent of the required vegetation removal. In many areas, only sporadic individual penetrations need removal. In other areas, significant understories may be preserved beneath the taller penetrating vegetation. The relative height of the protected airspace and the ground is important. Where the protected airspace is only a few feet above the ground, for example, removal of woody vegetation to ground level may be necessary, and a management method may then be employed to encourage lower growing vegetation to thrive. Where the airspace elevation is well above the ground, management for a taller vegetative community is possible.

Upon completion of the original (1998) obstruction analysis, the vegetation types and the environmental resources that exist within the study area were identified for the original VMP. For each update, the environmental resources are re-investigated for any potential changes. Sensitive environmental resources within the project area are discussed in Chapter 3.

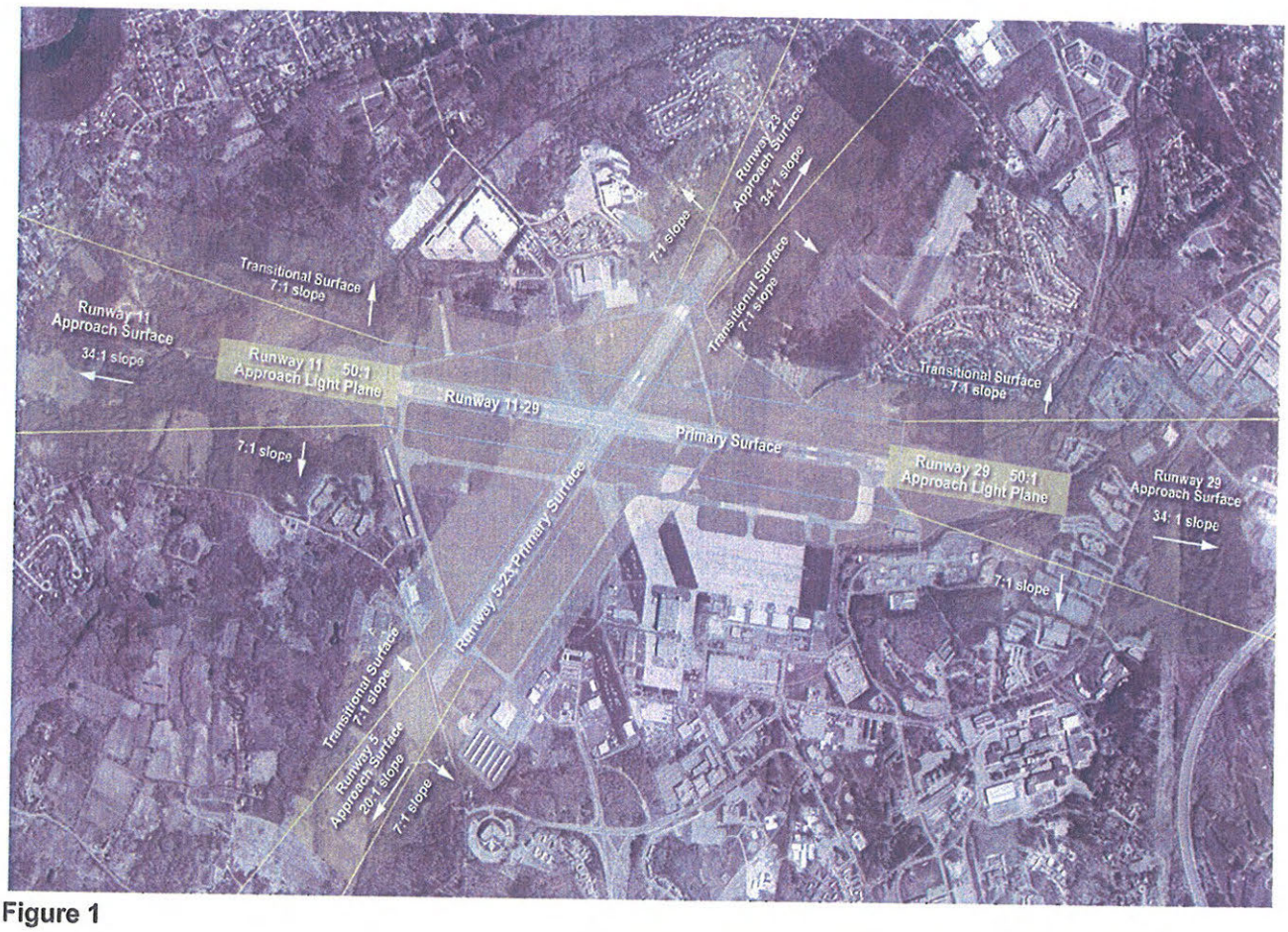

Transitional Surface
7:1 slope
Runway 11
Approach Surface
34:1 slope
Runway 11 50:1
Approach Light Plane
Runway 11-29
7:1 slope
Runway 5-23 Primary Surface
Primary Surface
Runway 23
Approach Surface
34:1 slope
7:1 slope
Transitional Surface
7:1 slope
Transitional Surface
7:1 slope
Runway 29 50:1
Approach Light Plane
Runway 29
Approach Surface
34:1 slope
7:1 slope
Transitional Surface
7:1 slope
Runway 5
Approach Surface
20:1 slope
7:1 slope

Figure 1

1

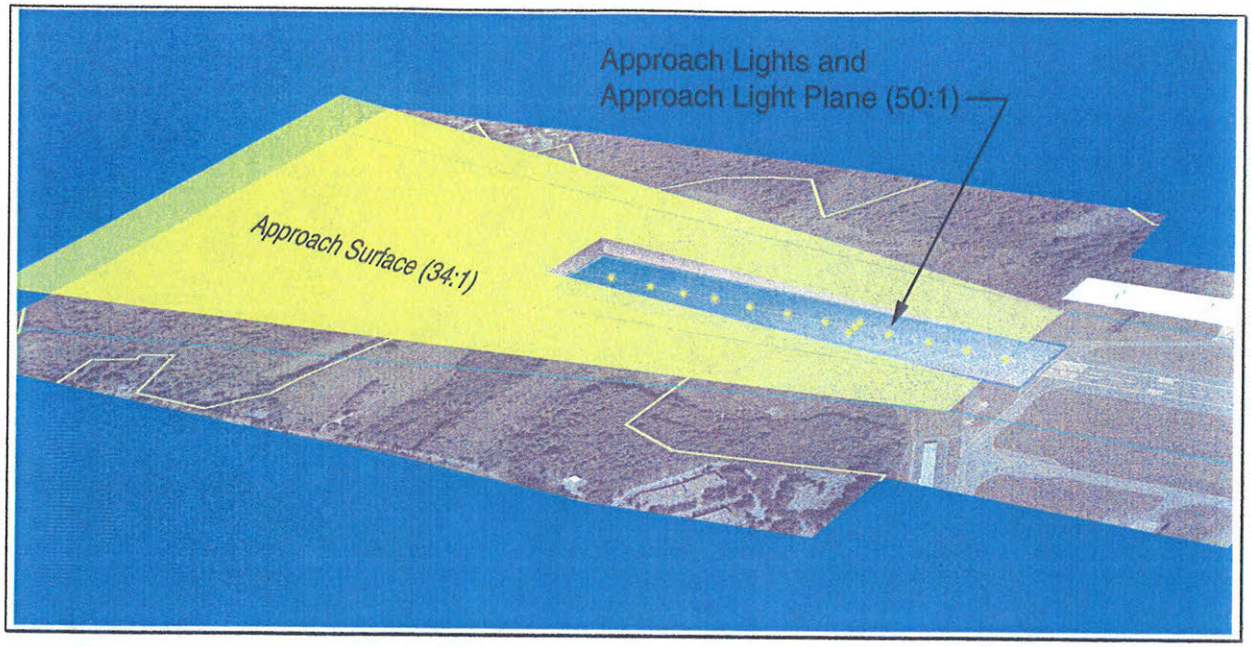


Figure 2

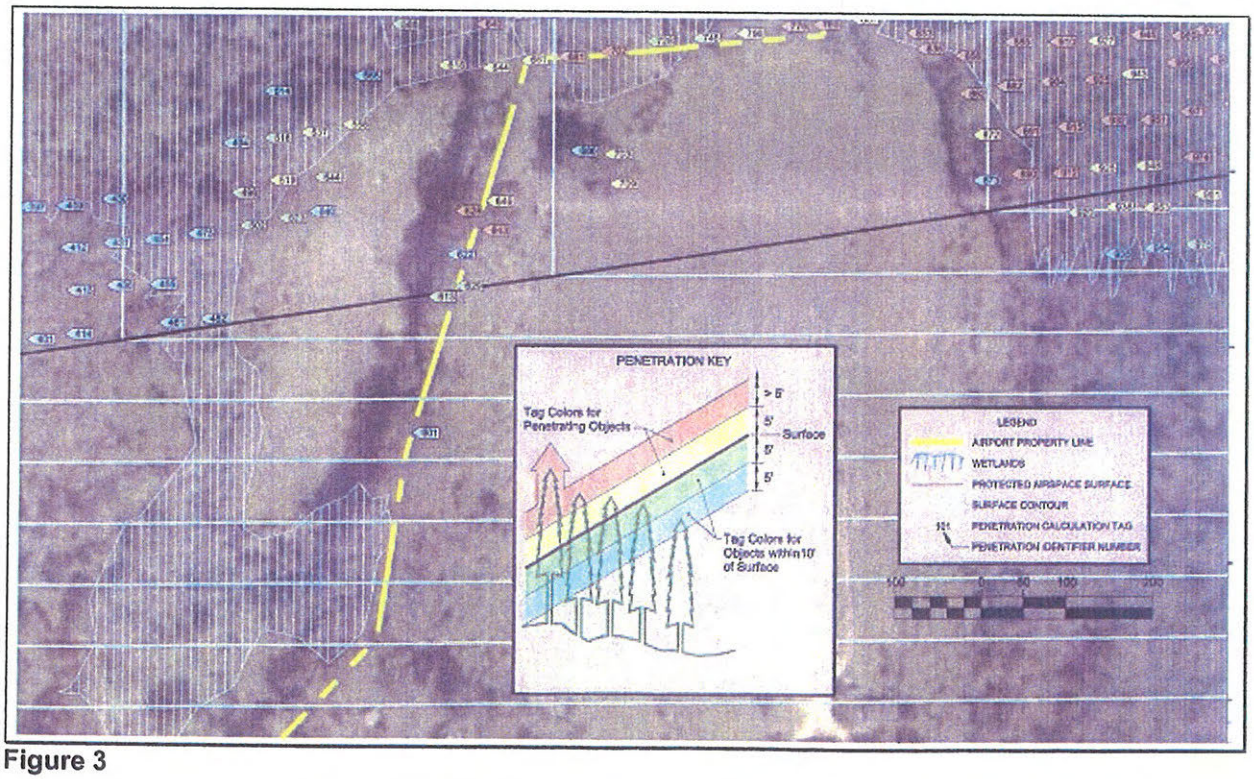


Figure 3

(3) **Compare the ROC surface elevation** at the clearance limit with the 40:1 surface elevation.

(a) If the computed 40:1 surface elevation is equal to or greater than the ROC surface elevation, a climb-in-hold evaluation is NOT required.

(b) If the computed 40:1 surface elevation is less than the ROC surface elevation, a climb-in-hold evaluation IS required. FAA Order 7130.3, Holding Pattern Criteria, paragraph 35, specifies higher speed groups and, therefore, larger template sizes are usually necessary for the climb-in-hold evaluation. These templates may require an increase in MHA under TERPS, paragraph 293a. If this evaluation requires an increase in the MHA, evaluate the new altitude using the higher speed group specified in paragraph 35. This sequence of review shall be used until the MHA does not increase, then the 40:1 surface is re-evaluated. If obstacles penetrate the 40:1 surface, take action to eliminate the penetration.

d. The charted missed approach altitude is the higher of the preliminary charted missed approach altitude or the MHA established under paragraph 274c(3)(b).

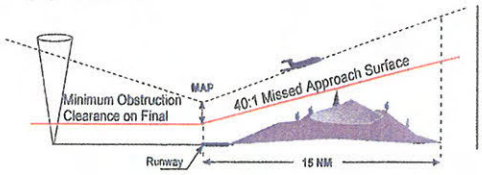


Figure 17. STRAIGHT MISSED APPROACH OBSTACLE CLEARANCE. Par 274.

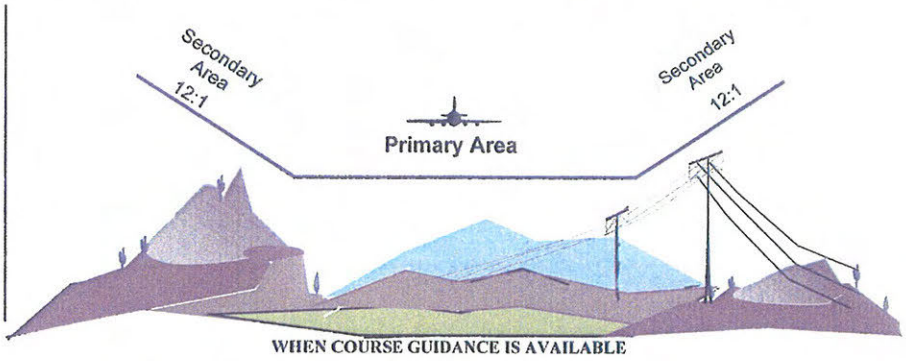


Figure 18. MISSED APPROACH CROSS SECTION. Par 274.

275. TURNING MISSED APPROACH AREA. (See Volume 3 for special provisions). If a turn of more than 15° from the FAC is required, a turning or combination straight and turning missed approach area must be constructed.

NOTE: If the HAT value associated with the DA/MDA is less than 400 feet, construct a combination straight and turning missed approach (see paragraph 277) to accommodate climb to 400 feet above touchdown zone elevation prior to turn.

a. The dimensions and shape of this area are affected by three variables:

(1) Width of final approach area at the MAP.

(2) All categories of aircraft authorized to use the procedure.

(3) Number of degrees of turn required by the procedure.

Figure 4

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CHAPTER 3: SENSITIVE ENVIRONMENTAL RESOURCES

Preparation of this VMP update involved the investigation of various environmental resources which could affect the design of the vegetation management program. Data were collected from state, federal, and municipal agencies as well as from field research. The following is a list of protected environmental resources investigated as part of the preparation of this VMP update.

- Rare and Endangered Species (state and federal)
- State and Federal Wetland Resources
- Areas of Critical Environmental Concern (state-defined)
- Wild and Scenic River Corridors (U.S. Dept. of the Interior)
- Drinking Water Supplies (Massachusetts Water Quality Classification)
- Nuisance Vegetation
- Steep Slopes
- Organic Soils
- Historic/Archaeological Resources
- Closed Landfill Areas

Table 3-1 provides a summary of the results of the environmental resources investigation.

A. Rare and Endangered Species

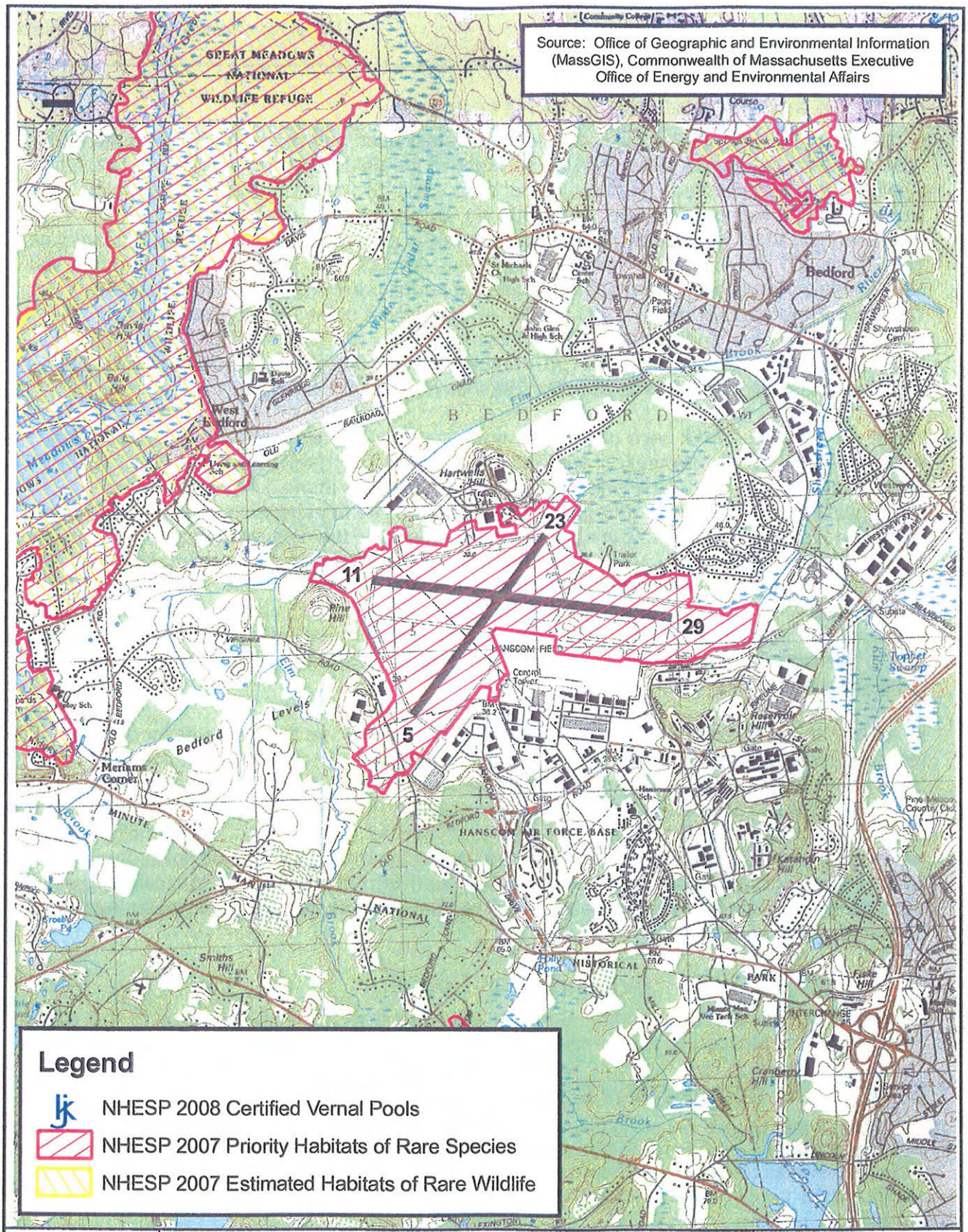
The most recent edition of the Massachusetts Natural Heritage Atlas (October 1, 2006) was consulted to determine whether this proposed VMP update will adversely impact any state-listed rare or endangered wildlife species. The Atlas indicates the presence of three certified vernal pools within Vegetation Management Area (VMA) 2 at the Runway 11 end in the Town of Concord on the Estimated Habitat Map (**Figure 3-1**). Additionally, a non-certified vernal pool area exists just north of the Runway 29 end within VMA 6 in the Town of Bedford.

The Atlas also shows a priority site designation (site PH-461 pursuant to the Massachusetts Endangered Species Act) for much of the non-wooded areas within the airport property (**Figure 3-1**). The identified species within the priority site designation include Grasshopper Sparrow (*Ammodramus savannarum*), Upland Sandpiper (*Bartramia longicauda*), and Elderberry Longhorn Beetle (*Desmocerus palliatus*). Due to the presence of protected wildlife species within and adjacent to the proposed clearing areas, coordination with the Massachusetts Natural Heritage and Endangered Species Program (MNHESP) during the preparation of each removal project under this VMP update will be required. Coordination will include the submission of a copy of the Notice of Intent (Massachusetts Wetlands Protection Act) for each removal project to the MNHESP for review and comment. Note that Massport has developed and enacted a grassland bird management plan as a part of the implementation of the original VMP.

Chapter 5 includes project mitigation measures designed to protect, preserve, and, in places, enhance the habitat provided for state-listed rare wildlife species. Vegetation within each of these identified habitat areas will be managed based upon the selected management technique described in Chapter 4 and shown on the VMA Map in Appendix F. However, the management within the identified sensitive habitat will be completed with additional mitigation measures, so that the obstruction is addressed, but the habitat is protected.

Table 3-1: *Summary of the environmental constraints analysis*

Protected Resource	Present or Absent at the airport	Comments
Rare and Endangered Species	Present	State-level threatened and special concern species have been identified within the project limits. Three certified vernal pools exist within the property limits at the RW 11 end (Concord), and one non-certified pool exists at the RW 29 end (Bedford). Notice of Intent review by the Mass. Natural Heritage Program required.
State / Federal Wetlands	Present	Full delineation of wetlands within the VMAs has been completed for this VMP
Areas of Critical Environmental Concern	Absent	No ACECs occur within the project area according to the Department of Conservation and Recreation (formerly Ma. Dept. of Environmental Management).
Wild and Scenic Rivers	Absent	The Shawsheen River and tributaries are not listed as Wild and Scenic by the National Park Service (NPS) according to the most recent update of the NPS database.
Public Water Supplies	Present	Elm Brook at the Runway 11 end and much of the surrounding land is within the Zone II of a public water supply wellfield. The Zone II designation indicates that it is a contributing watershed to the well.
Nuisance Vegetation	Present	European Buckthorn Common Reed and Purple Loosestrife exist within both wetland and upland areas on the project site. Buckthorn is a dominant shrub in most upland and wetland wooded areas of the airport property.
Steep Slopes	Present	Designated access routes and sensitive clearing techniques have been specified for the Shawsheen River and Elm Brook corridors which contain steep bank areas.
Organic Soils	Present	Full delineation of wetlands within the VMAs has been completed for this VMP and areas of soft soils identified.
Historical/Archeological Resources	Present	No reduction in visual buffer between Minuteman National Historical Park and aircraft operating areas will be allowed.
Closed Landfill Areas	Present	No equipment or vehicles will be allowed on or near landfill caps to ensure no damage is done to these areas.



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L.G. HANSCOM FIELD
VEGETATION MANAGEMENT PLAN
ESTIMATED AND PRIORITY HABITATS
FIGURE 3-1
BEDFORD MASSACHUSETTS

Project No.	195210330
Proj. Mgr.	SGL
Scale	1" = 3000'
Date	SEPT. 2008
A	

B. State and Federal Wetland Resources

Implementation of the VMP update requires the identification and delineation of the state and federal wetland resources within the VMAs. Many of the VMAs contain penetrations that are located within wetland areas, buffer zones of state wetlands, riverfront areas of perennial streams, or 100-year flood zones. Consequently, environmental permits are required to implement the VMP. If soil alteration within wetlands is proposed, a permit is required pursuant to Sections 401 and 404 of the Federal Clean Water Act (33 USC 1251 et seq.). Any proposed work within wetlands or wetland buffers requires a permit pursuant to the Massachusetts Wetlands Protection Act (MGL c. 131 s. 40). A requirement of the permit process is the delineation of the wetland resource areas pursuant to the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1987)* and the manual *Delineating Bordering Vegetated Wetlands pursuant to the Massachusetts Wetlands Protection Act (1995)*.

Wetlands within the VMAs were delineated by certified professional wetland scientists for this VMP update. The field delineation was completed during the growing season, in August 2001 and updated in July 2008. The limit of vegetated wetland was marked in the field using sequentially numbered surveyor flagging (pink and blue) tied to vegetation. These flags were refreshed for the 2008 update within those areas pertinent to the next removal project. To provide for quick identification of the wetland flags, each delineation point was marked with "witness" flags tied above and below the numbered flag to provide for easy observation in the field. These wetland areas were approved by the conservation commission of each municipality through the Abbreviated Notice of Resource Area Delineation (ANRAD) process in December 2001. The limits of the wetlands are shown on the Vegetation Management Areas map provided in Appendix F of this VMP.

In addition to vegetated wetland, other wetland resources exist on the site as defined in the Massachusetts Wetlands Protection Act Regulations (MWPA). Both Elm Brook and the Shawsheen River contain 100-year floodplain identified by the Federal Emergency Management Agency (FEMA). These areas are shown in **Figures 3-2 through 3-4**. A floodplain is a resource area known as "bordering land subject to flooding" in the MWPA. Additionally, these waterways are both shown to be perennial streams on the United States Geological Survey Quadrangle (**Figure 1-1**) and thus contain a 200-foot riverfront area measured outward from each bank. Additionally, the area between the banks below the average mean water level is defined as "land under water".

C. Areas of Critical Environmental Concern

No Areas of Critical Environmental Concern are located within close proximity to the airport according to the Massachusetts Department of Conservation and Recreation Website, 2008.

D. Wild and Scenic River Corridors

The United States Department of the Interior National Park Service maintains a database on the wild and scenic river program which provides the regulatory status of all rivers which have been designated since the implementation of the Wild and Scenic Rivers Act. The Shawsheen River, Elm Brook, and Kiln Brook are not listed in the most recent update (2006) of the database.

E. Drinking Water Resources / Outstanding Resource Waters

The on-site waterways are listed as Class B waters according to the most recent edition of the Massachusetts Surface Water Quality Standards indicating that they are not used as public drinking surface water supplies. While the wetlands and waterways within the VMAs are not considered to be drinking water resources, the three certified vernal pool areas at the Runway 11 end are considered to be Outstanding Resource Waters pursuant to Section 401 of the Federal Clean Water Act, and are thus afforded the same protection as Class A waters, and are subject to the "no alteration" provisions of the Section 401 regulations.

The Towns of Bedford, Concord, Lexington, and Lincoln were consulted to determine the presence of public or private water supply wells within 400 feet of those VMAs where herbicide applications are proposed as a secondary vegetation management technique (see Chapter 4). Based on the lists of registered private wells maintained by the towns' boards of health, and discussions with the individual town water departments, the following information is provided:

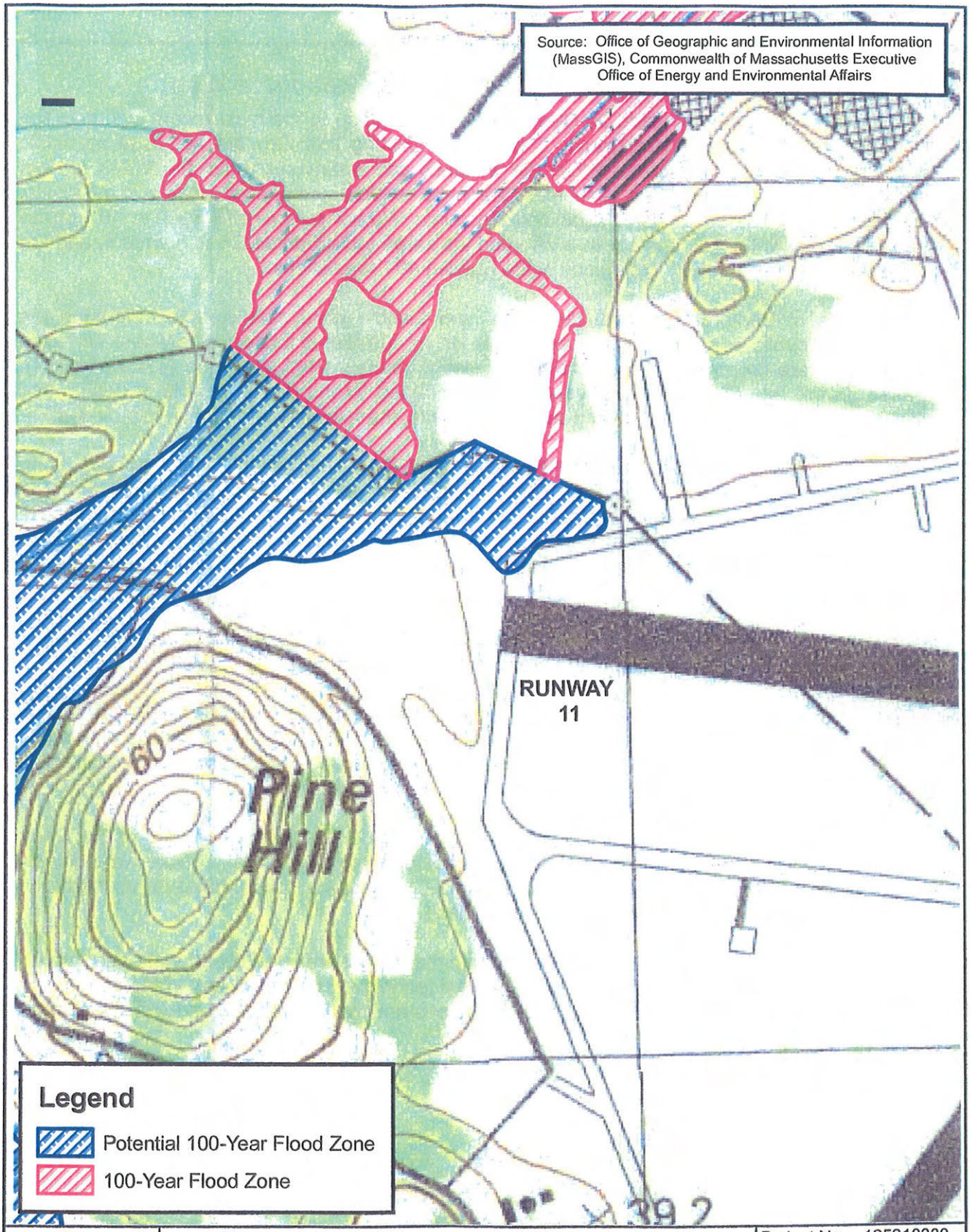
- The Town of Bedford maintains only three public water supply wells located along Shawsheen Road near the Page Road intersection. The proposed herbicide applications are located outside of the Zone 1 and Zone II boundaries of this wellfield. The remaining Town water is provided by the Massachusetts Water Resources Authority (MWRA). No private potable water supply wells were identified within the Town of Bedford adjacent to the site.

- A Zone II delineation of a public water supply wellfield includes a portion of the airport property along Elm Brook at the Runway 11 end (figure 3-5).

- The Town of Lexington obtains municipal water exclusively from the MWRA, and does not maintain any active municipal wells adjacent to the airport. The business park at the Runway 29 end is serviced by municipal water and does not maintain an on-site potable water supply well.

- The Town of Lincoln municipal water supply is located in the southern end of the Town. The Zone I and Zone II boundaries do not extend into any VMAs. Private water supply wells exist within Lincoln along Airport and Old Bedford Roads, however no herbicide applications will occur within 400 feet of these areas.

Based on the investigation of water supplies within the project area, the use of state-approved herbicide applications as a secondary management technique in the identified VMAs is allowable under the present drinking water regulations and the Massachusetts Pesticide Control Act.



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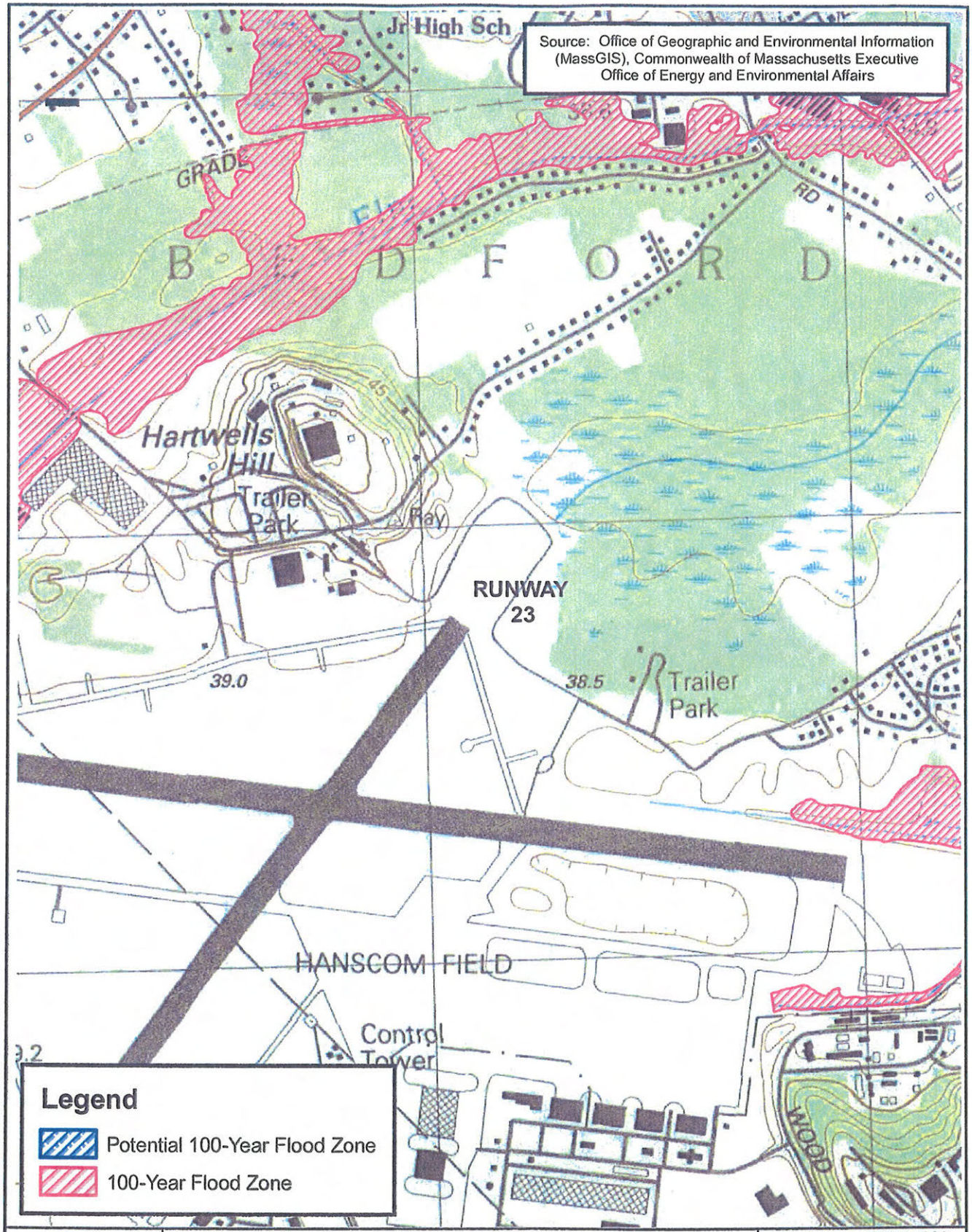
L.G. HANSCOM FIELD
VEGETATION MANAGEMENT PLAN
FEMA FLOOD MAP - RUNWAY 11
FIGURE 3-2

BEDFORD MASSACHUSETTS

Project No.	195210330
Proj. Mgr.	SGL
Scale	1" = 500'
Date	SEPT. 2008
A	



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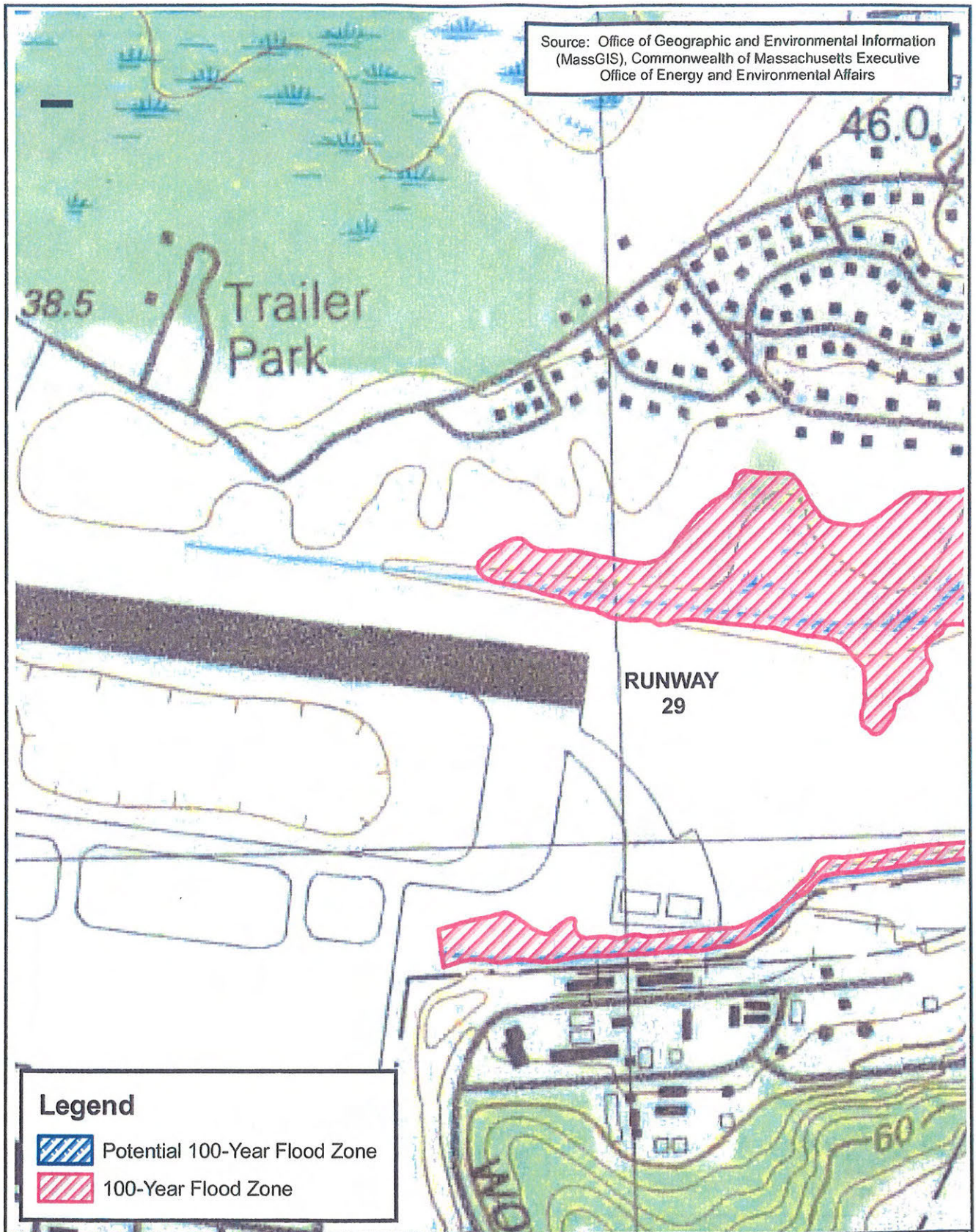
L.G. HANSCOM FIELD
VEGETATION MANAGEMENT PLAN
FEMA FLOOD MAP - RUNWAY 23
FIGURE 3-3

BEDFORD MASSACHUSETTS

Project No.	195210330
Proj. Mgr.	SGL
Scale	1" = 1000'
Date	SEPT. 2008
A	



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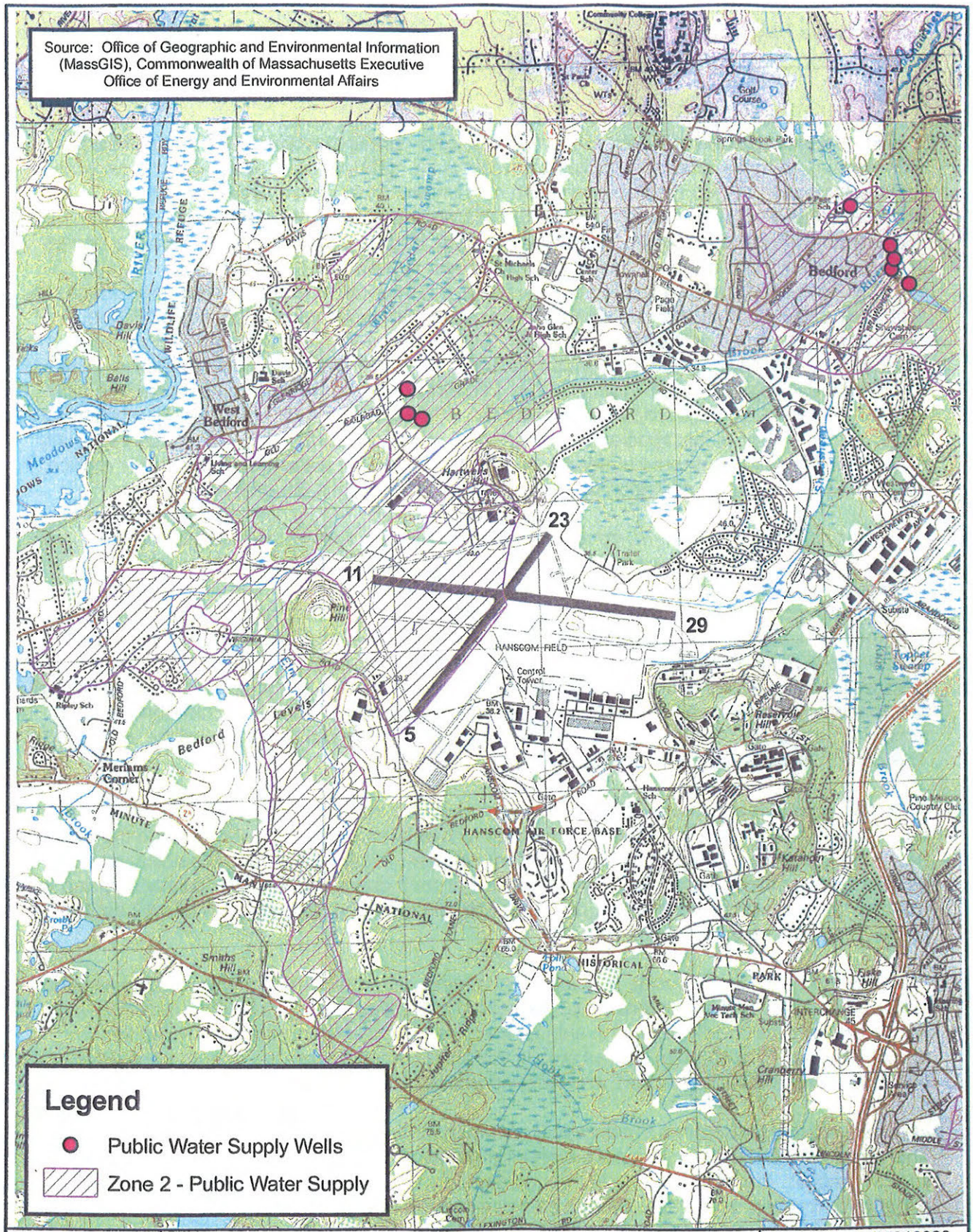
L.G. HANSCOM FIELD
VEGETATION MANAGEMENT PLAN
FEMA FLOOD MAP - RUNWAY 29
FIGURE 3-4

BEDFORD MASSACHUSETTS

Project No.	195210330
Proj. Mgr.	SGL
Scale	1" = 500'
Date	SEPT. 2008
A	



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L.G. HANSCOM FIELD
VEGETATION MANAGEMENT PLAN
WATER RESOURCES MAP
FIGURE 3-5
BEDFORD MASSACHUSETTS

Project No.	195210330
Proj. Mgr.	SGL
Scale	1" = 3000'
Date	SEPT. 2008
A	

F. Nuisance Vegetation

The airport property and adjacent properties presently contains established stands of purple loosestrife (*Lythrum salicaria*). Purple loosestrife is an herbaceous species which is capable of rapid colonization of disturbed soils and can outcompete most native vegetation where disturbed soils and full sun coverage occur within and adjacent to wetland areas. This species is dominant within the emergent marsh area of VMA 13, but is also common within the beaver impact areas of the Elm Brook and Shawsheen River corridors at the Runway 11, 29, and 23 ends. Where seed stock for these species exists, it is imperative that disturbed soil surfaces be protected within both upland and wetland areas, and that native vegetation is established through seeding where soil alterations occur. The spread of this species is primarily a concern in those wetland areas where conversion from a scrub-shrub wetland to a wet meadow area will result from the vegetation removal (VMA 7). In these cases, immediate protection of the soil through seeding is required to block colonization. Selective removal and mowing frequencies can be used to control this species within the VMA in the long term. Mowing can be especially effective if it is completed prior to seed germination. Mitigation measures to control or reduce the spread of nuisance vegetation on the airport are discussed in Chapter5.

European buckthorn (*Rhamnus frangula*), an invasive shrub species also located on the property, is the dominant shrub layer species in most wooded wetland areas on the site (see Appendix A). It is immune to removal through cutting, and is capable of rapid colonization of areas where competition is low, and light penetration is not a limiting factor. Seed dispersal by this species is completed by several common wildlife species, thus eradication of buckthorn from a site is not feasible if seed stock occurs within adjacent, unmanaged areas. The proposed control of this species within this VMP update is limited to the control of the spread of the species into new areas as a result of the vegetation removal, and the establishment of control areas where elimination of the nuisance species from selected areas will be attempted. The control process is detailed in Chapter 5.

Common reed (*Phragmites australis*) is present in limited amounts within VMA 7 on the north side of the Runway 29 end. Control of this colony has been partly achieved through the past use of herbicides on the airport property. Common reed is capable of rapid colonization of adjacent areas through spreading by rhizomes and seed dispersal. It is particularly adapted to wetland soils on sunny landscapes, but is capable of colonizing upland areas as well as the flooded margins of water bodies.

Areas of European honeysuckle (*Lonicera xylosteum*) are common within the wooded wetlands at the Runway 23 end in Bedford (VMA 14), and the Runway 5 end in Lincoln (VMA 13). It is not a dominant shrub species in the subject areas, and occurs along the wetland/upland transition area. This shrub is spread mainly through seed dispersal (the berries are readily eaten by several wildlife species), and is found primarily in shaded conditions.

Japanese barberry (*Berberis thunbergii*) is common at the Runway 5 end in Lincoln (VMA 13). This small shrub is found in rich soils along the wetland/upland transition zone, principally in shaded habitat. It spreads primarily through seed dispersal. Though only a low shrub, it is capable of creating dense thickets that can eliminate other shrub species. Its dense, long thorns can restrict pedestrian access through areas.

G. Steep Slopes

The presence of restrictive topography will often dictate the available access routes to a VMA, or, where the steep slopes contain penetrations to navigable airspace, how the penetrations are to be removed. Slopes at the airport are generally not severe, and pose only a minimal constraint for access and obstruction removal.

Disturbance of soils on slopes exceeding 2:1 in grade create a high potential for erosion, and are difficult to stabilize with basic control techniques. Due to this problem, removal methods that minimize the potential for soil disturbance on steep slopes are to be utilized. These methods involve selecting access routes that avoid the slopes, and require the careful removal of felled timber to protect the soils.

The Elm Brook and Shawsheen River corridors (VMAs 4 and 9) contain steep and tall banks which could be impacted through vehicle access. Control of access to the vegetation on either side of the channels needs to be specified to protect the banks. Further discussion of the protection for these areas and access to the VMAs is provided in Chapter 5.

H. Organic Soils

Many wetland soils include a surface horizon of highly decomposed organic material. The hydrology required to develop this characteristic typically results in a soil that will not support machinery under normal conditions. Such soils are highly susceptible to disturbance from vegetation removal activities, thus the identification of these areas on the project site is required to reduce wetland impacts. Where the areas of these soils are too wide (i.e. greater than 100 feet) to allow vehicle access to penetrating vegetation, special removal techniques must be considered.

A reconnaissance survey of the site resulted in the identification of the following VMAs where all or portions of the soils within the wetland boundary contain a thick layer of decomposed organic material, and the area of poor soils is too wide to allow for access to penetrating vegetation by vehicles. The subject VMAs include the following: 3A, 3B, 3C, and 10. VMAs 4, 13, and 14 contain small areas of these soils; however, alternate access routes to these areas are available and will be used to avoid soil disturbance.

I. Historic/Archaeological Resources

Minuteman National Historic Park is south of Hanscom Field. The park boundary abuts one of the VMAs (VMA 13), however only minimal work is proposed adjacent to the park property boundary. None of the vegetation removal that will be required in the next 5-year cycle is visible from the park, nor will a reduction in visual buffer between the park and aircraft operating areas occur.

J. Closed Landfill Areas

Two capped landfills exist in the project area; one at the Runway 29 end adjacent to the southern portion of VMA 10, and one at the Runway 5 end within VMA 13. The use of vegetation removal equipment could damage the cap and/or liner material, thus special provisions are included in the VMP for work adjacent to the landfill areas. See Chapter 5 for further discussion of this topic. The VMA map provides the location of these two landfills.

CHAPTER 4: VEGETATION MANAGEMENT

This chapter provides a description of the vegetation management areas (VMAs) and removal plans addressed by this vegetation management plan (VMP) update. The VMAs are characterized in section A of this chapter, with additional information on the VMAs presented in the wildlife habitat descriptions located in Appendix A. The process of reviewing and selecting available vegetation removal methods for each VMA is described in section B. Section C describes the alternatives analysis performed to determine the primary removal method for each VMA. Section D provides thorough descriptions of the selected primary removal methods recommended for L.G. Hanscom Field, and section E provides descriptions of the selected secondary removal (maintenance) methods. Finally, the recommended yearly operational plans (YOPs) for the next five years of the plan are presented in section F. Note that the YOPs will include the most recent removal project, along with the continued maintenance of previous removal projects. Over time, the acreage of maintenance will increase, as the acreage of any new removal will greatly decrease. This will signify the attainment of one of the principle VMP objectives; the creation of low-growing vegetative communities.

The wildlife habitat focus areas provided in Appendix A provide descriptions of the condition of the VMAs at the start of the VMP process. Over time, portions of the VMAs will be modified as removal plans are implemented. Modifications include the conversion of wooded habitats to lower growing vegetative communities through the elimination of taller species over time. This plan provides overall management for all of the critical areas of L.G. Hanscom Field, through the development of VMAs. Each vegetation removal project will encompass small sections of each VMA, which will then be permitted as a separate removal project. Since vegetative characteristics change over time, the wildlife habitat focus areas included in this VMP provide baseline (pre-vegetation management) conditions for the VMP. As future projects are proposed under this VMP, updates of the habitat information will be required. Comparison to the baseline provides some measure of the loss/gain/change of wildlife habitat resulting from VMP implementation.

A. VMA Descriptions

Most areas surrounding the airport containing vegetation that currently penetrates, or has the potential to penetrate protected airspace, have been categorized into distinct vegetation management areas, or VMAs. Each VMA at L.G. Hanscom Field shall be managed based on the criteria and procedures outlined in this section. VMAs have been defined based on distinct vegetation communities in relation to other factors including topography, soil type, geographic location, and the elevations of airport protection zones. For example, areas within runway primary surfaces, which allow no objects higher than the nearest point of a runway centerline, and which are currently dominated by upland grass will have management objectives much different from an area at the outer portion of a runway approach surface that is dominated by mature trees and includes protected airspace that is considerably higher in elevation. The VMA Map included in the back pocket of this VMP provides the location of each of the VMAs identified at L.G. Hanscom Field. Where a VMA has multiple locations, then the VMA identifier number is followed by a letter on the map (i.e. VMAs 3A, 3B, and 3C).

Each VMA has a primary mechanical vegetation removal method associated with it. In addition, some areas include recommendations for use of secondary management techniques which include hand removal of saplings through selective thinning and/or herbicide treatment in accordance with the Massachusetts Wetlands Protection Act and other applicable state and federal regulations. ~~Controlled burns are only proposed as a potential secondary management technique since the environmental and personnel conditions necessary to complete the burn are quite rigid, and are not always available in each year that maintenance is required.~~

Table 4-1 provides a summary of the VMAs, the recommended primary and secondary removal methods, and comments on special conditions that may exist within each VMA. The corresponding wildlife habitat identifier for the VMA is provided in the comments section of the table. Habitat identifier forms are located in Appendix A of this VMP.

Table 4-1: *Summary Table of Vegetation Management Areas at L.G. Hanscom Field. Habitat identifier forms and associated habitat areas focus maps in Appendix A provide additional information for each VMA. The VMA Map attached to this VMP provides the location and boundaries of each VMA.*

VMA (Land Type)	Runway	Municipality	Primary Removal Method	Secondary Removal Method	Comments
1 (Upland)	All	Bedford Concord Lincoln	Standard Lawn Mowing	None	Includes the existing turf infield areas within the primary, approach, and transition surfaces of all runways. To be maintained with turf mowing equipment. Area is defined as rare species habitat for upland birds. Mowing is timed to avoid nesting areas, as recommended by the Massachusetts Audubon Society.
2 (Upland Wetland)	11	Bedford Concord	Selective Mechanized Felling	None	Mature forested upland and wetland a moderate distance from the runway end and beyond the approach light plane. Only mature trees to be removed with protection of shrub and sapling layers. Soils will support machinery during dry or frozen ground conditions. Three certified vernal pools that exist within the VMA require special removal procedures as outlined in Chapter 5 of this VMP. Habitat identifiers 11-10 through 11-15.
4 (Wetland)	11	Bedford Concord	Cut and Chip	Foliar Treatment and Invasive Species Control in Selected Areas	Includes the Elm Brook wetland corridor. Scrub-shrub and early successional forest in close proximity to runway end and approach light plane. Small trees and saplings to be selectively removed and processed while protecting non-penetrating vegetation. The narrow width of this VMA allows for vegetation removal from wetland edge, avoiding the streambank and overhanging shrub layer with machinery. No wood chips to be placed in wetlands or buffers except as approved by jurisdictional authority. Habitat identifier 11-1, 11-2 and 11-5.
5 (Upland Wetland)	11	Concord	Selective Mechanized Felling	Foliar Treatment and Selective Thinning	Elevated terrain and the close proximity to the runway end and approach light plane require maintenance of vegetation at shrub height or less. All tree growth within this VMA result in penetrations to protected airspace. Controlled burns used in the past as a maintenance tool. Initial mechanical removal technique was modified from the original VMP due to the growth of the trees which prohibit simple flail mowing for primary removal. Habitat identifiers 11-3, 11-4 and 11-6.

Table 4-1 (continued): *Summary Table of Vegetation Management Areas at L.G. Hanscom Field. Habitat identifier forms in Appendix A provide additional information for each VMA. The VMA Map attached to this VMP provides the location and boundaries of each VMA.*

VMA (Land Type)	Runway	Municipality	Primary Removal Method	Secondary Removal Method	Comments
6 (Upland Wetland)	29	Bedford	Selective Mechanized Felling	Foliar Treatment and Invasive Species Control in Selected Areas	An area of mixed early successional vegetation and some mature trees within the transition surface Runway 29 and directly adjacent to residences. Selective removal of trees and saplings, with processing of the cut vegetation within upland staging area. Protect and preserve shrub and low sapling layer as an abutter screen. Non-certified vernal pool habitat exists within the VMA, so special protection of the site required during initial and secondary removal procedures as described in Chapter 5. No wood chips to be placed in wetlands or buffers except as approved by jurisdictional authority. No new removal in this VMP update.
7 (Wetland)	29	Bedford	Selective Mechanized Felling	Foliar Treatment	Early successional forested wetland within the approach surface, and close to the runway end. Contains high percentage of tree saplings and invasive shrub species. Maintenance of vegetation to ground level is required, since shrubs penetrate the approach surface in this area. Conversion of area to meadow habitat (without the grubbing of root systems) through mowing after tree removal will expand rare bird species habitat. Seeding with wetland seed mix will be required after mowing as specified in Chapter 5. Change from flail mowing in the original VMP necessary due to tree growth. No new removal in this VMP update.
8 (Upland)	29	Bedford Lexington	Clear and Grub	Standard Lawn Mowing	Upland areas along the Shawsheen River within the approach surface and the approach light plane. Much of the VMA is located within the outer riparian zone of the river. Maintenance of vegetation to ground level is required, since shrubs can penetrate the approach and light plane surfaces in this area. Conversion of the area to meadow habitat through mowing will expand rare bird species habitat, and will allow for easier future maintenance. Seeding will be required as specified in Chapter 5. Habitat identifier 29-1 and 29-2.
9 (Wetland)	29	Bedford	Cut and Chip	Foliar Treatment and Invasive Species Control in Selected Areas	Includes the Shawsheen River valley and adjacent inner riparian zone. Management includes selective removal of trees/saplings only, with encouragement of alder and dogwood growth by removing invasive shrub species. Steep banks and vegetation overhanging the water to be protected. No wood chips to be placed in wetlands or buffers except as approved by jurisdictional authority. Habitat identifier 29-4 and 29-5.

Table 4-1 (continued): *Summary Table of Vegetation Management Areas at L.G. Hanscom Field. Habitat identifier forms in Appendix A provide additional information for each VMA. The VMA Map attached to this VMP provides the location and boundaries of each VMA.*

VMA (Land Type)	Runway	Municipality	Primary Removal Method	Secondary Removal Method	Comments
10 (Wetland)	29	Bedford Lexington	Top-and-Girdle	Invasive Species Control in Selected Areas	Unstable soils, open water and limited access require top-and-girdle technique to protect wetlands. Avoidance of capped landfill with vegetation removal equipment required. Habitat identifier 29-6 and 29-10.
11 (Upland Wetland)	29	Bedford Lexington	Selective Mechanized Felling	None	Specific removal methods developed for work within the business parks. Large trees adjacent to buildings and parking areas require directional felling and strict coordination with the business parks. Individual tall tree removal from wetland areas. Habitat identifier 29-7.
12 (Upland)	5	Concord Lincoln	Clear and Grub	Standard Lawn Mowing	Elevated terrain and close proximity to the runway end require maintenance of vegetation to ground level since low shrubs can penetrate the transitional and/or approach surfaces. Creation of a field area within the upland is proposed which will expand the area of grassland habitat for rare bird species. 25-foot setback from wetland boundary required in this area. Habitat identifiers 5-1 and 5-3.
13 (Upland Wetland)	5	Concord Lincoln	Selective Mechanized Felling	Invasive Species Control in Selected Areas	Only large trees penetrate the approach and transition surface in this area. The identification and selective removal of these penetrations through mechanized felling is proposed. Special attention to the capped landfill and National Park boundary required. Soils will allow for the use of machinery during dry or frozen ground conditions to remove logs. Areas identified for buckthorn and honeysuckle control as part of secondary removal. Habitat identifiers 5-2 and 5-4.
14 (Upland Wetland)	23	Bedford	Selective Mechanized Felling	Invasive Species Control in Selected Areas	Only large trees penetrate the transition surface in this area. Soil conditions allow for the use of machinery during dry or frozen ground conditions. Beaver activity may result in flooding of portions of this VMA, requiring a modification to top-and-girdle in the future for portions of the VMA. White Pine is the principle target so secondary control not required for obstructions, but may be necessary for invasive species control. Habitat identifiers 23-1 and 23-2.

Table 4-1 (continued): *Summary Table of Vegetation Management Areas at L.G. Hanscom Field. Habitat identifier forms in Appendix A provide additional information for each VMA. The VMA Map attached to this VMP provides the location and boundaries of each VMA.*

VMA (Land Type)	Runway	Municipality	Primary Removal Method	Secondary Removal Method	Comments
15 (Upland Wetland)	23	Bedford	Cut and Chip	Foliar Treatment or Selective Thinning	Shrub wetland within the approach surface, and close to the runway end. Contains high percentage of tree saplings and invasive shrub species. Maintenance of vegetation to shrub level is required, since saplings penetrate the approach surface in this area. Conversion of area to shrub wetland through selective thinning of the trees and saplings will create a maintainable wetland habitat. The surrounding upland area will be maintained as upland meadow. Seeding of the upland areas with an upland seed mix to be completed after mowing. Habitat identifiers 23-3 and 23-4
16 (Upland)	23	Bedford	Selective Mechanized Felling	None	Only the larger trees penetrate the transition surface in this area. Upland soils will support machinery. Shrubs and saplings to be protected as vegetation screen for adjacent residential area. Habitat identifiers 23-5 and 23-6.
17 (Upland Wetland)	23	Bedford	Not Identified	Not Identified	The management of penetrating vegetation within the Jordan Conservation Area and Hartwell Town Forest is being investigated as part of a separate but parallel process.

The following narrative describes each of the 16 VMAs identified for this VMP:

VMA 1: This VMA includes the turf infield areas within the primary, approach, and transitional surfaces of all runways. It is located within the towns of Bedford, Concord, and Lincoln. This area includes all primary surfaces. This VMA has been identified as containing grassland habitat for two state-listed rare bird species. The continued preservation of this area as grassland habitat, and continuation of the current mowing practices will preserve the habitat for the identified species. Massport has coordinated with the Massachusetts Audubon Society and the Massachusetts Natural Heritage and Endangered Species Program to study the on-site grassland bird populations. This effort is on-going.

Management includes the scheduled periodic mowing of these areas to restrict the establishment of woody vegetation, and to maintain the height of the vegetation at or near the runway surface elevation. No secondary management techniques are required for the existing turf areas. No modifications to the vegetative characteristics of this VMA are proposed.

VMA 2: This VMA includes the approach and transitional surfaces at the Runway 11 end within the towns of Bedford and Concord. It consists of mature forested upland and wetland areas that are located a moderate distance from the runway end and approach light plane. The gently rolling topography results in groups of trees on the higher ground penetrating the airspace, while trees within the low pockets are not likely to achieve an obstructing height. Only mature trees are identified as penetrations within this VMA in the current analysis. Dominant tree species include Red Maple (*Acer rubrum*), Red Oak (*Quercus rubra*), and White Pine (*Pinus strobus*). The soils within this VMA are capable of supporting machinery in dry or frozen ground conditions, and access is available through a myriad of gravel roadways that traverse the site. Upland staging areas are available throughout the VMA. The wetland areas within this VMA are small and narrow, allowing for tree removal from the wetland edge. Three certified vernal pools are shown to occur in the western half of the VMA in the 2006 edition of the Massachusetts Natural Heritage Atlas (Figure 3-1), requiring mitigation measures to protect the habitat as detailed in Chapter 5 of this VMP. Direct inspection of the three areas in 2008 revealed that successful amphibian breeding continues to occur in each of the three pools.

Secondary management of the cut areas is not required since only the tallest trees within this VMA penetrate protected airspace. As trees are removed, sapling and shrub density increases within the cut areas. As the smaller trees grow and penetrate the airspace, they will be removed in the future by subsequent mechanized felling operations. Modifications to the vegetative community include the creation of pockets of early successional woodland between the non-cleared mature forested areas. Protection of the vernal pools is important and is discussed in Chapter 5.

VMA 3: VMA 3 includes deciduous forested wetland areas within the approach and transitional surfaces at the Runway 11 end within Bedford and Concord. The wetlands are located within the watershed of Elm Brook, and border a portion of the brook channel, as well as several intermittent tributaries to the brook. The three areas of forested wetland contain seasonally flooded soils that will not typically support machinery. Beaver activity in portions of this VMA has exacerbated the poor soil conditions. The three areas are located a moderate distance from the runway end and are not within the approach light plane, thus only mature trees are identified as penetrations to the protected airspace. Selective topping and girdling of the mature trees is proposed to avoid soil alteration that would occur from skidding operations.

This technique requires only foot access to each obstruction.

VMA 3A includes an area within the transitional surface that borders directly on Elm Brook within the Town of Bedford. Access is restricted by the brook channel to the west, the property line to the north, and by other wetland areas with poor soils within VMA 4 to the east. Large Red Maple (*Acer rubrum*) dominate the canopy layer with some mature White Pine (*Pinus strobus*) along the wetland fringe.

VMA 3B is a mixed deciduous/coniferous forested wetland area within the approach surface, located just north and west of the approach light plane within the Town of Concord. Portions of this wetland area are quite narrow, and are to be cleared by dropping individual trees, and using a cable where necessary to drag the logs to the adjacent uplands. However; a portion of the wetland within VMA 3B is too wide to access from the adjacent uplands. Furthermore, beaver activity has impacted the soil conditions in some areas, and the dragging of logs could disturb the wetland soils in these locations. Thus, the use of a removal method that is sensitive to the poor soil conditions is required. Top-and-girdle may have to be used to address mature Red Maple (*Acer rubrum*) from the wetland interior. Where suitable soils along the fringe of VMA 3B exist, the primary removal method prescribed for VMA 5 will be used.

VMA 3C is a large contiguous forested wetland area associated with a tributary to Elm Brook within the Town of Concord. It is located over 1,500 feet from the runway end, in an area of slightly depressed elevation, thus mature trees are the only vegetation capable of penetrating protected airspace. Soil conditions along the wetland boundary are suitable to support machinery during dry or frozen ground conditions; however, the soils within the wetland interior are saturated to the surface, and would be impacted by ground removal even under dry or frozen ground conditions. Red Maple (*Acer rubrum*) and some Oak (*Quercus spp.*) are capable of penetrating the approach surface of Runway 11 in the wetland interior. Top-and-girdle of individual penetrating trees will be utilized where equipment access is not available.

Secondary management of the cut areas within VMA 3 is not proposed since only the tallest trees penetrate the protected airspace. Stump regrowth, shrubs, and saplings will grow in response to the increased light penetration, restoring the wetland functions of the area. As the existing smaller trees grow and become obstructions, they will need to be removed during a future mechanized felling project. The principle vegetative characteristics of this VMA will not be significantly modified by the work as only individual locations require management. Most of VMA 3C is not expected to require large scale management in one removal operation.

VMA 4: This VMA includes a portion of the Elm Brook corridor, and an area of scrub-shrub wetland within the approach and transitional surfaces of Runway 11 within Bedford and Concord. Moderately steep slopes occur along the brook channel and within the northeast shrub wetland of this VMA. It is located close to the runway end, and the ground is similar in elevation to the runway, thus both trees and saplings are capable of penetrating the protected airspace. Most of the VMA is capable of supporting machinery, and only low vegetation presently exists in the area. Thus, the selective removal of small trees and saplings, and chipping of this small vegetation within the adjacent uplands is proposed. The maintenance of a dense shrub layer throughout this VMA will preserve the wetland functions, and also inhibit the establishment of trees. Machinery will not be allowed to cross the stream channel to access vegetation. Rather, all removal will occur from the wetland edge, and shrubs that currently overhang the channel will be protected.

This VMA is located within a critical area directly at the runway end, thus secondary management techniques are required to maintain a low cover of vegetation. An initial foliar treatment of tree species will be completed following the mechanical removal. Once the VMA has been reduced in shrub/sapling density, the use of foliar treatment will be used on tree species re-sprouts to maintain the VMA.

The control of invasive species within the wetland boundary along Elm Brook from the approach light access road northward to a straight line between wetland flag 3318 and 3378 is proposed as a mitigation strategy in this area. After the mechanical removal of obstructions as described above, the selective removal of invasive shrub species from the wetland boundary will be practiced, while protecting native shrub species. The goal is to control the invasive species until the density of native shrubs within the area is sufficient to suppress buckthorn and honeysuckle. The periodic inspection and foliar treatment of target species shall be practiced until native shrub densities approaching 40% cover have been realized (as measured within a random 15-foot radius circle within the mitigation area based on leaf-on conditions).

VMA 5: This combination of wetland and upland area consists of a dense area of shrubs and saplings within the approach and transition surfaces, as well as the approach light plane of Runway 11 within both Bedford and Concord. The VMA occurs close to the runway end, and contains areas that are both slightly below and above the runway elevation. Due to this close proximity to the runway end and the sections of elevated terrain, tall shrubs, saplings and trees are all capable of penetrating the protected airspace, and obscuring the light plane to the runway end. Maintenance of the vegetation to a low shrub cover is required. Red Oak (*Quercus rubra*), Scrub Oak (*Quercus ilicifolia*), and Black Cherry (*Prunus serotina*) dominate the sapling layer, while Sweet Fern (*Comptonia peregrina*), Lowbush Blueberry (*Vaccinium angustifolia*), and European Buckthorn (*Rhamnus frangula*) are common within the low-to-medium shrub layer. Preservation of the low shrubs while eliminating the taller vegetation is the objective in this VMA. The flail mowing technique will be used as the initial removal method.

Like VMA 4, this VMA is located within a critical area directly at the runway end, thus secondary management techniques are required to maintain a low cover of vegetation. Foliar treatment (selective application of herbicides to the leaves of target vegetation) of tree species will be completed following the mechanical removal to address tree re-growth. Once the VMA has been reduced in shrub/sapling density, the use of periodic foliar treatment to treat tree re-growth is proposed. ~~and controlled burning techniques as described in Appendix F of this VMP will be used to maintain the VMA if conditions allow. Further herbicide applications and/or selective thinning of tree saplings will be required if conditions do not allow for the use of a controlled burn.~~

VMA 6: This combination of scrub-shrub wetland and shrub upland area occurs within the transition surface of Runway 29 close to the runway end within the Town of Bedford. The terrain is slightly elevated from the runway elevation. It borders the northeastern property boundary of the airport, where there is an area of residential development. The wetland portion of this VMA contains a pooling area known to support vernal pool species. The soils are capable of supporting machinery under dry or frozen ground conditions. Surface water is absent except for the small pool area that typically contains water into the early summer months. Vegetation in this area consists of a moderate layer of low trees including Gray Birch (*Betula populifolia*), White Pine (*Pinus strobus*), and Red Maple (*Acer rubrum*), and a dense

shrub layer of European Buckthorn (*Rhamnus frangula*) and Highbush Blueberry (*Vaccinium corymbosum*). Elimination of the mature trees and tall saplings while maintaining the shrubs and low saplings is the objective for this area. The tall shrubs and saplings will maintain a visual screen between the runway and the adjacent residences, and will also preserve the wetland functions of the area. Special consideration of the vernal pool habitat requires the directional felling of vegetation, the avoidance of herbicide applications close to the water's edge, and the avoidance of continuous erosion control barriers during the amphibian migration period.

Protection and enhancement of the shrub layer and the elimination of mature tree species are objectives within this VMA. Secondary management will include the application of a foliar treatment to tree species within the cut area, and the periodic removal of individual saplings as a standard maintenance practice. The improved sunlight conditions will enhance the shrub and sapling layer within the wetland and upland, providing a screen for adjacent residences and improved habitat functioning.

VMA 7: This VMA consists of an early successional forested wetland within the approach and transitional surfaces of Runway 29 in the Town of Bedford. It is located immediately at the runway end, and at a similar elevation. Within this VMA, vegetation as low as 8 feet in height penetrates the approach surface. The wetland drains to the east via an intermittent drainage ditch with eventual discharge to the Shawsheen River. Soil conditions will allow for the use of machinery for vegetation removal under dry or frozen ground conditions. Tree sapling coverage is dense throughout the wetland, and there is a dense shrub layer consisting of several wetland species, but dominated by European Buckthorn (*Rhamnus frangula*). Due to the low elevation of the protected surface over this wetland, conversion of the scrub-shrub wetland to a wet meadow condition is proposed through the use of a wetland seed mix. The boundary between this VMA and VMA 6 is well short of the plantings that were completed as part of the 1995 vegetation removal project, and is also outside of the 100-foot habitat limit of the non-certified vernal pool.

Secondary management is critical within this VMA due to the close proximity to the runway end and the dense sapling growth that is comprised of species that will re-sprout immediately after cutting. The application of a foliar treatment is required to control the re-sprouts, and to allow the herbaceous wetland species in the seed mix to colonize the cut areas. While this methodology will result in a loss of scrub-shrub habitat, there will be a conversion to wet meadow habitat which is a rare wetland cover type in the area. Caution tape will be used to define the exact limit of the vegetation removal in the vicinity of the vernal pool during the mechanical removal process. ~~Prescribed burns would be a good secondary management method but will not be used due to the proximity to a residential neighborhood.~~

Portions of VMA 7 were managed as a part of the 2003/2004 removal project. Maintenance is on-going in the removal area, as conversion to a wet meadow is not yet complete.

VMA 8: VMA 8 includes upland areas along the east and west bank of the Shawsheen River in the Towns of Bedford and Lexington. Most of this VMA is within the outer riparian zone of the river as defined in the Massachusetts Wetlands Protection Act Regulations. The edge of this VMA ends at the inner riparian zone. It is located within the approach light plane, and the approach and transitional surfaces of Runway 29. The vegetation borders the turf areas surrounding the runway, and consists of a dense cover of deciduous saplings and shrubs

including Black Cherry (*Prunus serotina)*, Quaking Aspen (*Populus tremula*), Red Oak (*Quercus rubra*), and European Buckthorn (*Rhamnus frangula*). Due to the close proximity of the vegetation to the runway end and light plane, and the elevated terrain, even low vegetation penetrates protected surfaces. Management of this area through clearing and grubbing will result in the establishment of a mowable herbaceous surface, adding to the field habitat that presently exists within the turf areas of the airport. The upland shrub layer will be cleared and grubbed, and the area will be seeded with an upland seed mix. Erosion control barriers will be used as necessary to protect adjacent wetlands.

Once established, the turf will be maintained along with the adjacent existing field areas. Secondary management of this VMA will involve periodic mowing of the established turf.

VMA 9: This wetland VMA includes the section of the Shawsheen River corridor that is located within a deep channel at the Runway 29 end within the Town of Bedford. The channel is located within the approach light plane, as well as the approach and transitional surfaces. The river is contained within a trapezoidal valley with steep side slopes. The river channel is approximately 12 feet wide within the valley, and is approximately 15-20 feet below the elevation of the surrounding upland areas. Most vegetation that grows within the valley does not penetrate the airspace due to the elevation difference, however tree saplings near the top of the side slopes, and mature trees along the river bank are obstructions (primarily Red Maple (*Acer rubrum*)). Management includes the hand removal of vegetation that extends above the upland elevation. The bank areas will not support machinery, thus the processing of removed vegetation will occur within adjacent uplands. Since only large saplings penetrate the airspace, and open water is present, no herbicide application is proposed within 10 feet of the bank limit. Rather, hand removal of saplings as they penetrate the top of the gully will be performed.

VMA 10: VMA 10 consists of mixed deciduous/coniferous forested wetland and scrub-shrub swamp along the Shawsheen River and a tributary to the river within both Bedford and Lexington. Similar to VMAs 8 and 9, it is located within several protected airspace surfaces at the Runway 29 end, including the approach light plane. This VMA is located further out in the runway approach, thus only mature trees, dominated by Red Maple (*Acer rubrum*) and White Pine (*Pinus strobus*), penetrate protected airspace. Beaver activity and ponded areas restrict the use of ground vehicles for vegetation removal. Access to the taller vegetation within the VMA from adjacent uplands is not an alternative due to the width of the wetland. ~~Helicopter removal of logs that are felled by hand is proposed in order to protect the wetland soils from damage that would occur from skidding operations. Directional felling of trees away from the river channel and ponding areas will be necessary.~~ Top-and-girdle technique will be used to address the obstructing portions of individual trees.

A capped landfill occurs along the southern boundary of VMA 10 on the Bedford/Lexington boundary. No vegetation removal vehicles or tree felling associated with this project shall occur on the cap or the maintained landfill slope area.

VMA 11: This mix of upland and wetland vegetation is located along the roadways and buildings of the business parks at the Runway 29 end within both Bedford and Lexington. It is located within the approach surface of the runway, but is quite distant from the runway end. Only mature trees penetrate the approach surface within this VMA, with White Pine (*Pinus strobus*) as the dominant tree species. Individual large Red Maple (*Acer rubrum*) and Red Oak (*Quercus rubra*) also penetrate the airspace in this VMA. Selective removal of large trees within

easement areas will be completed with strict coordination with the business parks and other off-airport properties. The wetland areas within this VMA are small, and the trees to be removed are accessible by machinery.

No secondary management of the cut stumps is proposed since only the tallest vegetation penetrates the protected airspace within this VMA. The proposed management will not significantly modify the vegetative characteristics of the area.

VMA 12: VMA 12 consists of an early successional upland area dominated by tree saplings including Quaking and Big-tooth Aspen (*Populus tremula* and *grandidentata*), Red Oak (*Quercus rubra*), and American Elm (*Ulmus americana*). It is located within both Lincoln and Concord. The shrub layer is limited due to the high sapling density. It is located in an area of elevated terrain within the approach and transitional surfaces across Virginia Road from the Runway 5 end. The terrain is higher than the runway elevation, which exacerbates the penetration problem within the VMA, and saplings and trees penetrate the protected surfaces. Management of most of the area as a mowable herbaceous field is proposed. The extreme north and south portions of this VMA are sufficiently removed from the approach surface so that management as a scrub-shrub upland could be proposed. Erosion control barriers will be needed to protect the adjacent wetland area during stabilization of the soils within the VMA after the clearing/grubbing operation. A 25-foot setback from the wetland boundary will be established with the erosion control barrier prior to the grubbing of the root systems.

Secondary management of this VMA will involve the scheduled periodic mowing of the established turf, or the herbicide treatment of stumps in non clearing/grubbing areas. Once the area is cleared and grubbed of root systems, the soils will be seeded with an upland seed mix specified in this VMP. Once established, the turf will be maintained along with the adjacent existing field area. Erosion controls are needed to protect the adjacent wetland area until vegetation is established.

VMA 13: This VMA is located further south in the approach of Runway 5 than VMA 12, and the ground elevation drops from the boundary between the two VMAs to the southern boundary of VMA 13. It is located in the Towns of Lincoln and Concord. The combination of increased distance from the runway end and the lower topography results in a significant decrease in the number of airspace penetrations. In this area, only mature trees are capable of penetrating the approach and transitional surfaces, with Red Maple *(Acer rubrum)*, Red Oak (*Quercus rubra*), and White Pine (*Pinus strobus*) the most common large trees. The VMA includes both wetlands and uplands. Vegetation management is restricted to the wetland fringe where soils are capable of supporting machinery during dry or frozen ground conditions. Further within the wetland interior, saturation to the soil surface occurs, and the soils do not support trees, and thus the interior does not contain penetrations. If individual trees at the edge of the marsh area must be removed, evaluation of access on a case-by-case basis will be required. If soil conditions prevent access to an area, a modification to top-and-girdle will be needed as was completed in the first removal project in 2003.

A capped landfill exists within VMA 13 that has some obstructing vegetation located along the perimeter of the cap. Access to the vegetation with machinery would require work on the landfill that could potentially damage the liner. To avoid this impact, trees along the perimeter of the cap will be felled by hand away from the landfill, and processed in place. The logs and slash will be reduced and allowed to rot in place, thus avoiding any vehicles on the landfill liner.

Secondary management of the cut areas is not required since only the tallest trees within this VMA penetrate protected airspace. As trees are removed, sapling and shrub density increases within the cut areas. As the smaller trees grow and penetrate the airspace, they will be removed in the future by another mechanized felling. The proposed management will not significantly modify the characteristics of the area.

The control of invasive species within portions of this VMA is proposed as a mitigation strategy in this area. After the mechanical removal of obstructions as described above, the selective removal of invasive shrub species from the limits of the cut areas of Wet-1 and Up-3 will be practiced, while protecting native shrub species. The goal is to control the invasive species until the density of native shrubs within the area is sufficient to suppress buckthorn and honeysuckle. The periodic inspection and foliar treatment of target species shall be practiced until native shrub densities approaching 40% cover have been realized (as measured within a random 15-foot radius circle within the mitigation area based on leaf-on conditions).

VMA 14: This VMA consists of an area of mature coniferous forested wetland and upland within the transitional surface of Runway 23 in the Town of Bedford. Mature White Pine (*Pinus strobus*) are principally responsible for penetrations to the protected airspace in this area. The wetland contains some small pockets of unsuitable soils; however, access to these areas from adjacent stable soils will allow ground removal within the VMA. Beaver activity is significant within the adjacent wetland areas and new water diversions may alter the soil characteristics. Should this occur, a modification to helicopter removal or topping and girdling may be required for a portion of the VMA. Management of this area includes the removal of the mature trees only, with protection of the sapling and shrub layers. Secondary management of the cut stumps is not required, since only the tallest trees within this VMA penetrate the protected airspace, and most of the trees to be removed consist of coniferous species. Control of invasive shrubs through foliar treatments was practiced after the initial removal project in 2003.

VMA 15: This VMA, in the town of Bedford, consists of a mix of upland and wetland scrub-shrub areas directly at the end of Runway 23 within the approach and transitional surfaces. A drainage ditch exists along the runway perimeter roadway, and tall shrubs and saplings that exist along the ditch penetrate the protected airspace. Dominant tree species include Red Maple (*Acer rubrum*), Gray Birch (*Betula populifolia*), and Quaking Aspen (*Populus tremula*). Due to the close proximity of this VMA to the runway end, and the similar terrain elevation, all saplings are to be removed with preservation of the shrub layer within the wetland boundary. The upland sections will be mowed to ground level, and seeded with an upland seed mix. Maintenance of the upland areas as meadow habitat is proposed. The VMA is accessible from stable soils on either side of the subject vegetation, and removal can be completed easily from stable areas by reaching with the cutting equipment, or cutting by hand and dragging the cut vegetation out of the wetland area. The cut and chip technique is prescribed for the wetland areas in VMA 15, where access across the surrounding wetland ditches is not possible for flail mowing equipment.

It should be noted that a runway safety area project has been approved that will modify uplands and wetlands in this area. An update to the VMA description and prescribed management techniques may be necessary at the completion of the runway safety area project.

This VMA is located within the area directly at the runway end, thus secondary management

techniques are required to maintain a low cover of vegetation. Following the mechanical removal, there will be a foliar treatment of tree re-growth followed by selective thinning of saplings within the wetland boundary.

VMA 16: VMA 16 includes a mature upland forested area within the transitional surface of Runway 23. The northernmost area of the VMA borders a residential area. The VMA occurs along the side of a moderate slope that is slightly higher than the runway elevation. Mature Oak (*Quercus spp.*), Quaking Aspen (*Populus tremula*) and some individual White Pine (*Pinus strobus*) penetrate the protected airspace in this area. The soils are capable of supporting ground removal of the individual trees. Shrub and sapling layers are to be preserved in the northern portion of the VMA as a screen for adjacent residences. Secondary management of the VMA is not required since only the tallest trees penetrate the protected airspace.

VMA 17: This VMA is not located on Massport property. It is located directly within the approach of Runway 23 immediately north of the property boundary. It is an area of mature trees that penetrate the approach and transitional surfaces of Runway 23 has been identified in Bedford's Jordan Conservation Area. The management of the penetrating vegetation in this area will be addressed through meetings with the Town of Bedford. The selected management techniques will be included in a future update of this VMP.

B. Selection of Vegetation Removal Methods

An objective of this VMP is to eliminate or control the growth of woody vegetation that threatens protected airspace at L.G. Hanscom Field. To achieve this objective, the selection of an initial removal method that addresses the penetration and creates a maintainable vegetative community, but also is sensitive to environmental resources is required. Once a removal project is completed, it is necessary within many VMAs to address the re-growth of the vegetation from stumps, especially where the elevation of the protected airspace is close to the ground elevation. Examples of the problem of re-growth exist at the airport as a result of the 1995 clearing project. Dense and tall re-growth exists from most of the stumps within the previous management areas since secondary management techniques were not included in the project. To address this maintenance and project longevity issue, secondary vegetation management methods were incorporated into the 2003 VMP and are also considered and proposed in this VMP update in accordance with Section 5.2 of the GEIR for Vegetation Removal at Public Use Airports.

Analysis of the characteristics of the vegetation within the vegetation management areas (VMAs) was an integral part of the preparation of this VMP update, as shown in the habitat identifier forms in Appendix A. Such analysis is required to determine the most appropriate minimum impact vegetation management methods for a particular VMA. Each selected removal method considers environmental impacts, project longevity, ease of maintenance, and cost effectiveness. Environmental resources to be considered include wetlands, water quality, rare species habitat, topography, soil stability, abutter screening, historical/archaeological resources, and accessibility. Project longevity is directly related to environmental sensitivity and cost effectiveness, since the frequency of completing vegetation removal projects has both environmental impact and cost implications. Ease of maintenance is an important consideration when determining removal methods, because the ability of the airport to control future re-growth of vegetation into protected airspace directly impacts the initial project longevity, as well as the future costs and environmental impact of vegetation management at the airport.

The 2003 VMP included the control of invasive plant species using herbicide treatments. This effort was proposed as mitigation of wetland impacts resulting from vegetation management efforts. Several removal areas in the 2003 VMP were designated for invasive species control, and included both wetland areas and wetland buffers. Herbicides were applied in years 2 through 5 of the 2003 VMP process. Monitoring of the invasives was conducted in these areas as a part of the control program. The effort resulted in significant reduction of invasives in the control area, but outright elimination was not achieved. An objective of the herbicide treatment program was to control the numbers of invasives while protecting the native shrubs. The temporary control was to allow for a competitive advantage of the natives over the invasive species, thereby contributing to one of the overall VMP objectives of creating low-growing vegetative communities with a focus on native species. The results of the program were impressive, but further control through the next process appears warranted to encourage coverage of native species.

Additionally, the 2003 effort included research efforts to improve future VMP activities. One such effort was the comparison of the clear/grub technique to the use of herbicide in the conversion of a scrub-shrub wetland to a wet meadow. The results show that careful clear/grub methodology combined with the application of a wetland seed mix clearly provides a more successful post-clearing wetland community in terms of wetland plant coverage and overall wetland functions and values. Seed mix success in the grubbed area was more than twice as successful as the application of seed to non-grubbed ground area where herbicides alone were used to remove shrubs and saplings. Strict control of herbaceous invasives (i.e. purple loosestrife) in the grubbed areas was necessary for the first 3-5 years after seeding. Hand pulling of loosestrife from the plot was practiced annually.

The use of nursery stock shrubs to assist in the revegetation of managed areas was also attempted in the 2003 VMP program. Four hundred native shrubs were planted in wetlands and wetland buffer zones in an area where saplings and invasives were controlled using herbicide applications. Significant predation of the nursery stock by whitetail deer occurred, even though plastic mesh netting was applied to each planting. Crowding by adjacent, naturally occurring shrubs and groundcover also resulted in mortality of the nursery stock. Overall, it appears that 50% mortality was experienced by the nursery stock, while the planted area has re-vegetated naturally at a high rate. Invasives control, while protecting natural regrowth of native species, appears to be a more efficient way of revegetating wetlands and wetland buffers in comparison to the use of nursery stock. If used in the future, a concentrated planting of select problem areas would appear to be more beneficial in comparison to a lower density planting of a wider area.

The selection of appropriate vegetation removal methods involves a review of the techniques outlined in the Vegetation GEIR including physical, chemical, combination physical/chemical, and non-equipment/non-chemical methods. Each of the methods is assigned a "tier classification" that corresponds to its level of potential impact. A listing of the available removal methods from the Vegetation GEIR and their associated "tier classifications" are provided in Table 4-2.

Table 4-2: *Listing of available vegetation management methods with associated tier classifications from Section 5.2 of the Final Generic Environmental Impact Report (GEIR) for Vegetation Removal at Public Use Airports*

GEIR-Listed Management Method	Tier Classification
Physical Methods	
Push Trees Over	High Impact
Pull Trees Down	Moderate Impact
Shear Trees with a Bulldozer	High Impact
Mechanized Felling	Moderate Impact
Build an Impoundment (flooding)	High Impact
*Remove Trees by Helicopter	Minimal Impact
Clear and Grub	High Impact
Chemical Methods	
Fell/Lop/Cut-Surface Treatment	Low Impact
Fell/Frill-and-Inject Treatment	Low Impact
Fell/Selective Basal Treatment	Low Impact
Selective Foliar Treatment	Moderate Impact
Combined Physical/Chemical Methods	
Frill-and-Inject/Pull Trees Down	Moderate Impact
Frill-and-Inject/Push Trees Over	High Impact
Mechanized Felling/Cut Surface Treatment	Moderate Impact
Shear Trees with Bulldozer/Cut-Surface Treatment	High Impact
Non-Equipment / Non-Chemical Methods	
Fell Trees and Lop Slash	Minimal Impact
Top Trees	Minimal Impact
Girdle Trees	Minimal Impact
Prescribed Burning	High Impact

*Helicopter removal originally proposed in the VMP has been substantially replaced by top-and-girdle methodology.

Use of the guidelines for selection of vegetation removal alternatives (Section 5 of the GEIR) involves the use of a process that is based on:

- Size of the area requiring vegetation removal
- Elevation of the protected airspace surface compared to the ground surface
- Potential height of the dominant vegetative species
- Density of the trees and understory within the removal area
- Ability of the soils to support removal equipment
- Presence/absence of environmentally sensitive conditions
- Available funding

Each VMA was assessed for alternatives based upon these factors, resulting in the selection of the initial/secondary management techniques described in this chapter. The following section provides the alternatives analysis used to select the removal methods for the VMAs at L.G. Hanscom Field.

C. Alternatives Analysis

As part of the initial VMP, alternatives to vegetation removal were assessed including the "no action" and runway threshold displacement alternatives.

The "no action" alternative was considered for the project in order to establish a baseline for the project's environmental effects. By not addressing any of the penetrations at L.G. Hanscom Field, the degree of penetration into protected airspace, in terms of the number of penetrations and the height of each, would increase on an annual basis within each of the VMAs. Many of the tree species identified as obstructions have growth rates of three feet or more per year, and few of the obstructions have reached full mature height. A "no action" alternative would impact the operations at the airport, potentially resulting in decreased runway lengths available for landings, modifications to approach categories, loss of control tower line-of-sight, and overall reduction in airport utility.

Runway displacement to avoid or minimize the extent of obstructions to the approach surface was also assessed, and was identified as not practicable. The use of the displaced threshold siting criteria to address approach obstructions would impact all runway ends, resulting in a significant reduction in the amount of runway length available for landings. This is especially critical on the Runway 11-29 which has precision instrument landing systems for each end.

Displacing a runway threshold does not address the obstructions within the transitional surface, and allows approach obstructions to continue to grow, requiring further displacements and an incremental loss of safety and utility of the airport. The combination of the reduced runway usage, the continued obstruction presence, the threat of continued future threshold displacements, and the overall degrading of the facility for aircraft use would compromise the substantial federal and state investment in the facility. Maintenance of the airport for the existing based aircraft cannot be achieved if displaced thresholds are used to address the approach obstructions. The no-action alternative is not feasible since it does not address current FAA regulations and does not maintain the condition of the navigable airspace around Hanscom Field.

Having identified the need to physically manage the vegetation within the protected airspace in order to address FAA safety regulations, the alternatives are reduced to the type of management selected for each VMA.

Table 4-3 presents a summary of the selection of the initial and secondary vegetation removal alternatives for each of the VMAs at L.G. Hanscom Field. In the table, the "height of vegetation to remain" refers to the height of the woody species within that VMA that will not be removed because the subject vegetative layer is below the protected airspace elevation and can be easily maintained. "Soil suitability" refers to the ability of equipment to be used in the VMA under dry or frozen ground conditions without causing significant disturbance of the soils. The suitability is determined through field investigation and not through the use of existing soil surveys. "Environmental sensitivity" refers to the presence of resources within the VMA that could be impacted by the selected removal methods such as rare species, vernal pools, and/or sensitive wetlands. "Re-growth capability" refers to the ability of the vegetation within the VMA to generate rapid re-growth from the cut surface that would penetrate protected airspace within a short period of time if secondary management were not practiced. The "re-growth capability" is determined by assessing the dominant species within the VMA, as they relate to the difference in elevation between the protected airspace and the ground surface.

Table 4-3: *Summary of information for each VMA at Hanscom Field used to select the initial and secondary vegetation removal methods for the Vegetation Management Plan. Data includes entire airport and is not limited to areas requiring actual vegetation removal within the next 5 years.*

VMA	Size of VMA	Height of Dominant Vegetation	Height of Vegetation to Remain	Soil Stability	Environmental Sensitivity	Re-growth Capability
1	567 acres (includes pavement)	< 1'	< 1'	Stable	High	N/A
2	117 acres	60-80'	< 50'	Stable	Moderate	Low
3	65 acres	20-60'	< 25'	Unstable	High	Moderate
4	23 acres	35'	< 15'	Stable	Moderate	High
5	55 acres	35'	< 5'	Stable	Low	High
6	12 acres	60'	< 15'	Stable	High	High
7	10 acres	30'	< 5'	Stable	Moderate	High
8	9 acres	25'	< 5'	Stable	Low	High
9	12 acres	45'	< 15'	Unstable	High	Moderate
10	21 acres	65'	< 25'	Unstable	Moderate	Moderate
11	70 acres	60-90'	< 50'	Stable	Low	Low
12	23 acres	40-65'	< 5'	Stable	Low	High
13	27 acres	60-85'	< 50'	Stable	Moderate	Low
14	19 acres	55-80'	< 50'	Stable	Moderate	Low
15	10 acres	30'	< 5'	Stable	Moderate	High
16	11 acres	50-60'	< 25'	Stable	Low	Low

Based on the information collected for each VMA and a comparison of the vegetation characteristics to the elevation and location of the protected airspace surfaces, management options were selected that minimized impacts to environmental resources while providing for a reasonably maintained VMA. The following general principles were followed in analyzing the VMA alternatives:

- Where only mature trees penetrate protected airspace within a VMA, removal methods that protect and preserve the understory were selected while non-selective removal methods that may result in significant damage to the understory were not considered.
- Where the elevations of the protected airspace surfaces are greater than 50 feet above the ground elevation within a VMA, re-growth of the cut vegetation was not considered to be an issue so secondary control methods were not proposed.
- Removal methods that result in the alteration of soils (push/pull trees, clearing and grubbing) were not considered for any wetland VMAs.

- ~~Removal methods that result in standing dead timber (such as girdling) were not selected as a primary method due to the number of trees involved in the project, the safety implications of allowing dead vegetation to remain, and the labor intensiveness of these methods. However, the selective creation of snags is proposed as a wildlife habitat mitigation measure.~~

- Herbicide application is restricted to direct foliar treatments after at least one year of re-growth due to the increased effectiveness over cut-stump or frill-and-inject treatments. Increased method effectiveness results in reduced volumes of herbicide and overall lower project costs.

- Where unstable soils exist, removal methods that involve mechanized ground removal were not considered. Non-ground removal method alternatives were restricted to top-and-girdle since the subject VMAs are not conducive to high-lead logging based on VMA size, distance to staging areas, and soil conditions between the vegetation to be removed and the staging areas. High-lead logging is a means of removing cut vegetation from an area by means of high-tension cables strung above the area and eliminates the need to skid, or drag, trees along the ground. Helicopter removal, while included in the original version of the VMP, was not used as a primary removal technique based on the success and environmental sensitivity resulting from the top-and-girdle technique used in the 2003 clearing project.

Based on the above-noted principles, the number of alternatives considered for each of the VMAs was significantly reduced. The following methods from Table 4-2 were determined to be inappropriate:

- Push Trees Over/Pull Trees Down
  Soil disturbance is excessive as the root mass is removed from the ground with the attached soil, requires heavy machinery access to each individual tree, which is not available in many locations addressed in this VMP, and cannot be used in wetland situations since it involves disturbance of the soil. There is high potential for the spread of invasive species when using this technique.

- Shear Trees with a Bulldozer:
  While this method allows the root mass to remain in the ground, machinery access to each individual tree is required. A bulldozer exerts force on the soils to remove the tree, increasing the potential to alter the soils as compared to other available methods. Ground pressures developed by a bulldozer are much higher than those for typical logging machinery. Thus, the areas where this technique can be used are limited due to the presence of unstable soils on the site.

- Build an Impoundment:
  The creation of open water areas to flood the penetrating vegetation in close proximity to aircraft movement areas is contrary to FAA policy since open water resources attract waterfowl which pose a hazard to aircraft. Additionally, the standing dead timber created by flooding often remains a penetration to the airspace, and must be removed anyway. Impoundment creation may also be subject to the Department of Environmental Management Dam Safety Regulations, which require a thorough engineering design for any created dam. This would be a costly option and would not fully achieve the goals of the project.

- Cut Surface Treatments (Herbicide Application):
  The application of herbicides to freshly cut vegetation as a cut surface, frill-and-inject,

and/or basal treatment has a lower success rate as compared to foliar treatments following at least one season of re-growth. Over the long-term, the improved success of the selected application technique will result in lower herbicide volumes and improved project longevity. Cut surface treatments typically require a more concentrated solution of herbicide (up to a 50% solution compared to 7-15% solutions for foliar applications). The higher concentrations combined with the lower success rate results in overall higher volumes of herbicide, increased project costs, and more intensive labor.

- Combination Physical/Chemical Methods:
  All of the available combination methods utilized the immediate application of herbicides to the cut vegetation, which has been shown to have a lower success rate than selective foliar treatments of re-growth.

After eliminating the above removal/management methods, the remaining alternatives were reviewed. The assessment considered removing all vegetation (including the root systems), allowing only vegetation that would not likely penetrate the protected airspace to remain (selective removal), or allowing all vegetation to remain but reducing it in height to below the airspace elevation (topping). Topping was initially not selected for any of the VMAs in 2003 for the following reasons:

- Topping requires direct access to each individual penetration and access to the top of the penetration using either a type of lift truck or climbing the vegetation. This is a labor intensive action posing a higher degree of hazard to the work crew than other removal methods. Access to each tree with a lift truck involves a greater degree of incidental damage over selected clearing methods, since direct access to the base of each tree by heavy equipment is not required for the mechanized felling option.
- Access to many of the VMAs is constrained by soil conditions, thus topping with the use of a lift vehicle would be infeasible in those areas.
- The exact elevation of each penetration or group of penetrations would have to be determined so that the correct topping height is known. This would likely require ground survey of each penetration.
- Topping results in only a short-term gain, as re-growth would be rapid, requiring a new project within 2-3 years of the action. Maintenance of the topped areas is not feasible due to the number of penetrations existing at the airport.
- Many of the penetrations involve White Pine and Pitch Pine, which would die after topping resulting in standing dead timber.

However; based on the results of the 2003 removal project, topping has been determined to be an effectgive technique in some VMAs. It was also found to be feasible without the need for a lift vehicle. Skilled professional climbers were able to access target trees, and remove the obstructing portion. Further reduction of the dropped limbs on the ground was required to reduce the mulching effect of the downed limbs. All cut vegetation remained at the tree base. This technique was found to be suitable where small areas of trees similar in height exist, and direct view of the tree tops was observable from open ground so that survey could be performed on the cut tops to ensure adequate removal heights. Additionally, the area had to be well removed from any pedestrian activity or structures. The issue of re-growth was addressed through the girdling of all topped trees, which stunted their growth and resulted in the elimination of the tree over an approximate 3-5 year period.

Based on a thorough review of the available techniques versus the airspace, ground and plant community conditions at Hanscom, the extent of plant community conversion for the VMAs at Hanscom were evaluated. The following provides the degress of anticipated plant community conversion necessary for the Hanscom VMAs.

Removal (conversion) of all Vegetation:	VMAs 5, 7, 8, 12
Selective Removal of Vegetation:	VMAs 2, 3, 4, 6, 9, 10, 11, 13, 14, 15, 16

Having identified the type of vegetative community to be established, the remaining available vegetation removal methods were considered for each of the VMAs. In the list of selection principles, the narrowing of the alternatives based on environmental conditions is presented. Soil alteration and VMA access were two of the primary considerations in determining the initial removal method. Where unstable soils and/or limited site access were identified within a VMA, the lowest impact alternative was selected (helicopter removal or top-and-girdle). Where stable soil conditions allowed for machinery use and access, the height of the vegetation that could remain in the VMA determined the removal method. Where shrubs were to be protected, a selective removal was proposed (cut and chip, or mechanized felling depending upon the diameter of the vegetation to be removed). Where shrubs penetrated the protected airspace in the stable soil areas, mowing (wetlands) or clear and grub (uplands), with a conversion to meadow habitat was proposed.

The alternatives analysis resulted in the application of the principle of Integrated Vegetation Management to each of the VMAs. Removal methods were carefully selected based on environmental constraints, airspace elevation, and ground elevation. Then, the need for secondary measures to control re-growth within the VMA was assessed, and methods selected where appropriate. The use of the initial and secondary removal methods establishes a vegetative community within each VMA that is maintainable in the long-term, thus addressing the safety requirements of the airport for many years, and reducing the need for large scale projects in the cut areas in the future.

D. Selected Primary Removal Methods

The following section provides a description of the selected vegetation removal methods to be utilized at L.G. Hanscom Field. The selection of the appropriate removal methods was based on a host of factors, including the height and diameter of the obstructions, the ground/soil conditions, the height of the protected airspace above the VMA, and the accessability of the particular VMA. Where vegetation at shrub height penetrates the navigable airspace, the complete removal of the woody species, typically through mowing, is specified. However, where only trees have the ability to penetrate, selective mechanized clearing and protection of the shrub layer is specified. A summary of the removal methods to be used is provided in Table 4-4. Work within wetlands and buffers will not be performed until Massport has secured all necessary permits for each removal project under this phase of the VMP.

Table 4-4: *Summary of Primary Recommended Vegetation Removal Methods for the Vegetation Management Areas at L.G. Hanscom Field*

Initial Removal Method	Applicable VMAs	Height of Vegetation to Remain	Comments
Mowing, Grass Areas (using standard equipment)	1	<12"	Regular maintenance of grassy areas using standard landscape mowing equipment.
Mowing, Woody Vegetation (using flail-type equipment)	7, 15	<5'	Maximum ground surface loading restrictions will be imposed by Massport during any contracts for work in wetlands that are capable of supporting equipment. Dry or frozen ground conditions will also be required.
Clear and Grub	8, 12	<12"	Upland area is converted from woody vegetation to grass to provide for long-term maintenance by grass mowers. Slash and root systems are removed from the site. Existing topsoil is graded as needed, and seeded with an appropriate seed mix.
Cut and Chip	4, 9, 14, 15	<15	Cut vegetation will be lifted or hand carried out of project area and chipped into trucks within staging areas for removal from airport site. No chips will be spread onto ground surface. Intention of removal method is to protect non-target vegetation during removal, and to promote the growth of a dense shrub layer. A highly selective removal method specified for environmentally sensitive areas where smaller diameter vegetation is to be removed.
Mechanized Felling	2, 5, 6, 11, 13, 16	Variable	These areas generally include selective removal of tall trees where a significant understory of shorter trees is allowed to remain. A somewhat selective removal method that does not significantly modify the vegetative community. Specified for areas of mature trees where suitable access to the obstructing vegetation is available.
Helicopter Removal Top-and-Girdle	3, 10	Variable	Allow shrub and sapling layers to remain. Provides for protection of unstable soil in wetland areas while removing mature trees that penetrate the airspace. Hand clearing with chain saws by climbing crews will be followed by reducing the slash on the ground. A minimal impact removal method.

Mowing, Grass Areas

Mowing in grass areas is a regularly performed airport maintenance operation to maintain those areas in proximity to runways, taxiways, safety areas, and other operational areas of the airport. These areas are mowed to provide clear lines of sight and to prevent woody vegetation from encroaching into these areas. Standard tractor-type equipment is used. Vegetation in these areas is generally maintained at 12 inches or less.

Mowing, Woody Vegetation

This removal method is reserved for those areas where even saplings and tall shrub species are able to penetrate the protected airspace, which typically occurs in areas in close proximity to the primary surface, and within the initial section of the approach surface. Mowing is only used where stable soils are present under dry or frozen conditions, or where only a short reach is required over unstable areas to access the target vegetation. Flail mowers can reach approximately 15 feet over unstable areas.

Mowing will be performed by mechanical shredding of woody vegetation down to near ground level using a tracked or tired vehicle that exerts low ground pressures. In VMA 7, conversion to a meadow is proposed thus removal to ground level will occur. In VMAs 5 and 15, the establishment of a low shrub layer is proposed, thus mowing will be restricted to saplings and tall shrubs. Vegetation is converted to a fine, evenly spread mulch. Erosion control barriers are not typically required in these areas, however the use of seed and mulch to protect areas with no groundcover is specified. This removal method will result in the re-establishment of a low shrub layer or grassland habitat, and saplings will be subject to periodic removal as part of the long-term maintenance of the areas. It is recommended that these mowing areas be treated with a foliar herbicide application to eradicate tree saplings.

The use of flail mowing in VMAs 5 and 15 was limited after the 2003 removal project. The continued growth of the vegetation at the airport has resulted in a reduced area where flail mowing can be practiced. When the occurrence of tree species with a diameter exceeding 6 inches becomes too high, then mechanized felling replaces the flail mowing equipment. As the VMP updates are generated, the phasing out of this technique will likely occur.

Clear and Grub

This upland method includes removal of all woody vegetation to ground level. Grubbing shall involve the mechanical removal of all root systems, and the entire area will then be graded, topsoiled and seeded. All grubbing debris will be removed from the site. No grubbing within any wetland area is recommended in this VMP. Erosion control barriers are typically established along the downslope area to protect adjacent wetlands. This removal method will provide for easier long-term maintenance of the area as grassland.

Cut and Chip

This removal method is specified where tall shrubs, tree saplings, and small trees are the obstructing vegetation, and preservation of a low shrub layer is an objective. This method will include hand cutting of target woody vegetation in the most sensitive areas. Additionally, this

method is specified where soil conditions prohibit equipment access to all or part of the VMA, requiring the hand carrying or cabling of trees to a staging location for processing and removal from the project site. No wood chips will be deposited on the surface of the ground. Vegetation subject to cut and chip removal is highly selective, and results in the protection of the shrub and groundcover layers. Cut areas will be subject to herbicide application to control re-growth from stumps.

The locations of the VMAs to be subjected to this method require the contractor to preserve and protect vegetation 30 feet in height or less in the vicinity of residential neighborhoods at the Runway 29 and 23 ends. In all other areas, where it is more efficient to remove smaller trees in the process of removing those over 15 feet in height, the contractor will be directed to do so. In any case, if trees less than 15 feet in height are damaged during the removal of taller trees, they shall also be removed. All native shrubs in these areas are to be preserved and protected to the extent practicable.

All downed timber, logs, snags, debris, and rubbish of any nature shall be removed as part of the initial vegetation removal. No equipment will be allowed within wetland buffers unless the Contractor can demonstrate that no soil disturbance will occur. Work within wetlands and wetland buffers will not be performed until Massport has secured all necessary permits.

All rutting created by removal efforts will be regraded. Any rutting and soil disturbance that may occur on slopes shall be regraded and stabilized immediately by seeding and mulching as per the mitigation measures contained in Chapter 5 of this VMP. Erosion control barriers are used in these areas on an as-needed basis only. Where optimal working conditions occur, soil disturbance can be completely avoided.

Mechanized Felling

Vegetation in areas designated for mechanized felling predominantly have an upper-story height of 60 to 100 feet. Species primarily include Red Maple, Red Oak, and White Pine. Areas designated as mechanized felling areas are located around the airport periphery, where only the tallest vegetation penetrates the protected airspace and soils allow for equipment access. In these areas, only mature trees need to be removed from the site. Staging areas are to be established in upland areas for log loading.

This technique uses a front-mounted felling head operated hydraulically from a remote cab. The vehicle type can be either small or large, and the vehicle can be tracked or rubber tire. Mechanized fellers include three categories: feller-buncher, feller-director, multi-function harvester. Hand felling is proposed in the area of the capped landfill within VMA 13 to avoid any damage to the landfill liner by machinery.

Feller-bunchers allow the operator to cut several stems at one time and use an accumulator to carry cut trees together to a single location where they can be loaded onto trucks for disposal from the project site. Feller-directors can only cut one tree at a time and must bring individual trees to a bunch for removal from the site. Multi-function harvesters allow an operator to fell, delimb, and buck (cut to length) trees from a remote cab.

Erosion control barriers are used on an as-needed basis in these areas. Where rutting occurs, seed and mulch are applied. Jute netting is used where rutting occurs on slopes.

Helicopter Removal

The use of helicopter removal has been specified for those areas where access is limited due to poor soil conditions and/or the presence of other sensitive environmental resources. This removal methodology is suitable for those VMAs where the vegetation removal is limited to large trees and the sapling and shrub layers are to be preserved. This method is proposed primarily as a measure to address potential wetland impacts.

Helicopter removal requires the felling of trees by hand with chain-saws, lopping and reducing limbs in place (optional), and attaching the trunk sections to a cable lowered from a helicopter. The trees are then transported to an established staging area where further processing of each tree is completed. This processing may include chipping of unusable sections and reducing trunks to standard lengths for trucking. Chips and logs are then removed from the staging area by trucks.

Directional felling of trees within wetland areas is practiced to avoid stream channels and dense shrub areas, providing protection to wetland functions and values. Where possible, felling will be directed to the most open area available, since protection and promotion of the shrub layer is an objective within the helicopter removal areas. In VMA 10, directional felling will also be used to avoid impacts to the capped landfill area at the southern end of the VMA.

Top-and-Girdle

The use of the top-and-girdle technique is specified for those mature forested areas where access by machinery is not feasible due to poor soil conditions or other environmental issue; mainly in wetland areas and was substituted for helicopter removal during the 2003 VMP. This technique results in standing dead timber, and thus is not used where pedestrians may occur, or near parking areas or structures.

Top-and-girdle requires access to the trees (on foot) by climbers with chain saws. The height of the trees relative to the airspace elevation must be certain. The individual or small group of trees is then climbed, a specified amount of the limbs dropped to the ground, and then the limbs are further reduced on the ground. Some hand scattering of the limbs is prescribed to avoid too much biomass in one area.

This technique is the most target-specific and sensitive of the primary removal options. It is labor intensive, and results in standing dead timber. The added biomass on the ground did not result in groundcover or shrub impacts in the 2003 clearing project.

E. Selected Secondary Vegetation Management Methods

Vegetation management at public use airports is a multi-task, continuous process which can only be successful if the initial removal plan addresses the long term maintenance issues. Typically, the initial removal of penetrations is completed by a contractor, while the maintenance of selected areas is completed by the airport staff which is normally limited in terms of both number of personnel and budget. The ease of this maintenance task usually determines the

long term viability of the clearing project. It is this maintenance issue which is of primary concern to the airports in general since the protected surfaces must be kept clear of penetrations after the initial removal project.

The VMP for L.G. Hanscom Field involves an initial mechanical removal of the vegetation which is presently penetrating the protected surfaces. Dominant species within both the upland and wetland areas at the airport include many which are capable of rapid re-growth from stumps, stems, and/or root systems. Shrub species are typically not a concern in this regard since their maximum height restricts them from penetrating the protected surfaces in most cases. However, many deciduous tree species routinely exhibit re-sprouting from cut surfaces. These sprouts have the capacity for rapid growth since the full mature root systems remain in the ground providing the necessary ingredients for growth. Additionally, the sprouts are often multi-stemmed, resulting in more penetrations to the surface than the original individual plant, and a higher density of stems to maintain. Some of the species capable of this type of re-growth and which are common at the airport include:

Red Maple	*Acer rubrum*
Red Oak	*Quercus rubra*
White Oak	*Quercus alba*
Black Oak	*Quercus velutina*
Quaking Aspen	*Populus tremula*
Cottonwood	*Populus deltoides*

Secondary management techniques proposed with this project that address the long-term maintenance of the VMAs include:

- Herbicide application
- ~~Prescribed burns~~
- Selective thinning
- Mowing

Table 4-1 provides a listing of the VMAs and the applicable secondary management techniques proposed for each. The following sections provide a discussion of each of the selected secondary management techniques.

E-1 Herbicide Application

This maintenance issue has been a concern for many years in various vegetation management situations including power line rights-of-way, roadsides, and railroad corridors. Chemical control of these situations has developed as the preferred method in terms of the environmental protection, the intensity of the labor involved, durability of the control, longevity of the project, and cost. Since these efforts have been ongoing for many years, research and development of increasingly advantageous chemical controls has been constant, resulting in a variety of safe and beneficial types. Additionally, the research has developed a variety of types of these controls which have differing properties, allowing for the selection of one which is specifically matched for the intended situation. The data which have been accumulated over these many years regarding these modern herbicide types show that the proper use of these chemical methods provides an efficient means of control while protecting the environment. Many of the

products are approved by both federal and state resource protection agencies for use in wetland situations, and even within close proximity to drinking water supplies. Many conservation agencies employ chemical methods for the elimination of invasive species in sensitive wetland areas. Chemical methods are a lower impact, more efficient option than continuous mechanical removal of stems. In general, the use of the chemical control alternative has the following advantages over several mechanical clearings:

- There is an increased longevity of the original vegetation removal since new growth must generate new root systems, as opposed to regrowth utilizing existing mature root systems.
- The frequency of mechanical removal is decreased, thus improving the overall landscape of the site by eliminating stumps, slash, etc.
- Chemical controls are selective, allowing shrubs and groundcover to remain without injury after the completion of the application. There is typically no incidental damage to non-target vegetation.
- Access to the management sites is not an issue when chemical applications are used since a backpack sprayer is the common form of equipment used for the application.
- Maintenance of the areas is significantly decreased thus reducing the overall costs of vegetation management.

Herbicide Regulatory Authority

The use of various chemical methods for long term vegetation management is an acceptable alternative and was thoroughly discussed and reviewed throughout the GEIR for Vegetation Removal Process. The selected method of herbicide application and the brand name products to be employed were also included in the GEIR. This method has been reviewed pursuant to the Massachusetts Environmental Policy Act and the Massachusetts Wetlands Protection Act, and is regulated by the Massachusetts Department of Food and Agriculture (MDFA) through a series of regulations. Additional federal regulatory authority which may pertain to the use of the specified chemical controls includes the Occupational Safety and Health Agency and the Federal Insecticide, Fungicide, and Rodenticide Act. Over eight vegetation management plans at public use airports which involved the use of herbicides in buffer zone and wetland situations have been approved by local conservation commissions and the Massachusetts Department of Environmental Protection pursuant to the limited project provisions of the Massachusetts Wetlands Protection Act Regulations. Additionally, the particular herbicide to be used at Hanscom Field is approved for use in wetland situations and near public water supplies (see Appendix C).

In order for an herbicide to be used in a particular situation, it must be registered and approved for that use by the U.S. EPA and the corresponding state agency (Massachusetts Department of Food and Agriculture). Use of herbicides in wetland situations usually requires additional levels of regulation and, in Massachusetts, the Rights of Way Management Regulations (333 CMR 11.00) apply for railroad and utility rights of way. The GEIR recommends these regulations be used as guidance for airport vegetation removal projects. These regulations include measures for storage, mixture, application rates, species selection, applicator training requirements, etc. The preparation of a vegetation management plan prior to the use of the herbicides is a requirement of these regulations. The proposed use of chemical methods will be

in compliance with all state and federal regulations. Applicators will be required to be licensed as per the requirements of 333 CMR 13.00.

Proposed Application Techniques

The application of herbicides can take many forms such as hand spraying of un-cut vegetation, including foliar treatment, application into man-made wounds, or coating of tree stumps after cutting has occurred. Based on an evaluation of the techniques employed at other airports in combination with the target species at L.G. Hanscom Field, foliar treatment was selected as the single method of herbicide application most appropriate for this VMP due to its efficiency and ease of target selection. Discussions with conservation agencies that employ a variety of herbicide application methods assisted in our selection.

Foliar treatments will be conducted at least one growing season after the initial mechanical or hand removal of vegetation from the target areas. This treatment consists of applying a designated amount of spray (as per the manufacturer's recommendations) to the regrowth to cover about 50-60% of the existing foliage using a low pressure sprayer. The application is to an individual sprout, and is not broadcast over a wide area. It is not necessary to wet the entire plant, thus reducing herbicide volumes. The regrowth should be between 2 and 6 feet in height when treated, with a maximum of 10 feet. This height range should be achieved during the growing season following the cutting. Typical spray volumes are 15-25 gallons per acre of the low concentration herbicide/water mixture. Applications will be conducted during the growing season and during calm wind conditions to limit the mortality of non-target species.

Herbicides for use in wetland areas are even more limited since potential impacts due to toxicity, persistence, and mobility are key issues in protecting aquatic organisms and drinking water supplies. The Massachusetts Department of Food and Agriculture has developed a listing of the pesticide components which are not approved for use in wetland areas. The herbicide to be used in this VMP shall be approved for use in wetlands. Review of the material safety data sheet for the selected type reveals very low toxicity for aquatic organisms, a short half-life, and low mobility in soils (Appendix C). Restrictions on the use of the herbicide in wetland areas include the following (as found in 333 CMR 11.00):

- No herbicide shall be applied on or within 10 feet of any standing or flowing water. At L.G. Hanscom Field, the foliar treatment is to be completed annually until the objectives are achieved. For the 2003 clearing project, 4-5 applications were necessary to control re-growth and invasive species. Touch-up applications will be required periodically after the initial intensive control period.
- No herbicide shall be applied within 100 feet of the edge of a vernal pool. These existing and potential pool areas occur in VMAs 2 and 6.

Herbicide Product Information

The target species at the airport include deciduous trees that are capable of heights exceeding 60 feet. Many of the species are quick growing (*Populus* spp.) and are prolific (*Acer* sp.) warranting the additional management beyond the removal stage. As was discussed above, most modern herbicides are specific for groups of similar vegetation, thus the list of target species for a site needs to be compared to the manufacturer's data. For L.G. Hanscom Field,

the list of target species and the need for chemical control in wetlands is adequately addressed by a single type of herbicide: a glyphosate product with several brand names including Accord, Roundup, and Rodeo. Roundup is widely used by the general public and professionals throughout the world. It has an excellent safety record and is approved for use in wetlands by the MDFA (333 CMR 11.00).

It is recommended that a glyphosate herbicide with a surfactant be utilized as a foliar spray where the treatment is required. The application will consist of an approximate 7% solution which also contains a surfactant to improve contact time with the target species. Surfactants act as a detergent which improves coverage of the spray on the leaf surface and a higher mortality of the target species. The surfactant is composed of carbon, hydrogen, and oxygen, and is chemically related to an alcohol. Most surfactants have very low toxicities, and are rapidly broken down in the environment (short half-life) to harmless byproducts (carbon dioxide and water). The solution would be applied at the rate of approximately 20 gallons per acre using a backpack sprayer by a professional who is licensed in accordance with all applicable state and federal regulations. This person will be responsible for the proper mixing, handling, and application of the product.

After the completion of the initial clearing and foliar treatments, some regrowth will remain and tree saplings will become re-established within the management areas. The number of saplings will be initially low; but if no maintenance is practiced, the numbers can be unmanageable within three years after the initial treatments. Without maintenance, there will likely be a need for additional intensive mechanical and chemical management in the future.

It is anticipated that after the third or fourth foliar treatment of each removal area where this technique is prescribed by this VMP, tree saplings will begin to establish themselves within most management areas. Through the use of hand clippers, chain saws, or brush trimmers, the saplings will be selectively removed from wetland areas allowing all shrubs to remain. By protecting the shrub layer and enhancing shrub growth, sunlight will become a limiting factor for sapling establishment, thus reducing the maintenance effort in the wetland management areas. This is also important for the restriction of nuisance vegetation from the management areas. Protection of the shrub layer will restrict the spread of this vegetation to additional areas. Within the upland management areas, the same maintenance can be practiced or, if available, a small brush mower can be used to keep all vegetation down to ground level, promoting herbaceous growth. Through the use of a brush mower, additional land can be maintained at the airport in an efficient manner.

~~E-2 Prescribed Burning~~

~~Prescribed burning could be utilized as a supplemental maintenance tool within VMAs 4 and 5. This maintenance method offers various advantages to the airport and natural resources over mechanized maintenance; although, its use is limited to low shrub areas with adequate setbacks from residential areas. The timing of the burn is important in terms of both control of the burn, and protection of wildlife. The burns are set for the spring season, prior to May 1, or shortly thereafter, in order to take advantage of the natural ground moisture during that season (for burn control) and to avoid ground nesting bird species egg dates.~~

~~The methodology to be used for prescribed burns was developed by Massport and used within VMA 5 in 1998. The compilation of the burn plan involved input from several universities and local and state agencies, and may be used as the basis for future burns when feasible. It includes information on weather conditions as well as a safety/emergency response plan. It is included in Appendix F of this VMP document as a proposed method of implementation.~~

~~Prescribed burning is listed in this VMP as a potential maintenance tool, and not as a vegetation removal method, due to the extent of the vegetation growth within the subject VMAs. Mechanical methods must be used initially to reduce the amount of vegetative fuel in the subject VMAs, which is currently excessive compared to the standard. It is proposed to possibly utilize the burns during year 3 of the VMP, which is two growing seasons after the initial mechanical removal. All necessary permits and coordination will be completed during the winter months prior to the spring burn, since the burns are dependent upon local and state permit approvals. If the burns are not feasible, herbicide applications and/or selective thinning will be used to address the re-growth.~~

E-3 Selective Thinning

Selective thinning refers to the removal of target re-growth using hand clippers or gas operated brush cutters. Since ground disturbance is not an issue when using this technique, it can be completed during any season. The use of selective thinning is restricted by the density of the target vegetation. Where re-growth densities are high, the use of selective thinning becomes labor intensive. For this reason, it is listed in combination with herbicide applications, to be used at the discretion of the airport.

E-4 Mowing

The mowing of herbaceous cover within both wetland and upland areas is listed as both a primary and secondary management technique in this VMP. Where the existing VMA consists of herbaceous species (i.e. VMA 1), mowing is used to maintain the area in its present condition. Where the initial removal method will create an herbaceous cover (i.e. VMAs 7, 8, and 12), mowing will be used as a maintenance tool once the woody species have been eliminated. Mowing can be completed during any season within the upland areas, however the mowing of wetland areas (VMA 7) will require dry or frozen ground conditions.

F. Yearly Operational Plans (YOPs)

Development of Yearly Operational Plans (YOPs) provides strategies for annual scheduling and budgeting of vegetation management activities. The costs associated with the vegetation removal normally require the separation of the removal work into two or more years. Additionally, many maintenance tools require specific time periods and/or weather conditions to be utilized. YOPs are typically specified over a five year period.

The proposed vegetation management plan for areas other than the Hartwell Town Forest involves an initial mechanical and hand removal of obstructions followed by sapling removal and nuisance vegetation control through the following methods: foliar treatment of the regrowth, selective thinning, and/or mowing. It is proposed to complete all of the necessary penetration removal in the first year (during dry or frozen ground conditions sufficient to eliminate wetland

impacts due to the removal of the logs and slash), followed by foliar treatments as shown in Table 4-5. Maintenance of all management areas will be performed during the third year of the plan, and then on an annual basis. By continuously eliminating tree saplings, a dense shrub cover will become established suppressing future sapling growth within the applicable VMAs. Only through yearly maintenance will management areas remain free of obstructions, thus the maintenance is included in this VMP. Typically, lack of maintenance over one year is sufficient to create unmanageable conditions. However, the extent of the maintenance will be significantly reduced by the use of herbicide treatments as part of the VMP.

Table 4-5: *Yearly operational plans for the VMP at Hanscom Field for each of the five years of the plan.*

Year	Actions
1	Removal of all identified penetrating vegetation from the VMAs according to the removal methods proposed in this VMP. Wetland work is restricted to periods of dry or frozen ground conditions. Complete baseline monitoring of the vegetation plots and the invasive species control areas.
2	Initial Foliar Treatment within VMAs 4, 5, 6, 7, and 15, typically completed in mid-to-late summer. Initiate invasive species mitigation in VMAs 4,6, 9, and 13. Complete vegetation and invasive species monitoring reports.
3	Maintenance of all VMAs including second foliar treatment. Invasive species control in applicable VMAs. Complete vegetation and invasive species monitoring reports.
4	Third foliar treatment of all applicable VMAs. Invasive species control in applicable VMAs. Complete vegetation and invasive species monitoring reports.
5+	Maintenance of all VMAs including fourth foliar treatment. Invasive species control in applicable VMAs. Complete final vegetation and invasive species monitoring reports.

As the YOPs for each removal project prepared under this VMP are completed, the need for additional maintenance beyond the final year of the plan will be determined. If additional removal or treatments are needed, they will be included in the next VMP removal project (and the permitting thereof).

G. Discussion of Environmental Effects

The potential effects from the implementation of the VMP at Hanscom Field are primarily restricted to the modification of vegetative cover types within the VMAs. The change in cover may affect wildlife habitat, storm water runoff characteristics, surface water quality, and overall aesthetics. The assessment of the potential environmental effects associated with the vegetation removal projects completed under this VMP will be addressed in a project-specific fashion, within the individual permit applications completed for each removal project. The scope of the assessments should be based on the size and location of each removal project, and the assessment method should be consistent with applicable state and federal environmental regulations. Assessments of individual projects are to be provided in the respective Notices of Intent.

CHAPTER 5: MITIGATION MEASURES

Mitigation measures are proposed to address the environmental constraints discussed in Chapter 3. Additional measures may be included in the individual permit applications completed for each Vegetation Management Plan (VMP) update. The primary goals of the mitigation measures include:

- Remove identified and potential penetrations to the FAA Part 77 and TERPs surfaces at the airport in a safe and orderly manner according to the contract documents, environmental permits, and all applicable state and federal laws and regulations.
- Conduct the vegetation management in a manner that protects sensitive environmental resources, produces a wetland vegetative community that provides important functions and values and requires minimal maintenance.
- Be sensitive to immediate abutters of the airport who may be affected by any change in the vegetative community within the Vegetation Management Areas (VMAs).
- Control the spread of existing nuisance plant species at the airport through a combination of project timing, methodology, and restoration.
- Protect wetland resources from erosion and sedimentation impacts during the initial removal operation and maintain suitable wetland plant communities for wildlife.

The following is a listing of the mitigation measures which will help to achieve the overall goals of the project as listed in Chapter 1, while also addressing the mitigation goals as listed above.

Mechanical Removal Methods and Timing

Selection of the mechanical removal methods and identification of the VMAs that will receive designated treatment is the result of a comprehensive investigation of the vegetative communities and environmental resources that comprise the airport property and available removal alternatives as discussed in Chapter 4. Criteria for the selection included the locations and sensitivity of environmental constraints, and the elevations of the protection zones. The heights of the vegetation to be removed, the height and density of the vegetation to remain, along with the environmental conditions dictate the type of equipment that can be used to remove the obstructing vegetation. In this manner, only that vegetation which penetrates, or threatens to penetrate the protected surfaces will be removed allowing, in most cases, the shrub layer to remain.

The mechanical methods will be used only during periods of dry or frozen ground conditions where the tracked or rubber-tired vehicles will not cause disturbance of the soils. This is the most important mitigation measure proposed since it minimizes or avoids soil disturbance and thus eliminates the threat of sedimentation and significantly reduces the extent of disturbed ground which is favored by invasive species.

The proposed mechanical removal methods also result in a diversification of wildlife habitat; potentially resulting in a cover type that is increasingly rare in the northeast. Many rare avian species are facing a decline in numbers due to the cessation of farming and the gradual succession of open fields to mature woods. The loss of this habitat type to succession and development has left many avian species without nesting and feeding habitat. Many of the estimated habitats of rare species in Massachusetts include such ecosystems. In fact, most airports are included on the estimated habitat maps due to the presence of substantial area of the early successional cover types. Species such as the grasshopper sparrow, upland sandpiper, and short-eared owl are all confirmed rare species that currently inhabit airport properties in Massachusetts due to the presence of open grassland and early successional scrub-shrub habitat.

Removal of debris after the completion of the mechanical removal will be a condition of the contract, unless areas are identified where removal may result in more damage than allowing the cut vegetation to remain, such as in VMA 13 adjacent to the landfill or in top-and-girdle areas. In these cases, the logs may be cut into 24" lengths and allowed to rot in place. The creation of brush piles as habitat is an exception as discussed in this chapter.

Chemical Control Methods

Any Notice of Intent prepared for vegetation management proposing herbicides at L.G. Hanscom Field will include herbicide application guidelines similar to existing utility rights of way regulations as described in Chapter 4. Full compliance with these guidelines is a mandate. Through the full compliance with the guidelines, by following the additional use restrictions, and by using a product which is approved for use within wetlands and has a relatively low toxicity to aquatic organisms, potential impacts to wetlands will be mitigated. On this project, herbicide applications will not occur within 10 feet of any standing water, or within 100 feet of any certified or potential vernal pool.

Erosion Controls

Locations of erosion control barriers and matting are not established on the project plans since it is anticipated that only minimal controls will be required (based on experience with the first phase of VMP implementation at Hanscom Field as well as experiences with other several airport vegetation management projects). Barriers will be required adjacent to those VMAs where grubbing is proposed including VMAs 8 and 12. It will be a requirement that the contractor stockpiles a minimum of 300 feet of erosion control fence on the property, and 1,000 square feet of jute mesh in case of unforseen soil disturbance within other VMAs. The engineer and/or environmental monitor shall have the authority to direct the contractor to install any and all erosion controls within both wetland and upland areas which he/she deems necessary to protect wetland areas from sedimentation impacts. The environmental monitor will ensure that all necessary precautions are employed to avoid soil disturbance that could otherwise result in the spread of invasive plant species which presently inhabit the airport and surrounding areas. Much of the proposed work will occur during the winter months where snow and/or frost conditions do not typically allow for the proper installation of these erosion control devices, or it may be determined that the installation will not result in any additional protection. Since it is not possible to foresee all conditions under which the work will be completed, the engineer and/or environmental monitor will have the authority to determine the required controls.

Seeding Specifications

Areas of ground disturbance will be further protected through the use of seed mixes that will establish a reasonably quick cover (thus reducing the ground available for invasive species) but will not out-compete the species already present in the areas. The contractor shall have available 80 pounds of upland seed and 40 pounds of wetland seed, and sufficient mulch to cover 10,000 square feet (30 bales). Seed and mulch shall be applied at the direction of the engineer and/or environmental monitor. The seed mixtures and application rates for both upland and wetland situations are provided below.

Upland Seed Mixture:	45%	Red Fescue (*Festuca rubra*)
	35%	Annual Ryegrass (*Lolium multiflorum*)
	13%	Virginia Wild Ryegrass (*Elymus virginicus*)
	5%	Partridge Pea (*Chamaecrista fasciculata*)
	2%	Switchgrass (*Panicum virgatum*)
		40 lbs/Acre
Wetland Seed Mixture:	50%	Creeping Bentgrass (*Agrostis stolonifera*)
	20%	Fowl Bluegrass (*Poa palustris*)
	15%	Deertongue Grass (*Panicum clandestinum*)
	10%	Switchgrass (*Panicum virgatum*)
	5%	Annual Ryegrass (*Lolium multiflorum*)
		40 lbs/Acre

Each seeded area will receive additional protection through the use of a mulch to protect the seed during the winter months and to protect against dessication during the summer months. Mulch may consist of the following:

Mulch:	Hay or Straw, air dried and free of undesirable seeds.
	Wood fiber, cellulose with green dye (for hydroseed option)
	120 lbs/1000 SF (3 bales)

The upland seed mix shall be used within VMAs 8 and 12 where grubbing is proposed. In both areas, the seed and mulch shall be applied using a hydroseed application, where wood fiber mulch is included in the mixture. Where incidental soil disturbance occurs during the removal operation, hand application may be substituted for hydroseeding.

Staging Areas

Staging areas (the locations to be used for log/debris storage) are specified only for those areas where the proximity to wetland boundaries, property lines, and/or steep slopes make the pre-designation of such areas necessary to protect these resources. The contractor may establish as many other staging areas as necessary to complete the work, but only upon the approval of the engineer and/or environmental monitor. It is likely that permit applications for each vegetation removal plan prepared under this VMP will require that staging areas be specified on the permit application plans. Such areas are likely to result in some upland soil disturbance, thus all staging areas are to receive upland seed and mulch when construction is complete.

Debris is to be removed from the staging areas after completion of each section of the work, as per the removal specifications for each mechanical removal method discussed in Chapter 4.

~~The helicopter removal areas (VMAs 3 and 10) will require one or more staging areas within upland areas close to the VMA but in coordination with the air traffic control tower. The locations of the staging areas may vary depending upon the weather conditions during the days of operation, thus pre-determination of the sites is not practical.~~

Limited Access Areas

One of the environmental constraints identified on the project site was restrictive slopes, mainly associated with the two stream channels on the airport property. Additionally, soil conditions and rare species habitat also affect the areas to be used for access. Designated access is identified only for those areas where unrestricted access may affect the goals of this VMP. In other areas, access may be gained by a variety of routes, per the concurrence with the engineer and/or environmental monitor. All access and movement by vehicles associated with this VMP must adhere to airport safety policies and regulations. Access routes referenced herein do not relieve the contractor from meeting all restrictions and regulations regarding movement in and around the airport.

Table 5-1 provides information necessary to complete the vegetation management while avoiding sensitive areas.

Table 5-1: *Listing of sensitive areas at L.G. Hanscom Field which require specified staging areas and access routes due to soil, topography, rare species, and/or wetland issues.*

VMA Identifier	Comments on Access
3 and 10	Soil conditions unable to support heavy machinery. Directional felling and cabling of logs will be required for removal. Top-and-girdle is specified for the removal of interior obstructions from these VMAs.
15 and 16	Preserve a vegetated screen between the airport and adjacent residences.
14	Locate and mark groundwater monitoring wells, and avoid damage to the wells.
2 and 6	Vernal pool areas. No machinery allowed within 50 feet of pool banks. No herbicide application within 100 feet of pool banks. Pools and the setbacks are to be marked with flagging prior to vegetation removal.
4 and 9	Steep and wide stream channel with unstable banks will not allow for crossing between the upland VMAs on either side of the channel. Hand clearing will be required for the wetland VMA within the stream corridor. No crossing of the channel will be allowed.
13 and 10/11	Existing capped landfills to be avoided by machinery. Directional felling shall be practiced adjacent to the landfills to avoid damage to the liners.
6	Additional precautions shall be taken to preserve the shrub and sapling layer to continue functioning as a screen between the airport and adjacent residences.

Wildlife Habitat Improvements

FAA Advisory Circular 150/5200-33, *Hazardous Wildlife Attractants on or Near Airports,* states that "caution should be exercised to ensure that land use practices on or near airports do not enhance the attractiveness of the area to hazardous wildlife."

Within the criteria set forth within this advisory circular, limited numbers of isolated brush piles and standing dead timber (snags) will be constructed on the airport property to sustain existing wildlife habitat during the each removal operation. Brush piles shall be constructed of fresh cut branches and trunks that do not exceed six inches in diameter and are not less than six feet in length. Each pile shall measure between four and eight feet in height (lightly compacted), and have a surface area of between 300 and 600 square feet. Severe compaction of the piles shall be avoided, since the creation of void space is a goal of this habitat improvement. Piles shall be placed in locations approved by the Environmental Monitor at the densities indicated in Table 5-2 for the initial cutting plan. Snags shall be created out of live trees that are greater than 10 inches in diameter. Individual trees shall be selected by the environmental monitor at the density indicated in Table 5-2 for each removal plan that involves the applicable VMAs. The selected trees shall be cut a minimum of 15 feet off of the ground so that a standing trunk remains. The base of the tree shall be girdled to ensure tree mortality. Existing snags encountered during removal operations shall be preserved and protected if they are not obstructions to existing airspace. Additional snags/piles can be specified for future management operations.

Table 5-2: *Brush pile and snag creation within specified VMAs for each removal project where the VMA is involved.*

VMA	No. of Snags	No. of Brush Piles
2	12	8
3	8	n/a
13	8	3
14	12	3
16	4	2

Environmental Monitor

A qualified environmental monitor who is proficient in the state wetland, herbicide, and forest cutting regulations, and who has a working knowledge of this VMP shall supervise the completion of the mechanical removal portion of the yearly operational plans. The minimum requirements for the monitor include a bachelor's degree in environmental science or related field, a minimum of two years experience with erosion control/wetland monitoring of construction projects, and a minimum of five years experience with the Massachusetts Wetlands Protection Act Regulations. This monitor shall be aware of the locations of all sensitive areas, including wetland boundaries and the limits of the habitat of rare species. The environmental monitor shall direct the contractor to apply certain mitigation measures on an as-needed basis, including the installation of erosion controls and the seeding of altered areas. The environmental monitor shall be consulted on access routes and staging areas, and shall be the environmental contact person between the airport, community, and the contractor.

Vegetation Plot Monitoring

Massport will continue a program of vegetation monitoring of the existing plots within the VMAs throughout this VMP update. Plot locations were determined during the 2003 VMP and consist of the following:

- Plot centers permanently marked with an iron rod pounded into the ground and marked with highly visible paint. The plot locations have been survey-located and included on a plan of the airport. Each plot has been marked on the plan with latitude/longitude and Massachusetts state plane coordinates. The plan shall be used as a figure in each monitoring report.

Baseline data of the existing vegetation within the monitoring plot shall be collected during the growing season and prior to any project disturbance of the subject VMA. Photographs of the shrub/sapling layer, and a close-up of the groundcover layer shall be collected for each plot. Monitoring data shall be collected using techniques specified by the Department of Environmental Protection in determining wetland plant species composition and abundance. This technique includes an evaluation of the following vegetative strata:

Canopy Layer	Basal area, in square inches, of all tree species within a 30-foot radius circle
Lianas	Stem count of all climbing woody vines within a 30-foot radius circle
Saplings	Percent cover of all saplings greater than one inch diameter and 30 feet in height in leaf-on condition within a 15-foot radius circle
Shrubs	Percent cover of all shrubs greater than three feet in height in leaf-on condition within a 15-foot radius circle
Groundcover	Percent cover of all woody/herbaceous groundcover species within a 5-foot radius circle.

- An annual monitoring report shall be completed for the monitoring plots for an additional five years. Vegetation monitoring shall be completed each year during the growing season, and at approximately the same time of year as the baseline data collection. The reports shall contain an analysis of the vegetation in the plots using the above described methodology, a comparison of the percent coverage and species composition of the plots to the baseline data, a computation of percent wetland species coverage, a discussion of the increase/decrease of invasive species coverage, and a discussion of the re-vegetation of the plot relative to the performance standards of the Massachusetts Wetlands Protection Act. Photographs for each plot shall be collected for each annual report, and they shall be taken from the same location and angle as the photos taken for the baseline data.

- As part of each annual report, the measures taken for nuisance species elimination from the nuisance species control areas (described below) shall be included.

Nuisance Vegetation

Invasive vegetative species exist at the airport and have been identified as an environmental constraint in this VMP. In most wetland areas on the site, European Buckthorn is a dominant species within the shrub layer. Furthermore, Purple Loosestrife is common within the scrub-shrub and emergent wetlands on the site, particularly where beaver activity has resulted in increased light penetration along Elm Brook and the Shawsheen River. Since these species occur on and adjacent to the airport property in high densities, eradication of the species is not an objective of the VMP. Control of the spread of these species will be practiced. The following measures will be taken to control the spread of nuisance vegetation:

- Erosion control measures identified in this chapter shall be followed immediately upon the identification of disturbed soils. Seed and mulch specifications are particularly important since the establishment of a dense cover of other vegetation is the principle deterrent to the spread of these species. Staging areas and the clear/grub VMAs (8 and 12) are the largest potential areas of disturbed soil, thus the mitigation focus in these areas will be the quick establishment of turf.

- Where opportunities exist within the mowing and cut-and-chip VMAs, European Buckthorn will be targeted for removal if other shrub species are present in the community. The environmental monitor will identify mono-cultures of the nuisance species that can be cut along with the sapling removal. This will allow native shrub species an opportunity to colonize the area.

Four nuisance species control areas were established as part of the 2003 VMP. These included portions of VMAs 4, 6, 9, 10 and 13. Additional control areas may be established as a part of future VMP updates. Protection of native shrubs during the invasive species control is an objective of this mitigation measure. The control includes the identification of the control area limits followed by the systematic identification and elimination of nuisance shrub species using a combination of selective thinning and herbicide applications that favor the growth and spread of existing native shrubs. Target species in the sites include European Buckthorn, Japanese Barberry, and European Honeysuckle. Nuisance groundcover species are not known to occur in the selected areas, however, if present, the following species will also be targeted: Purple Loosestrife, Common Reed, and Oriental Bittersweet. The process of control includes the mechanical and/or hand removal of the nuisance species from the limits of the control areas during the mechanical removal phase of the project. During the following four yearly operational plans of a management period, hand thinning or a combination of thinning and herbicide treatments will be used for the elimination of the nuisance vegetation. Herbicide applications, while effective, cannot be used in all of the control areas due to open water restrictions on herbicide applications.

As part of this mitigation measure, the success of the control sites shall be documented on an annual basis, with the results submitted along with the vegetation monitoring reports described above. Baseline data of each control area shall be collected prior to any control measures including an analysis of the shrub layer composition and density using the vegetative data collection techniques for the shrub layer described above. A sufficient number of baseline

photographs shall be taken of each control area during the growing season which, in combination with the shrub plot data, can be used to determine the success of the control. Annual data collection and photographs shall be collected after each year's control efforts have been completed. Each control area will require five years of monitoring.

Vernal Pool Protection

Vernal pools within VMAs 2 and 6 shall be marked in the following manner prior to the vegetation removal projects within the subject VMAs:

- The pool edge shall be marked every five feet with brightly colored surveyor's flagging (four pools).
- The 50-foot perimeter from the pool edge shall be marked with "caution" tape during mechanical removal operations.
- The 100-foot perimeter from the pool edge shall be marked with "caution" tape during herbicide applications within the subject VMAs.
- All markings will be removed after completion of the work.

The following conditions are part of this VMP and apply to working within VMAs 2 and 6:

- No mechanical removal of vegetation shall occur within 50 feet of the vernal pool edge as marked by "caution" tape.
- No herbicide applications shall be made closer than 100 feet from the edge of the pool, and shall be completed within vernal pool habitat between July 1 and September 1.
- Directional felling of vegetation shall be practiced within 50 feet of the vernal pools. Trees shall be felled away from the established 50-foot perimeter.
- Erosion control barriers within 200 feet of the vernal pools shall be installed in a staggered format so that gaps exist within the barrier to allow for the passage of wildlife, but continue to provide effective stormwater filtering from disturbed areas. Barriers shall not remain in place for more than four months.

Appendix G Cultural Resources

Appendix G

Cultural and Historical Resources

List of Tables **Page**

Table G-1 Historic Architectural Resources located at Traffic Study Intersections, 2012

Intersection Number	Town	Intersection	Historic Resources Name (Designation)
1	Lexington	Route 4/225 (Great Rd)/Hartwell Ave	None
2	Lexington	Route 2A (Marrett Rd)/Mass Ave	None
3	Lexington	Route 2A (Mass Ave)/Old Mass Ave	Minute Man National Historical Park (MMNHP) (NHL, NR)
4	Lexington	Route 2A (Mass Ave)/Airport Rd (Marrett St)	Minute Man National Historical Park (NHL, NR)
5	Lincoln	Hanscom Drive/Old Bedford Rd	None
6	Lincoln	Route 2A (North Great Rd)/Hanscom Dr	Minute Man National Historical Park (NHL, NR) LIN.157 Giurleo House (MMNHP) LIN.158 Giurleo House Garage (MMNHP)
7	Lincoln	Route 2A (North Great Rd)/Bedford Rd	Minute Man National Historical Park (NHL, NR)
8	Lincoln/Concord	Route 2A (Lexington Rd)/Cambridge Turnpike Cutoff /Brooks Rd	Minute Man National Historical Park (NHL, NR) CON.358 Samuel Brooks House (MMNHP)
9	Concord	Lexington Rd/Old Bedford Rd	Minute Man National Historical Park (NHL, NR) CON-BL Lower Old Bedford Rd/Virginia Rd Area (MACRIS) CON.175 Deacon Sampson Mason-Terrence McHugh House (MMNHP/CON-BL) CON.349 Daniel Taylor House (MMNHP/CON-BL) CON.351 Burke House (MMNHP/CON-BL) CON.1812 Burke Garage (MMNHP/CON-BL)
10	Concord	Old Bedford Rd/Virginia Rd	CON-BL Lower Old Bedford Rd/Virginia Rd Area (MACRIS) CON.1069 Patrick Dalton House (CON-BL)
11	Concord	Old Bedford Rd/Route 62 (continues as Old Bedford Rd)	CON-BN Old Bedford Road Area II (MACRIS) CON-BO Bedford Street Area II (MACRIS) CON.1090 759 Bedford Street House (CON-BO)
12	Bedford	Route 62 (Concord Rd)/Hartwell Rd	BED.H Concord Road Area (MACRIS) BED.344 247-249 Concord Road House (MACRIS)
13	Bedford	South Rd/Hartwell Rd	None

Note 1. MMNHP – Minute Man National Historical Park; NHL – National Historic Landmark, NR – National Register of Historic Places; LHD – Local Historic District

Table G-1 Historic Architectural Resources located at Traffic Study Intersections (continued)

Intersection Number	Town	Intersection	Historic Resources Name (Designation)
14	Bedford	Routes 4/225/62	BED.A Bedford Historic District (LHD) BED.C Old Bedford Center Historic District (NR) BED.117 E.W. Stearns House (BED.A/BED.C) BED.119 The Red Barn (BED.A/BED.C) BED.29 Elijah Stearns-Squire Stearns House (BED.A/BED.C) BED.40 Amos Cutler House (BED.A/BED.C)
15	Bedford	Great Rd (4/225)/South Rd/Springs Rd	BED.A Bedford Historic District (LHD) BED.C Old Bedford Center Historic District (NR) BED.E Fletcher Road Area (MACRIS) BED.G Bedford Municipal Area (MACRIS) BED.227 78-88 Great Road Commercial Block (BED.A/BED.C/BED.E) BED.23 Bedford Old Town Hall (BED.A/BED.C/BED.G) BED.24 First Parish Church (BED.A/BED.C) BED.34 Mary Harwell-Dr. Edward Hamblen House (BED.A/BED.C/BED.E) BED.67 5 Springs Rd House (BED.A/BED.C) BED.68 94 Great Rd House (BED.A/BED.C) BED.92 Morgan Stores (BED.A/BED.C) BED.93 20 South Rd (BED.A/BED.C) BED.800 Old Burying Ground (BED.A/BED.C)
16	Bedford	South Rd/Railroad Ave/Loomis St	BED.F South Rd.-Depot Square Area (MACRIS) BED.V Bedford Depot Park Historic District (NR) BED.180 Billerica and Bedford Railroad Engine House (BED.F/BED.V) BED.279 Hodgdon Brothers Livery Stable (BED.F) BED.309 Blake Double House (BED.F) BED.310 R.W. Edwards-Wallace A. Calef House (BED.F) BED.311 Brown and Cox Store (BED.F)

Note 1. MMNH P – Minute Man National Historical Park; NHL – National Historic Landmark, NR – National Register of Historic Places; LHD – Local Historic District

G-2 ***All Historic Resources listed in the National and State Registers, and in the Inventory and MACRIS in Bedford, reconnaissance survey area (projected 2030 55 dB DNL high growth noise contour or within 200 feet from a traffic study area intersection), 2012.***

MHC Number	Historic Area/District[1]	Street Address	Historic Property[2]	Date	National Register /State Register Status[3]	55 dB DNL Contour[4]			Intersection[5]
						2012	2020	2030	
Bedford									
BED.V	Bedford Depot Park Historic District [NB-5]	80 Loomis St, 120 South Rd	N/A	Multiple	NR				TSA 16: Loomis Street & Railroad Avenue & South Road
BED.A	Bedford Historic District [NB-1]	Great Rd	N/A	Multiple	LHD/SR				TSA 14: Route 4/225 & Route 62 TSA 15: South Road & Great Road
BED.G	Bedford Municipal Area	Bedford Center	N/A	Multiple					TSA 15: South Road & Great Road
BED.H	Concord Road Area	Concord Rd	N/A	Multiple		P	P	P	TSA 12: Hartwell Road & Route 62
BED.E	Fletcher Road Area	Fitchdale Ave, Fletcher Rd, Hancock St, Springs Rd	N/A	Multiple					TSA 15: South Road & Great Road
BED.C	Old Bedford Center Historic District [NB-2]	Great Rd, North Rd, Spring Rd, Hillside Ave, Elm St, Maple St, South Rd	N/A	Multiple	NR				TSA 14: Route 4/225 & Route 62 TSA 15: South Road & Great Road
BED.F	South Road – Depot Square Area	South Rd	N/A	Multiple					TSA 16: Loomis Street & Railroad Avenue & South Road
BED.117	BED.A Bedford Historic District BED.C Old Bedford Center Historic District	2 Concord Rd	E. W. Stearns House	1820	LHD/SR NR				TSA 14: Route 4/225 & Route 62
BED.119	BED.A Bedford Historic District BED.C Old Bedford Center Historic District	5 Concord Rd	The Red Barn	1780	LHD/SR NR				TSA 14: Route 4/225 & Route 62
BED.359	BED.H Concord Road Area	435 Concord Rd	N/A	1947		✓	✓	✓	
BED.1	BED.H Concord Road Area	445 Concord Rd	Richard Wheeler House	1695		✓	✓	✓	
BED.39	BED.A Bedford Historic District BED.C Old Bedford Center Historic District	1 Great Rd	David Rice House	1810	LHD/SR NR				TSA 14: Route 4/225 & Route 62
BED.29	BED.A Bedford Historic District BED.C Old Bedford Center Historic District	4 Great Rd	Elijah Stearn - Squire Stearns House	1810	LHD/SR NR				TSA 14: Route 4/225 & Route 62

MHC Number	Historic Area/District[1]	Street Address	Historic Property[2]	Date	National Register /State Register Status[3]	55 dB DNL Contour[4]			Intersection[5]
						2012	2020	2030	
BED.40	BED.A Bedford Historic District BED.C Old Bedford Center Historic District	5 Great Rd	Amos Cutler House	1835	LHD/SR NR				TSA 14: Route 4/225 & Route 62
BED.24	BED.A Bedford Historic District BED.C Old Bedford Center Historic District	75 Great Rd	First Parish Church	1817	LHD/SR NR				TSA 15: South Road & Great Road
BED.227	BED.A Bedford Historic District BED.C Old Bedford Center Historic District BED.E Fletcher Road Area	78-88 Great Rd	78-88 Great Road Commercial Block	1925	LHD/SR NR				TSA 15: South Road & Great Road
BED.34	BED.A Bedford Historic District BED.C Old Bedford Center Historic District BED.E Fletcher Road Area	90 Great Rd	Mary Hartwell - Dr. Edward E. Hamblen House	1850	LHD/SR NR				TSA 15: South Road & Great Road
BED.92	BED.A Bedford Historic District BED.C Old Bedford Center Historic District	93 Great Rd	Morgan Stores	1950	LHD/SR NR				TSA 15: South Road & Great Road
BED.68	BED.A Bedford Historic District BED.C Old Bedford Center Historic District	94 Great Rd	N/A	1956	LHD/SR NR				TSA 15: South Road & Great Road
BED.927	N/A	Hartwell Rd	Hartwell Town Forest	1940				✓	
BED.928	N/A	Hartwell Rd	Hartwell Town Forest Horse Trough Memorial	1820				✓	
BED.279	BED.F South Road - Depot Square Area	1-5 Railroad Ave	Hodgdon Brothers Livery Stable	1910					TSA 16: Loomis Street & Railroad Avenue & South Road
BED.23	BED.A Bedford Historic District BED.C Old Bedford Center Historic District BED.G Bedford Municipal Area	16 South Rd	Bedford Old Town Hall [NB 4]	1856	LHD/SR NR				TSA 15: South Road & Great Road
BED.93	BED.A Bedford Historic District BED.C Old Bedford Center Historic District	20 South Rd	N/A	1875	LHD/SR NR				TSA 15: South Road & Great Road
BED.309	BED.F South Road - Depot Square Area	103-105 South Rd	Blake Double House	1880					TSA 16: Loomis Street & Railroad Avenue & South Road
BED.310	BED.F South Road - Depot Square Area	106 South Rd	R. W. Edwards - Wallace A. Calef House	1859					TSA 16: Loomis Street & Railroad Avenue & South Road
BED.311	BED.F South Road - Depot Square	111 South Rd	Brown and Cox	1900					TSA 16: Loomis Street &

MHC Number	Historic Area/District[1]	Street Address	Historic Property[2]	Date	National Register /State Register Status[3]	55 dB DNL Contour[4]			Intersection[5]
						2012	2020	2030	
	Area		Store						Railroad Avenue & South Road
BED.180	BED.F South Road - Depot Square Area BED.V Bedford Depot Park Historic District	120 South Rd	Billerica and Bedford Railroad Engine House	1877	NR				TSA 16: Loomis Street & Railroad Avenue & South Road
BED.184	N/A	330 South Rd	Clark Farm	1905		✓	✓	✓	
BED.492	N/A	330 South Rd	Clark Farm Barn	ca. 1905		✓	✓	✓	
BED.493	N/A	330 South Rd	Clark Farm- Out Building	ca. 1905		✓	✓	✓	
BED.494	N/A	330 South Rd	Clark Farm- Out Building	ca. 1905		✓	✓	✓	
BED.495	N/A	330 South Rd	Clark Farm- Out Building	ca. 1905		✓	✓	✓	
BED.185	N/A	345 South Rd	Peter Kelley House	1855		✓	✓	✓	
BED.444	BED.O South Road - Tilden Street Area	394 South Rd	N/A	1930		✓	✓	✓	
BED.445	BED.O South Road - Tilden Street Area	398 South Rd	N/A	1930		✓	✓	✓	
BED.446	BED.O South Road - Tilden Street Area	5 Tilden St		1930		✓	✓	✓	
BED.67	BED.A Bedford Historic District BED.C Old Bedford Center Historic District	5 Springs Rd	N/A	1880	LHD/SR NR				TSA 15: South Road & Great Road
BED.800	BED.A Bedford Historic District BED.C Old Bedford Center Historic District	7 Springs Rd	Old Burying Ground [NB-3]	1729	LHD/SR NR				TSA 15: South Road & Great Road

Notes
1. Historic district or area. Noise Analysis Location number is indicated in brackets where applicable. N/A indicates properties that are not located within a historic district or area.
2. N/A indicates districts, areas, or properties that are only identified by address. Noise analysis location number is indicated in brackets where applicable.
3. National Register of Historic Places (NR), State Register of Historic Places (LHD or SR), National Historic Landmark (NHL).
4. Area/property is partially (P) or completely (✓) within the 2012, 2020, or 2030 55 dB DNL contours. All historic resources listed are outside the 2012, 2020, and 2030 65 dB DNL contours.
5. Intersection that is located within 200 feet from historic district, area, or property.

G-3 ***All Historic Resources listed in the National and State Registers, and in the Inventory and MACRIS in Concord, reconnaissance survey area (projected 2030 55 dB DNL high growth noise contour or within 200 feet from a traffic study area intersection), 2012.***

MHC Number	Historic Area/District[1]	Street Address	Historic Property[2]	Date	National Register /State Register Status[3]	55 dB DNL Contour[4]			Intersection[5]
						2012	2020	2030	
CON.BO	Bedford Street Area II	Bedford St	N/A	Multiple		✓	✓	✓	TSA 11: Old Bedford Road & Route 62
CON.BK	Lexington Road – Shadyside Avenue Area	Lexington Rd, Shadyside Ave	N/A	Multiple		P	P	P	
CON.BL	Lower Old Bedford – Virginia Roads Area	Old Bedford Rd, Virginia Rd	N/A	Multiple		P	P	P	TSA 9: Old Bedford Road & Lexington Road (Route 2A) TSA 10: Old Bedford Road & Virginia Road
CON.C	Minute Man National Historical Park	Route 2A	N/A	Multiple	NR/SR NHL				TSA 8:Route 2A (Lexington Rd)/Cambridge Turnpike Cutoff/Brooks Rd) TSA 9: Old Bedford Road & Lexington Road (Route 2A)
CON.EC	Minute Man National Historical Park	Route 2A	N/A	Multiple	NR NHL				TSA 8:Route 2A (Lexington Rd)/Cambridge Turnpike Cutoff/Brooks Rd) TSA 9: Old Bedford Road & Lexington Road (Route 2A)
CON.BM	Old Bedford Road Area	Old Bedford Rd	N/A	Multiple		✓	✓	✓	
CON.BN	Old Bedford Road Area II	Old Bedford Rd	N/A	Multiple		✓	✓	✓	TSA 11: Old Bedford Road & Route 62
CON.183		587 Bedford St	Patrick McGrath House	1875				✓	
CON.1081	CON.BO Bedford Street Area II	643 Bedford St	N/A	1875				✓	
CON.1082	CON.BO Bedford Street Area II	649 Bedford St	N/A	1875				✓	
CON.1083	CON.BO Bedford Street Area II	668 Bedford St	N/A	1895				✓	
CON.1085	CON.BO Bedford Street Area II	689 Bedford St	N/A	1930				✓	
CON.1086	CON.BO Bedford Street Area II	701 Bedford St	N/A	1920				✓	
CON.1088	CON.BO Bedford Street Area II	715 Bedford St	N/A	1880				✓	

MHC Number	Historic Area/District[1]	Street Address	Historic Property[2]	Date	National Register /State Register Status[3]	55 dB DNL Contour[4]			Intersection[5]
						2012	2020	2030	
CON.1089	CON.BO Bedford Street Area II	737 Bedford St	N/A	1870				✓	
CON.1090	CON.BO Bedford Street Area II	759 Bedford St	N/A	1920				✓	TSA 11: Old Bedford Road & Route 62
CON.175	CON.DS American Mile Historic District	645 Lexington Rd	Dea. Sampson Mason - Terrence McHugh House	1850	LHD/SR NR NHL				TSA 9: Old Bedford Road & Lexington Road (Route 2A)
CON.349	CON.C/CON.EC Minute Man National Historical Park CON.DS American Mile Historic District	663 Lexington Rd	Daniel Taylor House	1804	LHD/SR NR NHL				TSA 9: Old Bedford Road & Lexington Road (Route 2A)
CON.9020	CON.C/CON.EC Minute Man National Historical Park CON.DS American Mile Historic District	663 Lexington Rd	Daniel Taylor Retaining Wall	1810	LHD/SR NR NHL				TSA 9: Old Bedford Road & Lexington Road (Route 2A)
CON.358	CON.C/CON.EC Minute Man National Historical Park	1175 Lexington Rd	Samuel Brooks House	1733	NR NHL				TSA 8: Route 2A (Lexington Rd)/Cambridge Turnpike Cutoff/Brooks Rd
CON.930	N/A	Old Bedford Rd	Concord - Bedford Boundary Marker	1903		✓	✓	✓	
CON.1067	CON.BL Lower Old Bedford - Virginia Roads Area	219 Old Bedford Rd	Terrence Magurn House	1900				✓	
CON.1068	CON.BL Lower Old Bedford - Virginia Roads Area	250 Old Bedford Rd	Frank Peterson House	1910				✓	
CON.1069	CON.BL Lower Old Bedford - Virginia Roads Area	275-277 Old Bedford Rd	Patrick Dalton House	1880				✓	TSA 10: Old Bedford Road & Virginia Road
CON.1070	CON.BL Lower Old Bedford - Virginia Roads Area	389 Old Bedford Rd	Daniel McManus House	1905		✓	✓	✓	
CON.179	N/A	430 Old Bedford Rd	Waldo Flint House	1890		✓	✓	✓	
CON.180	N/A	472-474 Old Bedford Rd	Benoni and Thomas Fox House	1711		✓	✓	✓	
CON.181	N/A	505 Old Bedford Rd	Samuel Fox House	1702		✓	✓	✓	
CON.1077	CON.BN Old Bedford Road Area II	527 Old Bedford Rd	N/A	1915		✓	✓	✓	
CON.1078	CON.BN Old Bedford Road Area II	537 Old Bedford Rd	N/A	1915		✓	✓	✓	
CON.1079	CON.BN Old Bedford Road Area II	547 Old Bedford Rd	Theodore Barry House	1870		✓	✓	✓	
CON.182		550 Old Bedford Rd	Enos Fox House	1770		✓	✓	✓	

MHC Number	Historic Area/District[1]	Street Address	Historic Property[2]	Date	National Register /State Register Status[3]	55 dB DNL Contour[4]			Intersection[5]
						2012	2020	2030	
CON.1080	CON.BN Old Bedford Road Area II	595 Old Bedford Rd	Theodore Barry House	1900		✓	✓	✓	
CON.1073	CON.BM Old Bedford Road Area	643 Old Bedford Rd	N/A	1920		✓	✓	✓	
CON.1074	CON.BM Old Bedford Road Area	654 Old Bedford Rd	Sennott House	1875		✓	✓	✓	
CON.1075	CON.BM Old Bedford Road Area	667 Old Bedford Rd	N/A	1920		✓	✓	✓	
CON.1071	CON.BL Lower Old Bedford - Virginia Roads Area	74 Virginia Rd	N/A	1925		✓	✓	✓	
CON.1072	CON.BL Lower Old Bedford - Virginia Roads Area	88 Virginia Rd	J. W. Kenney House	1925		✓	✓	✓	
CON.176	N/A	215-217 Virginia Rd	William Tibbets House - Thoreau Farm	1878		✓	✓	✓	
CON.177	N/A	341 Virginia Rd	Dea. John Wheeler - Capt. Jonas Minot Farmhouse [NC-18]	1730	NR	✓	✓	✓	
CON.178	N/A	477 Virginia Rd	Wheeler - Merriam House [NC-19]	1692	NR	✓	✓	✓	

Notes
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2. N/A indicates districts, areas, or properties that are only identified by address. Noise analysis location number is indicated in brackets where applicable.
3. National Register of Historic Places (NR), State Register of Historic Places (LHD or SR), National Historic Landmark (NHL).
4. Area/property is partially (P) or completely (✓) within the 2012, 2020, or 2030 55 dB DNL contours. All historic resources listed are outside the 2012, 2020, and 2030 65 dB DNL contours.
5. Intersection that is located within 200 feet from historic district, area, or property.

G-4 ***All Historic Resources listed in the National and State Registers, and in the Inventory and MACRIS in Lexington, reconnaissance survey area (projected 2030 55 dB DNL high growth noise contour or within 200 feet from a traffic study area intersection), 2012.***

MHC Number	Historic Area/District[1]	Street Address	Historic Property[2]	Date	National Register /State Register Status[3]	55 dB DNL Contour[4]			Intersection[5]
						2012	2020	2030	
LEX.AJ	Lexington Heights - Meagherville	Avon St, Center St, Earl St, Garfield St, Myrtle St, Reed St, Valley Rd	N/A	Multiple		✓	✓	✓	
LEX.913	N/A	Route 128	Boston and Maine Railroad Bridge over Route 128	1961		✓	✓	✓	
LEX.789	LEX.AJ Lexington Heights - Meagherville	12 Avon St	N/A	1906		✓	✓	✓	
LEX.776	N/A	297 Bedford St	Nathan Reed - James Parker House	1835				✓	
LEX.777	N/A	297 Bedford St	Reed-Parker House Out Building	ca. 1835				✓	
LEX.1028	N/A	315 Bedford St	Basil Hawkins House	1924				✓	
LEX.778	N/A	330 Bedford St	Capt. Christopher Reed House #1	1818				✓	
LEX.413	N/A	331 Bedford St	Simonds Tavern [NLX-1]	1795	NR			✓	
LEX.779	N/A	342 Bedford St	Christopher Reed House #2	1825				✓	
LEX.780	N/A	342 Bedford St	Christopher Reed Barn	ca. 1825				✓	
LEX.790	LEX.AJ Lexington Heights - Meagherville	33 Center St	N/A	1906				✓	
LEX.1047	N/A	7 Dexter Rd	Albert W. Emmons House	1926				✓	
LEX.1061	N/A	46 Harding Rd	John Andersen House	1925				✓	
LEX.1062	N/A	46 Harding Rd	John Andersen Garage	1931				✓	
LEX.785	LEX.AJ Lexington Heights - Meagherville	153 Reed St	N/A	1906			✓	✓	

MHC Number	Historic Area/District[1]	Street Address	Historic Property[2]	Date	National Register /State Register Status[3]	55 dB DNL Contour[4]			Intersection[5]
						2012	2020	2030	
LEX.786	LEX.AJ Lexington Heights - Meagherville	159 Reed St	N/A	1906		✓	✓	✓	
LEX.1012	LEX.AJ Lexington Heights - Meagherville	48 Valley Rd	N/A	1906		✓	✓	✓	
LEX.1013	LEX.AJ Lexington Heights - Meagherville	62 Valley Rd	N/A	1906		✓	✓	✓	
LEX.1014	LEX.AJ Lexington Heights - Meagherville	67 Valley Rd	N/A	1906		✓	✓	✓	

Notes
1. Historic district or area. Noise Analysis Location number is indicated in brackets where applicable. N/A indicates properties that are not located within a historic district or area.
2. N/A indicates districts, areas, or properties that are only identified by address. Noise analysis location number is indicated in brackets where applicable.
3. National Register of Historic Places (NR), State Register of Historic Places (LHD or SR), National Historic Landmark (NHL).
4. Area/property is partially (P) or completely (✓) within the 2012, 2020, or 2030 55 dB DNL contours. All historic resources listed are outside the 2012, 2020, and 2030 65 dB DNL contours.
5. Intersection that is located within 200 feet from historic district, area, or property.

G-5 *All Historic Resources listed in the National and State Registers, and in the Inventory and MACRIS in Lincoln, reconnaissance survey area (projected 2030 55 dB DNL high growth noise contour or within 200 feet from a traffic study area intersection), 2012.*

MHC Number	Historic Area/District[1]	Street Address	Historic Property[2]	Date	National Register /State Register Status[3]	55 dB DNL Contour[4]			Intersection[5]
						2012	2020	2030	
LIN.F	Minute Man National Historical Park	Route 2A	N/A	Multiple	NR NHL				TSA 6: Hanscom Drive & Route 2A
LIN.G	Minute Man National Historical Park	Route 2A	N/A	Multiple	NR NHL	P	P	P	TSA 6: Hanscom Drive & Route 2A
LIN.157	LIN.F/LIN.G Minute Man National Historical Park	165 North Great Rd	Giurleo House	1915	NR NHL				TSA 6: Hanscom Drive & Route 2A
LIN.158	LIN.F/LIN.G Minute Man National Historical Park	165 North Great Rd	Giurleo Garage	1915	NR NHL				TSA 6: Hanscom Drive & Route 2A

Notes
1. Historic district or area. Noise Analysis Location number is indicated in brackets where applicable. N/A indicates properties that are not located within a historic district or area.
2. N/A indicates districts, areas, or properties that are only identified by address. Noise analysis location number is indicated in brackets where applicable.
3. National Register of Historic Places (NR), State Register of Historic Places (LHD or SR), National Historic Landmark (NHL).
4. Area/property is partially (P) or completely (✓) within the 2012, 2020, or 2030 55 dB DNL contours. All historic resources listed are outside the 2012, 2020, and 2030 65 dB DNL contours.
5. Intersection that is located within 200 feet from historic district, area, or property.

Table G-6 Fifty Year Old Properties Surveyed in Hanscom Field, 2012

Town	Building Number	Building Name[1]	Date
Bedford	1	Hangar 1 - Signature Flight Services	1955
Bedford	2	Hangar 2 - Signature Flight Services	1955
Bedford	3	Hangar 3 - Signature Flight Services	1955
Concord	25	Draper Laboratory	1948
Lincoln	10	Hangar 10 - Vacant	1950s
Lincoln	12A	Hangar 12A – National Aviation Academy	1963
Lincoln	15	Civil Air Terminal	1953
Lincoln	16	Hangar 16 – Liberty Mutual	1940s
Lincoln	17	Hangar 2 - Jet Aviation	1954
Lincoln	20	Maintenance Building	1954

Notes: 1. Hangar 24 has been demolished since 2005.

Table G-7 Fifty Year Old Properties Surveyed at Hanscom Air Force Base, 2012

Town	Building Number[1]	Area Name[2]	Street Address
Bedford	1614	Administrative Complex	11 Barksdale Street
	1639	Base Center	97 Barksdale Street
	1723	Hangars	25 Chennault Street
	1728	Hangars	29 Chennault Street
	1729	Hangars	51 Chennault Street
	1642	Base Center	70 Chennault Street
	1825	Civil Engineering	72 Dow Street
	1716	Hangars	115 Eglin Street
	1917	Civil Engineering	Grenier Street
	1646	Base Center	81 Grenier Street
	1813	Civil Engineering	119 Grenier Street
	1809/1810	Civil Engineering	120-131 Grenier Street
	1843	Civil Engineering	141 Grenier Street
	1425	Hospitality	60 Kirtland Street
	1427	Hospitality	75 Kirtland Street
	1426	Hospitality	85 Kirtland Street
Lexington	1302 D	Lincoln Labs	71 Schilling Circle
	1302 E	Lincoln Labs	75 Schilling Circle
	1302 F	Lincoln Labs	51 Shilling Circle
	Multiple	Air Force Cambridge Research Laboratory Historic District	Randolph Road, Grenier Street, Wright Street
Lincoln	1712	Hangars	6 Chennault Street
	1710	Hangars	9 Chennault Street
	1610	Administrative Complex	111 Eglin Street

Notes: 1. N/A – Not Applicable

2. Bedford Trailer Park (East and West Sections) in Bedford has been demolished since 2005. AFCRL Historic District is an update to the 2006 architectural survey. It was determined eligible (NRDOE) for National Register listing by the USAF and SHPO in 2012. It is in the Hanscom ESPR 2012 General Study Area, but is outside the 2030 55 dB DNL high growth noise contour.

Table G-8 Fifty Year Old Properties Surveyed in Bedford, Concord and Lexington, 2012

Town[1]	Area Name[2]	Street Address	Category
Bedford[3]	*Hartwell Road*	*Beacon Street and Hartwell Road*	*Area*
	Hartwell Road	9,11,12 Beacon Street	House
	N/A	336,340,427 Concord Road	House
	Hartwell Road	23,41,47,00 Hartwell Road	House
Concord	*Carr Road*	*Carr Road*	*Area*
	Walden Street	*Walden Street*	*Area*
	Carr Road	45,61,81,111,131-147 Carr Road	House
	N/A	531 Monument Street	House
	N/A	675 Monument Street	House
	N/A	676 Monument Street	House
	N/A	842 Monument Street	House
	N/A	873 Monument Street	House
	N/A	183 Virginia Road	House
	N/A	201 Virginia Road	House
	Walden Street	208,335,349,363 Walden Street	House, Barn
Lexington	*Bedford Street*	*Bedford Street*	*Area*
	East of Bedford St	*Bertwell Road, Blake Road, Burlington Street, Crawford Road, Dee Road, Dexter Road, Eaton Road, Fuller Road, Gleason Street, Harding Road, Hillside Terrace, Nichols Road, North Hancock Street, Preston Road, Simonds Road, Williams Street, Wyman Road*	*Area*
	Ivan Street	*Bernard Street, Calvin Street, Donald Street, and Ivan Street*	*Area*
	Meagherville Extension	*Augustus Road, Hill Street, Kimball Road, Park Street, Reed Street, Sunny Knoll Road, and Vaille Avenue*	*Area*
	Meagherville Extension	4 Augustus Road	House
	Bedford Street	197-419 Bedford Street	House
	East of Bedford St	8,12,18,19,20,26,31,37,42,43,44,51,65, 69,72,75,84,100,101,104,108 Bertwell Road	House
	East of Bedford St	00 Blake and Preston Road	House
	East of Bedford St	48,51,57,58,65,66,73,91,97,106,118,123 Blake Road	House
	Ivan Street	19,20,21 Bernard Street	House
	East of Bedford St	16,22,27,28,30,46,47,50,54,60,61,66,70,80 Burlington Street	House
	Ivan Street	6,7,9,10 Calvin Street	House
	East of Bedford St	7,9 Crawford Road	House
	East of Bedford St	7,8,11 Dee Road	House
	East of Bedford St	6,7,10,11,14,15,18,19,22,23, 33,35,51,52,53,57,58,62 Dexter Road	House

Notes: 1. Lincoln did not have any properties within the reconnaissance study area.
2. Area is a neighborhood or district of multiple streets and/or structures. N/A – Not Applicable.
3. The Bedford Trailer Park (East and West Sections) in Bedford has been demolished since 2005.

Table G-8 Fifty Year Old Properties Surveyed in Bedford, Concord and Lexington, 2012 (continued)

Town[1]	Area Name[2]	Street Address	Category
Lexington	Ivan Street	12,14,22,24 Donald Street	House
	East of Bedford St	4,7,10,11,12,19,23,30,34,35,38 Eaton Road	House
	East of Bedford St	9,25,31 Fuller Road	House
	East of Bedford St	14,43,46,47,50,51,52,54,55,57,59,60,62,63,65,67,68,70,81,82,84,85,86, 87,91,93,94,99,100,102 Gleason Street	House
	East of Bedford St	14,15,20,25,27,28,29,30,31,35,37,40,41,45,46,47,48,51,55,57,60,62 Harding Road	House
	Meagherville Extension	55 Hill Street (Lexington Golf Club)	Golf Course
	East of Bedford St	4,5,7,8,9 Hillside Terrace	House
	Ivan Street	10,21,25,28,29,30,32,33,36,40 Ivan Street	House
	Meagherville Extension	3,4,5,7,8 Kimball Road	House
	East of Bedford St	9 Nichols Road	House
	East of Bedford St	9,10,11,14,20,21,22,23,25,27,29,31,35,36,40,45,49,59,63,71,79,81,83,8 7,95,101,105 North Hancock Street	House
	Meagherville Extension	4,6 Park Street	House
	East of Bedford St	37,40 Preston Road	House
	Meagherville Extension	28,36,38,39,40,42,44,45,46,49/51,52,53,54,55,56,57,58,63,65,67,87,94, 98,104 Reed Street	House
	East of Bedford St	20,31,32,36,44,53,54,70,74,75,78,82,88,91,95,100,103,104,105,107,109 ,127,135,138,144,152 Simonds Road	House
	Meagherville Extension	1,3,5,9 Sunny Knoll Road	House
	Meagherville Extension	6,10,16,17,20,21,24,26,32,35,36,37 Vaille Avenue	House
	East of Bedford St	20 Williams Street	House
	East of Bedford St	1 Wyman Road	House
	East of Bedford St	14,43,46,47,50,51,52,54,55,57,59,60,62,63,65,67,68,70,81,82,84,85,86, 87,91,93,94,99,100,102 Gleason Street	House
	East of Bedford St	14,15,20,25,27,28,29,30,31,35,37,40,41,45,46,47,48,51,55,57,60,62 Harding Road	House
	Meagherville Extension	55 Hill Street (Lexington Golf Club)	Golf Course
	East of Bedford St	4,5,7,8,9 Hillside Terrace	House
	Ivan Street	10,21,25,28,29,30,32,33,36,40Ivan Street	House
	Meagherville Extension	3,4,5,7,8 Kimball Road	House
	East of Bedford St	9 Nichols Road	House
	East of Bedford St	9,10,11,14,20,21,22,23,25,27,29,31,35,36,40,45,49,59,63,71,79,81,83,8 7,95,101,105 North Hancock Street	House
	Meagherville Extension	4,6 Park Street	House
	East of Bedford St	37,40 Preston Road	House
	Meagherville Extension	28,36,38,39,40,42,44,45,46,49/51,52,53,54,55,56,57,58,63,65,67,87,94, 98,104 Reed Street	House

Notes: 1. Lincoln did not have any properties within the reconnaissance study area.
2. Area is a neighborhood or district of multiple streets and/or structures. N/A – Not Applicable.
3. The Bedford Trailer Park (East and West Sections) in Bedford has been demolished since 2005.

Table G-8 Fifty Year Old Properties Surveyed in Bedford, Concord and Lexington, 2012 (continued)

Town[1]	Area Name[2]	Street Address	Category
Lexington	East of Bedford St	20,31,32,36,44,53,54,70,74,75,78,82,88,91,95,100,103,104,105,107,109 ,127,135,138,144,152 Simonds Road	House
	Meagherville Extension	1,3,5,9 Sunny Knoll Road	House
	Meagherville Extension	6,10,16,17,20,21,24,26,32,35,36,37 Vaille Avenue	House
	East of Bedford St	20 Williams Street	House
	East of Bedford St	1 Wyman Road	House

Notes: 1. Lincoln did not have any properties within the reconnaissance study area.
2. Area is a neighborhood or district of multiple streets and/or structures. N/A – Not Applicable.
3. The Bedford Trailer Park (East and West Sections) in Bedford has been demolished since 2005.

Table G-9 Minute Man National Historical Park National Register District Data Sheet Sorted Alphabetically by Town and Street Address

C/NC[1]	NR CATEGORY	NPS NO.	MHC NO.	ADDRESS/LOCATION	NAME	DATES	STYLE
ALL TOWNS							
C	site	None			Battle of Lexington and Concord Battlefield	1775	n/a
C	structure	000919, 040170			Battle Road	18th through 20th centuries	n/a
NC	structure	None			Battle Road Trail	1996-2001	n/a
C	structure	Various			System of Stone Walls	18th through 20th centuries	n/a
C	site	None			System of Fields (Battle Road Unit)		n/a
CONCORD							
C[2]	building	--	CON.256	448 Barrett's Mill Road	Col. James Barrett House	1705	Colonial
C	object	None		Estabrook and Liberty Street	Granite Mile Marker	early 20th century	n/a
C	object	None		Estabrook and Liberty Street	Granite Line of March Marker	early 20th century	n/a
C	object	040260		Estabrook and Liberty Street	John Buttrick Bas-Relief Monument	1915	n/a
C	structure	040255		Lexington Road	Meriam's Corner Area Stone Culvert	18th century	n/a
C	site	None		Lexington Road	(First) East Quarter School House Site	early 19th century	n/a
C	structure	040254		Lexington Road	Ox Pasture Stone Bridge	pre 1775	n/a
C	building	006549	CON.171	455 Lexington Road	Wayside (Samuel Whitney House)	1716-17; altered mid-1840s, 1860/70	Colonial/ Victorian Eclectic
C	site	None		455 Lexington Road	Wayside Site	19th century	n/a
C	site	040228, 040194, 040199, 040224		455 Lexington Road	Wayside Landscape	mid-1840s	n/a
C	building	000926		455 Lexington Road	Wayside Barn	1716-78; moved mid-1840s and 1860	No Style
C	site	012007		455 Lexington Road	Eliphelet Fox House Foundation	by 1666	n/a
C	building	006548	CON.349	663 Lexington Road	Gowing-Clark House	ca. 1836	Federal
C	site	040256		663 Lexington Road	Gowing-Clark Barn Foundation	19th century	n/a
C	building	040236	CON.352	737-739 Lexington Road	(Second) East Quarter Schoolhouse	ca. 1853-54	Frame Vernacular
C	building	4-119-B		750 Lexington Road	Palumbo Farm Enclosed Garage	ca. 1950	No Style
C	building	4-119-D		750 Lexington Road	Palumbo Farm Metal Shed	ca. 1950	No Style
C	building	4-119-C		750 Lexington Road	Palumbo Farm Open Shed	ca. 1950	No Style

Note: 1. Contributing/Non-Contributing

Table G-9 Minute Man National Historical Park National Register District Data Sheet Sorted Alphabetically by Town and Street Address (continued)

C/NC[1]	NR CATEGORY	NPS NO.	MHC NO.	ADDRESS/LOCATION	NAME	DATES	STYLE
C	building	4-119-E		750 Lexington Road	Palumbo Farm Wood Shed	ca. 1950	No Style
C	building	040028	CON.354	831 Lexington Road	Perry House	ca. 1865; ca. 1880	Greek Revival
NC	building	4-103-B		831 Lexington Road	Perry House Garage	ca. 1960	No Style
NC	building	4-103-C		831 Lexington Road	Perry Shed	ca. 1960	No Style
C	building	040231, 040232	CON.355	851 Lexington Road	Albano House, Albano Garage/Apt.	1915	Craftsman
C	building	101972		851 Lexington Road	Albano Produce Stand	1915	No Style
C	site	040246		851 Lexington Road	Albano Foundation	20th century	n/a
C	building	023167	CON.356	955 Lexington Road	Farwell Jones House	pre 1775; remodeled ca. 1870	Frame Vernacular
C	building	040241		955 Lexington Road	Farwell Jones Dairy Barn and Silo	1870	No Style
C	building	4-101-D		955 Lexington Road	Edward Nowalk Garage	early 20th century	No Style
NC	building	4-101-C		955 Lexington Road	Edward Nowalk Produce Stand	ca. 1960	No Style
C	building	4-101-E		955 Lexington Road	Edward Nowalk 6-Bay Tractor Shed	early 20th century	No Style
C	building	4-101-F		955 Lexington Road	Edward Nowalk Cottage	early 20th century	No Style
C	building	023166	CON.357	965 Lexington Road	Olive Stow House	ca. 1760	Colonial
C	building	101975		965 Lexington Road	Olive Stow House Garage	ca. 1920	No Style
C	building	101976	CON.359	1087 Lexington Road	D. Inferrara House	ca. 1927	Colonial Revival
C	building	101977	CON.360	1087 Lexington Road	D. Inferrara Farm Stand	ca. 1920s	No Style
C	building	3-118-B		1087 Lexington Road	D. Inferrara Farm Garage	ca. 1937	No Style
NC	building	3-118-D		1087 Lexington Road	D. Inferrara Farm Coop	late 20th century	No Style
NC	building	3-118-F		1087 Lexington Road	D. Inferrara Farm Field Shed	late 20th century	No Style
NC	building	3-118-E		1087 Lexington Road	D. Inferrara Farm Greenhouse	late 20th century	No Style
C	building	101978		1133 Lexington Road	Walter Beatteay House	ca. 1940-1946	Colonial Revival
NC	building	3-126-B		1133 Lexington Road	Walter Beatteay Garage	ca. 1980	No Style
C	building	006547	CON.358	1175 Lexington Road	Samuel Brooks House	ca. 1692-1728	Colonial
C	object	006545	CON.941	Liberty Street	The Minuteman	1875	n/a
C	object	040266		Liberty Street	Muster Field Monument	early 20th century	n/a
C	site	000939		Liberty Street	Ephraim and Willard Buttrick House Site	1697-1700	n/a
C	structure	040250		Liberty Street	Flint Bridge	1877	n/a
C	site	None		Liberty Street	Jonas Bateman Site	18th century	n/a

Note: 1. Contributing/Non-Contributing

Table G-9 Minute Man National Historical Park National Register District Data Sheet Sorted Alphabetically by Town and Street Address (continued)

C/NC[1]	NR CATEGORY	NPS NO.	MHC NO.	ADDRESS/LOCATION	NAME	DATES	STYLE
C	building	040024	CON.344	174 Liberty Street	Buttrick Mansion	1911	Classical Revival
C	building	040026	CON.346	174 Liberty Street	Buttrick Carriage House	1911	Colonial Revival
C	building	040025	CON.345	174 Liberty Street	Buttrick Caretaker's Cottage	1911	Colonial Revival
C	site	040183, 040182		174 Liberty Street	Buttrick Designed Landscape	early 20th century	n/a
C	site	014011		174 Liberty Street	Captain David Brown House Foundation	18th century	n/a
C	building	000932	CON.343	231 Liberty Street	Major John Buttrick House	ca. 1715; 19th-century alterations	Colonial
C	site	040249		231 Liberty Street	John Buttrick Foundation	19th century	n/a
C	building	040235		231 Liberty Street	Major John Buttrick Garage	early 20th century	Colonial Revival
NC	building	None		50 Manuel Drive	House	mid-late 20th century	Modern
NC	building	None		65 Manuel Drive	Korn House	ca. 1960	Modern Cape
NC	building	None		82 Manuel Drive	House	mid-late 20th century	Modern
NC	building	None		82 Manuel Drive	Shed	mid-late 20th century	No Style
NC	building	None		95 Manuel Drive	House	mid-late 20th century	Modern
NC	building	None		95 Manuel Drive	Garage	mid-late 20th century	No Style
C	object	006544		Monument Street	Grave and Monument to British Soldiers	1890-1910	n/a
NC	object	040262		Monument Street	DAR Marker	1975	n/a
C	object	006543	CON.939	Monument Street	1836 Battle Monument	1836	n/a
C	structure	000945	CON.940	Monument Street	North Bridge	1956	n/a
C	site	None	CON HA-13	Monument Street	Thomas Flint Site	after 1635	n/a
C	object	040261		Monument Street	Concord Fight Marker	early 20th century	n/a
NC	building	None		Monument Street	North Bridge Comfort Station	1984	No Style
C	structure	None		Monument Street	Road to North Bridge and Alleé	early 20th century	n/a
C	building	000924	CON.348	242 Monument Street	Elisha Jones House	early 18th century; rebuilt 1865-66	Colonial
C	site	None		242 Monument Street	Elisha Jones Site		n/a
C	building	None	CON.347	269 Monument Street	Old Manse	1769/70	Colonial
C	site	None		North Bridge	North Bridge Landscape	1836-1956	n/a

Note: 1. Contributing/Non-Contributing

Table G-9 Minute Man National Historical Park National Register District Data Sheet Sorted Alphabetically by Town and Street Address (continued)

C/NC[1]	NR CATEGORY	NPS NO.	MHC NO.	ADDRESS/LOCATION	NAME	DATES	STYLE
C	site	None		North Bridge	Battle Road/North Bridge Site	ca. 1635-1650	n/a
C	building	000928		North Great Road	Job Brooks House	1740	Colonial
C	object	040265		Old Bedford Road	Meriam's Corner Monument	1885	n/a
C	building	040243	CON.350	34 Old Bedford Road	Meriam House	ca. 1705, ca. 1725	Colonial
C	site	None		34 Old Bedford Road	John Meriam/Joseph Meriam House Sites	ca. 1665	n/a
C	building	040234	CON.351	55 Old Bedford Road	Burke House	ca. 1904	Dutch Colonial Revival
C	building	101974		55 Old Bedford Road	Burke House Garage	ca. 1940	No Style
LEXINGTON							
C	site	040253		Marrett Street	Tabitha Nelson House (Thomas Nelson, Sr.) Site	1754-57; 1716	n/a
C	building	000929	LEX.618	21 Marrett Street	Jacob Whittemore House	prior to 1754	Georgian/ Colonial
C	building	040239		21 Marrett Street	Barn at Whittemore House	19th century; moved 1978	No Style
C	site	None		Marrett Street	Jacob Whittemore Blacksmith Shop Site	18th century	n/a
C	site	None		Mass. Avenue and Marrett Street	Barn Foundation Site	1720-1900	n/a
C	site	None	LX HA-1	Mass. Avenue at Fiske Hill	Lt. David Fiske Site	1655-1721	n/a
NC	building	1-109-A		Massachusetts Avenue	Minute Man Visitors Center	1976	Modern
C	site	040247		Old Massachusetts Ave and Wood Street	Bashian Barn Foundation	1872-75	n/a
C	site	000923		Old Massachusetts Ave and Wood Street	Ebenezer Fiske House Foundation	ca. 1729-late 19th century	n/a
C	structure	006541		Old Massachusetts Ave and Wood Street	Fiske Hill Well	1700-75	n/a
C	object	040264		Old Massachusetts Ave and Wood Street	Hayward Well Monument	1885	n/a
C	object	040259		Old Massachusetts Ave and Wood Street	Bluff Monument	1885	n/a
C	site	None			Battle Road/ Fiske Hill Site	18th century	n/a
LINCOLN							
NC	building	2-129-A		58 Bedford Lane	Mrs. Edward Downing House	ca. 1954	Modern Cape
C	site	040248		Great North Road and Old Bedford Road	Thomas Brooks Farm Foundation	1800-50	n/a
C	site	040252		Massachusetts Ave. and Virginia Road	Samuel Hartwell Farm Cellar Hole	18th century	n/a

Note: 1. Contributing/Non-Contributing

Table G-9 Minute Man National Historical Park National Register District Data Sheet Sorted Alphabetically by Town and Street Address (continued)

C/NC[1]	NR CATEGORY	NPS NO.	MHC NO.	ADDRESS/LOCATION	NAME	DATES	STYLE
C	site	040258		Massachusetts Avenue	Unidentified Cut Stone Foundation	early 19th century	n/a
NC	object	040267		Massachusetts Avenue	Paul Revere Capture Marker	pre 1902	n/a
NC	building	2-101-A		190 Massachusetts Avenue	Irene Hegenian House	1949-54	Modern Cape
NC	building	2-101-B		190 Massachusetts Avenue	Irene Hegenian Shed	ca. 1960	No Style
C	site	040027		Massachusetts Avenue	Josiah Nelson, Jr. Hop House Foundation	1810-1820	n/a
C	building	006551		200 Massachusetts Avenue	John Nelson House	1808-1810	Federal
C	building	012008		200 Massachusetts Avenue	John Nelson Barn	ca. 1810; additions 1830, 1900	No Style
C	site	None		Nelson Road	Site 22, 23	1700-1800; 1720-1800	n/a
C	site	None		Nelson Road	Daniel Brown House and Shop Site	18th century	n/a
C	site	000920		Nelson Road	Josiah Nelson House Foundation	ca. 1775	n/a
C	site	012006	LN HA-6	Nelson Road	Thomas Nelson, Jr. House Foundation	1700-1750	n/a
C	site	None		Nelson Road	Site 24	18th century	n/a
C	site	None		North Great Road	Hastings Barn Foundation	19th century	n/a
C	building	006546, 040233	LIN.64	33 North Great Road	Noah Brooks Tavern, Noah Brooks Tavern Carriage House	ca. 1798	Federal
C	building	040245		33 North Great Road	Noah Brooks Barn (Rogers Barn)	1937/38	No Style
C	site	None		North Great Road	Brooks House Site	18th century	n/a
C	building	006552	LIN.65	37 North Great Road	Joshua Brooks, Jr. House	1780	Federal
C	site	None		North Great Road	Joshua Brooks Tanyard Site	18th century	n/a
NC	building	3-111-A		59 North Great Road	Moodey House	1956	Dutch Colonial Revival
NC	building	None		71 North Great Road	Bierlich House	ca. 1957	Ranch
C	building	040244		101 North Great Road	Rego House	1890-1910	Frame Vernacular
NC	building	2-124-B		101 North Great Road	Rego House Garage	mid-late 20th century	No Style
NC	building	2-112-A		112 North Great Road	James Russell House	1954	Modern
NC	building	3-110-A		4 Old Bedford Road	W.R. Barker House	ca. 1940	Modern Cape
NC	building	3-110-B		4 Old Bedford Road	W.R. Barker Garage	1940-45	No Style

Note: 1. Contributing/Non-Contributing

Table G-9 Minute Man National Historical Park National Register District Data Sheet Sorted Alphabetically by Town and Street Address (continued)

C/NC[1]	NR CATEGORY	NPS NO.	MHC NO.	ADDRESS/LOCATION	NAME	DATES	STYLE
NC	building	3-109-A		8 Old Bedford Road	Janet Swartz House	ca. 1955	Modern Cape
NC	building	3-109-B		8 Old Bedford Road	Janet Swartz Garage	ca. 1955	No Style
C	site	None		Virginia Road	Joseph Mason House Site	18th century	n/a
C	building	000931	LIN.66	Virginia Road	Ephraim Hartwell Tavern	ca. 1733	Colonial
C	site			Virginia Road	Ephraim Hartwell Site	18th century	n/a
C	building	006553	LIN.70	Virginia Road	Captain William Smith House	ca. 1750	Colonial
C	site	None		Virginia Road	Captain William Smith Site	18th century	n/a
C	site	000930	LIN.69	Virginia Road	Sgt. Samuel Hartwell House Site	1693-1716; burned 1968;shelter 1986	n/a
C	building	040029	LIN.140	Virginia Road	McHugh Barn	ca. 1830; rebuilt 1939	No Style

Notes: 1. Contributing/Non-Contributing
2. The Col. Barrett Farm Unit was added to the MMNHP in 2012, after the completion of the National Register nomination. It is assumed it would be contributing to an expanded nomination.