

# Town of Sturbridge Planning Board

Charles Blanchard, Chair  
Russell Chamberland  
Dane Labonte  
Michael Chisholm  
Jeff Adams  
Christopher Bouchard  
Susan Waters

Jean M. Bubon, Town Planner

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## PLANNING BOARD NOTICE OF DECISION SPECIAL PERMIT AND SITE PLAN APPROVAL

Date: April 15, 2020

Applicant: Caregiver Patient Connection LLC  
910 Boston Post Road E STE 310  
Marlborough, MA 01752

Phone: (617)593-2130

Owner: M&R Enterprises LLC  
4115 Bayhead Drive #103  
Bonita Springs, FL 34134

Engineer: Leonard Jalbert  
Jalbert Engineering, Inc.  
54 Main Street  
Sturbridge, MA 01566

Parcel Information: Assessor's Map 415-02551-365  
Book 21787 Page 0004

Zoning Designation: Commercial District

Property Location: 365 Main Street

Description of Request: The applicant requests a Special Permit and Site Plan Approval to allow the construction and operation of a 2,592 square foot adult use marijuana retail establishment and an additional 2,400 square foot health club/retail space and related site improvements.

Materials Submitted: The following information was submitted as part of the Special Permit and Site Plan application submitted on March 3, 2020:

- Site Plan Review Application.;

- Filing Fee;
- Peer Review Fee;
- A plan entitled “Caregiver Patient Connections, LLC DBA Local Roots NE – 365 Main Street, Sturbridge, MA.” Plan prepared by Jalbert Engineering, Inc. – 54 Main Street, Sturbridge, MA 01566-1244. Plan date is June 24, 2019 Revised through March 2, 2020 Revision 1;
- A document entitled “Traffic Impact and Access Study – Marijuana Dispensary/Health Club – 365 Main Street, Sturbridge, MA February 2020, Prepared for Caregiver Patient Connection, LLC;
- A document entitled “Stormwater Management Submittal, prepared for Caregiver Patient Connection, Inc. – 910 Boston Post Road, Marlborough, MA 01752, for property located on – 365 Main Street, Sturbridge, MA 01566 – Prepared by: Jalbert Engineering, 54 Main Street, Sturbridge, MA 01566;
- A document entitled “Caregiver Patient Connection Special Permit and Site Plan Review Application Chapter 31 Responses”;
- Elevation Plans entitled “Proposed Dispensary Plan – 365 Main Street, Sturbridge, MA”;
- Photographs of the site and neighboring properties;
- A Plan entitled “Photometric Lighting Plan”, Plan prepared by Radner Design Associates, Inc. – 945 Concord Street, Suite 100, Framingham, MA 01701. Issue date 02.26.2020;
- A rendering of the proposed monument sign prepared by Gemini Signs and Letters dated 2-24-20;
- A plan entitled “Linear Distance Compliance Plan – Caregiver Patient Connection LLC D.B.A. Local Roots NE – 365 Main Street, Sturbridge, Ma 01566”. Plan prepared by Jalbert Engineering, Inc. 54 Main Street, Sturbridge, MA 01566-1244. Plan date 2/24/20;
- National Flood Hazard Layer Firmette for the subject property;
- A GIS Map of the subject property;
- A property card for the subject property;
- A copy of the deed;
- A plan entitled “Plan of Property Owned by M & R Enterprises LLC, 335 Main Street, U.S. Route 20, Sturbridge, Massachusetts. Plan date 12/03/15;
- A copy of an executed Host Community Agreement;
- Promenade Series light fixture cut sheets;
- A tax paid certificate; and
- A certified list of abutters.

Additional Information Reviewed:

- Comments from Lt. John C. Marinelli, Fire Inspector dated March 5, 2020;
- Comments from Nelson Burlingame dated March 26, 2020;
- Comments from Mark Augello, DPW dated March 18, 2020;
- Memorandum from the Chief of Police dated March 18, 2020;
- Comments from Rebecca Gendreau, Conservation Agent dated March 30, 2020;
- Peer Review Report from Pare Corporation dated March 30, 2020;



- Working spreadsheet with comments and responses between applicant and Pare Corporation.
- A plan entitled “Caregiver Patient Connections, LLC DBA Local Roots NE – 365 Main Street, Sturbridge, MA.” Plan prepared by Jalbert Engineering, Inc. – 54 Main Street, Sturbridge, MA 01566-1244. Plan date is June 24, 2019 Revised through April 2, 2020 Revision 2;
- A document entitled “Stormwater Management Submittal, prepared for Caregiver Patient Connection, Inc. – 910 Boston Post Road, Marlborough, MA 01752, for property located on – 365 Main Street, Sturbridge, MA 01566 – Prepared by: Jalbert Engineering, 54 Main Street, Sturbridge, MA 01566 – Revised through April 2, 2020;
- Correspondence from abutters;
- Report from the Town Planner dated April 9, 2020.

Applicable Section of Zoning By-Law: Chapter 24 - Administration, Chapter 25 – Site Plan Review, and Chapter 31 – Adult Use Marijuana

Date of Meeting: April 14, 2020

Members Present: Charlie Blanchard, Sue Waters, Russell Chamberland, Michael Chisholm, Christopher Bouchard, Jeff Adams, and Dane Labonte.

At the Planning Board meeting of April 14, 2020, on a motion made by Jeff Adams, seconded by Sue Waters and voted 6-0-1 with Michael Chisholm opposed; the Board voted to grant the Special Permit for an Adult Use Marijuana and approve the Site Plan as requested by the applicant. The approval was granted subject to the following conditions of approval:

1. All construction and site improvements shall be in conformance with the plans submitted and approved by the Planning Board and as modified by these conditions of approval. Where plan notations are requested by these conditions, the applicant shall make those notations and provide a Final Plan to the Planning Department for review and approval.
2. All requirements of MassDOT regarding access construction and signal timing must be complied with and final approval received. The applicant shall provide the Planning Department with a copy of the final approval once received.
3. The curbing and sidewalk on the west side of the building shall be called out as bituminous curbing on the final plan.
4. A 12” stop bar shall be added at the end of the one way drive on the right side of the building.
5. All landscaping is to be installed as shown on the plans submitted. Final landscaping to be shown on the as-built plan to be submitted to the Planning Department at completion of this project.

6. Any exterior lighting of or from the buildings shall be subdued, shaded from the view of abutters and shall not be directed so as to extend above ground level onto the property of abutters or the public right-of-way.
7. All State and Local Zoning Bylaws, Building Codes and Regulations must be adhered to.
8. The access to the manufactured home community shall not be blocked at any time during construction or operation of the businesses at this location.
9. Exterior construction shall only occur during the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday and 8:00 a.m. to Noon on Saturday. No exterior construction shall occur on Sundays or the following holidays – New Year’s Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.
10. The applicant shall notify the Planning Department office forty-eight hours prior to the start of construction.
11. The site shall be maintained in a neat and orderly condition throughout the construction process.
12. Operating hours must comply with the terms of the Host Community Agreement with the Town as may from time to time, be amended.
13. An emergency contact phone list with at least two names and numbers on it be supplied to the Sturbridge Police Dept. and Planning Department to be used by the dispatchers, in case of an off hour emergency, prior to the start of the project. The list must be updated whenever necessary for the duration of the project.

Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to modify or revoke this Site Plan Approval. This Site Plan Approval does not relieve the applicant or any other person of the necessity of complying with all other applicable federal, state or local statutes, bylaws or regulations.

The provisions of this Site Plan Approval shall apply and be binding upon the applicant, its employees, and all successors and assigns in interest and control.

This Site Plan Approval shall lapse one year from the date of issuance if construction or substantial use thereof has not sooner commenced. An extension of time (one year) may be granted by the Planning Board upon application by the owner/applicant prior to the expiration and upon review of the circumstances and a finding of good cause.

Approval has been limited to matters of Site Plan Review only and not to construction details. Any persons aggrieved by a decision of the Planning Board may appeal to the Superior Court in accordance with the General Laws, Chapter 40A, Section 17.



  
Charles Blanchard, Chair

April 16, 2020  
Date Filed

cc: Leonard Jalbert, Jalbert Engineering  
M&R Enterprises LLC  
N. Burlingame, Building Inspector

# SPECIAL PERMIT AND SITE PLAN REVIEW APPLICATION

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# TOWN OF STURBRIDGE

## Planning Board Permit Application

### For Official Use:

Date of Receipt: \_\_\_\_\_

Received By: \_\_\_\_\_

File Number: \_\_\_\_\_

Date of Approval: \_\_\_\_\_

Completed: \_\_\_\_\_

Not Completed: \_\_\_\_\_

### Application Type

Special Permit

Site Plan Review

Waiver

### Part A General Information

1. NAME OF REGISTERED OWNER M & R Enterprises LLC  
Address 4115 Bayhead Drive #103  
City Bonita Springs State FL Zip Code 34134  
Telephone No. 978-771-0782  
Email Address bobswitzer@verizon.net

2. NAME OF APPLICANT/ AGENT Michael J Staiti, Careglver Patient Connection LLC  
Address 910 Boston Post Road E STE 310  
City Marlborough State MA Zip Code 01752  
Telephone No. 617-593-2130  
Email Address mikestaiti@keystonedev.net

3. MATTERS RELATED TO THE APPLICATION SHOULD BE ADDRES TO  
(check one or more):

Owner

Applicant/Agent





**Part C**

**Project Narrative** *Must be completed by applicant or agent*

Describe the proposed project in terms of use, design elements and construction timeframe.

See attached narrative

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Explain how the design and layout of the development or use constitutes suitable development without detriment to the neighborhood or to the environment.

See attached narrative

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Describe any special processes, mitigation measures or unique circumstances which may have a bearing on project approval

See attached narrative

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## Caregiver Patient Connection Special Permit and Site Plan Review Application Part C: Project Narrative

### **Describe the proposed project in terms of use, design elements and construction time frame:**

The applicant seeks a Special Permit and Site Plan approval under Sturbridge Zoning By-law Chapter 31 to construct and operate a 2,592 square foot, adult use marijuana retail establishment and an additional 2,400 SF health club/retail space. The property has two zoning classifications, Suburban Residential and Commercial. The rear portion of the property is zoned Residential A and has eight residential, manufactured homes on it. The front portion, zoned Commercial, is vacant. The property was formerly a Mobil gas station with convenience store but has been vacant for several years. There are no wetlands on the property nor any within 200' of the proposed construction zone.

Applicant has designed a 4,992 square foot, one story retail property with 47 parking spots. A detailed traffic study and stormwater design has been completed and the project meets all local zoning bylaws. No variances are being requested. Finally, the commercial property will be improved with a new parking lot and extensive landscaping.

The building has been designed in a traditional Cape architectural style utilizing Smartside cedar grain clapboard siding, 9 over 9 Masterview double hung windows, Certainteed Cedar Impression Shakes on gable ends, Certainteed architectural roof shingles and Certainteed Stonefacade on the front and right side elevations. The building will have exterior lights and security cameras on all sides of the building to meet CMR 935CMR500 rules and regulations. We are expecting a four month construction schedule from the issuance of the building permit to completion. Detailed construction schedule available upon request and details of construction materials and colors are included with the plans.

### **Explain how the design and layout of the development or use constitutes suitable development without detriment to the neighborhood or to the environment:**

The property has been vacant for over four years and is an eyesore in a very prominent location in Sturbridge. The new property is of appropriate scale and architectural style to fit with abutting properties while not overshadowing the manufactured home community at the rear of the property. The building is set perpendicular to Route 20 so the massing as seen from the street is not overwhelming. While our use and traffic analysis conservatively show the need for 40 spaces, our design incorporates 47 spaces with access to six more on the manufactured home property if needed. We are providing nearly 20% more parking than necessary under conservative assumptions. Our appointment only system, which is capped at 600 customers a day, ensures that parking will be more than adequate and traffic impacts will be negligible. The properties location is ideally suited for the proposed use, especially given the expected influx of out of town and out of state customers. Our proximity to I-84 allows Connecticut customers to easily access the dispensary with no impact to Sturbridge's residential neighborhoods (particularly Farrqhar and River Road neighborhoods). In addition, our location



on Route 20 is ideally located on a divided section of the road which allows for one-way ingress and egress at safe speeds due to the traffic lights immediately to the east and west of our location. Finally, from a financial standpoint to the town, our site is located in the heart of Sturbridge's retail district which will help insure the long term success for this business and help maximize the 6% in fees and taxes that the town will receive for years to come.

The current vacant property is almost 100% covered by impervious material left over from the prior use. The new building with related landscaping will have 20% less impervious material reducing offsite drainage concerns while also providing extensive landscaping. In addition, the building is designed to significantly exceed Stretch Code requirements and will include spray foam insulation, high efficiency HVAC units, 15 kw of PV solar on the roof and energy efficient windows.

**Describe any special processes, mitigation measures or unique circumstances which may have bearing on project approval:**

The applicant has undergone an extensive due diligence review by the Sturbridge Board of Selection, Town Administrator and Town Planner and was the only company of the three Host Community Agreement recipients to receive a 5-0 vote from the Board of Selectmen. Three of the five selectmen stated in public meetings that Caregiver had the best site of all the applicants, and was their first choice of all of the applicants.

The applicant has undertaken a full traffic study and has provide 20% more parking spaces than what is required under our most conservative assumptions and far more than required by code. The applicant has agreed not to sell dessert like edibles (cookies, brownies, ice cream) per the request of the Board of Selectmen.

Caregiver-Patient Connection is a local company which was founded by Catherine Trifilo, Dean landoli, Rick Olstein, and Michael Staiti, all of whom have roots in central Massachusetts. The company was founded in Barre, MA where two of our founding members live and one of our cultivation operations is located. The other founding members are also life-long Massachusetts residents.

We strongly believe that being invited to enter into a Host Community Agreement and being awarded a special permit from the Planning Board are just the beginning of a long-term, collaborative and cooperative relationship between Caregiver- Patient Connection and the Town of Sturbridge.

10. Please list any technical studies or background material being submitted to support the application.

Full traffic study

Architectural drawings & sample exterior materials

Storm water calculations

11. Please indicate (√) if the applicant or owner has submitted any of the following applications for all or part of the subject property and complete the following chart:

Other Applications	Required		Submitted		File Number	Status of Application
	Yes	No	Yes	No		
Conservation Commission (Notice of Intent or Request for Determination)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
DPW (Curb Cut Permit)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
DPW (Street entrance, water or sewer tie in)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Board of Health (Septic, food, other)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Zoning Board of Appeals (Special Permit, Variance)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Board of Selectmen (Liquor License)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Other (please list below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Other:

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# SITE PLAN CHECK LIST

## 1. Existing Site Plan – note any non-conformance

YES	NO – must give reason below	For Planning Board use
<input checked="" type="checkbox"/>	<input type="checkbox"/> Locus	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> North arrow	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Survey	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Existing Structures	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Existing roads and curbs	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Contours and elevations	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Abutters within 300 feet	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Zone and dimensional requirements	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Setbacks	_____

### Additional comments

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## 2. Proposed – meets zoning unless noted

YES	NO – must give reason below	For Planning Board use
<input checked="" type="checkbox"/>	<input type="checkbox"/> Lot dimensions	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Proposed buildings	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Percent building & impervious areas	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Sidewalks and buffer areas	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Streets, driveways and access	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Circulation patterns	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Parking spaces and calculations	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Allowed use reference	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Loading areas	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Building mean height	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Dumpsters & screening	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Outdoor storage areas	_____

### Additional comments

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### 3. Grading

YES	NO – must give reason below	For Planning Board use
<input checked="" type="checkbox"/>	<input type="checkbox"/> Buffer zones and distances	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Wetlands and vernal pools	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Riparian features	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Flood zones	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Ground water elevations	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Siltation fencing	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Significant species type and habitat	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Detention and Retention Basins	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Grading plan	_____

#### Additional comments

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### 4. Utilities

YES	NO – must give reason below	For Planning Board use
<input checked="" type="checkbox"/>	<input type="checkbox"/> Water lines and connections	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Hydrants and sprinklers	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Sewer lines and connections	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Electric and wire lines	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Drainage structures	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Oil and propane tanks	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Snow storage area	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Public and private wells	_____

#### Additional comments

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## 5. Landscaping, Lighting and Signs

YES	NO – must give reason below	For Planning Board use
<input checked="" type="checkbox"/>	<input type="checkbox"/> Landscaping and calculations	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Lighting location, size, type, direction	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Open space as percent of lot	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Sign location size and detail	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Geologic features	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Dust and noise control measures	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Fencing permanent and temporary	_____

### Additional comments

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## 6. Detail Sheets

YES	NO – must give reason below	For Planning Board use
<input checked="" type="checkbox"/>	<input type="checkbox"/> Tree planting	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Shrub planting	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Light poles	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Hydrants	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Catch basins	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Man holes	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Traps	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Trenching	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Road profiles	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Curbing and Burms	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Signs and support	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Sewer fixtures	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Water lines	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Fencing	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Headwalls	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Siltation fencing	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Facades	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> External materials & colors	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Fenestration	_____



## Additional comments

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## 7. Calculations and Studies unless waived

YES	NO – must give reason below	For Planning Board use
<input checked="" type="checkbox"/>	<input type="checkbox"/> Lot coverage	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> ITE trip generation calculations	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Planting calculations and schedule	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Traffic impacts	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Drainage calculations	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Water and sewer demands	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Hydrant pressure tests	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Water and aquifer studies	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/> Other	_____

## Additional comments

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## 8. Permits applied for / received from other boards, agencies or commissions

Board/Agency	Action or Conditions
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

**AUTHORIZATION (Must be signed by applicant)**

I hereby request that the Town of Sturbridge Planning Board review this application for Site Plan approval, including all plans, documents and information herewith. I represent to the best of my knowledge and belief, this application is being submitted in accordance with the Site Plan Review Regulations of the Planning Board of the Town of Sturbridge.

[Signature]  
Signature of Applicant

2/23/20  
Date

**AUTHORIZATION (Must be signed by owner)**

I am the record owner of the property for which this application is being filed and as such, I am familiar with the work proposed to be carried out on my property.

I hereby give permission for this application to be filed with the full understanding that certain restrictions may be placed on the property relative to the approval of the proposed work.

I further certify that under the penalties of perjury, I am authorized to sign this application.

Robert J. Smith  
Signature of Owner

2/23/2020  
Date

MANAGING PARTNER, M&R ENTERPRISES, LLC

If someone is representing the applicant or the owner, the applicant must designate such representative below:

Name of Representative: Leonard J. Jilbert, Jilbert Engineering

Address of Representative: 59 Main Street, Sturbridge

Telephone No.: 508-397-5136

Relationship of representative to owner or applicant: Engineer

If representing a group, corporation or other organization please attach a copy of the vote authorizing you to act on behalf of such organization for the purposes of this application.

*An application will not be considered complete and will not be submitted to the Planning Board for its action until all required documentation/information has been submitted to the Town Planner and filed with the Town Clerk.*

**Incomplete applications will be automatically rejected and returned to the applicant.**

Exhibit 2



THE CAREGIVER · PATIENT CONNECTION

## CPC Sturbridge-Security Procedures

CPC-Sturbridge, in accordance with 935CMR500.110, will implement security operating procedures to deter and prevent unauthorized entrance into all areas containing marijuana and the theft of marijuana, loitering and diversion, which will be in written form and include employee security and emergency policies, personal safety and crime prevention techniques. In accordance with 935 CMR 500.110(1) CPC will share the security operating procedures and plan with the Sturbridge police department.

Security measures are intended to protect the CPC/Sturbridge Marijuana Establishment (ME) premises, employees, consumers and the general public.

- **Hours of Operation**
- 11:00 A.M.-8:00 P.M., Monday-Saturday
- 12:00 A.M.-6:00 P.M. Sunday
- After Hours Security Contact Information:  
Ron L'Ecuyer, CPC Director of Security, 978-340-4647

CPC shall positively identify all individuals seeking access to the premises or to whom marijuana products are sold solely to individuals 21 years of age or older. CPC/Sturbridge shall utilize a **specialized ID Science model IDS5000 scanner, which scans id's from all 50 states and all international identification's and has the built-in capability to identify and prevent "looping."**

Only individuals engaging in activities expressly, or by necessary implication permitted by 935CMR500.000 will be allowed to remain on the premises of the CPC ME.

All entrances to the Sturbridge ME will be secured to prevent unauthorized access.

All entry and exit points and perimeter windows to the CPC Sturbridge ME will be equipped with an alarm. The Sturbridge/ME will have a failure notification system which will provide an alert to designated employees of the ME within 5 minutes after the failure, by either text message, e-mail, or telephone. The Sturbridge ME will have a duress alarm connected to public safety and the Sturbridge police department.

Video cameras, appropriate for the normal conditions of the area under surveillance, will be angled to allow for the clear capture of clear and certain identification of any person entering and

exiting the ME and will be directed at the following areas:

- Safes
- Vaults
- Sales areas
- All areas where marijuana is cultivated, harvested, processed, prepared, stored, handled or dispensed. Surveillance video will have the ability to produce a clear, color still photo and will include correct time and date stamps and shall have the ability to remain operational during a power outage. Video recorded will have the ability to be archived in an industry standard format (.jpg, .bmp, .gif) that ensures no alteration of the video image has taken place.

All CPC security system equipment and recordings will be maintained in a secured, limited access location at the ME which will remain locked in order to prevent theft, loss, destruction or alteration and will not be used for any other functions. Access to surveillance areas will be limited to persons essential to surveillance operations, law enforcement authorities and the Commission.

Video camera system recordings shall not be destroyed or altered and shall be retained for as long as necessary if the establishment is aware of a pending criminal, civil, or administrative investigation or proceeding in accordance with 935CMR500.110(5). Recordings from all video cameras shall be enabled to record 24 hours each day and be available for immediate viewing by the Commission on request for at least the preceding 90 calendar days or the duration of a request to preserve the recordings for a specified period of time made by the Commission, whichever is longer.

The CPC Sturbridge ME will also have a back-up alarm system, with all of the capabilities of the primary system, provided by a company supplying commercial grade equipment, which will not be the same company supplying the primary equipment.

All security equipment will remain in good working order and be tested at regular intervals not to exceed 30 calendar days from the previous inspection. On an annual basis CPC, at its' own expense will obtain a security audit from a vendor approved by the Commission. The audit report will be submitted no later than 30 days calendar days after the audit is conducted. Any concerns related to the CPC security system must be mitigated pursuant to a plan submitted to the Commission within 10 business days of submitting the audit.

Limited Access Areas (LAA's), shall be accessible to only specified, authorized personnel and shall be established and identified by the posting of a sign, which will be, at a minimum, 12"x12" and will state "Do Not Enter-Limited Access Area-Access Limited to Authorized Personnel Only" in lettering no smaller than one inch. Access to "Limited Access Areas" (LAA's) shall be restricted to employees, agents or volunteers specifically permitted by CPC,

agents of the Commission, state and local law enforcement and emergency personnel. Employees of the ME will visibly display an employee identification badge issued by CPC at all times while at the ME or when transporting marijuana. All outside vendors, contractors and visitors shall

obtain a visitor identification badge prior to entering a LAA and shall be escorted at all times by a ME agent authorized to enter the LAA. All visitors must be logged in and out in a log that will be made available for inspection by the Commission at all times, and shall visibly display their identification badge at all times while in any LAA.

A current list of authorized employees and service personnel that have access to the surveillance room will be available to the Commission on request. If the surveillance room is on-site of the Marijuana Establishment, it shall remain locked and shall not be used for any other function.

All "Limited Access Areas" will be clearly described by the filing of a diagram of the ME which will reflect entrances, exits, walls, partitions, vegetation, flowering, processing, production, storage, disposal and retail areas.

All finished marijuana products will be stored in a secure, locked safe or vault in such a manner to prevent diversion or loss. All safes, vaults, and any other equipment or areas used for the production, cultivation, harvesting, processing, or storage of marijuana will be kept securely locked and protected from entry, except for the actual time required to remove or replace marijuana. The locks and security equipment will be maintained in good working order. CPC will only use commercial-grade, non-residential locks in areas of limited access.

Keys shall not be left in any locks, nor shall they be stored or placed in a location accessible to authorized-personnel only. Security measures such as combination numbers, passwords or electronic or biometric security systems shall accessible only to specifically authorized personnel.

The outside of the ME will be sufficiently lit to facilitate surveillance. Trees, bushes and any other foliage outside the ME will be maintained to prevent a person from concealing themselves from sight.

Marijuana products will not be visible from a public place.

In accordance with 935 CMR 500.110(1) CPC has developed emergency policies and procedures for securing all product following any instance of diversion, theft or loss of Marijuana, which includes a provision to conduct an assessment to determine whether additional safeguards are necessary

In any instance of theft, diversion or loss of marijuana emergency procedures the incident will be



reported to the appropriate law enforcement authorities and the Commission within 24 hours. The following activities will be considered grounds for notification:

- Discrepancies discovered during inventory
- Diversion, theft or loss of any marijuana product
- Any criminal activity involving, or occurring on, or in the ME
- Suspicious acts involving the sale, cultivation, distribution, processing or production of marijuana by any person
- Loss, or unauthorized alteration of records related to marijuana
- Any alarm activation or other event that requires response by public safety personnel or security personnel privately engaged by the ME
- The failure of any alarm system due to a loss of electrical power or mechanical malfunction expected to last more than 8 hours. Upon the occurrence of any incident described above, the ME will submit an incident report to the Commission detailing the circumstances of the event and any corrective action taken and confirmation that the proper law enforcement authorities were notified. Documentation will be maintained in the ME for not less than one year, or the duration of an open investigation, whichever is longer, and shall be made available to the Commission and law enforcement authorities.

**CPC conducts its' banking with Garner Federal Credit Union** and has established and implemented adequate security measures and procedures for safe cash handling and cash transportation to prevent theft and loss, and to mitigate associated risks to the safety of employees, customers and the general public. Adequate security measures include:

- An on-site secure locked safe or vault maintained in an area separate from retail sales areas used exclusively for the purpose of securing cash;
- Video cameras directed to provide images of areas where cash is kept, handled and packaged for transport to financial institutions or DOR facilities, provided that the cameras may be motion-sensor activated cameras and provided, further, that all cameras be able to produce a clear, still image whether live or recorded;
- A written process for securing cash and ensuring transfers of deposits to the CPC's financial institutions on an incremental basis consistent with the requirements for deposit by the financial institution.
- Use of an armored transport provider that is licensed pursuant to M.G.L.c.147, §25 (watch, guard or patrol agency) and has been approved by the financial institution.
- In accordance with 935 CMR 500.110(7) CPC Sturbridge will prohibit the transportation of marijuana or marijuana products at the same time that cash is being transported for deposit to a financial institution or DOR facility.

In accordance with 935 CMR 500.110 (1) loitering will not be allowed at the CPC Sturbridge retail location. Operational security protocol at the CPC-Sturbridge location will include consistent monitoring of the exterior of the premises which will include all parking areas.



Home > Filters > Can-Filter 66 Without Flange 412 CFM

# Can-Filter 66 Without Flange 412 CFM

SKU: 700619

## At a Glance

Each Original Can-Filter® uses the most conceptually sound, pelletized carbon, packed-bed design to deliver the best performing carbon filter on the market. Even with the industry's thickest carbon bed, at 2.5 in, the Can Original provides for some of the lowest pressure drops, even on smaller size filters. This hefty pelletized carbon bed effectively makes the Original filter the "biggest sponge" for VOC removal capable of holding massive amounts of contaminant leading to a lifespan that leaves other filters, frankly, in the dust. The Original Can-Filter® are designed for the control of VOCs (paint fumes, hydrocarbons, etc...), odors and other gaseous contaminants. Built with the same proven packed bed design and pelletized virgin activated carbon we've



used for 30 years, this line of time tested activated carbon air filters sets the standard for long life, consistent performance and low pressure drop. Rated at a conservative 0.1 sec contact time, the Original Can-Filter® provide excellent value and confidence.

## Details

- Made in North America

---

- 7 sizes from 33-150cm, largest in industry

---

- You pick the flange that's right for you

---

- Low pressure drop even on smaller sizes

---

- Pelletized carbon delivers the cleanest filter available

---

- 2.5" Carbon bed, thickest in industry

---

- Flange comes separate to fit a wide range of fans and applications

CAN FILTER

FILTERS

## TECHNICAL DATA RECOMMENDED FANS

**Max Exhaust CFM:** 412 CFM / 700 m<sup>3</sup>h @ 0.1 sec contact time

---

**Max Recirculating (Scrubbing) CFM:** 824 CFM / 1400 m<sup>3</sup>h

---

**Recommended Min Airflow:** 206 CFM / 350 m<sup>3</sup>h

---

**Pre-filter:** Yes

**Flange: 6" – 8" – 10"**

---

**Outside Diameter: 30cm / 12"**

---

**Height: 66 cm / 26"**

---

**Total Weight: 20 kg / 44 lbs.**

---

**Carbon Weight: 14 kg / 31 lbs.**

---

**Carbon Bed Depth: 5 cm / 2"**

---

**Max Operating Temp: 80°C / 176°F**

---

**Pressure drop at max CFM: 180pa / .75"wg**

**Call us:**

**(888) 478-6544**

**Fax:**

**(888) 478-6555**

**[contact@canfilters.com](mailto:contact@canfilters.com)**

# Exhibit 4

## OSQ Series

OSQ™ LED Area/Flood Luminaire – Medium

Rev. Date: V23 01/10/2020

### Product Description

The OSQ™ Area/Flood luminaire blends extreme optical control, advanced thermal management and modern, clean aesthetics. Built to last, the housing is rugged cast aluminum with an integral, weathertight LED driver compartment. Versatile mounting configurations offer simple installation. Its slim, low-profile design minimizes wind load requirements and blends seamlessly into the site providing even, quality illumination. The 'B' Input power designator is a suitable upgrade for HID applications up to 250 Watt, and the 'K' Input power designator is a suitable upgrade for HID applications up to 400 Watt.

**Applications:** Parking lots, walkways, campuses, car dealerships, office complexes, tunnels, underpasses, and internal roadways

### Performance Summary

NanoOptic® Precision Delivery Grid™ optic

Assembled in the U.S.A. of U.S. and imported parts

**Initial Delivered Lumens:** Up to 17,291

**Efficacy:** Up to 136 LPW

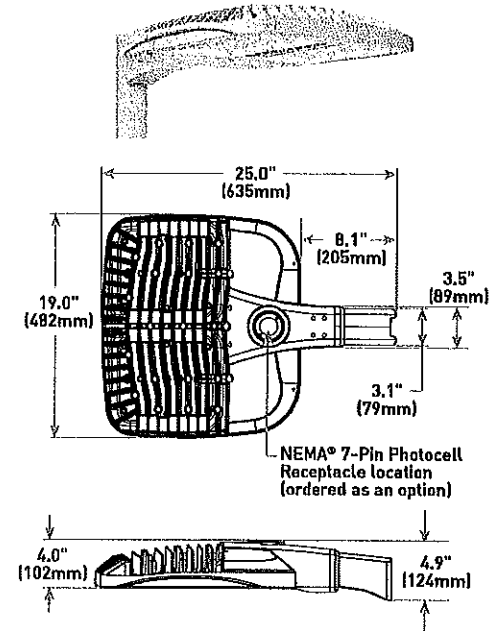
**CRI:** Minimum 70 CRI (3000K, 4000K & 5700K); 90 CRI (5000K)

**CCT:** 3000K, 4000K, 5000K, 5700K

**Limited Warranty:** 10 years on luminaire/10 years on Cotorfast DeltaGuard® finish/5 years on Synapse Wireless control accessories/1 year on luminaire accessories

\* See <http://creelighting.com/warranty> for warranty terms

### DA Mount



Weight
28.9 lbs. (13.1kg)

### Ordering Information

Fully assembled luminaire is composed of two components that must be ordered separately:

Example: Mount: OSQ-B-AASV + Luminaire: OSQ-A-NM-2ME-B-40K-UL-SV

Mount (Luminaire must be ordered separately)*	
OSQ-	
OSQ-B-AA Adjustable Arm OSQ-DA Direct Arm OSQ-M-TSP Transportation Mount (stainless steel; do not specify color) OSQ-TM Trunnion Mount	Color Options: SV Silver BZ Bronze BK Black WH White

\* Reference EPA and pole configuration suitability data beginning on page 9

Luminaire (Mount must be ordered separately)								
OSQ	A	NM						
Product	Version	Mounting	Optic	Input Power Designator	CCT	Voltage	Color Options	Options
OSQ	A	NM No Mount	<b>Asymmetric</b> 2ME* Type II Medium 4ME* Type IV Medium 3ME* Type III Medium  <b>Symmetric</b> 5ME Type V Medium 25D 25° Flood 40D 40° Flood 55H Type V Short 60D 60° Flood WSN Wide Sign 15D 15° Flood	B 86W K 130W Z 53W  30K 3000K, 70 CRI 48K 4000K, 70 CRI 50K 5000K, 90 CRI 57K 5700K, 70 CRI	UL Universal 120-277V UH Universal 347-480V - Available with B & K Input Power Designators only	BK Black BZ Bronze SV Silver WH White	<b>PML Programmable Multi-Level, up to 40' Mounting Height</b> - Refer to PML spec sheet for details - Intended for downlight applications at 0° tilt  <b>PML2 Programmable Multi-Level, 10-30' Mounting Height</b> - Refer to PML spec sheet for details - Intended for downlight applications at 0° tilt  <b>Q7/Q6/Q5/Q4/Q3/Q2/Q1 Field Adjustable Output</b> - Must select Q7, Q6, Q5, Q4, Q3, Q2, or Q1 - Offers full range adjustability - Refer to pages 11-12 for power and lumen values - Available with B & K Input Power Designators only - Not available with PML or PML2 options	<b>R NEMA® 7-Pin Photocell Receptacle</b> - 7-pin receptacle per ANSI C136.41 - Intended for downlight applications with maximum 45° tilt - Factory connected 0-10V d/m leads - 18" (457mm) seven-conductor cord exits luminaire - Requires photocell or shunting cap by others  <b>RL Rotate Left</b> - LED and optic are rotated to the left - Refer to RR/RL configuration diagram on page 13 for optic directionality  <b>RR Rotate Right</b> - LED and optic are rotated to the right - Refer to RR/RL configuration diagram on page 13 for optic directionality

\* Available with Backlight Shield when ordered with field-installed accessory (see table above)



# CREE LIGHTING

US: [creelighting.com](http://creelighting.com) (800) 236-6800

Canada: [creelighting-canada.com](http://creelighting-canada.com) (800) 473-1234



# OSQ™ LED Area/Flood Luminaire – Medium

## Product Specifications

### CONSTRUCTION & MATERIALS

- Slim, low profile design minimizes wind load requirements
- Luminaire housing is rugged die cast aluminum with an integral, weathertight LED driver compartment and high-performance heat sink
- Convenient interlocking mounting method on direct arm mount. Mounting adaptor is rugged die cast aluminum and mounts to 3-6" (76-152mm) square or round pole, secured by two 5/16-18 UNC bolts spaced on 2" (51mm) centers
- Mounting for the adjustable arm mount adaptor is rugged die cast aluminum and mounts to 2" (51mm) IP, 2.375" (60mm) O.D. tenon
- Adjustable arm mount can be adjusted 180° in 2.5° increments
- Transportation mount is constructed of 316 stainless steel and mounts to surface with (4) 3/8" fasteners by others
- Trunnion mount is constructed of A500 and A1011 steel and is adjustable from 0-180° in 15° degree increments. Trunnion mount secures to surface with (1) 3/4" bolt or (2) 1/2" or 3/8" bolts
- Includes 18" (340mm) 18/5 or 16/5 cord exiting the luminaire. When ordered with R option, 18" (340mm) 18/7 or 16/7 cord is provided
- Designed for uplight and downlight applications
- Exclusive Colorfast DeltaGuard® finish features an E-Coat epoxy primer with an ultra-durable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation and abrasion. Silver, bronze, black, and white are available
- **Weight:** OSQ-DA: 28.9 lbs. (13.1kg); OSQ-B-AA: 28.4 lbs. (12.9kg); OSQ-M-TSP: 42 lbs. (19.1kg); OSQ-TM: 32.6 lbs. (14.8kg)

### ELECTRICAL SYSTEM

- **Input Voltage:** 120-277V or 347-480V, 50/60Hz, Class 1 drivers
- **Power Factor:** > 0.9 at full load
- **Total Harmonic Distortion:** < 20% at full load
- Integral 10kV surge suppression protection standard
- When code dictates fusing, a slow blow fuse or type C/D breaker should be used to address inrush current
- Consult factory if in-luminaire fusing is required
- Designed with 0-10V dimming capabilities. Controls by others
- Refer to Dimming spec sheet for details
- **Maximum 10V Source Current:** 1.0mA

### REGULATORY & VOLUNTARY QUALIFICATIONS

- cULus Listed
- Suitable for wet locations
- Enclosure rated IP66 per IEC 60529 when ordered without R option
- Consult factory for CE Certified products
- Certified to ANSI C136.31-2001, 3G bridge and overpass vibration standards with AA, DA, TM, and TSP mounts
- ANSI C136.2 10kV surge protection, tested in accordance with IEEE/ANSI C62.41.2
- Meets FCC Part 15, Subpart B, Class A limits for conducted and radiated emissions
- Luminaire and finish endurance tested to withstand 5,000 hours of elevated ambient salt fog conditions as defined in ASTM Standard B 117
- Meets Buy American requirements within ARRA
- DLC and DLC Premium qualified versions available with 70 CRI. Some exceptions apply. Please refer to <https://www.designlights.org/search/> for most current information
- RoHS compliant. Consult factory for additional details
- Dark Sky Friendly, iDA Approved when ordered with 30K CCT and direct or transportation mounts only. Please refer to <https://www.darksky.org/our-work/lighting-for-industry/isa/isa-products/> for most current information

CA RESIDENTS WARNING: Cancer and Reproductive Harm - [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product Specifications

### SYNAPSE® SIMPLYSNAP INTELLIGENT CONTROL

The Synapse SimplySNAP platform is a highly intuitive connected lighting solution featuring zone dimming, motion sensing, and daylight harvesting with utility-grade power monitoring and support of up to 1000 nodes per gateway. The system features a reliable and robust self-healing mesh network with a browser-based interface that runs on smartphones, tablets, and PCs. The Twist-Lock Lighting Controller (TL7-B2) and Site Controller (SS450-002) take the OSQ Series to a new performance plateau, providing extreme energy productivity, code compliance and a better light experience.

Electrical Data*							
Input Power Designator	System Watts 120-480V	Total Current (A)					
		120V	208V	240V	277V	347V	480V
B	86	0.73	0.43	0.37	0.32	0.25	0.19
K	130	1.09	0.65	0.56	0.49	0.38	0.28
Z	53**	0.46	0.26	0.22	0.19	N/A	N/A

\* Electrical data at 25°C (77°F). Actual wattage may differ by +/- 10% when operating between 120-277V or 347-480V +/-10%

\*\* Available with UL voltage only

### OSQ Series Ambient Adjusted Lumen Maintenance<sup>1</sup>

Ambient	Optic	Initial LMF	25K hr Reported <sup>2</sup> LMF	50K hr Reported <sup>2</sup> LMF	75K hr Reported <sup>2</sup> /Estimated <sup>3</sup> LMF	100K hr Reported <sup>2</sup> /Estimated <sup>3</sup> LMF
5°C (41°F)	Asymmetric	1.04	1.02	1.01	1.00 <sup>2</sup>	0.99 <sup>2</sup>
	Symmetric	1.05	1.04	1.03	1.03 <sup>2</sup>	1.02 <sup>2</sup>
10°C (50°F)	Asymmetric	1.03	1.01	1.00	0.99 <sup>2</sup>	0.98 <sup>2</sup>
	Symmetric	1.04	1.03	1.02	1.01 <sup>2</sup>	1.00 <sup>2</sup>
15°C (59°F)	Asymmetric	1.02	1.00	0.99	0.98 <sup>2</sup>	0.97 <sup>2</sup>
	Symmetric	1.02	1.02	1.01	1.00 <sup>2</sup>	0.99 <sup>2</sup>
20°C (68°F)	Asymmetric	1.01	0.99	0.98	0.97 <sup>2</sup>	0.96 <sup>2</sup>
	Symmetric	1.01	1.01	1.00	0.99 <sup>2</sup>	0.98 <sup>2</sup>
25°C (77°F)	Asymmetric	1.00	0.98	0.97	0.96 <sup>2</sup>	0.95 <sup>2</sup>
	Symmetric	1.00	0.99	0.98	0.98 <sup>2</sup>	0.97 <sup>2</sup>

<sup>1</sup> Lumen maintenance values at 25°C (77°F) are calculated per IES TM-21 based on IES LM-80 report data for the LED package and in-situ luminaire testing. Luminaire ambient temperature factors (LATF) have been applied to all lumen maintenance factors. Please refer to the [Temperature Zone Reference Document](#) for outdoor average nighttime ambient conditions.

<sup>2</sup> In accordance with IES TM-21, Reported values represent interpolated values based on time durations that are up to 6x the tested duration in the IES LM-80 report for the LED.

<sup>3</sup> Estimated values are calculated and represent time durations that exceed the 6x test duration of the LED.

### Accessories

Field-Installed			
Backlight Shield OSQ-BLSMF - Front facing optics OSQ-BLSMR - Rotated optics	Hand-Held Remote XA-SENSREM - For successful implementation of the programmable multi-level option, a minimum of one hand-held remote is required	Bird Spikes OSQ-MED-BROSPK	Shorting Cap XA-XSLSHRT
Synapse Wireless Control Accessories			
Twist-Lock Lighting Controller TL7-B2 - Suitable for 120-277V (UL) voltage only - Requires NEMA/ANSI C136.41 7-Pin Dimming Receptacle - Not for use with PML or Q options - Provides On/Off switching, dimming, power metering, digital sensor input, and status monitoring of luminaires		SimplySNAP On-Site Controller SS450-002 - Verizon® LTE-enabled - Designed for indoor applications Building Management System (BMS) Gateway BMS-GW - Required for BACNET integration Outdoor Antennas (Optional, for increased range, 8dB gain) KIT-ANT420SM - Kit includes antenna, 20' cable and bracket KIT-ANT360 - Kit includes antenna, 30' cable and bracket KIT-ANT600 - Kit includes antenna, 50' cable and bracket	
SimplySNAP Central Base Station CBSW-450-002 - Includes On-Site Controller (SS450-002) and 5-button switch - Indoor and Outdoor rated			




Search

**Lighting Solutions**

- LED
- Outdoor
- Indoor
- Landscape
- Sports

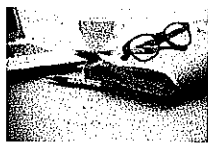
- DLC Qualified Products
- Phased Out/Discontinued
- Standard Colors Chart
- Terms, Conditions & Warranty
- ISO 9001:2015 Certified

Locate Sales Rep

Locate Certified Contractor

Outfit Ship Programs

Buyer's Guide



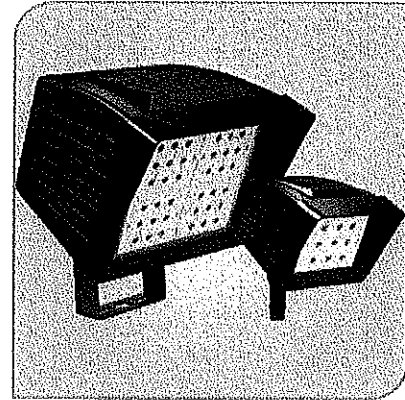
**LSI Newsroom**  
The most recent press releases, news articles, and upcoming events from LSI Industries.

[Learn More](#)

[← Previous Page](#)

**Traditional LED Flood Lights (TSFL, TMFL, TLFL)**

LSI flood lights are the most powerful LED flood lights available in the market today. They use optical grade individual acrylic lenses which deliver more lumens to the desired target, guaranteeing more footcandles, less glare and less wasted light.



**Applications Resources & Photometrics**

Name	Files
------	-------

**Photometric IES files**

*Description: Updated 1/8/2019*



**LM-79 PDF Reports**

*Description: Updated 1/8/2019*



*Reference our Product Specification Sheets and Installation Instructions concerning any limitations that would restrict the use of the IES Design files and LSI Industries Lighting Calculation Tools for specific applications.*

**LSI Industries (All IES Files)**

*Description: Updated 2/20/2020 (12mb)*



**LSI Outdoor LED Fixt. BUG Summary**

*Description: Updated 2/18/2020*



**LSI Industries Revit Files (All Revit Files)**

*Description: Updated 2/18/2020 (86mb)*



**LSI Revit Family User Guide**

*Description: Updated 1/15/2020*

*(Guide for using LSI REVIT Families & IES Files)*



**ROI Calculators**

**(Standard & 5 Fixture) (Excel format)**

*Description: Updated 11/12/2018*



**LED Fixture Images**

*Description: Updated 1/29/2020 (71mb)*



**Application Request Form**

*Description: Updated 4/18/2018*



This product, or selected versions of this product, meet the standards listed below



**Specification Sheets**

- TSFL Small 2L Specs sheet
- TMFL Medium 4L Specs sheet
- TLFL Large 8L Specs sheet
- TLFL Large 13L Specs sheet
- TLFL Large 17L Specs sheet
- TLFL Large 20L Specs sheet
- TLFL Large 26L Specs sheet
- TLFL Large 33L Specs sheet
- TLFL Large 40L Specs sheet

**DLC Rebate Lookup Tool**

**Find Local Rebates Here**

**Installation Instructions**

**Installation**

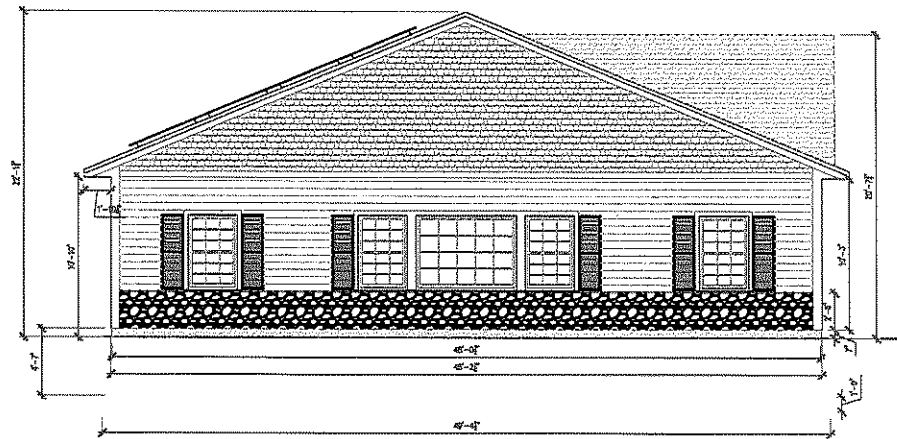
**Literature**

**Performance Comparison Guide**

**Lighting Calculator Tools**

**LED Traditional Flood**

LOCAL ROOTS  
 365 MAIN STREET, STURBRIDGE  
 FRONT ELEVATION



MAIN STREET SIDE

SCALE: 1/4" = 1'

SHEET:

A1.0

OF: 9

FRONT ELEVATION

DATE: 2/20/20

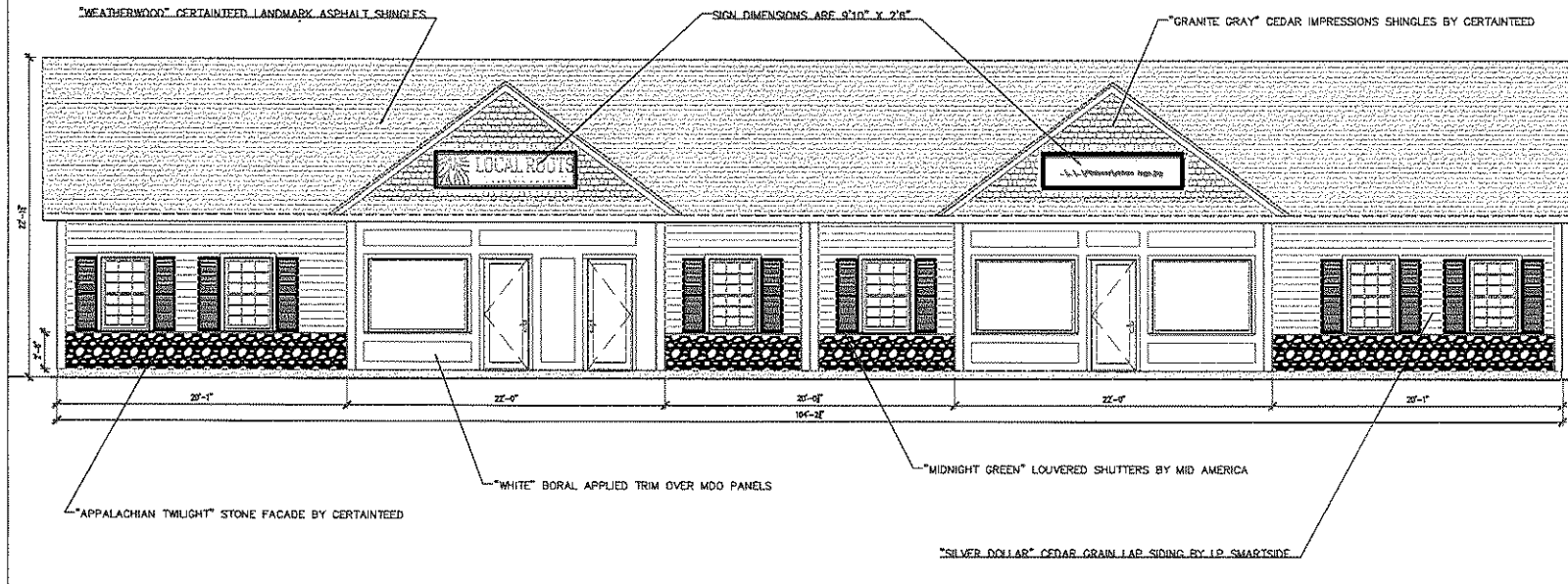
PROPOSED DISPENSARY PLAN  
 365 MAIN ST. STURBRIDGE, MA

CLIENT  
 CAREGIVER PATIENT CONNECTION  
 217 Chatham Street, Sturbridge, MA

DESIGN/ARCHITECT  
 KEYSTONE DEVELOPMENT  
 110 GOSDEN POST RD. EAST BRIMFIELD, MA 01522-7522

REVISIONS	DATE	BY
ELEVATION PLANS	2/20/20	JP

LOCAL ROOTS  
365 MAIN STREET, STURBRIDGE  
RIGHT ELEVATION



ENTRANCE/PARKING LOT SIDE

SCALE: 1/4" = 1'

SHEET  
**A1.1**  
OF 2

RIGHT SIDE ELEVATION

DATE: 2/20/20

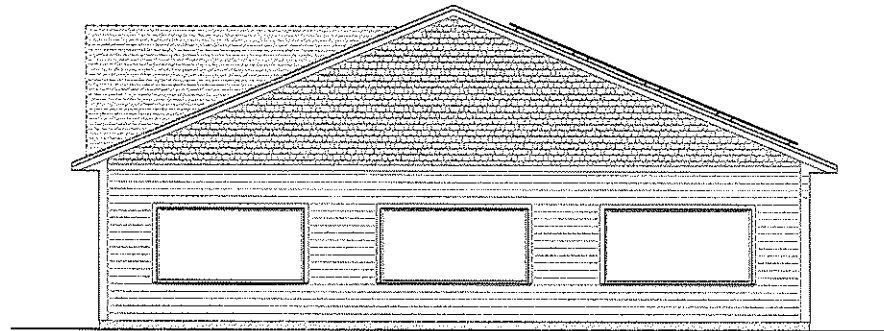
PROPOSED DISPENSARY PLAN  
365 MAIN ST. STURBRIDGE, MA

CLIENT  
CAREGIVER PATIENT CONNECTION  
507 Chapman Street, Uxbridge, MA 01568

DESIGNER/OWNER  
KEYSTONE DEVELOPMENT  
310 CANTON ROAD, SUITE 100, WARE, MA 01092-1717

REVISIONS	DATE	BY

LOCAL ROOTS  
365 MAIN STREET, STURBRIDGE  
REAR ELEVATION



PARKING LOT SIDE

SCALE: 1/4" = 1'

SHEET:

A1.2

of 2

REAR ELEVATION

DATE: 2/20/20

PROPOSED DISPENSARY PLAN  
365 MAIN ST. STURBRIDGE, MA

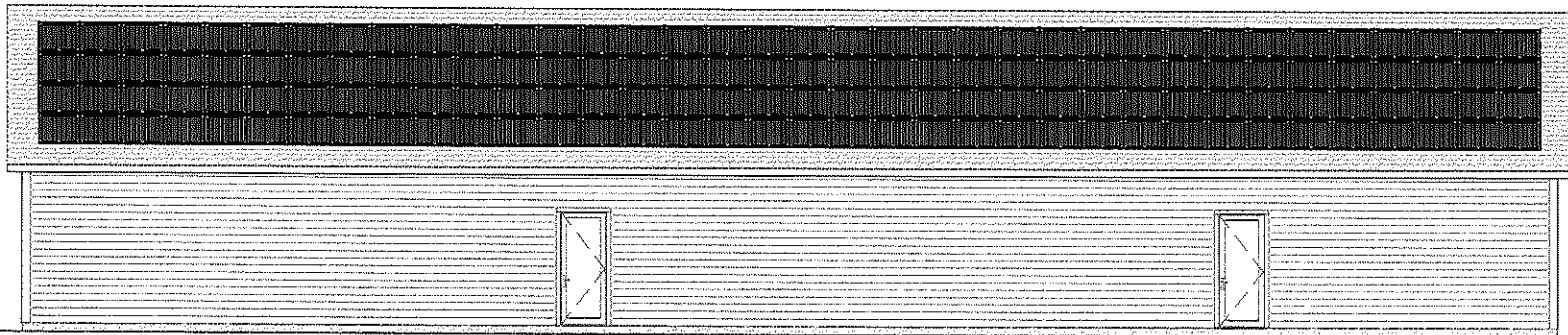
CLIENT  
CAREGIVER PATIENT CONNECTION  
237 Chester Field Court, Uxma

DESIGN FIRM  
KEYSTONE DEVELOPMENT  
216 BOSTON POST RD. 01070 WAREHOUSING MA 01556-2512

REVISION	DATE	BY
0.0000 PLAN	2/20/20	CP



LOCAL ROOTS  
 365 MAIN STREET, STURBRIDGE  
 LEFT ELEVATION



REAR PARKING LOT SIDE

SCALE: 1/4" = 1'

SHEET

A1.3

of 9

LEFT ELEVATION

DATE: 2/20/20

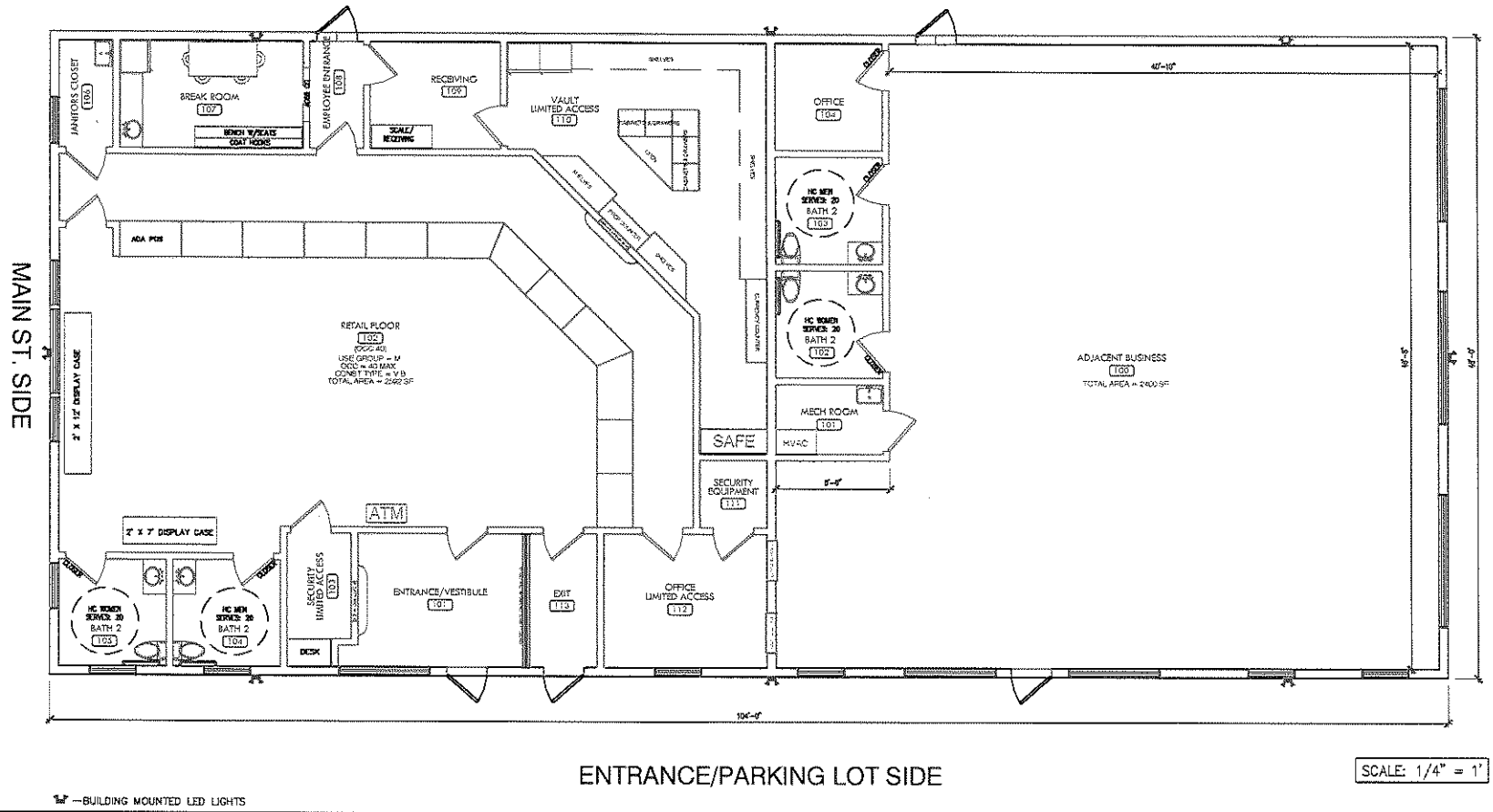
PROPOSED DISPENSARY PLAN  
 365 MAIN ST. STURBRIDGE, MA

CLIENT  
 CAREGIVER PATIENT CONNECTION  
 511 Chestnut Street, Suite 1100

DESIGNED BY  
 KEYSTONE DEVELOPMENT  
 110 GOSDEN STREET, 2ND FLOOR, STURBRIDGE, MA 01566-1102

REVISION	DATE	BY
GLYPH PLANE	2/20/20	JT

LOCAL ROOTS  
365 MAIN STREET, STURBRIDGE  
FLOOR PLAN



SHEET:  
**A1.4**  
OF 9

1ST FLOOR PLAN  
DATE: 9/17/19

PROPOSED DISPENSARY PLAN  
365 MAIN ST. STURBRIDGE, MA

CAREGIVER PATIENT CONNECTION  
241 Chapel Blvd, Sturbridge, MA

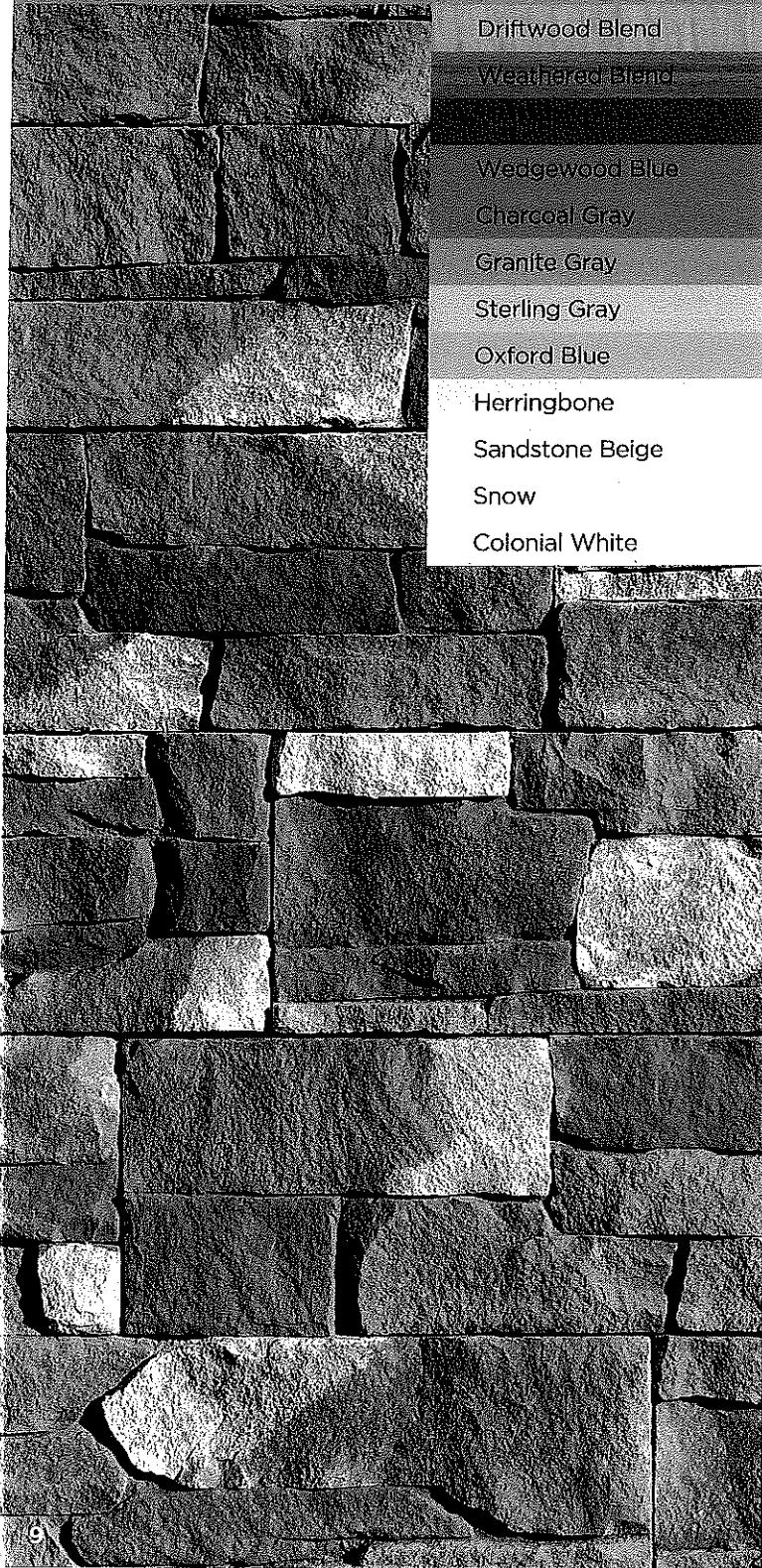
KEYSTONE DEVELOPMENT  
101 GOSDEN STREET, EAST CHARLESTON, MA 01525-1422

REVISIONS	DATE	BY
020000 PLAN	9/17/19	OP

# Complement your siding color.

## Adirondack Snowfall

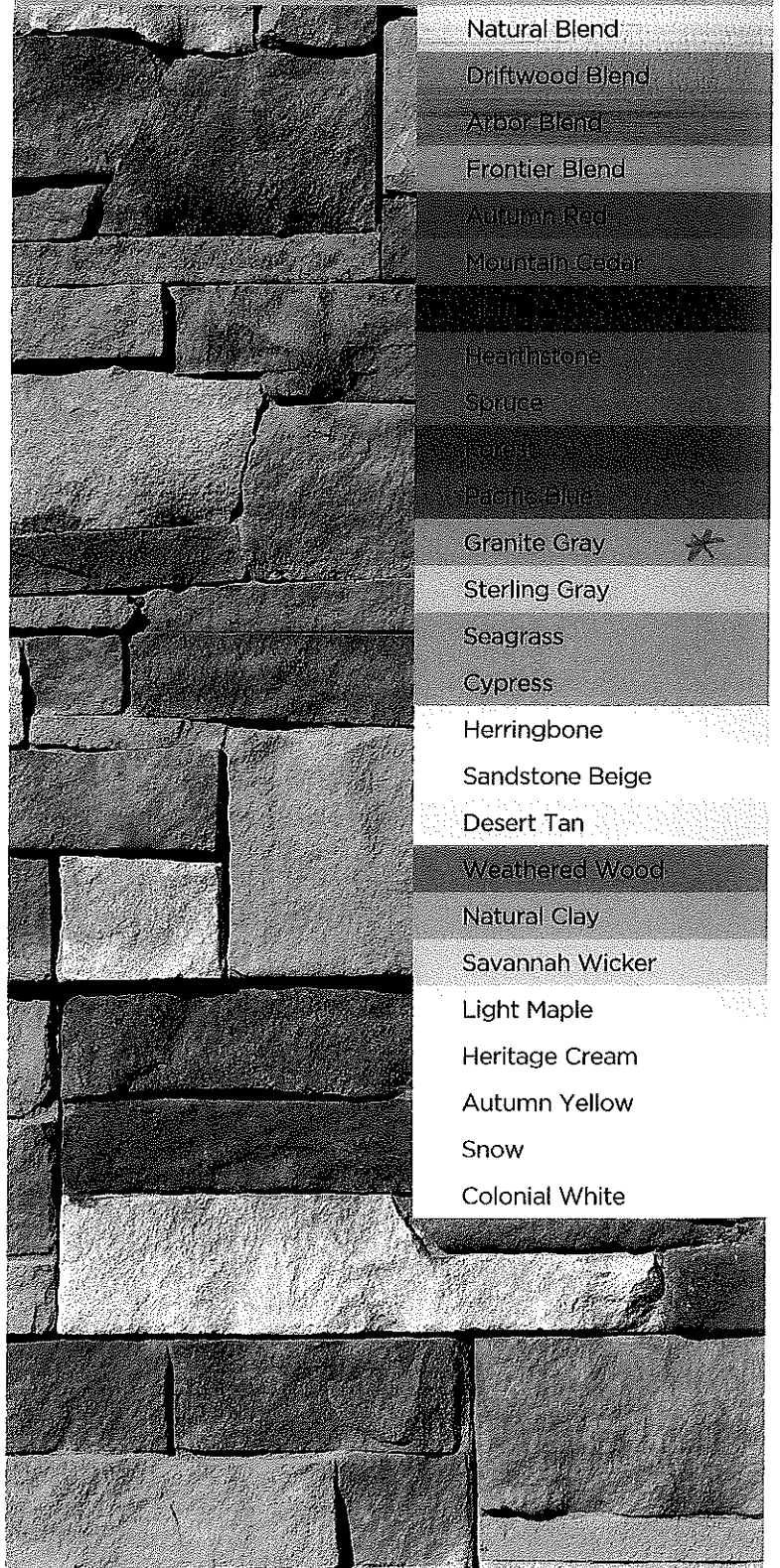
With hues of gray, adirondack snowfall matches best with siding in whites, blues and grays.



- Driftwood Blend
- Weathered Blend
- Wedgewood Blue
- Charcoal Gray
- Granite Gray
- Sterling Gray
- Oxford Blue
- Herringbone
- Sandstone Beige
- Snow
- Colonial White

## Appalachian Twilight

With calming grays and browns, appalachian twilight works well with an extensive palette of siding colors.



- Natural Blend
- Driftwood Blend
- Arbor Blend
- Frontier Blend
- Autumn Red
- Mountain Cedar
- Hearthstone
- Spruce
- Forest
- Pacific Blue
- Granite Gray
- Sterling Gray
- Seagrass
- Cypress
- Herringbone
- Sandstone Beige
- Desert Tan
- Weathered Wood
- Natural Clay
- Savannah Wicker
- Light Maple
- Heritage Cream
- Autumn Yellow
- Snow
- Colonial White

## BUILT ON LP® SMARTSIDE®

With 20 years of successful performance, it's easy to see why LP SmartSide brand is one of the fastest-growing brands of siding materials in the US. All LP SmartSide products are treated to the core through their proprietary SmartGuard process. With four components of protection, this process adds strength and helps LP products withstand impacts, freeze-thaw cycles, high humidity, fungal decay, termites and more.

- Primed cedar grain lap siding
- 16' lengths may mean fewer seams and less waste to haul off the site
- Cuts and works with standard woodworking tools
- Weighs less and resists breakage better in storage and handling
- Handles moisture better than fiber cement alternative
- SmartGuard four component protection (resins, overlay, waxes and zinc borate)
- A 50 year prorated limited warranty with a 5 year 100% labor and material replacement warranty on substrate



## PRECISION COATED WITH PPG MACHINE APPLIED COATINGS

Quality Wood Priming applies DuraColor IM 100% acrylic latex coatings to exacting standards in a factory controlled environment with the ideal level of temperature and humidity.

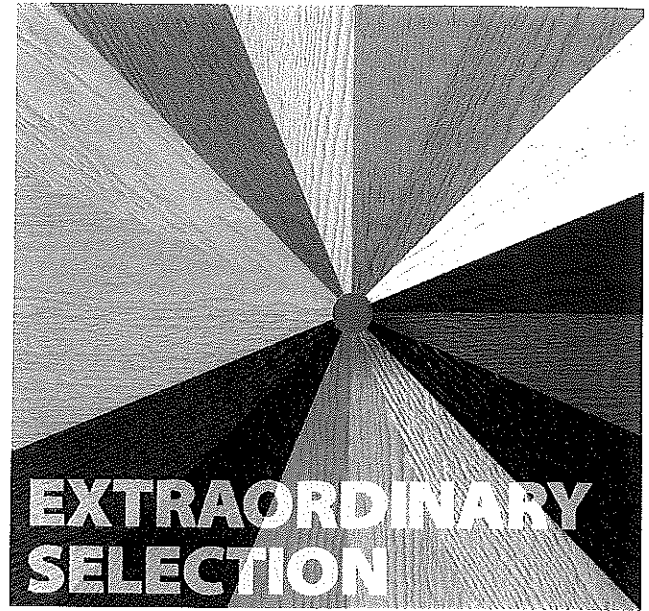
- 30 year limited finish warranty against excessive fade, peel and flaking and chalk washdown\*
- 15 year labor warranty includes first 7 years at 100% labor costs\*
- Desirable lower gloss level eggshell sheen
- Excellent paint adhesion, mar resistance and color retention
- Powerful UV protection
- Outstanding flexibility of coating that does not crack under extreme pressure



## EXPRESS DELIVERY FROM COASTAL. STOCKING PREFINISHED CEDAR LAP SIDING & WHITE TRIM.

Coastal Forest Products keeps a high level of inventory of stock colors on the ground and ready for prompt shipment. Don't see the right color? No problem, we have you covered with custom color matching capabilities from Quality Wood Priming in Bow, NH.

- 18 Solid Colors - 3/8" x 6" (4 7/8" exposure) In Stock for prompt delivery
- 3 Stained Colors - 3/8" x 6" (4 7/8" exposure) In Stock for prompt delivery
- 6 Solid Colors - 3/8" x 8" (6 7/8" exposure) In Stock for prompt delivery
- White trim products available for prompt delivery
- Custom colors and other sizes are available



© Photo courtesy of LP Corp.





365 Main St Current View

Legend



Google Earth

© 2019 Google  
© 2018 Google

9.32 ft



# Friendly's Exterior

Sturbridge, MA

Legend



Google Earth

© 2020 Google

10 ft

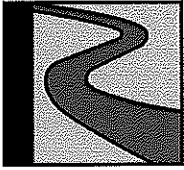












## **Local Roots – Landscape Narrative**

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The landscape approach to the development of the Local Roots site is to go beyond simply complying with the Zoning By-law.

As the site is currently mostly paved and undeveloped, there is little existing significant vegetation to preserve. The exception is on the west side of the site (adjacent to Friendly's), where there are two Eastern White Pines of significant size which will be retained to buffer the proposed development to the Friendly's parking lot. Additional plantings along this edge are not advised, as the roots of the Pine trees are surficial and probably extensive, and would interfere with the success of any new plantings.

The Route 20/Main Street edge, which currently has no landscape plantings, will consist of a 30 foot wide planted strip, including shade trees, shrubs, and a grass strip. A new monument identification sign will be supplemented with decorative plantings around its base.

The east side of the site will have a 10 foot wide planted strip of Green Giant Arborvitae and Japanese Zelkova trees, to provide both a year round evergreen screen and tall canopy trees.

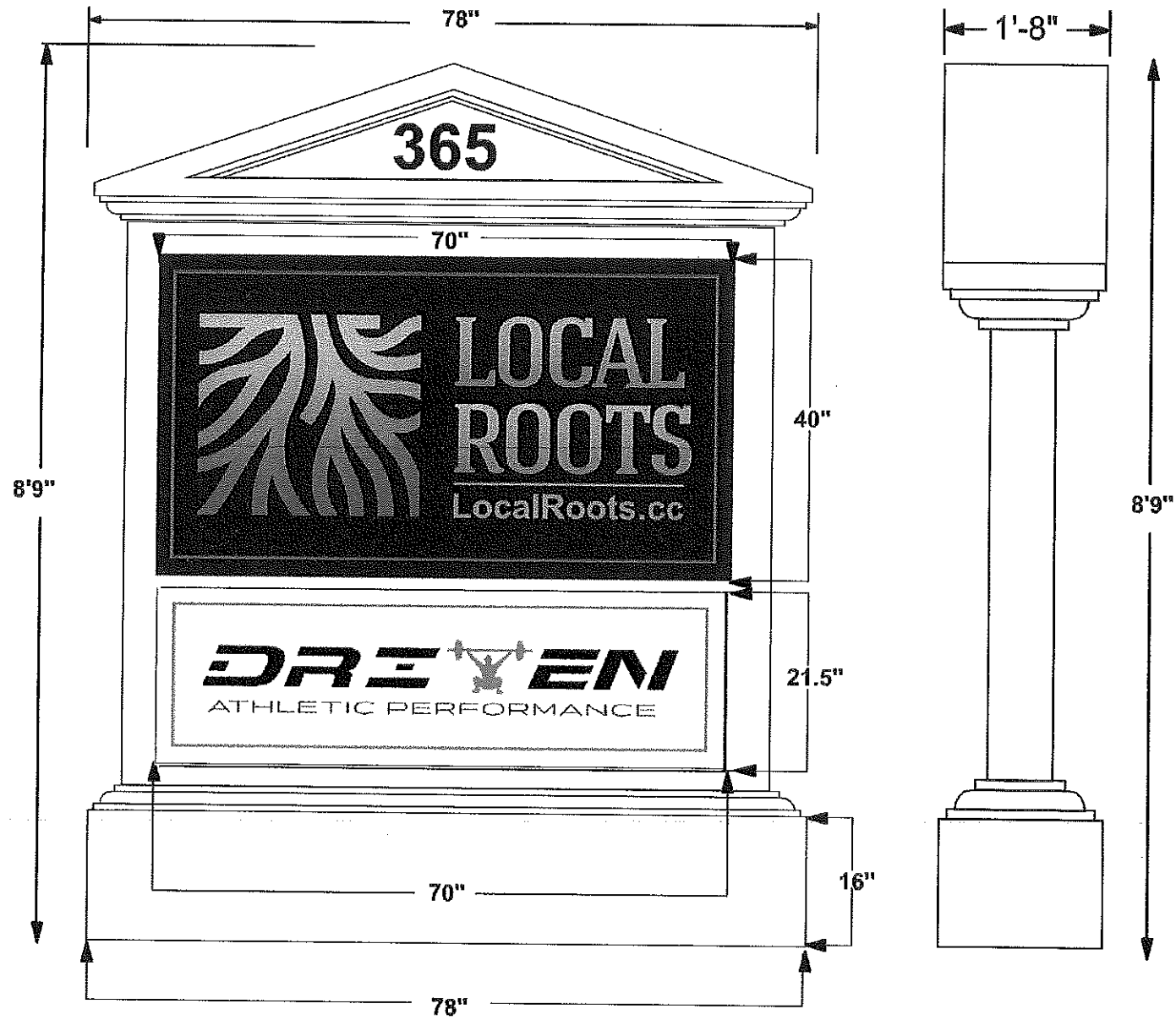
The south side of the site will be planted with a variety of evergreen trees which will supplement a 6' tall PVC solid vinyl fence to screen existing neighbors.

Intermediate parking islands at the perimeter of the parking lot will be planted with London Planetrees, a large shade tree, and low plantings. These in addition to two additional Oak trees along the west side of the parking lot will provide shade to parked cars and will reduce the urban heat island effect, especially due to the late afternoon summer sun.

Around the new building, 30" wide planting beds will contain a variety of flowering and evergreen shrubs and perennials for year-round interest, and color in the growing season. End islands at the south corners of the building will be planted with shrubs and ornamental grasses which will tolerate snow and salt in the winter.

Front and Back View

End View



**Description**

6'5"x8'9" HDU Foam Poly Armor Monument Style Sign  
 2 Tenants Signs 21.5"x70" & 40"x70" Acrylic Panels with Vinyl Graphics

**GEMINI** 128 S. Bolton St. Marlboro, MA 01752  
*Signs and LETTERS* Since 1980  
 508-485-3343 phone  
 508-485-9972 fax  
 geministyleletters.com

Location  
**365 Main Street**

Date  
**2-24-20**  
 Drawn By  
**Matt Evangelous**

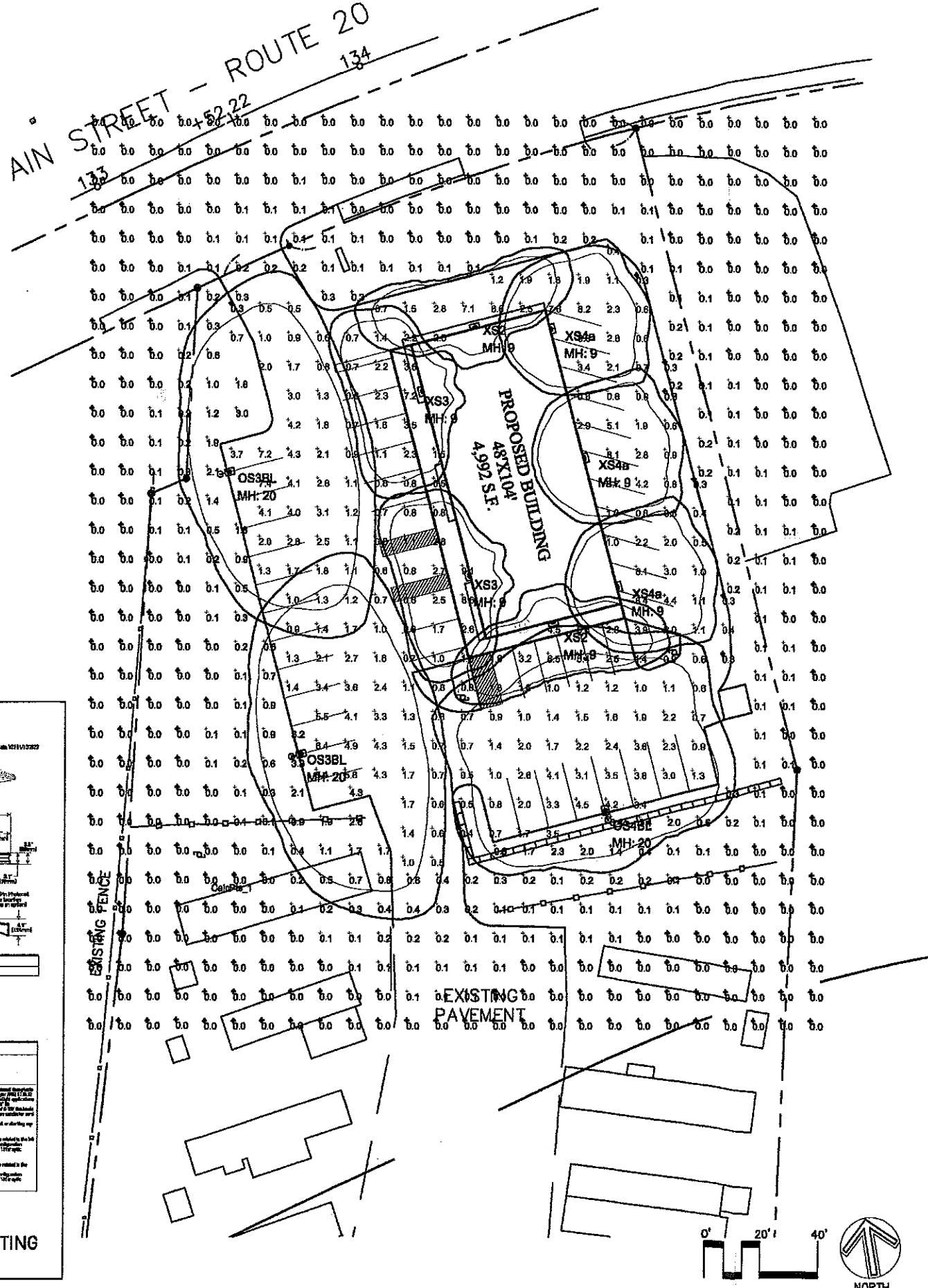
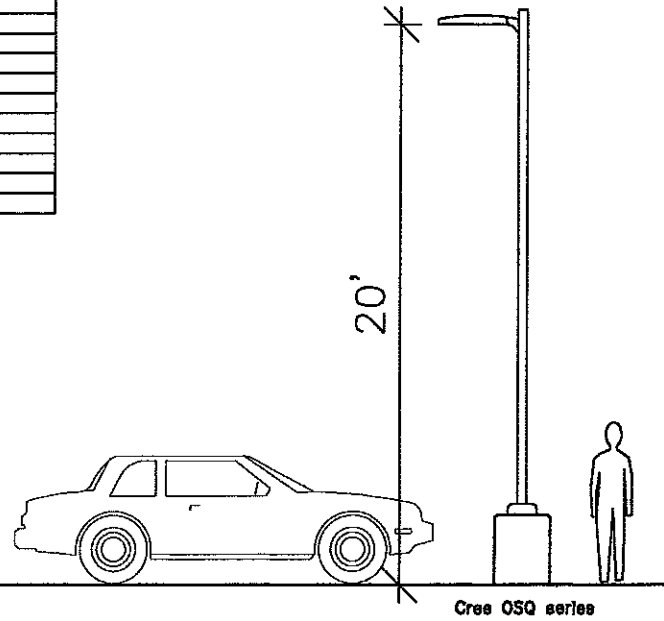
*This design/drawing is given in confidence and may not be used or disseminated in any way before or until all design fees are paid without the written consent from Gemini Sign Company. All common law and copyright laws are hereby specific all reserved.*



Symbol	Qty	Label	Description	Arm	Lum. Lumens	LLF	Footcandle
OS3BL	2	OS3BL	OSQ-A-xx-3ME-K-4K-UL-BLSMF CONF	1.5	13350	0.800	OSQ-A-xx-3ME-K-4K-UL-BLSMF_CONF
OS4BL	1	OS4BL	OSQ-A-xx-4ME-K-4K-UL-BLSMF CONF	1.5	13000	0.800	OSQ-A-xx-4ME-K-4K-UL-BLSMF_CONF
XS2	2	XS2	XSPW-B-xx-2ME-4L-4K-UL CONF	0	4270	0.800	XSPW-B-xx-2ME-4L-4K-UL_CONF
XS3	2	XS3	XSPW-B-xx-3ME-4L-4K-UL	0	4292	0.800	XSPW-B-xx-3ME-4L-4K-UL
XS4	3	XS4	XSPW-B-xx-4ME-4L-4K-UL CONF	0	5100	0.800	XSPW-B-xx-4ME-4L-4K-UL_CONF

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
CalcPt_1	Fluorescence	Fc	2.22	6.1	0.3	7.40	30.33
CalcPt_2	Fluorescence	Fc	0.76	4.3	0.0	N/A	N/A

LumNo	Label	X	Y	Z	Orient	YPR
1	XS2	118.825	307.870	0	104.621	0
2	XS4a	143.125	308	0	14.454	0
3	XS3	06.876	283.5	0	104.658	0
4	XS4a	158.75	291.75	0	14.454	0
5	OS3BL	32.125	287	20	11.729	0
6	XS3	113.875	220.5	0	104.658	0
7	XS4a	158.375	217.625	0	14.454	0
8	XS2	143.125	202.825	0	283.972	0
9	OS3BL	06.825	180.5	20	11.729	0
10	OS4BL	182.25	138.125	20	104.644	0



### XSP Series

XSPW LED PWM Mount Luminaire featuring Cree TrueWhite® Technology

**Product Description:**  
The XSPW LED luminaire is a 20' high, low profile luminaire designed for outdoor use. It features a die-cast aluminum housing and a polycarbonate lens. The luminaire is designed for use in a variety of applications, including street lighting, parking lots, and industrial sites. It is available in two models: XSPW-B-xx-2ME-4L-4K-UL CONF and XSPW-B-xx-3ME-4L-4K-UL.

**Performance Summary:**  
Luminaire Type: Street Lighting  
Housing Material: Die Cast Aluminum  
Lens Material: Polycarbonate  
Color Temperature: 4000K, 5000K, 6000K  
Warranty: 5 years or 50,000 hours (whichever comes first)

**Accessories:**  
- Pole Mount  
- Pole Bracket  
- Pole Nut  
- Pole Washer  
- Pole Seal  
- Pole Gasket  
- Pole Lock  
- Pole Key  
- Pole Pin  
- Pole Cap  
- Pole Base  
- Pole Flange  
- Pole Nut  
- Pole Washer  
- Pole Seal  
- Pole Gasket  
- Pole Lock  
- Pole Key  
- Pole Pin  
- Pole Cap  
- Pole Base  
- Pole Flange

**Ordering Information:**  
Part No. | Description | Qty. | Unit Price | Total Price

### OSQ Series

OSQW LED Area Flood Luminaire - Medium

**Product Description:**  
The OSQW LED luminaire is a medium profile luminaire designed for outdoor use. It features a die-cast aluminum housing and a polycarbonate lens. The luminaire is designed for use in a variety of applications, including street lighting, parking lots, and industrial sites. It is available in two models: OSQ-A-xx-3ME-K-4K-UL-BLSMF CONF and OSQ-A-xx-4ME-K-4K-UL-BLSMF CONF.

**Performance Summary:**  
Luminaire Type: Area Flood  
Housing Material: Die Cast Aluminum  
Lens Material: Polycarbonate  
Color Temperature: 4000K, 5000K, 6000K  
Warranty: 5 years or 50,000 hours (whichever comes first)

**Accessories:**  
- Pole Mount  
- Pole Bracket  
- Pole Nut  
- Pole Washer  
- Pole Seal  
- Pole Gasket  
- Pole Lock  
- Pole Key  
- Pole Pin  
- Pole Cap  
- Pole Base  
- Pole Flange

**Ordering Information:**  
Part No. | Description | Qty. | Unit Price | Total Price

**Local Roots**  
365 Main Street  
Sturbridge, MA

Applicant:  
**Caregiver Patient Connection LLC**  
DBA Local Roots NE  
910 Boston Post Road  
Marlborough, MA 01752

Landscape Architect  
**Radner Design Associates, Inc.**  
945 Concord Street, Suite 100  
Framingham, MA 01701  
508.736.6144  
www.RadnerDesign.com

Revision:

Drawn: mr

Scale: 1"=20'-0"



Sheet Name:  
**Photometric Lighting Plan**

Project No.:  
**20-08**

Issue Date:  
**02.26.2020**

Sheet No.:  
**L2**

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**Local Roots**

365 Main Street  
Sturbridge, MA

Applicant:

**Caregiver Patient  
Connection LLC**

DBA Local Roots NE  
910 Boston Post Road  
Marlborough, MA 01752

Landscape Architect



**Radner Design  
Associates, Inc.**

945 Concord Street, Suite 100  
Framingham, MA 01701  
508.736.6144  
www.RadnerDesign.com

Revision:

Drawn: mr

Scale: 1" = 20'-0"



Sheet Name:  
**Planting Plan**

Project No.:  
**20-08**

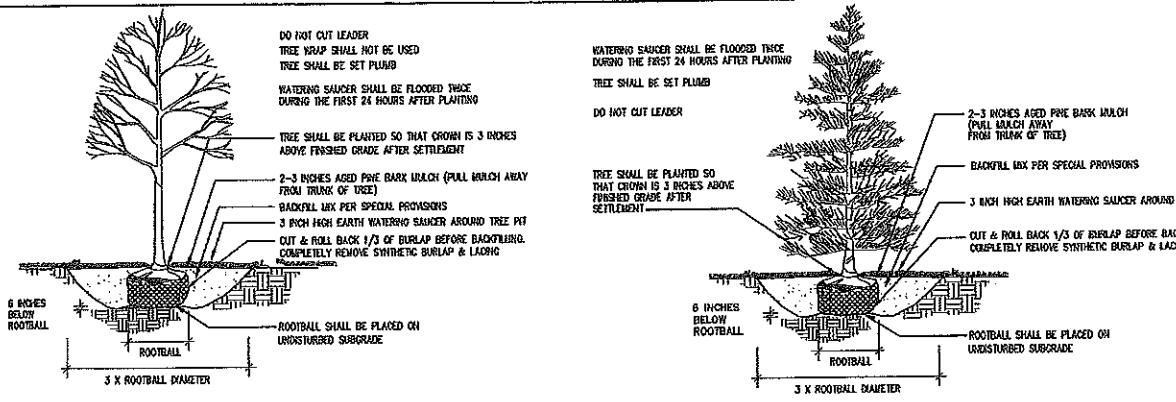
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**02.26.2020**

Sheet No.:

**L1**

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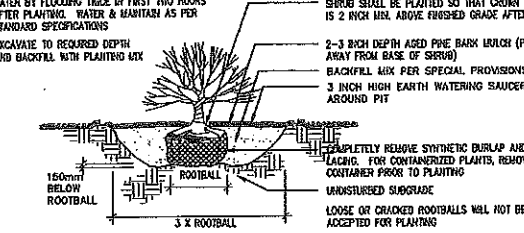
**MAIN STREET - ROUTE 20**  
133 +52.22 134



**DECIDUOUS TREE PLANTING**

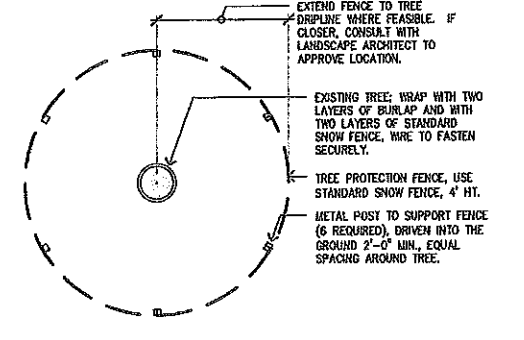
NOT TO SCALE

RAISE AND REPLANT ANY SHRUBS WHICH SETTLE MORE THAN 2 INCHES AFTER PLANTING & WATERING IN SHRUBS SHALL BE SET PLUMB



**SHRUB PLANTING**

NOT TO SCALE



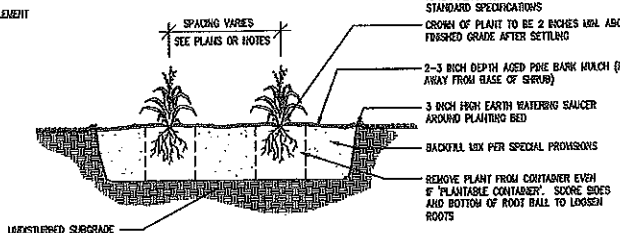
**TREE PROTECTION DETAIL**

NOT TO SCALE

**EVERGREEN TREE PLANTING**

NOT TO SCALE

EXCAVATE TO REQUIRED DEPTH AND BACKFILL WITH PLANTING MIX



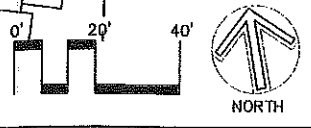
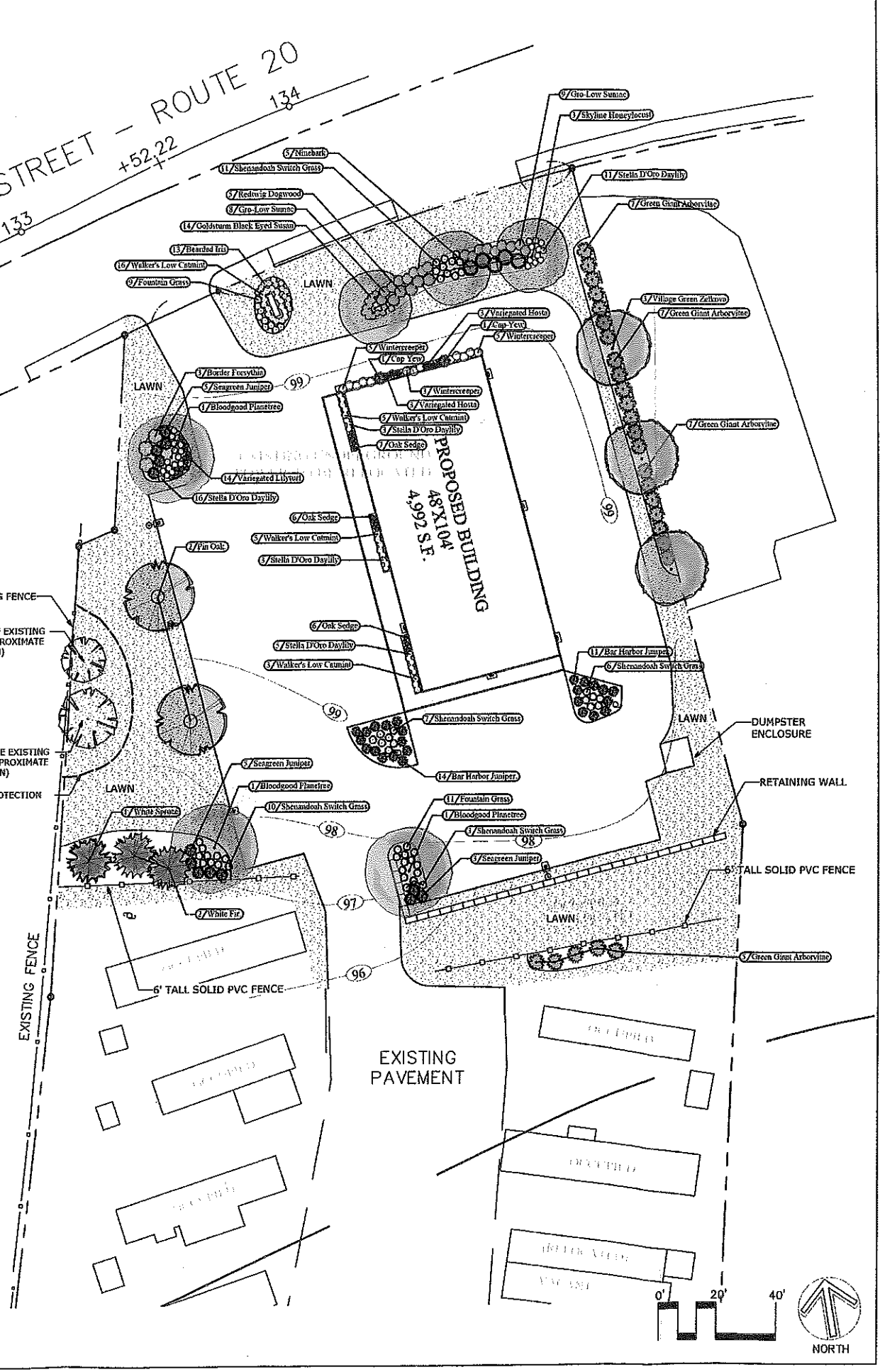
**PERENNIAL PLANTING**

NOT TO SCALE

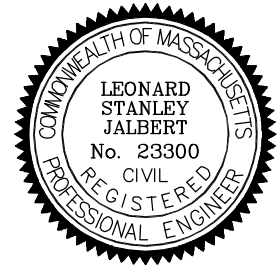
- NOTES**
1. FURNISH AND INSTALL PLANTS AS SHOWN. CONTRACTOR SHALL BE RESPONSIBLE FOR QUANTITY OF SHRUBS GRAPHICALLY SHOWN ON PLANS. IF THERE IS A DISCREPANCY BETWEEN PLANT LIST QUANTITIES AND GRAPHICS, THE GRAPHIC SHALL TAKE PRECEDENCE.
  2. PRIOR TO THE START OF EXCAVATION FOR THE PROJECT BOTH ON AND OF THE SITE, THE CONTRACTOR SHALL NOTIFY DIGSAFE AND BE PROVIDED A DIGSAFE NUMBER INDICATING THAT EXISTING UTILITIES HAVE BEEN LOCATED AND MARKED.
  3. CONTRACTOR SHALL BEGIN 90 DAY MAINTENANCE PERIOD IMMEDIATELY UPON PLANTING AND WILL CONTINUE UNTIL FINAL ACCEPTANCE.
  4. CONTRACTOR SHALL VERIFY TREE REMOVALS WITH LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION START.
  5. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AWAY FROM BUILDING FOUNDATIONS, STRUCTURES, AND PLANTING BEDS.
  6. MAXIMUM SLOPE WITHIN DISTURBED AREAS SHALL NOT EXCEED 3:1, UNLESS OTHERWISE NOTED.
  7. PLANTS SHALL BEAR THE SAME RELATIONSHIP TO FINISH GRADE AS TO ORIGINAL GRADES BEFORE DIGGING.
  8. PLANT MATERIALS SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY "THE AMERICAN STANDARD FOR NURSERY STOCK", PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
  9. PLANTS TO BE BALLED IN BURLAP OR CONTAINERIZED.
  10. MULCH FOR PLANTED AREAS TO BE AGED PINE BARK; PARTIALLY DECOMPOSED, DARK BROWN IN COLOR AND FREE OF WOOD CHIPS THICKER THAN 1/4 INCH.
  11. PLANTING SOIL MIX: LOAM THOROUGHLY INCORPORATED WITH ROTTED MANURE PROPORTIONED 5 C.Y. TO 1 C.Y. OR EQUIVALENT. USE OF PEAT MOSS IS PROHIBITED.
  12. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE PLANT MATERIALS FOR ONE (1) FULL YEAR FROM DATE OF ACCEPTANCE. REQUEST THE LANDSCAPE ARCHITECT PROVIDE A WRITTEN LETTER OF ACCEPTANCE UPON COMPLETION OF EACH PHASE.
  13. PLANT MATERIALS ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT, AT THE NURSERY, AND AT THE SITE.
  14. LANDSCAPE ARCHITECT TO FLAG TREES TO BE TRANSPORTED PRIOR TO CONSTRUCTION START.
  15. AREAS OF THE SITE WHICH HAVE BEEN DISTURBED AND NOT OTHERWISE DEVELOPED SHALL BE LOAMED WITH TOPSOIL TO A MINIMUM DEPTH OF 6", AND SEEDED WITH A MIX CONSISTING OF 40% PERENNIAL RYE GRASS; 30% CHEWINGS FESCUE; 30% KENTUCKY BLUEGRASS.
  16. SCREENED IMAGES SHOW EXISTING CONDITIONS. WHERE EXISTING CONDITIONS LIE UNDER OR ARE IMPINGED UPON BY PROPOSED BUILDINGS AND/OR SITE ELEMENTS, THE EXISTING CONDITION WILL BE REMOVED, ABANDONED AND/OR CAPPED OR DEMOLISHED AS REQUIRED.
  17. THERE SHALL BE NO SUBSTITUTION OF PLANT SPECIES WITHOUT AUTHORIZATION BY THE LANDSCAPE ARCHITECT.
  18. NO PLANTING SHALL BE INSTALLED BEFORE ACCEPTANCE OF ROUGH GRADING.
  19. PLANTS TO BE THOROUGHLY WATERED AFTER INSTALLATION, AT LEAST TWICE WITHIN THE FIRST 24 HOURS.

**PLANT SCHEDULE - Local Roots, Sturbridge**

#	Botanical Name	Common Name	Size/Form	Remarks
<b>Shade Trees</b>				
3	Gleditsia triacanthos 'Inermis'	Skyline Honeylocust	2.5-3' Cal	B&B, Full, Symmetrical, High Branched
3	Platanus acerifolia	Bloodgood Plane tree	2.5-3' Cal	B&B, Full, Symmetrical, High Branched
2	Quercus palustris	Pin Oak	2.5-3' Cal	B&B, Full, Symmetrical, High Branched
3	Zelkova serrata	Village Green Zelkova	2-2.5' Cal	B&B, Full, Symmetrical, High Branched
<b>Evergreen Trees</b>				
2	Abies concolor	White Fir	6-7' Ht	B&B, Full, Symmetrical, Strong Central Leader
1	Picea glauca	White Spruce	6-7' Ht	B&B, Full, Symmetrical, Strong Central Leader
26	Thuja 'Green Giant'	Green Giant Arborvitae	6-7' Ht	B&B, Full, Symmetrical, Strong Central Leader
<b>Shrubs</b>				
6	Cornus alba 'Sibirica'	Redtwig Dogwood	24-30" Ht	Container
13	Euonymus fortunei 'Emerald Gaiety'	Emerald Gaiety Wintercreeper	12-18" Ht	Container
3	Forsythia intermedia	Border Forsythia	3-4' Ht	Container
13	Juniperus chinensis 'Sea Green'	Sea Green Juniper	18-24" Ht	Container
25	Juniperus horizontalis 'Bar Harbor'	Bar Harbor Juniper	12-18" Spr	Container
6	Physocarpus opulifolius 'Diabolo'	Diabolo	24-30" Ht	Container
17	Rhus aromatica 'Gro-Low'	Gro-Low Sumac	12-18" Ht	Container
2	Taxus cuspidata 'Capitata'	Cap Yew	3-4' Ht	Container
<b>Perennials, Groundcovers, and Grasses</b>				
19	Carex pennsylvanica	Oak Sedge	1 Gal	Container
39	Hemerocallis x 'Stella de Oro'	Stella D'Oro Daylily	1 Gal	Container
6	Hosta 'Frances'	Variegated Hosta	1 Gal	Container
13	Hosta 'Frances'	Bearded Iris	1 Gal	Container
13	Iris germanica	Variegated Lily	1 Gal	Container
14	Lilium muscoides 'Variegata'	Walker's Low Callmhl	1 Gal	Container
29	Hepatica x 'Passant'	Walker's Low Callmhl	1 Gal	Container
37	Panicum virgatum 'Shenandoah'	Shenandoah Switch Grass	1 Gal	Container
20	Pennisetum alopecuroides	Fountain Grass	1 Gal	Container
14	Rudbeckia hirta 'Goldsturm'	Goldsturm Black Eyed Susan	1 Gal	Container







**JALBERT ENGINEERING, INC.**  
 CIVIL ENGINEERS & SURVEYORS  
 54 Main Street  
 Sturbridge, Massachusetts 01566-1244  
 Telephone: (508) 347-5136 • Toll Free: 1-800-339-5136  
 Fax: (508) 347-7962

I HEREBY CERTIFY THAT PRE-EXISTING PUBLIC OR PRIVATE, SCHOOL (PRE-SCHOOL THROUGH GRADE 12), PLAYGROUND PUBLIC PARK, YOUTH CENTER, LIBRARY, OR SIMILAR FACILITY IN WHICH CHILDREN COMMONLY CONGREGATE ARE NOT WITHIN 500-FOOT OF REPECTIVE PROPERTY LINES.

*Leonard S. Jalbert*  
 LEONARD S. JALBERT, P.E.

*LINEAR DISTANCE COMPLIANCE PLAN*  
 CAREGIVER PATIENT CONNECTION LLC  
 D.B.A. LOCAL ROOTS NE  
 365 MAIN STREET  
 STURBRIDGE, MA 01566

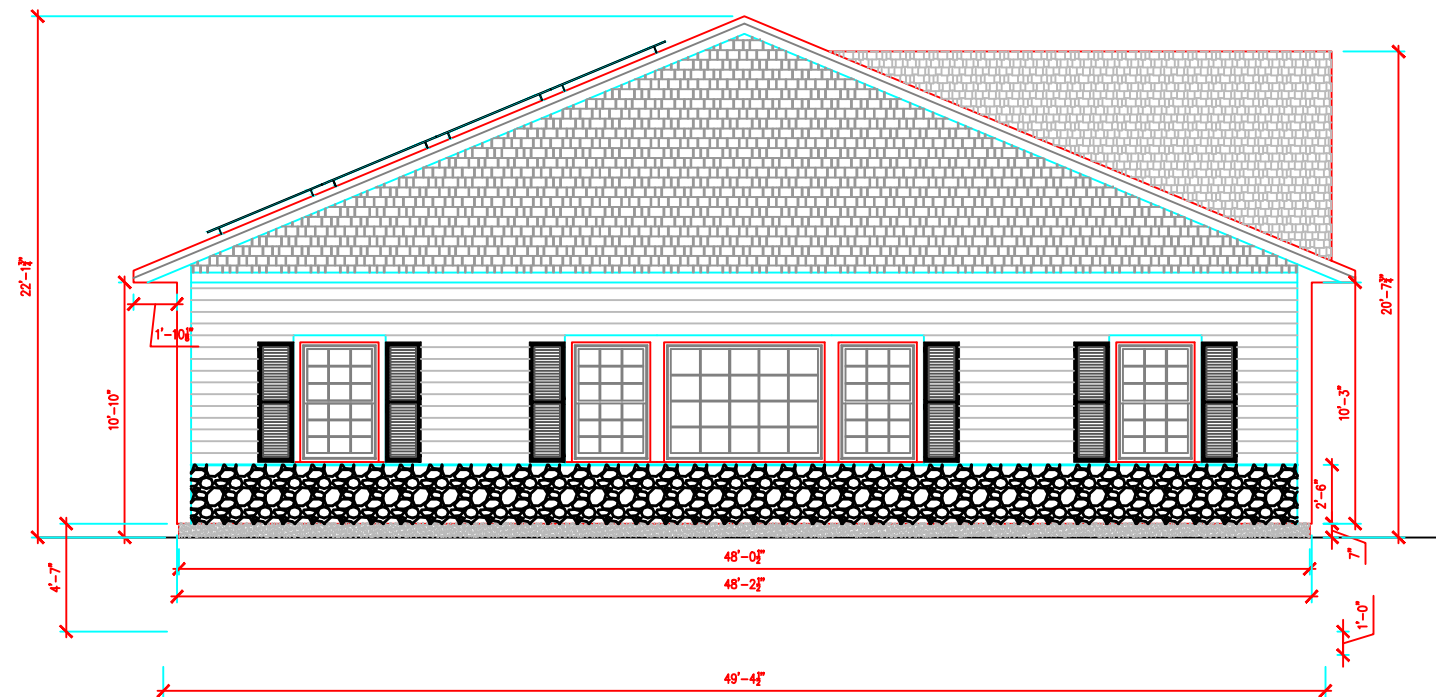
1 inch = 300 ft.

PLAN DATE:  
2/24/20

DWG NUMBER  
**19059**



LOCAL ROOTS  
365 MAIN STREET, STURBRIDGE  
FRONT ELEVATION



MAIN STREET SIDE

SCALE: 1/4" = 1'

SHEET:

A1.0

OF: 9

FRONT ELEVATION

DATE: 2/20/20

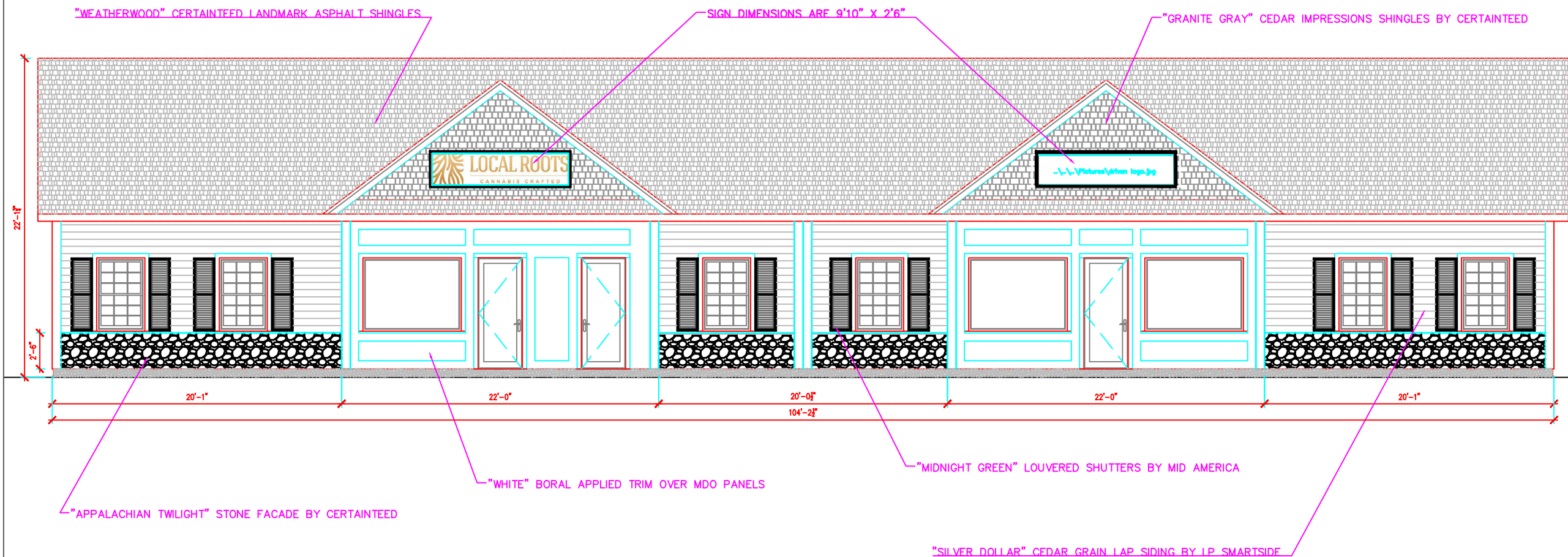
PROPOSED DISPENSARY PLAN  
365 MAIN ST. STURBRIDGE, MA

CLIENT:  
CAREGIVER PATIENT CONNECTION  
287 Chapman Road, Barre, Mass.

DESIGN / BUILD BY:  
KEYSTONE DEVELOPMENT  
910 BOSTON POST RD. EAST MARLBORO MA. 508-229-7827

REVISIONS	DATE	BY
ELECTRIC PLANS	9/17/19	DV

LOCAL ROOTS  
365 MAIN STREET, STURBRIDGE  
RIGHT ELEVATION



ENTRANCE/PARKING LOT SIDE

SCALE: 1/4" = 1'

SHEET:

A1.1

OF: 9

RIGHT SIDE ELEVATION

DATE: 2/20/20

PROPOSED DISPENSARY PLAN  
365 MAIN ST. STURBRIDGE, MA

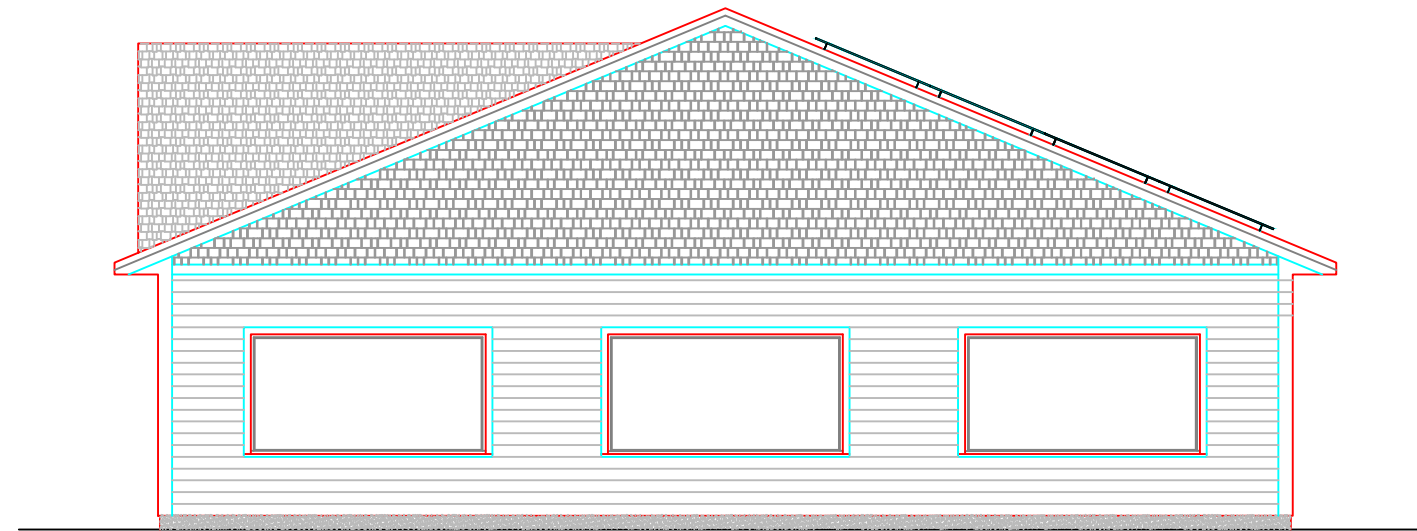
CLIENT:  
CAREGIVER PATIENT CONNECTION  
287 Chapman Road, Barre, Mass.

DESIGN / BUILD BY:  
KEYSTONE DEVELOPMENT  
910 BOSTON POST RD. EAST MARLBORO MA. 508-229-7827

REVISIONS	DATE	BY
ELECTRIC PLANS	9/17/19	DV



LOCAL ROOTS  
 365 MAIN STREET, STURBRIDGE  
 REAR ELEVATION



PARKING LOT SIDE

SCALE: 1/4" = 1'

SHEET:

**A1.2**

OF: 9

REAR ELEVATION

DATE: 2/20/20

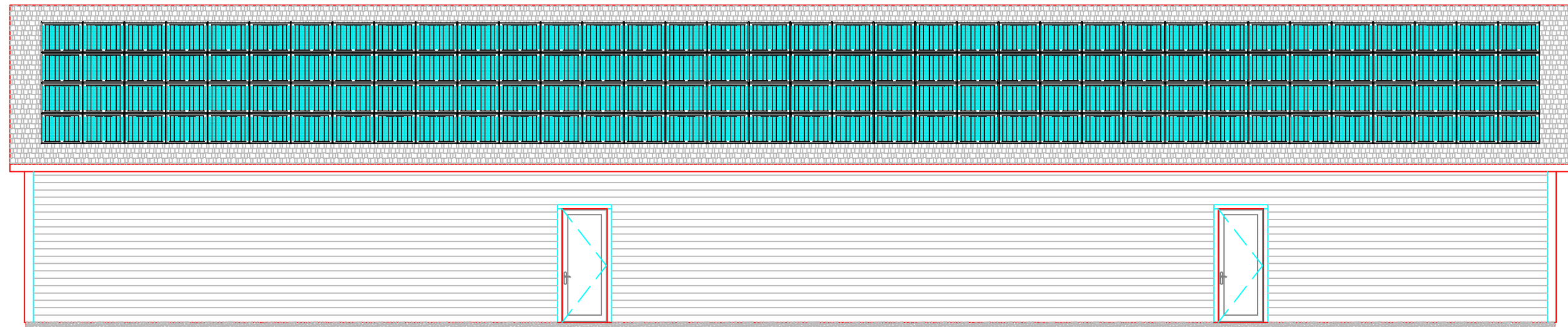
PROPOSED DISPENSARY PLAN  
 365 MAIN ST. STURBRIDGE, MA

CLIENT:  
 CAREGIVER PATIENT CONNECTION  
 287 Chapman Road, Barre, Mass.

DESIGN / BUILD BY:  
 KEYSTONE DEVELOPMENT  
 910 BOSTON POST RD. EAST MARLBORO MA. 508-229-7827

REVISIONS	DATE	BY
ELECTRIC PLANS	9/17/19	DV

LOCAL ROOTS  
 365 MAIN STREET, STURBRIDGE  
 LEFT ELEVATION



REAR PARKING LOT SIDE

SCALE: 1/4" = 1'

SHEET:

**A1.3**

OF: 9

LEFT ELEVATION

DATE: 2/20/20

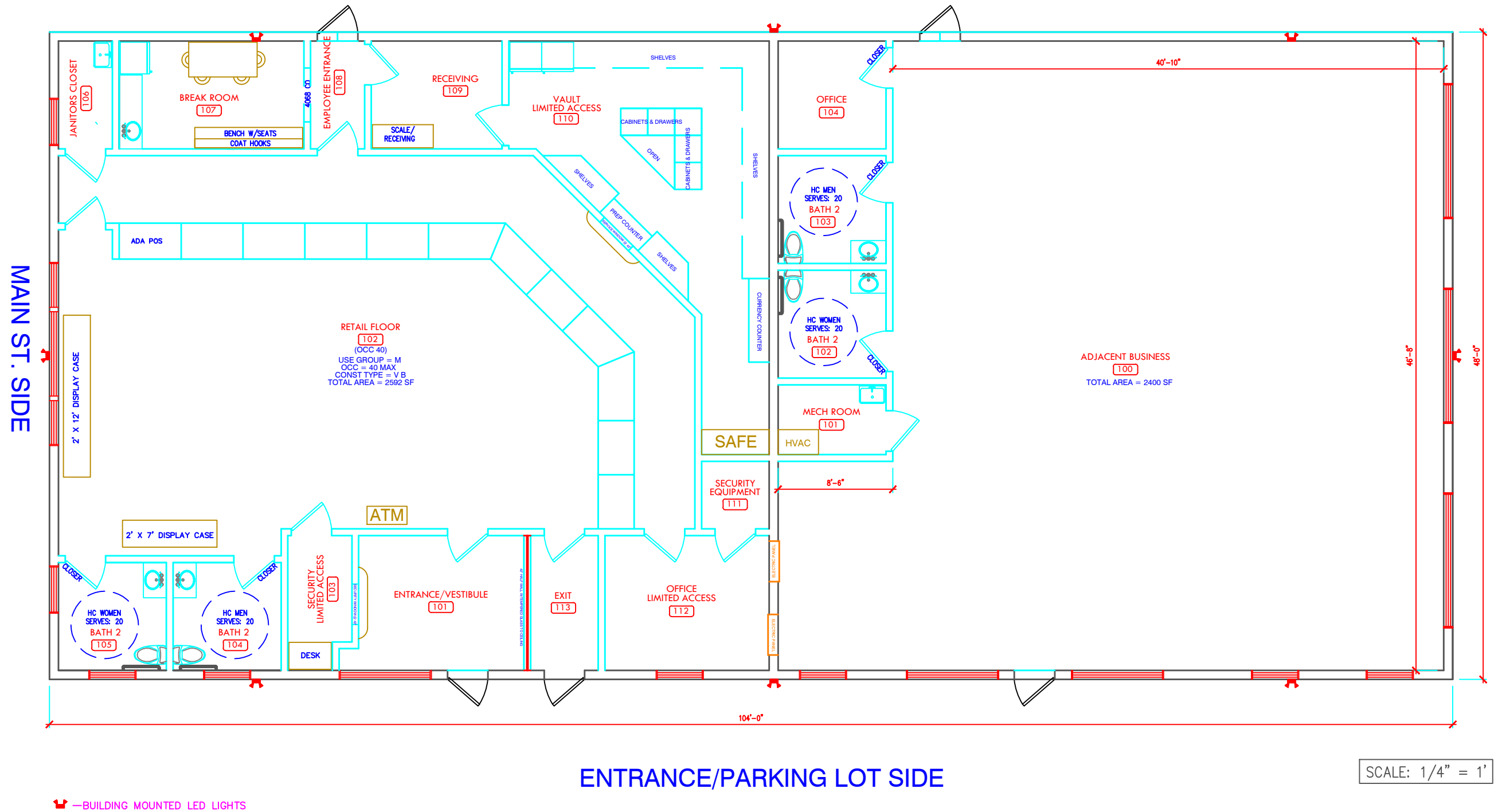
PROPOSED DISPENSARY PLAN  
 365 MAIN ST. STURBRIDGE, MA

CLIENT:  
 CAREGIVER PATIENT CONNECTION  
 287 Chapman Road, Barre, Mass.

DESIGN / BUILD BY:  
 KEYSTONE DEVELOPMENT  
 910 BOSTON POST RD. EAST MARLBORO MA. 508-229-7827

REVISIONS	DATE	BY
ELECTRIC PLANS	9/17/19	DV

# LOCAL ROOTS 365 MAIN STREET, STURBRIDGE FLOOR PLAN



SHEET:  
**A1.4**  
OF: 9

1ST FLOOR PLAN  
DATE: 9/17/19

**PROPOSED DISPENSARY PLAN  
365 MAIN ST. STURBRIDGE, MA**

CLIENT:  
**CAREGIVER PATIENT CONNECTION**  
287 Chapman Road, Barre, Mass.

DESIGN / BUILD BY:  
**KEYSTONE DEVELOPMENT**  
910 BOSTON POST RD. EAST MARLBORO MA. 508-229-7827

REVISIONS	DATE	BY
ELECTRIC PLANS	9/17/19	DV

DEVELOPMENT PLANS FOR

# CAREGIVER PATIENT CONNECTIONS LLC DBA LOCAL ROOTS NE

## 365 MAIN STREET STURBRIDGE, MASSACHUSETTS

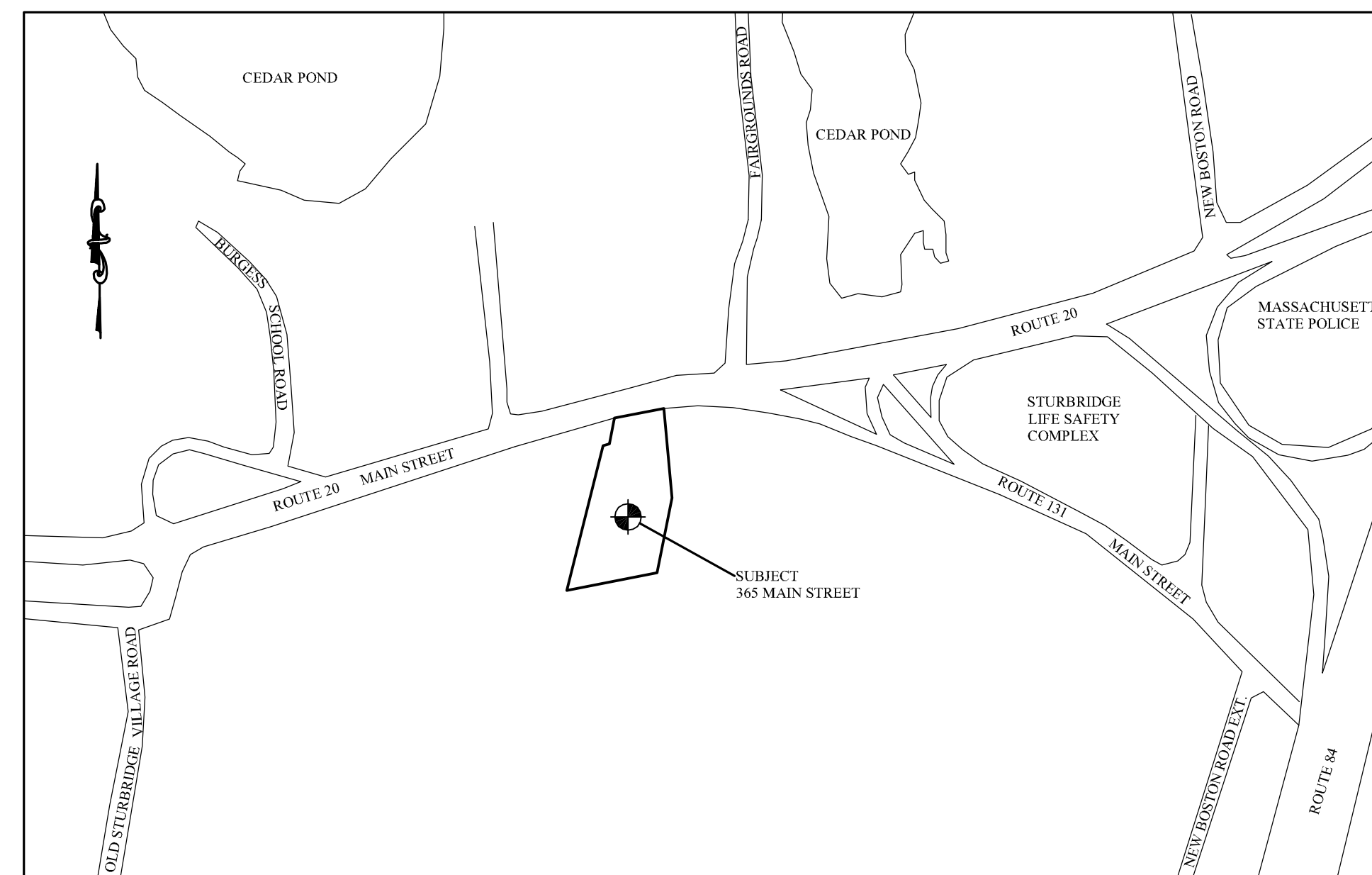
JUNE 24, 2019

RECORD OWNER(S):

*M & R ENTERPRISES LLC*  
4115 BAYHEAD DRIVE – UNIT #103  
BONITA SPRINGS, FL 34134

APPLICANT:

*CAREGIVER PATIENT CONNECTION LLC  
DBA LOCAL ROOTS NE*  
910 BOSTON ROAD  
MARLBOROUGH, MASSACHUSETTS 01752  
508-229-7827



LOT LOCUS

SCALE: 1" = 400'

INDEX:

1. COVER SHEET
2. EXISTING SITE PLAN
3. PROPOSED SITE LAYOUT PLAN
4. PROPOSED DEVELOPMENT PLAN
5. PROPOSED GRADING & DRAINAGE PLAN
6. DETAIL SHEET 1
- L1. PLANTING PLAN
- L2. PHOTOMETRIC LIGHTING PLAN

STURBRIDGE ZONING	
ZONE: COMMERCIAL	ZONE: SUBURBAN RESIDENTIAL
AREA: 1 ACRE	AREA: 3/4* ACRE
FRONTAGE: 150'	FRONTAGE: 125'
FRONT YARD: 25'	FRONT YARD: 30'
SIDE YARD: 10'	SIDE YARD: 15'
REAR YARD: 10'	REAR YARD: 15'
COVERAGE: 30%	COVERAGE: 15%

\*1/2 ACRE LOT IS SERVICED BY TOWN WATER AND SEWER

COVERAGE CALCULTIONS

REMAINING BUILDINGS AND SHEDS=8,218 S.F.  
PROPOSED BUILDING =4,992 S.F.  
TOTAL COVERAGE =13,210 S.F

TOTAL PERCENT COVERAGE  
13,210 S.F./94,089 S.F. X 100 = 14.04%

SUBURBAN RESIDENTIAL COVERAGE  
5,905 S.F./26,571 S.F. X 100 = 22.2% (EXISTING)

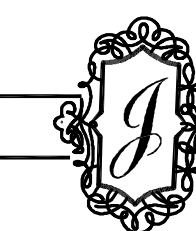
COMMERCIAL COVERAGE  
7,321 S.F./67,518 S.F. X 100 = 10.84%

ZONING DISTRICT: COMMERCIAL/RESIDENTIAL  
PROPOSED USE: CONTRACTOR YARD, P-SPR  
ASSESSOR MAP 25 PARCEL 365



*Leonard Jalbert*

**19059**  
SHEET 1 OF 6



JALBERT ENGINEERING, INC.

CIVIL ENGINEERS & SURVEYORS

54 Main Street  
Sturbridge, Massachusetts 01566-1244  
Telephone: (508) 347-5136 • Toll Free: 1-800-339-5136  
Fax: (508) 347-7962



DIG SAFE

NOTE: CONTRACTOR SHALL NOTIFY THE TOWN OF STURBRIDGE PUBLIC WORKS DEPARTMENT A MINIMUM OF 72 HOURS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY.

72 hours before you dig  
(EXCLUDING SAT., SUN. & HOL.)

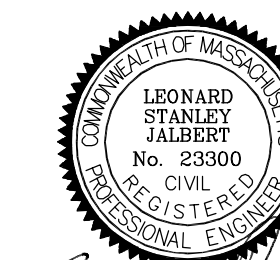
Call

**LEGEND**

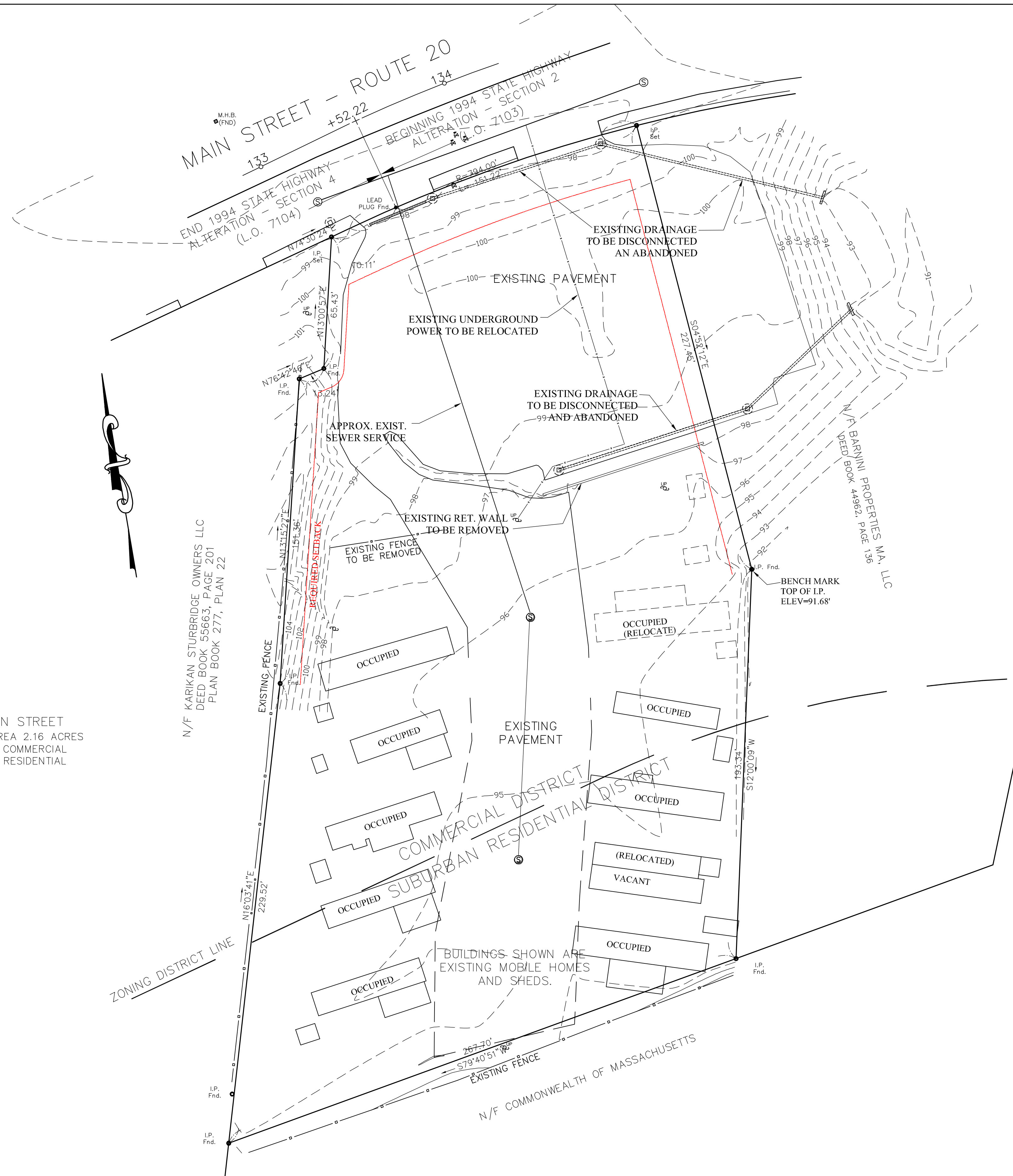
- DRILL HOLE FOUND
- IRON PIPE FOUND
- M.H.B. FOUND
- ⊙ SEWER MANHOLE
- ⊙ DRAIN MANHOLE
- CATCH BASIN
- ⊙ UTILITY POLE
- ⊙ LIGHT POLE
- ⊙ FIRE HYDRANT
- ⊙ WATER GATE

**LEGEND**

- MOBILE HOME SITE TO BE RELOCATED
- MOBILE HOME SITE TO REMAIN

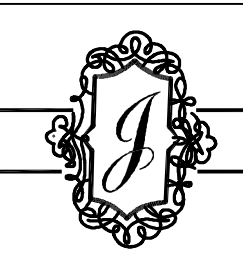


*Leonard Jalbert*



#365 MAIN STREET  
TOTAL LAND AREA 2.16 ACRES  
1.55 ACRES COMMERCIAL  
0.61 ACRES RESIDENTIAL

ORIGINAL		REVISIONS					
DATE	BY	REV.	DATE	DESCRIPTION	MADE	CHK'D	APV'D
6/24/19	ZMH		7/8/19				



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Fax: (508) 347-7962

**EXISTING SITE PLAN**  
CAREGIVER PATIENT CONNECTION LLC  
D.B.A. LOCAL ROOTS NE  
365 MAIN STREET  
STURBRIDGE, MA 01566

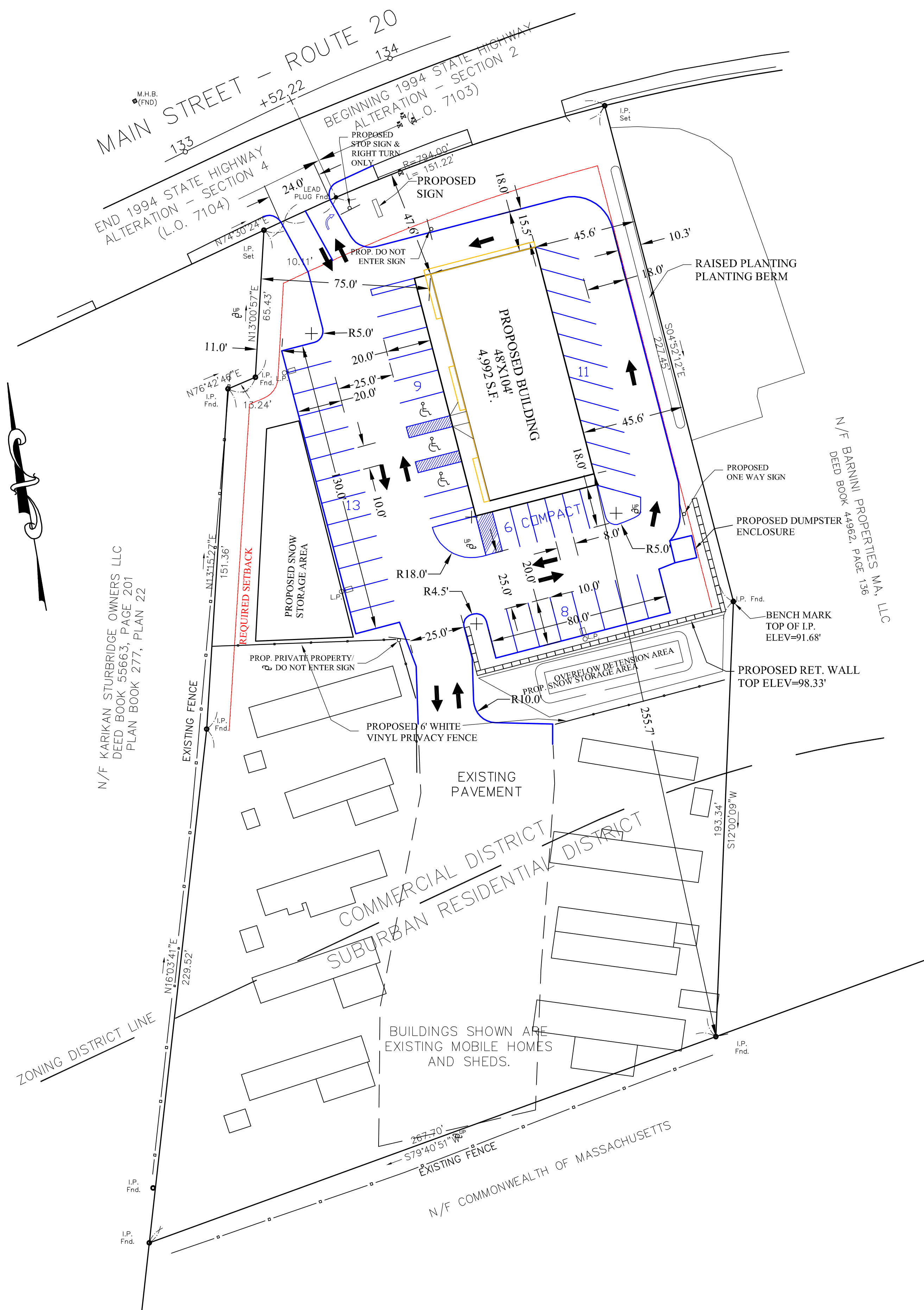
( IN FEET )  
1 inch = 30 ft.

PLAN DATE:  
6/24/19  
DWG NUMBER  
**19059**  
SHEET 2 OF 6



**LEGEND**

- DRILL HOLE FOUND
- IRON PIPE FOUND
- M.H.B. FOUND
- ⊗ SEWER MANHOLE
- ⊙ DRAIN MANHOLE
- CATCH BASIN
- ⊕ UTILITY POLE
- ⊕ LIGHT POLE
- ⊕ FIRE HYDRANT
- ⊕ WATER GATE



#365 MAIN STREET  
TOTAL LAND AREA 2.16 ACRES  
1.55 ACRES COMMERCIAL  
0.61 ACRES RESIDENTIAL

**PARKING CALCULATION**

BUILDING TOTAL IS 4,992 S.F

**DISPENSARY USE**

2,592 S.F. X 1 SPACE/200 S.F.=25 SPACES

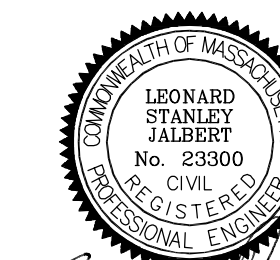
**GYM USE**

2,400 S.F.  
40 OCCUPANTS X 1SPACE/4 PERSONS=10 SPACES

**TOTAL PARKING SPACES REQUIRED=35 SPACES**

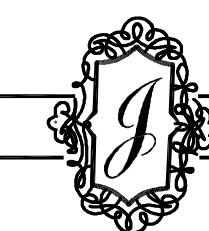
**PARKING PROVIDED**

COMPACT 8'X18'= 6 SPACES  
HANDICAPPED=3 SPACES  
STANDARD 10'X20'=37 SPACE  
**TOTAL SPACES PROVIDED=47**



*Leonard Jalbert*

ORIGINAL		REVISIONS					
DATE	BY	REV.	DATE	DESCRIPTION	MADE	CHK'D	APV'D
6/24/19	ZMH						



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Fax: (508) 347-7962

PROPOSED SITE LAYOUT PLAN  
CAREGIVER PATIENT CONNECTION LLC  
D.B.A. LOCAL ROOTS NE  
365 MAIN STREET  
STURBRIDGE, MA 01566

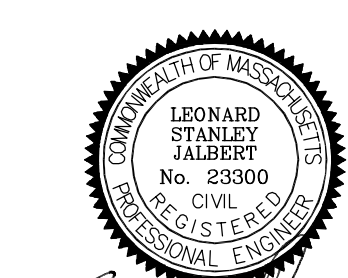
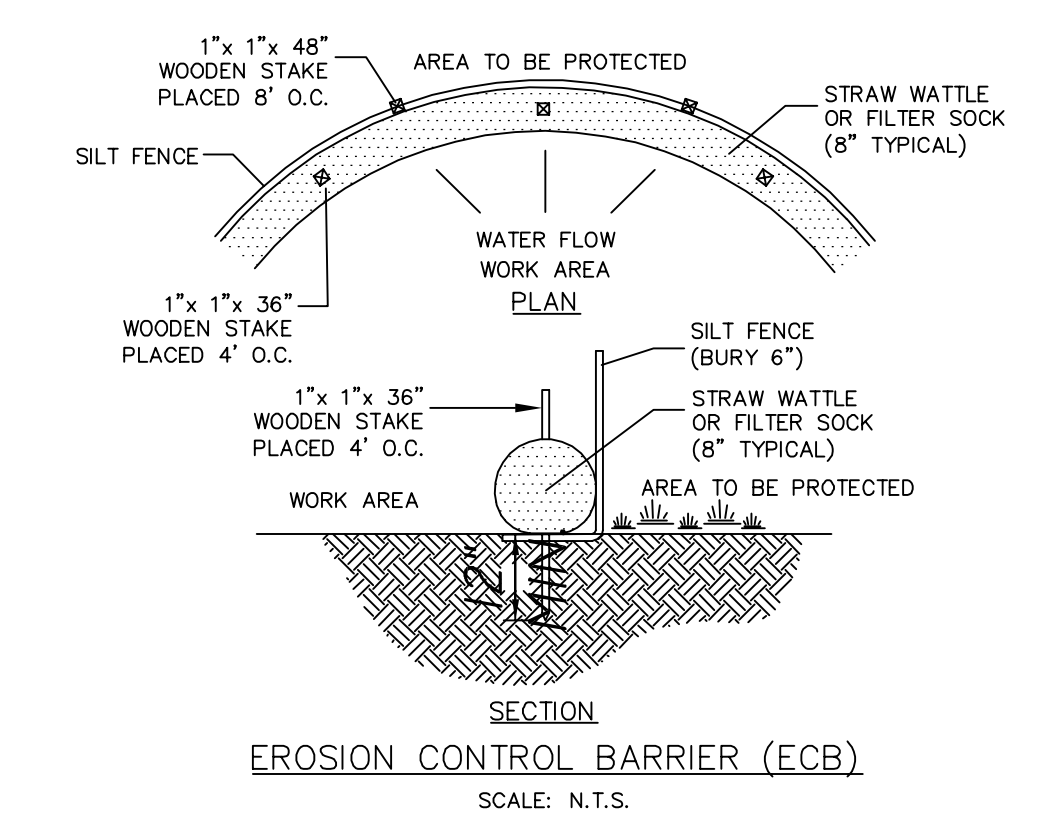
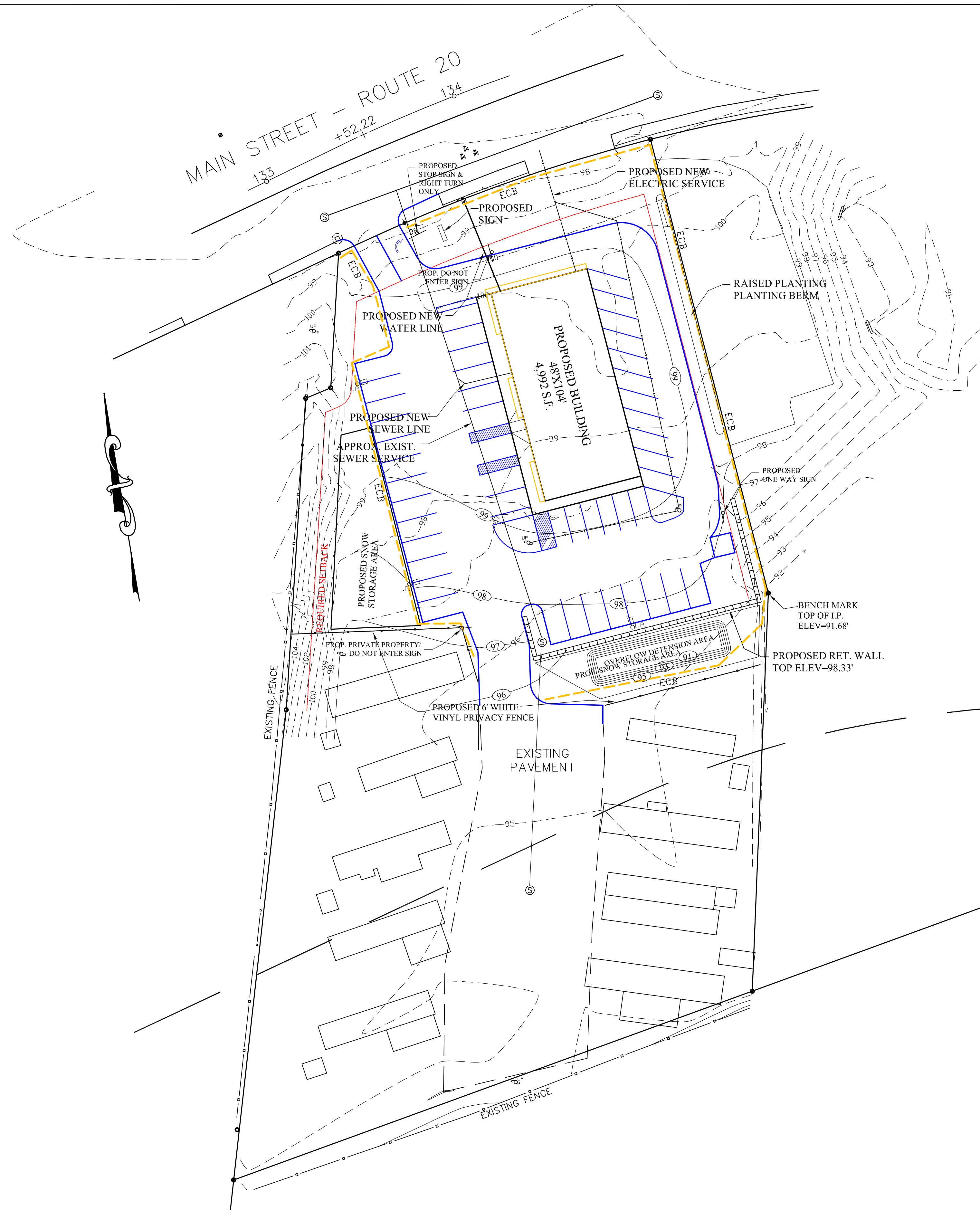
( IN FEET )  
1 inch = 30 ft.

PLAN DATE:  
6/24/19  
DWG NUMBER  
**19059**  
SHEET 3 OF 6



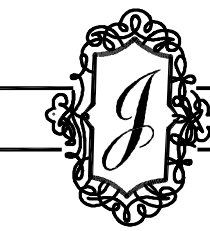
**LEGEND**

- DRILL HOLE FOUND
- IRON PIPE FOUND
- ⊖ M.H.B. FOUND
- ⊙ SEWER MANHOLE
- ⊕ DRAIN MANHOLE
- CATCH BASIN
- ⊕ UTILITY POLE
- ⊕ LIGHT POLE
- ⊕ FIRE HYDRANT
- ⊕ WATER GATE




*Leonard Jalbert*

ORIGINAL		REVISIONS					
DATE	BY	REV.	DATE	DESCRIPTION	MADE	CHK'D	APV'D
6/24/19	ZMH						



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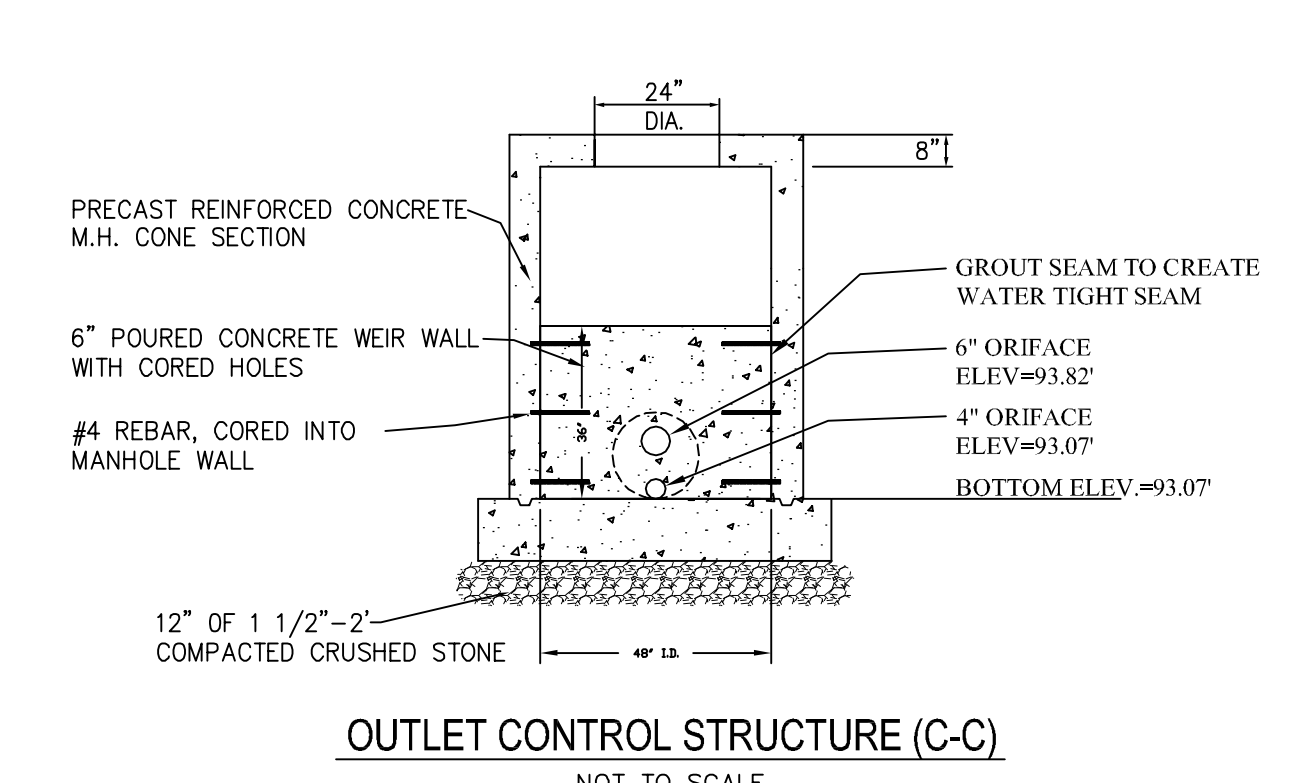
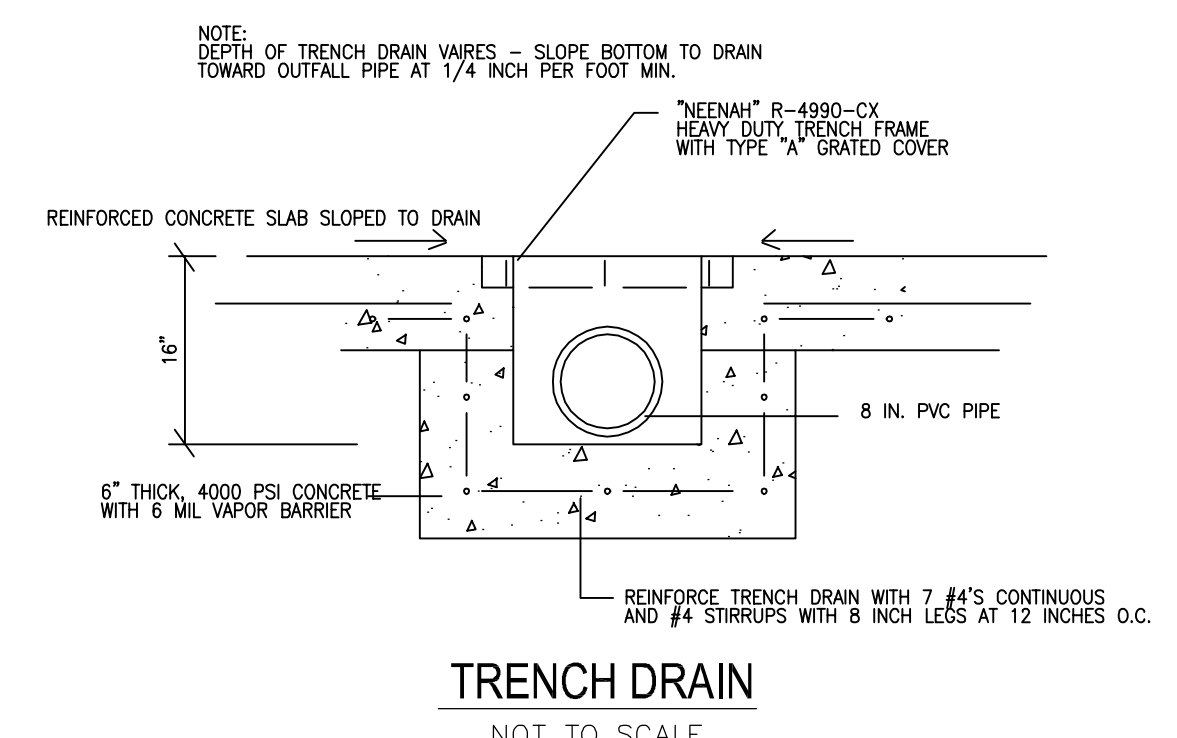
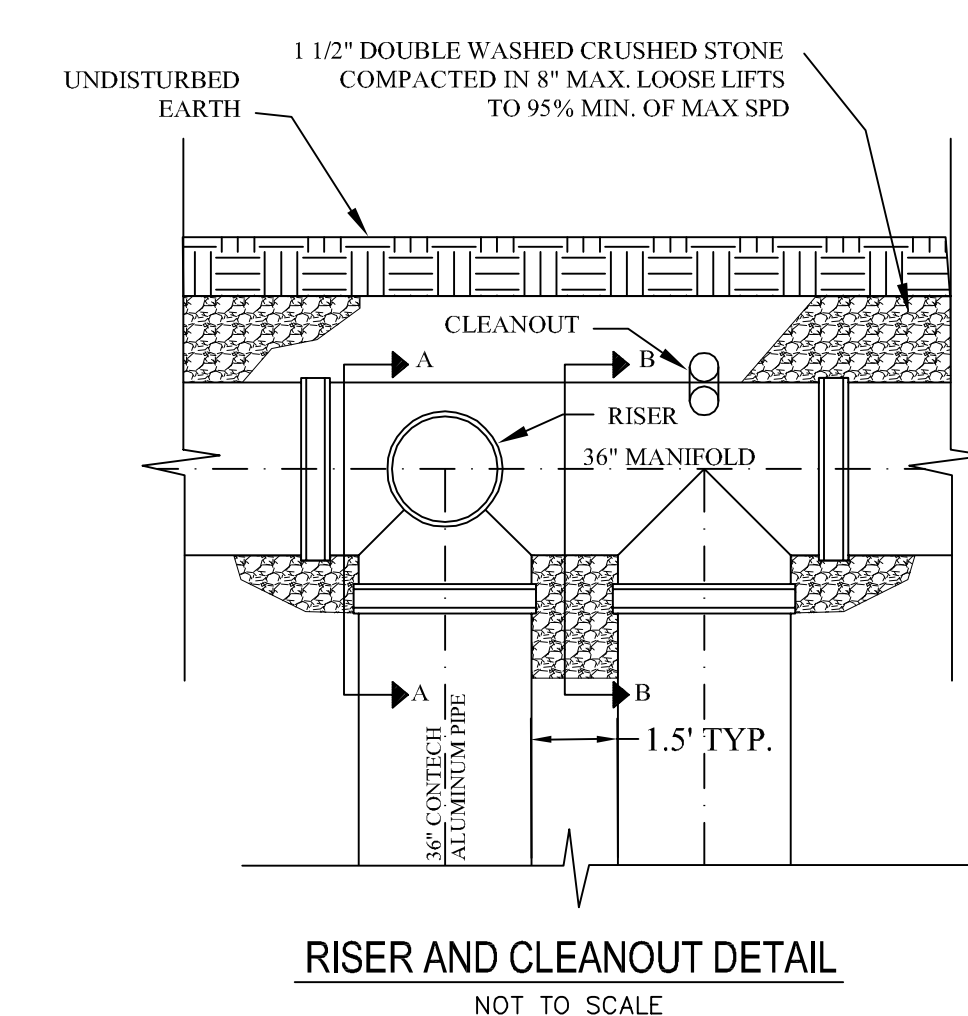
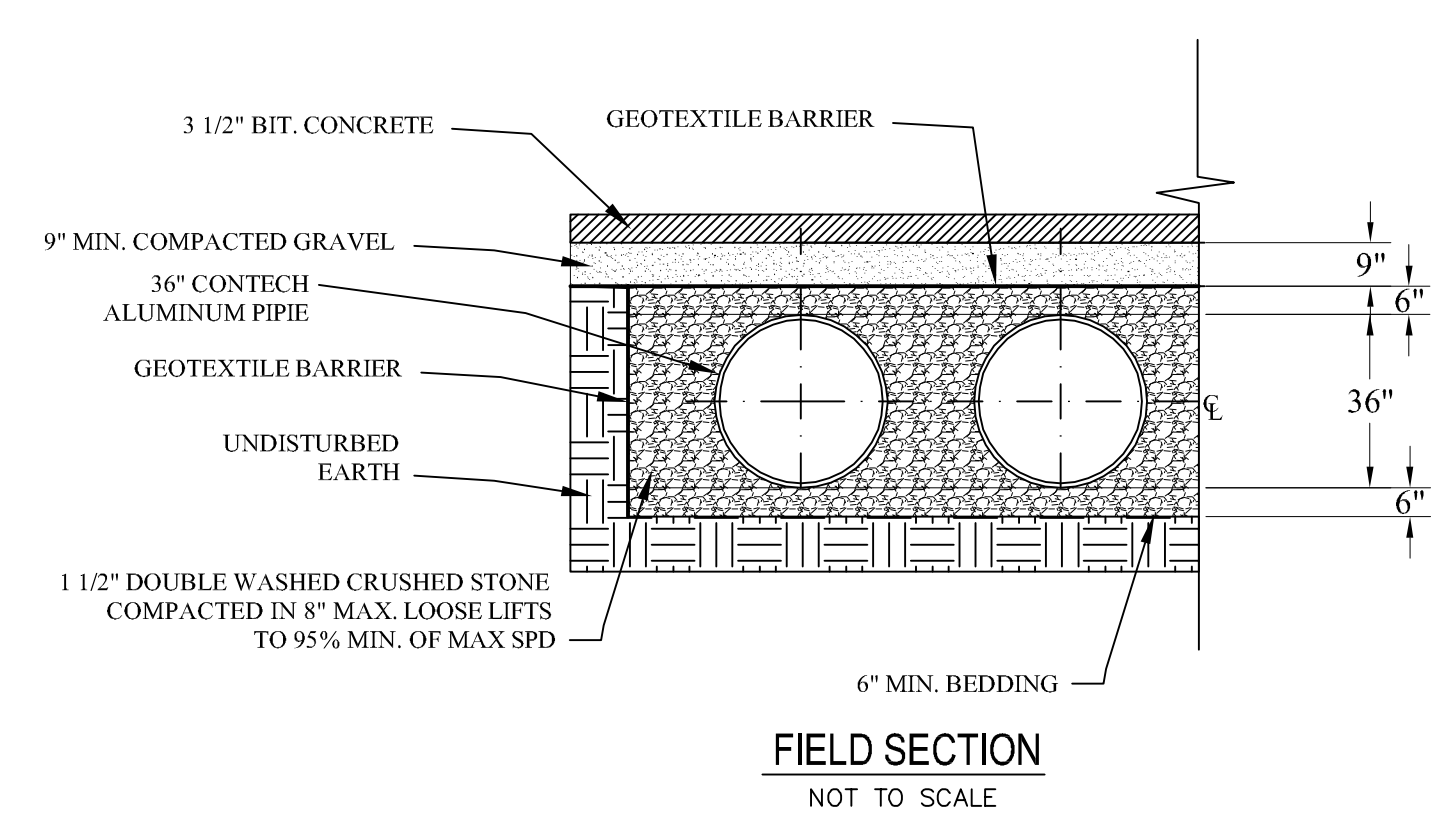
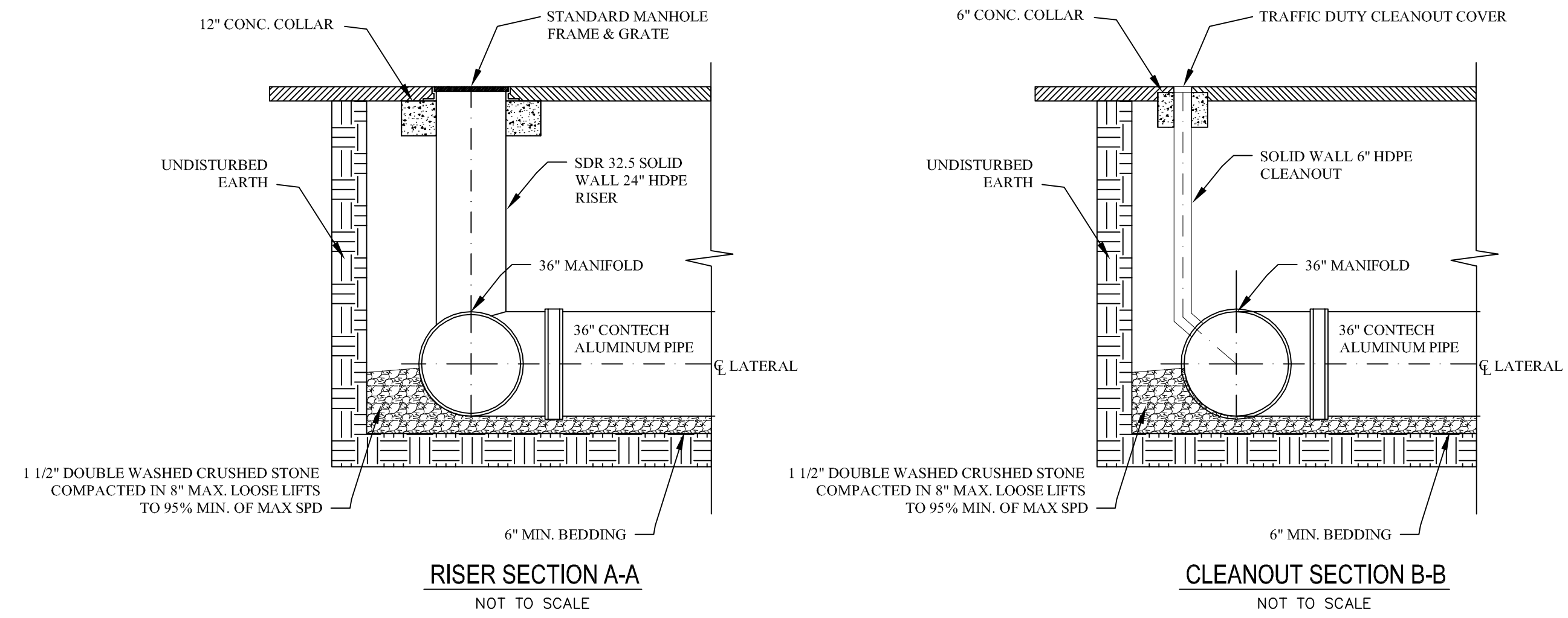
**PROPOSED DEVELOPMENT PLAN**  
 CAREGIVER PATIENT CONNECTION LLC  
 D.B.A. LOCAL ROOTS NE  
 365 MAIN STREET  
 STURBRIDGE, MA 01566



( IN FEET )  
 1 inch = 30 ft.

PLAN DATE: 6/24/19	
DWG NUMBER	<b>19059</b>
	SHEET 4 OF 6





**DEEP HOLE OBSERVATIONS**

DATE OF TEST: 2/19/20  
 PERFORMED BY: LEONARD S. JALBERT, P.E.

**OBSERVATION PITS**

ELEV=98.0' TP-1 G.W. ELEV=NONE

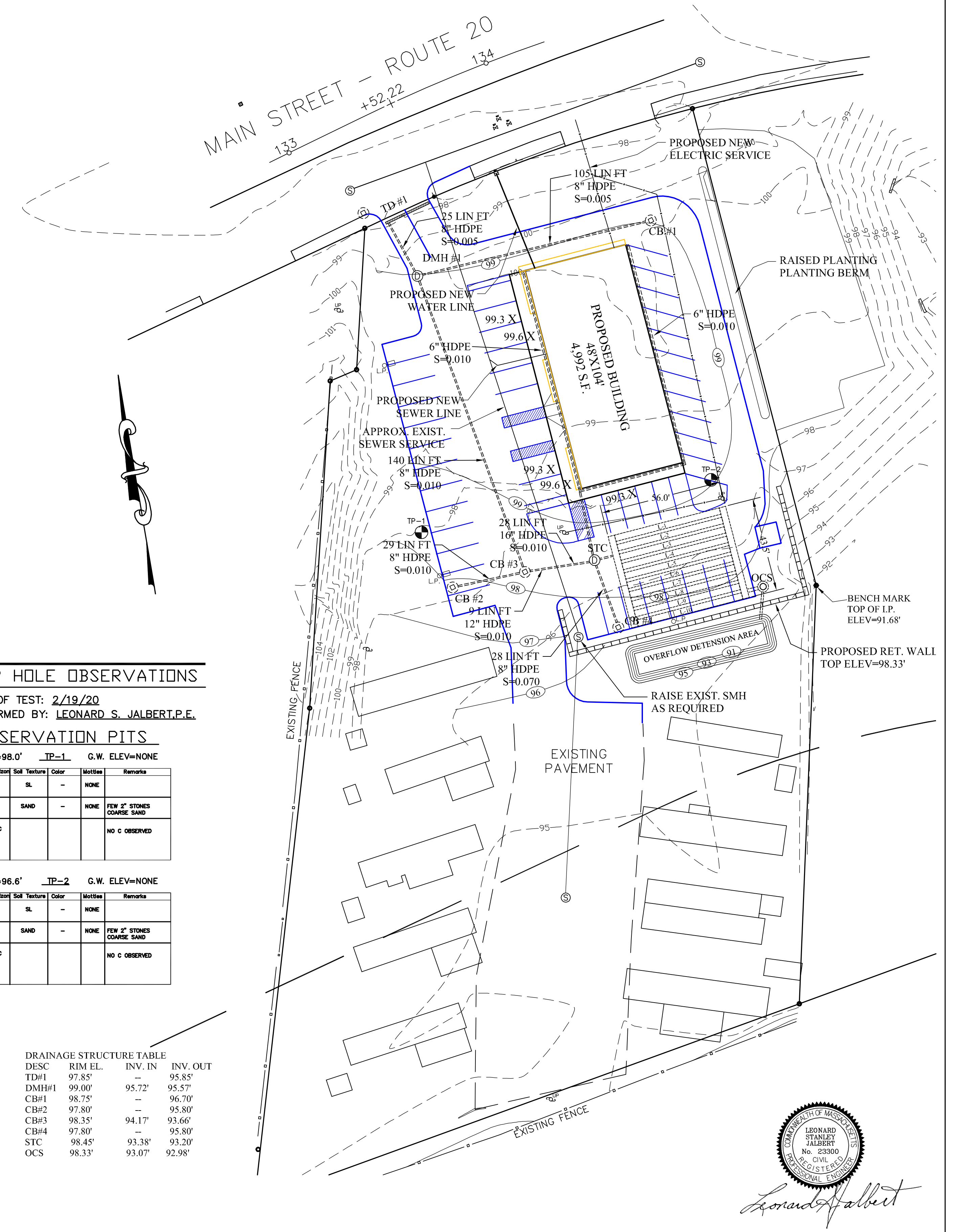
Depth	Horiz. Int.	Soil	Texture	Color	Moisture	Remarks
0-10'	A	SL	-	NONE	-	
10-120'	B	SAND	-	NONE	-	FEW 2" STONES COARSE SAND
	C					NO C OBSERVED

ELEV=96.6' TP-2 G.W. ELEV=NONE

Depth	Horiz. Int.	Soil	Texture	Color	Moisture	Remarks
0-10'	A	SL	-	NONE	-	
10-120'	B	SAND	-	NONE	-	FEW 2" STONES COARSE SAND
	C					NO C OBSERVED

**DRAINAGE STRUCTURE TABLE**

DESC	RIM EL.	INV. IN	INV. OUT
TD#1	97.85'	-	95.85'
DMH#1	99.00'	95.72'	95.57'
CB#1	98.75'	-	96.70'
CB#2	97.80'	-	95.80'
CB#3	98.35'	94.17'	93.66'
CB#4	97.80'	-	95.80'
STC	98.45'	93.38'	93.20'
OCS	98.33'	93.07'	92.98'



LEONARD S. JALBERT  
 No. 23300  
 CIVIL &  
 PROFESSIONAL ENGINEER

*Leonard Jalbert*

ORIGINAL	REVISIONS						
DATE	BY	REV.	DATE	DESCRIPTION	MADE	CHK'D	AP'VD
6/24/19	ZMH						

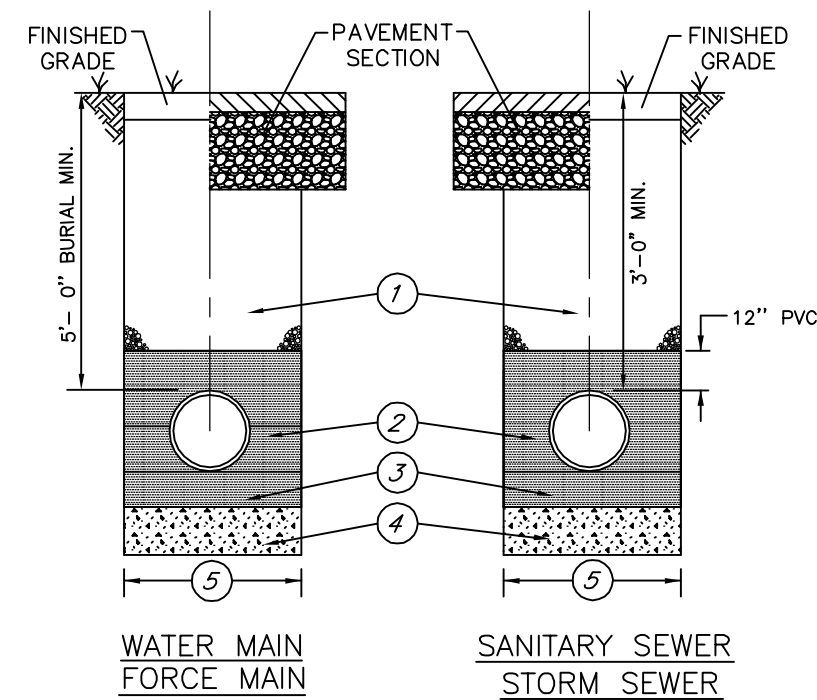
**JALBERT ENGINEERING, INC.**  
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 54 Main Street  
 Sturbridge, Massachusetts 01566-1244  
 Telephone: (508) 347-5136 • Toll Free: 1-800-339-5136  
 Fax: (508) 347-7962

**PROPOSED GRADING & DRAINAGE PLAN**  
 CAREGIVER PATIENT CONNECTION LLC  
 D.B.A. LOCAL ROOTS NE  
 365 MAIN STREET  
 STURBRIDGE, MA 01566

0 30 60 90  
 ( IN FEET )  
 1 inch = 30 ft.

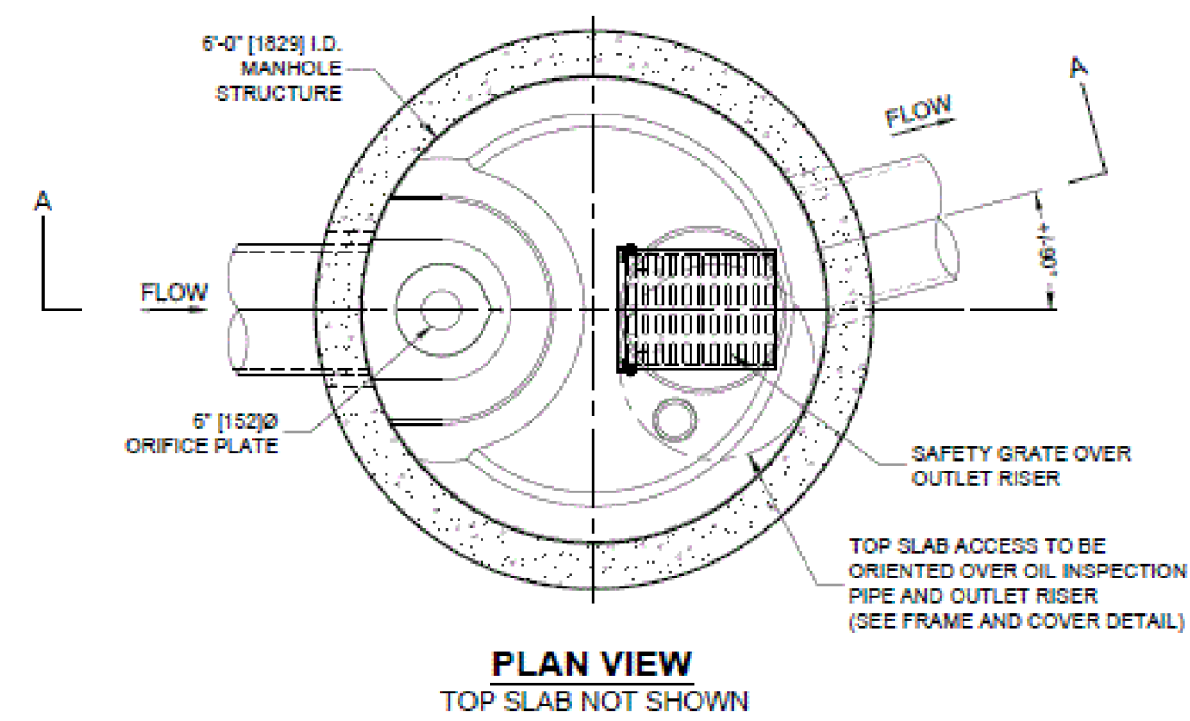
PLAN DATE: 6/24/19
DWG NUMBER <b>19059</b>
SHEET 5 OF 6



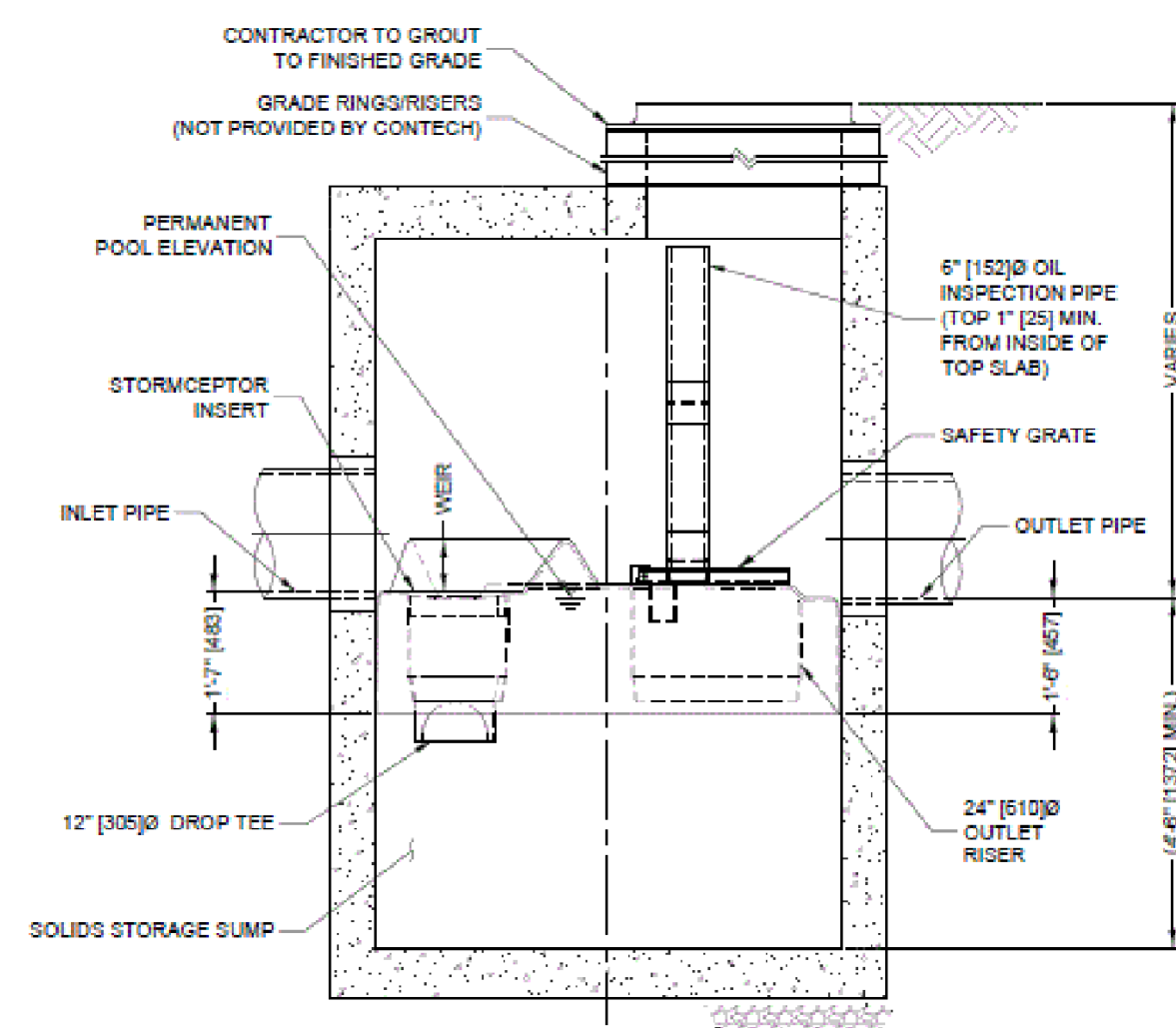


- 1 MECHANICALLY COMPACTED EXCAVATED MATERIAL WITH NO STONES OVER 3" IN 6 INCH LIFTS
- 2 STORM SEWER CROSSINGS OF PAVED AREAS SHALL BE MADE WITH AN OPEN GRADED COMPACTED 3/4" STONE
- 3 WATER MAIN, FORCE MAIN  
M.D.P.W. M1.04 SAND TAMPED INTO PLACE ALL AROUND PIPE TO A DEPTH OF 12" ABOVE PIPE  
STORM SEWER, SANITARY SEWER  
CLASS II MATERIAL CONFORMING TO ASTM D2321, MECHANICALLY COMPACTED TO 12" ABOVE TOP OF PIPE
- 4 WATER MAIN, FORCE MAIN: 6" SAND BEDDING MECHANICALLY COMPACTED  
STORM SEWER, SANITARY SEWER: 6" CLASS II BEDDING CONFORMING TO ASTM D2321, MECHANICALLY COMPACTED
- 5 UNSUITABLE MATERIAL TO BE REMOVED AND REPLACED WHERE INDICATED
- 6 TRENCH WIDTH  
OUTSIDE DIAMETER + 18 IN. (2 FT. DEPTH OR LESS)  
OUTSIDE DIAMETER + 36 IN. (2 FT. DEPTH OR MORE)

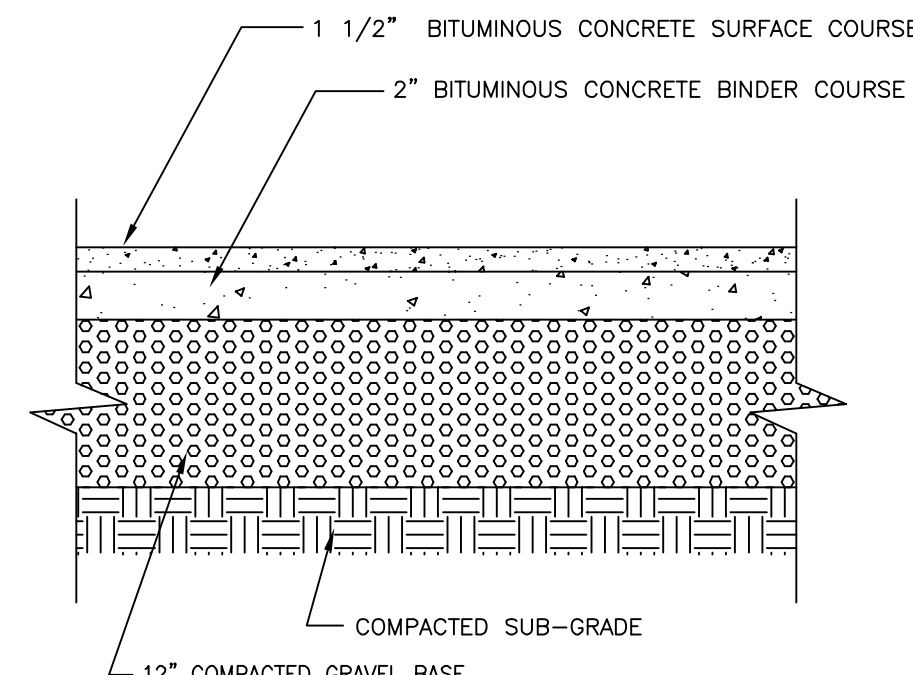
**TYPICAL TRENCH SECTIONS**  
NOT TO SCALE



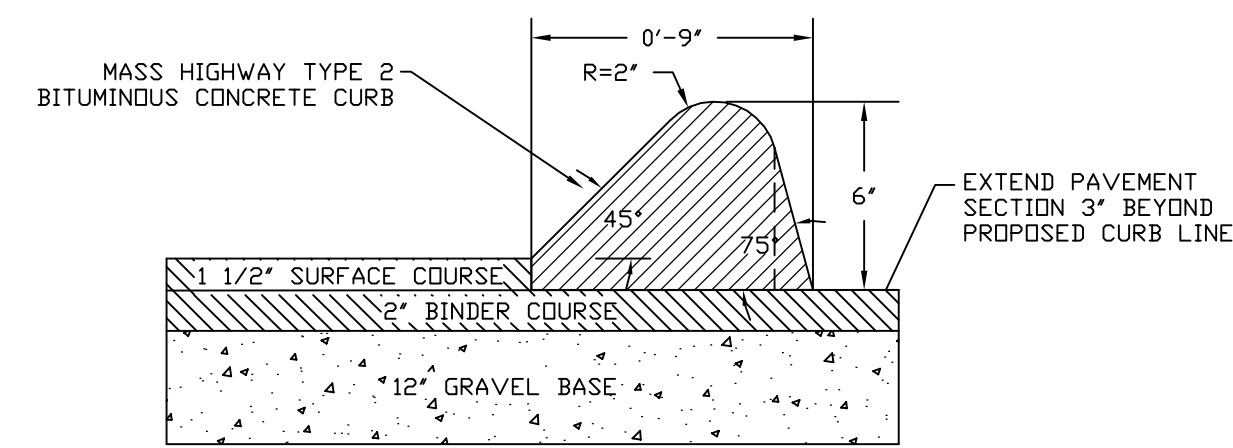
**PLAN VIEW**  
TOP SLAB NOT SHOWN



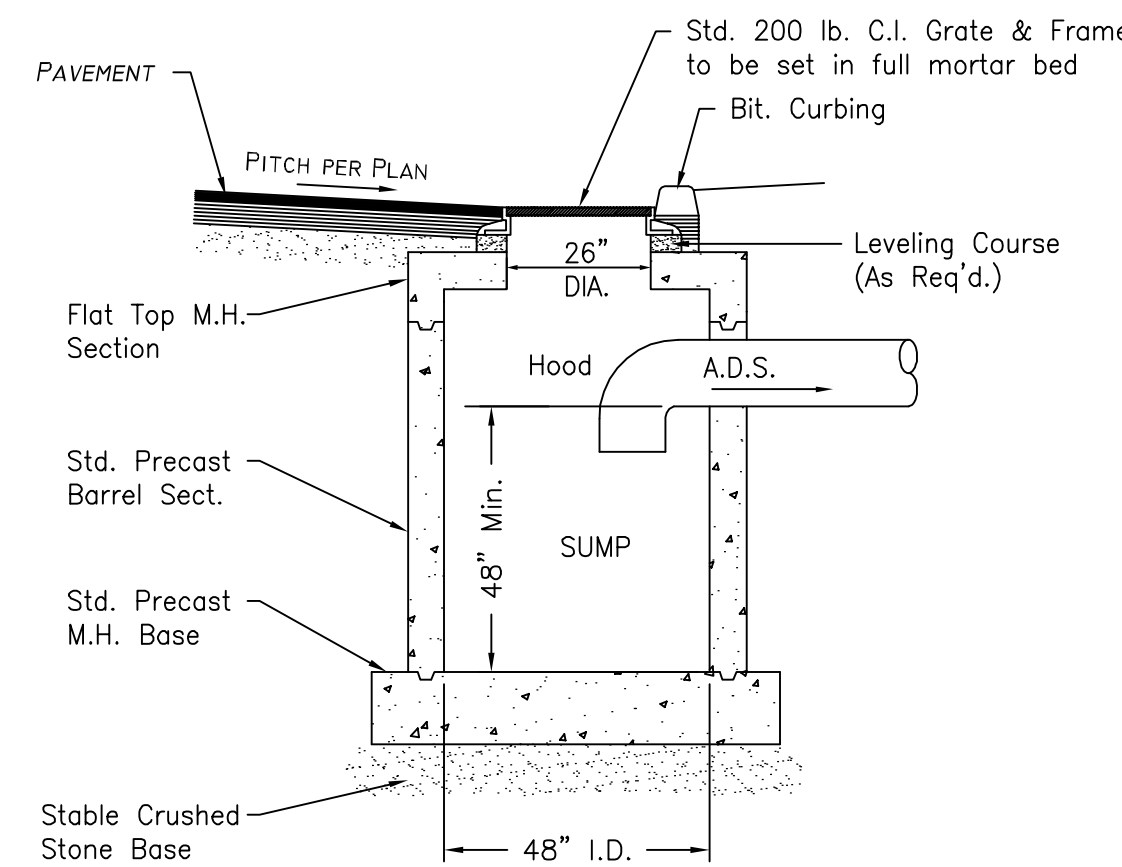
**SECTION A-A**  
**STORMCEPTOR STC900**  
NOT TO SCALE



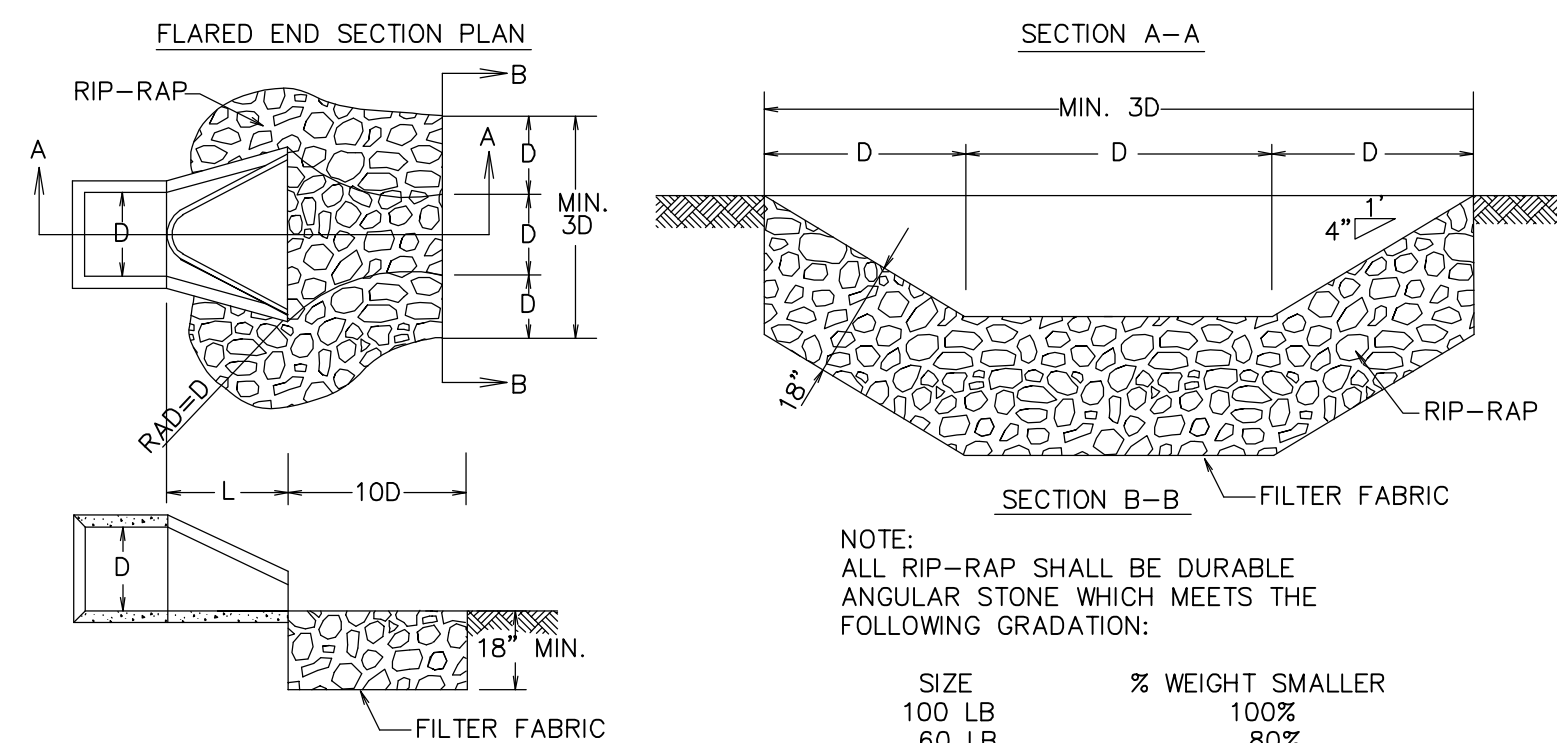
**BITUMINOUS PAVEMENT**  
NOT TO SCALE



**BITUMINOUS CONCRETE CURB**  
NOT TO SCALE



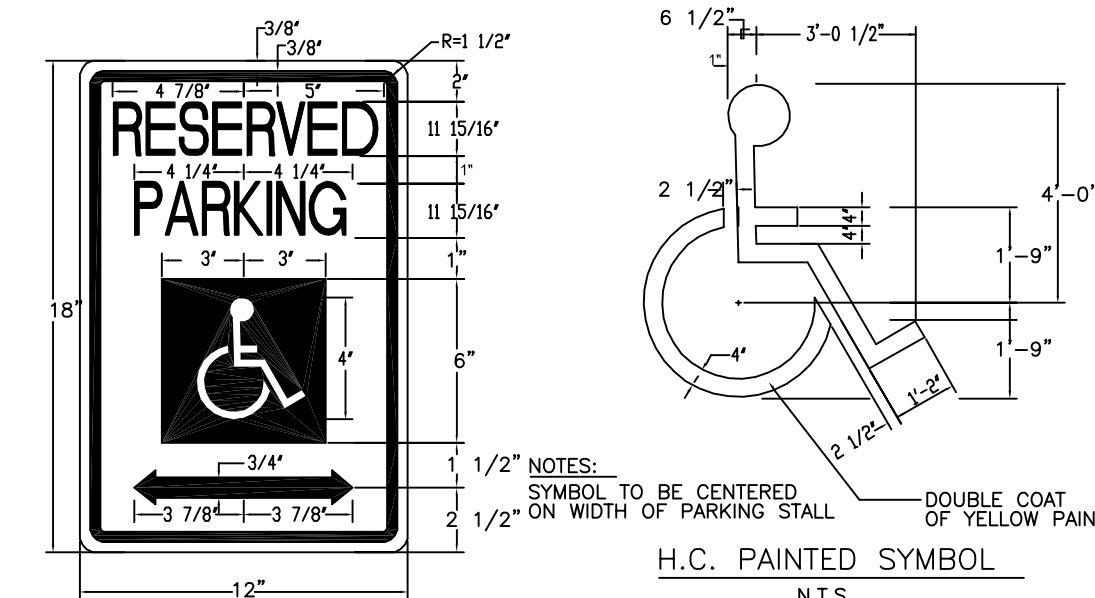
**FLAT TOP CATCH BASIN**  
NOT TO SCALE



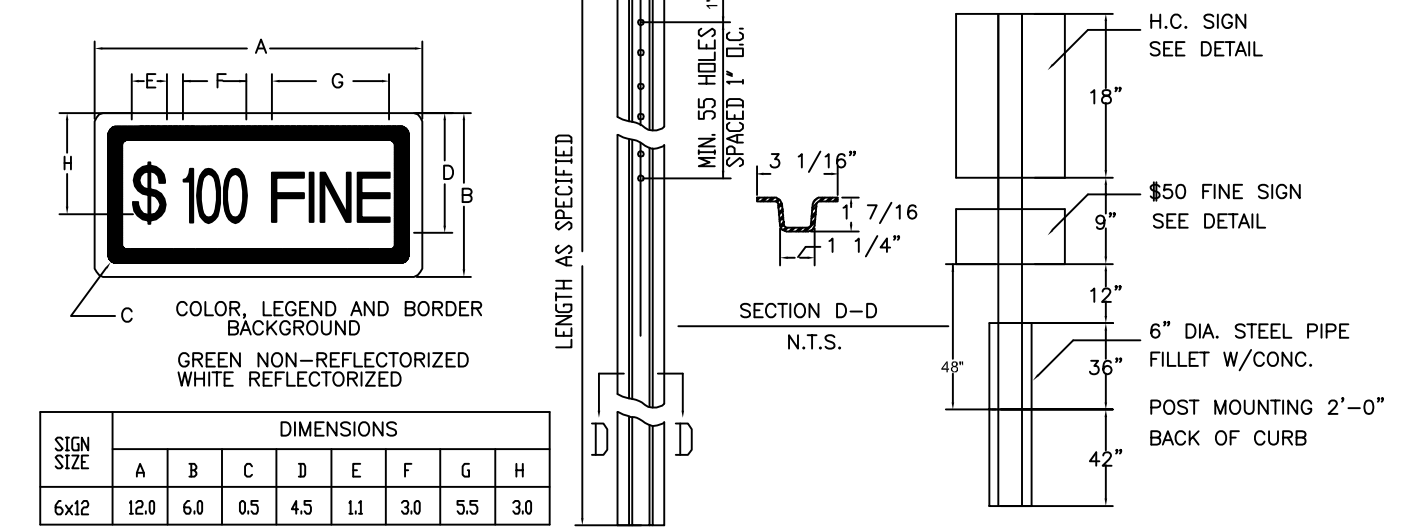
**OUTLET PROTECTION DETAIL**  
NOT TO SCALE

NOTE: ALL RIP-RAP SHALL BE DURABLE ANGULAR STONE WHICH MEETS THE FOLLOWING GRADATION:

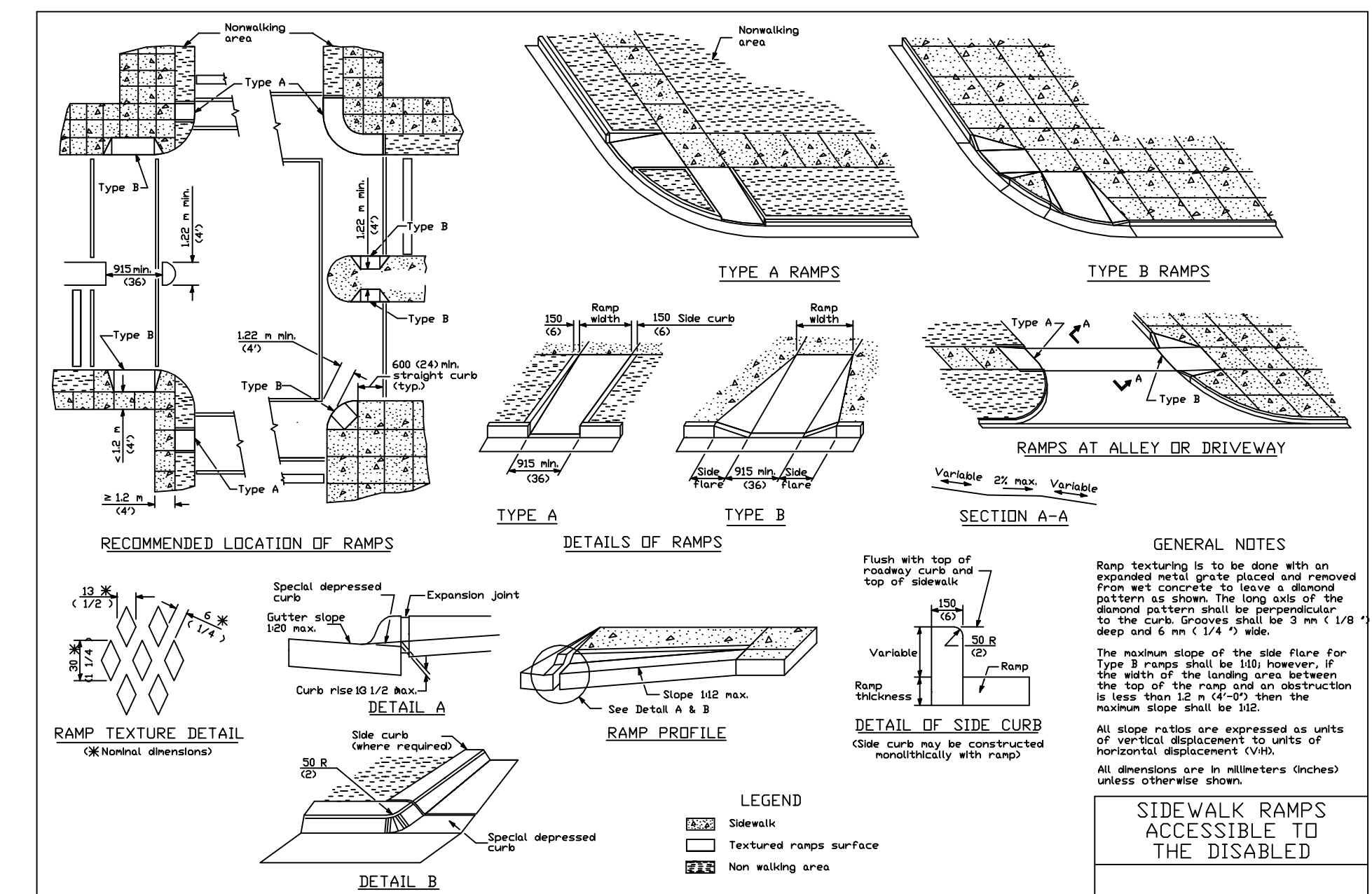
SIZE	% WEIGHT SMALLER
100 LB	100%
60 LB	80%
25 LB	50%
2 LB	10%



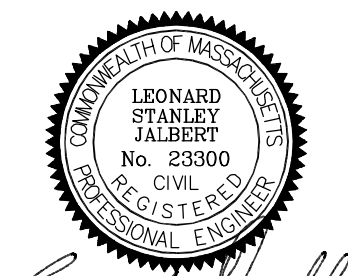
**RESERVED PARKING**  
COLORS LEGEND AND BORDER  
WHITE SYMBOL ON BLUE BACKGROUND  
BACKGROUND WHITE



**SIGN POST DETAIL**  
NOT TO SCALE

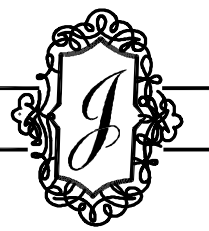


**HANDICAP RAMP**  
NOT TO SCALE

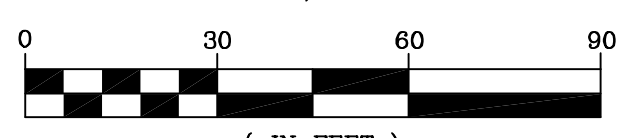


*Leonard Jalbert*

ORIGINAL	REVISIONS						
DATE	BY	REV.	DATE	DESCRIPTION	MADE	CHK'D	AP'VD
6/24/19	ZMH						


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 Sturbridge, Massachusetts 01566-1244  
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**CONSTRUCTION DETAILS**  
 CAREGIVER PATIENT CONNECTION LLC  
 D.B.A. LOCAL ROOTS NE  
 365 MAIN STREET  
 STURBRIDGE, MA 01566

  
 ( IN FEET )  
 1 inch = 30 ft.

PLAN DATE: 6/24/19
DWG NUMBER
<b>19059</b>
SHEET 6 OF 6

# STORMWATER MANAGEMENT SUBMITTAL

PREPARED FOR:

CAREGIVER-PATIENT CONNECTION, INC.

910 BOSTON POST ROAD

MARLBOROUGH, MA 01752

FOR PROPERTY LOCATED ON:

365 MAIN STREET

STURBRIDGE, MA 01566

PREPARED BY:

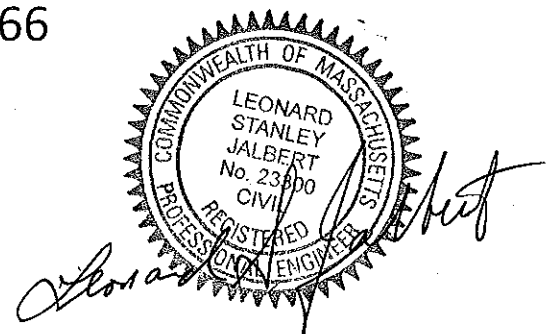
JALBERT ENGINEERING

54 MAIN STREET

STURBRIDGE, MA 01566

508-347-5136

JOB NO: 19059



Soil Map—Worcester County, Massachusetts, Southern Part  
(365 main)



Map Scale: 1:1,700 If printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

## Worcester County, Massachusetts, Southern Part

### 651—Udorthents, smoothed

#### Map Unit Setting

*National map unit symbol:* 9bfc  
*Elevation:* 0 to 3,000 feet  
*Mean annual precipitation:* 32 to 50 inches  
*Mean annual air temperature:* 45 to 50 degrees F  
*Frost-free period:* 145 to 240 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Udorthents and similar soils:* 80 percent  
*Urban land:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Udorthents

##### Setting

*Parent material:* Made land over firm coarse-loamy basal till and/or dense coarse-loamy lodgment till

##### Typical profile

*H1 - 0 to 6 inches:* variable  
*H2 - 6 to 60 inches:* variable

##### Properties and qualities

*Slope:* 0 to 25 percent  
*Depth to restrictive feature:* More than 80 inches  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (Ksat):*  
Moderately low to very high (0.06 to 20.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* A  
*Hydric soil rating:* No

## Data Source Information

Soil Survey Area: Worcester County, Massachusetts, Southern Part  
Survey Area Data: Version 11, Sep 11, 2018

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
102C	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	0.0	0.4%
245B	Hinckley loamy sand, 3 to 8 percent slopes	0.9	7.9%
600	Pits, gravel	1.9	16.3%
651	Udorthents, smoothed	8.9	75.4%
<b>Totals for Area of Interest</b>		<b>11.8</b>	<b>100.0%</b>



## MAP LEGEND

	Area of Interest (AOI)		Spoil Area
	Soils		Stony Spot
	Soil Map Unit Polygons		Very Stony Spot
	Soil Map Unit Lines		Wet Spot
	Soil Map Unit Points		Other
	Special Point Features		Special Line Features
	Blowout		
	Borrow Pit		Water Features
	Clay Spot		Streams and Canals
	Closed Depression		
	Gravel Pit		Transportation
	Gravelly Spot		Rails
	Landfill		Interstate Highways
	Lava Flow		US Routes
	Marsh or swamp		Major Roads
	Mine or Quarry		Local Roads
	Miscellaneous Water		
	Perennial Water		Background
	Rock Outcrop		Aerial Photography
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Worcester County, Massachusetts, Southern Part  
Survey Area Data: Version 11, Sep 11, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 14, 2011—Aug 27, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Worcester County, Massachusetts, Southern Part

### 600—Pits, gravel

#### Map Unit Setting

*National map unit symbol:* 9bf6

*Mean annual precipitation:* 32 to 50 inches

*Mean annual air temperature:* 45 to 50 degrees F

*Frost-free period:* 145 to 240 days

*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Pits, gravel:* 100 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Pits, Gravel

##### Setting

*Parent material:* Loose sandy and gravelly glaciofluvial deposits

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8s

*Hydric soil rating:* Unranked

## Data Source Information

Soil Survey Area: Worcester County, Massachusetts, Southern Part

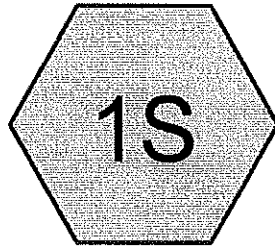
Survey Area Data: Version 11, Sep 11, 2018

## SUMMARY

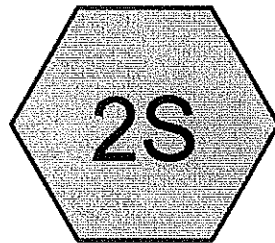
The proposed development will have a decrease in peak rate of runoff for the site. A comparison of the rates of runoff for storms of various return periods are tabulated and presented below.

<u>Return Period</u>	<u>Total Runoff to the Eastern Property Line</u>	
	<u>Exist. ( cfs )</u>	<u>Prop. ( cfs )</u>
2 yr	1.83	1.41
10 yr	3.25	2.73
25 yr	4.19	3.64
100 yr	5.81	5.19





Existing Runoff To East



Proposed Runoff To  
East



**Proposed**

Prepared by Microsoft

HydroCAD® 10.00-16 s/n 09355 © 2015 HydroCAD Software Solutions LLC

Type III 24-hr 2 -yr Rainfall=3.20"

Printed 3/4/2020

Page 2

**Summary for Subcatchment 1S: Existing Runoff To East**

Runoff = 1.83 cfs @ 12.08 hrs, Volume= 0.121 af, Depth> 1.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2 -yr Rainfall=3.20"

Area (sf)	CN	Description
* 29,537	98	Asphalt / Roof
14,808	49	50-75% Grass cover, Fair, HSG A
44,345	82	Weighted Average
14,808		33.39% Pervious Area
29,537		66.61% Impervious Area

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

**Summary for Subcatchment 2S: Proposed Runoff To East**

Runoff = 1.41 cfs @ 12.08 hrs, Volume= 0.094 af, Depth> 1.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2 -yr Rainfall=3.20"

Area (sf)	CN	Description
* 28,225	98	Asphalt / Roof
16,120	39	>75% Grass cover, Good, HSG A
44,345	77	Weighted Average
16,120		36.35% Pervious Area
28,225		63.65% Impervious Area

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

**Proposed**

Prepared by Microsoft

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Type III 24-hr 10-yr Rainfall=4.60"

Printed 3/4/2020

Page 3

**Summary for Subcatchment 1S: Existing Runoff To East**

Runoff = 3.25 cfs @ 12.08 hrs, Volume= 0.216 af, Depth> 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-yr Rainfall=4.60"

	Area (sf)	CN	Description
*	29,537	98	Asphalt / Roof
	14,808	49	50-75% Grass cover, Fair, HSG A
	44,345	82	Weighted Average
	14,808		33.39% Pervious Area
	29,537		66.61% Impervious Area

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

**Summary for Subcatchment 2S: Proposed Runoff To East**

Runoff = 2.73 cfs @ 12.08 hrs, Volume= 0.181 af, Depth> 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-yr Rainfall=4.60"

	Area (sf)	CN	Description
*	28,225	98	Asphalt / Roof
	16,120	39	>75% Grass cover, Good, HSG A
	44,345	77	Weighted Average
	16,120		36.35% Pervious Area
	28,225		63.65% Impervious Area

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

**Proposed**

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Type III 24-hr 25-yr Rainfall=5.50"

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**Summary for Subcatchment 1S: Existing Runoff To East**

Runoff = 4.19 cfs @ 12.08 hrs, Volume= 0.281 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-yr Rainfall=5.50"

Area (sf)	CN	Description
* 29,537	98	Asphalt / Roof
14,808	49	50-75% Grass cover, Fair, HSG A
44,345	82	Weighted Average
14,808		33.39% Pervious Area
29,537		66.61% Impervious Area

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

**Summary for Subcatchment 2S: Proposed Runoff To East**

Runoff = 3.64 cfs @ 12.08 hrs, Volume= 0.241 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-yr Rainfall=5.50"

Area (sf)	CN	Description
* 28,225	98	Asphalt / Roof
16,120	39	>75% Grass cover, Good, HSG A
44,345	77	Weighted Average
16,120		36.35% Pervious Area
28,225		63.65% Impervious Area

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

**Proposed**

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Type III 24-hr 100-yr Rainfall=7.00"

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Page 5

**Summary for Subcatchment 1S: Existing Runoff To East**

Runoff = 5.81 cfs @ 12.07 hrs, Volume= 0.393 af, Depth> 4.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100-yr Rainfall=7.00"

Area (sf)	CN	Description
* 29,537	98	Asphalt / Roof
14,808	49	50-75% Grass cover, Fair, HSG A
44,345	82	Weighted Average
14,808		33.39% Pervious Area
29,537		66.61% Impervious Area

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

**Summary for Subcatchment 2S: Proposed Runoff To East**

Runoff = 5.19 cfs @ 12.08 hrs, Volume= 0.347 af, Depth> 4.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 100-yr Rainfall=7.00"

Area (sf)	CN	Description
* 28,225	98	Asphalt / Roof
16,120	39	>75% Grass cover, Good, HSG A
44,345	77	Weighted Average
16,120		36.35% Pervious Area
28,225		63.65% Impervious Area

































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

Hydrologic Soil Group—Worcester County, Massachusetts, Southern Part





Hydrologic Soil Group—Worcester County, Massachusetts, Southern Part

MAP LEGEND		MAP INFORMATION	
<p><b>Area of Interest (AOI)</b></p> <p> Area of Interest (AOI)</p> <p><b>Soils</b></p> <p><b>Soil Rating Polygons</b></p> <p> A</p> <p> A/D</p> <p> B</p> <p> B/D</p> <p> C</p> <p> C/D</p> <p> D</p> <p> Not rated or not available</p> <p><b>Soil Rating Lines</b></p> <p> A</p> <p> A/D</p> <p> B</p> <p> B/D</p> <p> C</p> <p> C/D</p> <p> D</p> <p> Not rated or not available</p> <p><b>Soil Rating Points</b></p> <p> A</p> <p> A/D</p> <p> B</p> <p> B/D</p>		<p> C</p> <p> C/D</p> <p> D</p> <p> Not rated or not available</p> <p><b>Water Features</b></p> <p> Streams and Canals</p> <p><b>Transportation</b></p> <p> Rails</p> <p> Interstate Highways</p> <p> US Routes</p> <p> Major Roads</p> <p> Local Roads</p> <p><b>Background</b></p> <p> Aerial Photography</p>	
		<p>The soil surveys that comprise your AOI were mapped at 1:25,000.</p> <p><b>Warning: Soil Map may not be valid at this scale.</b></p> <p>Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.</p> <p>Please rely on the bar scale on each map sheet for map measurements.</p> <p>Source of Map: Natural Resources Conservation Service                  Web Soil Survey URL:                  Coordinate System: Web Mercator (EPSG:3857)</p> <p>Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.</p> <p>This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.</p> <p>Soil Survey Area: Worcester County, Massachusetts, Southern Part                  Survey Area Data: Version 12, Sep 12, 2019</p> <p>Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.</p> <p>Date(s) aerial images were photographed: May 18, 2019—Jul 9, 2019</p> <p>The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.</p>	

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
245B	Hinckley loamy sand, 3 to 8 percent slopes	A	0.7	6.5%
800	Pits, gravel		1.0	9.5%
651	Udorthents, smoothed	A	9.1	83.9%
Totals for Area of Interest			10.9	100.0%

### Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## OPERATION/MAINTENANCE PLAN

This plan has been designed to address both the construction and post-development operation and maintenance of the stormwater management controls for the commercial building. The plan addresses and identifies the following areas:

- Stormwater Management System Owner
- Party Responsible for Operation/Maintenance
- Schedule for Inspection and Maintenance
- Routine and Non-Routine Maintenance Tasks

### Stormwater Management System Owner

The Owner will maintain ownership of the stormwater management system.

### Party Responsible For Operation/Maintenance

The developer/general contractor will be responsible for the operation and maintenance of the stormwater management system until acceptance by the Town. After acceptance, the Owner will be responsible for the operation and maintenance of the stormwater management system.

### Schedule For Inspection And Maintenance

The inspection schedule and maintenance requirements for each structural BMP utilized in the site stormwater management system is indicated below:

Catch Basins: Inlets should be cleaned a minimum of four times per year and inspected monthly.

Subsurface Infiltration Structure: Structures should be inspected at least once per year to ensure that the structure is operating as intended. Inspections should be conducted during wet weather to determine if the structure is meeting the targeted detention times.

Sand Filters: Unit should be inspected and maintained as per manufacturer requirements.

### Routine And Non-Routine Maintenance Tasks

Routine and non-routine maintenance tasks for each structural BMP utilized are outlined below:

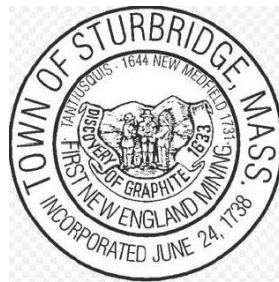
Catch Basins: Remove and properly dispose of all sediment and hydrocarbons in accordance with local, state, and federal guidelines and regulations.

Subsurface Infiltration Structure: Remove and properly dispose of all sediment and hydrocarbons in accordance with local, state, and federal guidelines and regulations. Sediment should be removed from the basin as necessary, and at least once every 10 years.

Sand Filters: Unit should be inspected and maintained as per manufacturer requirements.

# TRAFFIC IMPACT AND ACCESS STUDY

**Marijuana Dispensary/Health Club  
365 Main Street  
Sturbridge, MA**



***MARCH 2020***

**Prepared for:**

**Caregiver Patient Connection, LLC**

**Prepared by:**



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## 1.0 Introduction/Project Description

This Traffic Impact and Access Study (TIAS) was prepared for a proposed retail marijuana dispensary store/ health club located at 365 Main Street (Route 20) in the Town of Sturbridge, Massachusetts. The new marijuana dispensary will consist of 2,592 square feet of retail space with twelve sales kiosks as well as administrative space. The health club will occupy 2,400 square feet with a maximum occupancy of 40 people. The marijuana dispensary will operate Monday thru Saturday between the hours of 11:00 AM to 8:00 PM and Sunday between noon and 6:00 PM. **Marijuana sales will be by appointment only.** The health club will only operate for a few hours both in the morning and evening hours.

The site was previously occupied by gas station which is currently vacant. An existing manufactured home community is located immediately behind the site and shares access with the proposed marijuana dispensary/health club. The site will have a total of 47 parking spaces available at the site as well. Access to the site is proposed via a single right-in/right-out driveway directly onto Main Street (Route 20). The purpose of the TIAS was to evaluate the proposed project's effect on traffic flow and roadway operations as well as access/egress requirements.

The results of the traffic assessment indicate that the adjacent section of Main Street currently operates with no appreciable delays during the peak periods analyzed and trips to and from the site will not pose additional safety or operations issues. The site access driveway was analyzed as a single, unsignalized drive with stop sign control. The site drive intersection would operate at a "B" level of service (LOS) with delays of approximately 15 seconds. The analysis assumes that drivers exiting the site would have to wait for a gap in the Main Street traffic due to random arrivals. In reality, a traffic signal located approximately 1,000 feet to the west will provide additional gaps due to the platooning provided by the traffic signal operations. Additional analyses were conducted at the Route 20/Route 131-Fairgrounds interchange, and the Route 20/Old Sturbridge Village Road intersections. Adequate capacity exists at both of these intersections with the additional development traffic added to the traffic network. A minor adjustment in signal timing would be required at the Route 20/Route 131 interchange to maintain adequate operations.

Since access to the site is provided on Route 20, a state highway, the proposed development project will require a permit to Access State Highway from MassDOT.

### Study Area

To effectively evaluate the transportation impacts associated with the proposed development, it was necessary to review the existing roadway system near the site. The area delineated for this study includes the site drive along Route 20, the unsignalized intersection of Route 20 at Sturbridge Host Hotel, the signalized intersections at Route 20 and Fairground Road, Route 20 at Route 131 intersection and Route 20 at the Old Sturbridge Village Road. All roadways in the project area are under the jurisdiction of the MassDOT. A locus plan of the area is shown in Figure 1.0





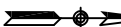
PREPARED FOR:



TITLE:

Traffic Impact Study - Marijuana Dispensary  
 365 Main Street  
 Sturbridge, Massachusetts  
 Locus Map

N



DATE:

4/5/19

SCALE:

N.T.S.

PREPARED BY:



300 TRADE CENTER, SUITE 5380  
 WORBRUN, MASSACHUSETTS 01801  
 PHONE: 781.593.4800

PROJECT  
 LOCATION

Figure 1

### **Study Methodology**

This traffic assessment was conducted in three phases. The first phase involved an assessment of existing traffic conditions in and around the proposed development area and included an inventory of existing roadway geometrics, peak period traffic counts, and a review of crash data in this area.

The second phase of the study built upon the database assembled in the first phase and established the framework for evaluating the transportation impacts of the proposed project. In this phase, projected background traffic growth for the project was assessed along with future traffic demands on the study area roadways due to projected traffic growth and other proposed area developments that will occur independent of the proposed development. Using MassDOT guidelines for development projects, a seven-year design horizon to 2027 was selected as the design year for analysis included in the preparation of this traffic impact and access study. The traffic analysis conducted in the second phase identifies both existing and projected future roadway capacities in addition to pertinent traffic safety issues.

The third and final phase of the study identifies, describes and analyzes future traffic operations and the traffic-related impacts associated with the proposed project.

Each of these three phases are described in detail in the following sections.

## 2.0 Existing Conditions

Existing roadway and traffic conditions in the vicinity of the site were determined based on field visits and development of a comprehensive traffic count program. The existing transportation conditions in the study area, including roadway geometrics, traffic controls, peak hour traffic flows, and traffic safety data are described below.

### 2.1 Roadway Geometry

#### Main Street (Route 20)

From the interchange of I-84 to Cedar street, Route 20 provides a four-lane cross-section with turning lanes at key intersections. A concrete median divides eastbound and westbound traffic. Speed limits along this stretch of Route 20 range from 30 to 35mph. The adjacent land uses in this area are primarily tailored to tourism with hotels, restaurants and retail uses. Sidewalks are present along both sides of Route 20 from Route 131 to Cedar Street. Main Street (Route 20) is urban principal arterial roadways extending in a generally east/west direction. Route 20 is under the jurisdiction of the Massachusetts Department of Transportation (MassDOT).

#### Main Street (Route 131)

Route 131 begins at Route 20 and travels southeast to the Southbridge town line. Route 131 is known locally as Main Street and is a two-lane cross section with turning lanes at key intersections. Route 131 is under the jurisdiction of MassDOT and is classified as an Urban Principal Arterial. Speed limits along the corridor range from 25 to 30 mph near Route 20 increases to 35 to 40 mph east of Route 15. The roadway links Route 20 and the hospitality/entertainment zone with the historic Town Hall, Town Common and then Southbridge center.

#### 2.1.1 Intersections

The following intersections were analyzed:

##### Unsignalized

- Route 20 at Site Drive
- Route 20 at Sturbridge Host Hotel

##### Signalized

- Main Street (Route 20) at Fairground Road
- Main Street (Route 20) at Route 131
- Main Street Route 20) at old Sturbridge Village Road

### **Main Street (Route 20) at Site Drive**

The site will be accessed from a single curb cut that serviced the former gas station and existing trailer park at the western end of the property. The trailer park will retain access/egress to the local roadway network through a shared curb cut with the proposed marijuana dispensary. The site drive is located along a section of Route 20, which operates as two lanes in each direction separated by a raised median. The drive is prior to the beginning of the taper for the right turn lane to Route 131 to the south toward Southbridge Center. The speed limit is 30 mph heading in the eastbound direction and 35 mph travelling in the westbound direction. Generally U-Turns are prohibited at unsignalized intersections along this section of Route 20. Adjacent land use is commercial with a major hotel complex located directly across the street from the site.

### **Main Street (Route 20) at Sturbridge Host Hotel**

This unsignalized “T” intersection is located approximately 500 feet west of the, Route 20/Route 131 signalized intersection. The intersection features a right-in/right out driveway along the westbound side of Route 20 and a break in the median for eastbound left turns to enter the site. Westbound left turns are prohibited at this median opening. The hotel driveway approach is uncontrolled and channelized to facilitate traffic exiting the hotel complex to easily enter the Route 20 westbound traffic flow. The Route 20 eastbound left turn is uncontrolled. Crosswalks are provided across the driveway exit with no signage or traffic control present.

### **Main Street (Route 20) at Fairgrounds Road**

#### **Main Street-Charlton Road (Route 20) at Main Street (Route 131)**

Route 20 at the Route 131 interchange consists of a split intersection with the Fairgrounds Road intersection located to the west and the Route 131 intersection located to the east. The two side roads are separated by approximately 350 feet and function as separate side street phases at the Route 20 signal. Route 20 features two lanes in each direction with EB left turns, heading into Fairgrounds Road, made from the left thru lane. U-turns are prohibited. In the WB direction there is a separate left turn lane for drivers heading south onto Route 131. The Fairgrounds approach features two lanes: a southbound right turn only lane and a left/thru lane. The Route 131 northbound approach features a single lane for left turners at the traffic signal. Right turns from Route 20 in the eastbound direction have a separate channelized right turn lane and yield to oncoming traffic. The Route 131 northbound traffic heading east on Route 20 have a similar right turn channelized lane outside the influence of the traffic signal operation. No crosswalks or pedestrian signals are present at the intersection.

### **Main Street (Route 20 at Old Sturbridge Village Road**

Route 20 at the jug handle and Stallion Hill Road intersection features two lanes on Route 20 in both directions with left turns prohibited. The southbound approach is a jug handle movement with turns from Route 20 westbound making A U—Turn



maneuver or travelling southbound onto Stallion Hill Road. Stallion Hill Road in the northbound direction forms two lanes: one for left turns and the other for right turns. The traffic signal operation features two phase operation.

### **2.1.2 Public Transportation**

No public transportation serves the proposed site.



## 2.2 Traffic Volumes

### 2.2.1 Traffic Counts

Baseline traffic conditions within the study area were developed by conducting counts along study area roadways and intersections to evaluate existing and future traffic operations. Automatic traffic recorder (ATR) counts, including volume, speed, and vehicle classification data, were collected for a 48-hour period from January 7 to January 8, 2020 along Main Street (Route 20) and adjacent to the project site. In addition, manual turning movement counts (TMCs) were collected at each study intersection during the 7:00 a.m. to 9:00 a.m. (morning) and 4:00 p.m. to 6:00 p.m. (evening) peak periods on Tuesday, January 7, 2020. Traffic to/from the existing driveway, serving the manufactured home community, were estimated based on ITE trip generation Land Use Code (LUC) 240, Mobile Home Park. These volumes were assigned to the existing driveway for the existing peak period analysis and then adjusted to 2027 No-Build and Build traffic networks.

Passenger vehicles, trucks, pedestrians and bicycles were counted as part of the intersection TMCs and are detailed in the count data contained in the appendix. 2020 Existing traffic volumes are summarized in the following sections. Detailed ATR and TMC data are included in the Appendix.

### 2.2.2 Seasonal Adjustments

Traffic on a given roadway typically fluctuates throughout the year depending on the area and the type of roadway. The functional classification along Main Street (Route 20) adjacent to the project site is Urban Other Principal Arterial. Based on the weekday seasonal factors summarized by MassDOT, thingifies that average annual volumes are approximately 3 percent higher than in the month of data collection.

The seasonal adjustment factor of 1.03 was applied to the traffic volumes to provide an average month condition. The Massachusetts Highway Department Statewide Traffic Data Collection 2017 Weekday Seasonal Factors report is in the appendix.

### 2.2.3 Existing Traffic Volumes

The Average Annual Daily Traffic (AADT) volumes along Main Street (Route 20) adjacent to the project site is given in Table 1 below. The AADT was calculated by multiplying the average daily traffic as collected by the ATRs by the seasonal adjustment factor described above.

The existing traffic volume of the Route 20, in front of the proposed site driveway, is 25,030 vehicles per day based on the calculation below.

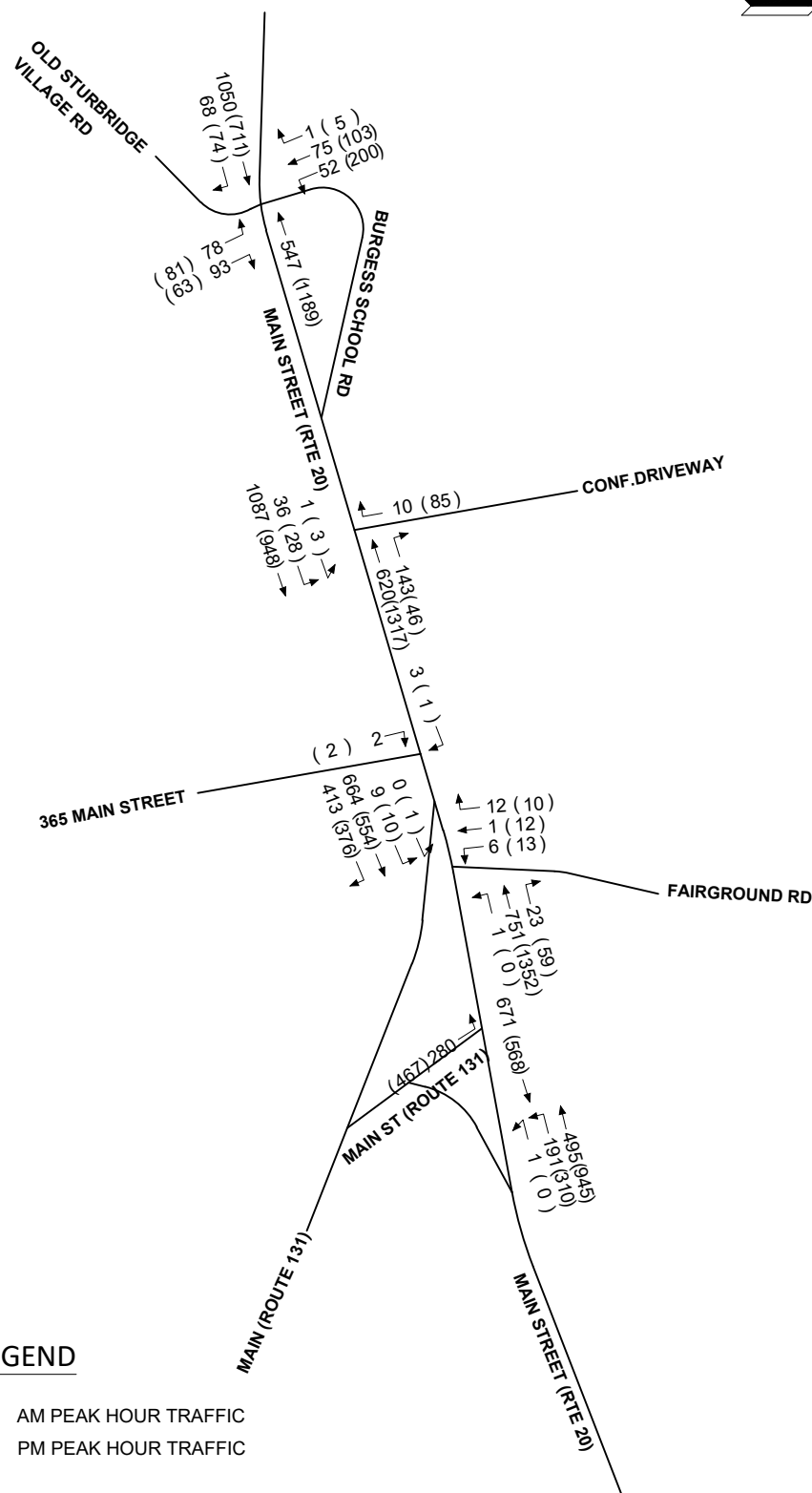
Table 1 - Existing Traffic Volumes (Seasonally adjusted)

Location	Daily Volume	Peak Hour Volume		K Factor (%)	Directional Distribution
		AM:	PM:		
Main Street (Route 20), <sup>a</sup>	24,300	1,638	2,307	6.7%	57.9% EB
				9.5%	56.9% WB
Main Street (Route 20), <sup>b</sup>	25,000	<b>1,687</b>	<b>2,376</b>	<b>6.7%</b>	<b>57.9% EB</b>
				<b>9.5%</b>	<b>56.9% WB</b>

<sup>a</sup>(ATR) counts conducted by Boston Traffic Data, average of January 7 & 8, 2020.



<sup>b</sup>(ATR) counts conducted by Boston Traffic Data, Seasonally adjusted.

The morning and evening peak hour volumes are summarized in Figure 2. TMC and ATR data are included in the report Appendix.



**LEGEND**

- 119 AM PEAK HOUR TRAFFIC
- (161) PM PEAK HOUR TRAFFIC

PREPARED FOR: 	TITLE: <b>Traffic Impact Study - Marijuana Dispensary</b> <b>365 Main Street</b> <b>Sturbridge, Massachusetts</b> <b>2020 Existing AM (PM) Peak Hour Traffic Volumes</b>	DATE: 2/13/20	SCALE: N.T.S.	<b>Figure 2</b>
		PREPARED BY:  <small>300 TRADE CENTER, SUITE 5580          WOBURN, MASSACHUSETTS 01801          PHONE: 781.933.4800</small>		

## 2.3 Vehicle Speeds

In addition to traffic volumes, vehicle speeds were collected along study area roadways to determine the average speed, 85th percentile speed, and 10 mph pace speed through the along the corridor. The 85th percentile speed is the speed at or below which 85 percent of the vehicles on a given roadway are traveling. This is typically the fundamental value in the establishment of traffic laws and the design of roadway geometrics. The 10-mph pace speed represents the 10-mph speed range at which the highest percentage of vehicles along a roadway are traveling. When the midpoint of the 10-mph pace corresponds with the average (mean) speed of the roadway, there is a uniform speed of traffic flow on a roadway and therefore increased safety. Table 2 – Roadway Speeds summarizes the average, 85th percentile, and pace speeds on Main Street (Route 20) in the vicinity of the site.

Table 2 – Roadway Speeds

Location	Direction	Posted Speed Limit	Average Speed	85th Percentile Speed	Pace Speed (%)
Main Street (Route 20)	EB	30	33.9	37.5	29-39 (75.16 %)
	WB	35	31.1	37.4	28-38 (60.88 %)

As indicated in Table 2, the 85th percentile speed on Route 20 adjacent to the project site are slightly higher than the posted speed limit in the westbound direction and significantly higher than speeds measured in the eastbound direction.

## 2.4 Safety Analysis

Collision data for the four study area intersections was obtained from MassDOT for the most recent five-year period (2013-2017). For the study area (from the intersection Main Street at Old Sturbridge Village Rd to Route 20 (Main Street) at Route 131 (Main Street)), a total of 74 crashes were recorded during the study period. A summary of the crashes at these intersections is provided in Table 3.

Table 2 - Intersection and Segment Crashes

Crashes 2013-2017	
Intersection	
Main Street at Old Sturbridge Village Rd	12
Main Street at Sturbridge Hotel & Conf. Driveway	2
Main Street at Fairground Road	26
Main Street at Route 131	27
Segment	
East of Old Sturbridge Village Rd to west of Route 131	74

To evaluate crash data effectively, the number of crashes must relate or be compared to the traffic volumes entering the intersection or traveling along the roadway. A procedure used for this purpose is the calculation of an intersection or roadway segment crash rate, which is a measure of the frequency of crashes compared to traffic volumes. Intersection crash rates are based on crashes per million entering vehicles

(C/MEV), while roadway segment crash rates are based on crashes per million vehicle miles traveled (C/MVM).

MassDOT releases official Statewide and District rates that can be used as an effective tool to compare safety hazards at a specific intersection. Table 3 shows the statewide and District 3 crash rates for signalized and unsignalized intersections as well as segment crash rates for all types of roadways.

Table 3 - MassDOT Crash Rates

	Intersection Crash Rates (C/MEV)	
	Signalized Intersection	Unsignalized Intersection
<b>Statewide</b>	0.78	0.57
<b>District 3</b>	0.89	0.61
Roadway Segment Crash Rates (C/MVM)		
<b>Urban Principal Arterial</b>	3.49	
<b>Urban Minor Arterial</b>	3.80	
<b>Urban Major Collector</b>	3.58	
<b>Local Road</b>	2.24	

2016 Average Crash Rates, per Million Vehicle Miles Traveled, by Federal Functional Classification

Crash rates higher than these averages indicate a potential safety issue. Crash summary sheets and crash rate calculation worksheets are included in the Appendix.

### 2.4.1 Intersection Crashes

Crash rates were calculated at intersections where 3 or more crashes per year were recorded. Table 4 shows the crash rates that were calculated from 2013-2017. Collision summary charts were developed for intersections with more than 3 crashes per year and are included in the appendix. These intersections were:

- **Main Street at Fairground Road**
- **Main Street at Route 131**

Table 4 - Crash Rates

Crash Rates 2013-2017	
Intersection	
Main Street at Old Sturbridge Village Rd	NA
Main Street at Sturbridge Hotel & Conf. Driveway	NA
Main Street at Fairground Road	0.65
Main Street at Route 131	0.71
Segment	
<b>East of Old Sturbridge Village Rd to west of Route 131</b>	<b>4.18</b>

*Bold = Above State/District 3 Average Rate*

**Main Street at Fairground Road** had 26 crashes in the five-year study period which equates to a rate of 0.65 C/MEV. This location had 17 rear-end crashes (65%) and 5 angle crashes (19%). Also, 24 of the crashes at this intersection occurred during the day (92%), 20 occurred with clear weather (77%) and 22 crashes occurred on



the dry pavement (85%). The crash rate at the intersection of Main Street at Fairground Road (0.65C/MEV) is below the Statewide and District 3 wide average for signalized intersections

**Main Street at Route 131** had 27 crashes in the five-year study period which equates to a rate of 0.71 C/MEV. This intersection had 16 of the crashes were rear-end (59%) and 6 were angle (22%). Also, 20 of the crashes at this intersection occurred during the day (74%), 20 occurred with clear weather (74%) and 24 crashes occurred on the dry pavement (89%). The crash rate at the intersection of Main Street at Route 131 (0.71C/MEV) is below the Statewide and District 3 wide average for signalized intersections.

The following intersections experienced less than three collisions per year over the five-year study period and crash rates well below both the district-wide and state-wide averages

**Main Street (Route 20) at Sturbridge Host Hotel**

The unsignalized intersection of Main Street (Route 20) at the Sturbridge Host Hotel has experienced, on average, 2 collisions during the most recent five-year study period of 2013 through 2017.

**Main Street at Old Sturbridge Village Road**

This signalized intersection had 12 crashes during the most recent five-year study period, averaging 2.4 crashes per year.

**2.4.2 Roadway Segment Crashes**

In addition to analyzing the crashes as intersections only, it was important to analyze the crashes as part of a road segment. Many of the crashes occurred, not because of a single intersection, but because of the characteristics that the corridor presents to motorists. A crash map and summary charts were developed for the road segment on Main Street (Route 20) from Old Sturbridge Village Rd to Route 131 (Main Street) are included in the appendix.

This less than 0.5 mile stretch of road experienced 74 recorded crashes. 15 crashes were angle (20%) and 40 crashes were rear-end collisions (54%). There were 33 rear-end crashes between Fairground Road to Route 131. Sixty of the crashes along this segment of roadway occurred during the day (81 %), 55 occurred with clear weather (74%) and 62 crashes occurred on dry pavement (84%).

Based on the analysis of crash data, the Main Street corridor safety record is dominated by crashes at the intersections where 67 of the 74 crashes were attributed to intersection's operations. The types of crashes dominated by rear-end type crashes on dry pavement and during daylight hours suggests improvements traffic signal clearance intervals should be reviewed and adjusted where necessary

## 2.5 Sight distance

In addition to evaluating traffic operations on the adjacent roadway network, sight distance at the proposed site driveway was checked to ensure safe access and egress to and from the site. Stopping sight distance (SSD) is the distance required for an approaching vehicle (with an eye height of 3.5 feet) to perceive and stop in time to avoid a collision with an object 2 feet in height in the roadway. The values are based on a perception and reaction time of 2.5 seconds and braking distance required under wet level pavements. Corner or intersection sight distance (ISD) is based on the time required to perceive, react and complete a desired exiting maneuver from a driveway once the driver decides to exit the site.

Values for ISD represent the time to turn left or right, in addition to accelerating to the operating speed of the roadway, without causing approaching vehicles to reduce speed to less than 70 percent of their initial speed. The minimum criteria are defined by the American Association of State Highway and Transportation officials (AASHTO).<sup>1</sup> As indicated by AASHTO, if the available ISD meets or exceeds the minimum SSD criteria, then there is adequate safe sight distance available for motorists to avoid collisions. A criterion for calculating minimum required sight distance can be established based on operating speed, the speed at or under which most motorists (85<sup>th</sup> percentile) actually travel along a particular portion of roadway.

Along Main Street (Route 20), near the project site the average speeds were measured to be 33 mph eastbound and 31 mph westbound, and the 85<sup>th</sup> percentile speeds were measured to be 37mph for both the eastbound and westbound directions. A median separates the eastbound and westbound sides of Route 20, so vehicles exiting the proposed site drive will only be allowed to make a right turn.

The posted speed limit along Main Street (Route 20) Road eastbound, adjacent to the project site is 30 miles per hour, requiring a minimum stopping sight distance of 200 feet. The eastbound approach of Route 20 is on a slight upgrade with a retaining wall adjacent to the new Friendly's restaurant. To be on the conservative side, the SSD and ISD analysis was performed for speeds of 40 mph, higher than the legal speed limit but recognizing the actual measured 85<sup>th</sup> percentile speeds are approaching 40 mph. A sight distance of 305 feet is desired to meet for a 40-mph roadway. The measured sight distance from the proposed driveway location, looking to the west, is approximately 350 feet, significantly greater than the desired 305 feet. A photograph of the site driveway looking toward the west to illustrate the site distance at the driveway is shown on the following page.

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<sup>1</sup> American Association of State Highway and Transportation Officials (AASHTO), [A Policy on Geometric Design of Highways and Streets](#). Washington, D.C., 2011



*Site driveway looking west along Route 20.*

### 3.0 Future Conditions and Operational Analysis

In this section, existing traffic volumes are projected to a future design year and then evaluated under alternative conditions to arrive at proposed optimal improvements.

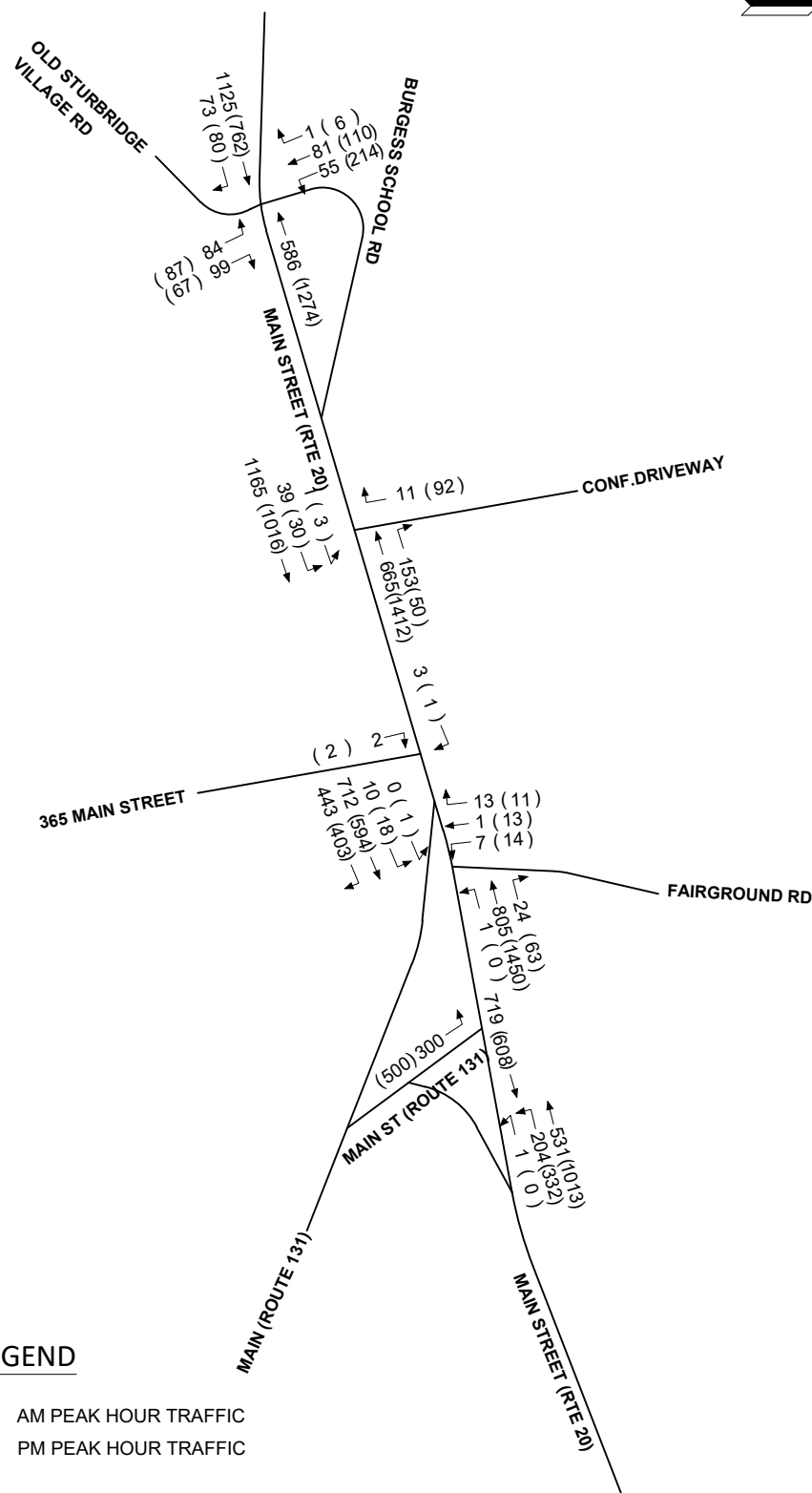
#### 3.1 Traffic Volume Projections

In order to make design improvements that will be beneficial for future growth as well as present conditions, existing traffic volumes were projected to a future design year. MassDOT TIAS guidelines require a minimum design year horizon of seven years.

To develop 2027 design year volumes, two components of traffic growth were considered. First, existing volumes are typically increased by an annual growth rate based on historical traffic volume data and/or population forecasts. Nearby MassDOT count stations indicated that 1% growth rates have been used recently for volume adjustments. Based on this information, a 1.0 percent per year compounded growth rate was selected and applied to the existing traffic volumes to develop the 2027 design year traffic volumes.

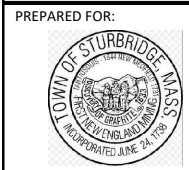
Second, additional traffic expected to be generated by planned developments within the study area was considered. WorldTech reached out to the Sturbridge Town Planner and discussed projects in the development stage or under construction that might affect the future traffic volumes in the study area. Several small projects are currently under design review or construction. However, the traffic impact to these were assumed to be accounted for within the annual growth rate established for the project.

The 2027 No Build traffic volumes are shown in Figure 3. Traffic data used to develop the annual growth rate are detailed in the report Appendix.



**LEGEND**

- 119 AM PEAK HOUR TRAFFIC
- (161) PM PEAK HOUR TRAFFIC



PREPARED FOR:  
**Traffic Impact Study - Marijuana Dispensary**  
 365 Main Street  
 Sturbridge, Massachusetts

TITLE:  
**2027 No-Build Future AM (PM) Peak Hour Traffic Volumes**

DATE: 2/13/20

SCALE: N.T.S.

PREPARED BY:  
**WORLDTECH ENGINEERING**  
 300 TRADE CENTER, SUITE 5580  
 WOBURN, MASSACHUSETTS 01801  
 PHONE: 781.933.4800

**Figure 3**



### 3.2 Project Generated Traffic

The design year 2027 Build traffic volumes for the study area roadways were determined by estimating site-generated traffic volumes for the proposed development of the site and distributing these volumes over the study area roadways. These site-generated volumes were added to the 2027 No-Build traffic volumes to create the 2027 Build traffic volume network.

Traffic volumes generated by various land uses generally follow well established patterns with respect to magnitude, duration, and temporal distribution of traffic. The Institute of Transportation Engineers (ITE) has established mathematical relationships to determine trip generation based on nationwide studies of similar types of developments. These trip generation relationships along with hourly, daily, and monthly variation factors have been standardized and grouped by Land Use Codes (LUCs) and published by ITE in *Trip Generation*, 10<sup>th</sup> Edition.

For this project, the ITE trip generation methodology for LUC 882, Marijuana Dispensary, would result in 21.83 trips per 1,000 gross square feet of building size in the PM peak hour with 50% entering and 50% exiting. The resultant number of PM peak hour trips, using the ITE LUC 882, would produce 28 trips entering and 29 trips exiting. Since the dispensary is closed during the morning peak, no trip generation estimates were prepared for the morning build analysis.

Since the dispensary will require appointments, an alternative estimate of the number of PM peak trips was prepared based on the number of sales stations using a 10-minute window for each transaction. Using appointments will essentially provide a maximum rate. A maximum PM peak rate was calculated utilizing 6 appointments per sales station, times twelve stations for a total of 72 customers per hour. That would translate into approximately 72 trips entering and 72 trips exiting the site during the peak hour. Using the appointments to determine the number of peak hour trips results in a very conservative estimate of new trips.

Since the operation of the dispensary will be by appointments only, no discount was applied for pass-by trips or for trips made by more than one customer arriving in the same car. For trip generation and parking requirements, a single occupant car is assumed resulting in a conservative estimate of the number of vehicles entering and parking at the site.

The health club portion of the development is expected to generate 8 trips (5 entering and 3 exiting) in the PM peak hour based on ITE's LUC 492, Health/fitness Club. Since the forecast trips from the marijuana dispensary were significantly higher (144 vs 57) than those predicted by ITE, these trips were considered incidental to the overall trip generation estimates prepared for the site.

Since the dispensary is NOT open during the morning peak hour, an analysis of the weekday AM peak hour was not included in this TIAS.

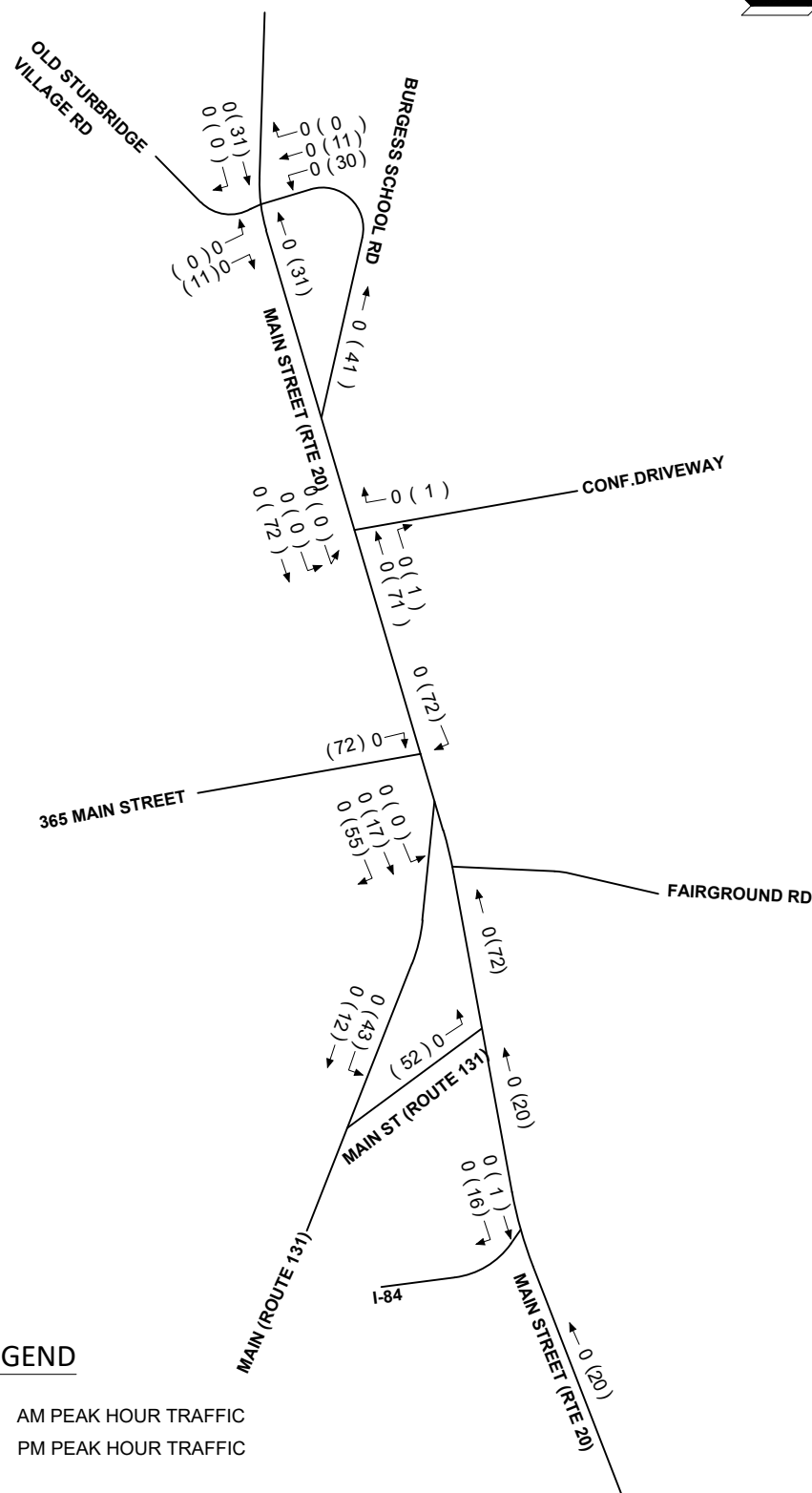
### 3.3 Trip Distribution and Assignment

The additional traffic generated by the proposed development was then distributed on the study area roadways. The vehicles generated by the proposed development are expected to be distributed on study area roadways based on expected travel routes to and from the site and existing traffic patterns through the study area. The location of other competing marijuana dispensaries was reviewed as well to establish the trip distribution patterns selected. Please note that the trips leaving the site that were assigned to I-84 to the south were assigned a different route than trips entering the site from I-84 due to the geometry of the Route 20/Route 131 interchange preventing certain turning movements.

Table 5. TRIP DISTRIBUTION SUMMARY



To/From-Direction	Distribution
Charlton Road (Route 20)-East	2%
Main Street (Route 20)-West	43%
Main Street (Route 131)-South	17%
I-84-South	22%
Stallion Hill Road-Southwest	11%

This distribution was applied to the site generated traffic. The anticipated net project generated trips are shown in Figure 4.



**LEGEND**

- 119 AM PEAK HOUR TRAFFIC
- (161) PM PEAK HOUR TRAFFIC

PREPARED FOR: 	TITLE: <b>Traffic Impact Study - Marijuana Dispensary</b> <b>365 Main Street</b> <b>Sturbridge, Massachusetts</b>  2027 AM (PM) Peak Hour Site Traffic Volumes	DATE: 2/13/20	SCALE: N.T.S.	<b>Figure 4</b>
		PREPARED BY:  <small>300 TRADE CENTER, SUITE 5580          WOBURN, MASSACHUSETTS 01801          PHONE: 781.933.4800</small>		

The site-generated traffic volumes were added to the 2027 No-Build peak hour traffic volumes to develop the 2027 Build peak hour traffic volume conditions. The 2027 Build weekday morning, and weekday evening, peak hour conditions are presented in Figure 5.

### 3.4 Parking Generation

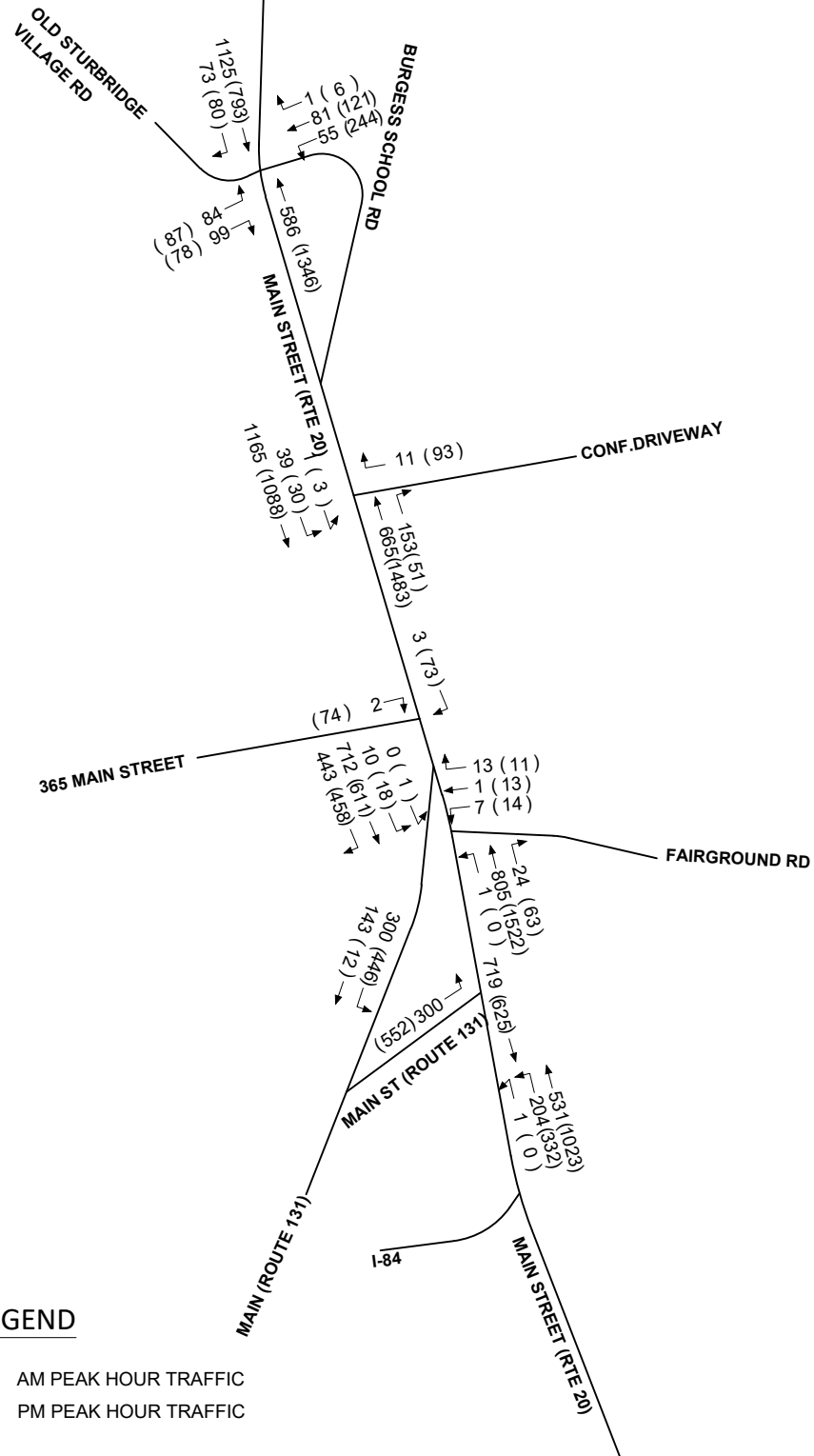
In order to accurately estimate the parking demand for the proposed marijuana dispensary/Health Club, WorldTech examined the zoning requirements for the Town of Sturbridge, and data from the Institute of Transportation Engineers (ITE) *Parking Generation Manual*.<sup>2</sup> The ITE peak parking demand rate for a retail marijuana dispensary is 7.19 spaces per 1000 SF on a weekday. This would translate into a requirement for 19 parking spaces for the proposed marijuana dispensary. It is not clear if the ITE trip rates included both dispensaries that featured appointments only or were open without restrictions. By allowing a maximum of twelve appointments every ten minutes, the 19 parking spaces would allow for some overlap in customers arriving early or leaving late to find a parking space.

An additional 12-14 spaces are needed to accommodate employees according to the owners of the proposed development. The health club is projected to need 10 spaces based on the town's zoning requirements for health clubs which includes one parking space for every 4 occupants. It should be noted that the peak parking demand for a marijuana dispensary is the early afternoon when the health club is not operating. Therefore, the peak demand for parking, which would occur at approximately 2 PM, would include the 19 spaces for the marijuana customers and 14 spaces for employees.

A second calculation was performed to represent the parking demand during the afternoon peak, when the marijuana dispensary and the health club are both open and operating. In this case, ITE reports that parking demand at a marijuana dispensary is approximately 85% of the peak demand. That would result in a parking demand of 16 vehicles. Adding the 14 employee spaces and the 10 health club spaces, results in a peak demand of 40 spaces. The proposed site plan for the marijuana dispensary/health club at 365 Main Street will provide 47 spaces.



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<sup>2</sup> Institute of Transportation engineers, *Parking Generation Manual*, 5<sup>th</sup> Edition, Washington, D.C., 2019



**LEGEND**

119 (161) — AM PEAK HOUR TRAFFIC (PM PEAK HOUR TRAFFIC)

PREPARED FOR: 	TITLE: <b>Traffic Impact Study - Marijuana Dispensary</b> <b>365 Main Street</b> <b>Sturbridge, Massachusetts</b>  <b>2027 Build Future AM (PM) Peak Hour Traffic Volumes</b>	DATE: 2/13/20	SCALE: N.T.S.	<b>Figure 5</b>
		PREPARED BY:  <small>300 TRADE CENTER, SUITE 5580          WOBURN, MASSACHUSETTS 01801          PHONE: 781.933.4800</small>		



## 3.5 Capacity Analysis

### 3.5.1 Capacity Analysis Methodology

The capacity analysis methodology is based on the concepts and procedures described in the 2010 Highway Capacity Manual (HCM), Transportation Research Board, Washington, DC. A capacity analysis is used to assess the quality of traffic operations on a roadway or intersection as a result of traffic volume demands placed on the respective facility. The primary result of a capacity analysis is a level of service (LOS) assignment to the traffic operations of the respective facility. A LOS analysis results in assigning a letter index of A through F to describe the quality of traffic operations at a facility in terms of such factors as speed, traffic interruptions, freedom to maneuver, comfort, convenience and safety. The six letter designations of A through F define the operating conditions from best to worst, respectively. In general, a LOS C is used as the minimum design criteria although D is acceptable at urban, high volume locations.

LOS for either signalized or unsignalized intersections can be computed by the methodology described below. LOS for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption and lost travel time. The delay experienced by a motorist is made of factors that relate to intersection control, geometrics and traffic volumes. This delay is called “control delay” or “signal delay”. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. Specifically, LOS criteria at an intersection with traffic signals are stated in terms of the average control delay per vehicle.

The LOS for an unsignalized intersection (yield, stop) is defined for each minor movement, not for the intersection as a whole. The LOS criteria for the unsignalized intersections are somewhat different from the criteria for the signalized intersections. The primary reason for the difference is that motorists expect different levels of performance from the two facilities. Due to these expectations, the control delay threshold for any given LOS is less for an unsignalized intersection than it is for a signalized intersection. Table 6 below summarizes the LOS criteria associated with the letter index and the relationship between level of service and average control delay for signalized and unsignalized intersections.

Table 6 - Intersection Level of Service Criteria

Level of Service	Average Stopped Delay per Vehicle (seconds)	
	Signalized Intersection	Unsignalized Intersection
A	0 - 10	0 - 10
B	>10 - 20	>10 - 15
C	>20 - 35	>15 - 25
D	>35 - 55	>25 - 35
E	>55 - 80	>35 - 50
F	>80	>50

2010 Highway Capacity Manual, Transportation Research Board, Washington, DC

The LOS delay criteria may be applied to individual lane groups, to individual intersection approaches or to the entire signalized or unsignalized intersections.

### 3.5.2 Level of Service Analysis

Level of Service (LOS) analysis was performed at the following intersections:

- Route 20 at Site Drive.
- Route 20 at Sturbridge Host Hotel
- Route 20 at Fairgrounds Road.
- Route 20 at Route 131
- Route 20 at Old Sturbridge Village Road

Analysis is based on the 2010 Highway Capacity Manual (HCM) using Synchro version 9 software.

The results of the capacity analysis are discussed and tabulated below. Detailed traffic analyses are provided in the Appendix.

### 3.5.3 Capacity Analysis with Existing Geometry & Future No-Build Condition

Unsignalized Intersections

#### Route 20 at Site Drive (365 Main Street)

At Route 20 / Site Drive intersection, the LOS for the driveway is well under capacity with no queuing present. The LOS for the exiting drive, making a right turn, is B in the morning and afternoon peak hour under both existing and future no build conditions. Average delays are expected to be in the 13 second range for drivers leaving the site and making a right turn.

#### Route 20 at Sturbridge Host Hotel Drive

At Route 20 / Sturbridge Host Hotel Drive intersection, the LOS of each approaches are well under capacity with no queuing present. Delays for eastbound left turners on Route 20 and Hotel traffic making a right turn to enter Route 20 are minor in nature.

## Signalized Intersections

### **Route 20 at Fairgrounds Road**

At Route 20 /Fairgrounds Road intersection, the overall LOS for this intersection is B in both morning and afternoon peak hour under both existing and future No Build conditions. The AM and PM peak hour shows the volume-to-capacity (v/c) ratio will be well below 1.00, indicating there will be ample capacity to accommodate the anticipated traffic volumes.

### **Route 20 at Route 131**

At the Route 20/ Route 131 intersection, the overall LOS for this intersection is C in the AM peak and D in the PM peak. V/C ratios are well below 1.00, indicating there is sufficient capacity to accommodate the anticipated traffic volumes, with one exception the Route 20 westbound left turn has been calculated to have a V/C ratio of 1.24 in the weekday AM peak hour under existing conditions and a V/C ratio of 1.34 in the weekday PM peak hour under No Build conditions. These analyses assume no improvements were made to the intersection to mitigate the increased traffic due to normal growth at the intersection. Mitigation measures for this intersection will be discussed in the Build portion of the TIAS.

### **Route 20 at Old Sturbridge Village Road**

At Route 20 /Old Sturbridge Village Road intersection, the overall LOS for this intersection is B in both morning and afternoon peak hour under both existing and future No Build conditions. The AM and PM peak hour shows the volume-to-capacity (v/c) ratio will be well below 1.00, indicating there will be ample capacity to accommodate the anticipated traffic volumes.

A summary of the existing and No Build traffic conditions is shown in Table 7.

Table 7 - Intersection Level of Service Summary

Intersection/ Peak Period/Movement	2020 Existing Conditions				2027 No-Build Conditions			
	v/c <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>e</sup> 50 <sup>th</sup> /95 <sup>th</sup>	v/c <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>e</sup> 50 <sup>th</sup> /95 <sup>th</sup>
<b>Main Street at Old Sturbridge Village Road</b>								
<i>Weekday Morning Peak Hour:</i>								
Main Street EB TR	0.60	9.3	A	174/234	0.63	9.5	A	194/261
Main Street WB L	0.29	7.0	A	67/96	0.31	6.9	A	74/104
Old Sturbridge Village Rd NB L	0.27	20.0	B	24/64	0.30	21.1	C	28/68
Old Sturbridge Village Rd NB R	0.13	18.9	B	8/44	0.18	20.1	C	15/53
Old Sturbridge Village Rd SB L	0.14	19.0	B	16/45	0.15	19.9	B	18/47
Old Sturbridge Village Rd SB TR	0.19	19.3	B	23/59	0.21	20.3	C	27/63
<b>Overall</b>	<b>0.51</b>	<b>10.2</b>	<b>B</b>		<b>0.54</b>	<b>10.4</b>	<b>B</b>	
<i>Weekday Evening Peak Hour:</i>								
Main Street EB TR	0.47	10.6	B	103/143	0.49	10.5	B	114/156
Main Street WB L	0.72	13.8	B	193/258	0.75	14.2	B	216/289
Old Sturbridge Village Rd NB L	0.23	17.2	B	27/66	0.25	18.4	B	33/70
Old Sturbridge Village Rd NB R	0.04	16.0	B	0/27	0.05	17.0	B	0/28
Old Sturbridge Village Rd SB L	0.40	18.4	B	71/139	0.44	19.8	B	85/149
Old Sturbridge Village Rd SB TR	0.20	17.0	B	35/78	0.23	18.1	B	42/83
<b>Overall</b>	<b>0.60</b>	<b>13.5</b>	<b>B</b>		<b>0.64</b>	<b>13.8</b>	<b>B</b>	
<b>Main Street at Sturbridge Hotel &amp; Conf. Driveway</b>								
<i>Weekday Morning Peak Hour:</i>								
Main Street EB L	0.05	9.4	A	4	0.05	9.6	A	4
Sturbridge Hotel & Conf. Driveway SB R	0.22	9.8	A	1	0.24	9.9	A	1
<i>Weekday Evening Peak Hour:</i>								
Main Street EB L	0.07	12.4	B	5	0.08	13.2	B	6
Sturbridge Hotel & Conf. Driveway SB R	0.31	10.4	B	10	0.33	10.2	B	11
<b>Main Street at Project Location (365 Main Street)</b>								
<i>Weekday Morning Peak Hour:</i>								
365 Main Street R	0.00	13.1	B	0	0.00	13.6	B	0
<i>Weekday Evening Peak Hour:</i>								
365 Main Street R	0.00	12.2	B	0	0.00	12.6	B	0
<b>Main Street at Fairground Road</b>								
<i>Weekday Morning Peak Hour:</i>								
Main Street EB LT	0.49	21.4	C	166/241	0.54	23.0	C	194/269
Main Street EB R	0.43	20.8	C	72/173	0.48	22.5	C	98/208
Main Street WB TR	0.34	1.2	A	1/0	0.36	1.0	A	1/0
Fairground Road SB LT	0.05	44.9	D	5/21	0.06	45.7	D	6/22
Fairground Road SB R	0.01	44.7	D	0/0	0.01	45.4	D	0/0
<b>Overall</b>	<b>0.41</b>	<b>13.2</b>	<b>B</b>		<b>0.44</b>	<b>14.1</b>	<b>B</b>	
<i>Weekday Evening Peak Hour:</i>								
Main Street EB LT	0.48	25.7	C	159/222	0.54	27.0	C	177/250
Main Street EB R	0.39	24.7	C	63/154	0.44	25.6	C	81/184
Main Street WB TR	0.60	1.5	A	2/0	0.65	1.6	A	2/0
Fairground Road SB LT	0.18	50.7	D	19/49	0.19	50.5	D	21/51
Fairground Road SB R	0.01	49.4	D	0/0	0.01	49.2	D	0/0
<b>Overall</b>	<b>0.59</b>	<b>11.6</b>	<b>B</b>		<b>0.64</b>	<b>12.1</b>	<b>B</b>	

Intersection/ Peak Period/Movement	2020 Existing Conditions				2027 No-Build Conditions			
	v/c <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>e</sup> 50 <sup>th</sup> /95 <sup>th</sup>	v/c <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>e</sup> 50 <sup>th</sup> /95 <sup>th</sup>
<b>Main Street at Route 131</b>								
<i>Weekday Morning Peak Hour:</i>								
Main Street EB T	0.43	9.8	A	210/294	0.46	10.1	B	242/324
Main Street WB L	0.70	49.7	D	138/#259	0.76	55.1	E	155/#290
Main Street WB T	0.34	19.6	B	112/167	0.37	20.8	C	130/186
Route 131 NB L	0.47	39.5	D	96/143	0.48	39.7	D	105/155
<b>Overall</b>	<b>0.56</b>	<b>22.5</b>	<b>C</b>		<b>0.60</b>	<b>23.7</b>	<b>C</b>	
<i>Weekday Evening Peak Hour:</i>								
Main Street EB T	0.40	10.6	B	0/257	0.42	10.3	B	212/281
Main Street WB L	1.24	184.4	F	~314/#520	1.34	224.4	F	~352/#570
Main Street WB T	0.71	30.3	C	299/396	0.76	32.3	C	331/442
Route 131 NB L	0.58	38.9	D	172/238	0.62	40.1	D	186/259
<b>Overall</b>	<b>0.77</b>	<b>48.1</b>	<b>D</b>		<b>0.82</b>	<b>54.5</b>	<b>D</b>	

<sup>a</sup>Volume to Capacity Ratio; <sup>b</sup>Average Delay Time in Seconds; <sup>c</sup>Level-of-Service; <sup>d</sup>Queue Length in Feet.

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound.

L = Left Turn; T = Through; R = Right Turn; LT = Shared Left-turn/Thorough; TR Shared Through/Right-turn;

LR = Shared Left/Right-turn; LTR = Shared Left/Through/Right-turn.

# - 95th percentile volume exceeds capacity; reported queues may not be accurate



### 3.5.4 Traffic Operations Build conditions

To effectively assess the impacts of proposed site traffic on the study area roadway network, the Synchro capacity analyses previously analyzed for existing and Future No-Build conditions were updated to with the addition of Project related traffic (Build conditions). The results are shown in Table 9 below. To provide a direct comparison with Future Build Conditions, Future No-Build results are repeated in Table 6. It should be noted that the AM peak hour Build analysis were not repeated due to the fact that the marijuana dispensary is not open during the morning peak hour and the health club operation results in a negligible ( 5 vehicles entering and 3 vehicles exiting) amount of traffic to study area intersections.

### 3.5.5 Future No-Build vs. Future Build Analysis

- Unsignalized Intersections

#### Route 20 at Site Drive (365 Main Street)

At Route 20 / Site Drive intersection, the LOS for the exiting drive, making a right turn, will remain a B in the morning and afternoon peak hour under future Build conditions, with delays increasing from 12.6 seconds to 14.7 seconds.

#### Route 20 at Sturbridge Host Hotel Drive

At Route 20 / Sturbridge Host Hotel Drive intersection, the LOS of each approaches will remain under capacity with no queuing present. Delays for eastbound left turners on Route 20 and Hotel traffic making a right turn to enter Route 20 increased approximately by 1 second and will result in no measurable impact to the intersection.

- Signalized Intersections

#### Route 20 at Fairgrounds Road

At Route 20 /Fairgrounds Road intersection, the overall LOS for this intersection will remain a B in both morning and afternoon peak hour under future Build conditions. The AM and PM peak hour shows the volume-to-capacity (v/c) ratio will continue to be below 1.00, indicating there will be ample capacity to accommodate the anticipated traffic volumes and result in no measurable impact to the intersection.

#### Route 20 at Route 131

At the Route 20/ Route 131 intersection, the overall LOS for this intersection under Build conditions will remain a D for PM peak. V/C ratios are well below 1.00 in the Build condition, indicating there is sufficient capacity to accommodate the anticipated background growth in traffic volumes, and will continue to offer a LOS D in the PM Build peak hour with a significant reduction in delays. The improvement in traffic operations at this intersection is due to a retiming of the

traffic signal with a lower cycle length and associated green times. The Route 20 westbound left turn has been calculated to have a V/C ratio of 1.34 in the weekday PM peak hour under No Build conditions and will be reduced to a V/C ratio of 0.92, with the approach now under the capacity.

**Route 20 at Old Sturbridge Village Road**

At Route 20 /Old Sturbridge Village Road intersection, the overall LOS for this intersection will remain at a B in both morning and afternoon peak hour under future Build conditions. The AM and PM peak hour shows the volume-to-capacity (v/c) ratio will be well below 1.00, indicating there will be ample capacity to accommodate the anticipated traffic volumes. Overall delays to the intersection are expected to increase by approximately 1 second and result in no measurable impact to the intersection.

Table 8 - Intersection Level of Service Summary with Improvements

Intersection/ Peak Period/Movement	2027 No-Build Conditions				2027 Build Conditions			
	v/c <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>e</sup> 50 <sup>th</sup> /95 <sup>th</sup>	v/c <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue 50 <sup>th</sup> /95 <sup>th</sup>
<b>Main Street at Old Sturbridge Village Road</b>								
<i>Weekday Morning Peak Hour:</i>								
Main Street EB TR	0.63	9.5	A	194/261				
Main Street WB L	0.31	6.9	A	74/104				
Old Sturbridge Village Rd NB L	0.30	21.1	C	28/68				
Old Sturbridge Village Rd NB R	0.18	20.1	C	15/53				
Old Sturbridge Village Rd SB L	0.15	19.9	B	18/47				
Old Sturbridge Village Rd SB TR	0.21	20.3	C	27/63				
<b>Overall</b>	<b>0.54</b>	<b>10.4</b>	<b>B</b>					
<i>Weekday Evening Peak Hour:</i>								
Main Street EB TR	0.49	10.5	B	114/156	0.47	8.0	A	96/164
Main Street WB L	0.75	14.2	B	216/289	0.73	11.1	B	191/317
Old Sturbridge Village Rd NB L	0.25	18.4	B	33/70	0.32	20.1	C	33/70
Old Sturbridge Village Rd NB R	0.05	17.0	B	0/28	0.05	18.3	B	0/30
Old Sturbridge Village Rd SB L	0.44	19.8	B	85/149	0.63	24.3	C	100/170
Old Sturbridge Village Rd SB TR	0.23	18.1	B	42/83	0.31	19.8	B	47/90
<b>Overall</b>	<b>0.64</b>	<b>13.8</b>	<b>B</b>		<b>0.70</b>	<b>12.2</b>	<b>B</b>	
<b>Main Street at Sturbridge Hotel &amp; Conf. Driveway</b>								
<i>Weekday Morning Peak Hour:</i>								
Main Street EB L	0.05	9.6	A	4				
Sturbridge Hotel & Conf. Driveway SB R	0.24	9.9	A	1				
<i>Weekday Evening Peak Hour:</i>								
Main Street EB L	0.08	13.2	B	6	0.08	13.4	B	6
Sturbridge Hotel & Conf. Driveway SB R	0.33	10.2	B	11	0.35	10.9	B	12
<b>Main Street at Project Location (365 Main Street)</b>								
<i>Weekday Morning Peak Hour:</i>								
365 Main Street R	0.00	13.6	B	0				
<i>Weekday Evening Peak Hour:</i>								
365 Main Street R	0.00	12.6	B	0	0.18	14.7	B	16
<b>Main Street at Fairground Road</b>								
<i>Weekday Morning Peak Hour:</i>								
Main Street EB LT	0.54	23.0	C	194/269				
Main Street EB R	0.48	22.5	C	98/208				
Main Street WB TR	0.36	1.0	A	1/0				
Fairground Road SB LT	0.06	45.7	D	6/22				
Fairground Road SB R	0.01	45.4	D	0/0				
<b>Overall</b>	<b>0.44</b>	<b>14.1</b>	<b>B</b>					
<i>Weekday Evening Peak Hour:</i>								
Main Street EB U	0.54	27.0	C	177/250	0.26	20.0	C	7/26
Main Street EB LT					0.90	40.2	D	305/451
Main Street EB R	0.44	25.6	C	81/184	0.58	22.8	C	105/203
Main Street WB TR	0.65	1.6	A	2/0	0.72	1.6	A	1/m10
Fairground Road SB LT	0.19	50.5	D	21/51	0.24	40.9	D	16/44
Fairground Road SB R	0.01	49.2	D	0/0	0.01	39.2	D	0/0
<b>Overall</b>	<b>0.64</b>	<b>12.1</b>	<b>B</b>		<b>0.81</b>	<b>14.6</b>	<b>B</b>	

Intersection/ Peak Period/Movement	2027 No-Build Conditions				2027 Build Conditions			
	v/c <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>e</sup> 50 <sup>th</sup> /95 <sup>th</sup>	v/c <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>e</sup> 50 <sup>th</sup> /95 <sup>th</sup>
<b>Main Street at Route 131</b>								
<i>Weekday Morning Peak Hour:</i>								
Main Street EB T	0.46	10.1	B	242/324				
Main Street WB L	0.76	55.1	E	155/#290				
Main Street WB T	0.37	20.8	C	130/186				
Route 131 NB L	0.48	39.7	D	105/155				
<b>Overall</b>	<b>0.60</b>	<b>23.7</b>	<b>C</b>					
<i>Weekday Evening Peak Hour:</i>								
Main Street EB T	0.42	10.3	B	212/281	0.47	9.1	A	156/151
Main Street WB L	1.34	224.4	F	~352/#570	0.92	60.1	E	202/#366
Main Street WB T	0.76	32.3	C	331/442	0.80	27.3	C	252/324
Route 131 NB L	0.62	40.1	D	186/259	0.98	68.9	E	~177/#286
<b>Overall</b>	<b>0.82</b>	<b>54.5</b>	<b>D</b>		<b>0.89</b>	<b>36.2</b>	<b>D</b>	

<sup>a</sup>Volume to Capacity Ratio; <sup>b</sup>Average Delay Time in Seconds; <sup>c</sup>Level-of-Service; <sup>d</sup>Queue Length in Feet.

NB = Northbound; SB = Southbound; EB = Eastbound; WB = Westbound.

L = Left Turn; T = Through; R = Right Turn; LT = Shared Left-turn/Through; TR Shared Through/Right-turn;

LR = Shared Left/Right-turn; LTR = Shared Left/Through/Right-turn.

# - 95th percentile volume exceeds capacity; reported queues may not be accurate

## 4.0 Conclusion and Recommendations

### 4.1 Conclusions

World Tech has completed a detailed assessment of the potential impacts on the transportation infrastructure associated with the proposed construction of a 2,592 square foot marijuana dispensary and 2,400 square foot health club to be located at 365 Main street in Sturbridge, Massachusetts. Based on this assessment, we have concluded the following with respect to the Project:

1. Using the trip generation statistics published by ITE for a similar land use as that proposed, the project is expected to generate approximately 655 (323 in/ 323 out) new vehicle trips on an average weekday (two-way, 24-hour volume), with approximately 57 vehicle trips (28 in/ 29 out) expected during the weekday evening peak-hour. The proposed operation of the marijuana dispensary will be by appointment only with twelve sales stations available for customers. Based on a maximum appointment-based sales operation and a ten-minute window allowed for each appointment, a maximum of 72 customers would be able to be serviced during any hour. To provide a conservative estimate of traffic impacts to study area intersections, 72 trips entering and 72 trips exiting the site were used in our traffic operations analyses.
2. The project was shown to result in no measurable impacts on operating conditions (motorist delays or vehicle queuing) along study area roadways and at study area intersections over existing and anticipated future conditions with the Project. At one location, Route 20 at the Route 131 interchange intersection, traffic signal timing changes are recommended for the PM peak.;
3. Parking demand was estimated by using data from ITE's new Parking Generation Manual which recommends a marijuana dispensary should provide 19 parking spaces to meet the demand of 2,592 square foot marijuana dispensary and 12-14 spaces for employees. An additional 10 spaces would be required for the Health club. The site will provide 47 spaces on-site with an additional parking available in the trailer park. It should be noted that the peak parking demand for a marijuana dispensary is the early afternoon when the health club is not in operation, which means the 47 spaces would be adequate for the site.
4. All movements along Main Street at the project site driveway were shown to operate at an adequate level-of-service during the PM peak period.
5. No safety deficiencies were noted with respect to the motor vehicle crash history at the study area intersections; and
6. Lines of sight to and from the project site driveways intersections with Main Street exceed the required minimum sight distance requirements to function as a safe and efficient manner based on a 40-mph approach speed along Main Street.



7. Police details will be provided for during the early opening dates of the facility to manage traffic operations during a break in period.

#### 4.2 Recommendations

Access to the project site will be provided by way of single existing/proposed driveways that will intersect Main Street. The following recommendations are offered with respect to the design and operation of the project site driveway:

- The project site driveways should be a minimum of 24-feet in width and accommodate two-way travel, with vehicles exiting the Project site placed under stop control.
- The traffic signals at the Route 20/Route 131 Interchange should be retimed. The retiming of the signal will involve reducing the cycle length from 122 seconds to 90 seconds and reducing the Fairgrounds Road green time while increasing the Route 131 off ramp green time.
- All signs and pavement markings to be installed within the project site shall conform to the applicable standards of the Manual on Uniform Traffic Control Devices (MUTCD)
- Signs or landscaping along the Project site driveways internal to the project site and at their intersections with Main Street should be designed and maintained so as not to restrict lines of sight.

## 5.0 Appendices

## 5.1 Traffic Volume Counts & Field Data



Map Credit: Google.com

<b>BOSTON</b> TRAFFIC DATA	BTD ID: 409_050_WT	Sturbridge, MA	# of TMC's: 04	Client: WorldTech Engineering
		Collected on January 7 to 8, 2020	# of ATR's: 02	Contact: Rodney Emery

# Volume Report

**Job** 409\_050\_WT\_ATR 1 (EB)  
**Area** Sturbridge, MA  
**Location** Route 20 Eastbound, between Sturbridge Host Hotel & Conference Center Driveway



PO BOX 1723, Framingham, MA 01701  
 Office: 978-746-1259  
 DataRequest@BostonTrafficData.com  
 www.BostonTrafficData.com

Tuesday, January 7, 2020

Time	Total	EB				Time	Total	EB				
0000	13	13		0		1200	199	199		0		
0015	5	5		0		1215	187	187		0		
0030	6	6		0		1230	167	167		0		
0045	6	30	6	30	0	1245	176	729	176	729	0	0
0100	2		2		0	1300	178		178		0	
0115	8		8		0	1315	202		202		0	
0130	2		2		0	1330	188		188		0	
0145	4	16	4	16	0	1345	210	778	210	778	0	0
0200	6		6		0	1400	244		244		0	
0215	12		12		0	1415	232		232		0	
0230	8		8		0	1430	243		243		0	
0245	13	39	13	39	0	1445	208	927	208	927	0	0
0300	3		3		0	1500	227		227		0	
0315	6		6		0	1515	228		228		0	
0330	18		18		0	1530	264		264		0	
0345	14	41	14	41	0	1545	244	963	244	963	0	0
0400	16		16		0	1600	202		202		0	
0415	26		26		0	1615	252		252		0	
0430	44		44		0	1630	242		242		0	
0445	63	149	63	149	0	1645	193	889	193	889	0	0
0500	69		69		0	1700	214		214		0	
0515	105		105		0	1715	211		211		0	
0530	114		114		0	1730	162		162		0	
0545	126	414	126	414	0	1745	168	755	168	755	0	0
0600	164		164		0	1800	169		169		0	
0615	192		192		0	1815	124		124		0	
0630	205		205		0	1830	120		120		0	
0645	241	802	241	802	0	1845	105	518	105	518	0	0
0700	220		220		0	1900	100		100		0	
0715	247		247		0	1915	101		101		0	
0730	254		254		0	1930	94		94		0	
0745	270	991	270	991	0	1945	86	381	86	381	0	0
0800	231		231		0	2000	75		75		0	
0815	232		232		0	2015	61		61		0	
0830	260		260		0	2030	56		56		0	
0845	215	938	215	938	0	2045	68	260	68	260	0	0
0900	181		181		0	2100	72		72		0	
0915	184		184		0	2115	71		71		0	
0930	165		165		0	2130	53		53		0	
0945	165	695	165	695	0	2145	49	245	49	245	0	0
1000	134		134		0	2200	41		41		0	
1015	186		186		0	2215	34		34		0	
1030	152		152		0	2230	30		30		0	
1045	172	644	172	644	0	2245	21	126	21	126	0	0
1100	171		171		0	2300	29		29		0	
1115	179		179		0	2315	15		15		0	
1130	178		178		0	2330	9		9		0	
1145	174	702	174	702	0	2345	7	60	7	60	0	0
<b>Total</b>	<b>12092</b>		<b>12092</b>		<b>0</b>						<b>0</b>	

# Volume Report

**Job** 409\_050\_WT\_ATR 1 (EB)  
**Area** Sturbridge, MA  
**Location** Route 20 Eastbound, between Sturbridge Host Hotel & Conference Center Driveway



PO BOX 1723, Framingham, MA 01701  
 Office: 978-746-1259  
 DataRequest@BostonTrafficData.com  
 www.BostonTrafficData.com

Wednesday, January 8, 2020

Time	Total	EB				Time	Total	EB				
0000	6	6		0		1200	185	185		0		
0015	12	12		0		1215	161	161		0		
0030	5	5		0		1230	144	144		0		
0045	7	30	7	30	0	1245	162	652	162	652	0	0
0100	8		8		0	1300	174		174		0	
0115	4		4		0	1315	185		185		0	
0130	5		5		0	1330	168		168		0	
0145	4	21	4	21	0	1345	149	676	149	676	0	0
0200	11		11		0	1400	204		204		0	
0215	9		9		0	1415	213		213		0	
0230	10		10		0	1430	220		220		0	
0245	10	40	10	40	0	1445	174	811	174	811	0	0
0300	9		9		0	1500	227		227		0	
0315	9		9		0	1515	215		215		0	
0330	16		16		0	1530	300		300		0	
0345	18	52	18	52	0	1545	282	1024	282	1024	0	0
0400	22		22		0	1600	230		230		0	
0415	22		22		0	1615	174		174		0	
0430	33		33		0	1630	229		229		0	
0445	41	118	41	118	0	1645	203	836	203	836	0	0
0500	47		47		0	1700	223		223		0	
0515	98		98		0	1715	186		186		0	
0530	97		97		0	1730	178		178		0	
0545	105	347	105	347	0	1745	157	744	157	744	0	0
0600	142		142		0	1800	151		151		0	
0615	140		140		0	1815	143		143		0	
0630	164		164		0	1830	111		111		0	
0645	193	639	193	639	0	1845	148	553	148	553	0	0
0700	202		202		0	1900	114		114		0	
0715	233		233		0	1915	91		91		0	
0730	233		233		0	1930	96		96		0	
0745	237	905	237	905	0	1945	89	390	89	390	0	0
0800	237		237		0	2000	91		91		0	
0815	203		203		0	2015	95		95		0	
0830	218		218		0	2030	84		84		0	
0845	183	841	183	841	0	2045	77	347	77	347	0	0
0900	152		152		0	2100	63		63		0	
0915	165		165		0	2115	78		78		0	
0930	140		140		0	2130	38		38		0	
0945	148	605	148	605	0	2145	41	220	41	220	0	0
1000	154		154		0	2200	40		40		0	
1015	142		142		0	2215	31		31		0	
1030	168		168		0	2230	17		17		0	
1045	175	639	175	639	0	2245	26	114	26	114	0	0
1100	167		167		0	2300	28		28		0	
1115	168		168		0	2315	12		12		0	
1130	125		125		0	2330	5		5		0	
1145	141	601	141	601	0	2345	9	54	9	54	0	0
<b>Total</b>	<b>11259</b>		<b>11259</b>		<b>0</b>							



# Volume Report

**Job** 409\_050\_WT\_ATR 1 (WB)  
**Area** Sturbridge, MA  
**Location** Route 20 Westbound, between Sturbridge Host Hotel & Conference Center Driveway



PO BOX 1723, Framingham, MA 01701  
 Office: 978-746-1259  
 DataRequest@BostonTrafficData.com  
 www.BostonTrafficData.com

**Tuesday, January 7, 2020**

Time	Total	WB				Time	Total	WB					
0000	19	19		0		1200	225	225		0			
0015	17	17		0		1215	215	215		0			
0030	16	16		0		1230	183	183		0			
0045	7	59	7	59	0	0	1245	209	832	209	832	0	0
0100	8	8		0		1300	200	200		0			
0115	8	8		0		1315	207	207		0			
0130	3	3		0		1330	239	239		0			
0145	7	26	7	26	0	0	1345	213	859	213	859	0	0
0200	6	6		0		1400	218	218		0			
0215	6	6		0		1415	240	240		0			
0230	4	4		0		1430	267	267		0			
0245	4	20	4	20	0	0	1445	265	990	265	990	0	0
0300	8	8		0		1500	278	278		0			
0315	5	5		0		1515	269	269		0			
0330	7	7		0		1530	315	315		0			
0345	4	24	4	24	0	0	1545	347	1209	347	1209	0	0
0400	7	7		0		1600	325	325		0			
0415	12	12		0		1615	353	353		0			
0430	7	7		0		1630	298	298		0			
0445	22	48	22	48	0	0	1645	318	1294	318	1294	0	0
0500	13	13		0		1700	308	308		0			
0515	22	22		0		1715	316	316		0			
0530	25	25		0		1730	300	300		0			
0545	47	107	47	107	0	0	1745	290	1214	290	1214	0	0
0600	49	49		0		1800	247	247		0			
0615	72	72		0		1815	188	188		0			
0630	116	116		0		1830	173	173		0			
0645	176	413	176	413	0	0	1845	158	766	158	766	0	0
0700	175	175		0		1900	153	153		0			
0715	132	132		0		1915	141	141		0			
0730	155	155		0		1930	126	126		0			
0745	175	637	175	637	0	0	1945	128	548	128	548	0	0
0800	175	175		0		2000	101	101		0			
0815	201	201		0		2015	103	103		0			
0830	148	148		0		2030	93	93		0			
0845	147	671	147	671	0	0	2045	94	391	94	391	0	0
0900	161	161		0		2100	99	99		0			
0915	125	125		0		2115	80	80		0			
0930	141	141		0		2130	52	52		0			
0945	124	551	124	551	0	0	2145	42	273	42	273	0	0
1000	134	134		0		2200	53	53		0			
1015	151	151		0		2215	39	39		0			
1030	130	130		0		2230	49	49		0			
1045	171	586	171	586	0	0	2245	32	173	32	173	0	0
1100	163	163		0		2300	35	35		0			
1115	172	172		0		2315	28	28		0			
1130	167	167		0		2330	29	29		0			
1145	238	740	238	740	0	0	2345	20	112	20	112	0	0
<b>Total</b>	<b>12543</b>	<b>12543</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12543</b>	<b>12543</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>



# Classification Report

**Job #** 409\_050\_WT\_ATR 1 (EB)  
**Area** Sturbridge, MA  
**Location** Route 20 Eastbound, between Sturbridge Host Hotel & Conference Center Driveway and Fairground Road  
**Direction** Eastbound  
**Tuesday, January 7, 2020**



Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	30	0	26	2	0	0	1	0	0	1	0	0	0	0
0100	16	0	12	2	0	0	0	1	0	0	1	0	0	0
0200	39	1	26	5	1	1	4	0	0	1	0	0	0	0
0300	41	0	33	6	1	0	0	0	0	0	0	0	0	1
0400	149	0	98	40	1	2	6	1	0	0	0	0	0	1
0500	414	0	286	94	2	10	9	7	0	1	0	0	0	5
0600	802	0	593	145	2	12	15	15	7	3	3	0	1	6
0700	991	1	816	107	9	12	15	13	9	5	1	0	0	3
0800	938	0	749	120	17	14	17	7	7	2	1	0	0	4
0900	695	1	577	78	4	7	14	6	1	2	1	0	0	4
1000	644	0	503	94	4	8	11	11	4	8	1	0	0	0
1100	702	2	547	103	4	12	19	7	5	2	1	0	0	0
1200	729	1	573	109	7	6	13	6	1	6	2	0	0	5
1300	778	3	632	98	2	11	16	9	1	5	0	0	0	1
1400	927	0	771	102	5	17	13	7	4	5	1	0	0	2
1500	963	2	774	130	18	12	12	8	6	1	0	0	0	0
1600	889	0	693	148	5	15	18	5	1	3	0	0	0	1
1700	755	0	616	103	5	11	8	9	2	1	0	0	0	0
1800	518	0	422	75	2	5	8	2	1	3	0	0	0	0
1900	381	0	338	32	1	2	5	3	0	0	0	0	0	0
2000	260	0	216	39	1	2	1	0	0	0	0	0	0	1
2100	245	0	209	29	1	2	2	0	1	1	0	0	0	0
2200	126	0	110	14	0	0	1	1	0	0	0	0	0	0
2300	60	0	48	10	0	1	0	0	0	0	1	0	0	0
<b>Total</b>	<b>12092</b>	<b>11</b>	<b>9668</b>	<b>1685</b>	<b>92</b>	<b>162</b>	<b>208</b>	<b>118</b>	<b>50</b>	<b>50</b>	<b>13</b>	<b>0</b>	<b>1</b>	<b>34</b>
	100.00%	0.09%	79.95%	13.93%	0.76%	1.34%	1.72%	0.98%	0.41%	0.41%	0.11%	0.00%	0.01%	0.28%

# Classification Report

**Job #** 409\_050\_WT\_ATR 1 (EB)  
**Area** Sturbridge, MA  
**Location** Route 20 Eastbound, between Sturbridge Host Hotel & Conference Center Driveway and Fairground Road  
**Direction** Eastbound  
**Wednesday, January 8, 2020**



Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	30	0	27	3	0	0	0	0	0	0	0	0	0	0
0100	21	0	16	2	0	1	1	0	0	0	1	0	0	0
0200	40	0	28	9	0	0	2	1	0	0	0	0	0	0
0300	52	0	37	11	1	0	2	1	0	0	0	0	0	0
0400	118	1	56	25	2	0	2	32	0	0	0	0	0	0
0500	347	2	164	60	1	3	1	110	0	2	1	0	0	3
0600	639	6	343	74	2	9	4	173	4	4	4	0	0	16
0700	905	1	741	88	5	13	6	28	3	7	2	0	0	11
0800	841	1	700	84	19	8	3	18	3	3	0	0	0	2
0900	605	1	499	70	5	6	5	12	2	0	1	0	0	4
1000	639	1	531	74	10	6	4	6	2	4	0	0	0	1
1100	601	2	441	83	0	11	6	45	0	2	5	0	0	6
1200	652	11	391	81	5	11	7	132	0	7	2	0	0	5
1300	676	5	424	72	7	15	5	127	1	6	2	0	0	12
1400	811	0	646	97	7	7	12	30	2	2	1	0	1	6
1500	1024	1	803	147	14	12	20	19	4	1	1	0	0	2
1600	836	1	675	115	1	11	21	7	1	1	1	0	0	2
1700	744	0	614	96	7	7	6	9	2	2	1	0	0	0
1800	553	1	472	60	0	4	7	3	4	2	0	0	0	0
1900	390	0	336	40	3	3	3	4	1	0	0	0	0	0
2000	347	1	303	30	5	3	2	1	1	1	0	0	0	0
2100	220	0	182	33	3	1	0	1	0	0	0	0	0	0
2200	114	0	105	8	0	1	0	0	0	0	0	0	0	0
2300	54	0	43	9	0	0	2	0	0	0	0	0	0	0
<b>Total</b>	<b>11259</b>	<b>35</b>	<b>8577</b>	<b>1371</b>	<b>97</b>	<b>132</b>	<b>121</b>	<b>759</b>	<b>30</b>	<b>44</b>	<b>22</b>	<b>0</b>	<b>1</b>	<b>70</b>
	100.00%	0.31%	76.18%	12.18%	0.86%	1.17%	1.07%	6.74%	0.27%	0.39%	0.20%	0.00%	0.01%	0.62%

# Classification Report

**Job #** 409\_050\_WT\_ATR 1 (WB)  
**Area** Sturbridge, MA  
**Location** Route 20 Westbound, between Sturbridge Host Hotel & Conference Center Driveway and Fairground Road  
**Direction** Westbound  
**Tuesday, January 7, 2020**



Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	59	0	47	5	1	1	0	5	0	0	0	0	0	0
0100	26	0	22	2	0	1	0	1	0	0	0	0	0	0
0200	20	0	14	0	1	1	0	0	0	2	1	1	0	0
0300	24	0	13	4	2	2	0	1	0	2	0	0	0	0
0400	48	1	25	8	0	3	2	6	0	1	2	0	0	0
0500	107	1	54	26	0	2	0	21	0	2	1	0	0	0
0600	413	9	216	67	12	13	7	83	1	2	2	0	0	1
0700	637	11	356	115	12	15	5	110	2	8	1	0	0	2
0800	671	8	412	128	12	24	6	75	0	2	2	0	0	2
0900	551	6	351	102	8	19	4	59	0	2	0	0	0	0
1000	586	3	406	82	6	16	13	46	3	4	6	0	0	1
1100	740	10	541	111	7	20	2	41	1	6	1	0	0	0
1200	832	3	636	126	5	10	9	33	2	6	0	1	0	1
1300	859	6	658	97	21	16	14	36	2	7	0	1	0	1
1400	990	5	732	160	12	18	8	50	2	1	0	0	0	2
1500	1209	20	898	168	11	22	15	60	7	1	2	0	0	5
1600	1294	27	961	169	8	22	7	89	6	1	0	0	0	4
1700	1214	33	900	136	0	10	7	120	2	2	1	0	0	3
1800	766	8	553	79	1	10	4	102	0	2	2	0	0	5
1900	548	6	402	62	6	8	1	59	0	1	1	0	0	2
2000	391	0	291	43	3	5	2	47	0	0	0	0	0	0
2100	273	0	208	21	1	2	2	38	0	1	0	0	0	0
2200	173	0	135	16	0	0	0	21	0	0	1	0	0	0
2300	112	0	85	15	0	0	0	12	0	0	0	0	0	0
<b>Total</b>	<b>12543</b>	<b>157</b>	<b>8916</b>	<b>1742</b>	<b>129</b>	<b>240</b>	<b>108</b>	<b>1115</b>	<b>28</b>	<b>53</b>	<b>23</b>	<b>3</b>	<b>0</b>	<b>29</b>
	100.00%	1.25%	71.08%	13.89%	1.03%	1.91%	0.86%	8.89%	0.22%	0.42%	0.18%	0.02%	0.00%	0.23%

# Classification Report

**Job #** 409\_050\_WT\_ATR 1 (WB)  
**Area** Sturbridge, MA  
**Location** Route 20 Westbound, between Sturbridge Host Hotel & Conference Center Driveway and Fairground Road  
**Direction** Westbound  
**Wednesday, January 8, 2020**



Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	71	2	59	5	0	1	0	4	0	0	0	0	0	0
0100	42	0	34	2	0	1	0	5	0	0	0	0	0	0
0200	24	0	17	2	1	0	2	2	0	0	0	0	0	0
0300	23	0	10	6	1	1	3	0	0	1	1	0	0	0
0400	39	0	20	6	2	1	3	6	0	0	1	0	0	0
0500	112	0	60	22	2	2	2	18	1	3	1	0	0	1
0600	355	5	192	62	11	10	8	60	0	5	2	0	0	0
0700	632	14	375	101	9	16	5	109	0	2	0	0	0	1
0800	709	9	432	119	15	23	13	89	1	5	1	0	0	2
0900	544	1	373	83	7	19	5	48	0	5	3	0	0	0
1000	606	1	428	93	11	20	8	37	1	4	1	0	0	2
1100	723	2	527	109	9	18	8	45	0	1	4	0	0	0
1200	844	0	665	110	9	15	14	25	1	4	1	0	0	0
1300	891	13	669	121	20	18	5	32	6	5	1	0	0	1
1400	941	3	715	129	13	23	5	49	2	1	0	0	0	1
1500	1218	15	857	238	11	17	11	61	3	2	0	0	0	3
1600	1333	16	982	172	6	19	9	117	6	0	3	0	0	3
1700	1264	20	951	138	3	14	4	120	5	0	0	0	0	9
1800	875	14	654	83	4	12	3	97	2	1	1	0	0	4
1900	563	5	411	52	0	7	1	84	2	0	0	0	0	1
2000	408	0	298	49	0	7	1	51	0	1	0	0	0	1
2100	239	2	169	29	1	4	1	32	0	0	0	0	0	1
2200	155	0	117	15	0	1	0	21	0	1	0	0	0	0
2300	96	0	72	9	0	2	0	13	0	0	0	0	0	0
<b>Total</b>	<b>12707</b>	<b>122</b>	<b>9087</b>	<b>1755</b>	<b>135</b>	<b>251</b>	<b>111</b>	<b>1125</b>	<b>30</b>	<b>41</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>30</b>
	<b>100.00%</b>	<b>0.96%</b>	<b>71.51%</b>	<b>13.81%</b>	<b>1.06%</b>	<b>1.98%</b>	<b>0.87%</b>	<b>8.85%</b>	<b>0.24%</b>	<b>0.32%</b>	<b>0.16%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.24%</b>



# Speed Report

Job 409\_050\_WT\_ATR 1 (EB)  
 Area Sturbridge, MA  
 Location Route 20 Eastbound, between Sturbridge Host Hotel & Conference Center Driveway and Fairground Road  
 Dir Eastbound  
**Tuesday, January 7, 2020**



Time	Total	Speed Bins (mph)															
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80
0000	30	0	0	0	1	0	2	13	13	1	0	0	0	0	0	0	0
0100	16	0	0	0	1	1	1	7	5	1	0	0	0	0	0	0	0
0200	39	0	0	0	0	1	7	17	10	4	0	0	0	0	0	0	0
0300	41	0	0	0	0	0	2	18	14	6	1	0	0	0	0	0	0
0400	149	0	0	0	0	0	14	42	69	19	5	0	0	0	0	0	0
0500	414	0	0	0	3	2	29	161	167	43	8	1	0	0	0	0	0
0600	802	0	1	2	18	48	153	338	200	39	3	0	0	0	0	0	0
0700	991	0	6	18	36	73	183	429	204	37	5	0	0	0	0	0	0
0800	938	0	0	2	14	35	169	396	265	52	5	0	0	0	0	0	0
0900	695	0	1	1	3	14	103	305	222	42	3	1	0	0	0	0	0
1000	644	0	0	1	2	21	83	269	216	44	6	2	0	0	0	0	0
1100	702	0	2	7	6	15	100	344	190	37	1	0	0	0	0	0	0
1200	729	0	0	1	2	12	96	341	233	42	1	1	0	0	0	0	0
1300	778	0	0	3	0	40	143	384	167	39	2	0	0	0	0	0	0
1400	927	0	2	5	14	64	205	379	207	49	2	0	0	0	0	0	0
1500	963	0	0	4	11	34	196	419	245	51	3	0	0	0	0	0	0
1600	889	0	1	1	5	38	189	401	208	40	6	0	0	0	0	0	0
1700	755	0	0	2	7	38	172	347	168	20	0	1	0	0	0	0	0
1800	518	0	0	5	1	12	84	250	137	28	1	0	0	0	0	0	0
1900	381	0	1	2	1	12	56	168	117	22	2	0	0	0	0	0	0
2000	260	0	1	0	0	8	18	96	117	19	1	0	0	0	0	0	0
2100	245	0	0	0	1	3	24	103	96	16	1	1	0	0	0	0	0
2200	126	0	0	0	0	2	11	48	53	11	0	1	0	0	0	0	0
2300	60	0	0	0	0	0	7	22	28	3	0	0	0	0	0	0	0
<b>Total</b>	<b>12092</b>	<b>0</b>	<b>15</b>	<b>54</b>	<b>126</b>	<b>473</b>	<b>2047</b>	<b>5297</b>	<b>3351</b>	<b>665</b>	<b>56</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**100.00%    0.00%    0.12%    0.45%    1.04%    3.91%    16.93%    43.81%    27.71%    5.50%    0.46%    0.07%    0.00%    0.00%    0.00%    0.00%    0.00%**

Maximum = 54.0 mph, Minimum = 6.2 mph, Mean = 33.0 mph  
 85% Speed = 37.64 mph, 95% Speed = 40.49 mph, Median = 33.27 mph  
 10 mph Pace = 29 - 39, Number in Pace = 9051 (74.85%)  
 Variance = 24.40, Standard Deviation = 4.94 mph

# Speed Report

Job 409\_050\_WT\_ATR 1 (EB)  
 Area Sturbridge, MA  
 Location Route 20 Eastbound, between Sturbridge Host Hotel & Conference Center Driveway and Fairground Road  
 Dir Eastbound  
**Wednesday, January 8, 2020**



Time	Total	Speed Bins (mph)															
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80
0000	30	0	0	0	0	0	3	15	12	0	0	0	0	0	0	0	0
0100	21	0	0	1	0	0	5	9	6	0	0	0	0	0	0	0	0
0200	40	0	0	0	0	0	2	20	15	3	0	0	0	0	0	0	0
0300	52	0	0	0	0	0	8	12	29	3	0	0	0	0	0	0	0
0400	118	0	0	0	0	0	7	45	49	11	5	1	0	0	0	0	0
0500	347	0	0	0	0	4	44	174	102	21	2	0	0	0	0	0	0
0600	639	0	0	0	8	40	141	290	137	22	1	0	0	0	0	0	0
0700	905	0	1	9	32	77	171	414	183	16	2	0	0	0	0	0	0
0800	841	0	2	1	10	37	124	364	266	36	1	0	0	0	0	0	0
0900	605	0	2	1	1	14	51	315	191	27	3	0	0	0	0	0	0
1000	639	0	0	1	1	15	83	303	203	29	3	1	0	0	0	0	0
1100	601	0	1	8	4	9	85	270	199	22	2	1	0	0	0	0	0
1200	652	0	3	0	1	28	114	285	166	48	6	1	0	0	0	0	0
1300	676	0	4	1	3	16	135	303	175	39	0	0	0	0	0	0	0
1400	811	0	2	7	17	47	171	352	178	36	1	0	0	0	0	0	0
1500	1024	0	1	5	28	105	241	399	206	37	2	0	0	0	0	0	0
1600	836	0	1	0	8	19	132	371	247	54	4	0	0	0	0	0	0
1700	744	0	4	3	18	37	123	352	171	31	5	0	0	0	0	0	0
1800	553	0	1	0	3	29	100	247	153	20	0	0	0	0	0	0	0
1900	390	0	0	0	1	10	59	161	131	23	4	1	0	0	0	0	0
2000	347	0	1	0	0	9	34	164	117	21	1	0	0	0	0	0	0
2100	220	0	0	0	0	1	22	93	78	26	0	0	0	0	0	0	0
2200	114	0	0	0	0	2	9	46	36	18	3	0	0	0	0	0	0
2300	54	0	0	0	0	0	5	24	18	7	0	0	0	0	0	0	0
<b>Total</b>	<b>11259</b>	<b>0</b>	<b>23</b>	<b>37</b>	<b>135</b>	<b>499</b>	<b>1869</b>	<b>5028</b>	<b>3068</b>	<b>550</b>	<b>45</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

100.00%
0.00%
0.20%
0.33%
1.20%
4.43%
16.60%
44.66%
27.25%
4.88%
0.40%
0.04%
0.00%
0.00%
0.00%
0.00%
0.00%

Maximum = 54.1 mph, Minimum = 6.6 mph, Mean = 32.8 mph  
 85% Speed = 37.36 mph, 95% Speed = 40.15 mph, Median = 33.22 mph  
 10 mph Pace = 28 - 38, Number in Pace = 8496 (75.46%)  
 Variance = 24.32, Standard Deviation = 4.93 mph

# Speed Report

Job 409\_050\_WT\_ATR 1 (WB)  
 Area Sturbridge, MA  
 Location Route 20 Westbound, between Sturbridge Host Hotel & Conference Center Driveway and Fairground Road  
 Dir Westbound  
**Tuesday, January 7, 2020**



Time	Total	Speed Bins (mph)															
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80
0000	59	0	0	1	1	2	6	19	21	9	0	0	0	0	0	0	0
0100	26	0	0	1	0	0	2	13	5	4	0	0	0	0	1	0	0
0200	20	0	0	1	1	0	4	3	8	0	2	1	0	0	0	0	0
0300	24	0	0	0	0	0	2	8	8	5	1	0	0	0	0	0	0
0400	48	0	0	1	1	2	3	14	21	5	1	0	0	0	0	0	0
0500	107	0	0	3	1	2	8	24	44	24	1	0	0	0	0	0	0
0600	413	0	0	19	11	22	42	138	121	50	9	1	0	0	0	0	0
0700	637	0	0	25	11	52	129	180	163	67	10	0	0	0	0	0	0
0800	671	0	1	26	17	62	138	217	151	59	0	0	0	0	0	0	0
0900	551	0	2	22	13	21	127	179	135	45	6	1	0	0	0	0	0
1000	586	0	0	25	12	42	94	209	160	41	2	1	0	0	0	0	0
1100	740	0	1	45	21	79	171	232	159	30	1	0	1	0	0	0	0
1200	832	0	0	52	29	65	166	291	173	50	6	0	0	0	0	0	0
1300	859	0	0	43	24	85	208	321	138	29	10	1	0	0	0	0	0
1400	990	0	1	34	35	85	273	353	171	36	2	0	0	0	0	0	0
1500	1209	0	0	32	20	112	344	469	202	29	1	0	0	0	0	0	0
1600	1294	0	0	33	43	167	387	394	226	38	6	0	0	0	0	0	0
1700	1214	0	2	37	34	145	353	426	180	32	4	1	0	0	0	0	0
1800	766	0	1	25	14	58	142	280	206	38	1	1	0	0	0	0	0
1900	548	0	0	27	17	37	82	211	144	27	3	0	0	0	0	0	0
2000	391	0	0	18	5	6	65	140	126	29	1	0	1	0	0	0	0
2100	273	0	0	15	5	4	22	101	99	20	6	1	0	0	0	0	0
2200	173	0	1	16	1	1	16	74	50	14	0	0	0	0	0	0	0
2300	112	0	0	4	0	2	8	33	52	12	1	0	0	0	0	0	0
<b>Total</b>	<b>12543</b>	<b>0</b>	<b>9</b>	<b>505</b>	<b>316</b>	<b>1051</b>	<b>2792</b>	<b>4329</b>	<b>2763</b>	<b>693</b>	<b>74</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
	<b>100.00%</b>	<b>0.00%</b>	<b>0.07%</b>	<b>4.03%</b>	<b>2.52%</b>	<b>8.38%</b>	<b>22.26%</b>	<b>34.51%</b>	<b>22.03%</b>	<b>5.52%</b>	<b>0.59%</b>	<b>0.06%</b>	<b>0.02%</b>	<b>0.00%</b>	<b>0.01%</b>	<b>0.00%</b>	<b>0.00%</b>

Maximum = 69.3 mph, Minimum = 6.7 mph, Mean = 31.1 mph  
 85% Speed = 37.41 mph, 95% Speed = 40.49 mph, Median = 31.93 mph  
 10 mph Pace = 28 - 38, Number in Pace = 7685 (61.27%)  
 Variance = 44.85, Standard Deviation = 6.70 mph

# Speed Report

Job 409\_050\_WT\_ATR 1 (WB)  
 Area Sturbridge, MA  
 Location Route 20 Westbound, between Sturbridge Host Hotel & Conference Center Driveway and Fairground Road  
 Dir Westbound  
**Wednesday, January 8, 2020**



Time	Total	Speed Bins (mph)															
		0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80
0000	71	0	0	3	2	3	7	24	27	5	0	0	0	0	0	0	0
0100	42	0	0	0	0	2	7	15	13	4	0	0	1	0	0	0	0
0200	24	0	0	1	1	1	3	13	4	1	0	0	0	0	0	0	0
0300	23	0	0	0	0	0	1	14	7	1	0	0	0	0	0	0	0
0400	39	0	0	0	1	2	7	14	10	5	0	0	0	0	0	0	0
0500	112	0	0	5	0	2	9	36	45	12	2	1	0	0	0	0	0
0600	355	0	1	16	7	9	46	129	115	27	5	0	0	0	0	0	0
0700	632	0	2	26	4	28	67	226	189	81	8	1	0	0	0	0	0
0800	709	0	0	27	24	64	152	216	173	44	7	2	0	0	0	0	0
0900	544	0	1	19	11	31	89	182	145	56	10	0	0	0	0	0	0
1000	606	0	0	25	12	50	110	192	153	51	9	4	0	0	0	0	0
1100	723	0	2	29	14	49	159	238	168	55	9	0	0	0	0	0	0
1200	844	0	1	55	21	82	205	279	146	51	3	1	0	0	0	0	0
1300	891	0	1	42	32	84	217	322	147	39	7	0	0	0	0	0	0
1400	941	0	1	33	34	83	269	326	153	33	8	1	0	0	0	0	0
1500	1218	0	0	39	63	200	303	382	190	38	3	0	0	0	0	0	0
1600	1333	0	0	36	36	179	397	433	222	29	1	0	0	0	0	0	0
1700	1264	0	0	32	27	139	367	483	189	27	0	0	0	0	0	0	0
1800	875	0	0	23	23	85	195	332	186	29	2	0	0	0	0	0	0
1900	563	0	0	29	8	16	75	223	163	46	2	0	1	0	0	0	0
2000	408	0	0	23	8	12	56	166	113	26	4	0	0	0	0	0	0
2100	239	0	0	17	4	4	21	101	71	20	1	0	0	0	0	0	0
2200	155	0	1	7	1	1	8	61	52	21	3	0	0	0	0	0	0
2300	96	0	1	3	0	1	5	26	45	13	2	0	0	0	0	0	0
<b>Total</b>	<b>12707</b>	<b>0</b>	<b>11</b>	<b>490</b>	<b>333</b>	<b>1127</b>	<b>2775</b>	<b>4433</b>	<b>2726</b>	<b>714</b>	<b>86</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
	<b>100.00%</b>	<b>0.00%</b>	<b>0.09%</b>	<b>3.86%</b>	<b>2.62%</b>	<b>8.87%</b>	<b>21.84%</b>	<b>34.89%</b>	<b>21.45%</b>	<b>5.62%</b>	<b>0.68%</b>	<b>0.08%</b>	<b>0.02%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>

Maximum = 59.1 mph, Minimum = 8.4 mph, Mean = 31.1 mph  
 85% Speed = 37.41 mph, 95% Speed = 40.66 mph, Median = 31.93 mph  
 10 mph Pace = 28 - 38, Number in Pace = 7685 (60.48%)  
 Variance = 44.92, Standard Deviation = 6.70 mph

Client: Rodney Emery  
 Project #: 409\_050\_WT  
 BTD #: Location 1  
 Location: Sturbridge, MA  
 Street 1: Route 20 (Main Street)  
 Street 2: Sturbridge Hotel & Conf. Driveway  
 Count Date: 1/7/2020  
 Day of Week: Tuesday  
 Weather: Mostly Cloudy, 40°F



**PASSENGER CARS & HEAVY VEHICLES COMBINED**

Start Time	Northbound				Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	3	1	9	238	0	0	0	161	14
7:15 AM	0	0	0	0	0	0	0	4	0	8	261	0	0	0	123	22
7:30 AM	0	0	0	0	0	0	0	2	1	11	272	0	0	0	130	36
7:45 AM	0	0	0	0	0	0	0	3	0	8	279	0	0	0	151	34
8:00 AM	0	0	0	0	0	0	0	4	0	7	253	0	0	0	149	40
8:15 AM	0	0	0	0	0	0	0	1	0	9	251	0	0	0	172	29
8:30 AM	0	0	0	0	0	0	0	3	1	9	265	0	0	0	138	15
8:45 AM	0	0	0	0	0	0	0	0	1	8	232	0	0	0	133	17

Start Time	Northbound				Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	15	0	7	218	0	0	0	314	12
4:15 PM	0	0	0	0	0	0	0	39	1	6	262	0	0	0	343	14
4:30 PM	0	0	0	0	0	0	0	18	1	5	247	0	0	0	303	10
4:45 PM	0	0	0	0	0	0	0	11	1	9	193	0	0	0	319	9
5:00 PM	0	0	0	0	0	0	0	21	0	5	207	0	0	0	313	6
5:15 PM	0	0	0	0	0	0	0	18	1	15	204	0	1	0	308	10
5:30 PM	0	0	0	0	0	0	0	8	2	6	168	0	0	0	293	7
5:45 PM	0	0	0	0	0	0	0	10	3	5	163	0	0	0	270	12

AM PEAK HOUR 7:30 AM to 8:30 AM	Northbound				Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	0	0	0	0	0	10	1	35	1055	0	0	0	602	139
<b>PHF</b>	0.00				0.63				0.95				0.92			
<b>HV %</b>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%	0.0%	11.4%	3.2%	0.0%	0.0%	0.0%	6.3%	0.7%

PM PEAK HOUR 4:00 PM to 5:00 PM	Northbound				Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	0	0	0	0	0	83	3	27	920	0	0	0	1279	45
<b>PHF</b>	0.00				0.53				0.88				0.93			
<b>HV %</b>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	1.1%	8.9%

Client: Rodney Emery  
 Project #: 409\_050\_WT  
 BTD #: Location 1  
 Location: Sturbridge, MA  
 Street 1: Route 20 (Main Street)  
 Street 2: Sturbridge Hotel & Conf. Driveway  
 Count Date: 1/7/2020  
 Day of Week: Tuesday  
 Weather: Mostly Cloudy, 40°F

# BOSTON TRAFFIC DATA

PO BOX 1723, Framingham, MA 01701  
 Office: 978-746-1259  
 DataRequest@BostonTrafficData.com  
 www.BostonTrafficData.com

## HEAVY VEHICLES

Start Time	Sturbridge Host Hotel & Conf. Center Drive Northbound				Sturbridge Host Hotel & Conf. Center Drive Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	8	0
7:15 AM	0	0	0	0	0	0	0	1	0	1	6	0	0	0	7	2
7:30 AM	0	0	0	0	0	0	0	0	0	4	10	0	0	0	7	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	10	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	10	0	0	0	8	0
8:15 AM	0	0	0	0	0	0	0	1	0	0	8	0	0	0	13	1
8:30 AM	0	0	0	0	0	0	0	1	0	1	20	0	0	0	6	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	7	1

Start Time	Sturbridge Host Hotel & Conf. Center Drive Northbound				Sturbridge Host Hotel & Conf. Center Drive Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	1	0	0	8	0	0	0	3	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	2
4:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	3	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	2	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	10	0	0	0	3	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0

AM PEAK HOUR 7:45 AM to 8:45 AM PHF	Sturbridge Host Hotel & Conf. Center Drive Northbound				Sturbridge Host Hotel & Conf. Center Drive Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	0	0	0	0	0	2	0	1	44	0	0	0	37	1
	0.00				0.50				0.54				0.68			

PM PEAK HOUR 4:00 PM to 5:00 PM PHF	Sturbridge Host Hotel & Conf. Center Drive Northbound				Sturbridge Host Hotel & Conf. Center Drive Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	0	0	0	0	0	1	0	0	22	0	0	0	14	4
	0.00				0.25				0.69				0.75			



Client: Rodney Emery  
 Project #: 409\_050\_WT  
 BTD #: Location 1  
 Location: Sturbridge, MA  
 Street 1: Route 20 (Main Street)  
 Street 2: Sturbridge Hotel & Conf. Driveway  
 Count Date: 1/7/2020  
 Day of Week: Tuesday  
 Weather: Mostly Cloudy, 40°F



**PEDESTRIANS & BICYCLES**

Start Time	Northbound				Sturbridge Host Hotel & Conf. Center Drive Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound				
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
7:00 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0

Start Time	Northbound				Sturbridge Host Hotel & Conf. Center Drive Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound				
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
4:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

AM PEAK HOUR <sup>1</sup> 7:30 AM to 8:30 AM	Northbound				Sturbridge Host Hotel & Conf. Center Drive Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0

PM PEAK HOUR <sup>1</sup> 4:00 PM to 5:00 PM	Northbound				Sturbridge Host Hotel & Conf. Center Drive Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0

<sup>1</sup> NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.

Client: Rodney Emery  
 Project #: 409\_050\_WT  
 BTD #: Location 2  
 Location: Sturbridge, MA  
 Street 1: Route 20 (Main Street)  
 Street 2: Fairground Road  
 Count Date: 1/7/2020  
 Day of Week: Tuesday  
 Weather: Mostly Cloudy, 40°F



**PASSENGER CARS & HEAVY VEHICLES COMBINED**

Start Time	Route 131 (Main Street) Northbound				Fairground Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	2	0	2	176	60	0	0	173	3
7:15 AM	0	0	0	0	0	3	0	2	1	1	185	74	0	1	142	3
7:30 AM	0	0	0	0	0	3	0	2	0	1	164	107	0	0	164	7
7:45 AM	0	0	0	0	0	2	0	5	0	4	154	121	0	0	180	7
8:00 AM	0	0	0	0	0	0	1	4	0	4	158	91	0	1	185	3
8:15 AM	0	0	0	0	0	1	0	1	0	0	169	82	0	0	200	5
8:30 AM	0	0	0	0	0	2	1	4	0	6	134	125	0	0	149	7
8:45 AM	0	0	0	0	0	1	0	4	0	5	114	113	0	0	146	4

Start Time	Route 131 (Main Street) Northbound				Fairground Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	6	5	3	0	5	121	92	0	0	323	13
4:15 PM	0	0	0	0	0	2	3	2	1	0	165	96	0	0	354	11
4:30 PM	0	0	0	0	0	3	3	2	0	5	143	99	0	0	311	19
4:45 PM	0	0	0	0	0	2	1	3	0	6	109	78	0	0	325	14
5:00 PM	0	0	0	0	0	3	5	1	0	5	110	92	0	0	318	16
5:15 PM	0	0	0	0	0	1	1	5	1	3	108	93	0	0	313	14
5:30 PM	0	0	0	0	0	3	4	4	1	4	94	69	0	0	295	13
5:45 PM	0	0	0	0	0	1	0	2	1	4	93	65	0	0	279	8

AM PEAK HOUR 7:30 AM to 8:30 AM	Route 131 (Main Street) Northbound				Fairground Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	0	0	0	6	1	12	0	9	645	401	0	1	729	22
<b>PHF</b>	0.00				0.68				0.95				0.92			
<b>HV %</b>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	2.7%	0.0%	0.0%	5.3%	0.0%

PM PEAK HOUR 4:00 PM to 5:00 PM	Route 131 (Main Street) Northbound				Fairground Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	0	0	0	13	12	10	1	16	538	365	0	0	1313	57
<b>PHF</b>	0.00				0.63				0.88				0.94			
<b>HV %</b>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	1.4%	0.0%	0.0%	1.1%	0.0%

Client: Rodney Emery  
 Project #: 409\_050\_WT  
 BTD #: Location 2  
 Location: Sturbridge, MA  
 Street 1: Route 20 (Main Street)  
 Street 2: Fairground Road  
 Count Date: 1/7/2020  
 Day of Week: Tuesday  
 Weather: Mostly Cloudy, 40°F

# BOSTON TRAFFIC DATA

PO BOX 1723, Framingham, MA 01701  
 Office: 978-746-1259  
 DataRequest@BostonTrafficData.com  
 www.BostonTrafficData.com

## HEAVY VEHICLES

Start Time	Route 131 (Main Street) Northbound				Fairground Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	5	1	0	0	7	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	5	2	0	0	9	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	4	4	0	0	6	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	8	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	5	4	0	0	11	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	5	2	0	0	14	0
8:30 AM	0	0	0	0	0	1	0	0	0	0	4	16	0	0	7	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	3	1	0	0	7	0

Start Time	Route 131 (Main Street) Northbound				Fairground Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	0	3	3	0	0	3	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	6	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	2	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	2	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	5	4	0	0	3	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	2	0

AM PEAK HOUR 7:45 AM to 8:45 AM PHF	Route 131 (Main Street) Northbound				Fairground Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	0	0	0	1	0	0	0	0	16	23	0	0	40	1
	0.00				0.25				0.49				0.73			

PM PEAK HOUR 4:00 PM to 5:00 PM PHF	Route 131 (Main Street) Northbound				Fairground Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	0	0	0	0	0	0	0	0	0	11	5	0	0	14	0
	0.00				0.00				0.67				0.58			

Client: Rodney Emery  
 Project #: 409\_050\_WT  
 BTM #: Location 2  
 Location: Sturbridge, MA  
 Street 1: Route 20 (Main Street)  
 Street 2: Fairground Road  
 Count Date: 1/7/2020  
 Day of Week: Tuesday  
 Weather: Mostly Cloudy, 40°F



**PEDESTRIANS & BICYCLES**

Start Time	Route 131 (Main Street) Northbound				Fairground Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0

Start Time	Route 131 (Main Street) Northbound				Fairground Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR <sup>1</sup> 7:30 AM to 8:30 AM	Route 131 (Main Street) Northbound				Fairground Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0

PM PEAK HOUR <sup>1</sup> 4:00 PM to 5:00 PM	Route 131 (Main Street) Northbound				Fairground Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

<sup>1</sup> NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.

Client: Rodney Emery  
 Project #: 409\_050\_WT  
 BTD #: Location 3  
 Location: Sturbridge, MA  
 Street 1: Route 20 (Main Street)  
 Street 2: Route 131 (Main Street)  
 Count Date: 1/7/2020  
 Day of Week: Tuesday  
 Weather: Mostly Cloudy, 40°F



**PASSENGER CARS & HEAVY VEHICLES COMBINED**

Start Time	Route 131 (Main Street) Northbound				Route 131 (Main Street) Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	87	0	0	0	0	0	0	0	0	176	0	1	27	89	0
7:15 AM	0	59	0	0	0	0	0	0	0	0	188	0	0	41	87	0
7:30 AM	0	57	0	0	0	0	0	0	0	0	167	0	1	48	114	0
7:45 AM	0	74	0	0	0	0	0	0	0	0	156	0	0	58	113	0
8:00 AM	0	67	0	0	0	0	0	0	0	0	158	0	0	35	122	0
8:15 AM	0	74	0	0	0	0	0	0	0	0	170	0	0	44	132	0
8:30 AM	0	63	0	0	0	0	0	0	0	0	136	0	1	62	93	0
8:45 AM	0	58	0	0	0	0	0	0	0	0	115	0	0	56	92	0

Start Time	Route 131 (Main Street) Northbound				Route 131 (Main Street) Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	109	0	0	0	0	0	0	0	0	127	0	0	74	227	0
4:15 PM	0	129	0	0	0	0	0	0	0	0	167	0	0	79	236	0
4:30 PM	0	103	0	0	0	0	0	0	0	0	146	0	0	68	227	0
4:45 PM	0	112	0	0	0	0	0	0	0	0	111	0	0	80	227	0
5:00 PM	0	102	0	0	0	0	0	0	0	0	113	0	0	60	233	0
5:15 PM	0	95	0	0	0	0	0	0	0	0	108	1	0	103	232	0
5:30 PM	0	101	0	0	0	0	0	0	0	0	97	0	0	91	207	0
5:45 PM	0	86	0	0	0	0	0	0	0	0	94	0	0	68	201	0

AM PEAK HOUR 7:30 AM to 8:30 AM	Route 131 (Main Street) Northbound				Route 131 (Main Street) Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	272	0	0	0	0	0	0	0	0	651	0	1	185	481	0
<b>PHF</b>	0.92				0.00				0.96				0.95			
<b>HV %</b>	0.0%	4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	4.9%	5.4%	0.0%

PM PEAK HOUR 4:00 PM to 5:00 PM	Route 131 (Main Street) Northbound				Route 131 (Main Street) Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	453	0	0	0	0	0	0	0	0	551	0	0	301	917	0
<b>PHF</b>	0.88				0.00				0.82				0.97			
<b>HV %</b>	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	0.0%	0.0%	3.0%	1.2%	0.0%

Client: Rodney Emery  
 Project #: 409\_050\_WT  
 BTD #: Location 3  
 Location: Sturbridge, MA  
 Street 1: Route 20 (Main Street)  
 Street 2: Route 131 (Main Street)  
 Count Date: 1/7/2020  
 Day of Week: Tuesday  
 Weather: Mostly Cloudy, 40°F

# BOSTON TRAFFIC DATA

PO BOX 1723, Framingham, MA 01701  
 Office: 978-746-1259  
 DataRequest@BostonTrafficData.com  
 www.BostonTrafficData.com

## HEAVY VEHICLES

Start Time	Route 131 (Main Street) Northbound				Route 131 (Main Street) Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	3	0	0	0	0	0	0	0	0	5	0	0	2	4	0
7:15 AM	0	1	0	0	0	0	0	0	0	0	5	0	0	3	7	0
7:30 AM	0	3	0	0	0	0	0	0	0	0	4	0	0	2	4	0
7:45 AM	0	2	0	0	0	0	0	0	0	0	2	0	0	1	6	0
8:00 AM	0	2	0	0	0	0	0	0	0	0	5	0	0	2	8	0
8:15 AM	0	6	0	0	0	0	0	0	0	0	4	0	0	4	8	0
8:30 AM	0	2	0	0	0	0	0	0	0	0	5	0	0	0	6	0
8:45 AM	0	3	0	0	0	0	0	0	0	0	3	0	0	3	4	0

Start Time	Route 131 (Main Street) Northbound				Route 131 (Main Street) Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	2	0	0	0	0	0	0	0	0	3	0	0	2	2	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	2	5	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	1	0	0	2	1	0
5:00 PM	0	2	0	0	0	0	0	0	0	0	4	0	0	2	1	0
5:15 PM	0	1	0	0	0	0	0	0	0	0	4	0	0	3	2	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	5	3	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	3	2	0

AM PEAK HOUR 8:00 AM to 9:00 AM PHF	Route 131 (Main Street) Northbound				Route 131 (Main Street) Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	13	0	0	0	0	0	0	0	0	17	0	0	9	26	0
	<b>0.54</b>				<b>0.00</b>				<b>0.85</b>				<b>0.73</b>			

PM PEAK HOUR 5:00 PM to 6:00 PM PHF	Route 131 (Main Street) Northbound				Route 131 (Main Street) Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	3	0	0	0	0	0	0	0	0	12	0	0	13	8	0
	<b>0.38</b>				<b>0.00</b>				<b>0.75</b>				<b>0.66</b>			



Client: Rodney Emery  
 Project #: 409\_050\_WT  
 BTD #: Location 3  
 Location: Sturbridge, MA  
 Street 1: Route 20 (Main Street)  
 Street 2: Route 131 (Main Street)  
 Count Date: 1/7/2020  
 Day of Week: Tuesday  
 Weather: Mostly Cloudy, 40°F



**PEDESTRIANS & BICYCLES**

Start Time	Route 131 (Main Street) Northbound				Route 131 (Main Street) Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	Route 131 (Main Street) Northbound				Route 131 (Main Street) Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR <sup>1</sup> 7:30 AM to 8:30 AM	Route 131 (Main Street) Northbound				Route 131 (Main Street) Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PM PEAK HOUR <sup>1</sup> 4:00 PM to 5:00 PM	Route 131 (Main Street) Northbound				Route 131 (Main Street) Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

<sup>1</sup> NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.

Client: Rodney Emery  
 Project #: 409\_050\_WT  
 BTD #: Location 4  
 Location: Sturbridge, MA  
 Street 1: Route 20 (Main Street)  
 Street 2: Old Sturbridge Village Road  
 Count Date: 1/7/2020  
 Day of Week: Tuesday  
 Weather: Mostly Cloudy, 40°F



**PASSENGER CARS & HEAVY VEHICLES COMBINED**

Start Time	Old Sturbridge Village Road Northbound				Old Sturbridge Village Road Southbound				Route 20 (Main Street) Eastbound			Route 20 (Main Street) Westbound				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	22	0	12	0	7	7	0	1	0	228	9	0	0	163	0
7:15 AM	0	17	0	17	0	10	9	0	0	0	257	19	0	0	113	0
7:30 AM	0	15	0	22	0	14	20	0	0	0	279	16	0	0	121	0
7:45 AM	0	22	0	35	0	16	22	1	0	0	265	19	0	0	128	0
8:00 AM	0	15	0	18	0	11	23	0	0	0	246	18	0	0	134	0
8:15 AM	0	24	0	15	0	9	8	0	0	0	229	13	0	0	148	0
8:30 AM	0	13	0	16	0	33	9	1	0	0	250	23	0	0	129	0
8:45 AM	0	9	0	7	0	14	8	0	4	0	225	16	0	0	135	0

Start Time	Old Sturbridge Village Road Northbound				Old Sturbridge Village Road Southbound				Route 20 (Main Street) Eastbound			Route 20 (Main Street) Westbound				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	23	0	19	0	41	23	3	0	0	170	22	0	0	303	0
4:15 PM	0	17	0	19	0	76	30	2	0	0	175	13	0	0	296	0
4:30 PM	0	17	0	12	0	41	23	0	0	0	192	21	0	0	288	0
4:45 PM	0	22	0	11	0	36	24	0	0	0	153	16	0	0	267	0
5:00 PM	0	16	0	17	0	39	26	1	0	0	148	24	1	1	259	0
5:15 PM	0	19	0	15	0	34	34	2	0	0	139	19	0	0	278	0
5:30 PM	0	20	0	9	0	27	28	2	0	0	126	11	0	0	275	0
5:45 PM	0	12	0	8	0	29	19	1	0	0	123	8	0	1	270	0

AM PEAK HOUR 7:30 AM to 8:30 AM	Old Sturbridge Village Road Northbound				Old Sturbridge Village Road Southbound				Route 20 (Main Street) Eastbound			Route 20 (Main Street) Westbound				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	76	0	90	0	50	73	1	0	0	1019	66	0	0	531	0
<b>PHF</b>	0.73				0.79				0.92			0.90				
<b>HV %</b>	0.0%	6.6%	0.0%	0.0%	0.0%	12.0%	5.5%	0.0%	0.0%	0.0%	2.6%	4.5%	0.0%	0.0%	5.8%	0.0%

PM PEAK HOUR 4:00 PM to 5:00 PM	Old Sturbridge Village Road Northbound				Old Sturbridge Village Road Southbound				Route 20 (Main Street) Eastbound			Route 20 (Main Street) Westbound				
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	79	0	61	0	194	100	5	0	0	690	72	0	0	1154	0
<b>PHF</b>	0.83				0.69				0.89			0.95				
<b>HV %</b>	0.0%	1.3%	0.0%	3.3%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	2.0%	2.8%	0.0%	0.0%	1.1%	0.0%

Client: Rodney Emery  
 Project #: 409\_050\_WT  
 BTD #: Location 4  
 Location: Sturbridge, MA  
 Street 1: Route 20 (Main Street)  
 Street 2: Old Sturbridge Village Road  
 Count Date: 1/7/2020  
 Day of Week: Tuesday  
 Weather: Mostly Cloudy, 40°F

# BOSTON TRAFFIC DATA

PO BOX 1723, Framingham, MA 01701  
 Office: 978-746-1259  
 DataRequest@BostonTrafficData.com  
 www.BostonTrafficData.com

## HEAVY VEHICLES

Start Time	Old Sturbridge Village Road Northbound				Old Sturbridge Village Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	1	0	0	0	0	6	0	0	0	8	0
7:15 AM	0	0	0	0	0	1	0	0	0	0	9	0	0	0	6	0
7:30 AM	0	0	0	0	0	1	2	0	0	0	10	1	0	0	4	0
7:45 AM	0	4	0	0	0	2	1	0	0	0	3	1	0	0	7	0
8:00 AM	0	0	0	0	0	1	1	0	0	0	9	0	0	0	8	0
8:15 AM	0	1	0	0	0	2	0	0	0	0	5	1	0	0	12	0
8:30 AM	0	0	0	1	0	17	0	1	0	0	6	0	0	0	7	0
8:45 AM	0	0	0	0	0	1	0	0	0	0	3	0	0	0	7	0

Start Time	Old Sturbridge Village Road Northbound				Old Sturbridge Village Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	2	0	2	0	0	0	0	5	1	0	0	1	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	3	0	0	0	4	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	4	1	0	0	5	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	4	0
5:15 PM	0	0	0	1	0	0	0	0	0	0	6	0	0	0	2	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	1	2	0

AM PEAK HOUR 7:45 AM to 8:45 AM PHF	Old Sturbridge Village Road Northbound				Old Sturbridge Village Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	5	0	1	0	22	2	1	0	0	23	2	0	0	34	0
	0.38				0.35				0.69				0.71			

PM PEAK HOUR 4:00 PM to 5:00 PM PHF	Old Sturbridge Village Road Northbound				Old Sturbridge Village Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	1	0	2	0	2	0	0	0	0	14	2	0	0	13	0
	0.38				0.25				0.67				0.65			

Client: Rodney Emery  
 Project #: 409\_050\_WT  
 BTD #: Location 4  
 Location: Sturbridge, MA  
 Street 1: Route 20 (Main Street)  
 Street 2: Old Sturbridge Village Road  
 Count Date: 1/7/2020  
 Day of Week: Tuesday  
 Weather: Mostly Cloudy, 40°F



**PEDESTRIANS & BICYCLES**

Start Time	Old Sturbridge Village Road Northbound				Old Sturbridge Village Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0

Start Time	Old Sturbridge Village Road Northbound				Old Sturbridge Village Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0

AM PEAK HOUR <sup>1</sup> 7:30 AM to 8:30 AM	Old Sturbridge Village Road Northbound				Old Sturbridge Village Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0

PM PEAK HOUR <sup>1</sup> 4:00 PM to 5:00 PM	Old Sturbridge Village Road Northbound				Old Sturbridge Village Road Southbound				Route 20 (Main Street) Eastbound				Route 20 (Main Street) Westbound			
	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	0	0	0	2	0	0	0	2	0	0	0	3	0	0	0	0

<sup>1</sup> NOTE: Peak hour summaries here correspond to peak hours identified for passenger cars and heavy vehicles combined.

## 5.2 Crash Rate Calculation







# Crash Data Summary Table

365 Main Street, Sturbridge MA  
2013 - 2017

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	D1 Age	D2 Age
#	mm/dd/yy	Day	hh:mm	Type	Type	Type	Type	Type	#	#
1	01/05/13	Saturday	12:48 PM	Rear-end	Daylight	Clear	Dry	Inattention	25-34	35-44
2	01/18/13	Friday	2:12 PM	Rear-end	Daylight	Clear	Dry	Inattention	25-34	55-64
3	02/09/13	Saturday	7:06 AM	Angle	Daylight	Snow	Snow	Failed to yield right of way	25-34	55-64
4	02/19/13	Tuesday	7:58 AM	Rear-end	Daylight	Clear	Dry	Glare	35-44	65-74
5	02/28/13	Thursday	8:51 AM	Sideswipe, same direction	Daylight	Rain	Wet	No improper driving	45-54	45-54
6	03/21/13	Thursday	5:00 PM	Rear-end	Daylight	Clear	Wet	Inattention	35-44	45-54
7	03/22/13	Friday	4:18 PM	Rear-end	Daylight	Cloudy	Dry	Inattention	16-17	25-34
8	06/18/13	Tuesday	1:35 PM	Rear-end	Daylight	Cloudy	Dry	Made an improper turn	25-34	45-54
9	07/06/13	Tuesday	4:00 PM	Rear-end	Daylight	Sleet, hail, freezing rain	Slush	No improper driving	45-54	65-74
10	07/08/13	Monday	4:31 PM	Rear-end	Daylight	Clear	Dry	Inattention	35-44	45-54
11	07/13/13	Saturday	1:25 PM	Rear-end	Daylight	Cloudy	Dry	Disregarded traffic signs, signals, road markings	21-24	35-44
12	08/01/13	Thursday	11:25 AM	Sideswipe, same direction	Daylight	Clear	Dry	Failed to yield right of way	55-64	75-84
13	08/16/13	Friday	10:47 AM	Rear-end	Daylight	Clear	Dry	Inattention	35-44	55-64
14	08/18/13	Sunday	1:54 PM	Rear-end	Daylight	Clear	Dry	Inattention	16-17	25-34
15	08/23/13	Friday	11:01 AM	Sideswipe, same direction	Daylight	Clear	Dry	Failed to yield right of way	45-54	55-64
16	08/25/13	Sunday	7:48 AM	Single vehicle crash	Daylight	Clear	Dry	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	25-34	25-34
17	09/03/13	Tuesday	2:50 PM	Rear-end	Unknown	Unknown	Unknown	Inattention	21-24	25-34
18	09/06/13	Friday	7:45 AM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	21-24	65-74
19	09/20/13	Friday	8:21 PM	Angle	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings	25-34	45-54
20	10/15/13	Tuesday	10:01 AM	Rear-end	Daylight	Clear	Dry	Inattention	75-84	75-84
21	10/30/13	Wednesday	2:34 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	55-64	65-74
22	11/16/13	Saturday	12:51 PM	Angle	Daylight	Clear	Dry	Inattention	25-34	65-74
23	02/11/14	Tuesday	2:14 PM	Rear-end	Daylight	Clear	Wet	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	35-44	45-54
24	03/19/14	Wednesday	6:21 AM	Rear-end	Daylight	Clear	Dry	Inattention	35-44	45-54
25	03/19/14	Wednesday	10:10 AM	Rear-end	Daylight	Cloudy	Dry	Disregarded traffic signs, signals, road markings	25-34	35-44
26	04/21/14	Monday	4:03 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	21-24	35-44
27	06/07/14	Saturday	9:56 PM	Sideswipe, same direction	Dark - lighted roadway	Clear	Dry	Failure to keep in proper lane or running off road	18-20	55-64
28	06/17/14	Tuesday	4:33 PM	Rear-end	Daylight	Cloudy	Dry	Inattention	25-34	55-64
29	07/21/14	Monday	5:22 PM	Angle	Daylight	Clear	Dry	Inattention	16-17	55-64
30	10/16/14	Thursday	11:26 AM	Single vehicle crash	Daylight	Rain	Wet	Failure to keep in proper lane or running off road	16-17	16-17

# Crash Data Summary Table

365 Main Street, Sturbridge MA  
2013 - 2017

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	D1 Age	D2 Age
#	mm/dd/yy	Day	hh:mm	Type	Type	Type	Type	Type	#	#
31	01/02/15	Friday	1:10 PM	Angle	Daylight	Cloudy	Dry	Failed to yield right of way	25-34	55-64
32	01/15/15	Thursday	12:35 PM	Angle	Daylight	Cloudy	Dry	Made an improper turn	25-34	75-84
33	02/20/15	Friday	9:07 PM	Angle	Dark - lighted roadway	Clear	Dry	Failed to yield right of way	16-17	45-54
34	03/30/15	Monday	11:22 AM	Rear-end	Daylight	Clear	Dry	Inattention	55-64	55-64
35	04/06/15	Monday	11:02 AM	Rear-end	Daylight	Unknown	Unknown	Inattention	65-74	65-74
36	04/25/15	Saturday	2:34 PM	Single vehicle crash	Daylight	Clear	Dry	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	45-54	45-54
37	05/01/15	Friday	2:37 PM	Rear-end	Daylight	Clear	Dry	Made an improper turn	21-24	45-54
38	05/29/15	Friday	3:20 PM	Single vehicle crash	Daylight	Clear	Dry	Fatigued/asleep	75-84	75-84
39	06/05/15	Friday	11:31 AM	Rear-end	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	45-54	>84
40	06/19/15	Friday	11:50 AM	Single vehicle crash	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	55-64	55-64
41	06/27/15	Saturday	4:13 PM	Rear-end	Daylight	Clear	Dry	Inattention	35-44	65-74
42	09/12/15	Saturday	9:09 PM	Angle	Dark - lighted roadway	Clear	Dry	Inattention	75-84	75-84
43	09/23/15	Wednesday	4:32 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	21-24	35-44
44	12/01/15	Tuesday	5:39 PM	Angle	Dark - lighted roadway	Clear	Dry	Unknown	16-17	75-84
45	12/11/15	Friday	4:27 PM	Rear-end	Dusk	Clear	Dry	Followed too closely	45-54	55-64
46	12/26/15	Saturday	7:20 PM	Angle	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings	16-17	21-24
47	01/04/16	Monday	4:48 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	45-54	55-64
48	04/04/16	Monday	11:33 AM	Rear-end	Daylight	Snow	Wet	Followed too closely	35-44	45-54
49	04/15/16	Friday	6:06 PM	Rear-end	Daylight	Clear	Dry	Exceeded authorized speed limit	18-20	75-84
50	05/08/16	Sunday	5:46 PM	Rear-end	Daylight	Clear	Dry	Inattention	21-24	25-34
51	05/12/16	Thursday	12:20 PM	Rear-end	Daylight	Clear	Dry	Inattention	45-54	75-84
52	06/02/16	Thursday	7:26 PM	Rear-end	Daylight	Clear	Dry	Inattention	21-24	35-44
53	07/22/16	Friday	2:30 PM	Sideswipe, same direction	Daylight	Clear	Dry	Failed to yield right of way	45-54	65-74
54	08/11/16	Thursday	7:24 AM	Rear-end	Daylight	Clear	Dry	Followed too closely	25-34	45-54
55	09/02/16	Friday	11:55 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way	25-34	25-34
56	09/21/16	Wednesday	8:49 AM	Single vehicle crash	Daylight	Clear	Dry	Fatigued/asleep	25-34	25-34
57	10/04/16	Tuesday	6:07 PM	Rear-end	Dusk	Cloudy	Dry	Inattention	45-54	65-74
58	01/25/17	Wednesday	4:22 PM	Sideswipe, same direction	Daylight	Clear	Dry	Failure to keep in proper lane or running off road	16-17	35-44
59	02/07/17	Tuesday	4:00 PM	Rear-end	Daylight	Sleet, hail, freezing rain	Slush	Followed too closely	25-34	45-54
60	03/16/17	Thursday	1:42 PM	Sideswipe, same direction	Daylight	Clear	Dry	Failure to keep in proper lane or running off road	35-44	65-74
61	03/22/17	Wednesday	11:02 PM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Unknown		
62	03/28/17	Tuesday	4:17 PM	Rear-end	Daylight	Rain	Wet	Followed too closely	18-20	35-44

## Crash Data Summary Table

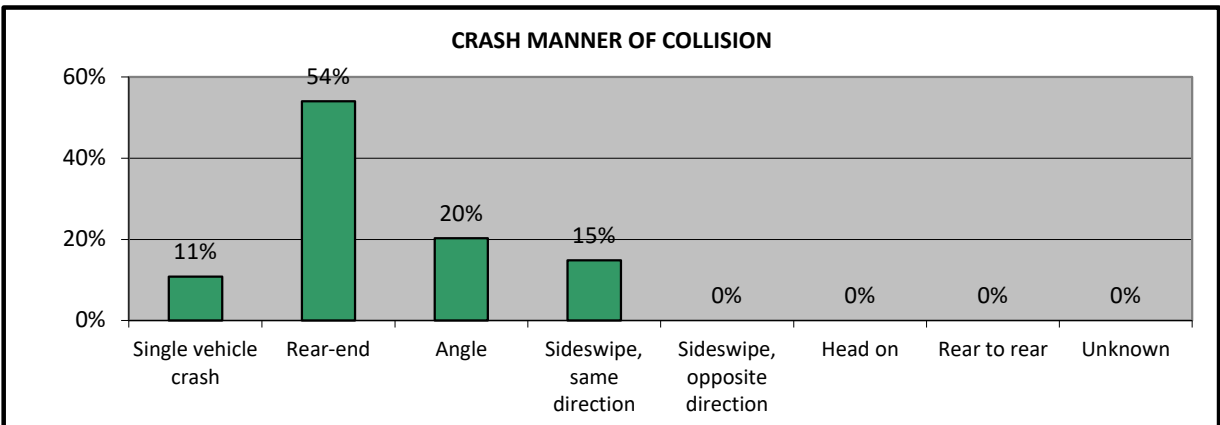
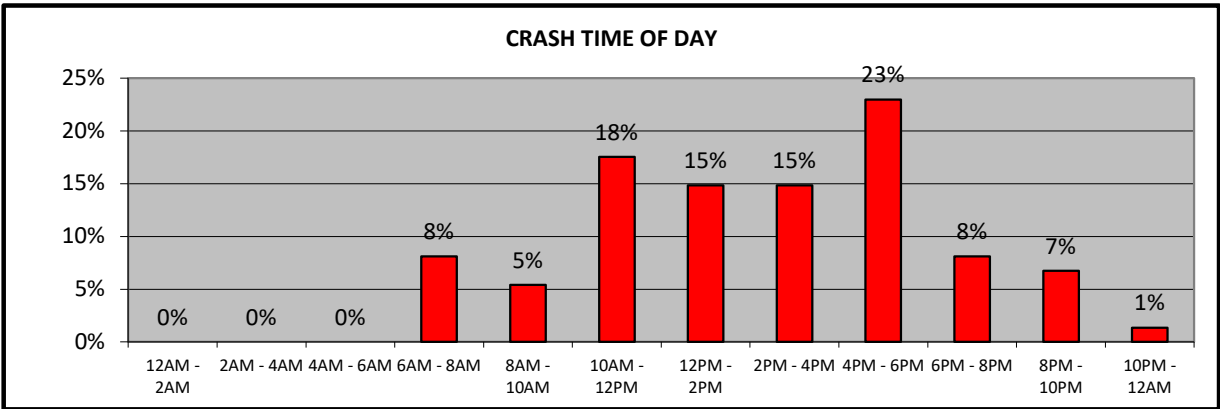
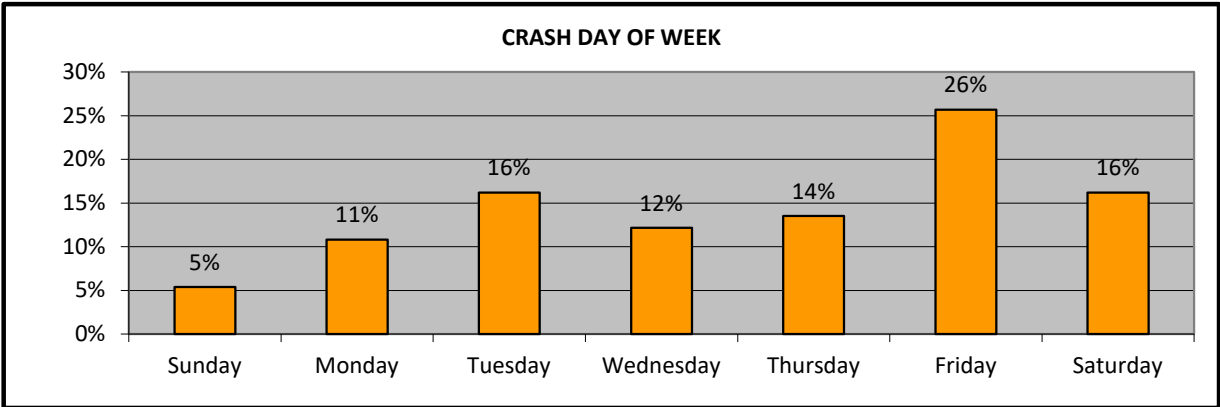
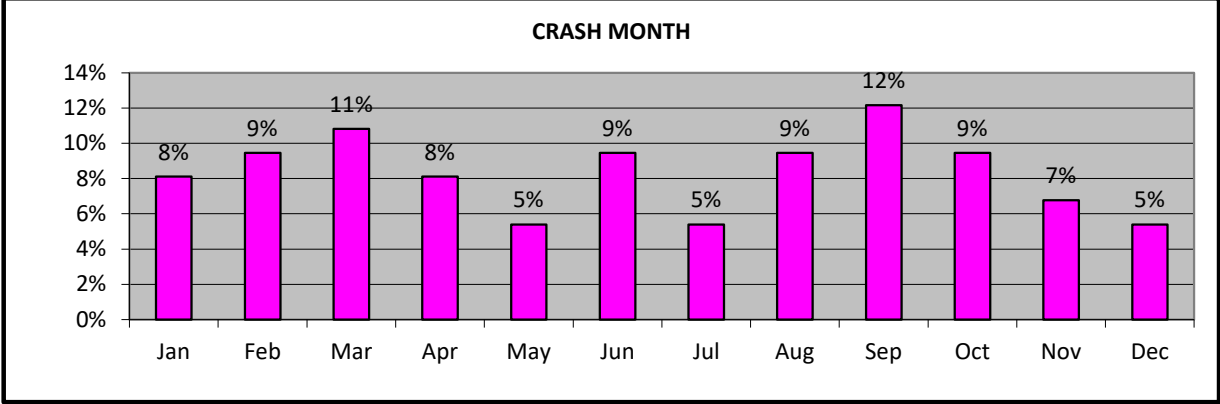
365 Main Street, Sturbridge MA  
2013 - 2017

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	D1 Age	D2 Age
#	mm/dd/yy	Day	hh:mm	Type	Type	Type	Type	Type	#	#
63	04/28/17	Friday	12:56 PM	Sideswipe, same direction	Daylight	Clear	Dry	Failure to keep in proper lane or running off road	21-24	55-64
64	08/22/17	Tuesday	3:48 PM	Sideswipe, same direction	Daylight	Clear	Dry	Failed to yield right of way	25-34	25-34
65	09/07/17	Thursday	8:32 AM	Rear-end	Daylight	Clear	Dry	Followed too closely	25-34	55-64
66	09/13/17	Wednesday	3:07 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	21-24	45-54
67	10/09/17	Monday	11:12 AM	Angle	Daylight	Rain	Wet	Inattention	25-34	25-34
68	10/14/17	Saturday	9:57 PM	Rear-end	Dark - lighted roadway	Cloudy	Dry	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	18-20	35-44
69	10/21/17	Saturday	3:43 PM	Single vehicle crash	Daylight	Clear	Dry	No improper driving	25-34	25-34
70	11/08/17	Wednesday	6:54 PM	Rear-end	Dark - roadway not lighted	Clear	Dry	Inattention	18-20	55-64
71	11/10/17	Friday	8:03 AM	Rear-end	Daylight	Clear	Dry	Inattention	45-54	55-64
72	11/19/17	Sunday	12:58 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	16-17	25-34
73	11/24/17	Friday	6:20 PM	Angle	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings	45-54	75-84
74	12/23/17	Saturday	5:13 PM	Sideswipe, same direction	Dark - lighted roadway	Rain	Wet	Failed to yield right of way	21-24	55-64

\*Courtesy Crash - A term used to describe a crash that occurs subsequent to a non-involved mainline driver who gives the right of way, contrary to the rules of the road, to another driver.

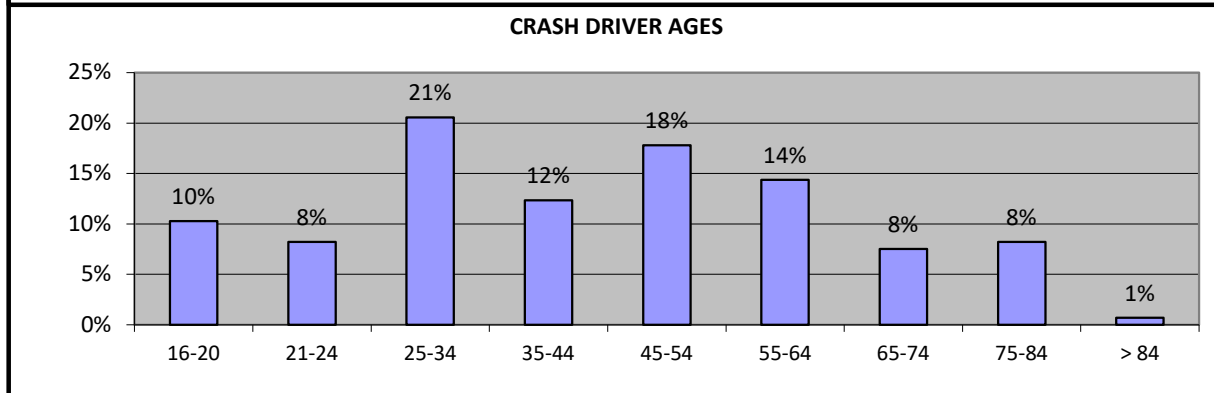
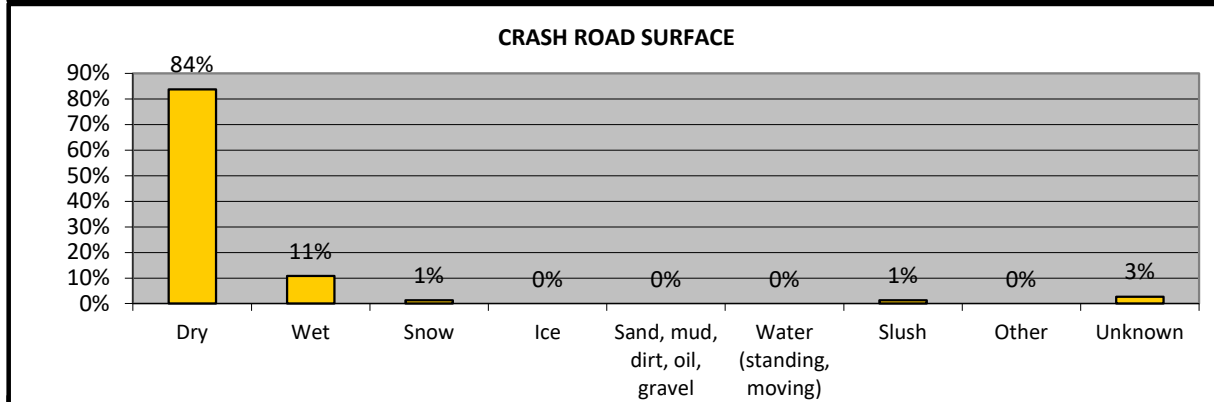
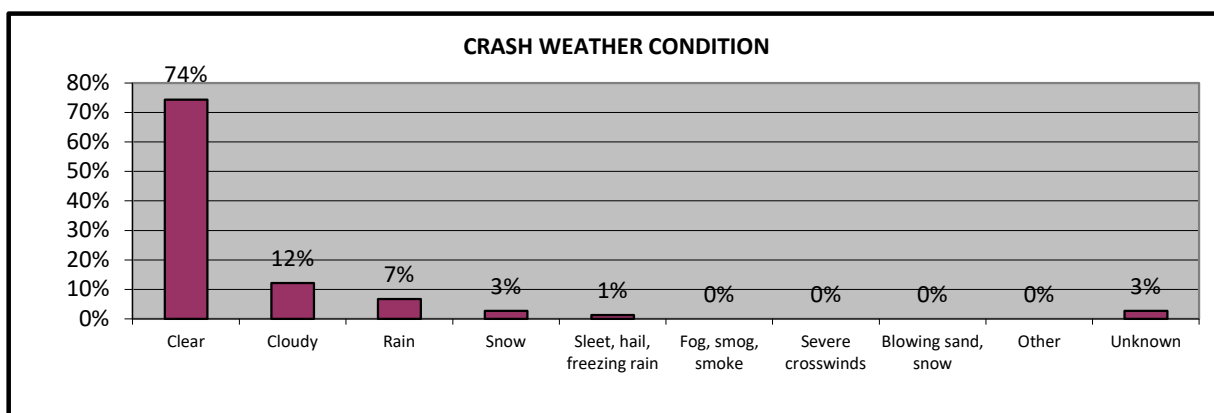
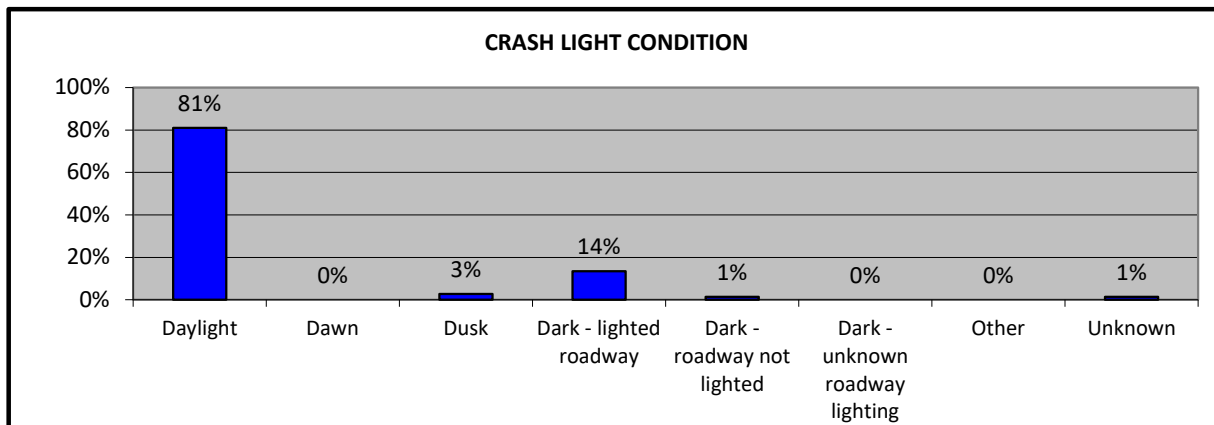
Summaries based on crash reports obtained from the MUNICIPALITY/STATE Police Department.

## Crash Data Summary Charts 365 Main Street, Sturbridge MA



## Crash Data Summary Charts

### 365 Main Street, Sturbridge MA





# SEGMENT CRASH RATE WORKSHEET

CITY/TOWN : Sturbridge COUNT DATE : Feb-20

DISTRICT : 3

### ~ SEGMENT DATA ~

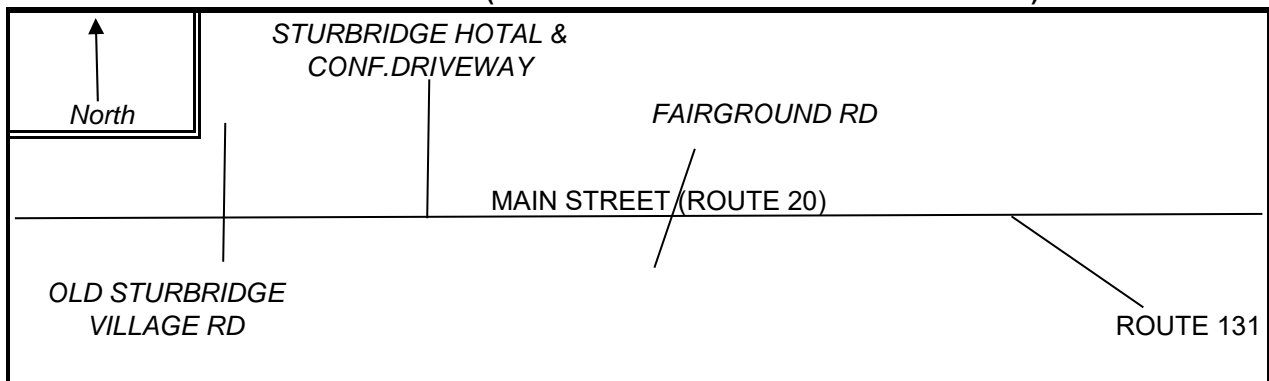
ROADWAY NAME: Main Street (Route 20)

START POINT: Old Sturbridge Village Rd

END POINT: Route 131

FUNCTIONAL CLASSIFICATION OF ROADWAY: Urban Principal Arterial

### ROADWAY DIAGRAM (LABEL ROADWAY AND CROSS STREETS)



### AVERAGE DAILY TRAFFIC

SEGMENT LENGTH IN MILES ( L ): **0.388**

AVERAGE DAILY TRAFFIC VOLUME ( V ): 25,030

TOTAL # OF CRASHES:

**74**

# OF YEARS :

**5**

AVERAGE # OF CRASHES PER YEAR ( A ) :

**14.80**

CRASH RATE CALCULATION :

**4.18**

$$\text{RATE} = \frac{(A * 1,000,000)}{(L * V * 365)}$$

Comments : Above Statewide Average for Urban principal arterial (3.49 C/MVMT)

Project Title & Date: Marijuana Dispensary 365 Main Street



# Crash Data Summary Table

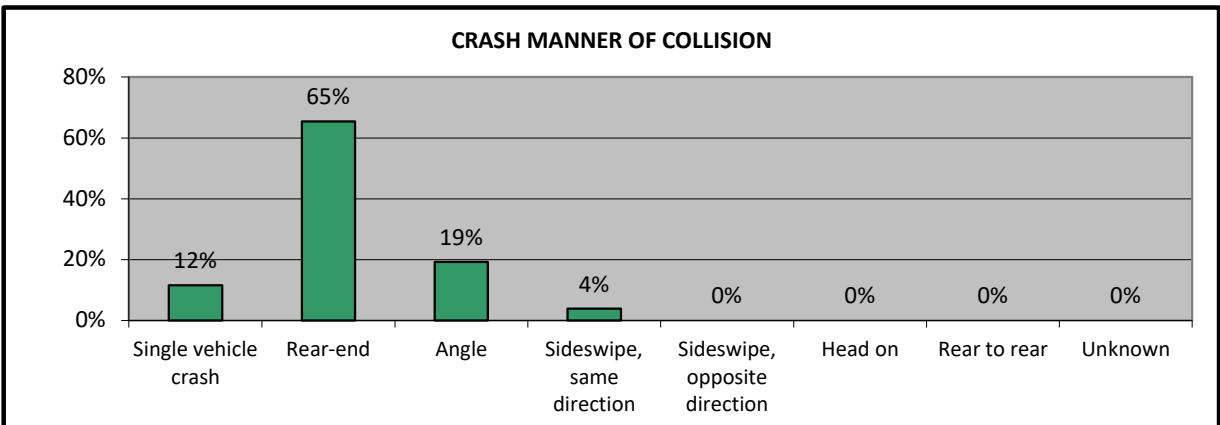
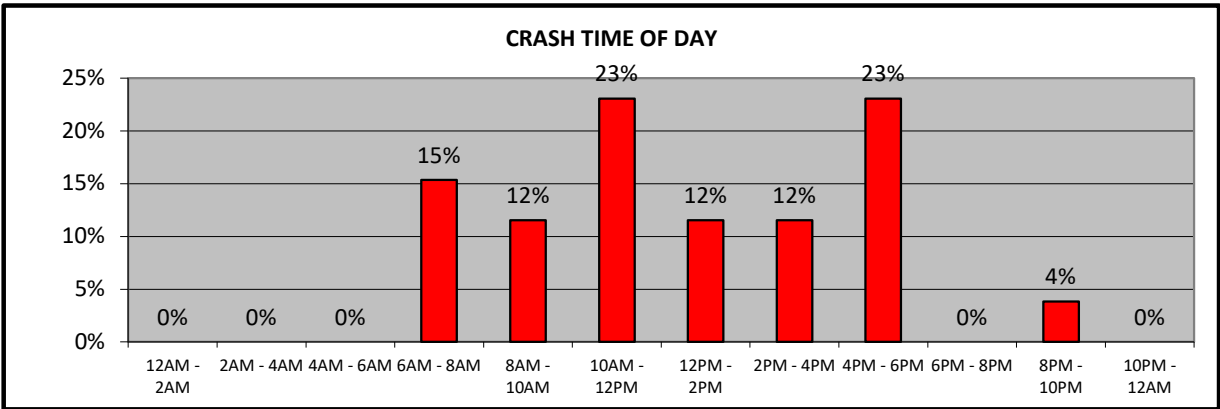
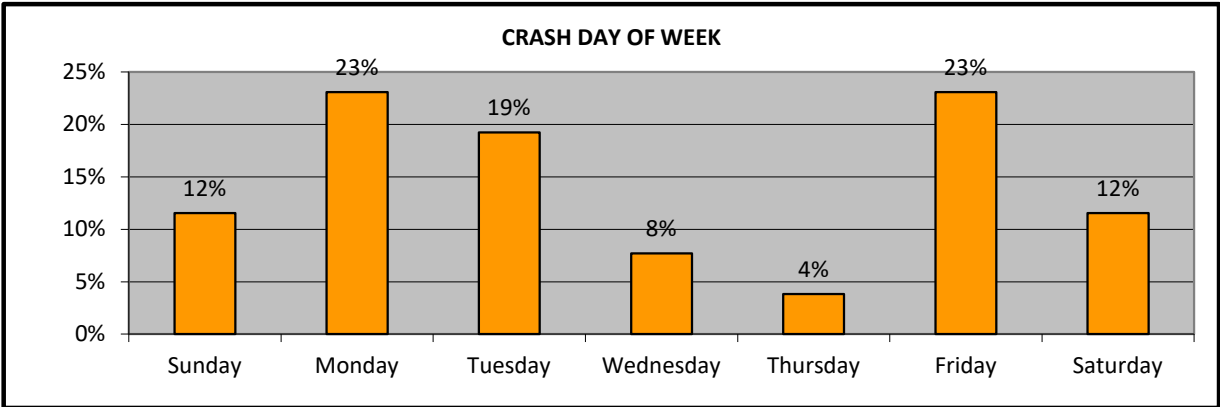
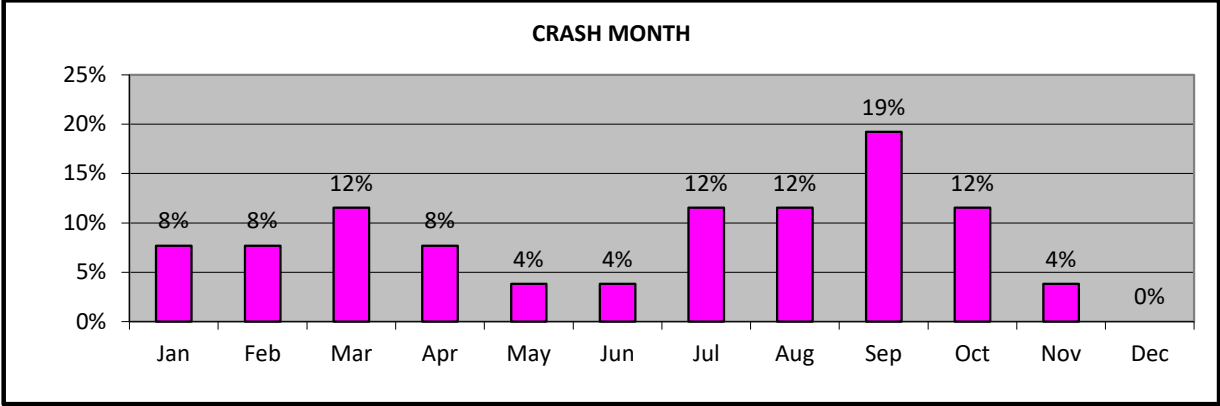
Main Street at Old Sturbridge Village Rd, Sturbridge MA  
2013 - 2017

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	D1 Age	D2 Age
#	mm/dd/yy	Day	hh:mm	Type	Type	Type	Type	Type	#	#
1	01/05/13	Saturday	12:48 PM	Rear-end	Daylight	Clear	Dry	Inattention	25-34	35-44
2	02/19/13	Tuesday	7:58 AM	Rear-end	Daylight	Clear	Dry	Glare	35-44	65-74
3	03/22/13	Friday	4:18 PM	Rear-end	Daylight	Cloudy	Dry	Inattention	16-17	25-34
4	07/06/13	Saturday	9:56 AM	Rear-end	Daylight	Clear	Dry	No improper driving	45-54	65-74
5	07/08/13	Monday	4:31 PM	Rear-end	Daylight	Clear	Dry	Inattention	35-44	45-54
6	08/16/13	Friday	10:47 AM	Rear-end	Daylight	Clear	Dry	Inattention	35-44	55-64
7	08/18/13	Sunday	1:54 PM	Rear-end	Daylight	Clear	Dry	Inattention	16-17	25-34
8	08/25/13	Sunday	7:48 AM	Single vehicle crash	Daylight	Clear	Dry	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	25-34	25-34
9	09/03/13	Tuesday	2:50 PM	Rear-end	Unknown	Unknown	Unknown	Inattention	21-24	25-34
10	09/06/13	Friday	7:45 AM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	21-24	65-74
11	09/20/13	Friday	8:21 PM	Angle	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings	25-34	45-54
12	10/15/13	Tuesday	10:01 AM	Rear-end	Daylight	Clear	Dry	Inattention	75-84	75-84
13	02/11/14	Tuesday	2:14 PM	Rear-end	Daylight	Clear	Wet	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	35-44	45-54
14	03/19/14	Wednesday	6:21 AM	Rear-end	Daylight	Clear	Dry	Inattention	35-44	45-54
15	04/21/14	Monday	4:03 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	21-24	35-44
16	06/17/14	Tuesday	4:33 PM	Rear-end	Daylight	Cloudy	Dry	Inattention	25-34	55-64
17	07/21/14	Monday	5:22 PM	Angle	Daylight	Clear	Dry	Inattention	16-17	55-64
18	01/15/15	Thursday	12:35 PM	Angle	Daylight	Cloudy	Dry	Made an improper turn	25-34	75-84
19	03/30/15	Monday	11:22 AM	Rear-end	Daylight	Clear	Dry	Inattention	55-64	55-64
20	04/04/16	Monday	11:33 AM	Rear-end	Daylight	Snow	Wet	Followed too closely	35-44	45-54
21	05/08/16	Sunday	5:46 PM	Rear-end	Daylight	Clear	Dry	Inattention	21-24	25-34
22	09/02/16	Friday	11:55 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way	25-34	25-34
23	09/21/16	Wednesday	8:49 AM	Single vehicle crash	Daylight	Clear	Dry	Fatigued/asleep	25-34	25-34
24	10/09/17	Monday	11:12 AM	Angle	Daylight	Rain	Wet	Inattention	25-34	25-34
25	10/21/17	Saturday	3:43 PM	Single vehicle crash	Daylight	Clear	Dry	No improper driving	25-34	25-34
26	11/10/17	Friday	8:03 AM	Rear-end	Daylight	Clear	Dry	Inattention	45-54	55-64

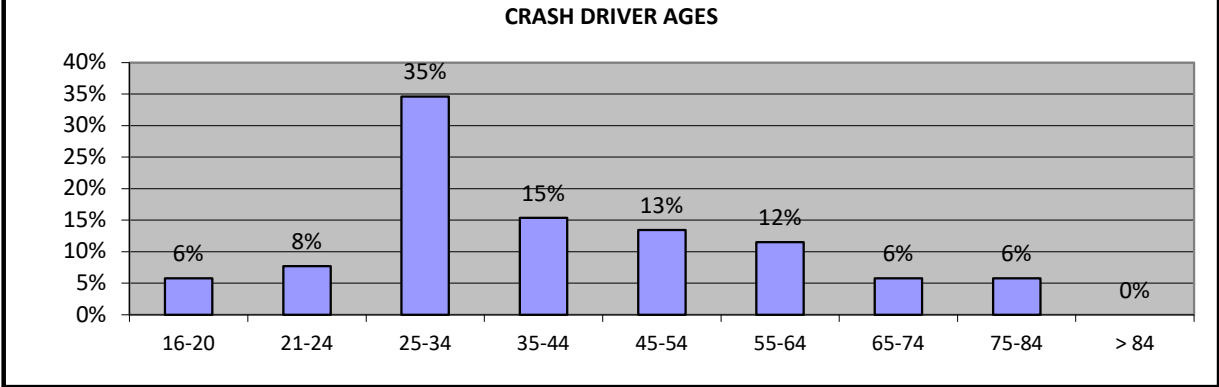
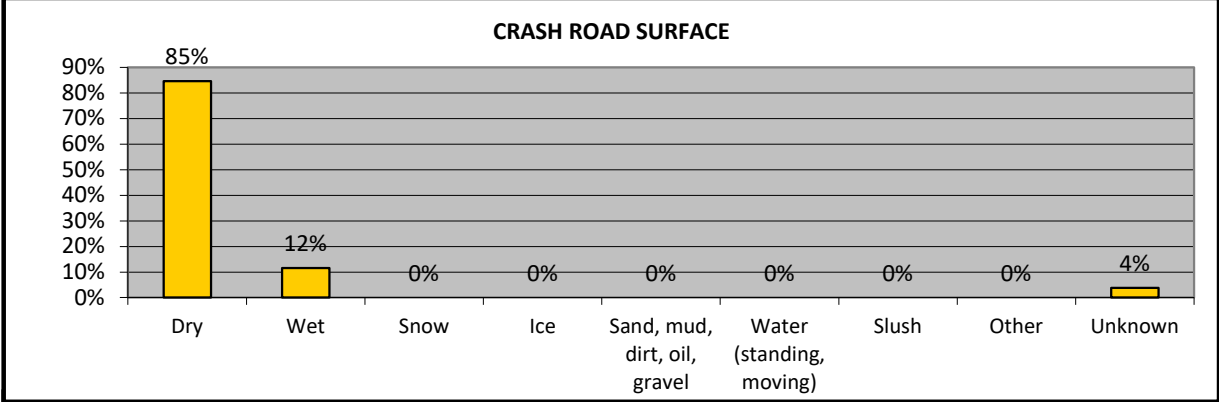
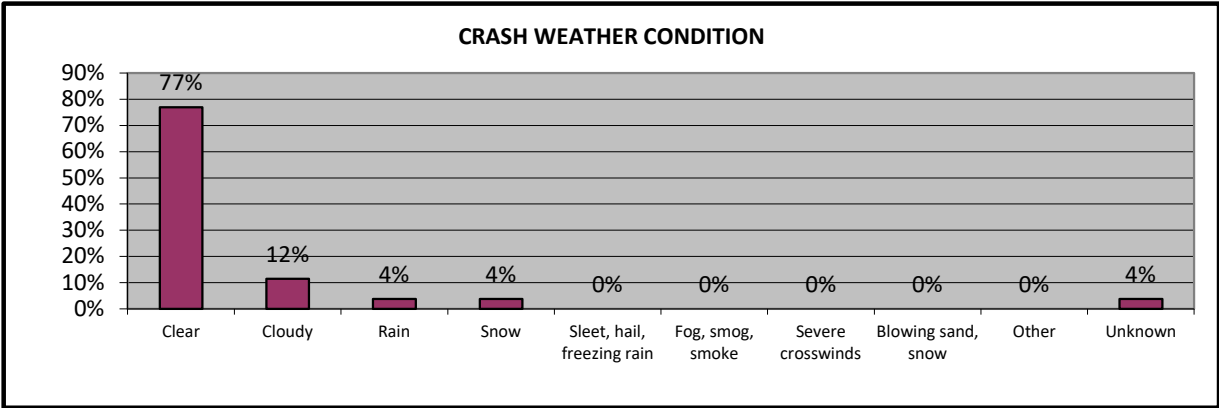
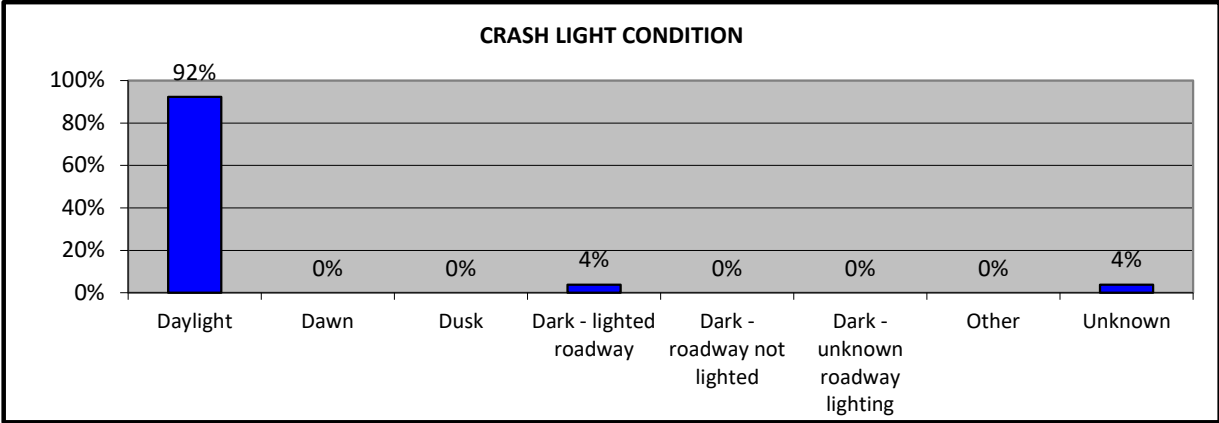
\*Courtesy Crash - A term used to describe a crash that occurs subsequent to a non-involved mainline driver who gives the right of way, contrary to the rules of the road, to another driver.

Summaries based on crash reports obtained from the MUNICIPALITY/STATE Police Department.

## Crash Data Summary Charts Main Street at Old Sturbridge Village Rd, Sturbridge MA



## Crash Data Summary Charts Main Street at Old Sturbridge Village Rd, Sturbridge MA





# Crash Data Summary Table

Main Street at Route 131

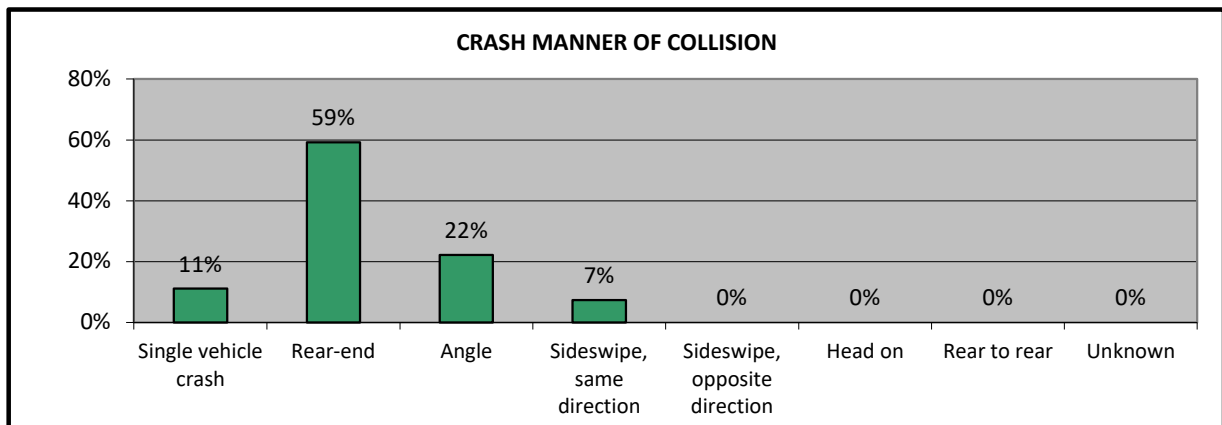
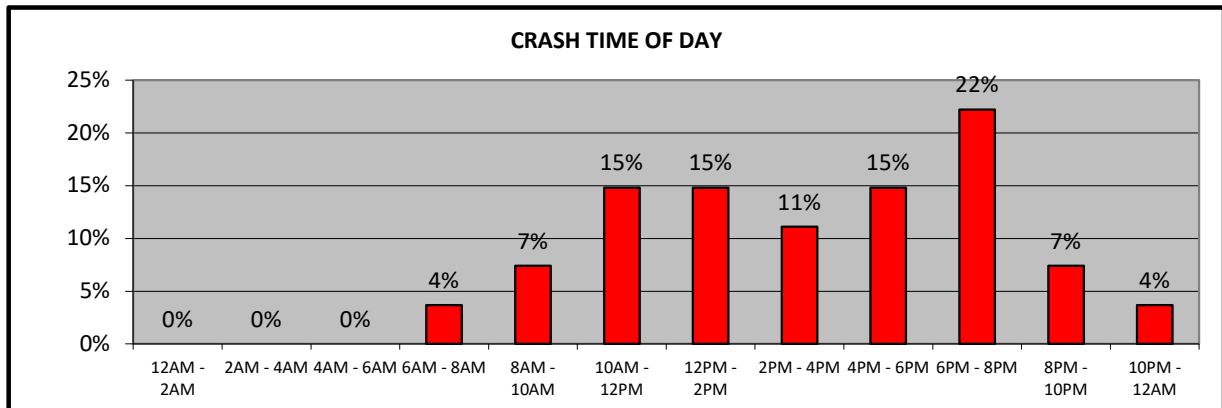
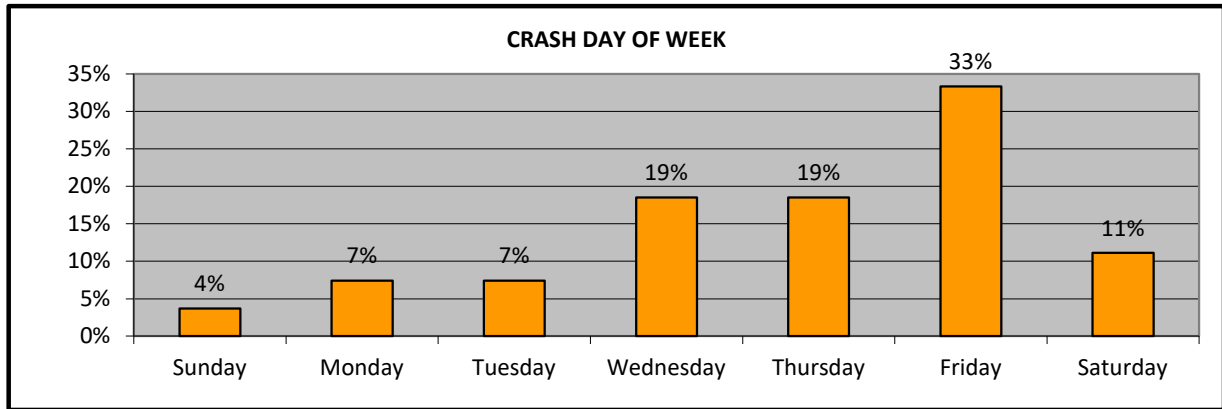
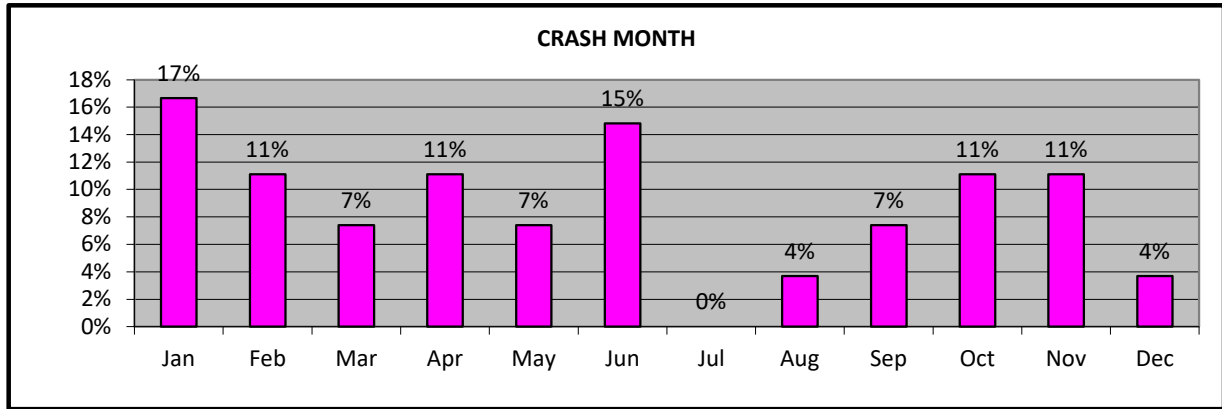
2013 - 2017

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	D1 Age	D2 Age
#	mm/dd/yy	Day	hh:mm	Type	Type	Type	Type	Type	#	#
1	01/18/13	Friday	2:12 PM	Rear-end	Daylight	Clear	Dry	Inattention	25-34	55-64
2	02/28/13	Thursday	8:51 AM	Sideswipe, same direction	Daylight	Rain	Wet	No improper driving	45-54	45-54
3	10/30/13	Wednesday	2:34 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	55-64	65-74
4	03/19/14	Wednesday	10:10 AM	Rear-end	Daylight	Cloudy	Dry	Disregarded traffic signs, signals, road markings	25-34	35-44
5	01/02/15	Friday	1:10 PM	Angle	Daylight	Cloudy	Dry	Failed to yield right of way	25-34	55-64
6	02/20/15	Friday	9:07 PM	Angle	Dark - lighted roadway	Clear	Dry	Inattention	16-17	45-54
7	04/06/15	Monday	11:02 AM	Rear-end	Daylight	Unknown	Unknown	Inattention	65-74	65-74
8	05/29/15	Friday	3:20 PM	Single vehicle crash	Daylight	Clear	Dry	Fatigued/asleep	75-84	75-84
9	06/05/15	Friday	11:31 AM	Rear-end	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	45-54	>84
10	06/19/15	Friday	11:50 AM	Single vehicle crash	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	55-64	55-64
11	06/27/15	Saturday	4:13 PM	Rear-end	Daylight	Clear	Dry	Inattention	35-44	65-74
12	09/23/15	Wednesday	4:32 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	21-24	35-44
13	12/26/15	Saturday	7:20 PM	Angle	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings	16-17	21-24
14	01/04/16	Monday	4:48 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way	45-54	55-64
15	04/15/16	Friday	6:06 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	18-20	75-84
16	05/12/16	Thursday	12:20 PM	Rear-end	Daylight	Clear	Dry	Inattention	45-54	75-84
17	06/02/16	Thursday	7:26 PM	Rear-end	Daylight	Clear	Dry	Inattention	21-24	35-44
18	08/11/16	Thursday	7:24 AM	Rear-end	Daylight	Clear	Dry	Followed too closely	25-34	45-54
19	10/04/16	Tuesday	6:07 PM	Rear-end	Dusk	Cloudy	Dry	Inattention	45-54	65-74
20	02/07/17	Tuesday	4:00 PM	Rear-end	Daylight	Sleet, rain, freezing rain	Slush	Followed too closely	25-34	45-54
21	03/22/17	Wednesday	11:02 PM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Unknown		
22	04/28/17	Friday	12:56 PM	Sideswipe, same direction	Daylight	Clear	Dry	Failure to keep in proper lane or running off road	21-24	55-64
23	09/07/17	Thursday	8:32 AM	Rear-end	Daylight	Clear	Dry	Followed too closely	25-34	55-64
24	10/14/17	Saturday	9:57 PM	Rear-end	Dark - lighted roadway	Cloudy	Dry	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	18-20	35-44
25	11/08/17	Wednesday	6:54 PM	Rear-end	Dark - roadway not lighted	Clear	Dry	Inattention	18-20	55-64
26	11/19/17	Sunday	12:58 PM	Rear-end	Daylight	Clear	Dry	Followed too closely	16-17	25-34
27	11/24/17	Friday	6:20 PM	Angle	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings	45-54	75-84

\*Courtesy Crash - A term used to describe a crash that occurs subsequent to a non-involved mainline driver who gives the right of way, contrary to the rules of the road, to another driver.

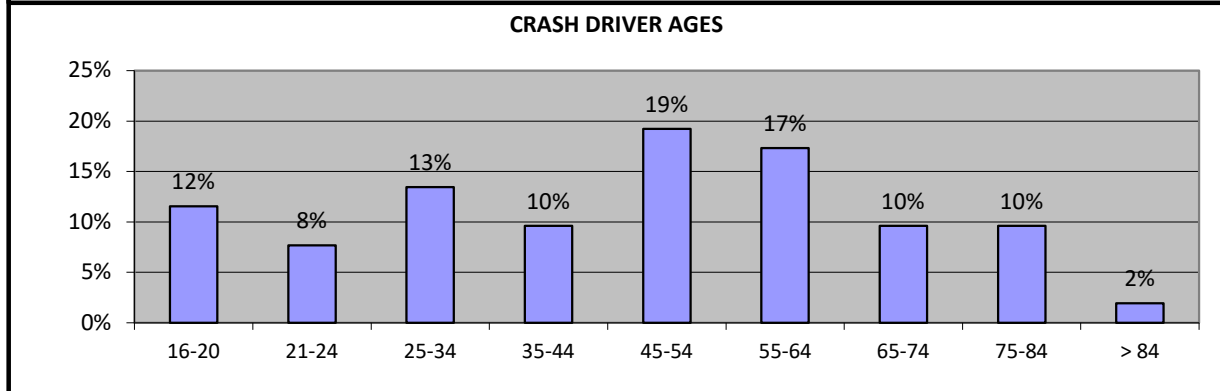
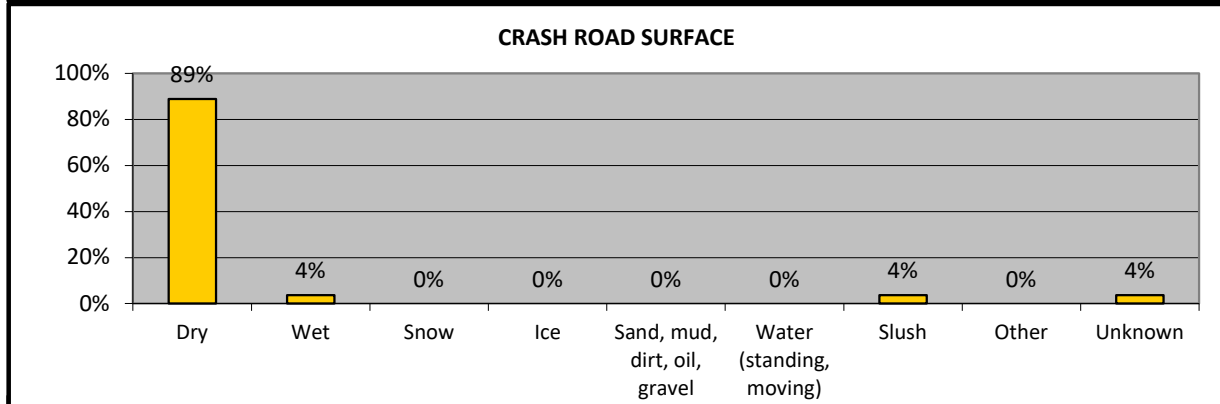
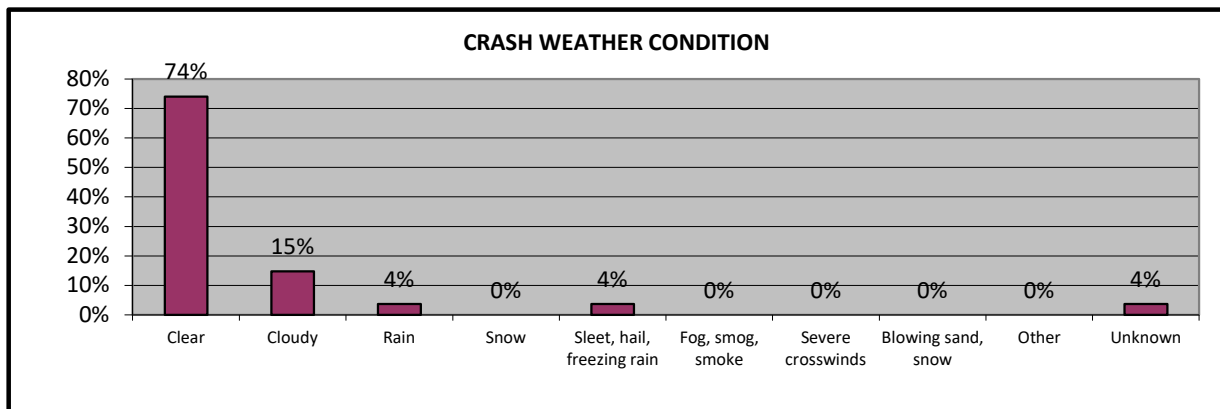
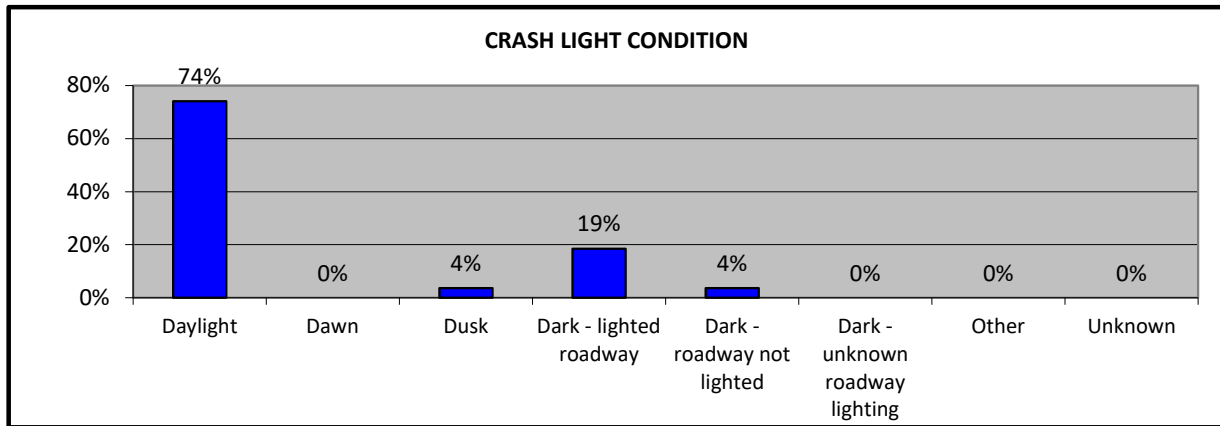
Summaries based on crash reports obtained from the MUNICIPALITY/STATE Police Department.

## Crash Data Summary Charts Main Street at Route 131





## Crash Data Summary Charts Main Street at Route 131





**5.3 Traffic Background Growth Worksheet**

Massachusetts Highway Department  
Statewide Traffic Data Collection  
2017 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
<b>R1</b>	1.30	1.23	1.21	1.04	0.98	0.92	0.86	0.81	0.95	0.99	1.03	1.10	0.80
<b>R2</b>	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
<b>R3</b>	1.05	1.01	1.04	0.99	0.94	0.93	0.91	0.92	0.96	0.94	1.01	1.03	0.97
<b>R4-R7</b>	1.10	1.07	1.09	1.00	0.95	0.89	0.88	0.87	0.92	0.95	1.04	1.09	0.93
<b>U1-Boston</b>	1.01	1.04	0.99	0.94	0.93	0.92	0.96	0.93	0.94	0.93	0.95	0.98	0.95
<b>U1-Essex</b>	1.04	1.05	1.00	0.96	0.93	0.89	0.90	0.90	0.93	0.93	0.98	1.03	0.90
<b>U1-Southeast</b>	1.07	1.05	1.02	0.97	0.95	0.90	0.89	0.88	0.92	0.94	0.98	1.01	0.97
<b>U1-West</b>	1.00	0.96	0.94	0.92	0.93	0.92	0.95	0.93	0.92	0.92	0.97	0.97	0.89
<b>U1-Worcester</b>	1.10	1.10	1.04	0.97	0.95	0.94	0.93	0.91	0.95	0.96	0.98	1.04	0.89
<b>U2</b>	1.01	1.03	0.98	0.95	0.93	0.91	0.94	0.92	0.95	0.95	0.95	0.97	0.98
<b>U3</b>	1.03	1.05	1.01	0.95	0.92	0.90	0.94	0.93	0.93	0.92	0.96	0.99	0.96
<b>U4-U7</b>	1.06	1.05	1.02	0.96	0.92	0.89	0.95	0.95	0.92	0.92	0.98	1.03	0.98
<b>Rec - East</b>	1.18	1.17	1.08	1.03	0.95	0.87	0.83	0.83	0.97	0.98	1.19	1.19	0.98
<b>Rec - West</b>	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.95

Round off:

0-999 = 10

>1000 = 100

U = Urban

R = Rural

1 - Interstate

2 - Freeway and Expressway

3 - Other Principal Arterial

4 - Minor Arterial

5 - Major Collector

6 - Minor Collector

7 - Local Road and Street

**Recreational - East Group** - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

**Recreational - West Group** - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.

captured within the past 10 years... [more](#)

[List View](#) [All DIRs](#) [Report Center](#)

Record		of 1	Goto Record	<input type="text"/>	<input type="button" value="go"/>
<b>Location ID</b>	S17-043-287-02		<b>MPO ID</b>		
<b>Type</b>	SPOT		<b>HPMS ID</b>		
<b>On NHS</b>	No		<b>On HPMS</b>	No	
<b>LRS ID</b>	US20 EB		<b>LRS Loc Pt.</b>	94.98447	
<b>SF Group</b>	U3		<b>Route Type</b>	US	
<b>AF Group</b>	U3		<b>Route</b>	20	
<b>GF Group</b>	U3		<b>Active</b>	Yes	
<b>Class Dist Grp</b>	U3		<b>Category</b>		
<b>Seas Clss Grp</b>	MHD Statewide				
<b>WIM Group</b>					
<b>QC Group</b>	Default				
<b>Fnc't'l Class</b>	(3) Other Principal Arterial		<b>Milepost</b>		
<b>Located On</b>	CHARLTON ROAD				
<b>Loc On Alias</b>					
<b>WEST OF</b>	NEW BOSTON ROAD				
<b>More Detail</b>					
<b>STATION DATA</b>					

**Directions:** [2-WAY](#) [EB](#) [WB](#)

**AADT**

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2018	21,199 <sup>7</sup>						
2017	20,907 <sup>7</sup>						

Travel Demand Model										
Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV	
No Data										

VOLUME COUNT			
Date	Int	Total	
No Data			

VOLUME TREND	
Year	Annual Growth
2018	1%

SPEED					
Date	Int	Pace	85th	Total	
No Data					

CLASSIFICATION			
Date	Int	Total	
No Data			

WEIGH-IN-MOTION				
Date	Axles	Avg GVW	Total	
No Data				

PER VEHICLE				
Date	Axles	85th	Total	
No Data				

GAP			
Date	Int	Total	
No Data			

**PARTIAL COUNT**  
 Date      Int      24-Hr Total

NOTES/FILES		
Note	Date	


Location ID	S17-043-287-01	MPO ID	
Type	SPOT	HPMS ID	
On NHS	No	On HPMS	No
LRS ID	US20 EB	LRS Loc Pt.	95.09553
SF Group	U3	Route Type	US
AF Group	U3	Route	20
GF Group	U3	Active	Yes
Class Dist Grp	U3	Category	
Seas Clss Grp	MHD Statewide		
WIM Group			
QC Group	Default		
Funct'I Class	(3) Other Principal Arterial	Milepost	
Located On	CHARLTON ROAD		
Loc On Alias			
EAST OF	NEW BOSTON ROAD		
More Detail	▶		
<b>STATION DATA</b>			

Directions: [2-WAY](#) [EB](#) [WB](#) [?](#)


**AADT** [?](#)


Year	AADT	DHV-30	K %	D %	PA	BC	Src
2018	21,336 <sup>3</sup>		10	66	20,792 (97%)	544 (3%)	Grown from 2017
2017	21,041	1,999	10	66	20,504 (97%)	536 (3%)	

Travel Demand Model										
Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV	

VOLUME COUNT			
Date	Int	Total	
Wed 11/1/2017	15	22,644	
Tue 10/31/2017	15	21,765	
			

VOLUME TREND <a href="#">?</a>	
Year	Annual Growth
2018	1%

SPEED					
Date	Int	Pace	85th	Total	
Wed 11/1/2017	15	39 - 49	47	22,628	
Tue 10/31/2017	15	39 - 49	47	21,748	
					

CLASSIFICATION			
Date	Int	Total	
Wed 11/1/2017	15	22,644	
Tue 10/31/2017	15	21,765	
			

WEIGH-IN-MOTION <a href="#">?</a>				
Date	Axles	Avg GVW	Total	
No Data				

PER VEHICLE			
Date	Axles	85th	Total
No Data			

GAP		
Date	Int	Total
No Data		

**PARTIAL COUNT**

Date	Int	24-Hr Total
No Data		

NOTES/FILES



<b>Location ID</b>	3929	<b>MPO ID</b>	
<b>Type</b>	SPOT	<b>HPMS ID</b>	287005406730
<b>On NHS</b>	No	<b>On HPMS</b>	Yes
<b>LRS ID</b>	I84 EB	<b>LRS Loc Pt.</b>	6.57822
<b>SF Group</b>	U1-Worcester	<b>Route Type</b>	I
<b>AF Group</b>	U1-Worcester	<b>Route</b>	84
<b>GF Group</b>	U1-Worcester	<b>Active</b>	Yes
<b>Class Dist Grp</b>	U1-Worcester	<b>Category</b>	HPMS
<b>Seas Clss Grp</b>	MHD Statewide		
<b>WIM Group</b>			
<b>QC Group</b>	Perm		
<b>Funct'l Class</b>	(1) Interstate	<b>Milepost</b>	
<b>Located On</b>	WILBUR CROSS HIGHWAY		
<b>Loc On Alias</b>	WILBUR CROSS HIGHWAY		
<b>SOUTH OF</b>	RTE.20		

More Detail **STATION DATA**

Directions:

**AADT**

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2018	57,169 <sup>3</sup>			52	53,282 (93%)	3,887 (7%)	Grown from 2016
2017	56,868 <sup>3</sup>	5,004	9	55	52,603 (93%)	4,265 (7%)	Grown from 2016
2016	55,862	6,234	11	52	52,174 (93%)	3,688 (7%)	
2015	55,467	6,188	11	57			
2014	52,522						

1-5 of 27

Travel Demand Model										
Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV	

VOLUME COUNT			
	Date	Int	Total
	Sun 5/7/2017	60	65,577
	Sat 5/6/2017	60	60,088
	Fri 5/5/2017	60	61,472
	Wed 5/3/2017	60	47,641
	Tue 5/2/2017	60	44,476
	Mon 5/1/2017	60	47,491
	Sun 4/30/2017	60	71,098
	Sat 4/29/2017	60	62,032
	Fri 4/28/2017	60	66,808
	Thu 4/27/2017	60	52,195

1-10 of 2499

mm / dd / yyyy To Date

VOLUME TREND	
Year	Annual Growth
2018	1%
2017	2%
2016	1%
2015	6%
2014	1%
2013	1%
2012	-4%
2011	-3%
2010	1%
2009	14%

1-10 of 26

SPEED					
Date	Int	Pace	85th	Total	

CLASSIFICATION			
Date	Int	Total	

<b>Location ID</b>	240983	<b>MPO ID</b>	
<b>Type</b>	SPOT	<b>HPMS ID</b>	
<b>On NHS</b>		<b>On HPMS</b>	No
<b>LRS ID</b>	SR131 EB	<b>LRS Loc Pt.</b>	0.3254794
<b>SF Group</b>	U3	<b>Route Type</b>	SR
<b>AF Group</b>	U3	<b>Route</b>	131
<b>GF Group</b>	U3	<b>Active</b>	Yes
<b>Class Dist Grp</b>	U3	<b>Category</b>	Special
<b>Seas Clss Grp</b>	MHD Statewide		
<b>WIM Group</b>			
<b>QC Group</b>	Default		
<b>Funct'l Class</b>	(3) Other Principal Arterial	<b>Milepost</b>	
<b>Located On</b>	MAIN STREET		
<b>Loc On Alias</b>	WILBUR CROSS HIGHWAY		
<b>More Detail</b>			
<b>STATION DATA</b>			

Directions:

AA DT

Year	AA DT	DHV-30	K %	D %	PA	BC	Src
2018	13,570 <sup>3</sup>				12,590 (93%)	980 (7%)	Grown from 2017
2017	13,383 <sup>3</sup>				12,834 (96%)	549 (4%)	Grown from 2016
2016	13,237 <sup>3</sup>		9	55	12,695 (96%)	542 (4%)	Grown from 2015
2015	13,067 <sup>3</sup>		9	55	12,123 (93%)	944 (7%)	Grown from 2014
2014	12,925	1,157	9	55	11,992 (93%)	932 (7%)	

1-5 of 7

Travel Demand Model										
Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV	

VOLUME COUNT			
	Date	Int	Total
	Thu 8/21/2014	15	14,879
	Wed 8/20/2014	15	14,482

VOLUME TREND	
Year	Annual Growth
2018	1%
2017	1%
2016	1%
2015	1%
2014	-2%
2005	3%

SPEED					
	Date	Int	Pace	85th	Total
	Thu 8/21/2014	15	30 - 40	41	14,879
	Wed 8/20/2014	15	35 - 45	42	14,482

CLASSIFICATION			
	Date	Int	Total
	Thu 8/21/2014	15	14,879
	Wed 8/20/2014	15	14,482

WEIGH-IN-MOTION

PER VEHICLE

#### 5.4 Level of Service Analyses – Existing Traffic Volumes with Existing Geometry

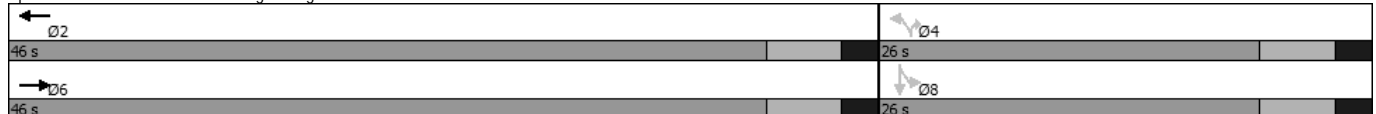


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑		↑		↑	↑	↑	
Traffic Volume (vph)	0	1050	68	0	547	0	78	0	93	52	75	1
Future Volume (vph)	0	1050	68	0	547	0	78	0	93	52	75	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3507	0	0	3539	0	1770	0	1583	1770	1859	0
Flt Permitted							0.703			0.950		
Satd. Flow (perm)	0	3507	0	0	3539	0	1310	0	1583	1770	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15							70		1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		449			961			352			377	
Travel Time (s)		12.2			26.2			9.6			10.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1215	0	0	595	0	85	0	101	57	83	0
Turn Type		NA			NA		Perm		Perm	custom	NA	
Protected Phases		6			2							
Permitted Phases							4		4	8	8	
Minimum Initial (s)		20.0			20.0		20.0		20.0	6.0	6.0	
Minimum Split (s)		26.0			26.0		26.0		26.0	26.0	26.0	
Total Split (s)		46.0			46.0		26.0		26.0	26.0	26.0	
Total Split (%)		63.9%			63.9%		36.1%		36.1%	36.1%	36.1%	
Maximum Green (s)		40.0			40.0		20.0		20.0	20.0	20.0	
Yellow Time (s)		4.0			4.0		4.0		4.0	4.0	4.0	
All-Red Time (s)		2.0			2.0		2.0		2.0	2.0	2.0	
Total Lost Time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0		3.0	3.0	3.0	
Recall Mode		Min			Min		None		None	None	None	
Walk Time (s)										5.0	5.0	
Flash Dont Walk (s)										15.0	15.0	
Pedestrian Calls (#/hr)										2	2	
Act Effct Green (s)		37.6			37.6		20.9		20.9	16.7	16.7	
Actuated g/C Ratio		0.61			0.61		0.34		0.34	0.27	0.27	
v/c Ratio		0.56			0.27		0.19		0.17	0.12	0.16	
Control Delay		11.5			8.7		20.0		9.3	18.8	18.9	
Queue Delay		0.0			0.0		0.0		0.0	0.0	0.0	
Total Delay		11.5			8.7		20.0		9.3	18.8	18.9	
LOS		B			A		B		A	B	B	
Approach Delay		11.5			8.7			14.2			18.9	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)		174			67		24		8	16	23	
Queue Length 95th (ft)		234			96		64		44	45	59	
Internal Link Dist (ft)		369			881			272			297	
Turn Bay Length (ft)												
Base Capacity (vph)		2386			2403		444		583	600	632	
Starvation Cap Reductn		0			0		0		0	0	0	
Spillback Cap Reductn		0			0		0		0	0	0	
Storage Cap Reductn		0			0		0		0	0	0	
Reduced v/c Ratio		0.51			0.25		0.19		0.17	0.10	0.13	

Intersection Summary

Area Type:	Other
Cycle Length:	72
Actuated Cycle Length:	61.4
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.56
Intersection Signal Delay:	11.5
Intersection Capacity Utilization:	67.9%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	C

Splits and Phases: 1: Old Sturbridge Village Rd & Main Street

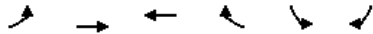


HCM Signalized Intersection Capacity Analysis  
 1: Old Sturbridge Village Rd & Main Street

02/17/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑		↑		↑	↑	↑	
Traffic Volume (vph)	0	1050	68	0	547	0	78	0	93	52	75	1
Future Volume (vph)	0	1050	68	0	547	0	78	0	93	52	75	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00		1.00	1.00	1.00	
Frt		0.99			1.00		1.00		0.85	1.00	1.00	
Flt Protected		1.00			1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		3507			3539		1770		1583	1770	1859	
Flt Permitted		1.00			1.00		0.70		1.00	0.95	1.00	
Satd. Flow (perm)		3507			3539		1310		1583	1770	1859	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1141	74	0	595	0	85	0	101	57	82	1
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	53	0	1	0
Lane Group Flow (vph)	0	1209	0	0	595	0	85	0	48	57	82	0
Turn Type		NA			NA		Perm		Perm	custom	NA	
Protected Phases		6			2							
Permitted Phases							4		4	8	8	
Actuated Green, G (s)		35.8			35.8		14.9		14.9	14.9	14.9	
Effective Green, g (s)		35.8			35.8		14.9		14.9	14.9	14.9	
Actuated g/C Ratio		0.57			0.57		0.24		0.24	0.24	0.24	
Clearance Time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		2002			2020		311		376	420	441	
v/s Ratio Prot		c0.34			0.17							
v/s Ratio Perm							c0.06		0.03	0.03	0.04	
v/c Ratio		0.60			0.29		0.27		0.13	0.14	0.19	
Uniform Delay, d1		8.8			6.9		19.5		18.8	18.8	19.1	
Progression Factor		1.00			1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.5			0.1		0.5		0.2	0.1	0.2	
Delay (s)		9.3			7.0		20.0		18.9	19.0	19.3	
Level of Service		A			A		B		B	B	B	
Approach Delay (s)		9.3			7.0			19.4			19.2	
Approach LOS		A			A			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			10.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			62.7			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			67.9%			ICU Level of Service				C		
Analysis Period (min)			15									

c Critical Lane Group

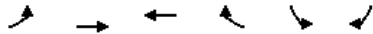


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	36	1087	620	143	0	10
Future Volume (vph)	36	1087	620	143	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1770	3539	3440	0	0	1611
Flt Permitted	0.950					
Satd. Flow (perm)	1770	3539	3440	0	0	1611
Link Speed (mph)		25	25		25	
Link Distance (ft)		961	391		600	
Travel Time (s)		26.2	10.7		16.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	1182	829	0	0	11
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.4%
	ICU Level of Service A
Analysis Period (min)	15

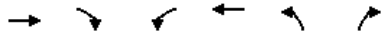
HCM Unsignalized Intersection Capacity Analysis  
 2: Main Street & Sturbridge Hotel & Conf. Driveway

02/17/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑↑	↑↑			↑
Traffic Volume (veh/h)	36	1087	620	143	0	10
Future Volume (Veh/h)	36	1087	620	143	0	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	1182	674	155	0	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		961	656			
pX, platoon unblocked	0.92				0.89	0.92
vC, conflicting volume	829				1420	414
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	636				804	184
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	99
cM capacity (veh/h)	866				271	759
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>EB 3</b>	<b>WB 1</b>	<b>WB 2</b>	<b>SB 1</b>
Volume Total	39	591	591	449	380	11
Volume Left	39	0	0	0	0	0
Volume Right	0	0	0	0	155	11
cSH	866	1700	1700	1700	1700	759
Volume to Capacity	0.05	0.35	0.35	0.26	0.22	0.01
Queue Length 95th (ft)	4	0	0	0	0	1
Control Delay (s)	9.4	0.0	0.0	0.0	0.0	9.8
Lane LOS	A					A
Approach Delay (s)	0.3			0.0		9.8
Approach LOS						A
<b>Intersection Summary</b>						
Average Delay			0.2			
Intersection Capacity Utilization			33.4%		ICU Level of Service	A
Analysis Period (min)			15			





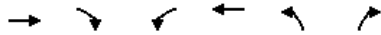
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (vph)	1087	3	0	763	0	2
Future Volume (vph)	1087	3	0	763	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3539	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1611
Link Speed (mph)	25			25	25	
Link Distance (ft)	391			265	291	
Travel Time (s)	10.7			7.2	7.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1185	0	0	829	0	2
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 3: Main Street

02/17/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	1087	3	0	763	0	2
Future Volume (Veh/h)	1087	3	0	763	0	2
Sign Control	Free			Stop		
Grade	0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1182	3	0	829	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	265					
pX, platoon unblocked	0.91					
vC, conflicting volume	1185			1598 592		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1185			1454 592		
tC, single (s)	4.1			6.8 6.9		
tC, 2 stage (s)						
tF (s)	2.2			3.5 3.3		
p0 queue free %	100			100 100		
cM capacity (veh/h)	585			110 449		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	788	397	414	414	2	
Volume Left	0	0	0	0	0	
Volume Right	0	3	0	0	2	
cSH	1700	1700	1700	1700	449	
Volume to Capacity	0.46	0.23	0.24	0.24	0.00	
Queue Length 95th (ft)	0	0	0	0	0	
Control Delay (s)	0.0	0.0	0.0	0.0	13.1	
Lane LOS						B
Approach Delay (s)	0.0	0.0			13.1	
Approach LOS						B
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	40.1%			ICU Level of Service	A	
Analysis Period (min)	15					

Lanes, Volumes, Timings  
 4: Main Street & Fairground Road

02/17/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø4	Ø5
Lane Configurations		↕↕	↗		↕↕						↕	↗				
Traffic Volume (vph)	9	664	413	0	751	23	0	0	0	6	1	12				
Future Volume (vph)	9	664	413	0	751	23	0	0	0	6	1	12				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0		75	0		0	0		0	0		0				
Storage Lanes	0		1	0		0	0		0	0		1				
Taper Length (ft)	25			25			25			25						
Satd. Flow (prot)	0	3536	1583	0	3525	0	0	0	0	0	1785	1583				
Flt Permitted		0.944									0.958					
Satd. Flow (perm)	0	3341	1583	0	3525	0	0	0	0	0	1785	1583				
Right Turn on Red			Yes			Yes			Yes			Yes				
Satd. Flow (RTOR)			264		8							186				
Link Speed (mph)		25			25			25			25					
Link Distance (ft)		265			362			687			607					
Travel Time (s)		7.2			9.9			18.7			16.6					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92				
Shared Lane Traffic (%)																
Lane Group Flow (vph)	0	732	449	0	841	0	0	0	0	0	8	13				
Turn Type	Perm	NA	Perm		NA					Split	NA	Prot				
Protected Phases		1 5		1 2 4 5						3	3	3	1	2	4	5
Permitted Phases	1 5		1 5													
Minimum Initial (s)										6.0	6.0	6.0	10.0	1.0	6.0	6.0
Minimum Split (s)										11.5	11.5	11.5	15.5	6.5	12.0	12.0
Total Split (s)										20.5	20.5	20.5	35.5	6.5	31.0	24.0
Total Split (%)										17.4%	17.4%	17.4%	30%	6%	26%	20%
Maximum Green (s)										15.0	15.0	15.0	30.0	1.0	25.0	18.0
Yellow Time (s)										3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)										2.0	2.0	2.0	1.5	1.5	2.0	2.0
Total Lost Time (s)											5.5	5.5				
Lead/Lag										Lead	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?										Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)										3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode										None	None	None	None	None	None	None
Act Efect Green (s)		54.2	54.2		87.1						9.8	9.8				
Actuated g/C Ratio		0.50	0.50		0.81						0.09	0.09				
v/c Ratio		0.44	0.49		0.30						0.05	0.04				
Control Delay		19.0	9.4		0.7						46.9	0.2				
Queue Delay		0.1	0.0		0.1						0.0	0.0				
Total Delay		19.1	9.4		0.8						46.9	0.2				
LOS		B	A		A						D	A				
Approach Delay		15.4			0.8						18.0					
Approach LOS		B			A						B					
Queue Length 50th (ft)		166	72		1						5	0				
Queue Length 95th (ft)		241	173		0						21	0				
Internal Link Dist (ft)		185			282			607			527					
Turn Bay Length (ft)			75													
Base Capacity (vph)		1676	925		2834						248	380				
Starvation Cap Reductn		0	0		872						0	0				
Spillback Cap Reductn		111	0		0						0	0				
Storage Cap Reductn		0	0		0						0	0				
Reduced v/c Ratio		0.47	0.49		0.43						0.03	0.03				

Intersection Summary

Area Type:	Other
Cycle Length:	117.5
Actuated Cycle Length:	108
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	9.4
Intersection LOS:	A
Intersection Capacity Utilization:	39.7%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 4: Main Street & Fairground Road



HCM Signalized Intersection Capacity Analysis  
 4: Main Street & Fairground Road

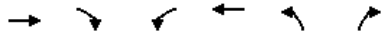
02/17/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗		↕↕						↕	↗
Traffic Volume (vph)	9	664	413	0	751	23	0	0	0	6	1	12
Future Volume (vph)	9	664	413	0	751	23	0	0	0	6	1	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5		5.5						5.5	5.5
Lane Util. Factor		0.95	1.00		0.95						1.00	1.00
Frt		1.00	0.85		1.00						1.00	0.85
Flt Protected		1.00	1.00		1.00						0.96	1.00
Satd. Flow (prot)		3537	1583		3523						1785	1583
Flt Permitted		0.94	1.00		1.00						0.96	1.00
Satd. Flow (perm)		3341	1583		3523						1785	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	722	449	0	816	25	0	0	0	7	1	13
RTOR Reduction (vph)	0	0	146	0	2	0	0	0	0	0	0	12
Lane Group Flow (vph)	0	732	303	0	839	0	0	0	0	0	8	1
Turn Type	Perm	NA	Perm		NA					Split	NA	Prot
Protected Phases		1 5			1 2 4 5					3	3	3
Permitted Phases	1 5		1 5									
Actuated Green, G (s)		54.2	54.2		87.1						9.8	9.8
Effective Green, g (s)		48.2	48.2		75.1						9.8	9.8
Actuated g/C Ratio		0.45	0.45		0.70						0.09	0.09
Clearance Time (s)											5.5	5.5
Vehicle Extension (s)											3.0	3.0
Lane Grp Cap (vph)		1492	707		2452						162	143
v/s Ratio Prot					c0.24						c0.00	0.00
v/s Ratio Perm		c0.22	0.19									
v/c Ratio		0.49	0.43		0.34						0.05	0.01
Uniform Delay, d1		21.2	20.4		6.5						44.8	44.6
Progression Factor		1.00	1.00		0.16						1.00	1.00
Incremental Delay, d2		0.3	0.4		0.1						0.1	0.0
Delay (s)		21.4	20.8		1.2						44.9	44.7
Level of Service		C	C		A						D	D
Approach Delay (s)		21.2			1.2			0.0			44.8	
Approach LOS		C			A			A			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			13.2									B
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			107.9							28.5		
Intersection Capacity Utilization			39.7%									A
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings  
5: Route 131 & Main Street

02/17/2020



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø2	Ø3
Lane Configurations	↑↑		↙	↑↑	↘				
Traffic Volume (vph)	671	0	191	495	280	0			
Future Volume (vph)	671	0	191	495	280	0			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Satd. Flow (prot)	3539	0	1770	3539	3433	0			
Flt Permitted			0.950		0.950				
Satd. Flow (perm)	3539	0	1770	3539	3433	0			
Right Turn on Red		Yes				Yes			
Satd. Flow (RTOR)									
Link Speed (mph)	25			25	25				
Link Distance (ft)	362			439	451				
Travel Time (s)	9.9			12.0	12.3				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92			
Shared Lane Traffic (%)									
Lane Group Flow (vph)	729	0	208	538	304	0			
Turn Type	NA		Prot	NA	Prot				
Protected Phases	1 2 3		5	1 5	4		1	2	3
Permitted Phases									
Minimum Initial (s)			6.0		6.0		10.0	1.0	6.0
Minimum Split (s)			12.0		12.0		15.5	6.5	11.5
Total Split (s)			24.0		31.0		35.5	6.5	20.5
Total Split (%)			20.4%		26.4%		30%	6%	17%
Maximum Green (s)			18.0		25.0		30.0	1.0	15.0
Yellow Time (s)			4.0		4.0		4.0	4.0	3.5
All-Red Time (s)			2.0		2.0		1.5	1.5	2.0
Total Lost Time (s)			6.0		6.0				
Lead/Lag					Lag		Lead	Lag	Lead
Lead-Lag Optimize?					Yes		Yes	Yes	Yes
Vehicle Extension (s)			3.0		3.0		3.0	3.0	3.0
Recall Mode			None		None		None	None	None
Act Efect Green (s)	52.0		18.1		54.2		20.4		
Actuated g/C Ratio	0.48		0.17		0.50		0.19		
v/c Ratio	0.43		0.70		0.30		0.47		
Control Delay	10.7		57.7		17.2		41.4		
Queue Delay	0.3		0.0		0.0		0.0		
Total Delay	11.0		57.7		17.2		41.4		
LOS	B		E		B		D		
Approach Delay	11.0				28.5		41.4		
Approach LOS	B				C		D		
Queue Length 50th (ft)	210		138		112		96		
Queue Length 95th (ft)	294		#259		167		143		
Internal Link Dist (ft)	282				359		371		
Turn Bay Length (ft)									
Base Capacity (vph)	1873		296		1775		797		
Starvation Cap Reductn	499		0		0		0		
Spillback Cap Reductn	0		0		0		0		
Storage Cap Reductn	0		0		0		0		
Reduced v/c Ratio	0.53		0.70		0.30		0.38		

Intersection Summary

Area Type: Other  
 Cycle Length: 117.5  
 Actuated Cycle Length: 108  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 23.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 51.7%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Route 131 & Main Street



HCM Signalized Intersection Capacity Analysis  
 5: Route 131 & Main Street

02/17/2020

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	
Traffic Volume (vph)	671	0	191	495	280	0
Future Volume (vph)	671	0	191	495	280	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		6.0	5.5	6.0	
Lane Util. Factor	0.95		1.00	0.95	0.97	
Frt	1.00		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	3539		1770	3539	3433	
Flt Permitted	1.00		0.95	1.00	0.95	
Satd. Flow (perm)	3539		1770	3539	3433	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	729	0	208	538	304	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	729	0	208	538	304	0
Turn Type	NA		Prot	NA	Prot	
Protected Phases	1 2 3		5	1 5	4	
Permitted Phases						
Actuated Green, G (s)	51.9		18.1	54.2	20.4	
Effective Green, g (s)	51.9		18.1	48.2	20.4	
Actuated g/C Ratio	0.48		0.17	0.45	0.19	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)	1702		296	1580	649	
v/s Ratio Prot	c0.21		c0.12	0.15	c0.09	
v/s Ratio Perm						
v/c Ratio	0.43		0.70	0.34	0.47	
Uniform Delay, d1	18.3		42.4	19.5	38.9	
Progression Factor	0.53		1.00	1.00	1.00	
Incremental Delay, d2	0.2		7.4	0.1	0.5	
Delay (s)	9.8		49.7	19.6	39.5	
Level of Service	A		D	B	D	
Approach Delay (s)	9.8			28.0	39.5	
Approach LOS	A			C	D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			22.5		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.56			
Actuated Cycle Length (s)			107.9		Sum of lost time (s)	28.5
Intersection Capacity Utilization			51.7%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑		↑		↑	↑	↑	
Traffic Volume (vph)	0	711	74	0	1189	0	81	0	63	200	103	5
Future Volume (vph)	0	711	74	0	1189	0	81	0	63	200	103	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3490	0	0	3539	0	1770	0	1583	1770	1852	0
Flt Permitted							0.682			0.950		
Satd. Flow (perm)	0	3490	0	0	3539	0	1270	0	1583	1770	1852	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							68		3	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		449			961			352			377	
Travel Time (s)		12.2			26.2			9.6			10.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	853	0	0	1292	0	88	0	68	217	117	0
Turn Type		NA			NA		Perm		Perm	custom	NA	
Protected Phases		6			2							
Permitted Phases							4		4	8	8	
Detector Phase		6			2		4		4	8	8	
Switch Phase												
Minimum Initial (s)		20.0			20.0		20.0		20.0	6.0	6.0	
Minimum Split (s)		26.0			26.0		26.0		26.0	26.0	26.0	
Total Split (s)		46.0			46.0		26.0		26.0	26.0	26.0	
Total Split (%)		63.9%			63.9%		36.1%		36.1%	36.1%	36.1%	
Maximum Green (s)		40.0			40.0		20.0		20.0	20.0	20.0	
Yellow Time (s)		4.0			4.0		4.0		4.0	4.0	4.0	
All-Red Time (s)		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	
Total Lost Time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0		3.0	3.0	3.0	
Recall Mode		Min			Min		None		None	None	None	
Walk Time (s)										5.0	5.0	
Flash Dont Walk (s)										15.0	15.0	
Pedestrian Calls (#/hr)										2	2	
Act Effct Green (s)		33.5			33.5		20.2		20.2	20.2	20.2	
Actuated g/C Ratio		0.51			0.51		0.31		0.31	0.31	0.31	
v/c Ratio		0.48			0.72		0.23		0.13	0.40	0.21	
Control Delay		10.8			14.8		21.2		6.5	22.5	19.7	
Queue Delay		0.0			0.0		0.0		0.0	0.0	0.0	
Total Delay		10.8			14.8		21.2		6.5	22.5	19.7	
LOS		B			B		C		A	C	B	
Approach Delay		10.8			14.8			14.8			21.5	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)		103			193		27		0	71	35	
Queue Length 95th (ft)		143			258		66		27	139	78	
Internal Link Dist (ft)		369			881			272			297	
Turn Bay Length (ft)												
Base Capacity (vph)		2151			2172		389		532	543	570	
Starvation Cap Reductn		0			0		0		0	0	0	
Spillback Cap Reductn		0			0		0		0	0	0	
Storage Cap Reductn		0			0		0		0	0	0	
Reduced v/c Ratio		0.40			0.59		0.23		0.13	0.40	0.21	

Intersection Summary

Area Type:	Other
Cycle Length:	72
Actuated Cycle Length:	65.8
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	14.4
Intersection LOS:	B
Intersection Capacity Utilization:	64.8%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 1: Old Sturbridge Village Rd & Main Street

← Ø2	↖ Ø4
46 s	26 s
→ Ø6	↗ Ø8
46 s	26 s

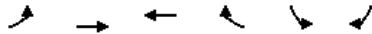


HCM Signalized Intersection Capacity Analysis  
 1: Old Sturbridge Village Rd & Main Street

02/17/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑		↑		↑	↑	↑	
Traffic Volume (vph)	0	711	74	0	1189	0	81	0	63	200	103	5
Future Volume (vph)	0	711	74	0	1189	0	81	0	63	200	103	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00		1.00	1.00	1.00	
Frt		0.99			1.00		1.00		0.85	1.00	0.99	
Flt Protected		1.00			1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		3489			3539		1770		1583	1770	1851	
Flt Permitted		1.00			1.00		0.68		1.00	0.95	1.00	
Satd. Flow (perm)		3489			3539		1270		1583	1770	1851	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	773	80	0	1292	0	88	0	68	217	112	5
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	47	0	2	0
Lane Group Flow (vph)	0	841	0	0	1292	0	88	0	21	217	115	0
Turn Type		NA			NA		Perm		Perm	custom	NA	
Protected Phases		6			2							
Permitted Phases							4		4	8	8	
Actuated Green, G (s)		33.5			33.5		20.2		20.2	20.2	20.2	
Effective Green, g (s)		33.5			33.5		20.2		20.2	20.2	20.2	
Actuated g/C Ratio		0.51			0.51		0.31		0.31	0.31	0.31	
Clearance Time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		1779			1804		390		486	544	569	
v/s Ratio Prot		0.24			c0.37							
v/s Ratio Perm							0.07		0.01	c0.12	0.06	
v/c Ratio		0.47			0.72		0.23		0.04	0.40	0.20	
Uniform Delay, d1		10.4			12.4		16.9		16.0	18.0	16.8	
Progression Factor		1.00			1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.2			1.4		0.3		0.0	0.5	0.2	
Delay (s)		10.6			13.8		17.2		16.0	18.4	17.0	
Level of Service		B			B		B		B	B	B	
Approach Delay (s)		10.6			13.8			16.7			17.9	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			13.5			HCM 2000 Level of Service					B	
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			65.7			Sum of lost time (s)					12.0	
Intersection Capacity Utilization			64.8%			ICU Level of Service					C	
Analysis Period (min)			15									

c Critical Lane Group

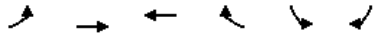


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑↑	↑↑			↘
Traffic Volume (vph)	31	948	1317	46	0	85
Future Volume (vph)	31	948	1317	46	0	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1770	3539	3522	0	0	1611
Flt Permitted	0.950					
Satd. Flow (perm)	1770	3539	3522	0	0	1611
Link Speed (mph)		25	25		25	
Link Distance (ft)		961	391		600	
Travel Time (s)		26.2	10.7		16.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	34	1030	1482	0	0	92
Sign Control		Free	Free		Stop	

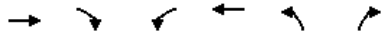
Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.8%
	ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 2: Main Street & Sturbridge Hotel & Conf. Driveway

02/17/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑↑	↑↑			↘
Traffic Volume (veh/h)	31	948	1317	46	0	85
Future Volume (Veh/h)	31	948	1317	46	0	85
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	1030	1432	50	0	92
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		961	656			
pX, platoon unblocked	0.77				0.80	0.77
vC, conflicting volume	1482				2040	741
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1026				1428	62
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	88
cM capacity (veh/h)	517				94	761
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	34	515	515	955	527	92
Volume Left	34	0	0	0	0	0
Volume Right	0	0	0	0	50	92
cSH	517	1700	1700	1700	1700	761
Volume to Capacity	0.07	0.30	0.30	0.56	0.31	0.12
Queue Length 95th (ft)	5	0	0	0	0	10
Control Delay (s)	12.4	0.0	0.0	0.0	0.0	10.4
Lane LOS	B					B
Approach Delay (s)	0.4			0.0		10.4
Approach LOS						B
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			49.8%		ICU Level of Service	A
Analysis Period (min)			15			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (vph)	948	1	0	1362	0	2
Future Volume (vph)	948	1	0	1362	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3539	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1611
Link Speed (mph)	25			25	25	
Link Distance (ft)	391			265	291	
Travel Time (s)	10.7			7.2	7.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1031	0	0	1480	0	2
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

3: Main Street

02/17/2020



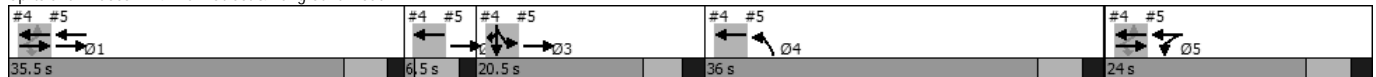
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	948	1	0	1362	0	2
Future Volume (Veh/h)	948	1	0	1362	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1030	1	0	1480	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	265					
pX, platoon unblocked	0.78					
vC, conflicting volume			1031		1770	516
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1031		1418	516
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			670		99	504
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	687	344	740	740	2	
Volume Left	0	0	0	0	0	
Volume Right	0	1	0	0	2	
cSH	1700	1700	1700	1700	504	
Volume to Capacity	0.40	0.20	0.44	0.44	0.00	
Queue Length 95th (ft)	0	0	0	0	0	
Control Delay (s)	0.0	0.0	0.0	0.0	12.2	
Lane LOS						B
Approach Delay (s)	0.0		0.0		12.2	
Approach LOS						B
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			41.0%	ICU Level of Service	A	
Analysis Period (min)			15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø4	Ø5
Lane Configurations		↕↕	↗		↕↕						↕	↗				
Traffic Volume (vph)	16	554	376	0	1352	59	0	0	0	13	12	10				
Future Volume (vph)	16	554	376	0	1352	59	0	0	0	13	12	10				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0		75	0		0	0		0	0		0				
Storage Lanes	0		1	0		0	0		0	0		1				
Taper Length (ft)	25			25			25			25						
Satd. Flow (prot)	0	3536	1583	0	3518	0	0	0	0	0	1816	1583				
Flt Permitted		0.888									0.975					
Satd. Flow (perm)	0	3143	1583	0	3518	0	0	0	0	0	1816	1583				
Right Turn on Red			Yes			Yes			Yes			Yes				
Satd. Flow (RTOR)			264		12							178				
Link Speed (mph)		25			25			25			25					
Link Distance (ft)		265			362			687			607					
Travel Time (s)		7.2			9.9			18.7			16.6					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92				
Shared Lane Traffic (%)																
Lane Group Flow (vph)	0	619	409	0	1534	0	0	0	0	0	27	11				
Turn Type	Perm	NA	Perm		NA					Split	NA	Prot				
Protected Phases		1.5		1.2 4.5						3	3	3	1	2	4	5
Permitted Phases	1.5		1.5													
Detector Phase	1.5	1.5	1.5	1.2 4.5						3	3	3				
Switch Phase																
Minimum Initial (s)										6.0	6.0	6.0	10.0	1.0	6.0	6.0
Minimum Split (s)										11.5	11.5	11.5	15.5	6.5	12.0	12.0
Total Split (s)										20.5	20.5	20.5	35.5	6.5	36.0	24.0
Total Split (%)										16.7%	16.7%	16.7%	29%	5%	29%	20%
Maximum Green (s)										15.0	15.0	15.0	30.0	1.0	30.0	18.0
Yellow Time (s)										3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)										2.0	2.0	2.0	1.5	1.5	2.0	2.0
Lost Time Adjust (s)										0.0	0.0	0.0				
Total Lost Time (s)										5.5	5.5	5.5				
Lead/Lag										Lead	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?										Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)										3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode										None	None	None	None	None	None	None
Act Effct Green (s)		54.0	54.0		96.6					9.6	9.6	9.6				
Actuated g/C Ratio		0.46	0.46		0.82					0.08	0.08	0.08				
v/c Ratio		0.43	0.47		0.53					0.18	0.04	0.04				
Control Delay		22.6	9.3		1.0					52.5	0.2	0.2				
Queue Delay		0.0	0.0		0.1					0.0	0.0	0.0				
Total Delay		22.6	9.3		1.1					52.5	0.2	0.2				
LOS		C	A		A					D	A	A				
Approach Delay		17.3			1.1					37.4						
Approach LOS		B			A					D						
Queue Length 50th (ft)		159	63		2					19	0	0				
Queue Length 95th (ft)		222	154		0					49	0	0				
Internal Link Dist (ft)		185			282			607		527						
Turn Bay Length (ft)			75													
Base Capacity (vph)		1449	872		2900					232	357	357				
Starvation Cap Reductn		0	0		223					0	0	0				
Spillback Cap Reductn		11	0		0					0	0	0				
Storage Cap Reductn		0	0		0					0	0	0				
Reduced v/c Ratio		0.43	0.47		0.57					0.12	0.03	0.03				

Intersection Summary																
Area Type: Other																
Cycle Length: 122.5																
Actuated Cycle Length: 117.2																
Natural Cycle: 75																
Control Type: Actuated-Uncoordinated																
Maximum v/c Ratio: 1.24																
Intersection Signal Delay: 8.0																
Intersection LOS: A																
Intersection Capacity Utilization 53.4%																
ICU Level of Service A																
Analysis Period (min) 15																

Splits and Phases: 4: Main Street & Fairground Road



HCM Signalized Intersection Capacity Analysis  
 4: Main Street & Fairground Road

02/17/2020

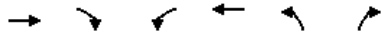
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	16	554	376	0	1352	59	0	0	0	13	12	10	
Future Volume (vph)	16	554	376	0	1352	59	0	0	0	13	12	10	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		5.5	5.5		5.5						5.5	5.5	
Lane Util. Factor		0.95	1.00		0.95						1.00	1.00	
Frt		1.00	0.85		0.99						1.00	0.85	
Flt Protected		1.00	1.00		1.00						0.97	1.00	
Satd. Flow (prot)		3534	1583		3517						1816	1583	
Flt Permitted		0.89	1.00		1.00						0.97	1.00	
Satd. Flow (perm)		3142	1583		3517						1816	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	17	602	409	0	1470	64	0	0	0	14	13	11	
RTOR Reduction (vph)	0	0	156	0	3	0	0	0	0	0	0	10	
Lane Group Flow (vph)	0	619	253	0	1531	0	0	0	0	0	27	1	
Turn Type	Perm	NA	Perm		NA					Split	NA	Prot	
Protected Phases		1 5			1 2 4 5					3	3	3	
Permitted Phases	1 5		1 5										
Actuated Green, G (s)		54.0	54.0		96.5						9.6	9.6	
Effective Green, g (s)		48.0	48.0		84.5						9.6	9.6	
Actuated g/C Ratio		0.41	0.41		0.72						0.08	0.08	
Clearance Time (s)											5.5	5.5	
Vehicle Extension (s)											3.0	3.0	
Lane Grp Cap (vph)		1287	648		2537						148	129	
v/s Ratio Prot					c0.44						c0.01	0.00	
v/s Ratio Perm		0.20	0.16										
v/c Ratio		0.48	0.39		0.60						0.18	0.01	
Uniform Delay, d1		25.4	24.3		8.0						50.1	49.4	
Progression Factor		1.00	1.00		0.14						1.00	1.00	
Incremental Delay, d2		0.3	0.4		0.3						0.6	0.0	
Delay (s)		25.7	24.7		1.5						50.7	49.4	
Level of Service		C	C		A						D	D	
Approach Delay (s)		25.3			1.5			0.0			50.3		
Approach LOS		C			A			A			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			11.6		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.59										
Actuated Cycle Length (s)			117.1		Sum of lost time (s)						28.5		
Intersection Capacity Utilization			53.4%		ICU Level of Service						A		
Analysis Period (min)			15										

c Critical Lane Group



Lanes, Volumes, Timings  
5: Route 131 & Main Street

02/17/2020

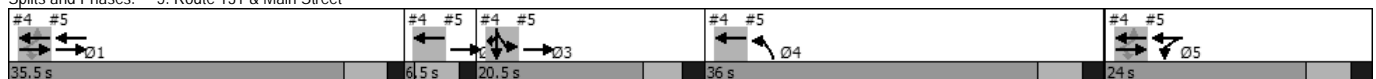


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø2	Ø3
Lane Configurations	↑↑		↙	↑↑	↘				
Traffic Volume (vph)	568	0	310	945	467	0			
Future Volume (vph)	568	0	310	945	467	0			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Satd. Flow (prot)	3539	0	1770	3539	3433	0			
Flt Permitted			0.950		0.950				
Satd. Flow (perm)	3539	0	1770	3539	3433	0			
Right Turn on Red		Yes				Yes			
Satd. Flow (RTOR)									
Link Speed (mph)	25			25	25				
Link Distance (ft)	362			439	451				
Travel Time (s)	9.9			12.0	12.3				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92			
Shared Lane Traffic (%)									
Lane Group Flow (vph)	617	0	337	1027	508	0			
Turn Type	NA		Prot	NA	Prot				
Protected Phases	1 2 3		5	1 5	4		1	2	3
Permitted Phases									
Detector Phase	1 2 3		5	1 5	4				
Switch Phase									
Minimum Initial (s)			6.0		6.0		10.0	1.0	6.0
Minimum Split (s)			12.0		12.0		15.5	6.5	11.5
Total Split (s)			24.0		36.0		35.5	6.5	20.5
Total Split (%)			19.6%		29.4%		29%	5%	17%
Maximum Green (s)			18.0		30.0		30.0	1.0	15.0
Yellow Time (s)			4.0		4.0		4.0	4.0	3.5
All-Red Time (s)			2.0		2.0		1.5	1.5	2.0
Lost Time Adjust (s)			0.0		0.0				
Total Lost Time (s)			6.0		6.0				
Lead/Lag					Lag		Lead	Lag	Lead
Lead-Lag Optimize?					Yes		Yes	Yes	Yes
Vehicle Extension (s)			3.0		3.0		3.0	3.0	3.0
Recall Mode			None		None		None	None	None
Act Effct Green (s)	51.7		18.0	54.0	30.0				
Actuated g/C Ratio	0.44		0.15	0.46	0.26				
v/c Ratio	0.40		1.24	0.63	0.58				
Control Delay	11.1		177.3	26.4	41.5				
Queue Delay	0.3		0.0	0.0	0.0				
Total Delay	11.4		177.3	26.4	41.5				
LOS	B		F	C	D				
Approach Delay	11.4			63.7	41.5				
Approach LOS	B			E	D				
Queue Length 50th (ft)	0		-314	299	172				
Queue Length 95th (ft)	257		#520	396	238				
Internal Link Dist (ft)	282			359	371				
Turn Bay Length (ft)									
Base Capacity (vph)	1722		272	1631	879				
Starvation Cap Reductn	511		0	0	0				
Spillback Cap Reductn	0		0	0	0				
Storage Cap Reductn	0		0	0	0				
Reduced v/c Ratio	0.51		1.24	0.63	0.58				

Intersection Summary

Area Type: Other  
 Cycle Length: 122.5  
 Actuated Cycle Length: 117.2  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.24  
 Intersection Signal Delay: 46.2  
 Intersection LOS: D  
 Intersection Capacity Utilization 60.8%  
 ICU Level of Service B  
 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: 5: Route 131 & Main Street



HCM Signalized Intersection Capacity Analysis  
 5: Route 131 & Main Street

02/17/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Traffic Volume (vph)	568	0	310	945	467	0
Future Volume (vph)	568	0	310	945	467	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		6.0	5.5	6.0	
Lane Util. Factor	0.95		1.00	0.95	0.97	
Frt	1.00		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	3539		1770	3539	3433	
Flt Permitted	1.00		0.95	1.00	0.95	
Satd. Flow (perm)	3539		1770	3539	3433	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	617	0	337	1027	508	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	617	0	337	1027	508	0
Turn Type	NA		Prot	NA	Prot	
Protected Phases	1 2 3		5	1 5	4	
Permitted Phases						
Actuated Green, G (s)	51.6		18.0	54.0	30.0	
Effective Green, g (s)	51.6		18.0	48.0	30.0	
Actuated g/C Ratio	0.44		0.15	0.41	0.26	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)	1559		272	1450	879	
v/s Ratio Prot	c0.17		c0.19	c0.29	c0.15	
v/s Ratio Perm						
v/c Ratio	0.40		1.24	0.71	0.58	
Uniform Delay, d1	22.2		49.5	28.7	38.0	
Progression Factor	0.47		1.00	1.00	1.00	
Incremental Delay, d2	0.2		134.9	1.6	0.9	
Delay (s)	10.6		184.4	30.3	38.9	
Level of Service	B		F	C	D	
Approach Delay (s)	10.6			68.4	38.9	
Approach LOS	B			E	D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			48.1		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.77			
Actuated Cycle Length (s)			117.1		Sum of lost time (s)	28.5
Intersection Capacity Utilization			60.8%		ICU Level of Service	B
Analysis Period (min)			15			

c Critical Lane Group

**5.5 Level of Service Analyses – Future Traffic Volumes with Existing Geometry**



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑		↖		↗	↖	↗	
Traffic Volume (vph)	0	1125	73	0	586	0	84	0	99	55	81	1
Future Volume (vph)	0	1125	73	0	586	0	84	0	99	55	81	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3507	0	0	3539	0	1770	0	1583	1770	1859	0
Flt Permitted							0.699			0.950		
Satd. Flow (perm)	0	3507	0	0	3539	0	1302	0	1583	1770	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15							57		1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		449			961			352			377	
Travel Time (s)		12.2			26.2			9.6			10.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1302	0	0	637	0	91	0	108	60	89	0
Turn Type		NA			NA		Perm		Perm	custom	NA	
Protected Phases		6			2							
Permitted Phases							4		4	8	8	
Detector Phase		6			2		4		4	8	8	
Switch Phase												
Minimum Initial (s)		20.0			20.0		20.0		20.0	6.0	6.0	
Minimum Split (s)		26.0			26.0		26.0		26.0	26.0	26.0	
Total Split (s)		46.0			46.0		26.0		26.0	26.0	26.0	
Total Split (%)		63.9%			63.9%		36.1%		36.1%	36.1%	36.1%	
Maximum Green (s)		40.0			40.0		20.0		20.0	20.0	20.0	
Yellow Time (s)		4.0			4.0		4.0		4.0	4.0	4.0	
All-Red Time (s)		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	
Total Lost Time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0		3.0	3.0	3.0	
Recall Mode		Min			Min		None		None	None	None	
Walk Time (s)										5.0	5.0	
Flash Dont Walk (s)										15.0	15.0	
Pedestrian Calls (#/hr)										2	2	
Act Effct Green (s)		39.4			39.4		20.9		20.9	16.6	16.6	
Actuated g/C Ratio		0.63			0.63		0.33		0.33	0.26	0.26	
v/c Ratio		0.59			0.29		0.21		0.19	0.13	0.18	
Control Delay		11.8			8.6		21.0		11.9	19.6	19.9	
Queue Delay		0.0			0.0		0.0		0.0	0.0	0.0	
Total Delay		11.8			8.6		21.0		11.9	19.6	19.9	
LOS		B			A		C		B	B	B	
Approach Delay		11.8			8.6			16.0			19.7	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)		194			74		28		15	18	27	
Queue Length 95th (ft)		261			104		68		53	47	63	
Internal Link Dist (ft)		369			881			272			297	
Turn Bay Length (ft)												
Base Capacity (vph)		2332			2348		432		563	587	617	
Starvation Cap Reductn		0			0		0		0	0	0	
Spillback Cap Reductn		0			0		0		0	0	0	
Storage Cap Reductn		0			0		0		0	0	0	
Reduced v/c Ratio		0.56			0.27		0.21		0.19	0.10	0.14	

Intersection Summary

Area Type:	Other
Cycle Length:	72
Actuated Cycle Length:	63
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.59
Intersection Signal Delay:	11.8
Intersection Capacity Utilization:	70.1%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	C

Splits and Phases: 1: Old Sturbridge Village Rd & Main Street

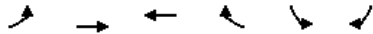
← Ø2	↖ Ø4
46 s	26 s
→ Ø6	↗ Ø8
46 s	26 s

HCM Signalized Intersection Capacity Analysis  
 1: Old Sturbridge Village Rd & Main Street

02/17/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑		↑		↑	↑	↑	
Traffic Volume (vph)	0	1125	73	0	586	0	84	0	99	55	81	1
Future Volume (vph)	0	1125	73	0	586	0	84	0	99	55	81	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00		1.00	1.00	1.00	
Frt		0.99			1.00		1.00		0.85	1.00	1.00	
Flt Protected		1.00			1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		3507			3539		1770		1583	1770	1860	
Flt Permitted		1.00			1.00		0.70		1.00	0.95	1.00	
Satd. Flow (perm)		3507			3539		1303		1583	1770	1860	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1223	79	0	637	0	91	0	108	60	88	1
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	44	0	1	0
Lane Group Flow (vph)	0	1296	0	0	637	0	91	0	64	60	88	0
Turn Type		NA			NA		Perm		Perm	custom	NA	
Protected Phases		6			2							
Permitted Phases							4		4	8	8	
Actuated Green, G (s)		37.6			37.6		14.8		14.8	14.8	14.8	
Effective Green, g (s)		37.6			37.6		14.8		14.8	14.8	14.8	
Actuated g/C Ratio		0.58			0.58		0.23		0.23	0.23	0.23	
Clearance Time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		2047			2066		299		363	406	427	
v/s Ratio Prot		c0.37			0.18							
v/s Ratio Perm							c0.07		0.04	0.03	0.05	
v/c Ratio		0.63			0.31		0.30		0.18	0.15	0.21	
Uniform Delay, d1		8.8			6.8		20.5		19.9	19.8	20.1	
Progression Factor		1.00			1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.6			0.1		0.6		0.2	0.2	0.2	
Delay (s)		9.5			6.9		21.1		20.1	19.9	20.3	
Level of Service		A			A		C		C	B	C	
Approach Delay (s)		9.5			6.9			20.6			20.2	
Approach LOS		A			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			10.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			64.4			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			70.1%			ICU Level of Service				C		
Analysis Period (min)			15									

c Critical Lane Group

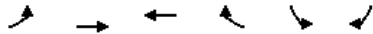


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	39	1165	665	153	0	11
Future Volume (vph)	39	1165	665	153	0	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1770	3539	3440	0	0	1611
Flt Permitted	0.950					
Satd. Flow (perm)	1770	3539	3440	0	0	1611
Link Speed (mph)		25	25		25	
Link Distance (ft)		961	391		600	
Travel Time (s)		26.2	10.7		16.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	1266	889	0	0	12
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.5%
	ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 2: Main Street & Sturbridge Hotel & Conf. Driveway

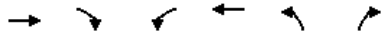
02/17/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑↑	↑↙			↑
Traffic Volume (veh/h)	39	1165	665	153	0	11
Future Volume (Veh/h)	39	1165	665	153	0	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	1266	723	166	0	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		961	656			
pX, platoon unblocked	0.91				0.86	0.91
vC, conflicting volume	889				1523	444
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	672				801	182
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	98
cM capacity (veh/h)	829				264	752
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	42	633	633	482	407	12
Volume Left	42	0	0	0	0	0
Volume Right	0	0	0	0	166	12
cSH	829	1700	1700	1700	1700	752
Volume to Capacity	0.05	0.37	0.37	0.28	0.24	0.02
Queue Length 95th (ft)	4	0	0	0	0	1
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	9.9
Lane LOS	A					A
Approach Delay (s)	0.3			0.0		9.9
Approach LOS						A
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			35.5%		ICU Level of Service	A
Analysis Period (min)			15			



3: Main Street



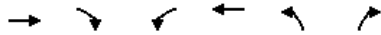
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (vph)	1165	3	0	818	0	2
Future Volume (vph)	1165	3	0	818	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3539	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1611
Link Speed (mph)	25			25	25	
Link Distance (ft)	391			265	291	
Travel Time (s)	10.7			7.2	7.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1269	0	0	889	0	2
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.3%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 3: Main Street

02/17/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	1165	3	0	818	0	2
Future Volume (Veh/h)	1165	3	0	818	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1266	3	0	889	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				265		
pX, platoon unblocked					0.90	
vC, conflicting volume			1269		1712	634
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1269		1566	634
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			543		92	422
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	844	425	444	444	2	
Volume Left	0	0	0	0	0	
Volume Right	0	3	0	0	2	
cSH	1700	1700	1700	1700	422	
Volume to Capacity	0.50	0.25	0.26	0.26	0.00	
Queue Length 95th (ft)	0	0	0	0	0	
Control Delay (s)	0.0	0.0	0.0	0.0	13.6	
Lane LOS					B	
Approach Delay (s)	0.0		0.0		13.6	
Approach LOS					B	
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			42.3%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings  
 4: Main Street & Fairground Road

02/17/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø4	Ø5
Lane Configurations		↕↕	↗		↕↕						↕	↗				
Traffic Volume (vph)	10	712	443	0	805	24	0	0	0	7	1	13				
Future Volume (vph)	10	712	443	0	805	24	0	0	0	7	1	13				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0		75	0		0	0		0	0		0				
Storage Lanes	0		1	0		0	0		0	0		1				
Taper Length (ft)	25			25			25			25						
Satd. Flow (prot)	0	3536	1583	0	3525	0	0	0	0	0	1783	1583				
Flt Permitted		0.942									0.957					
Satd. Flow (perm)	0	3334	1583	0	3525	0	0	0	0	0	1783	1583				
Right Turn on Red			Yes			Yes			Yes			Yes				
Satd. Flow (RTOR)			263		8							185				
Link Speed (mph)		25			25			25			25					
Link Distance (ft)		265			362			687			607					
Travel Time (s)		7.2			9.9			18.7			16.6					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92				
Shared Lane Traffic (%)																
Lane Group Flow (vph)	0	785	482	0	901	0	0	0	0	0	9	14				
Turn Type	Perm	NA	Perm		NA					Split	NA	Prot				
Protected Phases		1 5		1 2 4 5						3	3	3	1	2	4	5
Permitted Phases	1 5		1 5													
Detector Phase	1 5	1 5	1 5	1 2 4 5						3	3	3				
Switch Phase																
Minimum Initial (s)										6.0	6.0	6.0	10.0	1.0	6.0	6.0
Minimum Split (s)										11.5	11.5	11.5	15.5	7.0	12.0	12.0
Total Split (s)										20.5	20.5	20.5	35.5	7.0	31.0	24.0
Total Split (%)										17.4%	17.4%	17.4%	30%	6%	26%	20%
Maximum Green (s)										15.0	15.0	15.0	30.0	1.5	25.0	18.0
Yellow Time (s)										3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)										2.0	2.0	2.0	1.5	1.5	2.0	2.0
Lost Time Adjust (s)										0.0	0.0	0.0				
Total Lost Time (s)										5.5	5.5	5.5				
Lead/Lag										Lead	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?										Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)										3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode										None	None	None	None	None	None	None
Act Effct Green (s)		54.2	54.2		88.8					10.1	10.1	10.1				
Actuated g/C Ratio		0.49	0.49		0.81					0.09	0.09	0.09				
v/c Ratio		0.48	0.53		0.32					0.05	0.04	0.04				
Control Delay		20.6	11.1		0.7					47.1	0.2	0.2				
Queue Delay		0.1	0.0		0.1					0.0	0.0	0.0				
Total Delay		20.6	11.1		0.8					47.1	0.2	0.2				
LOS		C	B		A					D	A	A				
Approach Delay		17.0			0.8					18.6						
Approach LOS		B			A					B						
Queue Length 50th (ft)		194	98		1					6	0	0				
Queue Length 95th (ft)		269	208		0					22	0	0				
Internal Link Dist (ft)		185			282			607		527						
Turn Bay Length (ft)			75													
Base Capacity (vph)		1641	912		2815					243	376	376				
Starvation Cap Reductn		0	0		763					0	0	0				
Spillback Cap Reductn		118	0		0					0	0	0				
Storage Cap Reductn		0	0		0					0	0	0				
Reduced v/c Ratio		0.52	0.53		0.44					0.04	0.04	0.04				





















**Intersection Summary**  
 Area Type: Other  
 Cycle Length: 118  
 Actuated Cycle Length: 110  
 Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 10.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 41.6%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 4: Main Street & Fairground Road



HCM Signalized Intersection Capacity Analysis  
 4: Main Street & Fairground Road

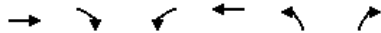
02/17/2020

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 						 		
Traffic Volume (vph)	10	712	443	0	805	24	0	0	0	7	1	13	
Future Volume (vph)	10	712	443	0	805	24	0	0	0	7	1	13	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		5.5	5.5		5.5						5.5	5.5	
Lane Util. Factor		0.95	1.00		0.95						1.00	1.00	
Frt		1.00	0.85		1.00						1.00	0.85	
Flt Protected		1.00	1.00		1.00						0.96	1.00	
Satd. Flow (prot)		3537	1583		3524						1783	1583	
Flt Permitted		0.94	1.00		1.00						0.96	1.00	
Satd. Flow (perm)		3333	1583		3524						1783	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	11	774	482	0	875	26	0	0	0	8	1	14	
RTOR Reduction (vph)	0	0	148	0	2	0	0	0	0	0	0	13	
Lane Group Flow (vph)	0	785	334	0	899	0	0	0	0	0	9	1	
Turn Type	Perm	NA	Perm		NA					Split	NA	Prot	
Protected Phases		1 5			1 2 4 5					3	3	3	
Permitted Phases	1 5		1 5										
Actuated Green, G (s)		54.2	54.2		88.8						10.1	10.1	
Effective Green, g (s)		48.2	48.2		76.8						10.1	10.1	
Actuated g/C Ratio		0.44	0.44		0.70						0.09	0.09	
Clearance Time (s)											5.5	5.5	
Vehicle Extension (s)											3.0	3.0	
Lane Grp Cap (vph)		1461	694		2462						163	145	
v/s Ratio Prot					c0.25						c0.01	0.00	
v/s Ratio Perm		c0.24	0.21										
v/c Ratio		0.54	0.48		0.36						0.06	0.01	
Uniform Delay, d1		22.7	22.0		6.7						45.5	45.4	
Progression Factor		1.00	1.00		0.14						1.00	1.00	
Incremental Delay, d2		0.4	0.5		0.1						0.1	0.0	
Delay (s)		23.0	22.5		1.0						45.7	45.4	
Level of Service		C	C		A						D	D	
Approach Delay (s)		22.8			1.0			0.0			45.5		
Approach LOS		C			A			A			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			14.1		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.44										
Actuated Cycle Length (s)			109.9		Sum of lost time (s)						28.5		
Intersection Capacity Utilization			41.6%		ICU Level of Service						A		
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings  
5: Route 131 & Main Street

02/17/2020



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø2	Ø3
Lane Configurations	↑↑		↖	↑↑	↗				
Traffic Volume (vph)	719	0	204	531	300	0			
Future Volume (vph)	719	0	204	531	300	0			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Satd. Flow (prot)	3539	0	1770	3539	3433	0			
Flt Permitted			0.950		0.950				
Satd. Flow (perm)	3539	0	1770	3539	3433	0			
Right Turn on Red		Yes				Yes			
Satd. Flow (RTOR)									
Link Speed (mph)	25			25	25				
Link Distance (ft)	362			439	451				
Travel Time (s)	9.9			12.0	12.3				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92			
Shared Lane Traffic (%)									
Lane Group Flow (vph)	782	0	222	577	326	0			
Turn Type	NA		Prot	NA	Prot				
Protected Phases	1 2 3		5	1 5	4		1	2	3
Permitted Phases									
Detector Phase	1 2 3		5	1 5	4				
Switch Phase									
Minimum Initial (s)			6.0		6.0		10.0	1.0	6.0
Minimum Split (s)			12.0		12.0		15.5	7.0	11.5
Total Split (s)			24.0		31.0		35.5	7.0	20.5
Total Split (%)			20.3%		26.3%		30%	6%	17%
Maximum Green (s)			18.0		25.0		30.0	1.5	15.0
Yellow Time (s)			4.0		4.0		4.0	4.0	3.5
All-Red Time (s)			2.0		2.0		1.5	1.5	2.0
Lost Time Adjust (s)			0.0		0.0				
Total Lost Time (s)			6.0		6.0				
Lead/Lag					Lag		Lead	Lag	Lead
Lead-Lag Optimize?					Yes		Yes	Yes	Yes
Vehicle Extension (s)			3.0		3.0		3.0	3.0	3.0
Recall Mode			None		None		None	None	None
Act Effct Green (s)	52.8		18.1	54.2	21.6				
Actuated g/C Ratio	0.48		0.16	0.49	0.20				
v/c Ratio	0.46		0.77	0.33	0.48				
Control Delay	11.0		63.4	18.4	41.8				
Queue Delay	0.3		0.0	0.0	0.0				
Total Delay	11.3		63.4	18.4	41.8				
LOS	B		E	B	D				
Approach Delay	11.3			30.9	41.8				
Approach LOS	B			C	D				
Queue Length 50th (ft)	242		155	130	105				
Queue Length 95th (ft)	324		#290	186	155				
Internal Link Dist (ft)	282			359	371				
Turn Bay Length (ft)									
Base Capacity (vph)	1855		290	1742	782				
Starvation Cap Reductn	475		0	0	0				
Spillback Cap Reductn	0		0	0	0				
Storage Cap Reductn	0		0	0	0				
Reduced v/c Ratio	0.57		0.77	0.33	0.42				

Intersection Summary

Area Type: Other  
 Cycle Length: 118  
 Actuated Cycle Length: 110  
 Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 24.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 54.3%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Route 131 & Main Street



HCM Signalized Intersection Capacity Analysis  
 5: Route 131 & Main Street

02/17/2020

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	
Traffic Volume (vph)	719	0	204	531	300	0
Future Volume (vph)	719	0	204	531	300	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		6.0	5.5	6.0	
Lane Util. Factor	0.95		1.00	0.95	0.97	
Frt	1.00		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	3539		1770	3539	3433	
Flt Permitted	1.00		0.95	1.00	0.95	
Satd. Flow (perm)	3539		1770	3539	3433	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	782	0	222	577	326	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	782	0	222	577	326	0
Turn Type	NA		Prot	NA	Prot	
Protected Phases	1 2 3		5	1 5	4	
Permitted Phases						
Actuated Green, G (s)	52.7		18.1	54.2	21.6	
Effective Green, g (s)	52.7		18.1	48.2	21.6	
Actuated g/C Ratio	0.48		0.16	0.44	0.20	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)	1697		291	1552	674	
v/s Ratio Prot	c0.22		c0.13	0.16	c0.09	
v/s Ratio Perm						
v/c Ratio	0.46		0.76	0.37	0.48	
Uniform Delay, d1	19.1		43.8	20.7	39.2	
Progression Factor	0.52		1.00	1.00	1.00	
Incremental Delay, d2	0.2		11.2	0.2	0.5	
Delay (s)	10.1		55.1	20.8	39.7	
Level of Service	B		E	C	D	
Approach Delay (s)	10.1			30.4	39.7	
Approach LOS	B			C	D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			23.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.60			
Actuated Cycle Length (s)			109.9		Sum of lost time (s)	28.5
Intersection Capacity Utilization			54.3%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑		↑		↑	↑	↑	
Traffic Volume (vph)	0	762	80	0	1274	0	87	0	67	214	110	6
Future Volume (vph)	0	762	80	0	1274	0	87	0	67	214	110	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3490	0	0	3539	0	1770	0	1583	1770	1848	0
Flt Permitted							0.676			0.950		
Satd. Flow (perm)	0	3490	0	0	3539	0	1259	0	1583	1770	1848	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25							73		4	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		449			961			453			377	
Travel Time (s)		12.2			26.2			12.4			10.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	915	0	0	1385	0	95	0	73	233	127	0
Turn Type		NA			NA		Perm		Perm	custom	NA	
Protected Phases		6			2							
Permitted Phases							4		4	8	8	
Detector Phase		6			2		4		4	8	8	
Switch Phase												
Minimum Initial (s)		20.0			20.0		20.0		20.0	6.0	6.0	
Minimum Split (s)		26.0			26.0		26.0		26.0	26.0	26.0	
Total Split (s)		46.0			46.0		26.0		26.0	26.0	26.0	
Total Split (%)		63.9%			63.9%		36.1%		36.1%	36.1%	36.1%	
Maximum Green (s)		40.0			40.0		20.0		20.0	20.0	20.0	
Yellow Time (s)		4.0			4.0		4.0		4.0	4.0	4.0	
All-Red Time (s)		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	
Total Lost Time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0		3.0	3.0	3.0	
Recall Mode		Min			Min		None		None	None	None	
Walk Time (s)										5.0	5.0	
Flash Dont Walk (s)										15.0	15.0	
Pedestrian Calls (#/hr)										2	2	
Act Effct Green (s)		35.5			35.5		20.2		20.2	20.2	20.2	
Actuated g/C Ratio		0.52			0.52		0.30		0.30	0.30	0.30	
v/c Ratio		0.50			0.75		0.25		0.14	0.44	0.23	
Control Delay		10.9			15.4		22.3		6.4	23.9	20.4	
Queue Delay		0.0			0.0		0.0		0.0	0.0	0.0	
Total Delay		10.9			15.4		22.3		6.4	23.9	20.4	
LOS		B			B		C		A	C	C	
Approach Delay		10.9			15.4			15.3			22.7	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)		114			216		33		0	85	42	
Queue Length 95th (ft)		156			289		70		28	149	83	
Internal Link Dist (ft)		369			881			373			297	
Turn Bay Length (ft)												
Base Capacity (vph)		2085			2104		374		521	526	552	
Starvation Cap Reductn		0			0		0		0	0	0	
Spillback Cap Reductn		0			0		0		0	0	0	
Storage Cap Reductn		0			0		0		0	0	0	
Reduced v/c Ratio		0.44			0.66		0.25		0.14	0.44	0.23	

Intersection Summary

Area Type:	Other
Cycle Length:	72
Actuated Cycle Length:	67.8
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.75
Intersection Signal Delay:	14.8
Intersection Capacity Utilization:	67.1%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	C

Splits and Phases: 1: Old Sturbridge Village Rd & Main Street

← Ø2	↖ Ø4
46 s	26 s
→ Ø6	↗ Ø8
46 s	26 s

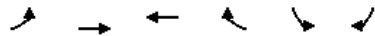
HCM Signalized Intersection Capacity Analysis  
 1: Old Sturbridge Village Rd & Main Street

02/17/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑		↑		↑	↑	↑	
Traffic Volume (vph)	0	762	80	0	1274	0	87	0	67	214	110	6
Future Volume (vph)	0	762	80	0	1274	0	87	0	67	214	110	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00		1.00	1.00	1.00	
Frt		0.99			1.00		1.00		0.85	1.00	0.99	
Flt Protected		1.00			1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		3489			3539		1770		1583	1770	1847	
Flt Permitted		1.00			1.00		0.68		1.00	0.95	1.00	
Satd. Flow (perm)		3489			3539		1258		1583	1770	1847	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	828	87	0	1385	0	95	0	73	233	120	7
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	51	0	3	0
Lane Group Flow (vph)	0	903	0	0	1385	0	95	0	22	233	124	0
Turn Type		NA			NA		Perm		Perm	custom	NA	
Protected Phases		6			2							
Permitted Phases							4		4	8	8	
Actuated Green, G (s)		35.5			35.5		20.1		20.1	20.1	20.1	
Effective Green, g (s)		35.5			35.5		20.1		20.1	20.1	20.1	
Actuated g/C Ratio		0.53			0.53		0.30		0.30	0.30	0.30	
Clearance Time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		1832			1858		374		470	526	549	
v/s Ratio Prot		0.26			c0.39							
v/s Ratio Perm							0.08		0.01	c0.13	0.07	
v/c Ratio		0.49			0.75		0.25		0.05	0.44	0.23	
Uniform Delay, d1		10.3			12.5		18.1		16.9	19.2	17.9	
Progression Factor		1.00			1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.2			1.7		0.4		0.0	0.6	0.2	
Delay (s)		10.5			14.2		18.4		17.0	19.8	18.1	
Level of Service		B			B		B		B	B	B	
Approach Delay (s)		10.5			14.2			17.8			19.2	
Approach LOS		B			B			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			13.8			HCM 2000 Level of Service					B	
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			67.6			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			67.1%			ICU Level of Service				C		
Analysis Period (min)			15									

c Critical Lane Group



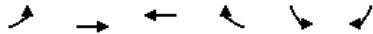


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	33	1016	1412	50	0	92
Future Volume (vph)	33	1016	1412	50	0	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1770	3539	3522	0	0	1611
Flt Permitted	0.950					
Satd. Flow (perm)	1770	3539	3522	0	0	1611
Link Speed (mph)		25	25		25	
Link Distance (ft)		961	391		600	
Travel Time (s)		26.2	10.7		16.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	1104	1589	0	0	100
Sign Control		Free	Free		Stop	

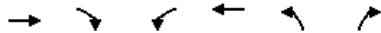
Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	53.0%
	ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 2: Main Street & Sturbridge Hotel & Conf. Driveway

02/17/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↵	↑↑	↑↑			↑
Traffic Volume (veh/h)	33	1016	1412	50	0	92
Future Volume (Veh/h)	33	1016	1412	50	0	92
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	1104	1535	54	0	100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		961	656			
pX, platoon unblocked	0.73				0.77	0.73
vC, conflicting volume	1589				2186	794
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1066				1442	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				100	87
cM capacity (veh/h)	474				88	791
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	36	552	552	1023	566	100
Volume Left	36	0	0	0	0	0
Volume Right	0	0	0	0	54	100
cSH	474	1700	1700	1700	1700	791
Volume to Capacity	0.08	0.32	0.32	0.60	0.33	0.13
Queue Length 95th (ft)	6	0	0	0	0	11
Control Delay (s)	13.2	0.0	0.0	0.0	0.0	10.2
Lane LOS	B					B
Approach Delay (s)	0.4			0.0		10.2
Approach LOS						B
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			53.0%		ICU Level of Service	A
Analysis Period (min)			15			



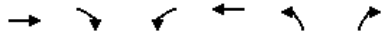
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (vph)	1016	1	0	1461	0	2
Future Volume (vph)	1016	1	0	1461	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3539	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1611
Link Speed (mph)	25			25	25	
Link Distance (ft)	391			265	291	
Travel Time (s)	10.7			7.2	7.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1105	0	0	1588	0	2
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	43.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 3: Main Street

02/17/2020



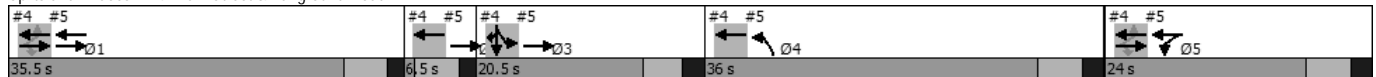
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	1016	1	0	1461	0	2
Future Volume (Veh/h)	1016	1	0	1461	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1104	1	0	1588	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	265					
pX, platoon unblocked	0.74					
vC, conflicting volume			1105		1898	552
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1105		1516	552
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			628		82	477
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	736	369	794	794	2	
Volume Left	0	0	0	0	0	
Volume Right	0	1	0	0	2	
cSH	1700	1700	1700	1700	477	
Volume to Capacity	0.43	0.22	0.47	0.47	0.00	
Queue Length 95th (ft)	0	0	0	0	0	
Control Delay (s)	0.0	0.0	0.0	0.0	12.6	
Lane LOS						B
Approach Delay (s)	0.0		0.0		12.6	
Approach LOS						B
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			43.7%	ICU Level of Service	A	
Analysis Period (min)			15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø4	Ø5
Lane Configurations		↔↕	↗		↕↔						↕↔	↗				
Traffic Volume (vph)	18	594	403	0	1450	63	0	0	0	14	13	11				
Future Volume (vph)	18	594	403	0	1450	63	0	0	0	14	13	11				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900				
Storage Length (ft)	0		75	0		0	0		0	0		0				
Storage Lanes	0		1	0		0	0		0	0		1				
Taper Length (ft)	25			25			25			25						
Satd. Flow (prot)	0	3536	1583	0	3518	0	0	0	0	0	1816	1583				
Flt Permitted		0.850									0.975					
Satd. Flow (perm)	0	3008	1583	0	3518	0	0	0	0	0	1816	1583				
Right Turn on Red			Yes			Yes			Yes			Yes				
Satd. Flow (RTOR)			262		12							178				
Link Speed (mph)		25			25			25			25					
Link Distance (ft)		265			362			687			607					
Travel Time (s)		7.2			9.9			18.7			16.6					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92				
Shared Lane Traffic (%)																
Lane Group Flow (vph)	0	666	438	0	1644	0	0	0	0	0	29	12				
Turn Type	Perm	NA	Perm		NA					Split	NA	Prot				
Protected Phases		1 5		1 2 4 5						3	3	3	1	2	4	5
Permitted Phases	1 5		1 5													
Detector Phase	1 5	1 5	1 5	1 2 4 5						3	3	3				
Switch Phase																
Minimum Initial (s)										6.0	6.0	6.0	10.0	1.0	6.0	6.0
Minimum Split (s)										11.5	11.5	11.5	15.5	6.5	12.0	12.0
Total Split (s)										20.5	20.5	20.5	35.5	6.5	36.0	24.0
Total Split (%)										16.7%	16.7%	16.7%	29%	5%	29%	20%
Maximum Green (s)										15.0	15.0	15.0	30.0	1.0	30.0	18.0
Yellow Time (s)										3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)										2.0	2.0	2.0	1.5	1.5	2.0	2.0
Lost Time Adjust (s)										0.0	0.0	0.0				
Total Lost Time (s)										5.5	5.5	5.5				
Lead/Lag										Lead	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?										Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)										3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode										None	None	None	None	None	None	None
Act Effct Green (s)		54.0	54.0		96.6					10.1	10.1	10.1				
Actuated g/C Ratio		0.46	0.46		0.82					0.09	0.09	0.09				
v/c Ratio		0.48	0.50		0.57					0.19	0.04	0.04				
Control Delay		23.9	10.8		1.1					52.3	0.3	0.3				
Queue Delay		0.1	0.0		0.1					0.0	0.0	0.0				
Total Delay		24.0	10.8		1.2					52.3	0.3	0.3				
LOS		C	B		A					D	A	A				
Approach Delay		18.8			1.2					37.0						
Approach LOS		B			A					D						
Queue Length 50th (ft)		177	81		2					21	0	0				
Queue Length 95th (ft)		250	184		0					51	0	0				
Internal Link Dist (ft)		185			282			607		527						
Turn Bay Length (ft)			75													
Base Capacity (vph)		1381	868		2888					231	357	357				
Starvation Cap Reductn		0	0		220					0	0	0				
Spillback Cap Reductn		67	0		0					0	0	0				
Storage Cap Reductn		0	0		0					0	0	0				
Reduced v/c Ratio		0.51	0.50		0.62					0.13	0.03	0.03				

**Intersection Summary**  
 Area Type: Other  
 Cycle Length: 122.5  
 Actuated Cycle Length: 117.7  
 Natural Cycle: 80  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.34  
 Intersection Signal Delay: 8.7  
 Intersection LOS: A  
 Intersection Capacity Utilization 56.3%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 4: Main Street & Fairground Road



HCM Signalized Intersection Capacity Analysis  
 4: Main Street & Fairground Road

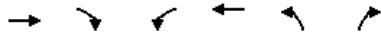
02/17/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕	↗		↕↕						↕	↗	
Traffic Volume (vph)	18	594	403	0	1450	63	0	0	0	14	13	11	
Future Volume (vph)	18	594	403	0	1450	63	0	0	0	14	13	11	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		5.5	5.5		5.5						5.5	5.5	
Lane Util. Factor		0.95	1.00		0.95						1.00	1.00	
Frt		1.00	0.85		0.99						1.00	0.85	
Flt Protected		1.00	1.00		1.00						0.97	1.00	
Satd. Flow (prot)		3534	1583		3517						1816	1583	
Flt Permitted		0.85	1.00		1.00						0.97	1.00	
Satd. Flow (perm)		3007	1583		3517						1816	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	20	646	438	0	1576	68	0	0	0	15	14	12	
RTOR Reduction (vph)	0	0	155	0	3	0	0	0	0	0	0	11	
Lane Group Flow (vph)	0	666	283	0	1641	0	0	0	0	0	29	1	
Turn Type	Perm	NA	Perm		NA					Split	NA	Prot	
Protected Phases		1 5			1 2 4 5					3	3	3	
Permitted Phases	1 5		1 5										
Actuated Green, G (s)		54.0	54.0		96.5						10.1	10.1	
Effective Green, g (s)		48.0	48.0		84.5						10.1	10.1	
Actuated g/C Ratio		0.41	0.41		0.72						0.09	0.09	
Clearance Time (s)											5.5	5.5	
Vehicle Extension (s)											3.0	3.0	
Lane Grp Cap (vph)		1227	646		2527						155	135	
v/s Ratio Prot					c0.47						c0.02	0.00	
v/s Ratio Perm		0.22	0.18										
v/c Ratio		0.54	0.44		0.65						0.19	0.01	
Uniform Delay, d1		26.5	25.1		8.7						49.9	49.2	
Progression Factor		1.00	1.00		0.13						1.00	1.00	
Incremental Delay, d2		0.5	0.5		0.4						0.6	0.0	
Delay (s)		27.0	25.6		1.6						50.5	49.2	
Level of Service		C	C		A						D	D	
Approach Delay (s)		26.4			1.6			0.0			50.1		
Approach LOS		C			A			A			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			12.1		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.64										
Actuated Cycle Length (s)			117.6		Sum of lost time (s)						28.5		
Intersection Capacity Utilization			56.3%		ICU Level of Service						B		
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings  
5: Route 131 & Main Street

02/17/2020

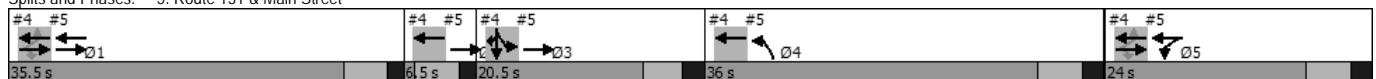


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø2	Ø3
Lane Configurations	↑↑		↙	↑↑	↘				
Traffic Volume (vph)	608	0	332	1013	500	0			
Future Volume (vph)	608	0	332	1013	500	0			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Satd. Flow (prot)	3539	0	1770	3539	3433	0			
Flt Permitted			0.950		0.950				
Satd. Flow (perm)	3539	0	1770	3539	3433	0			
Right Turn on Red		Yes				Yes			
Satd. Flow (RTOR)									
Link Speed (mph)	25			25	25				
Link Distance (ft)	362			439	451				
Travel Time (s)	9.9			12.0	12.3				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92			
Shared Lane Traffic (%)									
Lane Group Flow (vph)	661	0	361	1101	543	0			
Turn Type	NA		Prot	NA	Prot				
Protected Phases	1 2 3		5	1 5	4		1	2	3
Permitted Phases									
Detector Phase	1 2 3		5	1 5	4				
Switch Phase									
Minimum Initial (s)			6.0		6.0		10.0	1.0	6.0
Minimum Split (s)			12.0		12.0		15.5	6.5	11.5
Total Split (s)			24.0		36.0		35.5	6.5	20.5
Total Split (%)			19.6%		29.4%		29%	5%	17%
Maximum Green (s)			18.0		30.0		30.0	1.0	15.0
Yellow Time (s)			4.0		4.0		4.0	4.0	3.5
All-Red Time (s)			2.0		2.0		1.5	1.5	2.0
Lost Time Adjust (s)			0.0		0.0				
Total Lost Time (s)			6.0		6.0				
Lead/Lag					Lag		Lead	Lag	Lead
Lead-Lag Optimize?					Yes		Yes	Yes	Yes
Vehicle Extension (s)			3.0		3.0		3.0	3.0	3.0
Recall Mode			None		None		None	None	None
Act Effct Green (s)	52.1		18.0	54.0	30.0				
Actuated g/C Ratio	0.44		0.15	0.46	0.25				
v/c Ratio	0.42		1.34	0.68	0.62				
Control Delay	10.9		213.1	27.9	42.8				
Queue Delay	0.3		0.0	0.0	0.0				
Total Delay	11.3		213.1	27.9	42.8				
LOS	B		F	C	D				
Approach Delay	11.3			73.6	42.8				
Approach LOS	B			E	D				
Queue Length 50th (ft)	212		-352	331	186				
Queue Length 95th (ft)	281		#570	442	259				
Internal Link Dist (ft)	282			359	371				
Turn Bay Length (ft)									
Base Capacity (vph)	1715		270	1624	875				
Starvation Cap Reductn	492		0	0	0				
Spillback Cap Reductn	0		0	0	0				
Storage Cap Reductn	0		0	0	0				
Reduced v/c Ratio	0.54		1.34	0.68	0.62				

Intersection Summary

Area Type: Other  
 Cycle Length: 122.5  
 Actuated Cycle Length: 117.7  
 Natural Cycle: 80  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.34  
 Intersection Signal Delay: 51.9  
 Intersection LOS: D  
 Intersection Capacity Utilization 64.0%  
 ICU Level of Service C  
 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: 5: Route 131 & Main Street



HCM Signalized Intersection Capacity Analysis  
 5: Route 131 & Main Street

02/17/2020

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↔	↑↑	↔	
Traffic Volume (vph)	608	0	332	1013	500	0
Future Volume (vph)	608	0	332	1013	500	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		6.0	5.5	6.0	
Lane Util. Factor	0.95		1.00	0.95	0.97	
Frt	1.00		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	3539		1770	3539	3433	
Flt Permitted	1.00		0.95	1.00	0.95	
Satd. Flow (perm)	3539		1770	3539	3433	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	661	0	361	1101	543	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	661	0	361	1101	543	0
Turn Type	NA		Prot	NA	Prot	
Protected Phases	1 2 3		5	1 5	4	
Permitted Phases						
Actuated Green, G (s)	52.1		18.0	54.0	30.0	
Effective Green, g (s)	52.1		18.0	48.0	30.0	
Actuated g/C Ratio	0.44		0.15	0.41	0.26	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)	1567		270	1444	875	
v/s Ratio Prot	c0.19		c0.20	c0.31	c0.16	
v/s Ratio Perm						
v/c Ratio	0.42		1.34	0.76	0.62	
Uniform Delay, d1	22.4		49.8	29.9	38.8	
Progression Factor	0.45		1.00	1.00	1.00	
Incremental Delay, d2	0.2		174.6	2.4	1.4	
Delay (s)	10.3		224.4	32.3	40.1	
Level of Service	B		F	C	D	
Approach Delay (s)	10.3			79.8	40.1	
Approach LOS	B			E	D	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			54.5		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.82			
Actuated Cycle Length (s)			117.6		Sum of lost time (s)	28.5
Intersection Capacity Utilization			64.0%		ICU Level of Service	C
Analysis Period (min)			15			

c Critical Lane Group



## 5.6 Level of Service Analyses – Future Traffic Volumes with Improvements



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔			↕↔		↕		↕	↕↔	↕↔	↕
Traffic Volume (vph)	0	793	80	0	1346	0	87	0	78	244	121	6
Future Volume (vph)	0	793	80	0	1346	0	87	0	78	244	121	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3490	0	0	3539	0	1770	0	1583	1770	1848	0
Flt Permitted							0.668			0.950		
Satd. Flow (perm)	0	3490	0	0	3539	0	1244	0	1583	1770	1848	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							85		4	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		449			961			453			398	
Travel Time (s)		12.2			26.2			12.4			10.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	949	0	0	1463	0	95	0	85	265	139	0
Turn Type		NA			NA		Perm		Perm	Perm	NA	
Protected Phases		6			2						8	
Permitted Phases							4		4	8	8	
Detector Phase		6			2		4		4	8	8	
Switch Phase												
Minimum Initial (s)		20.0			20.0		6.0		6.0	6.0	6.0	
Minimum Split (s)		26.0			26.0		26.0		26.0	26.0	26.0	
Total Split (s)		46.0			46.0		26.0		26.0	26.0	26.0	
Total Split (%)		63.9%			63.9%		36.1%		36.1%	36.1%	36.1%	
Maximum Green (s)		40.0			40.0		20.0		20.0	20.0	20.0	
Yellow Time (s)		4.0			4.0		4.0		4.0	4.0	4.0	
All-Red Time (s)		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	
Total Lost Time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0		3.0	3.0	3.0	
Recall Mode		Min			Min		None		None	None	None	
Walk Time (s)							5.0		5.0	5.0	5.0	
Flash Dont Walk (s)							15.0		15.0	15.0	15.0	
Pedestrian Calls (#/hr)							2		2	2	2	
Act Effct Green (s)		35.1			35.1		14.6		14.6	14.6	14.6	
Actuated g/C Ratio		0.57			0.57		0.24		0.24	0.24	0.24	
v/c Ratio		0.48			0.73		0.33		0.19	0.64	0.32	
Control Delay		9.1			13.1		24.3		6.6	30.0	22.4	
Queue Delay		0.0			0.0		0.0		0.0	0.0	0.0	
Total Delay		9.1			13.1		24.3		6.6	30.0	22.4	
LOS		A			B		C		A	C	C	
Approach Delay		9.1			13.1			15.9			27.4	
Approach LOS		A			B			B			C	
Queue Length 50th (ft)		96			191		33		0	100	47	
Queue Length 95th (ft)		164			317		70		30	170	90	
Internal Link Dist (ft)		369			881			373			318	
Turn Bay Length (ft)												
Base Capacity (vph)		2334			2359		414		584	590	618	
Starvation Cap Reductn		0			0		0		0	0	0	
Spillback Cap Reductn		0			0		0		0	0	0	
Storage Cap Reductn		0			0		0		0	0	0	
Reduced v/c Ratio		0.41			0.62		0.23		0.15	0.45	0.22	

Intersection Summary

Area Type:	Other
Cycle Length:	72
Actuated Cycle Length:	62.1
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	13.9
Intersection Capacity Utilization:	63.9%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	B

Splits and Phases: 1: Old Sturbridge Village Rd & Main Street

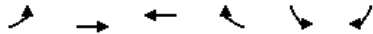
← Ø2	↕ Ø4
46 s	26 s
→ Ø6	↓ Ø8
46 s	26 s

HCM Signalized Intersection Capacity Analysis  
 1: Old Sturbridge Village Rd & Main Street

03/04/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑		↑		↑	↑	↑	
Traffic Volume (vph)	0	793	80	0	1346	0	87	0	78	244	121	6
Future Volume (vph)	0	793	80	0	1346	0	87	0	78	244	121	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Lane Util. Factor		0.95			0.95		1.00		1.00	1.00	1.00	
Frt		0.99			1.00		1.00		0.85	1.00	0.99	
Flt Protected		1.00			1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)		3491			3539		1770		1583	1770	1849	
Flt Permitted		1.00			1.00		0.67		1.00	0.95	1.00	
Satd. Flow (perm)		3491			3539		1245		1583	1770	1849	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	862	87	0	1463	0	95	0	85	265	132	7
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	65	0	3	0
Lane Group Flow (vph)	0	939	0	0	1463	0	95	0	20	265	136	0
Turn Type		NA			NA		Perm		Perm	Perm	NA	
Protected Phases		6			2						8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)		35.1			35.1		14.6		14.6	14.6	14.6	
Effective Green, g (s)		35.1			35.1		14.6		14.6	14.6	14.6	
Actuated g/C Ratio		0.57			0.57		0.24		0.24	0.24	0.24	
Clearance Time (s)		6.0			6.0		6.0		6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		1985			2013		294		374	418	437	
v/s Ratio Prot		0.27			0.41						0.07	
v/s Ratio Perm							0.08		0.01	0.15		
v/c Ratio		0.47			0.73		0.32		0.05	0.63	0.31	
Uniform Delay, d1		7.8			9.8		19.5		18.2	21.2	19.4	
Progression Factor		1.00			1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2		0.2			1.3		0.6		0.1	3.1	0.4	
Delay (s)		8.0			11.1		20.1		18.3	24.3	19.8	
Level of Service		A			B		C		B	C	B	
Approach Delay (s)		8.0			11.1			19.2			22.7	
Approach LOS		A			B			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			12.2			HCM 2000 Level of Service					B	
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			61.7			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			63.9%			ICU Level of Service				B		
Analysis Period (min)			15									

c Critical Lane Group

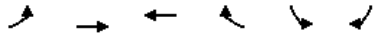


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↑↑	↑↑			↔
Traffic Volume (vph)	33	1088	1483	51	0	93
Future Volume (vph)	33	1088	1483	51	0	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25				25	
Satd. Flow (prot)	1770	3539	3522	0	0	1611
Flt Permitted	0.950					
Satd. Flow (perm)	1770	3539	3522	0	0	1611
Link Speed (mph)		25	25		25	
Link Distance (ft)		961	391		600	
Travel Time (s)		26.2	10.7		16.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	1183	1667	0	0	101
Sign Control		Free	Free		Stop	

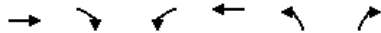
Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.0%
	ICU Level of Service B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 2: Main Street & Sturbridge Hotel & Conf. Driveway

03/04/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑↑	↑↑			↘
Traffic Volume (veh/h)	33	1088	1483	51	0	93
Future Volume (Veh/h)	33	1088	1483	51	0	93
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	1183	1612	55	0	101
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		961	656			
pX, platoon unblocked	0.65				0.68	0.65
vC, conflicting volume	1667				2303	834
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	953				1561	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				100	86
cM capacity (veh/h)	467				65	706
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	36	592	592	1075	592	101
Volume Left	36	0	0	0	0	0
Volume Right	0	0	0	0	55	101
cSH	467	1700	1700	1700	1700	706
Volume to Capacity	0.08	0.35	0.35	0.63	0.35	0.14
Queue Length 95th (ft)	6	0	0	0	0	12
Control Delay (s)	13.4	0.0	0.0	0.0	0.0	10.9
Lane LOS	B					B
Approach Delay (s)	0.4			0.0		10.9
Approach LOS						B
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			55.0%		ICU Level of Service	B
Analysis Period (min)			15			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (vph)	1015	73	0	1534	0	74
Future Volume (vph)	1015	73	0	1534	0	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3504	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3504	0	0	3539	0	1611
Link Speed (mph)	25			25	25	
Link Distance (ft)	391			265	291	
Travel Time (s)	10.7			7.2	7.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1182	0	0	1667	0	80
Sign Control	Free			Free	Stop	

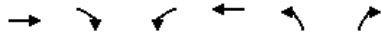
**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

3: Main Street

03/04/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	1015	73	0	1534	0	74
Future Volume (Veh/h)	1015	73	0	1534	0	74
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1103	79	0	1667	0	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (ft)	265					
pX, platoon unblocked	0.67					
vC, conflicting volume			1182		1976	591
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1182		1478	591
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	82
cM capacity (veh/h)			587		78	450
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	735	447	834	834	80	
Volume Left	0	0	0	0	0	
Volume Right	0	79	0	0	80	
cSH	1700	1700	1700	1700	450	
Volume to Capacity	0.43	0.26	0.49	0.49	0.18	
Queue Length 95th (ft)	0	0	0	0	16	
Control Delay (s)	0.0	0.0	0.0	0.0	14.7	
Lane LOS						B
Approach Delay (s)	0.0		0.0		14.7	
Approach LOS						B
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			45.7%	ICU Level of Service	A	
Analysis Period (min)	15					

Lanes, Volumes, Timings  
4: Main Street & Fairground Road

03/04/2020

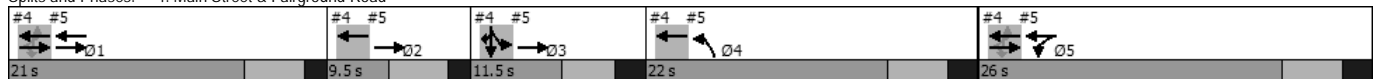


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Ø1	Ø2	Ø4	Ø5
Lane Configurations		↔	↑	↗		↕						↖	↘				
Traffic Volume (vph)	1	18	611	458	0	1522	63	0	0	0	14	13	11				
Future Volume (vph)	1	18	611	458	0	1522	63	0	0	0	14	13	11				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900				
Storage Length (ft)		0		75	0		0	0		0	0		0				
Storage Lanes		1		1	0		0	0		0	0		1				
Taper Length (ft)		25			25			25			25						
Satd. Flow (prot)	0	1770	1863	1583	0	3518	0	0	0	0	0	1816	1583				
Flt Permitted		0.113										0.975					
Satd. Flow (perm)	0	210	1863	1583	0	3518	0	0	0	0	0	1816	1583				
Right Turn on Red				Yes			Yes			Yes			Yes				
Satd. Flow (RTOR)				223		17							242				
Link Speed (mph)			25			25			25				25				
Link Distance (ft)			265			362			687				607				
Travel Time (s)			7.2			9.9			18.7				16.6				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92				
Shared Lane Traffic (%)																	
Lane Group Flow (vph)	0	21	664	498	0	1722	0	0	0	0	0	29	12				
Turn Type	Perm	Perm	NA	Perm		NA					Split	NA	Prot				
Protected Phases			1 5		1 2 4 5						3	3	3	1	2	4	5
Permitted Phases	1 5	1 5		1 5													
Detector Phase	1 5	1 5	1 5	1 5	1 2 4 5						3	3	3				
Switch Phase																	
Minimum Initial (s)											6.0	6.0	6.0	10.0	1.0	6.0	6.0
Minimum Split (s)											11.5	11.5	11.5	15.5	6.5	12.0	12.0
Total Split (s)											11.5	11.5	11.5	21.0	9.5	22.0	26.0
Total Split (%)											12.8%	12.8%	12.8%	23%	11%	24%	29%
Maximum Green (s)											6.0	6.0	6.0	15.5	4.0	16.0	20.0
Yellow Time (s)											3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)											2.0	2.0	2.0	1.5	1.5	2.0	2.0
Lost Time Adjust (s)											0.0	0.0					
Total Lost Time (s)											5.5	5.5					
Lead/Lag											Lead	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?											Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)											3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode											None	None	None	None	None	None	None
Act Effct Green (s)		41.5	41.5	41.5		73.0					6.0	6.0					
Actuated g/C Ratio		0.46	0.46	0.46		0.81					0.07	0.07					
v/c Ratio		0.22	0.77	0.59		0.60					0.24	0.04					
Control Delay		21.7	27.9	12.6		0.9					45.0	0.2					
Queue Delay		0.0	0.0	0.0		0.1					0.0	0.0					
Total Delay		21.7	27.9	12.6		1.0					45.0	0.2					
LOS		C	C	B		A					D	A					
Approach Delay			21.3			1.0					31.9						
Approach LOS			C			A					C						
Queue Length 50th (ft)		7	305	105		2					16	0					
Queue Length 95th (ft)		26	451	203		m6					44	0					
Internal Link Dist (ft)			185			282			607		527						
Turn Bay Length (ft)				75													
Base Capacity (vph)		96	859	850		2856					121	331					
Starvation Cap Reductn		0	0	0		258					0	0					
Spillback Cap Reductn		0	0	0		0					0	0					
Storage Cap Reductn		0	0	0		0					0	0					
Reduced v/c Ratio		0.22	0.77	0.59		0.66					0.24	0.04					

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.98  
 Intersection Signal Delay: 9.6  
 Intersection LOS: A  
 Intersection Capacity Utilization 58.2%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Main Street & Fairground Road





HCM Signalized Intersection Capacity Analysis  
 4: Main Street & Fairground Road

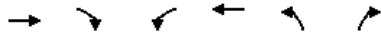
03/04/2020

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	1	18	611	458	0	1522	63	0	0	0	14	13	11
Future Volume (vph)	1	18	611	458	0	1522	63	0	0	0	14	13	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	5.5		5.5						5.5	5.5
Lane Util. Factor		1.00	1.00	1.00		0.95						1.00	1.00
Frt		1.00	1.00	0.85		0.99						1.00	0.85
Flt Protected		0.95	1.00	1.00		1.00						0.97	1.00
Satd. Flow (prot)		1770	1863	1583		3518						1816	1583
Flt Permitted		0.11	1.00	1.00		1.00						0.97	1.00
Satd. Flow (perm)		210	1863	1583		3518						1816	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	20	664	498	0	1654	68	0	0	0	15	14	12
RTOR Reduction (vph)	0	0	0	135	0	5	0	0	0	0	0	0	11
Lane Group Flow (vph)	0	21	664	363	0	1717	0	0	0	0	0	29	1
Turn Type	Perm	Perm	NA	Perm		NA					Split	NA	Prot
Protected Phases			1 5			1 2 4 5					3	3	3
Permitted Phases	1 5	1 5		1 5									
Actuated Green, G (s)		41.5	41.5	41.5		73.0						6.0	6.0
Effective Green, g (s)		35.5	35.5	35.5		61.0						6.0	6.0
Actuated g/C Ratio		0.39	0.39	0.39		0.68						0.07	0.07
Clearance Time (s)												5.5	5.5
Vehicle Extension (s)												3.0	3.0
Lane Grp Cap (vph)		82	734	624		2384						121	105
v/s Ratio Prot			c0.36			c0.49						c0.02	0.00
v/s Ratio Perm		0.10		0.23									
v/c Ratio		0.26	0.90	0.58		0.72						0.24	0.01
Uniform Delay, d1		18.4	25.7	21.4		9.1						39.8	39.2
Progression Factor		1.00	1.00	1.00		0.10						1.00	1.00
Incremental Delay, d2		1.7	14.6	1.4		0.7						1.0	0.0
Delay (s)		20.0	40.2	22.8		1.6						40.9	39.2
Level of Service		C	D	C		A						D	D
Approach Delay (s)			32.5			1.6			0.0			40.4	
Approach LOS			C			A			A			D	
<b>Intersection Summary</b>													
HCM 2000 Control Delay			14.5			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio			0.81										
Actuated Cycle Length (s)			90.0			Sum of lost time (s)			28.5				
Intersection Capacity Utilization			58.2%			ICU Level of Service			B				
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings  
5: Route 131 & Main Street

03/04/2020



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø1	Ø2	Ø3
Lane Configurations	↑↑		↙	↑↑	↘				
Traffic Volume (vph)	625	0	332	1023	552	0			
Future Volume (vph)	625	0	332	1023	552	0			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Satd. Flow (prot)	3539	0	1770	3539	3433	0			
Flt Permitted			0.950		0.950				
Satd. Flow (perm)	3539	0	1770	3539	3433	0			
Right Turn on Red		Yes				Yes			
Satd. Flow (RTOR)									
Link Speed (mph)	25			25	25				
Link Distance (ft)	362			439	451				
Travel Time (s)	9.9			12.0	12.3				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92			
Shared Lane Traffic (%)									
Lane Group Flow (vph)	679	0	361	1112	600	0			
Turn Type	NA		Prot	NA	Prot				
Protected Phases	1 2 3		5	1 5	4		1	2	3
Permitted Phases									
Detector Phase	1 2 3		5	1 5	4				
Switch Phase									
Minimum Initial (s)			6.0		6.0		10.0	1.0	6.0
Minimum Split (s)			12.0		12.0		15.5	6.5	11.5
Total Split (s)			26.0		22.0		21.0	9.5	11.5
Total Split (%)			28.9%		24.4%		23%	11%	13%
Maximum Green (s)			20.0		16.0		15.5	4.0	6.0
Yellow Time (s)			4.0		4.0		4.0	4.0	3.5
All-Red Time (s)			2.0		2.0		1.5	1.5	2.0
Lost Time Adjust (s)			0.0		0.0				
Total Lost Time (s)			6.0		6.0				
Lead/Lag					Lag		Lead	Lag	Lead
Lead-Lag Optimize?					Yes		Yes	Yes	Yes
Vehicle Extension (s)			3.0		3.0		3.0	3.0	3.0
Recall Mode			None		None		None	None	None
Act Effct Green (s)	36.5		20.0		41.5		16.0		
Actuated g/C Ratio	0.41		0.22		0.46		0.18		
v/c Ratio	0.47		0.92		0.68		0.98		
Control Delay	9.8		65.0		21.7		71.0		
Queue Delay	1.1		0.0		0.0		0.0		
Total Delay	10.9		65.0		21.7		71.0		
LOS	B		E		C		E		
Approach Delay	10.9				32.3		71.0		
Approach LOS	B				C		E		
Queue Length 50th (ft)	156		202		252		177		
Queue Length 95th (ft)	151		#366		324		#286		
Internal Link Dist (ft)	282				359		371		
Turn Bay Length (ft)									
Base Capacity (vph)	1435		393		1631		610		
Starvation Cap Reductn	492		0		0		0		
Spillback Cap Reductn	0		0		0		0		
Storage Cap Reductn	0		0		0		0		
Reduced v/c Ratio	0.72		0.92		0.68		0.98		

Intersection Summary

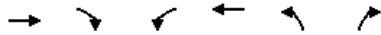
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.98  
 Intersection Signal Delay: 35.5  
 Intersection LOS: D  
 Intersection Capacity Utilization 66.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Route 131 & Main Street

#4 #5 ← → Ø1 21 s	#4 #5 ← → Ø2 9.5 s	#4 #5 ↙ ↘ Ø3 11.5 s	#4 #5 ← ↘ Ø4 22 s	#4 #5 ← ↘ Ø5 26 s
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HCM Signalized Intersection Capacity Analysis  
 5: Route 131 & Main Street

03/04/2020



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↙	
Traffic Volume (vph)	625	0	332	1023	552	0
Future Volume (vph)	625	0	332	1023	552	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		6.0	5.5	6.0	
Lane Util. Factor	0.95		1.00	0.95	0.97	
Frt	1.00		1.00	1.00	1.00	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	3539		1770	3539	3433	
Flt Permitted	1.00		0.95	1.00	0.95	
Satd. Flow (perm)	3539		1770	3539	3433	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	679	0	361	1112	600	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	679	0	361	1112	600	0
Turn Type	NA		Prot	NA	Prot	
Protected Phases	1 2 3		5	1 5	4	
Permitted Phases						
Actuated Green, G (s)	36.5		20.0	41.5	16.0	
Effective Green, g (s)	36.5		20.0	35.5	16.0	
Actuated g/C Ratio	0.41		0.22	0.39	0.18	
Clearance Time (s)			6.0		6.0	
Vehicle Extension (s)			3.0		3.0	
Lane Grp Cap (vph)	1435		393	1395	610	
v/s Ratio Prot	c0.19		c0.20	c0.31	c0.17	
v/s Ratio Perm						
v/c Ratio	0.47		0.92	0.80	0.98	
Uniform Delay, d1	19.7		34.2	24.1	36.9	
Progression Factor	0.46		1.00	1.00	1.00	
Incremental Delay, d2	0.2		25.9	3.3	32.1	
Delay (s)	9.1		60.1	27.3	68.9	
Level of Service	A		E	C	E	
Approach Delay (s)	9.1			35.4	68.9	
Approach LOS	A			D	E	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			36.2		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.89			
Actuated Cycle Length (s)			90.0		Sum of lost time (s)	28.5
Intersection Capacity Utilization			66.0%		ICU Level of Service	C
Analysis Period (min)			15			

c Critical Lane Group