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A Major Qualifying Project submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor of Science.

MASSDOT HIGHWAY INTERCHANGE DESIGN

This study examined the highway interchange of Interstate 190 and State Route 140 in Sterling, Massachusetts. Using data collected on-site as well as existing data from government agencies including MassDOT, the specific problem areas of the interchange were identified. Alternative designs were developed for the site characteristics based on industry standards and using engineering software. A single lane roundabout was recommended based on the criteria of safety, cost, and ability to meet future capacity demands.

Abstract

This study examined the highway interchange of Interstate 190 and State Route 140 in Sterling, Massachusetts. Using data collected on-site as well as existing data from government agencies including MassDOT, the specific problem areas of the interchange were identified. Alternative designs were developed for the site characteristics based on industry standards and using engineering software. A single lane roundabout was recommended based on the criteria of safety, cost, and ability to meet future capacity demands.

Acknowledgements

Our project would not have been possible without the assistance and guidance of a few people. Joe Frawley of MassDOT was very kind to have given advice on where to take the project and how to approach the problems. WPI's lab manager Donald Pellegrino and the Sterling Police Department were very helpful in coordinating the installation of the traffic count boxes. Professor Suzanne LePage and Professor Mingjiang Tao advised the project and provided both technical and moral support. This project would not be a success without all of the people who contributed.

Capstone Design Statement

To meet the Capstone Design requirement, a project must address the seven factors put forth by the American Society of Civil Engineers. The suggested design identifies and addresses safety and efficiency concerns by improving the geometry and pavement design of the interchange. The collection of traffic and site condition data aided in determining specific issues that needed to be improved upon.

As part of the Capstone Design requirement, this project addressed the constraints listed by the American Society of Civil Engineers. The items were completed as follows:

- Engineering Codes and Standards
    - Designs were conducted in accordance with the Mass Highway Department Project Development and Design Guide and other applicable design codes.
- Constructability
    - The designs developed in this project were created with realistic public funding and construction constraints. The input from Mass DOT regarding the revised designs allowed for a realistic assessment of the project's constructability constraints.
- Economic Factors
    - Given that this revised interchange would be publicly funded if constructed, all proposed designs were evaluated on the expected comparative cost. The costs of the proposed designs were then compared to the expected long term cost of the current interchange to determine if a redesign would be fiscally sound.
- Sustainability
    - The revised interchange accounts for the projected growth in demand and was designed to function effectively based on a twenty year effective

lifetime.

- Environmental Effects
    - The design process considered how proposed changes to the interchange might affect the environment and drainage to adjacent properties.
- Health and Safety Issues
    - The proposed design improved upon safety concerns found in the existing layout, with the intent of reducing the severity and number of crashes.
- Ethical Considerations
    - The design process followed ASCE's code of ethics.

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Authorship

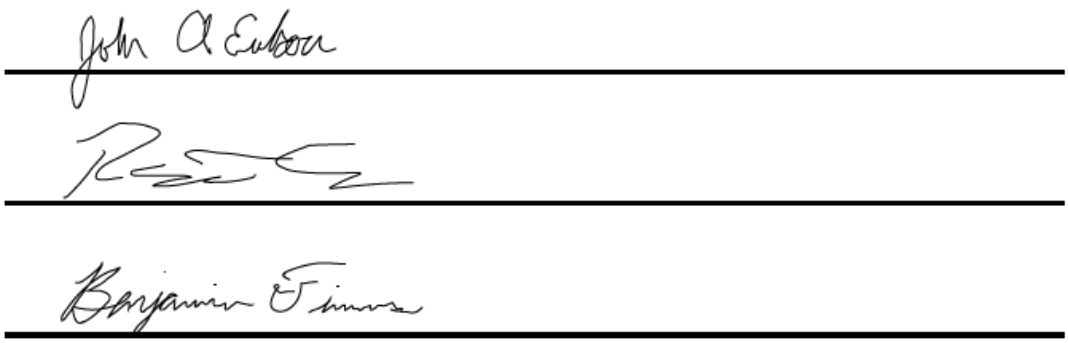
John Erikson was the sole author of sections 1.0, 1.1, 2.1, 2.7, 3.0, 3.1, 3.4, 4.0, 4.1, 4.7

Patrick Cardone was the sole author of sections 2.4, 2.6, 3.2, 3.3, 3.6, 4.2, 4.3, 4.5

Benjamin Timms was the sole author of the Acknowledgements section and Capstone Design Requirement section as well as sections 2.2, 2.3, 2.5, 2.7, 3.5, 3.7, 3.8, 3.9, 4.4, 4.6, 4.8, 5.0, 5.1, 5.2, 5.3, and 6.0.

Sections not listed were the product of collaboration between multiple authors, and many sections include edits from all members.

Signed



1 - Project Overview

The purpose of this project is a redesign of the Interstate 190 – State Route 140 interchange in order to improve safety and traffic conditions. The design must meet the WPI's Major Qualifying Project criteria as well as ABET Capstone Design requirements and AASHTO standards. The interchange has been deemed potentially unsafe by the Massachusetts Department of Transportation, and there is a potential that the intersection is unable to service the current traffic volume at peak hours. The design worked to improve the Level of Service (LOS) of the interchange by improving the geometry and layout of the interchange to meet demand.

To achieve the design goals, the team met with members of MassDOT and collected data from various sources. The focus of the project is on the transportation and geotechnical aspects of the design. The project team drafted multiple possible designs of the intersection and determined which design is preferred based on cost, feasibility, the expected impacts on safety and efficiency, and other factors. The design which best addresses all of these concerns was chosen and presented.

The findings of this study, including the recommended design, are presented to Professors Mingjiang Tao and Suzanne LePage, the faculty advisors of the project. The findings were submitted to Joe Frawley and others from MassDOT as well as other applicable organizations. The results of the project were presented to the WPI community during the April 2012 Project Presentation day. The deliverables are as follows:

- Project Need Form for MassDOT
- Data findings and report for MassDOT to include:
    - Crash Diagram
    - Traffic Counts

  - Turning Movement Counts
  - Level-of-Service Analysis
- Auto CAD drawings of the recommended designs
- Final Presentation to MassDOT
- MQP report for WPI
- Poster for WPI Project Presentation Day

1.1 - Problem Statement

The interchange between Interstate 190 and Route 140 in Sterling Massachusetts has been identified as a problematic design. Many design factors of the interchange have contributed to the perceived safety issues at this site. The interchange is a heavily traveled one, seeing over 12,000 vehicles per day according to the Montachusett Regional Planning Commission. In winter months, it services traffic to Mount Wachusett Ski Resort from populated areas to the south. In addition, the interchange provides a crucial connection for the town of Sterling to I-190, which links the town to job centers such as Worcester and Leominster.

The infrastructural importance of this Interchange coupled with its perceived design and safety flaws demonstrate a necessity for development of a revised interchange design.

2 - Background

2.1 - Site Background

This project deals with the Interstate 190 – State Route 140 interchange located in Sterling, Massachusetts. Figure 1 shows a bird's eye view of this interchange. The interchange is a grade-separated diamond interchange with the off ramps from I-190 intersecting with Route 140 at stop-controlled intersections, with channelized yield-controlled lanes for right turns. At these intersections, left turn movements must cross three travel lanes of Route 140. There is also a large concrete island median separating southbound and westbound traffic on Route 140. The existing foundations supporting both Interstate 190 roadways appear to be situated upon offsite structural material.

FIGURE 1. BIRD'S EYE VIEW OF THE INTERCHANGE

The number of lanes and width of the concrete island increase the travel-time across the intersection for vehicles turning left onto Route 140 as well as for vehicles making left turns onto the ramps. In addition, the sight distances on some of the ramps are inadequate. The sightlines at the end of the southbound exit ramp looking south are limited by the side slope of I-190 and vegetation, as well as a large sign. In addition, the side slope and vegetation on the north side of the ramp obscures the view of the bottom of the ramp, blocking the view of cars stopped at the end of the ramp from cars traveling down the ramp.

FIGURE 2. SPLITTER ISLAND AT I-190 SB OFF RAMP

2.2 - Interchanges

Interchanges and grade separations occur when two or more roadways cross at different levels. This eliminates crossing conflicts and improves the intersection's efficiency. Interchanges provide a connection through a series of ramps to the grade

separated roadways. In deciding whether to use a grade separated interchange at an intersection, multiple factors must be considered. These factors are referred to as warrants and listed below: (MassDOT, 2006)

- Design Designation – Once it is decided to develop a route as a limited-access freeway, designers must decide whether intersecting highways will be terminated, rerouted, or provided with a grade separation or interchange, with traffic flow on the freeway being the chief concern.
- Safety – The crash reduction benefit may warrant an interchange selection at a dangerous at-grade intersection.
- Congestion – An interchange may be chosen when an at-grade intersection cannot provide the desired Level-of-Service.
- Site Topography – At certain locations a grade-separated intersection may be more feasible than an at-grade intersection due to topographical concerns.
- Traffic Volume – Interchanges are desirable at cross streets with heavy traffic volumes to eliminate conflict and improve traffic flow.
- Road-User Benefit – Efficiently designed interchanges reduce travel time and cost. The road- user benefits may outweigh the cost over the life of the interchange.

There are two types of freeway interchanges; system interchanges and service interchanges. A system interchange connects a freeway to a freeway, while a service interchange connects a freeway to a lesser facility. The existing service interchange at the Sterling design site is a diamond interchange. Diamond interchanges use one-way diagonal ramps in each quadrant with two at grade intersections provided on the minor road. The preferred design is to elevate the minor roadway over the major roadway to aid in acceleration to freeway speed and deceleration to minor road speeds. The advantages to using such an interchange are as follows:

- Continuity of pedestrian and bicycle accommodations on the minor road are easier to maintain since merging and diverging movements can be avoided.
- Relatively little right-of-way is required.
- The configuration allows modifications to provide greater ramp capacity if needed in the future.
- Their common usage has resulted in a high degree of driver familiarity.
- All traffic can enter and exit the freeway mainline at relatively high speeds and all exits are made prior to reaching the structure.
- Adequate sight distances can usually be provided and traffic maneuvers are normally uncomplicated.

The primary disadvantages of a diamond interchange are the potential operational problems with the two closely spaced intersections on the minor road and the potential for wrong-way entry onto the ramps. For this reason a median is usually provided to help with channelization.

2.3 - Roundabouts

Roundabouts are circular intersections with specific design and traffic control features. The main features of an interchange are shown in Figure 3. These features include yield control of all entering traffic, channelized approaches, and appropriate geometric curvature to ensure that travel speeds on the circulatory roadway are typically less than 30 mph. The key features of a roundabout, as defined by *Roundabouts: an Informational Guide,* are as follows: (US Department of Transportation)

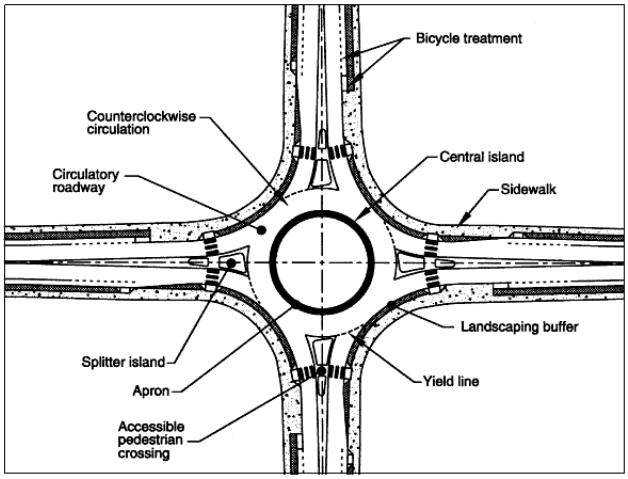


FIGURE 3. FEATURES OF A ROUNDABOUT

- "Central Island - The central island is the raised area in the center of a roundabout around which traffic circulates.
- Splitter Island - A splitter island is a raised or painted area on an approach used to separate entering from exiting traffic, deflect and slow entering traffic, and provide storage space for pedestrians crossing the road in two stages.
- Circulatory roadway - The circulatory roadway is the curved path used by vehicles to travel in a counterclockwise fashion around the central island
- Apron - If required on smaller roundabouts to accommodate the wheel tracking of large vehicles, an apron is the mountable portion of the central island adjacent to the circulatory roadway.
- Yield line - A yield line is a pavement marking used to mark the point of entry from an approach into the circulatory roadway and is generally marked along the inscribed circle. Entering vehicles must yield to any circulating traffic coming from the left before crossing this line into the circulatory roadway.
- Accessible pedestrian crossings - Accessible pedestrian crossings should be provided at all roundabouts. The crossing location is set back from the yield line, and the splitter island is cut to allow pedestrians, wheelchairs, strollers, and bicycles to pass through.

- Bicycle treatments - Bicycle treatments at roundabouts provide bicyclists the option of traveling through the roundabout either as a vehicle or as a pedestrian, depending on the bicyclist's level of comfort.
- Landscaping buffer - Landscaping buffers are provided at most roundabouts to separate vehicular and pedestrian traffic and to encourage pedestrians to cross only at the designated crossing locations. Landscaping buffers can also significantly improve the aesthetics of the intersection."

2.4 - Transportation Engineering Aspects of Interchange Design

Data used to evaluate interchanges include Traffic Counts, Turning Movement Counts, Crash Data, and Level-of-Service (LOS) Analysis. Traffic counts provide valuable information about how many vehicles use an intersection and allow a determination of peak traffic flow for the intersection. Automatic Traffic Recorder (ATR) boxes use pneumatic tubes to record information about vehicles traveling by. They can be configured to record volume, speed, or vehicle class. Traffic counts allow for the calculation of ADT (Average Daily Traffic). Data from this procedure can be adjusted using seasonal adjustment factors developed by MassDOT to determine the AADT (Average Annual Daily Traffic). AADT and the vehicle classification can be used as input loading parameters for pavement design.

FIGURE 4. ATR BOX AND TUBES

Turning Movement Counts record the number of vehicles taking each available route through the intersection. The number of heavy vehicles (trucks, buses, etc.) traveling through the intersection is also recorded. This technique of data collection is typically conducted during peak travel times and is used to calculate Level-of-Service.

Crash data helps to identify the causes of crashes and to identify the root problems associated with them. By analyzing trends in where and how crashes occur, specific problem areas of a roadway, intersection, or interchange can be identified. The crash rate can be calculated and compared to state or regional averages.

Level-of-Service (LOS) Analysis uses data to determine whether or not the current control measures and lane configurations are appropriate and provide models to adjust them accordingly in the new design. The LOS is an indicator of operating conditions at intersections or road segments, and is defined by six levels ("A" through "F") as per the 2000 edition of the *Highway Capacity Manual*.

2.5 - Traffic Signal Warrant

To determine if signalization of an intersection is warranted, a traffic signal warrant analysis is typically performed. This consists of checking to see if the intersection meets various criteria which would indicate the need for signalized traffic controls. The criteria that must be met as outlined in chapter 6 of the Massachusetts Highway Department Project Development and Design Guide are as follows: (MassDOT, 2006)

- "Warrant 1: 8-hour vehicular volume - met by 500 to 600 vehicles per hour on the major street (both directions, two-four lanes respectively) and 150-200

vehicles on the minor street (major direction, one-two lanes respectively), for any combination of 8 hours daily. A variation ("interruption of continuous traffic") warrant is met with 750 to 900 vehicles hourly on major street (two-four lanes, both directions), and 75 to 100 vehicles hourly (major direction, one-two lanes), on the minor street. These volumes can be reduced under certain circumstances (see Part 4 of the MUTCD for details).

- Warrant 2: four-hour vehicular volume - met on two-lane streets when the volume approaching the intersection on both major street approaches combined plus the higher of the minor street approaches is around 900 vehicles hourly, for four hours daily.
- Warrant 3: peak hour - met on two-lane streets when the volume approaching the intersection on both major street approaches combined plus the higher of the minor street approaches is around 1,200 vehicles in a single peak hour.
- Warrant 4: pedestrian volume - met with intersection or mid-block pedestrian crossing volumes of at least 100 for each of four hours, or 190 during any one hour, in combination with fewer than 60 hourly gaps of adequate length to allow pedestrian crossing when the volume criteria are satisfied.
- Warrant 5: school crossing - met with a minimum of 20 students crossing in the highest crossing hour, and less than one acceptable gap in the traffic stream per minute during the highest crossing hour. Engineering judgment and attention to other remedies (such as crossing guards, improved signage, and crossing islands) are strongly recommended.
- Warrant 6: coordinated traffic signal system - where existing traffic signal spacing does not provide the necessary degree of platooning (grouping) of traffic, as needed to provide a progressive operation.
- Warrant 7: crash experience - met when crash data indicates a problem remediable by traffic signal installation.
- Warrant 8: roadway network - met when the street has importance as a principal roadway network or is designated as a major route on an official plan, as defined

by the Massachusetts Highway Department project Development and Design Guide."

2.6 - Structural and Geotechnical Engineering Aspect of Interchange Design

Given the large size and infrastructural importance of highways, evaluating the strength of supporting members, and associated foundations is a paramount aspect of interchange design. Furthermore, the existing conditions of an area where an interchange is to be placed can factor significantly into the design process. The geological conditions and soil profile of a site will often dictate different aspects of the roadway's design criteria

Another important geotechnical aspect of highway design is pavement design. Pavement is a critical part of the functionality of an intersection or interchange. Pavement in poor condition can damage vehicles and cause crashes. More than 30% of traffic fatalities in Massachusetts have reportedly been attributed to poor road conditions (Mallick and El-Korchi, 2008). A pavement must remain adequately strong and durable for the duration of its design life.

Pavement can refer to either a rigid pavement made of concrete or a flexible pavement made with asphalt concrete. Typically, flexible pavements are better suited for cold weather climates because they are less susceptible to freeze-thaw damage. In warmer areas, rigid pavements may be favored.

Flexible Pavement usually consists of a number of layers of different materials designed to protect the underlying soil from the forces of the passing vehicles. A typical asphalt pavement cross-section is shown below in Figure 5. From bottom to top, the first layer is the subgrade, which is the term used for the natural ground soil. Often, the subgrade is

compacted to give it a higher resistance to the stresses imposed on it by vehicles. The next layer is typically the subbase, which consists of gravel or crushed stone. A subbase layer is not always necessary and is sometimes omitted. Typically, a subbase is not necessary if the existing subgrade is very strong or the pavement will not need to sustain a large load. Next is the base, which typically consists of gravel or crushed stone of a higher quality than that of the subbase. Finally, the top layer is the asphalt concrete, which is the surface layer. This layer is made up of an asphalt concrete, which is made from asphalt binder mixed with aggregates and other additives. The mixing is usually done at high temperatures to make the mixture less viscous and easier to work with. After placement, the Hot Mix Asphalt (HMA) cools and hardens.

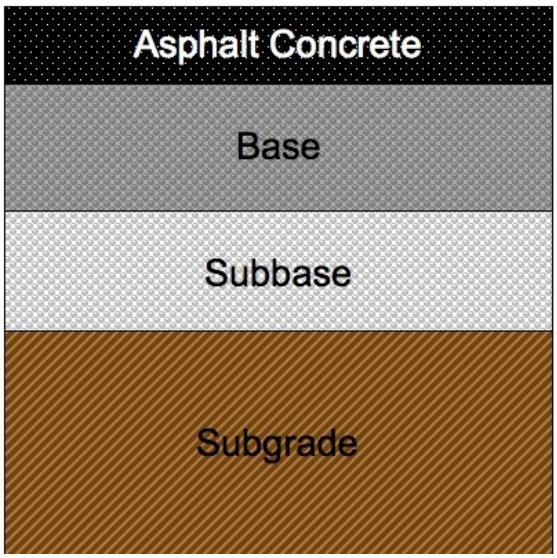


FIGURE 5. TYPICAL PAVEMENT CROSS SECTION

The thicknesses of each of the layer will depend on the conditions of each specific project, such as traffic level, materials properties, local environmental conditions, etc. The pavement must be designed to withstand the stresses from the traffic traveling on it, but it is uneconomical to over-design the pavement because the materials, particularly HMA, can be quite costly.

The makeup of a pavement cross-section can be determined using a variety of methods. A typical method is the AASHTO Method, which uses the empirical flexible pavement design equation shown in the Methodology. The equation takes into account the Equivalent Single Axle Load (ESAL) value. This represents the total loading of vehicles over the design life of the pavement. The structural number of a pavement represents the thickness and strengths of various layers, and is taken into account by the equation. The equation also accounts for reliability of future predictions for traffic data and for the gradual deterioration of pavement over time.

2.7 - Massachusetts DOT Project Need Form

The Massachusetts Department of Transportation (MassDOT) consists of four divisions: Highway, Transit, Aeronautics, and Registry of Motor Vehicles. The Highway Division oversees the roadways, bridges, and tunnels of the commonwealth and is divided into five districts. This project falls under the jurisdiction of the Highway Division District 3 office, which generally oversees the highways and bridges in central Massachusetts.

Projects that are performed in conjunction with Massachusetts DOT have a pair of forms that are filled out to determine the necessity, magnitude and details of a specific transportation project. The first form, which will be completed as part of this project, is the Project Need Form.

The Massachusetts DOT Project Need Form is a form that assesses the necessity of redesign. It requires both a description of an alternate design, and an evaluation of numerous existing site conditions. Mobility within a specific area, safety concerns, environmental impact, and economic development are all addressed in separate sections within the form.

The Project Need Form is a basic evaluation of a specific project. Upon the completion

of this form, it will be decided whether or not the project will progress to the next step. The next step in the project is the completion of another form, the Project Initiation Form. This form is a much more in-depth look at many of the same aspects of the Project Need Form. The initiation form includes specifics on proposed designs, cost estimates, sources of funding and other data.

From here a proposed project is a candidate for federal funding and project initiation form is submitted to the district office, usually a Metropolitan Planning Organization such as Montachusett Regional Planning Commission. In the case of Massachusetts, the forms are then sent to MassDOT Highway's Project Review Committee to review, evaluate and discuss the project and decide whether or not to proceed. Metropolitan Planning Organizations are federally funded and regulated transportation policy makers designed to manage urbanized areas. They coordinate communication between the local government, transportation authorities and the citizens of their district. Approved project at this point are ready to be designed and implemented.

3 - Methodology

Figure 6 displays the six stages of this project, their order of execution, and a brief outline of what each step entails. The squares display these major stages and their related tasks. The arrows indicate the tasks necessary to transition between the stages, and the progression of the project. The remainder of this section gives a more in-depth look at how the project was performed, with emphasis on the specific tasks performed in each stage of the project.

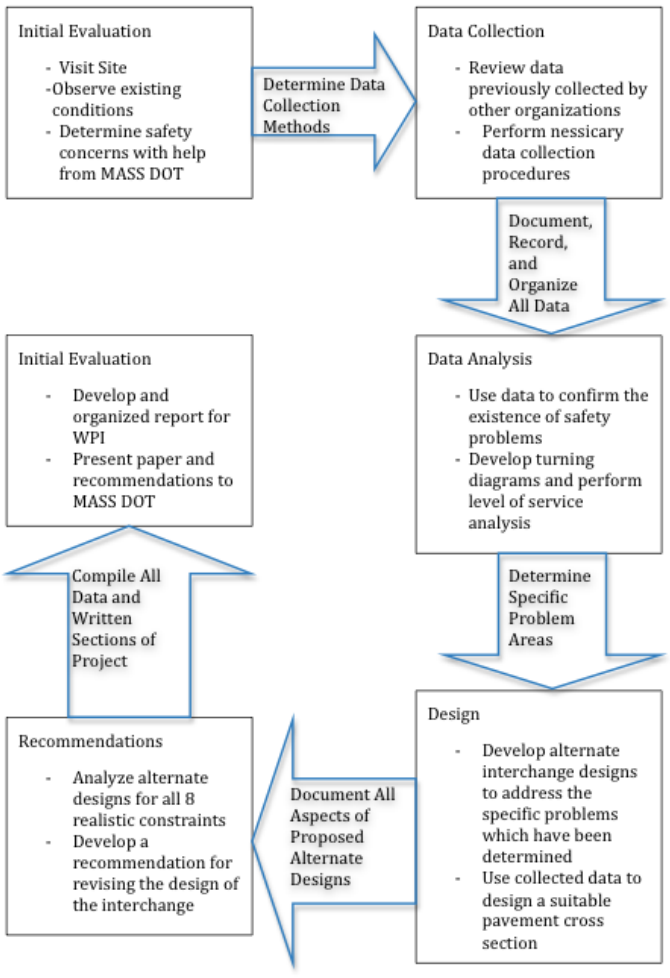


FIGURE 6. SCOPE OF WORK DIAGRAM

The first stage of this project is an initial evaluation of the existing Interstate 190 Route 140 interchange. This evaluation was performed in two different ways. First, the project group visited the site, and looked for any elements of the existing interchange that could present a danger to vehicles or pedestrians. In addition, the group photographed the existing site conditions. The next step in evaluating the current interchange design involved contacting with Mr. Joe Frawley of MassDOT. MassDOT's existing safety concerns with the interchange were then reviewed. After all safety concerns were reviewed, the group determined what data needed to be collected on the site. Mr. Joe Frawley's input regarding the necessity of different data collection activities also contributed to these decisions.

Once the data collection methods were decided, the second stage of the project began. This phase involved the collection of data from the site, as well as a review of previously collected data. First, a request was put in for crash data from the Interstate 190 Route 140 interchange. In addition, the group (under guidance of Mr. Joe Frawley and the advising professors) collected 24-hour ATR counts as well as manual turning movement counts from the interchange and resulting intersections. Please note that traffic counts were only preformed on Route 140, and that the only data obtained regarding I-190 is on-ramp and off-ramp traffic counts. Traffic data collected by the group was supplemented by previously collected traffic data, which was obtained by the group. The group measured the sight distance on the Interstate 190 off-ramps.

The third stage of the project commenced when all necessary data had been obtained. Once this has occurred, the project group analyzed the data. As part of the analysis, the group compiled collision diagrams pertaining to the interchange and determined its crash rate. By evaluating the interchange's crash data, the group was able to determine which areas of the interchange are the most problematic. The group also analyzed the existing and future capacities of the intersection based upon the data collected from

Route-140 and the I-190 ramps.

This traffic data was reviewed and the existing pavement design examined. After determining whether a pavement redesign is necessary, traffic data, local climate conditions, the extents of the roadways and known mechanical properties of pavement materials were used to determine the required structural specifications of the proposed new pavement. These specifications were then analyzed to develop the design of an appropriate pavement

The design and analysis of revised interchange designs composed the fourth stage of the project. The design process began by reviewing the interchange problems determined from data analysis. Alternate interchange designs were conceptually developed with special attention to these specific problems. MassDOT was contacted during the design process and their input was also considered. Many different realistic constraints were addressed in the process of designing alternate interchanges. The specific design procedures varied between the different designs, but structural, geotechnical, and traffic engineering elements were the main focus of this project. All designs were performed in accordance with the Mass Highway Department Project Development and Design Guide. (Massachusetts Highway Department: Project Development and Design Guide 2006)

Once all alternate interchange designs were completed, the project group evaluated the designs. The designs were analyzed using the evaluation criteria used by the Montachusett Metropolitan Planning Organization, who have voting rights over federally funded transportation projects such as this. The criteria used are shown below in Table 1.

TABLE 1. EVALUATION CRITERIA FOR MAJOR HIGHWAY, ARTERIAL, AND INTERSECTION IMPROVEMENTS

Condition and Service Quality	Magnitude of pavement condition improvement	Magnitude of improvement of other infrastructure elements			
Mobility	Effect on magnitude and duration of congestion	Effect on travel time and connectivity/access	Effect on other modes using facility	Effect on regional and local traffic	
Safety and Security	Effect on crash rate compared to state average	Effect on bicycle and pedestrian saftey			
Cost Effectiveness	Cost Unit Change in condition	Cost per Linear Mile	Cost per AADT		
Community Effects and Support	Residential effects: right-of way, noise, aesthetics, cutthrough traffic, other	Effect on serive to minority or low-income neighborhoods	Other impacts/benefits to minority or low-income neighborhoods	Public, local government, legislative, and regional support	Effect on development and redevelopment of housing stock
Land Use and Economic Development	Business effects: right-of-way, access, noise, traffic, parking, freight access, other				
Environmental Effects	Air Quality/ Climate Effects	Water quality/ supply effects	Historic and cultural resources effects	Effect on wildlife habitat and endangered species	

The evaluation process was conducted by using a Montachusett Regional Planning Committee TIP form. This form used a rating system of 1-5 which was used to individually evaluate the different interchange aspects shown above. The scores from the different evaluation criteria were added, and thus the improvements of the group's interchange redesigns were compared to one another.

After these constraints were considered, the group began the fifth stage of the project and presented a recommendation based on the analysis. The group prepared a report analyzing the different design constraints and the resulting design recommendation.

The final stage of this project involved the compilation of all data, figures, tables, and all written sections. The group presented the findings of this project in an organized report, which was reviewed by the advising professors before final submission

This project included the completion of a Mass DOT Project Need Form that states the evaluation of existing site conditions, and displays the findings of the project group's proposed interchange design. Although a Project Initiation Form was not completed as part of this project, an evaluation of the Project Need Form may warrant further analysis of the revised design, and a Project Initiation Form may be completed at a later time.

The following section discusses the specific methods used to collect data for this project. Each section expands upon a previously discussed procedure and discusses how the project group used known methods to assess the existing conditions of the project site.

3.1 - Site Visits

The following is a list of site visits, and the various tasks performed on each day:

09/19/2011 – **Initial Site Visit**: This was an initial evaluation of the site. The group aimed to document the existing conditions of the interchange, photograph the intersections, and examine existing safety concerns.

11/09/2011 – **Turning Movement Counts**: The group visited the site twice on this day in order to perform manual turning movement counts. The group decided to perform counts during the AM and PM peak traffic hours

12/14/2011 – **Installation of JAMAR Boxes**: The group arranged for a Sterling Police Officer to be present so that the group could install JAMAR boxes.

12/16/2011 – **Removal of JAMAR Boxes**: The group planned to remove the JAMAR boxes which had been previously installed.

3.2 - Turning Movement Count

Data was collected for the Turning Movement Counts using two Jamar Technologies, Inc. DB-100 Intersection Counters. The data collection occurred on Wednesday, November 9, 2011 during morning and evening peak hours. The morning data was collected between the hours of 6am and 8am; the evening was collected between the hours of 4pm and 6pm. During each data collection period, one intersection counter box was operated at the intersection of Route 140 and the I-190 Northbound ramps, and one box was operated at the intersection of Route 140 and the I-190 Southbound ramps. The boxes were operated under standard procedure, with one button being pressed for each vehicle completing a given turning movement. After the data was

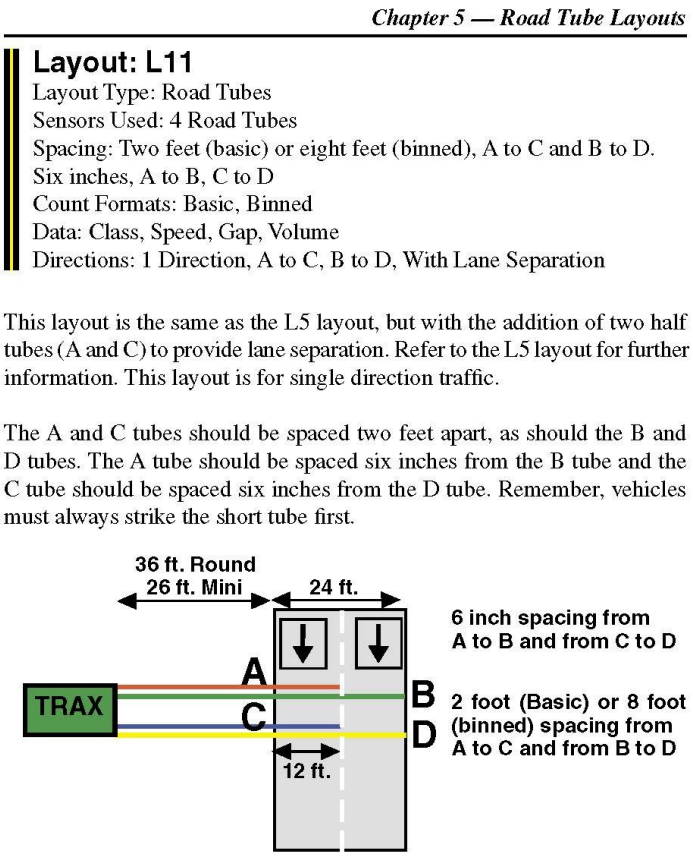
collected, it was downloaded to a Microsoft Excel spreadsheet for analysis. The Peak Hour Factor was calculated using the following formula:

$$Peak\ Hour\ Factor\ (PHF) = \frac{Peak\ Hour\ Volume}{4 * Peak\ 15 - minute\ Volume}$$

EQUATION 1: PEAK HOUR FACTOR (PHF)

3.3 - ATR Traffic Count with Speed and Weight Classification

For speed and heavy vehicle data two Jamar Automatic Traffic Recorder (ATR) boxes were installed on-site. Both boxes were installed with tube configuration L-11 across two lanes of traffic, as shown below in an excerpt from the JAMAR Trax Plus User Manual. The L-11 configuration is shown in Figure 7.



Chapter 5 — Road Tube Layouts

Layout: L11
Layout Type: Road Tubes
Sensors Used: 4 Road Tubes
Spacing: Two feet (basic) or eight feet (binned), A to C and B to D.
Six inches, A to B, C to D
Count Formats: Basic, Binned
Data: Class, Speed, Gap, Volume
Directions: 1 Direction, A to C, B to D, With Lane Separation

This layout is the same as the L5 layout, but with the addition of two half tubes (A and C) to provide lane separation. Refer to the L5 layout for further information. This layout is for single direction traffic.

The A and C tubes should be spaced two feet apart, as should the B and D tubes. The A tube should be spaced six inches from the B tube and the C tube should be spaced six inches from the D tube. Remember, vehicles must always strike the short tube first.

FIGURE 7. EXCERPT FROM JAMAR TRAX PLUS USER MANUAL

One ATR box was installed on the Rt. 140 Northbound lanes and the other on the Rt. 140 Southbound lanes. On each side of the road, four tubes were laid across Rt. 140 in the segment that passes below the I-190 overpass. The ATR boxes were installed on Wednesday December 14th and picked up on Friday the 16th. The layout used (L11) counts the volume of traffic as well as the speed and weight classification of each vehicle that passes over each lane. The data from the boxes were exported from the devices to a computer as excel files. A 24-hour period of data from the count boxes was scaled using the monthly adjustment factors according to Massachusetts Highway Department to determine the Annual Average Daily Traffic (AADT). Photos from the installation of the boxes can be viewed in Figures 8 and 9.

FIGURE 8. INSTALLING ATR TUBES

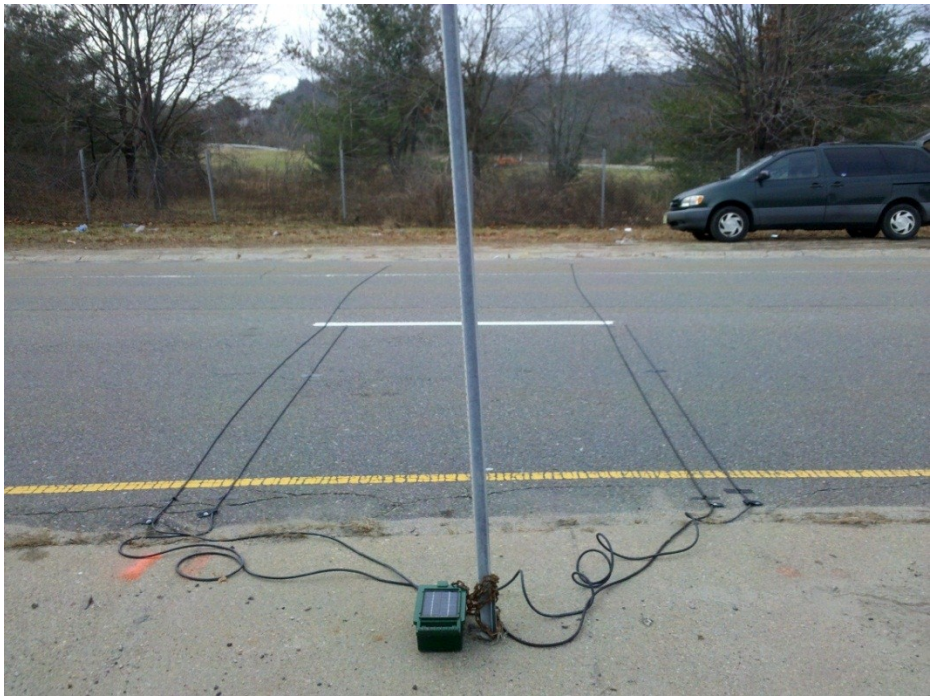


FIGURE 9. INSTALLED TUBES ON ROUTE 140 SB

The weight classification data recovered from the ATR boxes was used to determine the Equivalent Single Axle Load (ESAL) for pavement design. The procedure for determining the ESAL value can be viewed in the next section.

Data for speed was placed into several categories or bins based upon predetermined values. For example, a vehicle traveling at 18.5 mph would be recorded as one vehicle in the 16-20 mph bin. The speed data was analyzed using the average speed of each bin and the number of vehicles in each bin. Using this data, the average speed was calculated along with the standard deviation. In addition, the 85th percentile speed was determined, which is the speed below which 85% of drivers are traveling. This is typically used as a benchmark for speed limits. The average speed was calculated using the following formula, where the average speed of each bin is halfway between the top speed and bottom limits of the bin.

$$Average\ Speed = \frac{\sum_i \#\ of\ vehicles\ in\ bin_i * average\ speed\ of\ bin_i}{total\ number\ of\ vehicles}$$

EQUATION 2. AVERAGE SPEED FOR BINNED DATA

3.4 - Pavement Design

The design of flexible pavement performed in this report began with using the empirical flexible pavement equation (Equation 3) to determine the required structural number for design.

$$log_{10}(W_{18}) = Z_R \times S_o + 9.36 \times log_{10}(SN+1) - 0.20 + \frac{log_{10}\left(\frac{\Delta PSI}{4.2-1.5}\right)}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 \times log_{10}(M_R) - 8.07$$

EQUATION 3. EMPIRICAL DESIGN EQUATION FOR FLEXIBLE PAVEMENTS (MALIK AND EL KORCHI)

The variables in this equation are defined as follows:

- W_{18}: The predicted number of 18-kip equivalent single axle load applications
- Z_R: Standard Normal Deviate
- S_0: Combined standard error of the traffic prediction and performance prediction
- ΔPSI: Difference between the initial design serviceability index, p0, and the design terminal serviceability index, pt.
- M_R: Resilient modulus (psi)

As discussed above an EASL value was calculated from the ATR box data the group collected. The ESAL value was calculated by totaling the number of vehicles in a 24 hour period that were recoded under each weight classification. The percentage of distribution in each classification was used to adjust the numbers to include vehicles that the machine was unable to classify. For example, if Class 1 had 300 vehicles totaling 20% of the vehicles, and there were 50 unclassified vehicles, the adjusted number would be 300 + (20%*50) = 310. Then, the numbers were adjusted for seasonal variation using the Massachusetts Highway Department Weekday Seasonal Factors (Massachusetts Highway Department, 2007). The value was then scaled for 20 year growth using a linear growth model and an annual growth rate of 2.59% as determined by the MRPC in the Sterling Route 140 Corridor Profile. (MMPO, 2010) The value was also multiplied by 365 days/year and divided by two because of the directional split of traffic. The resulting values for each classification were then multiplied by the ESAL factor for that weight class (FHWA, 1998). The sum of the individual ESAL values represents the total Equivalent Single Axle Load that the road would need to endure over the next 20 years. This value is represented in the empirical equation by the variable W_{18}. The numerical calculations of the ESAL value are available in Appendix G.

The value used for delta PSI was 1.7, a value recommended for flexible highways with low classification. A Z_R value was calculated for a 95% reliability level, and the suggested

value of 0.5 was used for the combined standard of error represented by S_0. All of these recommended values were taken from “Pavement Design” By Malick and El Korchi.

The M_R value used to solve this equation represents the modulus of resilience for the pavement’s sub grade material. Upon consulting existing data available from MassGIS, it was determined that the subsoil existing onsite was either Canton Fine Sandy Loam or Merrimack Fine Sandy Loam (Massachusetts Office of Geographic Information, 2011). Typically, in-situ testing would be used to determine the modulus of resilience for this material; however an inability to perform such tests made it necessary to approximate this value. Instead, the group utilized a soil texture triangle plot to determine a representative material composition. Figure 10 displays the soil texture triangle plot utilized to classify the onsite material.

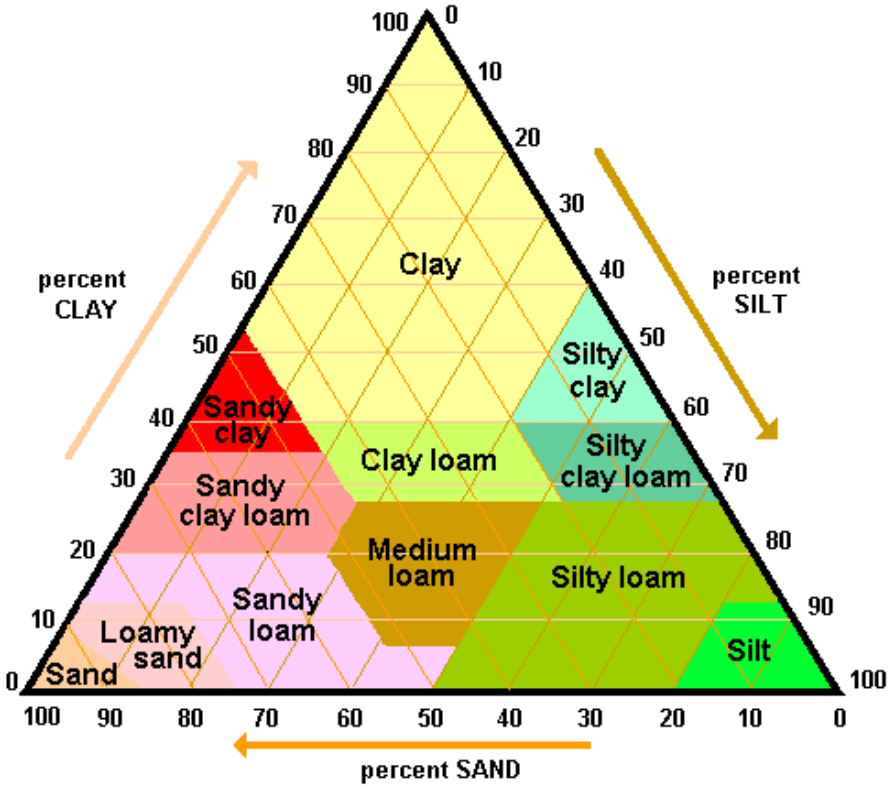


FIGURE 10. SOIL TEXTURE TRIANGLE PLOT

As shown in Figure 10, sandy loam is a soil with a sand composition of 50-75%. In addition, up to 40% silt and 20% clay may compose the existing on-site material. The makeup of this soil suggests high plasticity sand, and therefore the soil was approximated to be silty sand of high plasticity, or MH. (Standard Handbook for Civil Engineers, Third Edition). Referring to an empirical design guide, an approximate value of 6 kips per square inch was used for the modulus of elasticity of the existing sub base. (Guide for Mechanistic-Empirical Design)

Once all necessary variables were determined, the empirical equation for flexible pavement design was utilized, and a structural number was obtained. Using the obtained structural number, Equation 4 was utilized to determine the required thicknesses of the different pavement layers. (Guide for Mechanistic-Empirical Design)

$$SN = a_1 D_1 + a_2 D_2 m_2 + a_3 D_3 m_3$$

$$Structural\ Number\ Determined\ by\ Layer\ Properties$$

EQUATION 4. PAVEMENT REQUIRED THICKNESS

The variables in this equation are defined as follows. (Guide for Mechanistic-Empirical Design):

$$a_i : i^{th}\ layer\ coefficient$$

$$D_i : i^{th}\ layer\ thickness\ (inches)$$

$$m_i : i^{th}\ layer\ drainage\ coefficient$$

The layer coefficient is a value that is based up the elastic moduli of different pavement layer materials. These coefficients are determined based upon extensive stress and strain calculations for a multi-layer pavement. (Guide for Mechanistic-Empirical Design) For typical pavement design, a FWD test would be performed on the existing pavement and alternate pavement materials in order to determine their layer coefficients. Due to an inability to perform such procedures, average layer coefficient values were used for the design of this pavement. The coefficients used were as follows, and were taken from the Guide for Mechanistic-Empirical Design:

$$a_1 = 0.44\ (Asphaltic\ concrete\ surface\ course)$$

$$a_2 = 0.14\ (Crushed\ stone\ base\ course)$$

$$a_3 = 0.11\ (Sandy\ gravel\ subbase)$$

Using the structural number determined using Equation 3, Equation 4 was solved using a spread sheet. The average layer coefficients were input into the equation, and the layer drainage coefficients were assumed to be 1. Using the spreadsheet, different layer thicknesses were examined until a pavement design exhibited a structural number adequate to satisfy the previously determined value.

3.5 - Crash Rate Analysis

To determine if there is a safety issue at an intersection, a crash rate (number of crashes per million entering vehicles) is determined through a process defined by the MassDOT highway division. This number compared to the state average for a specific road classification gives a good idea of the relative safety of the interchange. To calculate the crash rate, the following data is needed:

- Peak hour entering volume for the intersection
- K value of 0.09 calculated from peak hour traffic divided by total traffic.
- Crash data for intersection and time period over which crash information was collected

With this, the average daily traffic can be calculated. The formula given for crash rate by the MassDOT crash rate intersection work sheet is as follows:

$$crash\ \ rate = \frac{crashes\ per\ year * 1{,}000{,}000}{average\ daily\ traffic * 365}$$

EQUATION 5. CRASH RATE CALCULATION

3.6 - Level of Service

The Level-of-Service was determined based on the turning movement counts conducted Wednesday, November 9, 2011. The data was analyzed to determine the peak hour, peak hour factor, and percent heavy vehicles. The data was not adjusted with a monthly adjustment factor in order to produce a more conservative result. The monthly adjustment factor that would have been used is 0.98 (Massachusetts Highway

Department, 2007). The turning movement count data was input into the HCS2000 Highway Capacity Software by McTrans. The data was analyzed for an unsignalized two-way stop-controlled intersection. An analysis was performed for both the intersection with the northbound ramps and the southbound ramps for both the morning and evening peak hours.

3.7 – Conceptual Design Evaluation

Of the possible designs, the scope of the project only allowed the in depth evaluation of a few alternatives. To rule out the designs that were not feasible or were inefficient at dealing with the design problem, each idea was evaluated informally on the expected impact based on the evaluation template. Early designs considered included a reduction in number of lanes, a single point urban interchange, full or partial cloverleaf interchanges, adjustments to lane geometry and channelization, roundabouts, and no change. The designs chosen to be investigated further were a single lane roundabout and a double lane roundabout, along with the option for no change. These alternatives were in line with suggestions provided by Mr. Joe Frawley of MassDOT at the beginning of this study.

3.8 - Roundabout Design

Roundabout design involves trade-offs among safety, operations, and accommodating large vehicles. Some roundabout features are uniform, while others vary depending on the location and size of the roundabout. The design process requires multiple iterations to ensure safety, operational analysis, and layout performance. The design process followed is the one outlined in the Roundabout Design Guide by the US Department of Transportation. Before design can begin, the three main concerns are finding the optimal roundabout size, position, and alignment.

The main constraints in determining the radius of a roundabout are the speed through which vehicles will be able to travel through it along with the turning radii of various types of vehicles, especially emergency vehicles such as fire trucks. By setting the maximum speed that vehicles will be traveling through the roundabout, the appropriate radius for each of the arc paths that vehicles will be traveling can be determined. Entry and exit radii are likewise determined by the speeds that vehicles will be traveling, with a smaller entry radius to decrease speed for vehicles entering the roundabout and a larger exit radius for vehicles traveling out of the roundabout. Design values for other features such as splitter islands and crosswalks are derived from the USDOT Roundabout Design Guide.

3.9 – Design Evaluation

The revised interchange designs were evaluated using a TIP evaluation form. This form took into account transportation criteria and cost as well as community effect and support, land use and economic development and environmental effects. The full descriptions of factors considered are shown in Table 1. The factors the conditions were judged on were Condition, Mobility, Safety, Cost Effectiveness, Community Effects and Support, Land Use and Economic Development, and Environmental Effects. Each factor was rated on a scale of 1 to 5 based on the expected change using the group's judgment.

4 – Results

The following section addresses the specific data obtained from the procedures described in the "Methodology" section. All raw data obtained for this project can be viewed in the appendices of this report.

4.1 - Site Visits

09/19/2011 – **Initial Site Visit**: This was an initial evaluation of the site. The group documented the existing conditions of the interchange, photographed the two intersections, and examined existing safety concerns.

11/09/2011 – **Turning Movement Counts**: The group visited the site twice on this day to perform manual turning movement counts. The group was present on site from 6am to 8 am, and then again from 4pm to 6 pm. Turning movement counts were performed from a car on the shoulder of the road.

12/14/2011 – **Installation of JAMAR Boxes**: The group was on site from 8:20 am to 10:30 am in order to place two JAMAR boxes on Route 140. A Sterling Police Officer was also present to direct traffic around the installation.

12/16/2011 – **Removal of JAMAR Boxes**: The group was on site from 5 pm until 5:35 pm to remove the previously installed boxes. Tubes and nails were removed from the road, and the boxes were brought back so that data could be extracted.

4.2 - Manual Turning Counts

After the data from the Turning Movement Count was downloaded to a computer, turning diagrams were constructed for the two intersections during both the AM and PM Peak hours. The locations of the intersections where these counts were performed can be viewed in Figure 11.

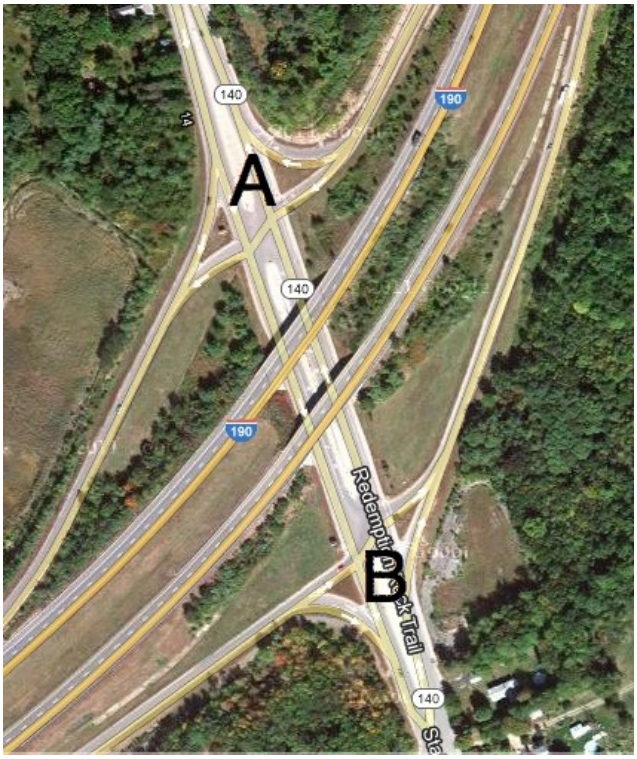


FIGURE 11. LAYOUT OF MANUAL TURNING COUNTS

Total Volumes and Peak Hour Factors are summarized in Table 2. In addition, raw data collected during this Turning Movement Count can be viewed in Appendix B and the turning diagrams themselves can be viewed in Appendix C.

TABLE 2. MANUAL TURNING MOVEMENT COUNT VOLUME RESULTS

Count	Peak Hour	Peak Hour Volume	Peak Hour Factor
A AM	7:00 - 8:00 AM	1583	0.85
B AM	7:00 - 8:00 AM	865	0.94
A PM	4:45 - 5:45 PM	1311	0.89
B PM	5:00 - 6:00 PM	1040	0.87

It is important to note that due to an error, data was not recorded in the AM period for the intersection with the I-190 SB Ramps of the straight through movement from the westbound approach. However, this number was determined by subtracting the total volume for all other movements from the westbound approach from the total westbound exiting volume recorded at the Northbound I-190 Ramp intersection.

Based upon the data collected, important information about the intersection could be ascertained. For example, during the morning peak hour, greater than 75% of the traffic volume entering intersection A comes from Route 140 Southbound. (See Turning Diagram in Appendix C) In addition, the data clearly shows that the total percentage of the turning movements taken up by left turns is significantly higher in intersection with the I-190 NB ramps than in the intersection with the SB ramps, as shown in Table 3.

TABLE 3. MANUAL TURNING COUNT TRENDS

Count	Peak Hour	Peak Hour Volume	Peak Hour Left Turn Volume	Peak Hour Left Turns as %
A, I-190 SB Ramps - AM	7:00am - 8:00am	1583	124	7.83%
B, I-190 NB Ramps - AM	7:00am - 8:00am	865	388	44.86%
A, I-190 SB Ramps - PM	4:45pm - 5:45 pm	1311	129	9.84%
B, I-190 NB Ramps - PM	5:00pm - 6:00pm	1040	414	39.81%

Using the peak hour volume and peak hour factor it was calculated that the average daily traffic for the northern intersection is 17,588 vehicles per day and 11,555 vehicles per day through the southern intersection. Projecting the trends shown from historical data from the area gives a growth factor of 1.33 over twenty years. This gives estimated values of 23,392 ADT for the north intersection and 15,368 ADT for the south.

4.3 - ATR Box Speed Data Analysis

The speed analysis of the data from the ATR box produced the results shown in Table 4:

TABLE 4. SPEED ANALYSIS RESULTS

Direction of Travel on Route 140	Southbound	Northbound
Average Speed	38.25	25.33
Standard Deviation	10.81	12.24
85th Percentile	45	37.5

These results produced a much lower average speed than expected. However, this is likely due to the placement of the tubes in close proximity to the intersections. As a result, and cars turning left onto Route 140 would be traveling slower than the typical travel speed on the road. This hypothesis is supported by the large standard deviation of 10.81 for the southbound lanes and 12.24 for the northbound lanes. These values may also be attributed to the placement of the tubes and the fact that some of the tubes were ripped up during the test period. The raw data obtained from the ATR box counts can be viewed in Appendix D.

4.4 - Traffic Signal Warrant Analysis

Using the signal warrant procedures discussed earlier in this report, the group evaluated the possibility of signalization. The results were as follows:

- Warrant 1: 8-hour vehicular volume
    - The collected traffic count data shows that there were not large enough volumes to consistently reach 600 vehicles on the main road and 150 cross road vehicles for eight consecutive hours. While the intersections have an average volume of 796 vehicles for eight hours, the distribution between the main road and cross road was not enough to satisfy the warrant.
- Warrant 2: four-hour vehicular volume
    - The highest volume period observed by the group was a four hour total volume of 698 vehicles. This does not reach the required hourly volume of 900 vehicles.
- Warrant 3: peak.
    - The peak hour warrant requires a volume of 1200 vehicles. For peak hour, the south intersection actually satisfies the warrant with a volume of 1583 vehicles. The north intersection falls short at around 1040 vehicles however.
- Warrant 4: pedestrian volume
    - No pedestrian traffic was observed during data collection, and the rural nature of the intersection suggests a low volume of pedestrian traffic.
- Warrant 5: school crossing
    - There were no signs of either intersection being used as a school crossing, and there are no schools in the vicinity of the interchange.
- Warrant 6: coordinated traffic signal system

- Due to the fact that there aren't other traffic signals in the area, this warrant is not met.

- Warrant 7: crash experience.
  - Both North and South intersections have crash rates above the state average at .94 and .97 crashes per million entering vehicles respectively. This could possibly be remedied by a traffic control and would meet a warrant.
- Warrant 8: roadway network
  - While I-190 is a major part of the interstate highway system, the interchange itself does not seem to play a critical role as part of an evacuation plan or other prioritized plan.

4.5 - LOS Analysis

The Level-of-Service Analysis was performed using the HCS2000 Highway Capacity Software by McTrans. A LOS of E or F is generally considered unacceptable. The results are shown in the Table 5 below.

TABLE 5. CALCULATED LOS

Intersection	Peak Hour	LOS of Minor Approach
Intersection A – Southbound I-190 Ramps	AM	B
	PM	C
Intersection B – Northbound I-190 Ramps	AM	D
	PM	E

The results of this analysis do not suggest a need for interchange improvements, however they are not consistent with the results of the LOS Analysis found in the MRPC Route 140 Corridor Study, which are summarized in Table 6. The discrepancy is possibly due to a sample size error, as MRPC collected data over a 5 month period.

TABLE 6. LOS FROM MRPC STERLING ROUTE 140 CORRIDOR REPORT

Intersection	Peak Hour	LOS of Minor Approach (Present)	LOS of Minor Approach (20 year projection)
Intersection A – Southbound I-190 Ramps	AM	F	
	PM	E	F
Intersection B – Northbound I-190 Ramps	AM	C	
	PM	F	F

4.6 - Crash Analysis

MassDOT publishes the state and district averages for signalized and unsignalized intersection crash rates. The district average for an unsignalized intersection in District III (Sterling) is .66 crashes per million entering vehicles. The values obtained for the crash rate on the northbound and southbound intersections were both much higher than the state average. Crash rates are displayed bellow in Table 7. The raw crash data obtained from MassDOT can be viewed in Appendix D .

TABLE 7. CRASH RATE ANALYSIS

North Intersection	.94 crashes per million entering vehicles
South Intersection	.97 crashes per million entering vehicles

In the case of the southbound off ramp, many of the crashes were rear end crashes and single vehicle loss of control accidents. This is consistent with the conditions at the intersection, as the southbound off ramp has a sight distance problem as well as having a steeper grade and tighter turning radius off of a short high speed off ramp. The northbound intersection had more angle collisions and injuries than the southbound despite having fewer total accidents. There was also a fatal accident recorded during the period of time reviewed due to a left turn angle collision. The collision diagram for the interchange can be viewed in Figure 12.

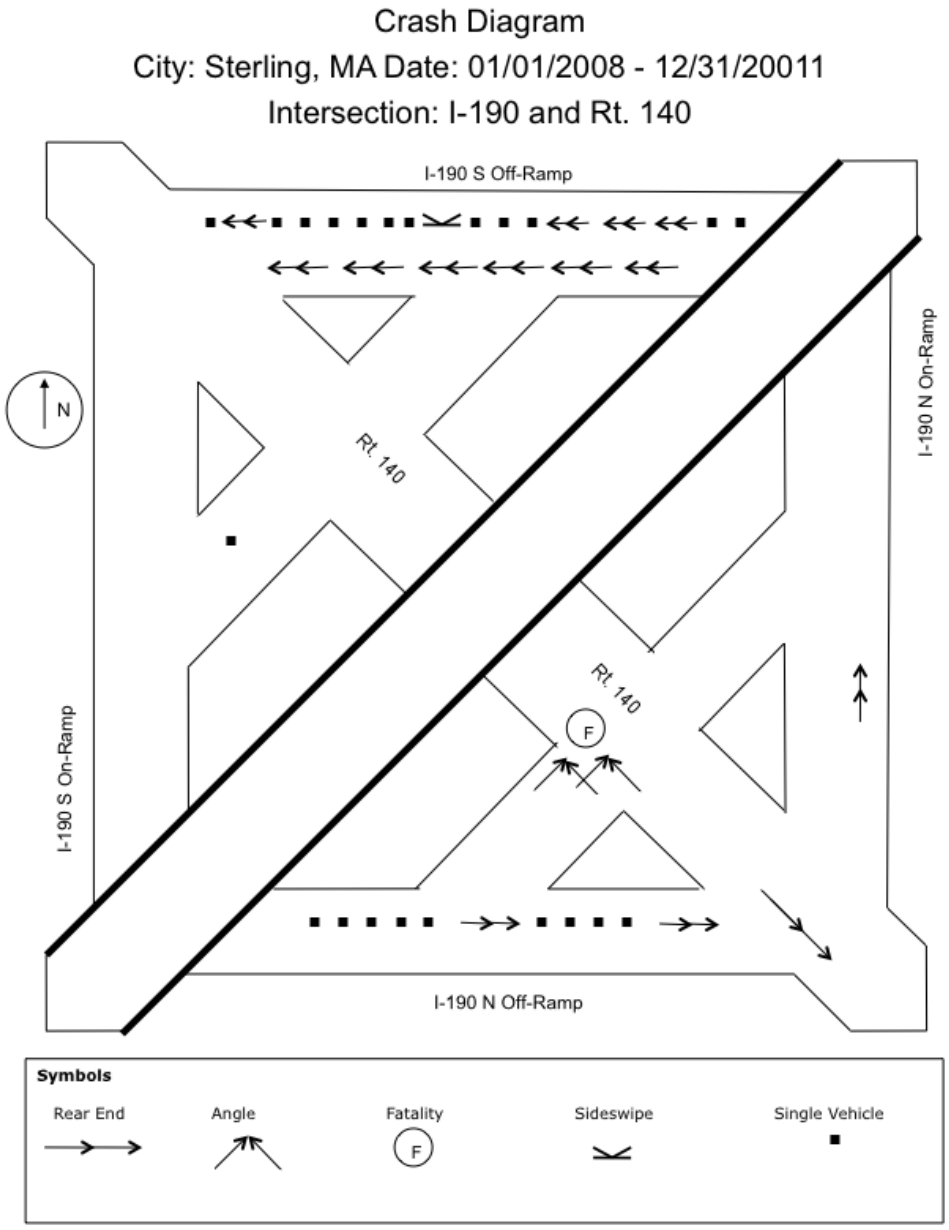


FIGURE 12: COLLISION DIAGRAM

Factors contributing to these high crash rates include both road condition and geometry problems. The amount of single vehicle loss of control accidents that occurred during the winter months is most likely the result of snow condition. The geometry also contributes though, as the high exit speed from the highway combined with sharp bends and stops make it more likely that a vehicle will lose control. The high crash rates do

show that this interchange is a problem and needs to be improved. As the volume of traffic grows, the crash rate is only going to get worse until these problems are addressed.

4.7 - Pavement Design Results

Using the empirical equation for flexible pavement design (Equation 3, Methodology), the required structural number for the pavement design was found to be 4.46. The calculation was performed in a Microsoft excel in 4 different steps. The first step was inputting the design parameters for the empirical equation. All of these parameters were established earlier in this report, and can be viewed below in Table 8.

TABLE 8. DESIGN PARAMETERS

Variable	Value
W_{18}	2,900,243.59
Z_R	-1.65
S_0	0.35
DPSI	1.70
M_R (psi)	6,000.00

The second step of this procedure was calculating the six different terms observed in the empirical equations that were based upon the design parameters. The values calculated for this pavement design can be viewed in Table 9. Please note that this table

displays the values calculated for a structural number of 4.46, the structural number determined by this procedure.

TABLE 9. VALUES CALCULATED FROM PARAMETERS AND STRUCTURAL NUMBER

Log W_{18}	6.4624
Z_r x S_0	-0.5758
9.36 x log10 (SN+1)	6.9001
$\log_{10}(\Delta PSI/(4.2 - 1.5))$	-0.2009
0.4 + 1094/(SN+1)^5.19	0.5633
2.32 x $\log_{10}(M_R)$	8.7653

After these values were calculated, the third step of this procedure began: solving the empirical flexible pavement design equation. The values calculated in the second step of this procedure were input to the equation, and the equation was solved. This calculation can be observed in Equation 6. The value calculated in this step was then compared to the previously calculated value of $\log(W_{18})$, the last remaining component of the empirical design equation. Once again, please note that the value calculated by this equation utilized the correct calculated structural number. Based upon the input of a different structural number, different values were encountered.

$$\log(W_{18}) = Z_r \times S_0 + 9.36 \times log_{10}(SN+1) - 0.2 + \frac{log_{10}\left(\frac{\Delta PSI}{4.2-1.5}\right)}{0.4 + 1094/(SN+1)^{5.19}} + 2.3 \times log_{10}(M_r) - 8.07$$

$$\log(W_{18}) = -0.576 + 6.900 - 0.2 + \frac{-0.201}{0.563} + 8.765 - 8.07$$

$$6.463 \quad \textit{This value is compared to the Log } W_{18} \textit{ value calculated above}$$

$$6.463 = (Approx) \qquad 6.4624$$

EQUATION 6. REQUIRED STRUCTURAL NUMBER FOR PAVEMENT DESIGN

The fourth step of this procedure was a trial and error assessment of the structural number. Varying structural numbers were put into the spreadsheet, and the resulting value calculated from the empirical equation was compared to the log(W_{18}) value. The structural number which produced a value equal to the log(W_{18}) value was determined to be the design structural number.

Once the design structural number was determined, a new spreadsheet was utilized to assess the required thicknesses of each of the pavement layers. Using Equation 3 (methodology), the average layer coefficients established earlier in this report, and drainage coefficients of 1, the required structural number was expressed as a function of the three layer depths. A trial and error procedure was utilized to determine appropriate layer thicknesses that would satisfy the structural number requirements. The existing pavement cross-section displayed in Appendix F was used as a guide for reasonable layer thicknesses in order to start this trial and error process. The table used to calculate these layer thicknesses is shown in Table 10.

TABLE 10. REQUIRED LAYER THICKNESS

Material	A	Thickness	
Asphaltic Concrete Surface Course	0.44	6	$SN = a_1T_1 + a_2T_2 \times 1 + a_3T_3 \times 1$
GP: Crushed Stone Base Course	0.14	2	SN = 4.46
SW: Sandy Gravel Sub Base	0.11	14	

The values calculated in Table 10 completed the pavement cross-section redesign. Lastly a pavement cross-section was drawn in AutoCAD to display the layer materials and the required layer thicknesses of the pavement redesign.

4.8 - Design

The design capacities of the roundabouts that were considered are shown below in Table 11 (US Department of Transportation). These values are based off of a left turn percentage of 40% based on the turning counts.

TABLE 11. DESIGN ALTERNATIVES

Single Lane 33% minor traffic	20,000 – 23,000 AADT
Single Lane 50% minor traffic	24,000 – 26,000 AADT
Double Lane 33% minor traffic	40,000 – 44,000 AADT
Double Lane 50% minor traffic	47,000 – 52,000 AADT

The main design control of the intersection is the desired speed through the roundabout. Approach speed based on the traffic data fits in the 45 mph range for this calculation. Deceleration starts about 325 feet before reaching the entrance of the roundabout according to the procedure. For a rural single lane roundabout a design entry speed of 25 mph is optimal. Since the radius of the fastest path through the intersection is the control for speed, the radius of the three arcs involved in the roundabout determines the speed profile of the intersection. The curvature that would reduce speeds to 25-27 mph is 166'-205', so anywhere in that range would be ideal. The exit curve should be a larger radius than the entrance curve, so a value above 205' would work. The radius around the island is in between these two at 198', giving a speed of around 25 mph through the whole intersection. For a double lane roundabout the design speed is 30 mph, and the entry/exit/island curves are 272-275'/above 272'/333' respectively. In the case of the double lane roundabout a smaller radius is required for the entrance because of spatial constraints of the site, limiting it to 250' and a slightly lower average speed.

The design vehicle for the roundabout is a class WB-20 multi-axle truck. This in turn limits the minimum radius through the roundabout and further precludes the use of a single lane roundabout without modification. To accommodate a WB-20 multi-axle truck, a mountable shoulder is included on the single lane design. Furthermore, the pedestrian and bicycle traffic volume of both intersections is very low. The design includes crosswalks on the legs of the roundabouts and ramps for handicap access.

The alignment of the existing intersections is modified in the new design within the given right of way. The approach to the roundabout will be changed to approach at as close to a right angle as the available space permits. This will be helpful in allowing the roundabout to function as intended, as oblique angle approaches reduce sight distance and have higher design speeds because of reduced deflection.

For a rural single lane roundabout to function at the design entry speed of 25 mph, an inscribed circle diameter of between 115’ and 130’ is desirable. A double lane roundabout would function at between 180’ and 200’. Entry width is the limiting factor for speed, and a range of 14’-16’ is effective for a single lane roundabout (>20’ for double lane). To reach this width from the standard lane width of 12’, a flared road section of 130’ in length is suggested.

The circular roadway width may be up to 120% of the size of the entry width, giving a range of between 12’ and 18’ for a single lane and up to 30’ for a two lane roundabout. The width cannot be too small though, as there should be a minimum of 2’ from the tire edge to the curb while the vehicle is driving in the center of the lane. With the remaining available space, the diameter of the center island is 100’ across on the single lane and between 120’ and 140’ for the double lane. The truck apron for the single lane may be between 3’ and 13’ with a 4% cross slope.

The entry curve radius for the roundabout can increase the capacity up to 65’, past that has little effect. For a single lane roundabout, a radius of between 33’ and 98’ is optimal for a tradeoff between safety and capacity. The radius should be chosen so that travel speed is reduced no more than 12 mph from the speed of the main road. Any greater reduction of speed should be made through curves before the roundabout. The exit curve should have a larger radius than the entrance curve, with a minimum radius of about 50’.

Pedestrian crosswalk designs should be at least 6’ wide and 25’ away from the yield lines (50’ or 75’ for double lane). Splitter Islands should be at least 50’ long with a 10’ wide pedestrian crossing area at street level to accommodate wheelchair access.

The designs shown in Figures 13, 14, 15, and 16 were constructed using AutoCAD Civil 3D. Data collected and values calculated from the Roundabout Informational Guide were used to determine the geometric designs. The values used for design elements are shown in Table 12. Sight distance and alignment information was estimated using Google Earth. Since experience with the software was limited, the designs presented are conceptual. An accurate set of construction plans is beyond the scope of the project.

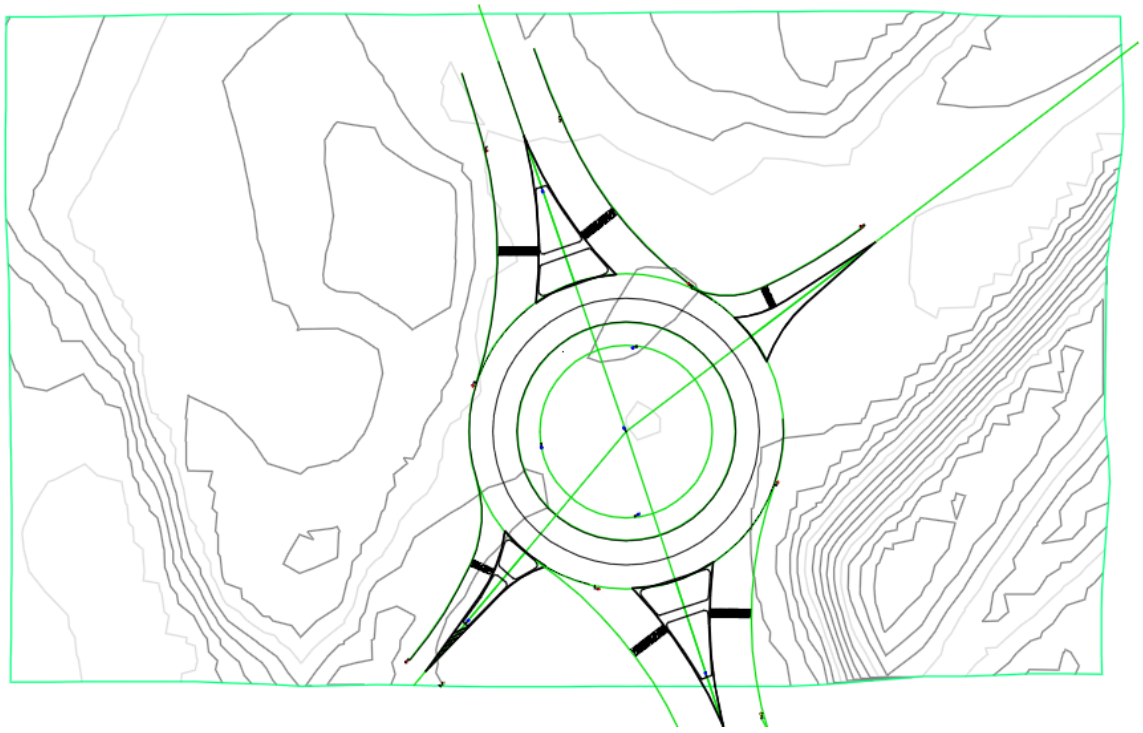


FIGURE 13. NORTH INTERSECTION DOUBLE LANE

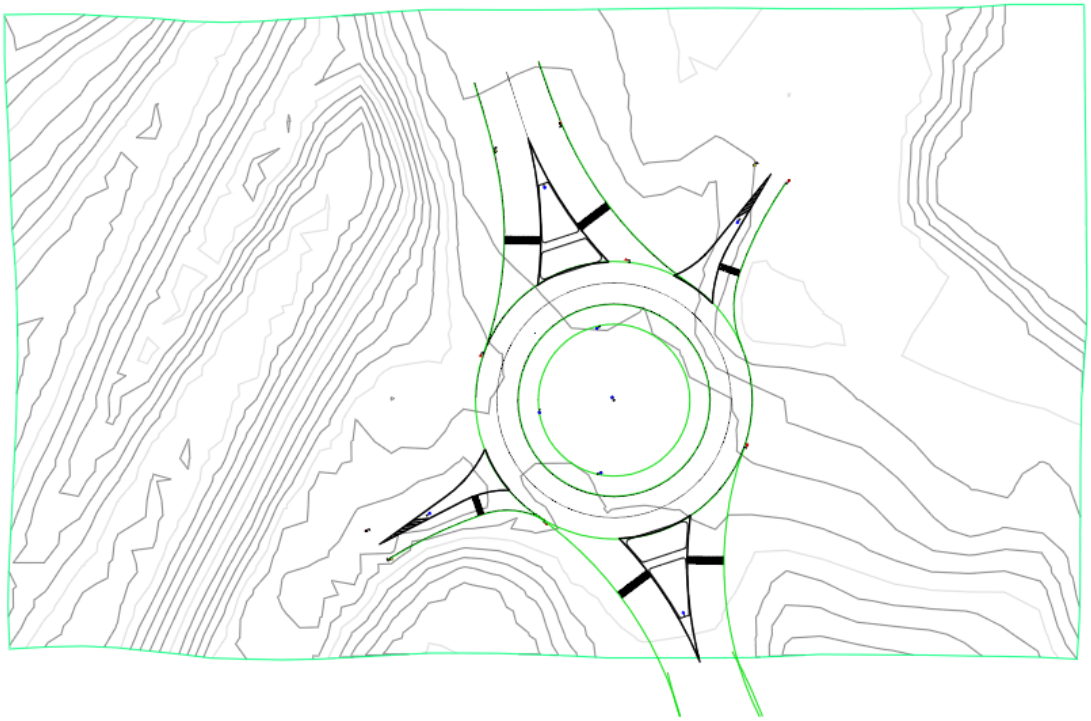


FIGURE 14. SOUTH INTERSECTION DOUBLE LANE

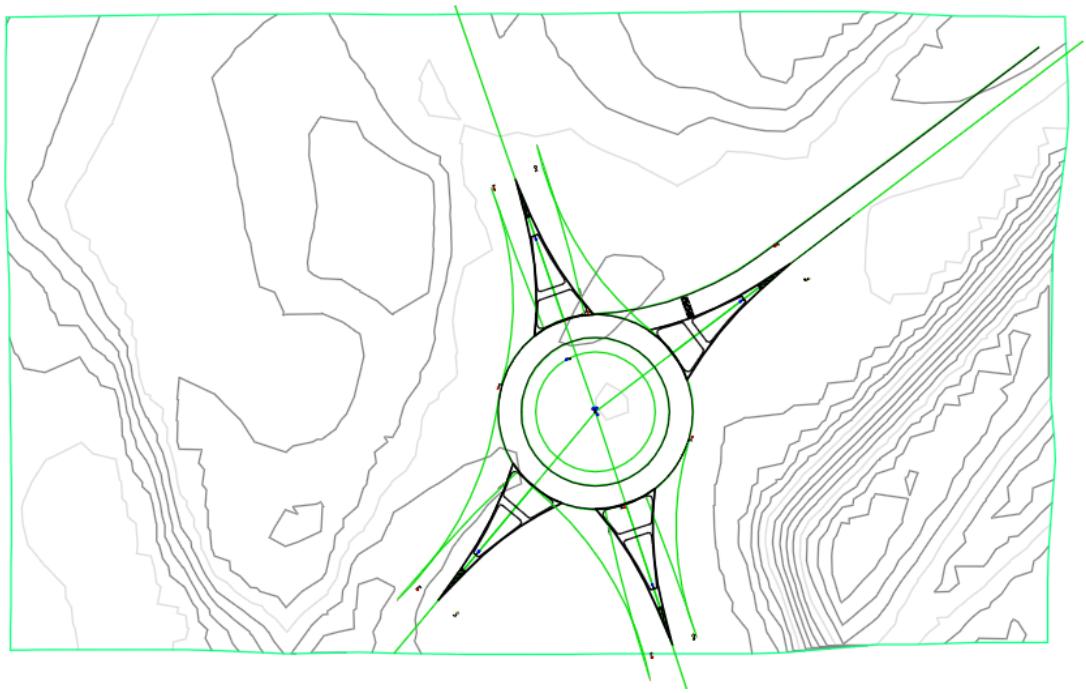


FIGURE 15. NORTH INTERSECTION SINGLE LANE

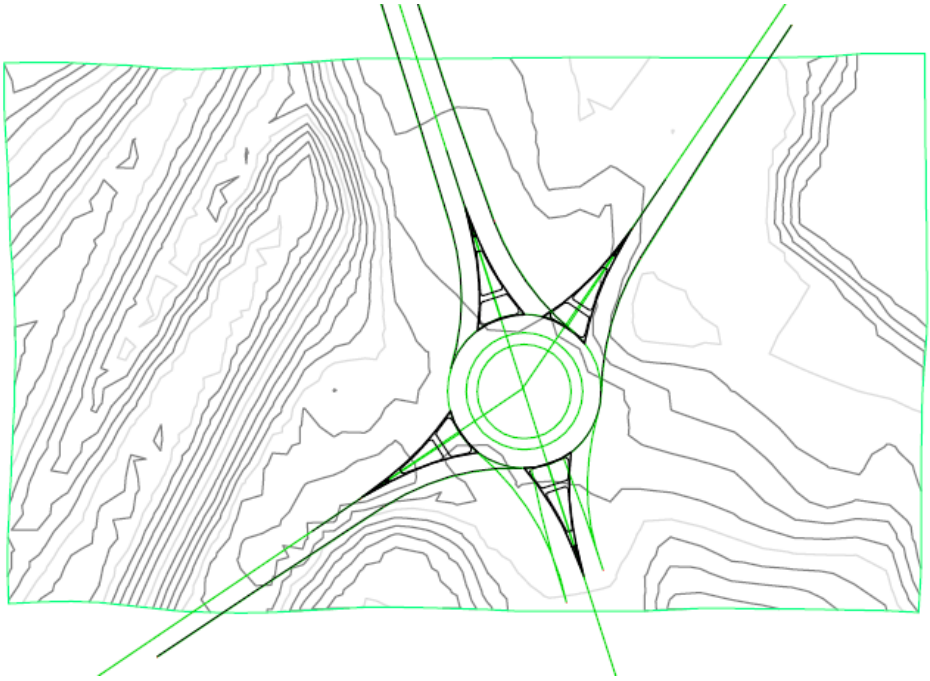


FIGURE 16. SOUTH INTERSECTION SINGLE LANE

TABLE 12. ROUNDABOUT GEOMETRY DESIGN

	Single	Double
Approach Width	14’	26’
Entry Width	15’	30’
Departure Width	14’	26’
Exit Width	18’	30’
Central Island	50’	70’
Circulatory Road Width	15’	30’
Inscribed Circle Diameter	130’	200’
Entry Radius (R1)	205’	250’
Mid Radius (R2)	215’	260’
Exit Radius (R3)	225’	270’
Left Turn Radius (R4)	55’	75’

5 - Design Evaluation

To evaluate the possible designs, the first round of preliminary designs were considered and the best options chosen. These final candidates for further development were drawn out and further considered, and were graded against each other. The first describes the evaluation of preliminary design options, then analyzes and evaluates various conceptual roundabout designs.

5.1 – Preliminary Designs

A number of preliminary design options were considered and evaluated on their expected merits and flaws. Table 13 shows the results of the preliminary design evaluation.

TABLE 13. PRELIMINARY DESIGN EVALUATION

Design	Pros	Cons
Lane Reduction	Greater safety	Lower capacity / Level-of-Service
Single Point Urban Interchange	Less intersections / saves space	Decrease in safety and driver confusion
Full or Partial Cloverleaf	Higher speed and capacity	Cost and space concerns
Lane and Geometry Adjustment	Improvements to safety and capacity	Low magnitude of improvements to cost of change
Roundabout	Increased safety / Level-of-Service	Lower speed and higher cost
No Change	No cost	High crash rate and failing level of service

Lane reduction would be a possible solution to the safety issues found at the interchange. Fewer lanes to cross would mean a lower amount of conflict points, which would significantly impact the crash rate. The problem that would occur with this design is that the reduction in capacity could negatively affect the Level-of-Service of the interchange and adjacent road segments.

At one point in the project the group considered a single point urban interchange, but the confusing layout and the lack of driver familiarity with this kind of interchange ruled out this possibility. Essentially the interchange would be a signalized six way intersection under I-190 consisting of eight lanes of traffic coming from all directions. Since this would not solve the safety issues already present, and most likely would introduce more issues, this design was not considered further.

Since a common design for interchanges is the full or partial cloverleaf, the group evaluated the benefits before ruling it out. The main concern with using a cloverleaf for the interchange re-design was the added cost and the lack of right of way. Since the area around the interchange is already developed, the placement of new road is near impossible without crossing over other property or buildings. The cost of buying the right of way to fit this type of interchange would be extremely expensive given the existing development, so this design was not considered further.

Adjusting the lane geometry and changing channelization was the most reasonable option given the project scope. Changes to the existing geometry could potentially fix sight distance problems and help direct traffic. This design did not seem like it would be able to significantly change the existing level of service though, and would only have a

small effect on the crash rate. The number of conflict points would also remain almost the same. This design was not considered further because of the existence of more effective options.

The option of using a roundabout was considered early in the process, and was suggested by Joseph Frawley of MassDOT to look into. Since roundabouts reduce conflict points and lower entry speeds into intersections, it was expected that crash rates would be reduced. The capacity of roundabouts can be modified by changing the geometry, so it was feasible that a proposed design could be altered to handle the traffic load required. The designs are also space and cost efficient solutions, and are reasonably familiar to drivers.

In order to have a complete evaluation, the option of no change needs to be considered. The existing conditions of the pavement seem sufficient, but further investigation is needed. An estimate of the condition would be that the road needs repair, and since cracks are present the road should probably be resurfaced soon. Data obtained from MRPC as well as the group's findings show failing or near failing Level-of-Service ratings for both intersections. Crash rates are above the state average for this type of interchange.

5.2 - Single Lane Roundabout

The evaluation of the designs considered was rated on a 1 to 5 scale using the group's judgment. The final scores were compared and can be seen in Table 14.

For the condition factor, the single lane roundabout would require complete removal and replacement of the pavement and infrastructure of the route 140 section of the interchange. This would mean brand new pavement and the ability to access and replace the existing base layers if needed. **Rating 5**

The mobility rating takes into account changes to congestion and travel time of the interchange. Since the single lane roundabout would be a vast improvement over the existing conditions in terms of ability to handle volume, it is expected that the level of service would increase to passing levels for many years to come. The capacity of the single lane roundabout is not as high as the double lane roundabout, and travel speeds are lower. **Rating 3**

The safety rating considers the effect improvements would have on crash rate compared to state average and the effect on bicycle and pedestrian traffic. The reduction in conflict points and the reduced travel speed would improve safety for vehicles. Pedestrian and bicycle traffic did not have large volumes based on the data, but would be positively affected by the inclusion of traffic islands and crosswalks. The addition of lighting would also contribute greatly to the safety of the area. **Rating 5**

Cost Effectiveness is the expected additional expenses over the lifetime of the proposed design. Although a roundabout is an expensive option, a drastic change to the interchange would be required eventually because of growth in traffic volume. Of the possible redesigns, a roundabout would be moderately expensive compared to changes in lane configuration or other alternatives. **Rating 3**

The effects of both designs on the community, land use and economic development and the environment are complicated and require more data. While a single lane roundabout would not have as great of an effect on the hydrology of the area, a double lane roundabout could further reduce congestion. The impact on the environmental and social aspects for each design cannot be judged with confidence without further investigation, so these factors were not considered in the grading process.

5.3 - Double Lane Roundabout

As with the single lane roundabout design construction would require the complete removal of the existing pavement. The road conditions would be improved because of new pavement, and access to the existing infrastructure would allow for maintenance. The rating is the same as the single lane design because of this. **Rating 5**

Mobility would be greatly improved with a double lane roundabout. Since the capacity will be more than enough even accounting for twenty years of growth, level of service is expected to be an A. Speed through the intersection is greater than the single lane roundabout design. **Rating 5**

Safety in the case of a double lane roundabout is expected to be better than existing conditions but worse than a single lane roundabout. The increase in conflict points and higher speeds will contribute to a higher crash rate than the single lane roundabout. Also, pedestrian and bicycle traffic would have a greater distance to cross. **Rating 4**

The cost of a double lane roundabout would be substantially higher than for a single lane roundabout. Much wider lanes, bigger diameters and more pavement combined with the potential need for greater right of way mean costs would be very high. **Rating 1**

TABLE 14. DESIGN EVALUATION RESULTS

Design	Condition	Mobility	Safety	Cost	Total
Single Lane Roundabout	**5**	**3**	**5**	**3**	**16**
Double Lane Roundabout	**5**	**5**	**4**	**1**	**15**

6 – Recommendations

The results of the evaluation show that the single lane roundabout is the best option in the group's opinion. The main differences between the single-and double-lane interchanges were the expected cost and the safety improvements. The double-lane roundabout would be more expensive and potentially less safe than the single lane roundabout. The total score of the single lane roundabout over the initial conditions shows that changing the intersection would have significant effects on the quality of the interchange. For these reasons the single lane roundabout redesign is recommended.

Since reconstructing the interchange would require federal funding, the next step to take would be the submittal of the project initiation form. Depending on the priority placed on the interchange and available funds, the project could eventually be approved or rejected. From there, MassDOT would be able to put together a full design of engineered plans and proceed with construction of the interchange.

Works Cited

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APPENDIX A

PROJECT PROPOSAL

MassDOT Highway Interchange Design
I-190 Rt. 140 Interchange
Sterling, MA

Major Qualifying Project Proposal

Benjamin Timms

John Erikson

Patrick Cardone

Advisors

Professor Suzanne LePage

Professor Mingjiang Tao

Oct 10th 2011

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Capstone Design Requirement

To meet the Capstone Design requirement, a project must meet certain engineering and design criteria. This project involves the planning and design of a highway interchange. Our design will identify and fix safety concerns and reduce maintenance on the roadway by improving the geometry and pavement design.

To accomplish this design, we have to investigate many parameters. In engineering the interchange from a transportation perspective, we have to collect relevant traffic counts and crash data to help identify problem areas. Soil conditions at the site as well as traffic data will aid in the design of pavement cross section. In addition, opinions of those in the community are important to our design because if implemented, our design would affect the volume of traffic in the area.

As part of the Capstone Design requirement, our project must address the constraints listed by the American Society of Civil Engineers. Each one will be addressed as follows.

- Engineering Codes and Standards
  - Our design will be done in accordance with the Mass Highway Department Project Development and Design Guide and other applicable design codes.
- Manufacturability
  - The final design of our project will be realistic in terms of expectations of public funding and construction.
- Economic Factors
  - Given that our project would be publicly funded if constructed, our design must be done with what funding is available from the state and federal budget.
- Sustainability
  - The design must be effective over the lifetime of the interchange and take into account the future demands and growth of the roadway.
- Environmental Effects
  - Changes to the interchange can easily effect the environment and drainage properties of the area. This must be taken into account in our design.
- Health and Safety Issues
  - Our design focuses on improving the safety and sight distance.
- Ethical Considerations

Our project must follow ASCE's code of ethics.

Project Overview

This project will identify and attempt to improve upon a problematic highway interchange. A organized and systematic design process will be planned and executed by the project group. The project will involve the consideration of realistic design constraints as alternate interchange designs are created.

The focus of this project will be on the transportation engineering and geotechnical aspects of design. The project team will draft multiple possible designs of the intersection and identify which design we believe to be most effective. The design decision process will be carried out using a decision matrix, which will take into account variables including cost, effectiveness, feasibility, and other realistic constraints of design. Data pertaining to existing site conditions and traffic patterns will be collected and organized in a way that can be useful to MassDOT. The deliverables associated with this project include the following:

Deliverables

1. AutoCAD draft of our design
2. Collision diagram showing crash data
3. Project Need Form for MassDOT
4. Data findings and report for MassDOT
5. Final Presentation to MassDOT
6. MQP report for WPI
7. Poster for WPI Project Presentation Day

Problem Statement

The interchange between Interstate 190 and Route 140 in Sterling Massachusetts has been identified as a problematic design. Many design factors of the interchange have contributed to the perceived safety issues at this site. This project will utilize data collected by the project group and other organizations to perform an analysis and design process with realistic constraints to develop alternate designs of the interchange.

Background

This project deals with the Interstate 190, Route 140 interchange located in Sterling, MA. MassDOT, which is serving as an external project adviser, has identified a number of problems associated with the existing interchange design. The interchange is a grade-separated diamond interchange with the off ramps from I-190 coming to stop-controlled intersections with Route 140. At the points of the stop-controlled intersections, 140 has two travel lanes in addition to a left-turn lane on the near side of Route 140. There is also a large concrete island median separating eastbound and westbound traffic on Route 140. The high number of lanes and wide concrete island increase the travel time across the intersection for vehicles turning left onto Route 140. In addition, the sight distances on some of the ramps do not allow drivers to see if vehicles are stopped at the stop sign.

Interchanges

Interchanges and grade separations occur when two or more roadways cross at different levels. This eliminates crossing conflicts and improves the intersection's efficiency. Interchanges provide a connection through a series of ramps to the grade separated roadways.

In deciding whether to use a grade separated interchange at an intersection, multiple factors must be considered. These factors are referred to as warrants and include:

- **Design Designation** – Once it is decided to develop a route as a freeway, designers must decide whether intersecting highways will be terminated, rerouted, or provided with a grade separation or interchange, with traffic flow on the freeway being the chief concern.
- **Safety** – The crash reduction benefit may warrant an interchanges selection at a dangerous at grade intersection.
- **Congestion** – An interchange may be chosen when an at grade intersection cannot provide the desired level of service.
- **Site Topography** – At certain locations a grade separated intersection may be more feasible than an at grade intersection due to topographical concerns.
- **Traffic Volume –** Interchanges are desirable at cross streets with heavy traffic volume to eliminate conflict and improve traffic flow.
- **Road-User Benefit** – Efficiently designed intersections reduce travel time and cost. The road-user benefits may outweigh the cost over the life of the interchange.

There are two types of freeway interchanges. A system interchange connects a freeway to a freeway, while a service interchange connects a freeway to a lesser facility. The existing interchange at our design site is a diamond interchange. Diamond interchanges use one-way diagonal ramps in each quadrant with two at grade intersections provided on the minor road. The preferred design is to elevate the minor roadway over the major roadway to aid in acceleration to freeway speed and deceleration to minor road speeds. The advantages to using such an intersection are as follows:

1. Continuity of pedestrian and bicycle accommodations on the minor road are easier to maintain since merging and diverging movements can be avoided.
2. Relatively little right of way is required.
3. The configuration allows modifications to provide greater ramp capacity if needed in the future.

4. Their common usage has resulted in a high degree of driver familiarity.
5. All traffic can enter and exit the freeway mainline at relatively high speeds and all exits are made prior to reaching the structure.
6. Adequate sight distances can usually be provided and traffic maneuvers are normally uncomplicated.

The primary disadvantages of a diamond interchange are the potential operational problems with the two closely spaced intersections on the minor road and the potential for wrong way entry onto the ramps. For this reason a median is usually provided to help channelization.

Transportation Engineering

Data that can be used to evaluate the interchange include Traffic Counts, Turning Movement Counts, Crash Data, and Level of Service Analysis.

The Traffic counts will provide valuable information about how many vehicles use the intersection and will allow us to determine peak traffic flow for the intersection. The team will utilize count boxes, which will record 24-hour traffic flow at various locations on the site. ADT (Average Daily Traffic) will be calculates. The data will then be adjusted using adjustment factors developed by MassDOT to determine the AADT (Average Annual Daily Traffic).

Turning Movement counts will be incorporated, where team members will observe the intersection during peak travel times and record the number of vehicles taking each available route through the intersection. This technique of data collection will be applied to both stop-controlled intersections of Route 140 and the I-190 ramps.

Crash data will help us to identify the causes of crashes and to identify the root problems associated with them. We can then incorporate that information into the redesign of the interchange. Crash data will be obtained through the MassDOT crash database and more detailed crash reports will be obtained though the Sterling Police Department.

Level of Service (LOS) Analysis will allow us to determine whether or not the current control measures and lane configurations are appropriate and to adjust them accordingly in the new design. The LOS is an indicator of operating conditions at intersections or road segments, and is defined by six levels ("A" through "F") as per the 2000 edition of the *Highway Capacity Manual*.

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Structural and Geotechnical Engineering

Given the large size and infrastructural importance of highways, evaluating the strength of supporting members, and associated foundations is a paramount aspect of interchange design. Furthermore, the existing conditions of an area where an interchange is to be placed can factor significantly into the design process. The subsoil that will compose the bearing surface for the highway's foundations must be adequate to support the weight applied to it without settling. In addition, the stability of any load bearing soil must be assessed if the foundations or any other element of the interchange are located on a significant slope.

The current interchange of Interstate 190 and Route 140 consists of several large piers that support Interchange 190 in both directions. Revised design of this structure will most likely not involve

the alteration of these existing structural elements, however addition load bearing members may be utilized if required in a revised design. In addition, the existing slope of the area containing the interchange is minimal, so slope stability evaluation and associated aspects of the design may be negligible.

The existing foundations supporting both Interstate 190 roadways appear to be situated upon offsite structural material. If design of additional foundations is to be conducted, an analysis of existing subsoil will need to be conducted. If this analysis reveals that the existing on-site material is unsuitable for use as a structural fill, offsite materials will be considered. Analysis of surrounding conditions may reveal a suitable alternate material.

Another geotechnical aspect of highway design that will need to be addressed is pavement design. Pavement consists of several different layers, which consist of different materials. Pavement design generally involves the determination of the required pavement layer thickness and which material should be used for each of the different layers. In order to perform pavement design, traffic data, climate conditions, and mechanical properties of pavement materials are all required.

For the interchange between Interstate 190 and Route 140, traffic data will be reviewed and the existing pavement design will be examined. If pavement redesign is necessary, traffic data, local climate conditions, the extents of the roadways and known mechanical properties of pavement materials will be used to determine the required structural specifications of the proposed new pavement. These specifications will then be met with the design of an appropriate pavement.

Methodology: Task List Overview

1. **Visit site, determine the problems that need to be addressed.**

    - Contact MASS DOT regarding existing safety issues
    - Determine what data collection will be required for project
    - Make contact with Mr. Joe Frawley

2. **Collect data from the I-190 Rt. 140 interchange**

    - Contact Mr. Joe Frawley regarding necessary data collection
    - Review previously collected crash data
    - Perform 24 hour ATR counts
    - Perform manual turning movement counts
    - Measure the sight distance from the I-190 off-ramps
    - Review previously collected traffic data

3. **Analyze data collected on-site**

    - Determine problem areas
    - Analyze existing/ future intersection capacity
    - Compile collision diagrams
    - Determine accurate traffic flow approximation

4. **Design and Analysis of Alternate Interchange**
    - Develop alternate interchange designs
    - Contact MASS DOT regarding proposed interchange improvements
    - Structural design of revised interchanges
    - Pavement design for road based upon traffic flow approximations
    - Geotechnical design for interchange
    - Analyze all 8 constraints of design
    - Analyze the adequacy of structural members
    - Analyze slope stability and other geotechnical aspects of revised interchanges.
    - Present hypothesis for traffic flow improvements

5. **Recommend a solution based upon analysis of revised interchange designs.**

    - Present strengths and weaknesses of each design
    - Address all 8 realistic constraints of design
    - Recommend a solution
    - Meet with MassDOT to discuss recommendations
    - Write recommendation section

6. **Report findings in an organized report.**
    - Compile data, figures, tables, sources and written sections
    - Complete MassDOT Project Initiation Form
    - Have report draft critiqued by advisers prior to final submission

Scope of Work:

In order to assure the completion of all aspects of a design project, the required tasks of this project have been broken into six different stages. These stages have all been set to a schedule in an attempt to streamline the project's progression. These schedules can be viewed at the end of this report in Table 1 and Table 2.

The first stage of this project is an initial evaluation of the existing Interstate 190 Route 140 interchange. This evaluation will be performed in two different ways. First, the project group will visit the site, and look for any elements of the existing interchange that could present a danger to vehicles or pedestrians. In addition, the group will photograph the existing site conditions.

The next step in evaluating the current interchange design will involve contact with Mr. Joe Frawley of MassDOT. MassDOT's existing safety concerns with the interchange will be reviewed. After all safety concerns have been reviewed, the group will determine what data will be collected on the site. Mr. Joe Frawley's input regarding the necessity of different data collections will also contribute to this decision.

Once the data collection methods have been decided, the second stage of the project will begin. This phase involves the collection of data from the site, as well as a review of previously collected data. First, a request will be put in to request crash data from the Interstate 190 Route 140 interchange. In addition, the group will (under guidance of Mr. Joe Frawley and the advising professors) collect 24 hour ATR counts as well as manual turning movement counts from the interchange and resulting intersections. Traffic data collected by the group will be supplemented by previously collected traffic data, which will be obtained by the group. Lastly, the group will measure the sight distance on the Interstate 190 off-ramps.

The third stage of the project will commence when all necessary data has been obtained and collected. Once this occurs, the project group will analyze the data. In addition, the group will compile collision diagrams pertaining to the interchange. By evaluating the interchange's crash data, the group will determine which areas of the interchange are the most problematic. The group will also analyze the existing and future capacities of the interchange and resulting intersections. All raw data will be formatted and included in the final project report. In addition, significant analysis will be included in the paper with the use of tables and figures.

The design and analysis of revised interchange designs will compose the fourth stage of the project. The design process will begin by reviewing the interchange problems determined from data analysis. Alternate interchange designs will be roughly developed with special attention to these specific problems. MassDOT will be contacted during the design process, and any of their existing interchange revision designs will also be considered. Once alternate designs have been roughly developed, the design of the alternate interchanges will begin.

Many different realistic constraints will be addressed in the design process of alternate interchanges. The specific design procedures will vary between the different designs, but structural, geotechnical, and traffic engineering elements will all be focused on in this project. Structural adequacy of structural members will be evaluated when needed. In addition, the assessment of existing site soil conditions and pavement design may be required for design of certain alternate interchanges. All design

will be performed in accordance with the Mass Highway Department Project Development and Design Guide. All calculations involved in the design process will be included in the final report.

Once all alternate interchange designs are completed, the project group will analyze the designs. The designs will be analyzed for the 8 realistic constraints of design. Emphasis will be put upon the analysis of: health and safety issues, accordance with engineering codes and standards, economic factors, and manufacturability.

When all of these constraints have been considered, the group will begin the fifth stage of the project and present a recommendation based on this analysis. Figures displaying the benefits and drawbacks of each alternate design will be included in the project. In addition, the group will prepare a written section explaining the analysis of different design constraints and the resulting design recommendation. The recommendation developed by the group will then be presented to MassDOT.

The final stage of this project involves the compilation of all data, figures, tables, and all written sections. The group will present the findings of this project in an organized report, which will be reviewed by the advising professors before final submission. In addition, the group will complete a MassDOT project initiation form and all additional material required by MassDOT.

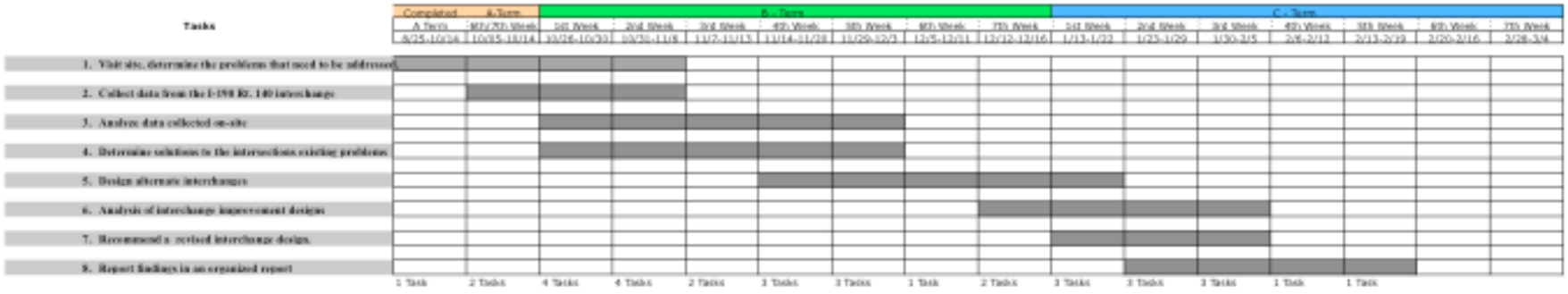

Table 1: Detailed Schedule of Task List Overview

Table 2: Detailed Schedule of Complete Task List

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APPENDIX B

TURNING MOVEMENT COUNT RAW DATA

AM TURNING MOVEMENT COUNTS

	Southbound					Westbound			Northbound				Eastbound					
6:00	0	0	0	0	0	4	10	0	18	0	1	0	36	37	0	1	106	
6:15	0	0	0	0	0	10	13	0	22	0	3	0	54	59	0	1	161	
6:30	0	0	0	0	0	10	19	0	29	0	3	0	55	61	0	0	177	
6:45	0	0	0	0	0	12	14	0	39	0	2	1	50	59	0	0	176	620
7:00	0	0	0	0	0	18	19	1	26	0	5	1	66	77	0	1	211	725
7:15	0	0	0	0	0	27	26	1	35	0	1	1	57	71	0	1	217	781
7:30	0	0	0	0	0	24	22	0	34	0	2	1	71	78	0	4	231	835
7:45	0	0	0	0	0	21	15	1	29	0	4	3	70	67	0	0	206	865
						90	82	3	124		12	6	264	293		6	865	
								2%				4%				1%		0.936147 PHF

	Southbound					Westbound			Northbound				Eastbound					
6:00	9	0	6	3	1	0	0	0	0	0	0	0	0	66	58	1	140	
6:15	10	0	10	0	4	0	0	0	0	0	0	0	0	96	134	7	254	
6:30	14	5	14	2	5	0	0	0	0	0	0	0	0	97	133	1	268	
6:45	13	0	18	2	11	0	0	0	0	0	0	0	0	99	122	3	263	925
7:00	24	0	24	3	12	0	0	0	0	0	0	0	3	118	137	4	318	1103
7:15	14	1	13	0	5	1	0	0	0	0	0	0	0	114	193	4	341	1190
7:30	24	0	21	0	12	0	0	0	0	0	1	2	0	134	227	6	419	1341
7:45	25	0	12	0	8	0	0	0	0	0	0	0	0	126	163	5	334	1412
	87	1	70	3	37	1	0	0	0	0	1	2	3	492	720	19	1412	
								0%				200%				2%		0.842482 PHF

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PM TURNING MOVEMENT COUNTS

	Southbound					Westbound			Northbound				Eastbound					
4:00	0	0	0	0	1	49	26	1	69	0	4	0	26	40	0	3	215	
4:15	0	0	0	0	0	50	26	0	90	0	8	1	27	48	0	1	249	
4:30	0	0	0	0	0	68	16	2	102	0	12	2	22	35	0	4	255	
4:45	0	0	0	0	0	63	15	0	96	0	9	0	22	38	0	0	243	962
5:00	0	0	0	0	0	58	19	0	69	0	7	1	15	51	0	2	219	966
5:15	0	0	0	0	0	74	24	3	89	0	11	1	19	51	0	0	268	985
5:30	0	0	0	0	0	93	28	1	104	0	11	0	15	48	0	2	299	1029
5:45	0	0	0	0	0	79	24	0	81	0	2	0	22	46	0	0	254	1040
						304	95	4	343		31	2	71	196		4	1040	
								1%				1%				1%		0.869565 PHF

	Southbound					Westbound			Northbound				Eastbound					
4:00	23	0	54	3	6	110	0	1	0	0	0	0	0	43	37	1	273	
4:15	26	0	58	4	7	119	0	1	0	0	0	0	0	49	48	3	307	
4:30	13	0	52	1	7	163	0	6	0	0	0	0	0	46	49	4	330	
4:45	24	0	58	1	5	147	0	0	0	0	0	0	0	40	44	1	318	1228
5:00	26	1	59	0	6	117	0	1	0	0	0	0	0	41	36	5	286	1241
5:15	33	0	69	2	5	148	0	1	0	0	0	0	0	40	46	0	341	1275
5:30	28	0	69	1	2	181	0	0	0	0	0	0	0	32	55	3	367	1312
5:45	26	0	57	0	3	144	0	0	0	0	0	0	0	39	41	2	310	1304
	111	1	255	4	18	593	0	2	0	0	0	0	0	153	181	9	1312	
																		0.888283 PHF

APPENDIX C

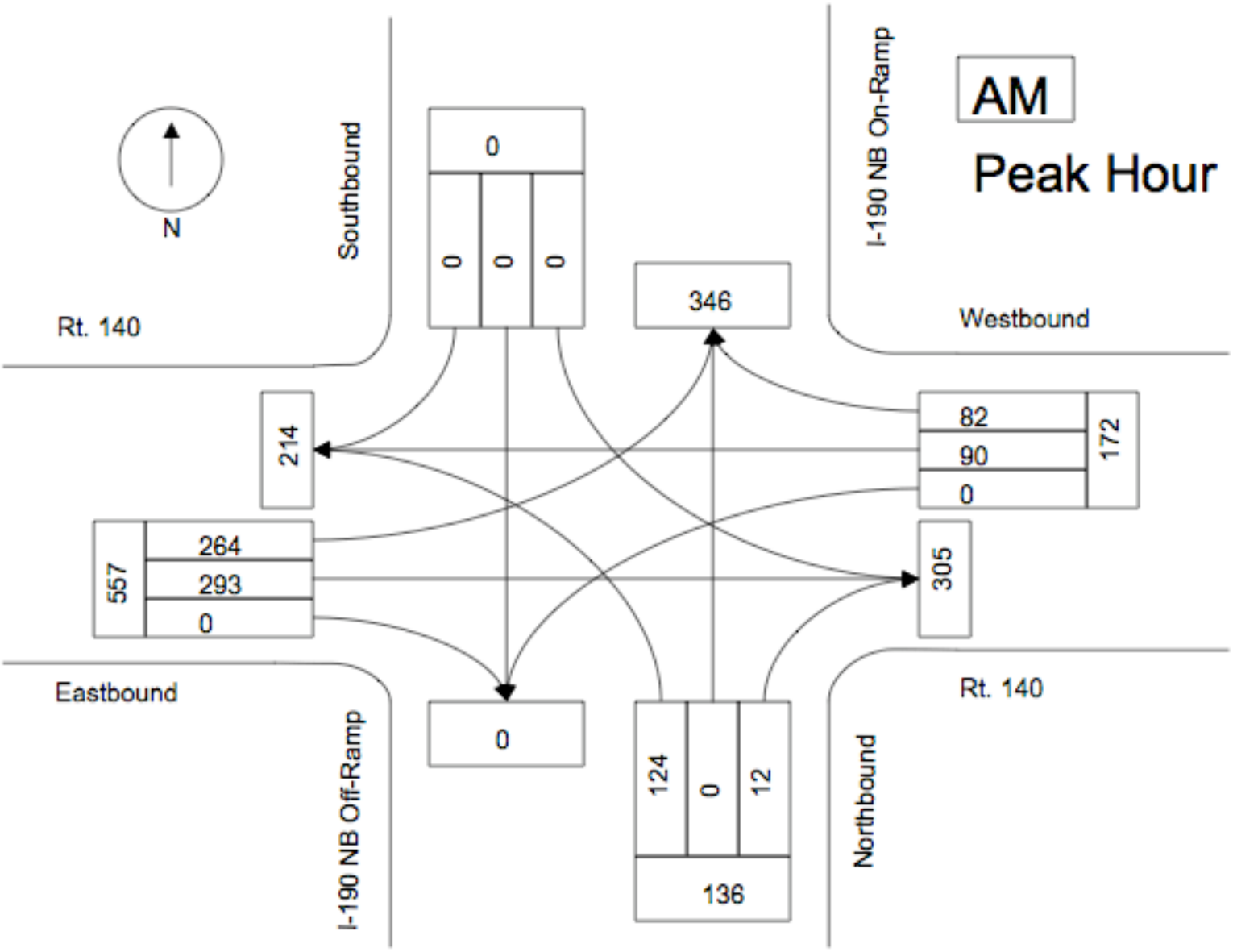
TURNING MOVEMENT DIAGRAMS

MassDOT MQP

Intersection Turning Movement Count

City: Sterling, MA Date: 11/9/2011 Day of Week: Wednesday

Intersection: MA Rt. 140 and I-190 NB Interchange



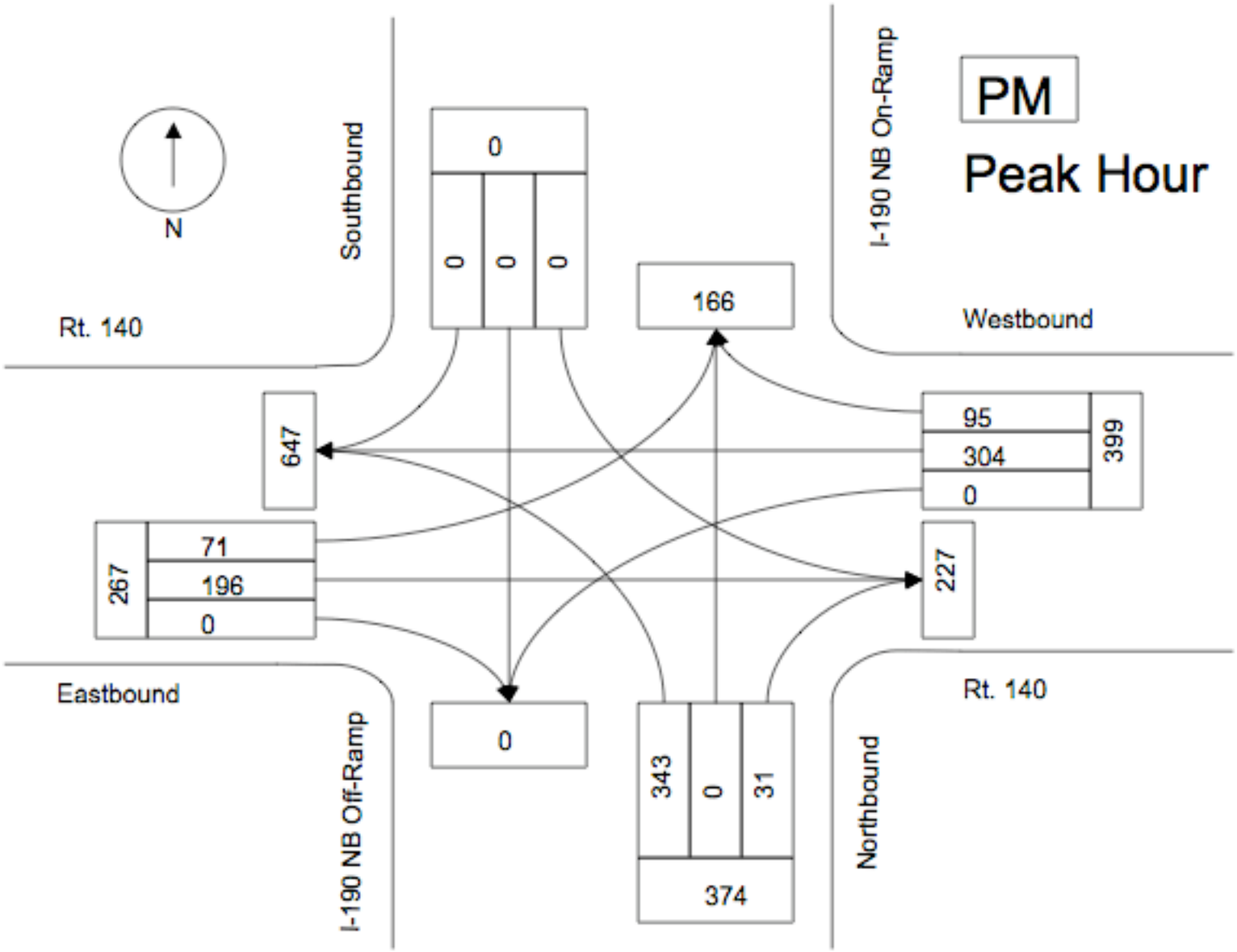
STREET	ENTERING VOLUMES	PERCENT OF FLOW	TIME OF COUNT
Rt. 140 EB	557	64.39%	Peak Hour 7:00 - 8:00 AM
Rt. 140 WB	172	19.89%	PHF = 0.94
I-190 NB On-Ramp	0	0.00%	VEHICLES COUNTED
I-190 NB Off-Ramp	136	15.72%	ALL VEHICLES: 865
TOTAL	865	100.00%	TRUCKS: 15
			PERCENT TRUCKS: 1.73%

MassDOT MQP

Intersection Turning Movement Count

City: Sterling, MA Date: 11/9/2011 Day of Week: Wednesday

Intersection: MA Rt. 140 and I-190 NB Interchange



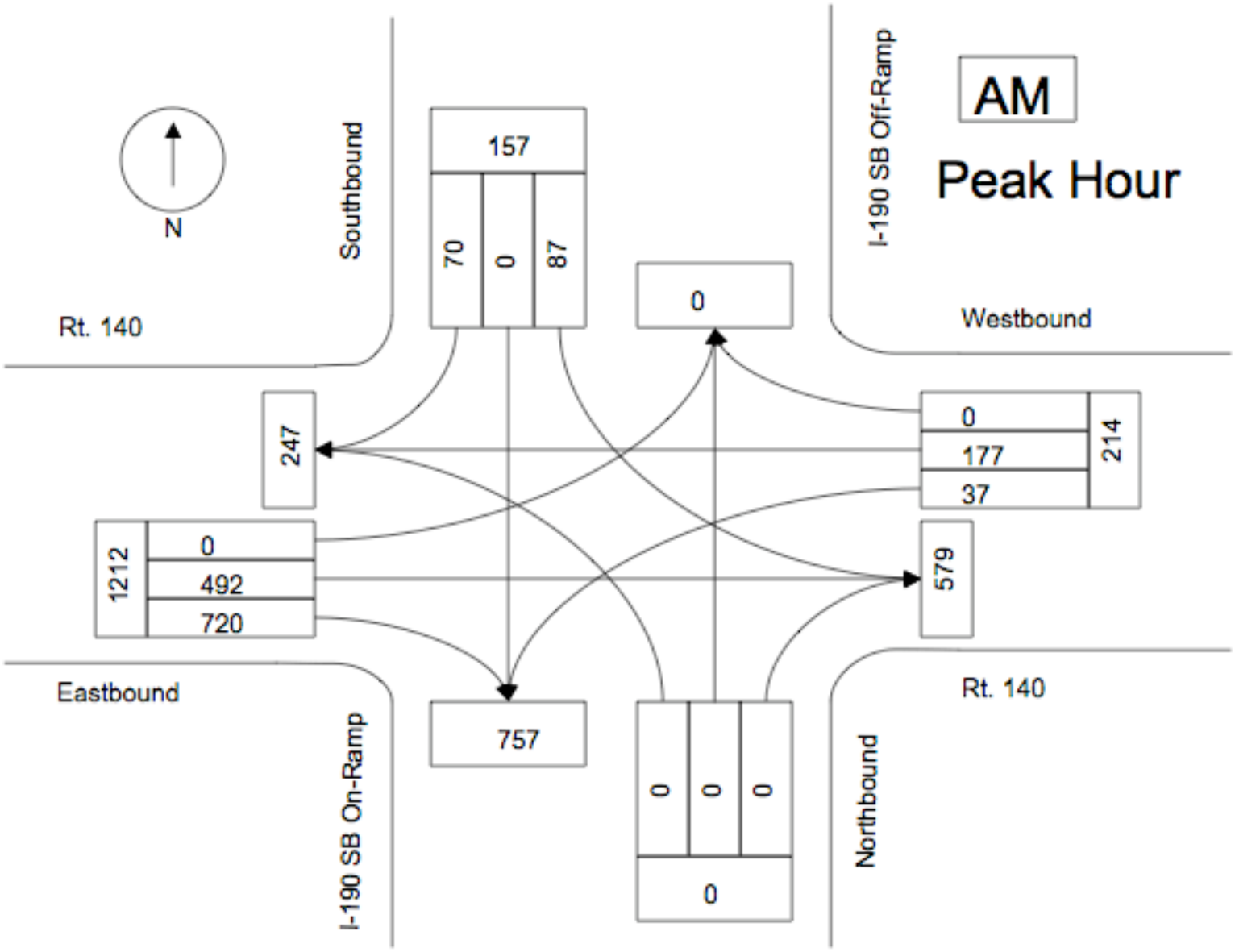
STREET	ENTERING VOLUMES	PERCENT OF FLOW	TIME OF COUNT
Rt. 140 EB	267	25.67%	Peak Hour 5:00 - 6:00 PM
Rt. 140 WB	399	38.37%	PHF = 0.87
I-190 NB On-Ramp	0	0.00%	VEHICLES COUNTED
I-190 NB Off-Ramp	374	35.96%	ALL VEHICLES: 1040
TOTAL	1040	100.00%	TRUCKS: 10
			PERCENT TRUCKS: 0.96%

MassDOT MQP

Intersection Turning Movement Count

City: Sterling, MA Date: 11/9/2011 Day of Week: Wednesday

Intersection: MA Rt. 140 and I-190 SB Interchange



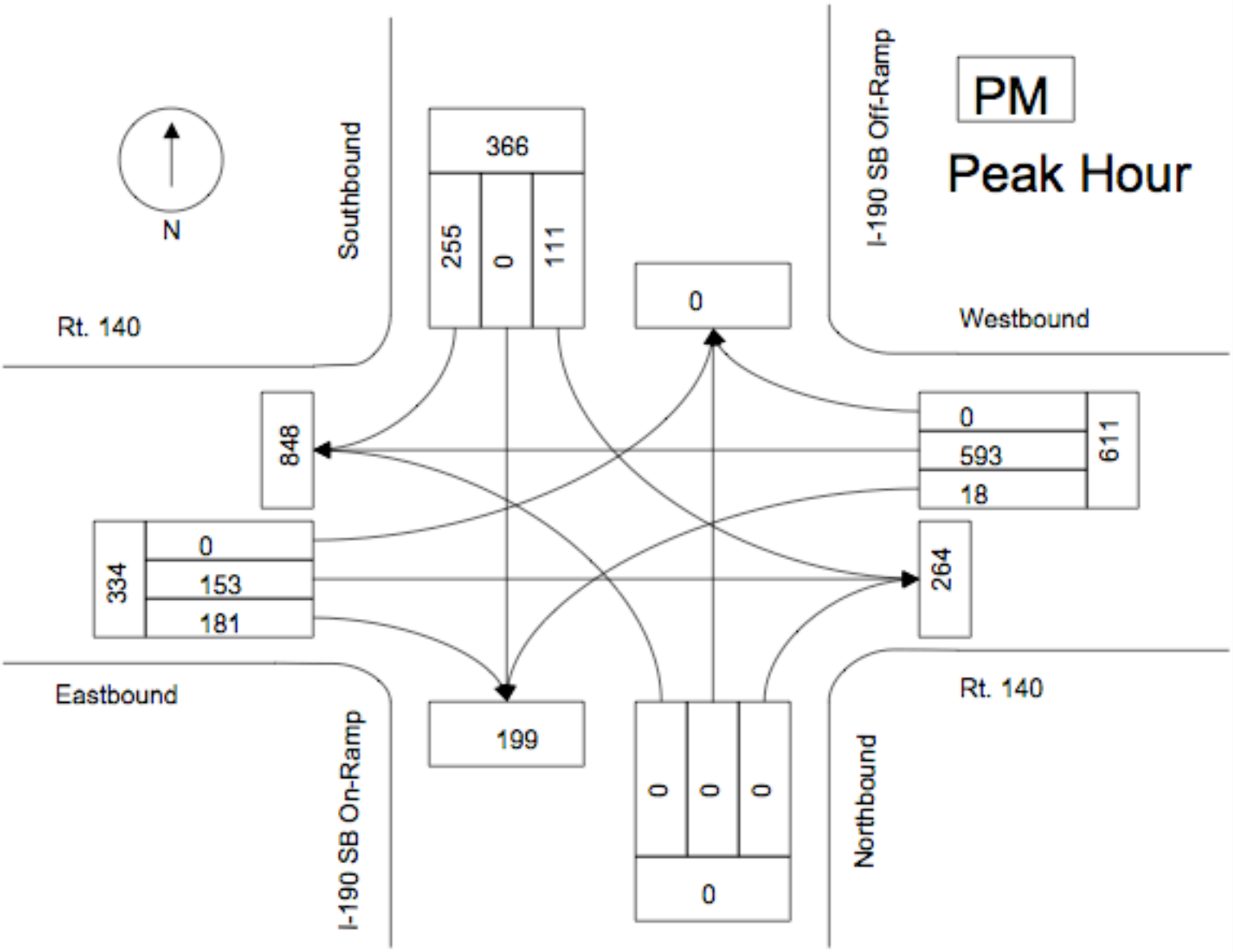
STREET	ENTERING VOLUMES	PERCENT OF FLOW	TIME OF COUNT
Rt. 140 EB	1212	76.56%	Peak Hour 7:00 - 8:00 AM
Rt. 140 WB	214	13.52%	PHF = 0.85
I-190 SB On-Ramp	0	0.00%	VEHICLES COUNTED
I-190 SB Off-Ramp	157	9.92%	ALL VEHICLES: 1583
TOTAL	1583	100.00%	TRUCKS: 19
			PERCENT TRUCKS: 1.20%

MassDOT MQP

Intersection Turning Movement Count

City: Sterling, MA Date: 11/9/2011 Day of Week: Wednesday

Intersection: MA Rt. 140 and I-190 SB Interchange



STREET	ENTERING VOLUMES	PERCENT OF FLOW	TIME OF COUNT
Rt. 140 EB	334	25.48%	Peak Hour 4:45 - 5:45 PM
Rt. 140 WB	611	46.60%	PHF = 0.89
I-190 SB On-Ramp	0	0.00%	VEHICLES COUNTED
I-190 SB Off-Ramp	366	27.92%	ALL VEHICLES: 1311
TOTAL	1311	100.00%	TRUCKS: 15
			PERCENT TRUCKS: 1.14%

APPENDIX D

ATR BOX COLLECTION RAW DATA

Combined

12/14/2011 10:33 AM	4	0	7	10	14	6	6	0	0	0	0	0	0	1
12/14/2011 10:48 AM	1	0	1	9	12	18	7	4	1	0	0	0	0	0
12/14/2011 11:03 AM	0	0	6	4	17	11	10	3	0	0	0	0	0	0
12/14/2011 11:18 AM	1	1	1	4	7	15	15	2	0	0	0	0	0	0
12/14/2011 11:33 AM	1	0	1	2	10	8	7	3	1	0	0	0	0	0
12/14/2011 11:48 AM	0	0	0	6	7	13	13	7	1	0	0	0	0	0
12/14/2011 12:03 PM	0	1	0	4	7	13	13	7	7	0	0	0	0	0
12/14/2011 12:18 PM	0	0	2	5	7	13	10	4	2	0	0	0	0	0
12/14/2011 12:33 PM	2	0	0	5	7	10	13	6	3	0	0	0	0	0
12/14/2011 12:48 PM	2	0	1	2	12	13	17	4	1	0	0	0	0	0
12/14/2011 01:03 PM	0	0	0	8	8	13	14	3	2	0	0	0	0	0
12/14/2011 01:18 PM	0	0	1	5	8	16	14	7	0	0	0	0	0	0
12/14/2011 01:33 PM	2	0	0	7	9	10	12	5	1	0	0	0	0	1
12/14/2011 01:48 PM	2	0	0	5	11	13	18	8	1	1	0	0	0	0
12/14/2011 02:03 PM	2	0	0	6	19	18	14	11	1	0	0	0	0	0
12/14/2011 02:18 PM	0	0	0	4	8	17	12	9	2	0	0	0	0	0
12/14/2011 02:33 PM	1	0	1	3	12	16	13	6	1	0	0	0	0	0
12/14/2011 02:48 PM	1	0	0	1	13	18	11	8	3	1	0	1	0	0
12/14/2011 03:03 PM	7	0	0	3	11	7	12	9	2	0	0	0	0	2
12/14/2011 03:18 PM	7	0	1	9	8	17	10	5	4	0	0	0	0	5
12/14/2011 03:33 PM	4	1	0	2	16	12	16	3	0	0	0	0	0	2
12/14/2011 03:48 PM	3	0	1	7	10	19	13	5	2	0	0	0	0	1
12/14/2011 04:03 PM	2	0	2	3	16	6	18	9	4	1	0	0	0	1
12/14/2011 04:18 PM	1	0	0	9	12	10	17	9	5	1	0	0	0	0
12/14/2011 04:33 PM	4	0	0	7	9	16	13	12	5	3	0	0	0	0
12/14/2011 04:48 PM	4	0	0	11	11	14	11	6	1	0	0	0	0	2
12/14/2011 05:03 PM	7	0	1	7	18	14	23	4	1	0	0	0	0	0
12/14/2011 05:18 PM	4	0	2	4	13	14	21	7	4	1	0	0	0	1
12/14/2011 05:33 PM	4	2	0	7	19	16	26	8	2	2	0	0	0	3
12/14/2011 05:48 PM	2	1	0	6	16	24	14	2	5	1	0	0	0	1
12/14/2011 06:03 PM	4	0	0	10	25	21	15	4	2	1	0	0	0	3
12/14/2011 06:18 PM	5	1	3	4	15	13	12	9	4	1	0	0	1	1
12/14/2011 06:33 PM	4	0	1	6	22	19	8	4	3	0	0	1	0	0
12/14/2011 06:48 PM	2	0	1	4	18	12	17	4	1	1	0	0	0	2
12/14/2011 07:03 PM	4	0	2	12	13	12	6	2	3	0	0	0	0	1
12/14/2011 07:18 PM	1	0	1	4	5	10	10	8	0	2	0	0	0	0
12/14/2011 07:33 PM	6	0	0	6	9	7	3	3	3	2	0	0	0	3
12/14/2011 07:48 PM	4	1	1	2	8	6	5	5	0	0	0	0	0	1
12/14/2011 08:03 PM	1	0	0	4	8	10	5	2	1	1	0	0	0	0
12/14/2011 08:18 PM	3	0	0	1	12	3	5	5	1	1	0	0	0	0
12/14/2011 08:33 PM	0	0	0	5	8	7	6	3	1	1	0	0	0	1
12/14/2011 08:48 PM	0	0	0	0	1	3	13	4	1	0	0	0	0	0
12/14/2011 09:03 PM	1	0	0	2	3	3	3	3	0	0	0	0	0	2
12/14/2011 09:18 PM	2	0	0	2	5	2	2	1	2	0	0	1	0	0
12/14/2011 09:33 PM	0	0	0	2	1	2	7	2	2	0	0	0	0	0
12/14/2011 09:48 PM	1	0	1	4	4	3	4	0	3	0	0	0	0	0
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12/14/2011 10:18 PM	0	0	1	0	5	9	0	3	0	0	0	0	0	0
12/14/2011 10:33 PM	0	0	0	0	2	5	5	3	0	0	0	0	0	0
12/14/2011 10:48 PM	2	0	0	4	7	1	0	1	1	0	1	0	0	1

12/14/2011 11:03 PM	1	0	0	2	2	0	3	1	1	0	0	0	0	0
12/14/2011 11:18 PM	0	0	0	2	2	2	3	2	2	0	0	0	0	0
12/14/2011 11:33 PM	2	0	0	0	2	1	2	0	2	0	0	0	0	1
12/14/2011 11:48 PM	0	0	0	1	5	0	1	2	0	0	0	0	0	0
12/15/2011 12:03 AM	0	0	0	2	2	2	1	0	0	0	0	0	0	0
12/15/2011 12:18 AM	0	0	0	0	1	0	1	0	1	0	1	0	0	0
12/15/2011 12:33 AM	0	0	1	1	1	2	1	0	0	0	0	0	0	0
12/15/2011 12:48 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0
12/15/2011 01:03 AM	1	1	0	0	0	2	3	0	0	0	0	0	0	0
12/15/2011 01:18 AM	0	0	0	0	2	0	0	0	0	0	0	0	0	0
12/15/2011 01:33 AM	0	0	0	1	2	0	0	0	0	0	0	0	0	0
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12/15/2011 04:33 AM	0	0	0	0	1	0	1	1	0	0	0	0	0	0
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12/15/2011 05:48 AM	0	0	0	0	3	4	6	3	2	0	0	1	0	0
12/15/2011 06:03 AM	0	0	0	1	5	2	12	7	3	1	0	0	0	0
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12/15/2011 09:18 AM	11	0	0	4	13	35	28	20	6	1	0	0	0	0
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12/15/2011 10:48 AM	1	0	0	3	17	14	18	7	2	1	0	0	0	1
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12/15/2011 12:33 PM	6	0	0	5	7	10	10	5	4	2	0	0	0	0
12/15/2011 12:48 PM	6	0	5	3	8	8	13	8	2	0	0	0	0	0
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12/15/2011 02:18 PM	3	0	0	7	6	15	14	9	1	0	0	0	0	1
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12/15/2011 02:48 PM	5	0	2	1	3	11	16	5	3	0	0	0	0	2
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12/15/2011 04:03 PM	5	0	0	8	7	16	12	5	0	0	0	0	1	2
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12/15/2011 05:03 PM	1	0	1	6	11	13	19	1	2	1	0	0	0	0
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12/15/2011 07:48 PM	0	0	0	2	7	8	7	4	1	1	0	0	0	0
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12/15/2011 08:18 PM	2	0	0	6	3	3	4	3	2	1	1	0	0	1
12/15/2011 08:33 PM	0	0	0	1	5	4	10	4	1	0	0	0	0	0
12/15/2011 08:48 PM	0	0	1	1	7	6	5	1	2	3	0	0	0	0
12/15/2011 09:03 PM	2	0	0	2	11	6	1	4	1	0	0	0	0	0
12/15/2011 09:18 PM	0	0	1	2	7	2	3	2	3	0	0	0	0	0
12/15/2011 09:33 PM	1	0	0	2	6	3	1	1	1	0	0	0	0	0
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12/15/2011 11:48 PM	0	0	0	2	2	0	1	1	1	1	0	0	0	0
12/16/2011 12:03 AM	0	0	0	0	2	1	0	0	0	0	0	0	0	0
12/16/2011 12:18 AM	0	1	0	0	2	1	0	0	0	0	0	0	0	0
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12/16/2011 01:03 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0
12/16/2011 01:18 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0

12/16/2011 01:33 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0
12/16/2011 01:48 AM	0	0	0	0	2	0	0	0	0	0	1	0	0	0
12/16/2011 02:03 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0
12/16/2011 02:18 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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12/16/2011 05:33 AM	0	0	3	1	4	4	2	0	0	0	0	0	0	0
12/16/2011 05:48 AM	5	0	0	3	7	8	8	4	0	1	0	0	0	2
12/16/2011 06:03 AM	3	0	0	4	4	6	6	4	2	1	0	0	0	2
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12/16/2011 06:33 AM	8	1	1	2	6	6	13	7	5	1	0	0	0	0
12/16/2011 06:48 AM	13	1	1	3	2	16	17	10	12	0	0	0	1	2
12/16/2011 07:03 AM	15	1	1	5	9	19	26	7	7	7	1	0	0	5
12/16/2011 07:18 AM	12	2	3	8	15	34	28	21	17	6	1	1	0	4
12/16/2011 07:33 AM	16	1	1	7	16	33	19	11	14	1	1	0	0	5
12/16/2011 07:48 AM	14	1	1	6	5	26	29	10	2	3	0	0	0	2
12/16/2011 08:03 AM	19	1	0	6	17	38	32	20	9	3	0	0	0	1
12/16/2011 08:18 AM	29	1	0	0	17	45	44	32	15	3	0	0	0	5
12/16/2011 08:33 AM	29	0	0	3	22	25	35	23	16	8	0	0	0	4
12/16/2011 08:48 AM	19	0	2	6	20	34	35	21	8	4	0	0	0	4
12/16/2011 09:03 AM	19	0	2	6	19	21	40	28	13	2	0	0	0	0
12/16/2011 09:18 AM	20	0	2	5	14	32	37	14	11	4	0	0	1	5
12/16/2011 09:33 AM	22	0	3	5	11	23	20	19	6	3	0	0	0	3
12/16/2011 09:48 AM	15	0	0	11	10	21	21	14	3	0	0	1	0	2
12/16/2011 10:03 AM	15	1	0	10	8	19	24	8	9	1	0	0	0	2
12/16/2011 10:18 AM	11	0	1	5	13	10	14	11	2	2	0	0	0	3
12/16/2011 10:33 AM	13	0	3	3	11	25	18	5	8	5	0	0	1	1
12/16/2011 10:48 AM	6	0	1	6	9	12	13	4	0	1	0	0	0	4
12/16/2011 11:03 AM	16	0	0	4	9	15	12	13	2	0	0	0	0	2
12/16/2011 11:18 AM	13	0	1	5	6	13	16	6	3	3	0	0	0	2
12/16/2011 11:33 AM	10	2	0	4	11	16	12	7	0	1	1	0	0	4
12/16/2011 11:48 AM	8	0	4	8	11	9	14	8	4	1	0	0	0	3
12/16/2011 12:03 PM	10	1	0	4	7	10	18	7	4	2	0	0	0	3
12/16/2011 12:18 PM	15	0	2	5	10	17	16	4	0	2	0	0	0	6
12/16/2011 12:33 PM	6	0	0	7	9	8	11	5	6	3	0	1	0	2
12/16/2011 12:48 PM	9	1	1	9	14	21	14	7	1	0	0	0	0	5
12/16/2011 01:03 PM	9	1	0	7	8	14	9	7	2	1	0	0	0	1
12/16/2011 01:18 PM	14	1	0	2	11	14	14	7	0	0	0	0	0	1
12/16/2011 01:33 PM	11	0	1	9	9	13	15	5	4	1	1	0	0	4
12/16/2011 01:48 PM	8	0	1	5	8	14	16	9	0	1	0	0	0	3
12/16/2011 02:03 PM	13	2	2	1	8	17	14	4	1	1	1	0	0	3
12/16/2011 02:18 PM	9	0	2	7	5	20	9	8	3	1	0	0	0	3
12/16/2011 02:33 PM	10	0	0	4	14	13	15	15	4	1	0	0	0	1

12/16/2011 02:48 PM	3	0	1	2	3	13	13	6	1	1	0	0	0	1
12/16/2011 03:03 PM	11	1	0	6	7	11	16	8	2	0	0	0	0	1
12/16/2011 03:18 PM	14	1	3	15	15	11	15	7	4	1	0	0	0	1
12/16/2011 03:33 PM	9	0	5	4	14	14	17	7	1	1	0	0	0	2
12/16/2011 03:48 PM	18	0	2	8	15	10	14	7	7	0	0	0	0	2
12/16/2011 04:03 PM	10	1	0	4	14	19	15	15	5	1	1	1	0	7
12/16/2011 04:18 PM	12	0	1	8	23	25	14	5	1	1	0	0	0	8
12/16/2011 04:33 PM	18	1	1	8	19	17	16	13	4	0	1	0	0	4
12/16/2011 04:48 PM	14	0	2	14	20	17	13	6	7	0	0	0	0	2
12/16/2011 05:03 PM	10	0	3	6	14	17	17	8	3	3	2	1	0	1
12/16/2011 05:18 PM	7	1	3	8	17	19	12	7	2	0	1	0	0	1
12/16/2011 05:33 PM	13	2	3	10	25	21	23	7	1	0	0	0	0	7

Combined

12/14/2011	10:33 AM	0	30	8	1	0	2	0	0	0	0	0	0	0	7
12/14/2011	10:48 AM	0	41	6	1	1	0	1	2	0	0	0	0	0	1
12/14/2011	11:03 AM	0	37	6	1	3	0	0	0	3	0	0	0	0	1
12/14/2011	11:18 AM	0	34	7	0	1	0	0	1	1	0	0	0	1	1
12/14/2011	11:33 AM	1	24	1	1	1	1	0	2	0	0	0	0	0	2
12/14/2011	11:48 AM	0	33	7	1	2	0	0	1	0	0	0	0	0	3
12/14/2011	12:03 PM	1	41	4	1	3	0	0	1	0	0	0	0	0	1
12/14/2011	12:18 PM	1	27	9	4	0	1	0	0	0	0	0	0	0	1
12/14/2011	12:33 PM	1	30	11	1	0	0	0	1	0	0	0	0	0	2
12/14/2011	12:48 PM	0	38	5	0	4	0	0	1	0	0	0	0	0	4
12/14/2011	01:03 PM	3	34	8	0	2	0	0	0	1	0	0	0	0	0
12/14/2011	01:18 PM	0	37	11	1	2	0	0	0	0	0	0	0	0	0
12/14/2011	01:33 PM	1	29	7	2	3	0	0	0	1	0	0	0	0	4
12/14/2011	01:48 PM	2	40	7	0	1	2	0	0	1	0	0	0	1	5
12/14/2011	02:03 PM	2	47	13	1	3	0	1	0	0	0	0	0	1	3
12/14/2011	02:18 PM	2	35	11	1	1	0	0	0	1	0	0	0	0	1
12/14/2011	02:33 PM	4	25	8	1	1	2	0	0	1	0	0	0	2	9
12/14/2011	02:48 PM	1	37	8	0	3	1	0	0	0	0	0	0	1	6
12/14/2011	03:03 PM	6	14	1	2	1	2	0	1	0	0	0	0	1	25
12/14/2011	03:18 PM	2	25	3	1	1	8	0	0	0	0	0	0	1	25
12/14/2011	03:33 PM	5	17	1	0	2	3	0	0	0	0	0	0	2	26
12/14/2011	03:48 PM	4	32	3	0	1	1	0	0	0	0	0	0	1	19
12/14/2011	04:03 PM	1	33	2	1	1	1	0	0	1	0	0	0	0	22
12/14/2011	04:18 PM	8	33	3	0	3	3	0	0	0	0	0	0	1	13
12/14/2011	04:33 PM	3	35	6	0	4	3	0	0	0	0	0	0	1	17
12/14/2011	04:48 PM	4	21	8	1	0	2	0	0	0	0	0	0	0	24
12/14/2011	05:03 PM	2	30	10	0	1	5	0	0	0	0	0	0	0	27
12/14/2011	05:18 PM	3	28	7	1	1	4	0	0	0	0	0	0	1	26
12/14/2011	05:33 PM	1	41	10	2	1	5	0	0	0	0	0	0	0	29
12/14/2011	05:48 PM	3	33	10	0	0	3	0	0	0	0	0	0	0	23
12/14/2011	06:03 PM	4	33	2	1	2	8	0	0	0	0	0	0	2	33
12/14/2011	06:18 PM	3	21	7	0	1	4	0	0	0	0	0	0	0	33
12/14/2011	06:33 PM	4	30	6	0	0	5	0	0	0	0	0	0	2	21
12/14/2011	06:48 PM	3	30	5	1	2	1	0	0	0	0	0	0	0	20
12/14/2011	07:03 PM	3	19	3	0	2	2	0	0	0	0	0	0	0	26
12/14/2011	07:18 PM	6	17	5	0	1	1	0	0	0	0	0	0	1	10
12/14/2011	07:33 PM	4	13	7	0	0	2	0	0	0	0	0	0	0	16
12/14/2011	07:48 PM	0	8	1	0	1	0	0	0	0	0	0	0	0	23
12/14/2011	08:03 PM	2	16	1	0	0	3	0	1	0	0	0	0	0	9
12/14/2011	08:18 PM	1	15	2	0	0	1	0	1	0	0	0	0	1	10
12/14/2011	08:33 PM	2	17	1	1	1	1	0	0	0	0	0	0	0	9
12/14/2011	08:48 PM	1	11	5	0	0	1	0	0	0	0	0	0	0	4
12/14/2011	09:03 PM	1	7	2	1	1	1	0	0	0	0	0	0	0	4
12/14/2011	09:18 PM	0	6	1	1	0	0	0	0	0	0	0	0	0	9
12/14/2011	09:33 PM	3	7	3	0	0	2	0	0	0	0	0	0	0	1
12/14/2011	09:48 PM	1	7	5	0	0	0	0	0	0	0	0	0	0	7
12/14/2011	10:03 PM	0	7	2	0	0	1	0	0	0	0	0	0	0	8
12/14/2011	10:18 PM	0	6	1	0	0	2	0	0	0	0	0	0	0	9
12/14/2011	10:33 PM	1	9	0	0	0	2	0	0	0	0	0	0	0	3
12/14/2011	10:48 PM	0	5	0	0	0	2	0	0	0	0	0	0	0	11

12/14/2011	11:03 PM	1	5	0	0	0	0	0	0	0	0	0	0	0	4
12/14/2011	11:18 PM	0	5	0	0	3	3	0	0	0	0	0	0	0	2
12/14/2011	11:33 PM	2	4	0	1	0	1	0	0	0	0	0	0	0	2
12/14/2011	11:48 PM	1	5	1	0	0	0	0	0	0	0	0	0	0	2
12/15/2011	12:03 AM	0	2	1	0	0	1	0	0	0	0	0	0	0	3
12/15/2011	12:18 AM	0	2	1	0	0	0	0	0	0	0	0	0	0	1
12/15/2011	12:33 AM	0	3	1	0	1	0	0	0	0	0	0	0	0	1
12/15/2011	12:48 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
12/15/2011	01:03 AM	1	4	0	0	0	0	0	0	0	0	0	0	0	2
12/15/2011	01:18 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
12/15/2011	01:33 AM	0	1	1	0	0	0	0	0	0	0	0	0	0	1
12/15/2011	01:48 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
12/15/2011	02:03 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12/15/2011	02:18 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0
12/15/2011	02:33 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12/15/2011	02:48 AM	0	3	0	0	1	2	0	0	0	0	0	0	0	0
12/15/2011	03:03 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12/15/2011	03:18 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
12/15/2011	03:33 AM	0	1	1	0	0	0	0	0	0	0	0	0	0	0
12/15/2011	03:48 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0
12/15/2011	04:03 AM	1	3	0	0	0	0	0	0	0	0	0	0	0	1
12/15/2011	04:18 AM	1	3	2	0	0	0	0	0	0	0	0	0	0	0
12/15/2011	04:33 AM	0	1	1	0	1	0	0	0	0	0	0	0	0	0
12/15/2011	04:48 AM	1	1	1	0	0	0	0	0	0	0	0	0	0	7
12/15/2011	05:03 AM	1	4	0	1	0	0	0	0	0	0	0	0	0	7
12/15/2011	05:18 AM	1	2	2	0	0	0	0	0	1	0	0	0	0	2
12/15/2011	05:33 AM	1	5	2	0	0	1	0	0	0	0	0	0	0	7
12/15/2011	05:48 AM	1	7	2	0	1	2	0	0	0	0	0	0	0	6
12/15/2011	06:03 AM	2	14	4	0	1	1	0	0	0	0	0	0	0	9
12/15/2011	06:18 AM	4	27	4	0	1	4	0	0	0	0	0	0	0	18
12/15/2011	06:33 AM	4	28	10	1	1	2	0	0	0	0	0	0	0	10
12/15/2011	06:48 AM	6	38	9	0	1	3	0	0	0	0	0	0	0	10
12/15/2011	07:03 AM	8	41	13	0	1	2	0	0	0	0	0	0	1	22
12/15/2011	07:18 AM	4	64	17	1	1	10	0	0	0	0	0	0	0	33
12/15/2011	07:33 AM	16	58	17	0	3	7	0	0	0	0	0	0	0	37
12/15/2011	07:48 AM	9	67	16	2	2	7	0	0	0	0	0	0	0	26
12/15/2011	08:03 AM	10	53	9	0	2	7	0	0	0	0	0	0	0	38
12/15/2011	08:18 AM	8	71	16	1	1	11	0	0	0	1	0	0	0	38
12/15/2011	08:33 AM	10	74	17	1	2	7	0	0	0	1	0	0	0	38
12/15/2011	08:48 AM	11	78	6	0	1	3	0	0	0	0	0	1	1	44
12/15/2011	09:03 AM	4	63	10	1	0	5	0	0	0	0	0	0	2	35
12/15/2011	09:18 AM	3	58	6	0	0	6	0	0	0	1	0	0	2	42
12/15/2011	09:33 AM	8	48	6	0	2	3	0	0	0	0	0	0	0	37
12/15/2011	09:48 AM	3	36	15	2	3	10	0	0	0	0	0	0	1	23
12/15/2011	10:03 AM	3	22	6	0	1	1	0	0	0	0	0	0	0	24
12/15/2011	10:18 AM	7	35	7	1	1	3	0	0	0	0	0	0	3	10
12/15/2011	10:33 AM	1	27	10	0	3	3	0	0	0	0	0	0	0	23
12/15/2011	10:48 AM	8	32	5	0	2	3	0	0	0	0	0	0	0	14
12/15/2011	11:03 AM	3	29	3	1	3	1	0	0	0	0	0	0	1	21
12/15/2011	11:18 AM	4	24	6	1	2	4	0	0	0	0	0	0	0	8
12/15/2011	11:33 AM	1	19	7	0	2	1	0	0	0	0	0	0	0	19
12/15/2011	11:48 AM	6	24	2	0	2	2	0	0	0	0	0	0	0	22
12/15/2011	12:03 PM	3	19	5	0	2	2	0	1	0	0	0	0	1	6

12/15/2011	12:18 PM	6	20	8	0	0	2	0	0	0	0	0	0	0	13
12/15/2011	12:33 PM	3	20	5	1	0	2	0	0	0	0	0	0	0	18
12/15/2011	12:48 PM	5	18	6	1	1	0	0	0	0	0	0	1	2	19
12/15/2011	01:03 PM	2	24	4	1	1	3	0	1	0	1	0	0	1	15
12/15/2011	01:18 PM	5	21	6	1	0	1	0	0	0	1	0	0	1	16
12/15/2011	01:33 PM	1	19	3	1	3	2	0	0	0	0	0	0	0	21
12/15/2011	01:48 PM	6	16	3	0	1	0	0	0	0	0	0	0	0	14
12/15/2011	02:03 PM	4	25	7	1	2	1	0	0	0	0	0	0	1	20
12/15/2011	02:18 PM	2	24	8	1	1	3	0	0	0	1	0	0	0	16
12/15/2011	02:33 PM	1	23	3	0	0	0	0	0	0	0	0	0	0	23
12/15/2011	02:48 PM	1	21	5	0	1	3	0	0	0	0	0	0	1	16
12/15/2011	03:03 PM	2	27	5	0	1	2	0	0	0	0	0	0	0	19
12/15/2011	03:18 PM	5	35	8	1	0	4	0	0	0	0	0	0	0	14
12/15/2011	03:33 PM	4	26	3	0	1	2	0	0	0	0	0	0	0	6
12/15/2011	03:48 PM	4	23	7	0	2	2	0	0	0	1	0	0	0	14
12/15/2011	04:03 PM	3	25	5	1	2	1	0	0	0	0	0	0	1	18
12/15/2011	04:18 PM	5	35	7	1	2	4	0	0	0	0	0	0	0	17
12/15/2011	04:33 PM	7	40	7	0	1	2	0	0	0	0	0	0	0	18
12/15/2011	04:48 PM	5	26	9	0	2	3	0	0	1	0	0	0	1	15
12/15/2011	05:03 PM	5	33	7	0	0	1	0	0	0	0	0	0	0	9
12/15/2011	05:18 PM	5	32	5	0	0	1	0	0	1	0	0	0	1	16
12/15/2011	05:33 PM	3	33	9	0	1	0	0	0	0	0	0	0	0	19
12/15/2011	05:48 PM	2	29	12	0	1	0	0	0	0	0	0	0	0	9
12/15/2011	06:03 PM	4	41	10	1	2	3	0	0	0	0	0	0	1	9
12/15/2011	06:18 PM	8	32	12	1	6	2	0	0	0	1	0	0	0	9
12/15/2011	06:33 PM	6	35	10	0	1	2	0	0	0	0	0	0	0	7
12/15/2011	06:48 PM	6	31	8	0	3	0	0	0	0	0	0	0	0	7
12/15/2011	07:03 PM	1	40	5	0	0	2	2	0	0	0	0	0	2	4
12/15/2011	07:18 PM	3	25	7	0	2	0	0	0	0	0	0	0	0	5
12/15/2011	07:33 PM	3	25	4	0	4	1	0	1	0	0	0	0	0	7
12/15/2011	07:48 PM	1	23	5	0	1	0	0	0	0	0	0	0	0	0
12/15/2011	08:03 PM	1	19	7	0	1	0	0	0	0	0	0	0	0	5
12/15/2011	08:18 PM	2	17	1	0	0	1	0	0	0	0	0	0	0	5
12/15/2011	08:33 PM	3	16	2	0	1	0	0	0	0	0	0	0	0	3
12/15/2011	08:48 PM	3	15	2	0	1	1	0	0	0	0	0	0	0	4
12/15/2011	09:03 PM	1	12	7	0	0	2	0	0	0	0	0	0	0	5
12/15/2011	09:18 PM	0	13	2	0	0	0	0	0	0	0	0	0	0	5
12/15/2011	09:33 PM	0	8	3	0	0	2	0	0	0	0	0	0	0	2
12/15/2011	09:48 PM	2	12	1	0	0	0	0	0	0	0	0	0	0	0
12/15/2011	10:03 PM	1	12	0	0	1	0	0	0	0	0	0	0	0	3
12/15/2011	10:18 PM	3	7	1	0	1	0	0	0	0	0	0	0	0	1
12/15/2011	10:33 PM	3	3	1	0	1	0	0	0	0	0	0	0	0	1
12/15/2011	10:48 PM	3	15	3	0	0	0	0	0	0	0	0	0	0	3
12/15/2011	11:03 PM	3	7	1	0	0	1	0	0	0	0	0	0	0	1
12/15/2011	11:18 PM	2	8	0	0	1	0	0	0	0	0	0	0	0	0
12/15/2011	11:33 PM	1	3	0	0	0	0	0	0	0	0	0	0	0	3
12/15/2011	11:48 PM	0	5	3	0	0	0	0	0	0	0	0	0	0	0
12/16/2011	12:03 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12/16/2011	12:18 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	1
12/16/2011	12:33 AM	0	8	3	0	0	0	0	0	0	0	0	0	1	0
12/16/2011	12:48 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	0
12/16/2011	01:03 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12/16/2011	01:18 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0

12/16/2011	01:33 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0
12/16/2011	01:48 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	1
12/16/2011	02:03 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
12/16/2011	02:18 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12/16/2011	02:33 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0
12/16/2011	02:48 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0
12/16/2011	03:03 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12/16/2011	03:18 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0
12/16/2011	03:33 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	2
12/16/2011	03:48 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0
12/16/2011	04:03 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0
12/16/2011	04:18 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
12/16/2011	04:33 AM	2	4	0	0	1	0	0	0	0	0	0	0	0	1
12/16/2011	04:48 AM	1	1	3	0	0	0	0	0	0	0	0	0	0	1
12/16/2011	05:03 AM	0	4	2	0	1	0	0	0	0	0	0	0	0	6
12/16/2011	05:18 AM	3	5	4	0	0	0	1	0	0	0	0	0	1	3
12/16/2011	05:33 AM	1	4	3	0	0	1	0	0	0	0	0	0	1	4
12/16/2011	05:48 AM	2	14	3	1	2	0	1	0	0	0	0	0	3	12
12/16/2011	06:03 AM	3	12	3	4	2	1	0	0	0	0	0	0	1	6
12/16/2011	06:18 AM	6	26	11	6	4	4	0	0	0	0	0	0	3	14
12/16/2011	06:33 AM	3	17	5	1	2	3	0	0	0	0	0	0	0	19
12/16/2011	06:48 AM	9	24	11	6	1	1	1	1	1	0	0	0	2	21
12/16/2011	07:03 AM	11	37	13	2	2	4	0	1	0	0	0	0	1	32
12/16/2011	07:18 AM	8	67	23	4	4	4	2	1	0	0	0	0	5	34
12/16/2011	07:33 AM	7	53	15	3	3	1	0	3	0	2	0	0	2	36
12/16/2011	07:48 AM	17	36	9	3	2	3	1	1	0	0	0	0	2	25
12/16/2011	08:03 AM	13	61	15	5	3	5	0	1	0	1	0	0	4	38
12/16/2011	08:18 AM	16	83	12	11	3	5	0	1	1	0	0	0	5	54
12/16/2011	08:33 AM	11	66	21	4	1	2	0	0	0	0	0	0	2	58
12/16/2011	08:48 AM	12	67	14	8	2	6	0	0	0	0	0	0	3	41
12/16/2011	09:03 AM	12	54	16	6	6	5	0	1	1	0	0	0	2	47
12/16/2011	09:18 AM	8	57	19	9	5	6	0	4	1	0	0	0	2	34
12/16/2011	09:33 AM	11	45	13	0	1	2	0	0	0	2	0	0	1	40
12/16/2011	09:48 AM	13	32	11	2	2	0	0	0	1	0	0	0	3	34
12/16/2011	10:03 AM	7	41	7	3	2	7	0	0	0	1	0	0	2	27
12/16/2011	10:18 AM	4	24	9	2	2	1	0	1	0	0	0	0	3	26
12/16/2011	10:33 AM	9	27	9	4	5	5	0	0	1	0	0	0	0	33
12/16/2011	10:48 AM	5	18	5	3	4	5	1	1	0	0	0	0	1	13
12/16/2011	11:03 AM	6	27	5	1	2	4	0	0	0	0	0	0	1	27
12/16/2011	11:18 AM	6	27	3	2	2	2	0	0	0	1	0	0	2	23
12/16/2011	11:33 AM	5	18	8	1	0	1	1	1	0	0	0	0	3	30
12/16/2011	11:48 AM	7	26	5	5	0	1	2	4	0	0	0	0	4	16
12/16/2011	12:03 PM	13	19	6	5	1	2	1	0	0	1	0	0	0	18
12/16/2011	12:18 PM	2	26	8	4	1	3	1	0	0	0	0	0	1	31
12/16/2011	12:33 PM	4	27	2	3	2	3	0	0	0	0	0	0	1	16
12/16/2011	12:48 PM	12	31	7	3	1	4	1	0	0	0	0	0	3	20
12/16/2011	01:03 PM	3	24	7	2	1	2	0	0	0	0	0	0	1	19
12/16/2011	01:18 PM	6	21	4	3	3	3	0	0	0	0	0	0	0	24
12/16/2011	01:33 PM	12	18	8	6	2	2	0	1	0	0	0	0	1	23
12/16/2011	01:48 PM	4	24	8	1	1	4	0	0	0	0	0	0	1	22
12/16/2011	02:03 PM	6	21	4	3	5	2	0	0	0	0	0	0	3	23
12/16/2011	02:18 PM	5	23	7	6	2	2	0	0	1	0	0	0	1	20
12/16/2011	02:33 PM	5	29	11	1	0	1	0	0	1	0	0	0	2	27

12/16/2011	02:48 PM	7	18	2	0	2	1	0	0	0	0	0	0	1	13
12/16/2011	03:03 PM	7	22	6	1	3	1	0	0	0	0	0	0	2	21
12/16/2011	03:18 PM	5	35	4	6	2	3	0	1	0	1	0	0	2	28
12/16/2011	03:33 PM	8	35	8	3	0	3	0	0	0	0	0	0	2	15
12/16/2011	03:48 PM	5	31	7	5	2	3	0	1	0	0	0	0	2	27
12/16/2011	04:03 PM	7	38	8	7	2	5	0	0	0	1	0	0	2	23
12/16/2011	04:18 PM	10	36	7	4	4	3	0	4	0	0	0	0	4	26
12/16/2011	04:33 PM	7	36	9	2	1	5	0	0	0	1	0	0	2	39
12/16/2011	04:48 PM	4	42	12	5	1	1	0	1	0	0	0	0	2	27
12/16/2011	05:03 PM	9	25	12	4	6	1	0	2	0	0	0	0	1	25
12/16/2011	05:18 PM	8	33	10	5	3	2	0	0	0	0	0	0	2	15
12/16/2011	05:33 PM	5	41	11	6	0	6	1	2	0	0	0	0	4	36

Combined

12/14/2011 11:47 AM	0	27	8	0	2	2	0	0	1	0	0	0	0	6
12/14/2011 12:47 PM	2	152	29	2	8	0	0	2	0	0	0	0	0	8
12/14/2011 01:47 PM	2	159	35	4	7	0	0	2	2	0	0	0	1	5
12/14/2011 02:47 PM	2	203	33	4	4	4	0	3	2	0	0	0	0	9
12/14/2011 03:47 PM	0	260	44	3	7	2	0	0	1	0	0	0	0	14
12/14/2011 04:47 PM	15	282	58	4	20	7	0	7	4	0	0	0	8	74
12/14/2011 05:47 PM	22	286	33	1	8	20	4	8	0	0	0	0	19	153
12/14/2011 06:47 PM	27	293	26	0	4	11	0	4	2	2	0	0	20	98
12/14/2011 07:47 PM	20	329	19	0	7	8	0	4	1	0	0	0	17	91
12/14/2011 08:47 PM	23	259	34	0	16	1	0	5	0	0	0	0	5	51
12/14/2011 09:47 PM	8	230	22	1	18	5	0	2	0	1	0	0	1	21
12/14/2011 10:47 PM	16	168	13	1	6	5	0	0	0	0	0	0	0	38
12/14/2011 11:47 PM	10	115	11	1	15	2	0	2	0	0	0	0	1	26
12/15/2011 12:47 AM	20	97	8	0	8	2	1	0	0	0	0	0	0	18
12/15/2011 01:47 AM	4	37	3	1	2	0	0	0	0	0	0	0	0	17
12/15/2011 02:47 AM	1	28	1	0	3	1	0	1	0	0	0	0	0	5
12/15/2011 03:47 AM	0	12	1	1	1	0	0	0	0	0	0	0	0	3
12/15/2011 04:47 AM	2	8	0	0	5	0	0	0	0	0	0	0	0	4
12/15/2011 05:47 AM	2	10	1	0	3	1	0	0	1	0	0	0	0	1
12/15/2011 06:47 AM	8	23	3	0	3	4	0	0	0	1	0	0	0	3
12/15/2011 07:47 AM	6	76	12	0	9	4	1	1	1	0	0	0	0	6
12/15/2011 08:47 AM	22	166	26	5	13	10	0	1	0	0	0	0	2	33
12/15/2011 09:47 AM	24	178	27	5	9	10	0	4	2	1	0	0	2	17
12/15/2011 10:47 AM	30	141	26	3	14	5	0	2	3	0	0	0	1	28
12/15/2011 11:47 AM	16	117	18	5	29	7	0	0	2	0	0	0	2	33
12/15/2011 12:47 PM	23	166	21	5	28	8	0	7	1	0	0	0	1	32
12/15/2011 01:47 PM	21	188	47	6	32	5	2	4	1	0	0	0	0	38
12/15/2011 02:47 PM	20	209	32	5	18	5	1	4	0	0	0	0	7	43
12/15/2011 03:47 PM	13	226	33	3	15	8	0	4	2	0	0	0	12	60
12/15/2011 04:47 PM	16	409	68	4	9	6	0	3	3	0	0	0	8	47
12/15/2011 05:47 PM	9	506	71	4	11	12	2	2	2	2	0	0	10	70
12/15/2011 06:47 PM	23	492	46	2	8	12	2	2	1	0	0	0	17	71
12/15/2011 07:47 PM	21	373	40	2	9	10	1	1	2	0	0	0	16	94
12/15/2011 08:47 PM	15	242	36	4	8	11	2	2	1	1	0	0	4	70
12/15/2011 09:47 PM	12	195	32	5	11	9	1	0	1	0	0	0	4	71
12/15/2011 10:47 PM	13	76	53	5	27	4	0	1	0	0	0	0	1	59
12/15/2011 11:47 PM	6	52	43	7	23	6	0	0	0	0	0	0	1	41
12/16/2011 12:47 AM	4	51	42	6	15	5	1	0	0	0	0	0	2	34
12/16/2011 01:47 AM	5	36	31	1	10	4	0	0	0	0	0	0	0	11
12/16/2011 02:47 AM	3	16	12	0	9	3	0	0	0	0	0	0	0	12
12/16/2011 03:47 AM	0	13	11	2	2	2	0	0	0	0	0	0	0	4
12/16/2011 04:47 AM	2	9	4	0	4	0	0	0	0	0	0	0	0	12
12/16/2011 05:47 AM	2	6	3	1	5	2	0	0	0	0	0	0	1	5
12/16/2011 06:47 AM	3	16	12	3	9	4	0	0	0	0	0	0	0	12
12/16/2011 07:47 AM	2	35	30	3	16	6	1	0	0	0	0	0	0	30
12/16/2011 08:47 AM	13	83	57	4	35	5	0	1	0	0	0	0	5	79
12/16/2011 09:47 AM	10	122	58	13	38	12	0	1	0	0	0	0	5	55
12/16/2011 10:47 AM	6	79	59	4	38	13	1	3	2	1	0	0	5	50
12/16/2011 11:47 AM	9	121	61	6	47	20	2	2	3	0	0	0	1	66
12/16/2011 12:47 PM	12	62	28	15	102	14	0	4	0	1	0	0	3	52

12/16/2011 01:47 PM	7	32	41	21	135	20	1	9	1	1	0	1	4	57
12/16/2011 02:47 PM	20	49	30	23	129	21	2	6	0	1	0	0	8	124
12/16/2011 03:47 PM	29	63	25	27	155	24	3	2	1	0	0	0	8	109
12/16/2011 04:47 PM	23	54	20	18	145	29	4	4	1	3	0	0	16	147
12/16/2011 05:47 PM	22	51	59	12	120	16	3	14	1	2	1	0	13	179
12/16/2011 06:47 PM	6	12	21	0	6	2	2	4	2	0	0	0	12	101
12/16/2011 07:47 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	8

Combined

12/14/2011 11:47 AM	6	3	9	17	1	5	4	1	0	0	0	0	0	0
12/14/2011 12:47 PM	17	1	14	74	30	21	27	13	5	1	0	0	0	0
12/14/2011 01:47 PM	12	2	21	78	19	26	33	23	1	2	0	0	0	0
12/14/2011 02:47 PM	11	7	31	95	32	28	42	9	7	0	0	0	0	2
12/14/2011 03:47 PM	22	4	38	110	40	30	53	24	7	3	0	0	0	0
12/14/2011 04:47 PM	92	13	77	139	33	24	59	32	7	1	0	0	1	1
12/14/2011 05:47 PM	108	8	161	148	44	29	37	14	4	1	0	0	0	0
12/14/2011 06:47 PM	60	21	167	109	47	41	28	9	3	1	1	0	0	0
12/14/2011 07:47 PM	88	23	136	102	45	39	45	15	1	1	1	0	0	0
12/14/2011 08:47 PM	109	12	88	59	23	36	44	18	5	0	0	0	0	0
12/14/2011 09:47 PM	81	15	62	55	16	19	40	21	0	0	0	0	0	0
12/14/2011 10:47 PM	74	12	60	45	15	13	16	9	3	0	0	0	0	0
12/14/2011 11:47 PM	60	14	43	23	7	8	17	8	2	0	0	0	0	1
12/15/2011 12:47 AM	56	8	32	25	10	9	8	5	1	0	0	0	0	0
12/15/2011 01:47 AM	24	7	15	10	2	2	1	2	1	0	0	0	0	0
12/15/2011 02:47 AM	14	4	5	7	2	0	3	4	1	0	0	0	0	0
12/15/2011 03:47 AM	5	2	5	3	1	0	0	1	1	0	0	0	0	0
12/15/2011 04:47 AM	9	4	1	3	0	1	1	0	0	0	0	0	0	0
12/15/2011 05:47 AM	4	4	3	2	0	2	2	2	0	0	0	0	0	0
12/15/2011 06:47 AM	16	4	9	6	4	1	4	1	0	0	0	0	0	0
12/15/2011 07:47 AM	36	11	29	18	11	4	5	0	2	0	0	0	0	0
12/15/2011 08:47 AM	89	24	50	59	26	13	6	8	2	0	0	1	0	0
12/15/2011 09:47 AM	86	15	64	39	25	26	17	5	2	0	0	0	0	0
12/15/2011 10:47 AM	90	15	57	37	15	14	19	5	1	0	0	0	0	0
12/15/2011 11:47 AM	75	19	48	38	11	13	10	10	4	0	0	0	0	1
12/15/2011 12:47 PM	94	27	54	51	11	10	34	8	2	1	0	0	0	0
12/15/2011 01:47 PM	120	32	64	33	26	18	23	18	6	2	1	0	0	1
12/15/2011 02:47 PM	113	23	77	45	23	23	29	9	1	0	0	0	0	1
12/15/2011 03:47 PM	88	17	94	83	25	24	25	10	2	0	1	0	0	7
12/15/2011 04:47 PM	41	20	135	175	77	34	40	38	9	2	0	0	0	2
12/15/2011 05:47 PM	56	22	145	205	85	57	65	40	15	4	3	0	0	4
12/15/2011 06:47 PM	47	12	156	187	88	62	77	25	13	1	1	0	0	7
12/15/2011 07:47 PM	58	22	127	151	58	51	63	24	8	2	1	0	0	4
12/15/2011 08:47 PM	53	5	82	106	45	21	27	36	11	3	1	0	0	6
12/15/2011 09:47 PM	78	8	64	86	24	14	22	23	10	2	3	1	1	5
12/15/2011 10:47 PM	67	5	43	39	24	28	7	2	6	6	8	2	1	1
12/15/2011 11:47 PM	52	3	32	22	13	22	8	3	7	5	6	2	3	1
12/16/2011 12:47 AM	46	4	32	15	18	15	9	1	6	6	3	2	3	0
12/16/2011 01:47 AM	23	3	15	15	10	16	6	4	2	1	2	0	0	1
12/16/2011 02:47 AM	14	1	11	5	8	8	3	1	2	0	0	2	0	0
12/16/2011 03:47 AM	8	1	6	6	4	3	3	1	1	0	0	1	0	0
12/16/2011 04:47 AM	7	3	6	4	3	3	2	2	0	0	0	1	0	0
12/16/2011 05:47 AM	6	3	6	3	3	2	0	0	0	1	0	1	0	0
12/16/2011 06:47 AM	15	0	10	7	6	10	2	1	2	2	2	2	0	0
12/16/2011 07:47 AM	28	6	15	20	9	22	10	2	1	3	4	3	0	0
12/16/2011 08:47 AM	70	9	42	46	32	28	21	9	3	10	7	2	1	2
12/16/2011 09:47 AM	76	12	58	44	35	29	18	13	7	10	9	2	0	1
12/16/2011 10:47 AM	57	12	35	44	30	29	15	12	5	9	10	2	1	0
12/16/2011 11:47 AM	76	4	54	48	22	33	41	16	7	18	9	3	3	4
12/16/2011 12:47 PM	76	6	29	20	19	13	27	26	21	19	8	12	6	11

12/16/2011 01:47 PM	154	1	2	3	6	10	19	30	32	13	12	11	11	26
12/16/2011 02:47 PM	188	1	2	12	6	18	23	33	30	22	18	18	14	28
12/16/2011 03:47 PM	217	1	4	5	8	15	21	28	44	30	19	20	12	22
12/16/2011 04:47 PM	229	0	1	4	14	20	44	35	24	12	12	9	10	50
12/16/2011 05:47 PM	293	0	1	4	12	16	40	40	19	11	10	8	15	24
12/16/2011 06:47 PM	152	1	0	2	2	1	1	1	0	0	2	1	0	5
12/16/2011 07:47 PM	8	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX E

RAW CRASH DATA FROM MASSDOT

November 4, 2011

John Erikson
District Three
Worcester P I

E-mail: john.erikson@wpi.edu

CRASH DATA TRANSMITTAL

In accordance with your request, MassDOT is pleased to transmit the following crash data:

REQUEST NO.: 11-2211

CITIES/TOWN(S): Sterling

YEAR(S): 2007-2009

__X__ Via E-mail

_____ CD-ROM

_____ Paper Report

All files are Microsoft Excel except as noted. Please note that all crash locations are presented as "raw text" as received from the Registry of Motor Vehicles (RMV).

See the file named Support_Information_1-10.doc for more information.

The submitted information is subject to the terms of 23 United States Code, Section 409, which provides that any reports, surveys, schedules, lists, or data compiled shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

Direct all questions and requests to:

Neil E. Boudreau
State Traffic Engineer
ATTN: Rosalynd Scott
Massachusetts Department of Transportation – Highway Division
Traffic Engineering Section
10 Park Plaza, Rm. 7210
Boston, MA 02116
E-mail: CrashDataRequest@MHD.state.ma.us

MassHighway Crash Report for STERLING in the year 2007

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2300105	STERLING	02-Jan-2007	6:26 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Overturn/rollover	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2268312	STERLING	02-Jan-2007	7:15 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Slowing or stopped in traffic	V1:Southbound	V1: Not reported	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2234336	STERLING	06-Jan-2007	12:15 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Turning left	V1:Southbound	V1: Collision with utility pole	V1: Passenger car
2300093	STERLING	06-Jan-2007	8:20 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with guardrail	V1: Passenger car
2300086	STERLING	07-Jan-2007	5:12 PM	Non-fatal injury	1	2	0	Single vehicle crash	V1: Turning left	V1:Westbound	V1: Collision with tree	V1: Passenger car
2300082	STERLING	08-Jan-2007	9:18 AM	Property damage only (none injured)	2	0	0	Angle	V1: Entering traffic lane / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2157072	STERLING	08-Jan-2007	10:04 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Slowing or stopped in traffic	V1:Northbound	V1: Collision with embankment	V1: Passenger car
2300076	STERLING	09-Jan-2007	5:40 PM	Non-fatal injury	2	1	0	Rear-end	V1: Entering traffic lane / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2291456	STERLING	15-Jan-2007	5:45 AM	Non-fatal injury	2	1	0	Rear-end	V1: Entering traffic lane / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2359040	STERLING	18-Jan-2007	7:30 AM	Not Reported	2	0	0	Single vehicle crash	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2286879	STERLING	18-Jan-2007	10:30 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Other	V1: Passenger car
2300564	STERLING	18-Jan-2007	7:56 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with curb	V1: Passenger car
2301255	STERLING	19-Jan-2007	8:08 AM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with guardrail	V1: Not reported
2301260	STERLING	20-Jan-2007	10:25 AM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Turning left	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2301263	STERLING	21-Jan-2007	3:57 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with other movable object	V1: Passenger car
2301280	STERLING	23-Jan-2007	8:18 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with tree	V1: Passenger car
2301286	STERLING	23-Jan-2007	9:27 AM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Turning right	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2295729	STERLING	24-Jan-2007	5:40 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with tree	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2301297	STERLING	24-Jan-2007	8:29 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with tree	V1: Passenger car
2301300	STERLING	02-Feb-2007	6:39 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with tree	V1: Passenger car
2274461	STERLING	03-Feb-2007	9:30 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Slowing or stopped in traffic	V1:Southbound	V1: Collision with guardrail	V1: Passenger car
2284902	STERLING	07-Feb-2007	3:30 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Not reported	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2301313	STERLING	07-Feb-2007	10:23 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2362400	STERLING	08-Feb-2007	4:00 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car
2298515	STERLING	08-Feb-2007	5:04 PM	Non-fatal injury	2	1	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300038	STERLING	11-Feb-2007	5:05 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with tree	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2301347	STERLING	12-Feb-2007	6:58 AM	Not Reported	1	0	0	Single vehicle crash	V1: Turning right	V1:Westbound	V1: Collision with light pole or other post/support	V1: Tractor/semi-trailer
2337427	STERLING	12-Feb-2007	7:40 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2301365	STERLING	12-Feb-2007	2:24 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Entering traffic lane / V2:Entering traffic lane	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2301372	STERLING	14-Feb-2007	1:24 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with ditch	V1: Passenger car
2287663	STERLING	14-Feb-2007	1:39 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Turning left / V2:Making U-turn	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Bus (seats for more than 15 people, including driver) / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2301378	STERLING	21-Feb-2007	10:00 AM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with pedestrian	V1: Passenger car
2301387	STERLING	22-Feb-2007	10:35 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with utility pole	V1: Passenger car
2352447	STERLING	27-Feb-2007	6:00 AM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Turning right	V1:Southbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2300105	Ice	Dawn	Cloudy		289 PRINCETON ROAD				
2268312	Ice	Daylight	Cloudy	ROWLEY HILL ROAD / PINE WOODS LANE					
2234336	Dry	Daylight	Clear	PINE STREET / WAUSHACUM AVENUE	8 WAUSHACUM AVENUE				
2300093	Dry	Dark - lighted roadway	Clear	CLINTON ROAD Rte 62 W / Rte 62					
2300086	Dry	Dark - roadway not lighted	Clear		BOUTELLE ROAD / Rte 12				
2300082	Wet	Daylight	Cloudy/Rain	REDEMPTION ROCK TRAIL / PRINCETON ROAD					
2157072	Snow	Daylight	Cloudy/Snow		382 REDEMPTION ROCK TRAIL				
2300076	Dry	Dark - lighted roadway	Clear	INTERSTATE 190 Rte 190 S / LEOMINSTER ROAD Rte 12 N					
2291456	Wet	Dark - roadway not lighted	Rain/Fog, smog, smoke	LEOMINSTER ROAD / INTERSTATE 190 / Rte 12					
2359040	Dry	Dark - unknown roadway lighting	Clear		Rte 190 N / Rte 12		Exit 6 on Rte 190 N		
2286879	Snow	Dark - roadway not lighted	Snow/Sleet, hail (freezing rain or drizzle)		LUCAS ROAD				
2300564	Ice	Dark - roadway not lighted	Sleet, hail (freezing rain or drizzle)/Clear		84 CLINTON ROAD				
2301255	Snow	Daylight	Cloudy		39 LUCAS ROAD				
2301260	Dry	Daylight	Clear		171 WORCESTER ROAD				
2301263	Ice	Dark - roadway not lighted	Clear		LUCAS ROAD				
2301280	Wet	Daylight	Clear	CAMPGROUND ROAD / GATES ROAD					
2301286	Wet	Daylight	Clear	REDEMPTION ROCK TRAIL / PRINCETON ROAD					
2295729	Ice	Dusk	Clear		220 REDEMPTION ROCK TRAIL				
2301297	Wet	Daylight	Clear		83 MEETINGHOUSE HILL ROAD				
2301300	Dry	Daylight	Clear		279 REDEMPTION ROCK TRAIL				
2274461	Ice	Daylight	Clear		50 LEOMINSTER ROAD Rte 12 / Rte 12			DUNKIN DONUTS PLAZA	
2284902	Dry	Daylight	Clear	CHOCKSETT ROAD / LEOMINSTER ROAD					
2301313	Dry	Daylight	Clear		69 REDEMPTION ROCK TRAIL				
2362400	Dry	Daylight	Clear	CLINTON ROAD Rte 62 / FLAGG ROAD					
2298515	Dry	Daylight	Clear		NORTH ROW ROAD Rte 12 / PRATTS JUNCTION ROAD Rte 12				
2300038	Dry	Daylight	Clear		209 CHACE HILL ROAD			10 feet N from MEADOW BROOK ORCHARDS	
2301347	Dry	Dawn	Clear		SPRATT TECHNOLOGY WAY / PRATTS JUNCTION ROAD				
2337427	Dry	Daylight	Clear	Rte 62 / Rte 140					
2301365	Dry	Daylight	Clear/Other	CHOCKSETT ROAD / LEOMINSTER ROAD Rte 12					
2301372	Snow	Dark - roadway not lighted	Snow		NORTH ROW ROAD				
2287663	Snow	Daylight	Snow/Sleet, hail (freezing rain or drizzle)	LEOMINSTER ROAD Rte 12 / CHOCKSETT ROAD					
2301378	Dry	Daylight	Clear		46 ROWLEY HILL ROAD				
2301387	Snow	Dark - lighted roadway	Snow	MAPLE STREET / BIRD STREET					
2352447	Dry	Daylight	Clear	REDEMPTION ROCK TRAIL Rte 140					

Crash Number	X Coordinate	Y Coordinate
2300105	174222.202867669	909286.438859414
2268312	178328.394653060	910469.533432879
2234336	178573.437341288	909541.750008013
2300093		
2300086	177749.796477709	906389.687914800
2300082	174310.421913318	909239.125239734
2157072	173654.107573438	911826.520840443
2300076	179748.212628312	912116.231180627
2291456	179748.212640225	912116.231162005
2359040	179729.672094367	912040.937722340
2286879		
2300564	180473.804421432	910807.463481486
2301255	173193.882216040	915276.103790949
2301260	177761.823277723	908511.375271294
2301263		
2301280	178275.984285012	906437.062389124
2301286	174297.484185308	909273.749751765
2295729	174333.519284087	909161.708060548
2301297	179037.371857828	911009.089192555
2301300	174035.842536988	910051.553947102
2274461	179210.798794387	910247.352777386
2284902	179573.140382215	911457.374969799
2301313	175321.724727100	906547.571902046
2362400	181977.859488457	910279.250168700
2298515	179725.562137220	913429.562674340
2300038	181611.242247465	908044.107006314
2301347		
2337427	174310.421913318	909239.125239734
2301365	179573.140382215	911457.374969799
2301372		
2287663	179573.140382215	911457.374969799
2301378	178148.764336108	910868.805462570
2301387	178833.046941526	909544.562424015
2352447		

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2160811	STERLING	02-Mar-2007	6:50 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2160814	STERLING	02-Mar-2007	7:11 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Slowing or stopped in traffic	V1:Northbound	V1: Collision with guardrail	V1: Not reported
2165904	STERLING	02-Mar-2007	7:33 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Leaving traffic lane	V1:Southbound	V1: Collision with motor vehicle in traffic	V1: Passenger car
2160818	STERLING	02-Mar-2007	7:36 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2161552	STERLING	02-Mar-2007	9:45 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2277870	STERLING	04-Mar-2007	2:50 PM	Non-fatal injury	2	3	0	Angle	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2348272	STERLING	10-Mar-2007	2:55 AM	Non-fatal injury	2	2	0	Unknown	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Northbound / V2:Not reported	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2303084	STERLING	11-Mar-2007	8:04 AM	Property damage only (none injured)	1	0	0	Angle	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with utility pole	V1: Passenger car
2303086	STERLING	11-Mar-2007	8:40 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Not reported	V1: Passenger car
2371416	STERLING	12-Mar-2007	4:00 PM	Not Reported	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2303087	STERLING	13-Mar-2007	8:07 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with pedestrian	V1: Passenger car
2350137	STERLING	13-Mar-2007	8:07 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Not reported	V1: Passenger car
2303090	STERLING	13-Mar-2007	9:21 AM	Property damage only (none injured)	1	0	0	Rear-end	V1: Slowing or stopped in traffic	V1:Southbound	V1: Collision with motor vehicle in traffic	V1: Passenger car
2284155	STERLING	16-Mar-2007	8:00 AM	Property damage only (none injured)	4	0	0	Not reported	V1: Travelling straight ahead / V2:Other / V3:Not reported / V4:Not reported	V1:Southbound / V2:Southbound / V3:Not reported / V4:Not reported	V1: Not reported / V2: Not reported / V3: Not reported / V4: Not reported	V1: Passenger car / V2:Passenger car / V3:Not reported / V4:Not reported
2303093	STERLING	16-Mar-2007	12:49 PM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with tree	V1: Not reported
2300598	STERLING	18-Mar-2007	1:42 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with mail box	V1: Passenger car
2300595	STERLING	19-Mar-2007	10:29 AM	Not Reported	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Backing	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Other
2300592	STERLING	24-Mar-2007	3:18 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with tree	V1: Passenger car
2189086	STERLING	26-Mar-2007	9:10 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Reported but invalid	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2267003	STERLING	01-Apr-2007	3:05 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Travelling straight ahead / V2:Changing lanes	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Truck tractor (bobtail)
2300589	STERLING	04-Apr-2007	4:10 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with tree	V1: Passenger car
2349272	STERLING	04-Apr-2007	4:10 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Turning left	V1:Not reported	V1: Not reported	V1: Passenger car
2187383	STERLING	06-Apr-2007	8:03 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Changing lanes	V1:Southbound	V1: Reported but invalid	V1: Passenger car
2300585	STERLING	06-Apr-2007	3:00 PM	Property damage only (none injured)	1	0	0	Unknown	V1: Travelling straight ahead	V1:Southbound	V1: Collision with other movable object	V1: Passenger car
2300583	STERLING	07-Apr-2007	11:55 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with ditch	V1: Passenger car
2300578	STERLING	09-Apr-2007	4:16 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with utility pole	V1: Passenger car
2187439	STERLING	11-Apr-2007	11:07 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Entering traffic lane / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Truck/trailer
2300562	STERLING	12-Apr-2007	2:46 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with light pole or other post/support	V1: Passenger car
2300559	STERLING	12-Apr-2007	3:54 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with tree	V1: Passenger car
2187461	STERLING	12-Apr-2007	5:33 PM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2300557	STERLING	13-Apr-2007	7:43 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with tree	V1: Passenger car
2300555	STERLING	17-Apr-2007	8:56 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with utility pole	V1: Passenger car
2300552	STERLING	21-Apr-2007	6:07 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Not reported / V2:Passenger car
2300538	STERLING	21-Apr-2007	8:52 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2160811	Ice	Daylight	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)		Rte 190 N	100 feet S from Rte 190 N Milemarker 10.0			
2160814	Ice	Daylight	Sleet, hail (freezing rain or drizzle)/Cloudy		Rte 190 N	Rte 190 N Milemarker 9.8			
2165904	Slush	Dusk	Snow/Sleet, hail (freezing rain or drizzle)		Rte 62 S			ON RAMP FROM RT. 117 TO RT. 190	
2160818	Ice	Daylight	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)		Rte 190 N	Rte 190 N Milemarker 13.5			
2161552	Ice	Daylight	Rain/Sleet, hail (freezing rain or drizzle)		Rte 190 N		Exit 5 on Rte 190		
2277870	Dry	Daylight	Clear/Cloudy		175 LEOMINSTER ROAD			BARBERS CROSSING	
2348272	Dry	Dark - unknown roadway lighting	Clear		Rte 190		Exit 5 on Rte 190	BETWEEN EXITS 5 AND 6	
2303084	Ice	Daylight	Clear	PRINCETON ROAD / WILDER ROAD					
2303086	Ice	Daylight	Clear	PRINCETON ROAD / REDEMPTION ROCK TRAIL					
2371416	Dry	Daylight	Clear	Rte 62 / Rte 140					
2303087	Wet	Daylight	Clear		33 PRINCETON ROAD				P2:Pedestrian
2350137	Dry	Daylight	Clear		33 PRINCETON ROAD / Rte 12				
2303090	Dry	Daylight	Clear	REDEMPTION ROCK TRAIL / JOHN DEE ROAD					
2284155	Snow	Dark - roadway not lighted	Snow		Rte 190		Exit 5 on Rte 190		
2303093	Snow	Daylight	Snow/Blowing sand, snow		ROWLEY HILL ROAD			SMLD POLE 24	
2300598	Wet	Dark - lighted roadway	Clear		35 NORTH ROW ROAD				
2300595	Dry	Daylight	Clear	LEOMINSTER ROAD Rte 12 / PRATTS JUNCTION ROAD					
2300592	Ice	Dark - roadway not lighted	Clear		REDEMPTION ROCK TRAIL				
2189086	Dry	Daylight	Clear/Cloudy		Rte 190 S		Exit 6 on Rte 190 S		
2267003	Dry	Daylight	Clear		Rte 190 N				
2300589	Slush	Daylight	Sleet, hail (freezing rain or drizzle)		12 CAMPGROUND ROAD				
2349272	Ice	Daylight	Sleet, hail (freezing rain or drizzle)		CAMPGROUND ROAD / LAKE SHORE DRIVE Rte 12				
2187383	Dry	Daylight	Clear/Clear		Rte 190 S		Exit 5 on Rte 190 S		
2300585	Dry	Daylight	Clear		REDEMPTION ROCK TRAIL / DANA HILL ROAD				
2300583	Dry	Dark - roadway not lighted	Clear		METROPOLITAN ROAD Rte 110 E				
2300578	Dry	Dark - roadway not lighted	Clear		JUSTICE HILL CUTOFF				
2187439	Dry	Daylight	Clear/Clear		Rte 190 S		Exit 6 on Rte 190 S		
2300562	Ice	Daylight	Sleet, hail (freezing rain or drizzle)		140 JUSTICE HILL ROAD				
2300559	Ice	Daylight	Sleet, hail (freezing rain or drizzle)/Rain		500 feet W from intersection 104 MEETINGHOUSE HILL ROAD / LAURELWOOD ROAD				
2187461	Ice	Daylight	Sleet, hail (freezing rain or drizzle)/Sleet, hail (freezing rain or drizzle)		Rte 190 N		Exit 6 on Rte 190 N		
2300557	Wet	Daylight	Clear		72 KENDALL HILL ROAD				
2300555	Wet	Daylight	Snow/Rain		39 MAPLE STREET			SMLD POLE 11	
2300552	Dry	Daylight	Clear	NORTH OAKDALE CUTOFF STREET / REDEMPTION ROCK TRAIL					
2300538	Dry	Dark - lighted roadway	Clear		9 DANA HILL ROAD				

Crash Number	X Coordinate	Y Coordinate
2160811	175760.117998248	906941.065690619
2160814	175745.584592916	906650.062335880
2165904	181577.695579042	915258.918395555
2160818	178994.713363706	911370.009386320
2161552	175525.605695785	905843.637049904
2277870	179789.368238323	912387.153003030
2348272	175525.605695785	905843.637049904
2303084	175155.687322102	909485.874935962
2303086	174297.484185308	909273.749751765
2371416	174310.421913318	909239.125239734
2303087	177928.391340030	909291.681126137
2350137		
2303090	175114.250138067	907276.437749904
2284155	175510.472223557	905885.472423811
2303093		
2300598	179193.417238805	913530.856638807
2300595	179725.562270358	913429.562619634
2300592		
2189086	179739.077294800	912111.162273067
2267003	179998.343582615	912189.062394480
2300589	178385.537211440	906390.769803117
2349272	177790.688090080	905769.250067024
2187383	175693.716891124	906388.755337297
2300585	175378.906036859	906322.437253193
2300583		
2300578		
2187439	180024.131598404	912273.827117507
2300562	174532.658395701	913970.551525428
2300559	179191.394994039	911168.017331920
2187461	179163.866266963	911598.802218519
2300557	179666.066879031	908315.435367268
2300555	179063.943709905	909348.387820781
2300552	173720.797080768	911326.562553677
2300538	175435.893918570	906374.439801713

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2187516	STERLING	23-Apr-2007	1:35 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with guardrail	V1: Passenger car
2257658	STERLING	01-May-2007	6:30 AM	Non-fatal injury	2	2	0	Sideswipe, same direction	V1: Travelling straight ahead / V2:Changing lanes	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Tractor/semi-trailer
2300528	STERLING	04-May-2007	12:29 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300512	STERLING	04-May-2007	6:05 PM	Property damage only (none injured)	2	0	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2209643	STERLING	07-May-2007	8:15 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with animal - deer	V1: Passenger car
2300502	STERLING	07-May-2007	8:49 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with animal - deer	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2300490	STERLING	09-May-2007	1:07 PM	Property damage only (none injured)	3	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic / V3:Slowing or stopped in traffic	V1:Northbound / V2:Not reported / V3:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car / V3:Passenger car
2300471	STERLING	11-May-2007	5:11 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Entering traffic lane / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300466	STERLING	17-May-2007	12:25 PM	Non-fatal injury	2	1	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2209879	STERLING	22-May-2007	8:10 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with guardrail	V1: Passenger car
2300450	STERLING	23-May-2007	4:45 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2212700	STERLING	26-May-2007	2:48 AM	Fatal injury	2	0	1	Angle	V1: Travelling straight ahead / V2:Parked	V1:Northbound / V2:Northbound	V1: Collision with guardrail / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300445	STERLING	27-May-2007	8:57 AM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with tree	V1: Not reported
2209983	STERLING	28-May-2007	9:50 PM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2300431	STERLING	04-Jun-2007	3:25 PM	Non-fatal injury	2	1	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2300422	STERLING	07-Jun-2007	7:06 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2368457	STERLING	08-Jun-2007	6:00 AM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Eastbound / V2:Southbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2300418	STERLING	13-Jun-2007	5:52 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2300458	STERLING	15-Jun-2007	12:37 PM	Non-fatal injury	3	2	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead	V1:Southbound / V2:Southbound / V3:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car / V3:Passenger car
2300413	STERLING	16-Jun-2007	10:13 AM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300409	STERLING	19-Jun-2007	1:24 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Entering traffic lane / V2:Entering traffic lane	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300404	STERLING	20-Jun-2007	5:45 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2322688	STERLING	21-Jun-2007	3:30 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Not reported
2215428	STERLING	23-Jun-2007	3:37 PM	Non-fatal injury	1	3	0	Single vehicle crash	V1: Changing lanes	V1:Southbound	V1: Reported but invalid	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2300374	STERLING	26-Jun-2007	8:27 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Backing	V1:Northbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)	V1: Other
2300366	STERLING	26-Jun-2007	7:47 PM	Non-fatal injury	2	1	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300360	STERLING	28-Jun-2007	4:39 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Parked / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with parked motor vehicle / V2: Collision with parked motor vehicle	V1: Passenger car / V2:Passenger car
2220828	STERLING	28-Jun-2007	10:20 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with animal - deer	V1: Passenger car
2300353	STERLING	03-Jul-2007	5:20 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2267109	STERLING	09-Jul-2007	8:04 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Entering traffic lane / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Truck/trailer
2300312	STERLING	12-Jul-2007	3:59 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	V1: Turning left / V2:Travelling straight ahead	V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Tractor/semi-trailer / V2:Passenger car

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2187516	Dry	Not reported	Clear/Clear		Rte 190 S		Exit 5 on Rte 190 S	190S PRIOR TO EXIT 5	
2257658	Dry	Daylight	Cloudy		Rte 190 S		Exit 5 on Rte 190 S		
2300528	Dry	Daylight	Clear	PRATTS JUNCTION ROAD / LEOMINSTER ROAD					
2300512	Dry	Daylight	Clear		140 LEOMINSTER ROAD				
2209643	Dry	Daylight	Clear		Rte 190 N / Rte 190		Exit 5 on Rte 190		
2300502	Dry	Daylight	Clear		22 CLINTON ROAD				
2300490	Dry	Daylight	Clear		135 LEOMINSTER ROAD				
2300471	Dry	Daylight	Cloudy	CHOCKSETT ROAD / LEOMINSTER ROAD / Rte 12					
2300466	Dry	Daylight	Clear	INTERSTATE 190 / LEOMINSTER ROAD / Rte 12					
2209879	Dry	Dusk	Clear/Clear		Rte 190 S		Exit 5 on Rte 190 S		
2300450	Dry	Daylight	Clear	LEOMINSTER ROAD / CHOCKSETT ROAD					
2212700	Dry	Dark - roadway not lighted	Clear/Clear		Rte 190 N	Rte 190 N Milemarker 10.7	Exit 5 on Rte 190 N		
2300445	Dry	Daylight	Cloudy/Clear		329 REDEMPTION ROCK TRAIL				
2209983	Dry	Dark - roadway not lighted	Clear/Clear		Rte 190 N		Exit 5 on Rte 190		
2300431	Wet	Daylight	Rain/Cloudy		50 LEOMINSTER ROAD			10 feet S from DUNKIN DONUTS	
2300422	Dry	Daylight	Cloudy	REDEMPTION ROCK TRAIL / PRINCETON ROAD					
2368457	Dry	Daylight	Clear	Rte 62 / Rte 140					
2300418	Dry	Daylight	Cloudy	LEOMINSTER ROAD / CHOCKSETT ROAD / Rte 12					
2300458	Dry	Daylight	Clear	INTERSTATE 190 Rte 190 S / LEOMINSTER ROAD / Rte 12					
2300413	Dry	Daylight	Clear	BOUTELLE ROAD / MUDDY POND ROAD					
2300409	Dry	Daylight	Clear	INTERSTATE 190 / REDEMPTION ROCK TRAIL					
2300404	Dry	Daylight	Clear		REDEMPTION ROCK TRAIL			FOUR SONS WAY	
2322688	Dry	Daylight	Clear		CHOCKSETT ROAD Rte 12 / Rte 12				
2215428	Dry	Daylight	Clear		Rte 190 S		Exit 5 on Rte 190 S		
2300374	Dry	Daylight	Clear		205 UPPER NORTH ROW ROAD				
2300366	Dry	Daylight	Clear	LEOMINSTER ROAD / CHOCKSETT ROAD					
2300360	Dry	Daylight	Clear		MAIN STREET / WAUSHACUM AVENUE				
2220828	Dry	Dark - roadway not lighted	Clear		Rte 190 N		Exit 6 on Rte 190 N		
2300353	Dry	Daylight	Clear		32 REDEMPTION ROCK TRAIL				
2267109	Dry	Daylight	Clear		Rte 190 N		Exit 6 on Rte 190 N		
2300312	Dry	Daylight	Clear		FLAGG ROAD				

Crash Number	X Coordinate	Y Coordinate
2187516	175693.716891124	906388.755337297
2257658	175510.462932804	905885.459659649
2300528	179725.562270358	913429.562619634
2300512	179652.434204443	911812.724388821
2209643	175525.604927836	905843.636370495
2300502	179706.452197092	910314.116012903
2300490	179643.529808083	911717.108768010
2300471	179573.140382215	911457.374969799
2300466	179748.212628312	912116.231180627
2209879	175510.462932804	905885.459659649
2300450	179573.140382215	911457.374969799
2212700	176410.463793689	907842.863340793
2300445	174019.908511269	910145.927727792
2209983	175525.604927836	905843.636370495
2300431	179210.798794387	910247.352777386
2300422	174297.484185308	909273.749751765
2368457	174310.421913318	909239.125239734
2300418	179573.140382215	911457.374969799
2300458	179748.212628312	912116.231180627
2300413	176952.468891777	907324.937461950
2300409	175517.531546444	905833.125108562
2300404	173472.281496537	912353.624826633
2322688	179573.140383355	911457.374957231
2215428	175510.462932804	905885.459659649
2300374	175831.263972177	913969.935963255
2300366	179573.140382215	911457.374969799
2300360	178508.000157230	909638.625016104
2220828	179720.853377159	912036.704765158
2300353	175435.558850746	906093.343504483
2267109	179720.853377159	912036.704765158
2300312		

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2219318	STERLING	15-Jul-2007	1:25 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Slowing or stopped in traffic	V1:Northbound	V1: Collision with curb	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2300297	STERLING	22-Jul-2007	4:06 AM	Unknown	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with tree	V1: Passenger car
2300263	STERLING	24-Jul-2007	6:50 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300255	STERLING	29-Jul-2007	4:29 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	V1: Slowing or stopped in traffic / V2:Turning left	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Single-unit truck (2-axle, 6-tire)
2300207	STERLING	30-Jul-2007	8:14 AM	Non-fatal injury	2	1	0	Rear-end	V1: Turning left / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2223511	STERLING	14-Aug-2007	12:19 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2300228	STERLING	16-Aug-2007	1:34 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Northbound	V1: Collision with highway traffic sign post / V2: Other non-collision	V1: Passenger car / V2:Passenger car
2300179	STERLING	28-Aug-2007	9:03 PM	Non-fatal injury	2	1	0	Rear-end	V1: Turning right / V2:Turning right	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300170	STERLING	29-Aug-2007	8:40 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Not reported	V1: Motorcycle
2300165	STERLING	01-Sep-2007	3:30 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300157	STERLING	03-Sep-2007	7:01 PM	Non-fatal injury	2	1	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300130	STERLING	09-Sep-2007	6:36 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with tree	V1: Passenger car
2382993	STERLING	12-Sep-2007	3:10 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Travelling straight ahead / V2:Not reported	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2300127	STERLING	19-Sep-2007	2:20 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with tree	V1: Passenger car
2300121	STERLING	21-Sep-2007	3:51 PM	Non-fatal injury	2	2	0	Angle	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2375940	STERLING	22-Sep-2007	11:50 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2300112	STERLING	23-Sep-2007	1:57 PM	Property damage only (none injured)	2	0	0	Angle	V1: Turning right / V2:Travelling straight ahead	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2301250	STERLING	28-Sep-2007	12:41 PM	Not Reported	2	0	0	Single vehicle crash	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Southbound	V1: Collision with other movable object / V2: Other non-collision	V1: Passenger car / V2:Single-unit truck (2-axle, 6-tire)
2301246	STERLING	29-Sep-2007	10:58 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2301238	STERLING	06-Oct-2007	12:53 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2301232	STERLING	07-Oct-2007	6:57 PM	Non-fatal injury	3	1	0	Angle	V1: Turning left / V2:Travelling straight ahead / V3:Travelling straight ahead	V1:Westbound / V2:Southbound / V3:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car / V3:Passenger car
2301212	STERLING	10-Oct-2007	5:25 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Turning left / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Single-unit truck (2-axle, 6-tire)
2301203	STERLING	19-Oct-2007	5:06 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2299801	STERLING	30-Oct-2007	6:05 AM	Non-fatal injury	3	1	0	Angle	V1: Turning left / V2:Slowing or stopped in traffic / V3:Slowing or stopped in traffic	V1:Northbound / V2:Southbound / V3:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with other movable object	V1: Passenger car / V2:Motorcycle / V3:Passenger car
2259728	STERLING	30-Oct-2007	11:20 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with animal - deer	V1: Passenger car
2301164	STERLING	01-Nov-2007	5:16 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Turning right / V2:Turning right	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2301148	STERLING	10-Nov-2007	7:59 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with other fixed object (wall, building, tunnel, etc.)	V1: Passenger car
2267980	STERLING	12-Nov-2007	4:52 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with animal - deer	V1: Passenger car
2301140	STERLING	12-Nov-2007	9:24 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Turning left	V1:Eastbound	V1: Collision with motor vehicle in traffic	V1: Passenger car
2301135	STERLING	17-Nov-2007	12:02 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Backing / V2:Parked	V1:Not reported / V2:Not reported	V1: Collision with parked motor vehicle / V2: Other	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2263381	STERLING	19-Nov-2007	3:46 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2219318	Dry	Dark - lighted roadway	Clear		Rte 190 N		Exit 6 on Rte 190 N		
2300297	Dry	Dark - roadway not lighted	Clear		112 KENDALL HILL ROAD				
2300263	Dry	Daylight	Cloudy	CHOCKSETT ROAD / LEOMINSTER ROAD					
2300255	Dry	Daylight	Clear	WAUSHACUM AVENUE / SCHOOL STREET					
2300207	Dry	Daylight	Cloudy	CLINTON ROAD Rte 62 E / FLAGG ROAD					
2223511	Dry	Daylight	Clear		Rte 190		Exit 5 on Rte 190	HEADING NORTH	
2300228	Dry	Daylight	Clear	INTERSTATE 190 / LEOMINSTER ROAD / Rte 12					
2300179	Dry	Dark - lighted roadway	Clear	LEOMINSTER ROAD / CHOCKSETT ROAD					
2300170	Dry	Dark - roadway not lighted	Clear		50 feet S from intersection REDEMPTION ROCK TRAIL / JOHNSON ROAD				
2300165	Dry	Daylight	Clear	MAIN STREET / CLINTON ROAD					
2300157	Dry	Daylight	Clear		73 NEWELL HILL ROAD				
2300130	Wet	Dusk	Cloudy		154 REDEMPTION ROCK TRAIL				
2382993	Wet	Daylight	Rain		Rte 190 N				
2300127	Dry	Dark - roadway not lighted	Clear		7 ELLIOTT ROAD				
2300121	Dry	Daylight	Clear		140 LEOMINSTER ROAD				
2375940	Dry	Daylight	Clear		Rte 140				
2300112	Dry	Daylight	Clear	REDEMPTION ROCK TRAIL / PRINCETON ROAD					
2301250	Dry	Daylight	Clear		1500 feet N from intersection 194 WORCESTER ROAD Rte 12 / GREENLAND ROAD Rte 12 N				
2301246	Dry	Daylight	Clear	CHOCKSETT ROAD / CLINTON ROAD					
2301238	Dry	Daylight	Clear	PRINCETON ROAD / REDEMPTION ROCK TRAIL					
2301232	Dry	Dark - roadway not lighted	Clear		LEOMINSTER ROAD / INTERSTATE 190				
2301212	Wet	Daylight	Rain		MEETINGHOUSE HILL ROAD / PARK STREET				
2301203	Wet	Daylight	Cloudy/Rain	LEOMINSTER ROAD / CHOCKSETT ROAD					
2299801	Dry	Dark - lighted roadway	Clear	REDEMPTION ROCK TRAIL Rte 140 / PRINCETON ROAD Rte 62					
2259728	Dry	Dark - roadway not lighted	Clear		Rte 190 S	500 feet N from Rte 190 S Milemarker 12.0			
2301164	Dry	Daylight	Cloudy	CHOCKSETT ROAD / LEOMINSTER ROAD					
2301148	Dry	Dark - roadway not lighted	Clear		10 KILBURN ROAD				
2267980	Dry	Dark - lighted roadway	Clear		Rte 190 S		Exit 6 on Rte 190 S		
2301140	Dry	Dark - lighted roadway	Clear	SQUARESHIRE ROAD / CAMPGROUND ROAD					
2301135	Dry	Daylight	Clear		MAIN STREET				
2263381	Dry	Daylight	Clear		Rte 190 N		Exit 5 on Rte 190		

Crash Number	X Coordinate	Y Coordinate
2219318	179720.853377159	912036.704765158
2300297	180062.401814317	907909.842832714
2300263	179573.140382215	911457.374969799
2300255	178617.593757331	909481.374967959
2300207	181977.859488457	910279.250168700
2223511	175525.604927836	905843.636370495
2300228	179748.212628312	912116.231180627
2300179	179573.140382215	911457.374969799
2300170		
2300165	178834.765725531	909734.749944195
2300157	178410.871188285	908024.218350932
2300130	174670.122496813	907950.864014623
2382993		
2300127	174441.892256284	913970.048077268
2300121	179652.434204443	911812.724388821
2375940		
2300112	174297.484185308	909273.749751765
2301250		
2301246	181327.702943854	910733.375225123
2301238	174297.484185308	909273.749751765
2301232	179748.212640225	912116.231162005
2301212	178587.156450807	909790.062522101
2301203	179573.140382215	911457.374969799
2299801	174297.484185308	909273.749751765
2259728	177386.193704241	909714.937980365
2301164	179573.140382215	911457.374969799
2301148	178093.407943774	911289.184837753
2267980	179739.077294800	912111.162273067
2301140	179868.265374497	905903.125236627
2301135		
2263381	175525.604927836	905843.636370495

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2301128	STERLING	19-Nov-2007	5:26 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2267982	STERLING	20-Nov-2007	9:55 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Reported but invalid	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2372341	STERLING	20-Nov-2007	10:15 AM	Non-fatal injury	2	1	0	Not reported	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Tractor/semi-trailer
2301108	STERLING	21-Nov-2007	7:25 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with tree	V1: Other
2327730	STERLING	21-Nov-2007	9:07 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Not reported	V1: Not reported
2328443	STERLING	21-Nov-2007	11:00 AM	Non-fatal injury	1	1	0	Not reported	V1: Turning right	V1:Not reported	V1: Not reported	V1: Not reported
2301099	STERLING	23-Nov-2007	9:40 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with tree	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2349135	STERLING	26-Nov-2007	8:50 AM	Property damage only (none injured)	2	0	0	Angle	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Southbound / V2:Northbound	V1: Not reported / V2: Not reported	V1: Not reported / V2:Passenger car
2301095	STERLING	28-Nov-2007	5:50 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with animal - deer	V1: Passenger car
2301091	STERLING	29-Nov-2007	8:00 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2301089	STERLING	30-Nov-2007	10:00 AM	Not Reported	2	0	0	Sideswipe, opposite direction	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Truck/trailer
2301083	STERLING	03-Dec-2007	6:35 AM	Not Reported	2	0	0	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2301082	STERLING	03-Dec-2007	11:07 AM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Not reported	V1: Passenger car
2298266	STERLING	06-Dec-2007	12:45 PM	Non-fatal injury	1	1	0	Not reported	V1: Travelling straight ahead	V1:Not reported	V1: Not reported	V1: Passenger car
2301079	STERLING	06-Dec-2007	12:52 PM	Non-fatal injury	2	1	0	Angle	V1: Turning left / V2:Slowing or stopped in traffic	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2301081	STERLING	07-Dec-2007	4:59 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with tree	V1: Passenger car
2301078	STERLING	08-Dec-2007	1:57 AM	Non-fatal injury	2	4	0	Rear-end	V1: Travelling straight ahead / V2:Parked	V1:Eastbound / V2:Eastbound	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2265036	STERLING	10-Dec-2007	5:55 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2301076	STERLING	11-Dec-2007	6:28 PM	Not Reported	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2301074	STERLING	12-Dec-2007	5:44 PM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with utility pole	V1: Passenger car
2301073	STERLING	13-Dec-2007	12:58 PM	Non-fatal injury	2	1	0	Sideswipe, same direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Westbound / V2:Eastbound	V1: Collision with utility pole / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2301072	STERLING	13-Dec-2007	6:36 PM	Non-fatal injury	2	3	0	Head-on	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2301071	STERLING	13-Dec-2007	9:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with tree	V1: Passenger car
2300576	STERLING	14-Dec-2007	8:27 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Backing / V2:Slowing or stopped in traffic	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300566	STERLING	17-Dec-2007	11:49 AM	Property damage only (none injured)	2	0	0	Angle	V1: Turning right / V2:Turning left	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2300549	STERLING	17-Dec-2007	10:07 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300540	STERLING	19-Dec-2007	8:31 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300527	STERLING	20-Dec-2007	4:12 PM	Property damage only (none injured)	2	0	0	Head-on	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Bus (seats for more than 15 people, including driver) / V2:Passenger car
2300511	STERLING	26-Dec-2007	12:45 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2319524	STERLING	27-Dec-2007	6:51 PM	Property damage only (none injured)	2	0	0	Head-on	V1: Travelling straight ahead / V2:Turning left	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300503	STERLING	28-Dec-2007	9:08 AM	Non-fatal injury	2	4	0	Angle	V1: Travelling straight ahead / V2:Turning left	V1:Westbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300483	STERLING	28-Dec-2007	10:36 AM	Not Reported	2	0	0	Angle	V1: Turning left / V2:Overtaking/passing	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300476	STERLING	31-Dec-2007	10:37 AM	Property damage only (none injured)	1	0	0	Unknown	V1: Travelling straight ahead	V1:Northbound	V1: Jackknife	V1: Truck/trailer

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2301128	Dry	Dark - roadway not lighted	Cloudy	CROWLEY ROAD / REDEMPTION ROCK TRAIL					
2267982	Snow	Daylight	Snow		Rte 190 N		Exit 5 on Rte 190		
2372341	Not reported	Not reported	Not Reported		Rte 190		Exit 6 on Rte 190		
2301108	Wet	Daylight	Cloudy/Rain		500 feet E from Intersection CROWLEY ROAD / REDEMPTION ROCK TRAIL				
2327730	Dry	Daylight	Clear		Rte 190		Exit 6 on Rte 190		
2328443	Wet	Dark - roadway not lighted	Fog, smog, smoke		Rte 12 / Rte 12				
2301099	Dry	Dark - roadway not lighted	Clear		HASTING ROAD				
2349135	Dry	Daylight	Cloudy		Rte 12 / Rte 12				
2301095	Dry	Dark - roadway not lighted	Clear		REDEMPTION ROCK TRAIL				
2301091	Dry	Daylight	Cloudy		301 LEOMINSTER ROAD				
2301089	Dry	Daylight	Clear	BIRD STREET / SHOLAN TERRACE					
2301083	Snow	Dawn	Sleet, hail (freezing rain or drizzle)/Cloudy		50 feet E from Intersection 167 CLINTON ROAD / CHOCKSETT ROAD				
2301082	Snow	Daylight	Rain/Cloudy		338 UPPER NORTH ROW ROAD				
2298266	Wet	Daylight	Cloudy	Rte 62 / Rte 140					
2301079	Dry	Daylight	Clear	REDEMPTION ROCK TRAIL / PRINCETON ROAD					
2301081	Ice	Dark - roadway not lighted	Snow		500 feet S from Intersection 372 REDEMPTION ROCK TRAIL / BEAMAN ROAD				
2301078	Wet	Dark - lighted roadway	Clear		153 CLINTON ROAD				
2265036	Ice	Dark - roadway not lighted	Sleet, hail (freezing rain or drizzle)		Rte 190 N / Rte 190		Exit 5 on Rte 190		
2301076	Wet	Dark - lighted roadway	Rain/Cloudy	MAIN STREET / LEOMINSTER ROAD					
2301074	Dry	Dark - roadway not lighted	Cloudy		TWINE ROAD Rte 12 / GATES ROAD Rte 12				
2301073	Snow	Daylight	Snow		32 CHOCKSETT ROAD				
2301072	Snow	Dark - roadway not lighted	Snow/Blowing sand, snow	LEOMINSTER ROAD Rte 12 / LAURELWOOD ROAD					
2301071	Snow	Dark - roadway not lighted	Snow		298 UPPER NORTH ROW ROAD				
2300576	Slush	Daylight	Clear		DANA HILL ROAD / Rte 140				
2300566	Wet	Daylight	Clear		261 LEOMINSTER ROAD / NORTH ROW ROAD				
2300549	Ice	Dark - lighted roadway	Clear	PRINCETON ROAD / BEAMAN ROAD					
2300540	Wet	Daylight	Clear	REDEMPTION ROCK TRAIL / JENNIFER LANE / RAMP - RT 140 TO RT 190 NB					
2300527	Snow	Daylight	Snow		500 feet E from Intersection 130 CHACE HILL ROAD				
2300511	Dry	Daylight	Clear		50 LEOMINSTER ROAD				
2319524	Wet	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)	LEOMINSTER ROAD / CHOCKSETT ROAD					
2300503	Dry	Daylight	Clear	CLINTON ROAD / FLAGG ROAD					
2300483	Wet	Daylight	Clear	NORTH OAKDALE CUT OFF / REDEMPTION ROCK TRAIL					
2300476	Snow	Daylight	Clear		160 REDEMPTION ROCK TRAIL				

Crash Number	X Coordinate	Y Coordinate
2301128	174684.875161663	907925.062390510
2267982	175525.604927836	905843.636370495
2372341	179720.827469991	912036.689603659
2301108	174833.678330005	907957.988181859
2327730	179739.108068371	912111.179638409
2328443		
2301099		
2349135		
2301095		
2301091	179560.620990139	913899.074914294
2301089	178787.765661485	909488.562423963
2301083	181722.062289430	910524.360175041
2301082	174897.317395316	914011.175821071
2298266	174310.421913318	909239.125239734
2301079	174297.484185308	909273.749751765
2301081	173683.975727407	911683.582992499
2301078	181567.224265487	910635.087894346
2265036	175525.604927836	905843.636370495
2301076	178730.984349437	909749.312248208
2301074	178268.906397007	906501.437685184
2301073	180500.270329734	911238.496761235
2301072	179617.809875065	911625.574112020
2301071	175186.578460694	913987.174374870
2300576	175378.906182287	906322.437534344
2300566	179725.562270358	913429.562619634
2300549	176804.156315640	909951.250168394
2300540	175555.062682480	905781.625076514
2300527	181021.403170570	907566.932390294
2300511	179210.798794387	910247.352777386
2319524	179573.140382215	911457.374969799
2300503	181977.859488457	910279.250168700
2300483	173720.797080770	911326.562553678
2300476	174616.785626824	908074.028416504

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration

MassDOT Crash Report for STERLING for the year 2008

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2308111	STERLING	04-Jan-2008	6:32 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Entering traffic lane	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2308108	STERLING	05-Jan-2008	12:27 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2308074	STERLING	08-Jan-2008	8:21 AM	Not Reported	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2308072	STERLING	08-Jan-2008	10:31 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with embankment	V1: Passenger car
2308069	STERLING	11-Jan-2008	7:54 AM	Non-fatal injury	2	1	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2308060	STERLING	11-Jan-2008	11:15 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with embankment	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2306732	STERLING	12-Jan-2008	00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with embankment	V1: Passenger car
2308057	STERLING	12-Jan-2008	11:02 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2300831	STERLING	14-Jan-2008	6:58 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2406986	STERLING	14-Jan-2008	7:30 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Slowing or stopped in traffic	V1:Southbound	V1: Not reported	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2271707	STERLING	14-Jan-2008	7:55 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Not reported	V1: Collision with median barrier	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2308053	STERLING	14-Jan-2008	7:58 AM	Non-fatal injury	2	1	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2326070	STERLING	14-Jan-2008	8:20 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Changing lanes	V1:Southbound	V1: Overturn/rollover	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2308259	STERLING	14-Jan-2008	1:23 PM	Non-fatal injury	2	1	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2308254	STERLING	18-Jan-2008	6:36 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with tree	V1: Passenger car
2308748	STERLING	22-Jan-2008	11:39 AM	Non-fatal injury	2	2	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2308770	STERLING	23-Jan-2008	9:08 AM	Property damage only (none injured)	3	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead / V3:Travelling straight ahead	V1:Southbound / V2:Northbound / V3:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car / V3:Passenger car
2408121	STERLING	23-Jan-2008	5:07 PM	Property damage only (none injured)	3	0	0	Unknown	V1: Turning left / V2:Travelling straight ahead / V3:Travelling straight ahead	V1:Northbound / V2:Southbound / V3:Southbound	V1: Not reported / V2: Not reported / V3: Not reported	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Not reported / V3:Not reported
2308535	STERLING	27-Jan-2008	10:51 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Other	V1: Passenger car
2309941	STERLING	27-Jan-2008	11:44 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2308523	STERLING	31-Jan-2008	4:09 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2308511	STERLING	01-Feb-2008	1:58 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with tree	V1: Passenger car
2301342	STERLING	08-Feb-2008	1:54 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2308505	STERLING	08-Feb-2008	7:42 AM	Not Reported	2	0	0	Sideswipe, same direction	V1: Overtaking/passing / V2:Slowing or stopped in traffic	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2308495	STERLING	10-Feb-2008	1:27 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Overturn/rollover	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2308469	STERLING	12-Feb-2008	10:08 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Other	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2308452	STERLING	13-Feb-2008	9:03 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with tree	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2308445	STERLING	14-Feb-2008	5:10 PM	Property damage only (none injured)	2	0	0	Head-on	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2289220	STERLING	21-Feb-2008	5:00 PM	Property damage only (none injured)	2	0	0	Not reported	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with other movable object / V2: Cargo/equipment loss or shift	V1: Passenger car / V2:Passenger car

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2308111	Dry	Dark - lighted roadway	Clear	LEOMINSTER ROAD / CHOCKSETT ROAD					
2308108	Dry	Daylight	Clear		LEOMINSTER ROAD / CHOCKSETT ROAD				
2308074	Wet	Daylight	Cloudy	PRATTS JUNCTION ROAD / LINDAS WAY					
2308072	Wet	Dark - roadway not lighted	Fog, smog, smoke		GATES ROAD				
2308069	Wet	Daylight	Cloudy/Rain	REDEMPTION ROCK TRAIL / PRINCETON ROAD					
2308060	Ice	Dark - roadway not lighted	Other		PRATTS JUNCTION ROAD / INTERSTATE 190				
2306732	Ice	Dark - roadway not lighted	Cloudy/Rain		METROPOLITAN ROAD Rte 110 N			100 feet S from CLINTON TOWN LINE	
2308057	Wet	Daylight	Clear		27 MAIN STREET				
2300831	Snow	Daylight	Snow		INTERSTATE 190				
2406986	Snow	Daylight	Snow/Clear	Rte 190					
2271707	Snow	Daylight	Snow		Rte 190 S		Exit 6 on Rte 190 S		
2308053	Snow	Daylight	Snow		110 LEOMINSTER ROAD				
2326070	Snow	Daylight	Snow		Rte 190 S		Exit 6 on Rte 190 S		
2308259	Snow	Daylight	Cloudy		61 CLINTON ROAD				
2308254	Wet	Dark - lighted roadway	Clear	REDEMPTION ROCK TRAIL / NORTH OAKDALE CUT OFF					
2308748	Dry	Daylight	Clear		175 LEOMINSTER ROAD				
2308770	Wet	Daylight	Clear		372 REDEMPTION ROCK TRAIL				
2408121	Dry	Daylight	Clear		Rte 12 / Rte 12				
2308535	Snow	Daylight	Snow/Cloudy		74 HEYWOOD ROAD				
2309941	Snow	Daylight	Snow		67 CHOCKSETT ROAD				
2308523	Dry	Daylight	Cloudy		95 BEAMAN ROAD				
2308511	Ice	Daylight	Snow		104 WORCESTER ROAD				
2301342	Dry	Daylight	Clear	CLINTON ROAD Rte 62 / FLAGG ROAD					
2308505	Wet	Daylight	Clear/Cloudy		73 REDEMPTION ROCK TRAIL				
2308495	Slush	Dark - roadway not lighted	Cloudy/Snow		84 CLINTON ROAD				
2308469	Snow	Dark - lighted roadway	Snow		CLINTON ROAD / CHOCKSETT ROAD				
2308452	Slush	Dark - roadway not lighted	Rain		HEYWOOD ROAD				
2308445	Sand, mud, dirt, oil, gravel	Dusk	Clear	ALBRIGHT ROAD / CHOCKSETT ROAD					
2289220	Dry	Dusk	Clear		Rte 190 S		Exit 6 on Rte 190 S		

Crash Number	X Coordinate	Y Coordinate

Crash Number	X Coordinate	Y Coordinate
2308111	179573.14038	911457.37497
2308108	179573.14038	911457.37497
2308074	180690.01595	911729.20782
2308072		
2308069	174297.4842	909273.7498
2308060	180332.3437	912448.1252
2306732	181631.1267	905947.9531
2308057	178561.0757	909689.8098
2300831		
2406986		
2271707	179739.0773	912111.1623
2308053	179522.9843	911329.2829
2326070	179739.1081	912111.1796
2308259	180001.5812	910563.5629
2308254	173720.7971	911326.5626
2308748	179789.3682	912387.153
2308770	174006.2669	910227.3183
2408121		
2308535	177339.4449	913993.4654
2309941	181104.7644	911072.4081
2308523	175673.4035	910971.0785
2308511	177387.672	907410.3349
2301342	181977.8595	910279.2502
2308505	175302.6322	906625.7302
2308495	180473.8044	910807.4635
2308469	181361.156	910724.9999
2308452		
2308445	180955.1252	911161.8127
2289220	179739.1081	912111.1796

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2308163	STERLING	22-Feb-2008	12:21 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with tree	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2308157	STERLING	22-Feb-2008	6:16 PM	Not Reported	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2308155	STERLING	28-Feb-2008	2:02 PM	Non-fatal injury	2	2	0	Angle	V1: Entering traffic lane / V2:Travelling straight ahead	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2308095	STERLING	01-Mar-2008	11:30 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with mail box	V1: Passenger car
2308090	STERLING	01-Mar-2008	11:49 AM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with tree	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2308087	STERLING	05-Mar-2008	6:32 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with tree	V1: Passenger car
2308077	STERLING	11-Mar-2008	10:36 AM	Non-fatal injury	2	1	0	Angle	V1: Travelling straight ahead / V2:Turning left	V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2308062	STERLING	12-Mar-2008	7:20 AM	Non-fatal injury	2	1	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2445268	STERLING	28-Mar-2008	6:47 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Not reported	V1: Passenger car
2308052	STERLING	28-Mar-2008	7:33 AM	Property damage only (none injured)	2	0	0	Head-on	V1: Turning right / V2:Travelling straight ahead	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2305412	STERLING	28-Mar-2008	11:58 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Changing lanes	V1:Southbound	V1: Collision with ditch	V1: Passenger car
2308043	STERLING	28-Mar-2008	6:52 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Unknown	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2312753	STERLING	30-Mar-2008	9:12 AM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2352773	STERLING	01-Apr-2008	9:39 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with tree	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2351630	STERLING	02-Apr-2008	7:17 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2351639	STERLING	02-Apr-2008	4:14 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2351649	STERLING	04-Apr-2008	6:50 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2351658	STERLING	10-Apr-2008	4:23 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2351662	STERLING	14-Apr-2008	6:45 AM	Property damage only (none injured)	1	0	0	Rear-end	V1: Turning left	V1:Southbound	V1: Collision with highway traffic sign post	V1: Passenger car
2351665	STERLING	20-Apr-2008	5:42 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with tree	V1: Passenger car
2320584	STERLING	20-Apr-2008	10:08 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Not reported	V1:Not reported	V1: Not reported	V1: Passenger car
2352398	STERLING	23-Apr-2008	4:06 AM	Property damage only (none injured)	1	0	0	Angle	V1: Travelling straight ahead	V1:Not reported	V1: Collision with tree	V1: Passenger car
2312613	STERLING	23-Apr-2008	8:58 PM	Property damage only (none injured)	1	0	0	Angle	V1: Travelling straight ahead	V1:Northbound	V1: Collision with animal - deer	V1: Passenger car
2351676	STERLING	24-Apr-2008	4:24 PM	Property damage only (none injured)	2	0	0	Angle	V1: Entering traffic lane / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Truck/trailer
2351737	STERLING	28-Apr-2008	10:13 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Turning right	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2351739	STERLING	01-May-2008	7:26 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with tree	V1: Passenger car
2351776	STERLING	05-May-2008	7:58 AM	Property damage only (none injured)	2	0	0	Angle	V1: Making U-turn / V2:Entering traffic lane	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Tractor/semi-trailer
2351777	STERLING	05-May-2008	5:08 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Turning left	V1:Southbound	V1: Collision with curb	V1: Passenger car
2351783	STERLING	06-May-2008	2:40 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with utility pole	V1: Passenger car
2466584	STERLING	11-May-2008	8:45 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Not reported	V1: Passenger car
2487080	STERLING	11-May-2008	9:00 AM	Non-fatal injury	1	1	0	Not reported	V1: Travelling straight ahead	V1:Southbound	V1: Not reported	V1: Motorcycle
2351790	STERLING	14-May-2008	10:03 AM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Parked / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with parked motor vehicle / V2: Collision with parked motor vehicle	V1: Passenger car / V2:Unknown heavy truck, cannot classify
2351795	STERLING	20-May-2008	9:20 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2351809	STERLING	30-May-2008	8:50 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with animal - deer	V1: Passenger car

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2308163	Snow	Daylight	Snow	LEOMINSTER ROAD / BEVERLY DRIVE					
2308157	Snow	Dark - roadway not lighted	Snow	REDEMPTION ROCK TRAIL / CLEMENCE AVENUE					
2308155	Dry	Daylight	Clear		LEOMINSTER ROAD				
2308095	Snow	Daylight	Snow	CAMPGROUND ROAD / GATES ROAD					
2308090	Snow	Daylight	Cloudy		261 REDEMPTION ROCK TRAIL				
2308087	Wet	Dark - roadway not lighted	Clear		39 JEWETT ROAD				
2308077	Dry	Daylight	Clear		6 CLINTON ROAD				
2308062	Snow	Daylight	Snow		55 CLINTON ROAD				
2445268	Snow	Dawn	Sleet, hail (freezing rain or drizzle)		14 TAFT ROAD				
2308052	Wet	Daylight	Cloudy/Rain	MEETINGHOUSE HILL ROAD / PARK STREET					
2305412	Ice	Daylight	Cloudy/Rain		Rte 190 S		Exit 6 on Rte 190 S		
2308043	Slush	Dusk	Snow/Rain		280 UPPER NORTH ROW ROAD				
2312753	Dry	Daylight	Clear		Rte 190 N	Rte 190 N Milemarker 9.4			
2352773	Wet	Daylight	Cloudy		34 SWETT HILL ROAD				
2351630	Dry	Daylight	Clear	PRINCETON ROAD / REDEMPTION ROCK TRAIL					
2351639	Dry	Daylight	Clear	REDEMPTION ROCK TRAIL Rte 140 S / PRINCETON ROAD Rte 62 W					
2351649	Wet	Daylight	Rain		140 LEOMINSTER ROAD Rte 12 / RAMP-RT 190 NB TO RT 12				
2351658	Dry	Daylight	Clear	MAIN STREET / CLINTON ROAD					
2351662	Dry	Daylight	Clear	LEOMINSTER ROAD Rte 12 S / INTERSTATE 190 Rte 190 S					
2351665	Dry	Dawn	Clear		LEOMINSTER ROAD				
2320584	Dry	Dark - roadway not lighted	Clear		Rte 190 N		Exit 5 on Rte 190		
2352398	Wet	Daylight	Cloudy/Unknown		87 OSGOOD ROAD				
2312613	Dry	Dark - roadway not lighted	Clear		Rte 190 N		Exit 6 on Rte 190 N		
2351676	Dry	Daylight	Clear		20 feet N from Intersection 140 LEOMINSTER ROAD Rte 12 N / RAMP-RT 12 TO RT 190 NB			190 N EXIT 6 ON RAMP	
2351737	Wet	Dark - lighted roadway	Rain	WORCESTER ROAD / BOUTELLE ROAD					
2351739	Dry	Daylight	Clear		REDEMPTION ROCK TRAIL Rte 140 / Rte 140				
2351776	Dry	Daylight	Clear		14 LEGATE HILL ROAD				
2351777	Dry	Daylight	Clear		LEOMINSTER ROAD Rte 12 / RAMP-RT 12 TO RT 190 NB				
2351783	Dry	Daylight	Clear		JOHNSON ROAD				
2466584	Dry	Daylight	Clear		Rte 190 S		Exit 7 on Rte 190		
2487080	Not reported	Not reported	Not Reported		1000 feet S from Intersection Rte 140 / Rte 62				
2351790	Dry	Daylight	Clear		6 MEETINGHOUSE HILL ROAD				
2351795	Dry	Dark - lighted roadway	Clear		LEOMINSTER ROAD Rte 12 / Rte 12				
2351809	Dry	Dark - roadway not lighted	Clear		200 feet N from Intersection WORCESTER ROAD / BOUTELLE ROAD				

Crash Number	X Coordinate	Y Coordinate
2308163	179564.3289	913892.8745
2308157	175229.7655	906911.9373
2308155		
2308095	178275.9843	906437.0624
2308090	174120.6748	909749.1022
2308087	177166.8795	907940.2977
2308077	179104.2945	909780.1804
2308062	179918.3863	910499.5429
2445268	178121.9647	910661.8729
2308052	178587.1564	909790.0623
2305412	179739.1081	912111.1796
2308043	175315.8213	913943.9007
2312753	175634.6354	906021.8173
2352773	180119.6935	907580.9429
2351630	174297.4842	909273.7498
2351639	174297.4842	909273.7498
2351649	179660.6371	911843.196
2351658	178834.7657	909734.7499
2351662	179748.2126	912116.2312
2351665		
2320584	175510.4722	905885.4724
2352398	176825.612	911480.4292
2312613	179720.8275	912036.6896
2351676	179705.1554	911947.4776
2351737	177749.7968	906389.6875
2351739		
2351776	179927.9068	913753.7725
2351777	179686.7967	911936.8747
2351783		
2466584		
2487080	174397.1697	908950.2634
2351790	178617.5484	909868.5161
2351795		
2351809	177739.2614	906449.7188

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2351811	STERLING	01-Jun-2008	9:39 AM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Turning right	V1:Eastbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2351816	STERLING	01-Jun-2008	5:09 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Entering traffic lane / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2453085	STERLING	02-Jun-2008	5:00 AM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Not reported	V1: Not reported
2332841	STERLING	03-Jun-2008	2:52 PM	Property damage only (none injured)	2	0	0	Angle	V1: Entering traffic lane / V2:Travelling straight ahead	V1:Northbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2351827	STERLING	07-Jun-2008	8:07 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Backing	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Unknown heavy truck, cannot classify
2351830	STERLING	10-Jun-2008	4:25 PM	Non-fatal injury	2	2	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2437497	STERLING	11-Jun-2008	8:25 AM	Non-fatal injury	2	1	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Westbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car
2351835	STERLING	12-Jun-2008	3:57 PM	Non-fatal injury	2	1	0	Single vehicle crash	V1: Travelling straight ahead / V2:Turning left	V1:Southbound / V2:Northbound	V1: Collision with other fixed object (wall, building, tunnel, etc.) / V2: Not reported	V1: Motorcycle / V2:Passenger car
2351851	STERLING	15-Jun-2008	11:49 AM	Not Reported	2	0	0	Rear-end	V1: Parked / V2:Backing	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with parked motor vehicle	V1: Passenger car / V2:Passenger car
2351861	STERLING	19-Jun-2008	3:41 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Not reported	V1: Passenger car
2351866	STERLING	19-Jun-2008	7:01 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Turning left	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2351869	STERLING	19-Jun-2008	9:49 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Not reported
2351881	STERLING	20-Jun-2008	10:55 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Not reported	V1:Northbound	V1: Not reported	V1: Passenger car
2351887	STERLING	21-Jun-2008	7:01 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Turning right / V2:Turning right	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2351891	STERLING	26-Jun-2008	3:30 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Turning left	V1:Southbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2351894	STERLING	27-Jun-2008	4:49 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with tree	V1: Passenger car
2351898	STERLING	27-Jun-2008	3:34 PM	Non-fatal injury	2	1	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2351905	STERLING	29-Jun-2008	2:03 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Changing lanes / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2497054	STERLING	13-Jul-2008	5:30 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	V1: Turning left / V2:Travelling straight ahead	V1:Northbound / V2:Southbound	V1: Not reported / V2: Not reported	V1: Not reported / V2:Not reported
2353933	STERLING	25-Jul-2008	1:35 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Entering traffic lane	V1:Southbound	V1: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2509363	STERLING	07-Aug-2008	4:45 AM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Making U-turn	V1:Northbound / V2:Southbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car
2485810	STERLING	11-Aug-2008	12:45 PM	Non-fatal injury	2	1	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2476362	STERLING	25-Aug-2008	2:51 AM	Non-fatal injury	2	1	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Southbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Motorcycle / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2493875	STERLING	05-Sep-2008	8:15 AM	Non-fatal injury	2	1	0	Rear-end	V1: Turning right / V2:Turning right	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car
2512015	STERLING	07-Sep-2008	2:30 AM	Not Reported	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Westbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2502575	STERLING	13-Sep-2008	3:35 AM	Non-fatal injury	2	1	0	Sideswipe, same direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Not reported / V2: Not reported	V1: Motorcycle / V2:Motorcycle
2502451	STERLING	13-Sep-2008	3:35 PM	Non-fatal injury	1	1	0	Not reported	V1: Travelling straight ahead	V1:Southbound	V1: Not reported	V1: Not reported
2508625	STERLING	19-Sep-2008	7:41 AM	Unknown	2	0	0	Head-on	V1: Travelling straight ahead / V2:Turning left	V1:Northbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2376457	STERLING	25-Sep-2008	7:38 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2521367	STERLING	29-Sep-2008	7:35 AM	Non-fatal injury	2	1	0	Rear-end	V1: Slowing or stopped in traffic / V2:Turning left	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Not reported / V2:Not reported
2457147	STERLING	01-Oct-2008	5:45 PM	Property damage only (none injured)	2	0	0	Not reported	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	V1: Single-unit truck (2-axle, 6-tire) / V2:Passenger car
2392410	STERLING	24-Oct-2008	12:56 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with animal - deer	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2397788	STERLING	30-Oct-2008	2:37 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with animal - deer	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2394936	STERLING	10-Nov-2008	11:10 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with guardrail	V1: Passenger car

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2351811	Dry	Daylight	Cloudy	MAPLE STREET / ASHTON LANE					
2351816	Dry	Daylight	Clear	LEOMINSTER ROAD / CHOCKSETT ROAD					
2453085	Dry	Dawn	Clear		62 PRINCETON ROAD				
2332841	Dry	Daylight	Clear	RAMP-RT 190 NB TO RT 140 / REDEMPTION ROCK TRAIL Rte 140					
2351827	Dry	Daylight	Clear		33 ALBRIGHT ROAD				
2351830	Dry	Daylight	Clear		50 feet N from Intersection CHOCKSETT ROAD Rte 62 / CLINTON ROAD Rte 62 N				
2437497	Dry	Daylight	Clear		35 CHOCKSETT ROAD			HOPE CHAPEL DRIVEWAY	
2351835	Dry	Daylight	Clear		372 REDEMPTION ROCK TRAIL				
2351851	Dry	Daylight	Cloudy		MAIN STREET / WAUSHACUM AVENUE				
2351861	Dry	Dark - roadway not lighted	Clear		13 SQUARESHIRE ROAD				
2351866	Dry	Daylight	Clear	CLINTON ROAD / FLAGG ROAD					
2351869	Dry	Dark - roadway not lighted	Clear		12 MEETINGHOUSE HILL ROAD				
2351881	Dry	Daylight	Clear		WORCESTER ROAD				
2351887	Dry	Daylight	Clear	LEOMINSTER ROAD / CHOCKSETT ROAD					
2351891	Dry	Daylight	Cloudy		LEOMINSTER ROAD Rte 190 / Rte 190				
2351894	Dry	Dark - unknown roadway lighting	Clear		89 JUSTICE HILL ROAD				
2351898	Dry	Daylight	Cloudy		SQUARESHIRE ROAD / CHACE HILL ROAD				
2351905	Dry	Daylight	Cloudy	LEOMINSTER ROAD / CHOCKSETT ROAD					
2497054	Dry	Daylight	Clear		100 WORCESTER ROAD Rte 12				
2353933	Dry	Not reported	Clear		Rte 190 S		Exit 6 on Rte 190 S	RAMP TO 190 SB	
2509363	Wet	Daylight	Other		CROSS STREET			BEHIND FIRE STATION	
2485810	Dry	Daylight	Cloudy		167 CLINTON ROAD Rte 62				
2476362	Dry	Daylight	Clear	LUCAS ROAD / JUSTICE HILL CUTOFF					
2493875	Dry	Daylight	Clear	STERLING AVENUE / Rte 140					
2512015	Dry	Daylight	Clear		62 MOORES CORNERS Rte 140 / Rte 62				
2502575	Dry	Daylight	Clear		124 REDEMPTION ROCK TRAIL				
2502451	Not reported	Daylight	Cloudy		124 REDEMPTION ROCK TRAIL				
2508625	Dry	Dark - roadway not lighted	Clear		LEOMINSTER ROAD Rte 12 / Rte 62				
2376457	Dry	Dark - roadway not lighted	Clear		Rte 190 S		Exit 6 on Rte 190 S		
2521367	Dry	Daylight	Clear		CHOCKSETT ROAD Rte 62 / Rte 62				
2457147	Dry	Daylight	Clear	CHOCKSETT ROAD / LEOMINSTER ROAD Rte 12					
2392410	Dry	Daylight	Clear		Rte 190 S		Exit 5 on Rte 190 S		
2397788	Dry	Dark - roadway not lighted	Clear		Rte 190 S		Exit 5 on Rte 190 S		
2394936	Dry	Dark - roadway not lighted	Clear		Rte 190 S		Exit 5 on Rte 190 S	EX 5 ON RAMP TO RT190 N/B	

Crash Number	X Coordinate	Y Coordinate
2351811	179429.7031	909248.375
2351816	179573.1404	911457.375
2453085	177504.5553	909407.0386
2332841	175543.5155	905759.6874
2351827	181145.7349	911574.2804
2351830	181359.8324	910740.1103
2437497	180567.4741	911231.1734
2351835	174006.4269	910226.3761
2351851	178508.0002	909638.625
2351861	180115.5892	906153.4764
2351866	181977.8595	910279.2502
2351869	178647.2223	909967.9508
2351881		
2351887	179573.1404	911457.375
2351891	179731.6873	912107.0001
2351894	175021.2968	913242.4246
2351898	180483.5312	906605.6875
2351905	179573.1404	911457.375
2497054	177396.814	907348.4355
2353933	179739.1081	912111.1796
2509363		
2485810	181729.9961	910518.0098
2476362	173110.703	914543.2502
2493875		
2512015		
2502575	174831.0722	907721.954
2502451	174831.0722	907721.954
2508625	178730.9845	909749.3122
2376457	179739.1081	912111.1796
2521367	181361.156	910724.9999
2457147	179573.1404	911457.375
2392410	175510.4722	905885.4724
2397788	175510.4722	905885.4724
2394936	175510.4722	905885.4724

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2472586	STERLING	19-Nov-2008	6:52 PM	Non-fatal injury	2	2	0	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Westbound / V2:Southbound	V1: Not reported / V2: Not reported	V1: Not reported / V2:Not reported
2488441	STERLING	26-Nov-2008	9:00 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1:Westbound / V2:Westbound	V1: Not reported / V2: Not reported	V1: Not reported / V2:Not reported
2500274	STERLING	27-Nov-2008	7:30 PM	Non-fatal injury	2	2	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Northbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2499845	STERLING	08-Dec-2008	6:00 AM	Non-fatal injury	1	1	0	Not reported	V1: Other	V1:Not reported	V1: Not reported	V1: Passenger car
2445128	STERLING	09-Dec-2008	4:50 AM	Non-fatal injury	2	1	0	Not reported	V1: Slowing or stopped in traffic / V2:Not reported	V1:Eastbound / V2:Southbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car
2491889	STERLING	10-Dec-2008	2:43 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Unknown	V1:Eastbound / V2:Southbound	V1: Not reported / V2: Not reported	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2488311	STERLING	10-Dec-2008	5:08 PM	Non-fatal injury	2	1	0	Angle	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Southbound / V2:Northbound	V1: Not reported / V2: Not reported	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2478004	STERLING	16-Dec-2008	12:16 PM	Non-fatal injury	2	1	0	Not reported	V1: Travelling straight ahead / V2:Turning right	V1:Southbound / V2:Southbound	V1: Not reported / V2: Not reported	V1: Not reported / V2:Not reported
2409989	STERLING	17-Dec-2008	7:54 AM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with motor vehicle in traffic	V1: Passenger car
2409632	STERLING	17-Dec-2008	12:17 PM	Not Reported	2	0	0	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Single-unit truck (2-axle, 6-tire) / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2412550	STERLING	19-Dec-2008	3:58 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2410006	STERLING	19-Dec-2008	4:26 PM	Not Reported	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with other movable object	V1: Passenger car
2458415	STERLING	27-Dec-2008	2:00 AM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Other	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car
2495688	STERLING	27-Dec-2008	6:51 AM	Property damage only (none injured)	2	0	0	Not reported	V1: Turning left / V2:Travelling straight ahead	V1:Southbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Passenger car
2478001	STERLING	31-Dec-2008	12:40 PM	Property damage only (none injured)	2	0	0	Not reported	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Eastbound / V2:Northbound	V1: Not reported / V2: Not reported	V1: Not reported / V2:Not reported

massDOT

MassDOT Crash Report for STERLING for the year 2009

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2501197	STERLING	06-Jan-2009	6:07 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with other movable object / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2453737	STERLING	07-Jan-2009	11:00 AM	Non-fatal injury	2	1	0	Not reported	V1: Parked / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Other / V2: Collision with pedestrian	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Tractor/semi-trailer
2501191	STERLING	08-Jan-2009	5:09 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Overturn/rollover	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2501186	STERLING	09-Jan-2009	10:34 AM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Other / V2:Passenger car
2572342	STERLING	11-Jan-2009	2:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Not reported	V1: Passenger car
2501183	STERLING	11-Jan-2009	12:39 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Not reported / V2:Passenger car
2419175	STERLING	12-Jan-2009	5:50 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with other movable object	V1: Passenger car
2501762	STERLING	13-Jan-2009	7:59 AM	Property damage only (none injured)	2	0	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2443959	STERLING	14-Jan-2009	11:49 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Reported but invalid	V1: Passenger car
2502095	STERLING	15-Jan-2009	3:39 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Parked / V2:Travelling straight ahead	V1:Northbound / V2:Southbound	V1: Other / V2: Collision with parked motor vehicle	V1: Single-unit truck (2-axle, 6-tire) / V2:Passenger car
2427086	STERLING	16-Jan-2009	3:03 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with animal - deer	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2506124	STERLING	18-Jan-2009	2:30 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Turning left	V1:Westbound	V1: Collision with ditch	V1: Passenger car
2595198	STERLING	22-Jan-2009	7:35 PM	Not Reported	2	0	0	Angle	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Westbound / V2:Southbound	V1: Not reported / V2: Not reported	V1: Not reported / V2:Not reported
2501658	STERLING	24-Jan-2009	8:56 AM	Non-fatal injury	2	2	0	Not reported	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2501655	STERLING	28-Jan-2009	11:48 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2501644	STERLING	28-Jan-2009	4:53 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2423907	STERLING	28-Jan-2009	7:51 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2472586	Dry	Dark - unknown roadway lighting	Clear	METROPOLITAN ROAD Rte 110 / CHACE HILL ROAD					
2488441	Dry	Unknown	Clear		REDEMPTION ROCK TRAIL Rte 140 / RAMP - RT 140 TO RT 190 NB Rte 190				
2500274	Dry	Dark - roadway not lighted	Cloudy	ALBRIGHT ROAD / CHOCKSETT ROAD					
2499845	Ice	Dark - roadway not lighted	Clear		NEWELL HILL ROAD / GOULDING ROAD				
2445128	Dry	Dusk	Not Reported	Rte 190 / Rte 12 / RAMP - I190 NB TO RT 12					
2491889	Wet	Daylight	Cloudy	CHOCKSETT ROAD / Rte 12					
2488311	Wet	Not reported	Not Reported	LEOMINSTER ROAD Rte 12 S / INTERSTATE 190 Rte 190 N					
2478004	Not reported	Not reported	Not Reported	LEOMINSTER ROAD / LAURELWOOD ROAD / CLINTON ROAD					
2409989	Snow	Daylight	Snow		Rte 190 N		Exit 5 on Rte 190		
2409632	Snow	Daylight	Rain/Cloudy		108 CLINTON ROAD				
2412550	Snow	Daylight	Snow		Rte 190 N		Exit 5 on Rte 190		
2410006	Snow	Dark - roadway not lighted	Snow		Rte 190 S		Exit 5 on Rte 190 S		
2458415	Ice	Dark - unknown roadway lighting	Sleet, hail (freezing rain or drizzle)		Rte 190		500 feet S from Exit 5 on Rte 190		
2495688	Not reported	Not reported	Not Reported	LEOMINSTER ROAD / LEOMINSTER ROAD / CHOCKSETT ROAD					
2478001	Ice	Daylight	Snow	MAPLE STREET / SCHOOL STREET					

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type

2501197	Dry	Dark - roadway not lighted	Clear	INTERSTATE 190 Rte 190 S / RAMP-RT 190 SB TO RT 140			Exit 5 on Rte 190 S		
2453737	Snow	Daylight	Cloudy/Snow		Rte 190		Exit 5 on Rte 190	1/2 NORTH OF EXIT 5	P1:Other non-motorist (wheelchair, etc.) / P2:Other non-motorist (wheelchair, etc.) / P3:Other non-motorist (wheelchair, etc.)
2501191	Ice	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)		113 PRINCETON ROAD				
2501186	Dry	Daylight	Clear		20 GREENLAND ROAD				
2572342	Snow	Dark - roadway not lighted	Snow		Rte 190		1000 feet S from Exit 6 on Rte 190		
2501183	Snow	Daylight	Clear	COLE ROAD / NORTH ROW ROAD					
2419175	Dry	Dark - roadway not lighted	Clear		Rte 190 N	Rte 190 N Milemarker 10.0			
2501762	Dry	Daylight	Cloudy	CHOCKSETT ROAD / PRATTS JUNCTION ROAD					
2443959	Dry	Dark - roadway not lighted	Clear		Rte 190 S		Exit 6 on Rte 190 S		
2502095	Dry	Daylight	Clear		7 MAIN STREET				
2427086	Dry	Daylight	Clear		Rte 190 S		Exit 6 on Rte 190 S		
2506124	Snow	Dark - roadway not lighted	Snow		100 NORTH ROW ROAD				
2595198	Dry	Dark - lighted roadway	Clear		CHOCKSETT ROAD Rte 62 / Rte 62				
2501658	Not reported	Not reported	Not Reported	LEOMINSTER ROAD / PRATTS JUNCTION ROAD					
2501655	Wet	Daylight	Snow/Sleet, hail (freezing rain or drizzle)	INTERSTATE 190 Rte 190 N / RAMP-RT 190 NB TO RT 12			30 feet N from Exit 6 on Rte 190 N		
2501644	Slush	Dark - lighted roadway	Rain/Sleet, hail (freezing rain or drizzle)		17 WORCESTER ROAD				
2423907	Ice	Dark - roadway not lighted	Not Reported		Rte 190 N		Exit 6 on Rte 190 N		

Crash Number	X Coordinate	Y Coordinate
2472586	180430.0937	905510.6875
2488441	175531.2418	905851.5319
2500274	180955.1252	911161.8127
2499845	178628.1251	909261.5002
2445128	179712.0397	912031.6753
2491889	179573.1404	911457.375
2488311	179748.2287	912116.2276
2478004		
2409989	175525.6057	905843.637
2409632	180877.5817	910812.2815
2412550	175525.6057	905843.637
2410006	175510.4722	905885.4724
2458415	175425.5181	905728.9047
2495688	179573.1404	911457.375
2478001	178741.5157	909613.5626

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Crash Number	X Coordinate	Y Coordinate
2501197	175697.09353	906435.81260
2453737	175046.68659	905457.28979
2501191	176869.90329	909963.63390
2501186	176998.16248	907888.34475
2572342	178963.76840	911324.79152
2501183	177894.38096	914418.16089
2419175	175763.23796	906971.38699
2501762	181081.96854	911089.87519
2443959	180169.31703	912352.44889
2502095	178472.87494	909604.58316
2427086	180169.31703	912352.44889
2506124	178355.93932	914193.16340
2595198	181361.15600	910724.99993
2501658	179725.56227	913429.56262
2501655	179139.35401	911570.65139
2501644	177783.88814	906122.65906
2423907	179140.99005	911572.58880

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2501641	STERLING	30-Jan-2009	3:13 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501637	STERLING	04-Feb-2009	8:13 AM	Not Reported	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501635	STERLING	05-Feb-2009	3:04 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car
2556481	STERLING	09-Feb-2009	12:30 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2501623	STERLING	09-Feb-2009	4:55 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1:Northbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2550293	STERLING	16-Feb-2009	9:47 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with other movable object / V2: Collision with mail box	V1: Passenger car / V2:Passenger car
2463081	STERLING	17-Feb-2009	10:45 PM	Non-fatal injury	2	1	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501605	STERLING	21-Feb-2009	10:45 AM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501602	STERLING	22-Feb-2009	3:06 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Overturn/rollover	V1: Passenger car
2501595	STERLING	22-Feb-2009	6:32 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with light pole or other post/support	V1: Other
2501590	STERLING	23-Feb-2009	8:25 AM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Westbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501583	STERLING	27-Feb-2009	1:55 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with utility pole	V1: Passenger car
2501577	STERLING	28-Feb-2009	11:51 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with tree	V1: Passenger car
2501573	STERLING	03-Mar-2009	5:01 PM	Property damage only (none injured)	2	0	0	Single vehicle crash	V1: Travelling straight ahead / V2:Entering traffic lane	V1:Southbound / V2:Southbound	V1: Collision with curb / V2: Other	V1: Passenger car / V2:Passenger car
2609909	STERLING	04-Mar-2009	4:00 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Turning right	V1:Not reported / V2:Not reported	V1: Not reported / V2: Not reported	V1: Not reported / V2:Not reported
2489720	STERLING	04-Mar-2009	9:26 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Travelling straight ahead / V2:Changing lanes	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2463141	STERLING	07-Mar-2009	5:00 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with guardrail	V1: Passenger car
2500566	STERLING	09-Mar-2009	9:30 AM	Not Reported	2	0	0	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Backing	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Unknown heavy truck, cannot classify / V2:Unknown heavy truck, cannot classify
2501569	STERLING	09-Mar-2009	3:24 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Turning left	V1:Southbound	V1: Collision with embankment	V1: Passenger car
2501567	STERLING	09-Mar-2009	4:19 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with utility pole	V1: Passenger car
2501562	STERLING	12-Mar-2009	11:44 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501457	STERLING	17-Mar-2009	6:18 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Entering traffic lane / V2:Entering traffic lane	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501453	STERLING	19-Mar-2009	8:05 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with utility pole	V1: Passenger car
2501444	STERLING	06-Apr-2009	2:36 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2500564	STERLING	14-Apr-2009	3:04 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Entering traffic lane / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Tractor/semi-trailer
2501441	STERLING	16-Apr-2009	2:05 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Other	V1: Passenger car
2501435	STERLING	16-Apr-2009	4:16 PM	Property damage only (none injured)	2	0	0	Head-on	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1:Westbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501431	STERLING	17-Apr-2009	7:27 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with utility pole	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2457805	STERLING	19-Apr-2009	5:24 PM	Non-fatal injury	2	2	0	Rear-end	V1: Turning left / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Motorcycle / V2:Motorcycle
2471711	STERLING	21-Apr-2009	2:07 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Parked / V2:Backing	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with parked motor vehicle	V1: Passenger car / V2:Passenger car

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2501641	Slush	Daylight	Clear	MAPLE STREET / BRIDGE STREET					
2501637	Wet	Daylight	Clear	REDEMPTION ROCK TRAIL / MERRILL ROAD					
2501635	Dry	Daylight	Clear		253 LEOMINSTER ROAD				
2556481	Wet	Daylight	Clear		314 LEOMINSTER ROAD Rte 12 N				
2501623	Dry	Daylight	Clear	REDEMPTION ROCK TRAIL / PRINCETON ROAD					
2550293	Dry	Dark - lighted roadway	Clear		243 LEGATE HILL ROAD				
2463081	Dry	Dark - unknown roadway lighting	Clear		Rte 190		Exit 6 on Rte 190		
2501605	Dry	Daylight	Clear	RIDGEWOOD DRIVE / HASTING ROAD					
2501602	Slush	Daylight	Snow/Sleet, hail (freezing rain or drizzle)	HASTING ROAD / JUSTICE HILL ROAD					
2501595	Slush	Dark - lighted roadway	Snow/Sleet, hail (freezing rain or drizzle)	REDEMPTION ROCK TRAIL / BEAMAN ROAD					
2501590	Slush	Daylight	Clear		30 FLANAGAN HILL ROAD				
2501583	Wet	Daylight	Cloudy		254 JUSTICE HILL ROAD				
2501577	Sand, mud, dirt, oil, gravel	Dark - lighted roadway	Clear		193 CLINTON ROAD				
2501573	Dry	Daylight	Clear	LEOMINSTER ROAD Rte 12 / Rte 190 / Rte 12					
2609909	Dry	Daylight	Clear		CHOCKSETT ROAD Rte 12 / Rte 12				
2489720	Dry	Dark - roadway not lighted	Clear		Rte 190 S		Exit 6 on Rte 190 S		
2463141	Dry	Daylight	Cloudy		Rte 190 S		Exit 5 on Rte 190 S	10.6 MM	
2500566	Snow	Daylight	Snow	ROWLEY HILL ROAD / HEYWOOD ROAD					
2501569	Snow	Daylight	Snow		32 MUDDY POND ROAD				
2501567	Snow	Daylight	Snow		SQUARESHIRE ROAD			UTILITY POLE #51	
2501562	Dry	Daylight	Clear	LEOMINSTER ROAD / MAIN STREET					
2501457	Dry	Daylight	Clear	INTERSTATE 190 Rte 190 S / RAMP-RT 190 SB TO RT 12			Exit 6 on Rte 190 S		
2501453	Dry	Dark - lighted roadway	Clear		5 MAIN STREET				
2501444	Wet	Daylight	Cloudy/Rain	LEOMINSTER ROAD Rte 12 S / LAURELWOOD ROAD					
2500564	Dry	Daylight	Clear	CHOCKSETT ROAD / LEOMINSTER ROAD					
2501441	Dry	Daylight	Clear		41 CHOCKSETT ROAD				
2501435	Dry	Daylight	Clear	CLINTON ROAD / CHOCKSETT ROAD					
2501431	Dry	Daylight	Clear		BEAMAN ROAD			BTWN POLES 80 AND 82	
2457805	Dry	Daylight	Clear		Rte 190 S		Exit 5 on Rte 190 S		
2471711	Dry	Daylight	Cloudy/Rain		LEOMINSTER ROAD Rte 12 S / CHOCKSETT ROAD			RT 190	

Crash Number	X Coordinate	Y Coordinate
2501641	178774.43728	909594.12505
2501637	175334.96873	906495.93727
2501635	179682.26305	913330.94217
2556481	179531.36436	913948.02697
2501623	174297.48419	909273.74975
2550293	179970.00425	914020.68023
2463081	180169.31703	912352.44889
2501605	173533.41276	915437.05523
2501602	173406.79670	915084.93747
2501595	173668.43740	911781.24979
2501590	180680.37840	913081.17658
2501583	173602.80236	914763.73015
2501577	181981.59400	910273.37099
2501573	179731.30578	912107.09890
2609909	179573.14038	911457.37496
2489720	180169.31703	912352.44889
2463141	175697.09328	906435.81221
2500566	176983.14076	912240.68735
2501569	176953.23420	907326.78721
2501567		
2501562	178730.9843	909749.3122
2501457	180169.3173	912352.4493
2501453	178455.1898	909587.4467
2501444	179175.8908	910189.9999
2500564	179573.1404	911457.375
2501441	180728.3598	911213.4809
2501435	181327.7029	910733.3752
2501431		
2457805	175697.0933	906435.8122
2471711	179573.1404	911457.3749

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2500251	STERLING	23-Apr-2009	10:52 AM	Non-fatal injury	2	1	0	Angle	V1: Backing / V2:Travelling straight ahead	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Tractor/semi-trailer / V2:Passenger car
2501423	STERLING	24-Apr-2009	8:38 PM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Overturn/rollover	V1: Motorcycle
2501428	STERLING	25-Apr-2009	7:41 PM	Property damage only (none injured)	3	0	0	Head-on	V1: Turning left / V2:Travelling straight ahead / V3:Slowing or stopped in traffic	V1:Southbound / V2:Northbound / V3:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic / V3: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car / V3:Passenger car
2501421	STERLING	29-Apr-2009	11:16 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Turning right / V2:Turning right	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2506210	STERLING	03-May-2009	2:30 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with tree	V1: Passenger car
2500256	STERLING	07-May-2009	4:23 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	V1: Other / V2:Turning left	V1:Eastbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Bus (seats for 7-15 people, including driver) / V2:Passenger car
2466933	STERLING	08-May-2009	4:43 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Single-unit truck (2-axle, 6-tire)
2506212	STERLING	13-May-2009	4:55 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2490210	STERLING	16-May-2009	2:47 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Entering traffic lane / V2:Travelling straight ahead	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2501417	STERLING	18-May-2009	10:03 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Westbound	V1: Collision with animal - deer	V1: Passenger car
2501416	STERLING	22-May-2009	5:29 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501415	STERLING	24-May-2009	10:37 AM	Property damage only (none injured)	2	0	0	Angle	V1: Turning left / V2:Travelling straight ahead	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2501412	STERLING	10-Jun-2009	3:59 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Westbound / V2:Westbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501411	STERLING	18-Jun-2009	6:56 AM	Non-fatal injury	2	1	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2495542	STERLING	20-Jun-2009	10:17 AM	Property damage only (none injured)	2	0	0	Not reported	V1: Slowing or stopped in traffic / V2:Backing	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501409	STERLING	22-Jun-2009	7:39 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Eastbound	V1: Collision with animal - deer	V1: Passenger car
2501382	STERLING	05-Jul-2009	6:31 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with highway traffic sign post	V1: Passenger car
2609625	STERLING	08-Jul-2009	5:30 PM	Not Reported	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Not reported
2501378	STERLING	10-Jul-2009	3:59 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501376	STERLING	10-Jul-2009	9:55 PM	Property damage only (none injured)	2	0	0	Sideswipe, opposite direction	V1: Not reported / V2:Slowing or stopped in traffic	V1:Not reported / V2:Westbound	V1: Not reported / V2: Collision with motor vehicle in traffic	V1: Not reported / V2:Passenger car
2501348	STERLING	12-Jul-2009	8:26 AM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2650619	STERLING	12-Jul-2009	5:48 PM	Non-fatal injury	2	2	0	Rear-end	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2500242	STERLING	13-Jul-2009	4:01 PM	Non-fatal injury	2	2	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Eastbound / V2:Eastbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Tractor/semi-trailer
2500118	STERLING	15-Jul-2009	12:24 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Backing / V2:Parked	V1:Northbound / V2:Northbound	V1: Collision with parked motor vehicle / V2: Collision with parked motor vehicle	V1: Bus (seats for 7-15 people, including driver) / V2:Passenger car
2604930	STERLING	16-Jul-2009	8:40 PM	Not Reported	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Travelling straight ahead	V1:Northbound / V2:Northbound	V1: Not reported / V2: Not reported	V1: Passenger car / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2501345	STERLING	17-Jul-2009	7:45 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Passenger car
2501340	STERLING	23-Jul-2009	1:47 PM	Not Reported	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Eastbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:MOPED
2657522	STERLING	11-Aug-2009	8:40 PM	Not Reported	1	0	0	Sideswipe, same direction	V1: Slowing or stopped in traffic	V1:Westbound	V1: Not reported	V1: Not reported
2520529	STERLING	26-Aug-2009	3:47 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Southbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2500251	Dry	Daylight	Clear	CHOCKSETT ROAD / LEOMINSTER ROAD					
2501423	Dry	Dark - roadway not lighted	Clear		220 REDEMPTION ROCK TRAIL				
2501428	Dry	Dawn	Cloudy/Clear		258 LEOMINSTER ROAD				
2501421	Dry	Dark - roadway not lighted	Clear	CHOCKSETT ROAD / LEOMINSTER ROAD					
2506210	Dry	Dark - lighted roadway	Clear		82 ROWLEY HILL ROAD				
2500256	Dry	Daylight	Cloudy	LEGG ROAD / REDEMPTION ROCK TRAIL					
2466933	Dry	Daylight	Not Reported		Rte 190 S		Exit 6 on Rte 190 S		
2506212	Dry	Daylight	Clear		4 HOLDEN ROAD / PRINCETON ROAD				
2490210	Dry	Daylight	Not Reported		50 LEOMINSTER ROAD Rte 12			DUNKIN DONUTS ENTRANCE	
2501417	Dry	Dark - roadway not lighted	Clear		14 CLINTON ROAD				
2501416	Dry	Daylight	Clear	REDEMPTION ROCK TRAIL Rte 140 S / LEGG ROAD					
2501415	Dry	Daylight	Clear		220 REDEMPTION ROCK TRAIL			50 feet S from COUNTRY SIDE CAFE	
2501412	Dry	Daylight	Cloudy		6 CLINTON ROAD				
2501411	Dry	Daylight	Cloudy		9 MAIN STREET				
2495542	Dry	Daylight	Not Reported		Rte 190 S		Exit 5 on Rte 190 S		
2501409	Wet	Daylight	Rain		CLINTON ROAD			HILLSIDE CEMETRY	
2501382	Dry	Daylight	Clear		12 WORCESTER ROAD				
2609625	Dry	Daylight	Clear		SOUTH NELSON ROAD / ROWLEY HILL ROAD				
2501378	Dry	Daylight	Clear		179 WORCESTER ROAD			STERLING AUTO BODY	
2501376	Dry	Dark - roadway not lighted	Clear		109 SWEET HILL RD				
2501348	Dry	Daylight	Clear		303 LEOMINSTER ROAD / BEVERLY DRIVE				
2650619	Dry	Daylight	Clear		Rte 190 N		Exit 5 on Rte 190		
2500242	Dry	Daylight	Clear	CHOCKSETT ROAD / GEORGE E PEESO LANE					
2500118	Dry	Daylight	Clear		27 MAIN STREET				
2604930	Dry	Dark - roadway not lighted	Clear		Rte 190 N		Exit 6 on Rte 190 N		
2501345	Dry	Daylight	Clear		205 WORCESTER ROAD				
2501340	Dry	Daylight	Cloudy	PRINCETON ROAD Rte 62 / GREENLAND ROAD					
2657522	Dry	Dark - lighted roadway	Cloudy	NORTH ROW ROAD / HEYWOOD ROAD					
2520529	Dry	Daylight	Cloudy		Rte 190 S		Exit 5 on Rte 190 S		

Crash Number	X Coordinate	Y Coordinate
2500251	179573.1404	911457.375
2501423	174333.7393	909160.7894
2501428	179705.7943	913379.2819
2501421	179573.1404	911457.375
2506210	177732.5862	911370.967
2500256	175378.906	906322.4374
2466933	180169.317	912352.4489
2506212	174019.7186	909414.8124
2490210	179286.3217	910444.3546
2501417	179203.4121	909863.1954
2501416	175378.906	906322.4374
2501415	174333.7393	909160.7894
2501412	179103.9091	909779.9494
2501411	178490.5696	909621.6658
2495542	175697.0933	906435.8122
2501409	179515.6541	910139.7699
2501382	177782.731	905734.4971
2609625	176289.6875	912485.1873
2501378	177853.7651	908595.9047
2501376	180359.5151	907165.5533
2501348	179556.8131	913905.4396
2650619	175046.6866	905457.2898
2500242		
2500118	178560.6305	909689.4251
2604930	179140.99	911572.5888
2501345	178151.6503	908934.5684
2501340	174471.0471	909267.7501
2657522	177328.9532	914138.6877
2520529	175697.0933	906435.8122

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration
2603325	STERLING	27-Aug-2009	12:45 PM	Not Reported	2	0	0	Not reported	V1: Turning right / V2:Not reported	V1:Eastbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Not reported / V2:Not reported
2520545	STERLING	04-Sep-2009	00:00 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with guardrail	V1: Passenger car
2520555	STERLING	07-Sep-2009	11:17 AM	Non-fatal injury	1	1	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with embankment	V1: Passenger car
2604159	STERLING	20-Sep-2009	11:20 AM	Property damage only (none injured)	2	0	0	Rear-end	V1: Slowing or stopped in traffic / V2:Slowing or stopped in traffic	V1:Southbound / V2:Eastbound	V1: Not reported / V2: Not reported	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2520677	STERLING	24-Sep-2009	2:50 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Changing lanes / V2:Travelling straight ahead	V1:Southbound / V2:Southbound	V1: Not reported / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Truck/trailer
2527949	STERLING	30-Sep-2009	10:03 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Turning left	V1:Northbound	V1: Reported but invalid	V1: Tractor/semi-trailer
2525470	STERLING	03-Oct-2009	6:30 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with embankment	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires
2525697	STERLING	08-Oct-2009	11:08 AM	Non-fatal injury	2	1	0	Rear-end	V1: Travelling straight ahead / V2:Parked	V1:Northbound / V2:Eastbound	V1: Collision with parked motor vehicle / V2: Collision with motor vehicle in traffic	V1: Passenger car / V2:Unknown heavy truck, cannot classify
2535205	STERLING	09-Nov-2009	6:47 PM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Southbound	V1: Collision with animal - deer	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires

Crash Number	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Milemarker	Distance from Nearest Exit	Distance from Nearest Landmark	Non Motorist Type
2603325	Dry	Daylight	Clear	PRINCETON ROAD Rte 62 / REDEMPTION ROCK TRAIL Rte 140					
2520545	Dry	Dark - roadway not lighted	Clear		Rte 190		Exit 6 on Rte 190		
2520555	Dry	Daylight	Clear		Rte 190 S		Exit 5 on Rte 190 S		
2604159	Dry	Daylight	Clear	PRATTS JUNCTION ROAD / Rte 62 / CLINTON ROAD					
2520677	Dry	Daylight	Clear		Rte 190 S		Exit 6 on Rte 190 S		
2527949	Dry	Daylight	Clear		Rte 190 N / Rte 12		Exit 6 on Rte 190 N	ON RAMP FROM RTE 12	
2525470	Wet	Daylight	Rain/Fog, smog, smoke		Rte 190 S	Rte 190 S Milemarker 11.8			
2525697	Dry	Daylight	Not Reported		Rte 190 N				
2535205	Dry	Dark - roadway not lighted	Clear		Rte 190 S		Exit 5 on Rte 190 S		

Crash Number	X Coordinate	Y Coordinate
2603325	174297.4842	909273.7498
2520545	179140.99	911572.5888
2520555	175697.0933	906435.8122
2604159		
2520677	180169.317	912352.4489
2527949	179729.0369	912042.0914
2525470	177226.5868	909268.0293
2525697		
2535205	175697.0933	906435.8122

Support Information for Using Year 2002 through 2009 MassDOT (formerly MassHighway) Crash Data Files

As of 5/26/2011

Note: This document pertains only to year 2002 through year 2009 crash data. See the file named Support_Information_10-02a for crash data for earlier years.

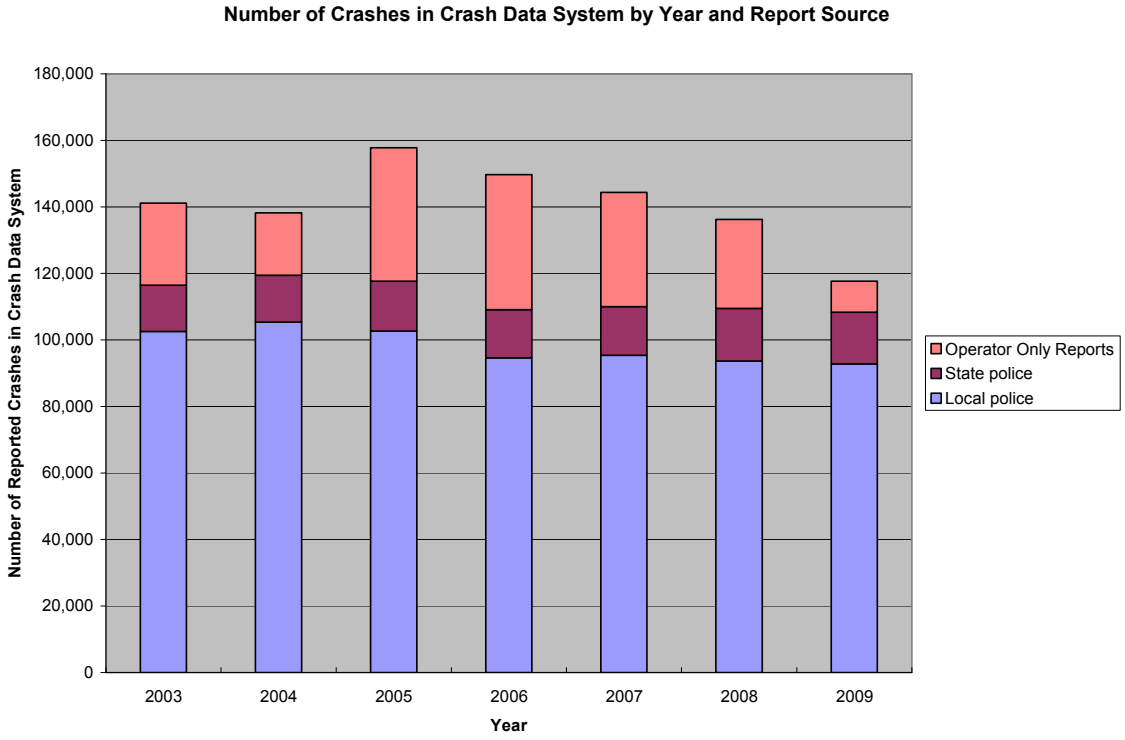
Crash data for years 2002 through 2009 are derived from the Registry of Motor Vehicles (RMV) Crash Data System (CDS). The RMV Division of MassDOT obtains crash reports from local police, State Police, other police agencies, and operators (motorists) who were involved in crashes, and enters the data into CDS. The reporting threshold is any crash involving an injury or fatality, or damage to any one vehicle or other personal property in excess of $1000. Crashes not on public ways are often, but not always, excluded.

The RMV is dependent upon the cooperation of police agencies and the public in sending crash reports in a complete and timely fashion. The Highway Division of MassDOT has geocoded (where possible) the RMV crash data and makes the crash data files available upon request.

The year 2009 Statewide crash data contain 117,762 crashes, compared to 136,384 crashes in 2008, 144,510 crashes in 2007, 149,860 crashes in 2006, 158,084 crashes in 2005 and 138,635 crashes in 2004. The decrease in the total number of crashes in recent years is in part attributable to different reporting rates by different police jurisdictions, but also to the declining number of operator-only reports (reports submitted by motorists who are involved in crashes, for which no police report was submitted) that were entered in CDS by the RMV in recent years. An Excel file named 'Total Crashes by Town and Year1990-2009.xls' is available to show the differences in total crash reports by city/town from year to year.

The chart on the next page shows that the number of operator-only reports that have been entered in the Registry's Crash Data System has been declining each year since 2005. This is not due to a decrease in the number of reports received, but is due to the number of reports that have actually been entered. In recent years not all operator reports that have been received have been entered. However, all police reports received (that have been determined by RMV to be reportable and valid) have been entered.

For cities/towns where local police regularly report all motor vehicle crashes to the RMV, the effects of missing operator-only reports is minimal. However, for those cities/towns where local police do not routinely submit crash reports, or underreport crashes to RMV, the effects of missing operator-only reports in the database is significant when comparisons of crash data are made between years.



As can be seen from the chart above, the total number of crashes reported by and entered from local and State police agencies has been reasonably consistent in recent years. However, due to limited data entry staff at RMV, there has been a significant decline in the number of operator-only reports entered by RMV within the past several years. It cannot be assumed that all operator-only reports are for property damage only crashes. In fact, approximately 25% of all crashes reported by operators and entered into the RMV Crash Data System were non-fatal injury crashes (which is nearly identical to the percentage of injury crashes reported by local police). On a Statewide level the percentage of reports that are property damage only has remained relatively constant in recent years (64.3% in 2009, 63.1% in 2008 and 62.2% in 2007) despite the declining number of operator reports that have been entered each year. However, this may not be the case in each city/town due to different levels of reporting by local police agencies.

Cities/towns with the lowest rates of local police crash reporting in 2009 are shown in the table below (In some cases, actions are being taken to increase reporting in subsequent years):

		NUMBER OF CRASHES REPORTED BY			
CITY/TOWN	Total Crashes	Operator-Only	State Police	Local Police	MBTA Police
BARNSTABLE	202	120	78	4	0
BOSTON	4626	1523	2109	952	42
DUXBURY	76	28	46	2	0
SPRINGFIELD	561	132	421	8	0
WINCHENDON	24	23	0	1	0
BOXBOROUGH	31	8	23	0	0

EASTHAMPTON	78	59	19	0	0
GROVELAND	9	9	0	0	0
LEE	31	13	18	0	0
WELLFLEET	15	15	0	0	0
WEST BRIDGEWATER	78	40	38	0	0
WHATELY	41	3	38	0	0

Some other cities/towns under-reported year 2009 crashes to a lesser degree. See the file named 'Police_Crosstabs_2002-2009 5-11-2011.xls' for further information on individual city/town crash data showing the percentages of crashes by source of report.

The year 2009 crash data files from the Highway Division of MassDOT are in the same format as the year 2007 and 2008 files. X and Y coordinates are included in the last two columns in the data files but note that these columns have been excluded from the default print range. For year 2009 about 94% and for 2008 about 88% of the records have X and Y coordinates. However these are Statewide averages and do not apply to particular crash locations.

Attempts have been made to prevent duplicate crashes from appearing in the crash data, however sometimes they occur. If the crash date, time and location are identical (or nearly identical), the crash may be a duplicate, but with a different crash number.

The data MassDOT Highway Division has supplied is in Microsoft Excel 2003 format. Sorting the data by location may be difficult because of the five different columns that may contain location data. Crash data are not completely standardized. Several different variations of a street name (or other field) may exist. Due to the format of the year 2002-2009 data, searching may be more useful than sorting. Search all five crash location columns for each occurrence of a street name. When selected records are found, they can be copied and pasted into another sheet in the same Workbook.

Explanation of columns and abbreviations in Excel Spreadsheets

A. ***Crash Number*** – Unique number used by Registry of Motor Vehicles to identify each crash. Each crash could have several reports: police, operator(s), so this is the master record ID number. There is no relationship between this number and police department incident numbers.

B. ***City/Town Name*** – The city or town in which the crash occurred. If the crash was reported as occurring in a locality (neighborhood name) within the city or town, this is shown in parentheses after the proper city/town name. However if the crash was just reported as occurring in the city/town (rather than in a locality/neighborhood), then the locality name is not shown. Therefore, searching/sorting by locality name will not identify all crashes that actually occurred in that locality.

C. ***Crash Date*** – Date of the Crash

D. ***Crash Time*** - Time of Crash

E. ***Crash Severity*** – Type of Crash

- Fatal injury
- Non-fatal injury

- Property damage only (none injured)
- Not Reported
- Unknown

F. Number of Vehicles – Total number of vehicles involved in the crash

G. Total Nonfatal Injuries - Number of persons injured in the crash excluding fatalities

H. Total Fatal Injuries - Number of persons killed in the crash

I. Manner of Collision - Manner of Collision or Collision Type

- Angle
- Head-on
- Rear-end
- Rear-to-Rear
- Sideswipe, opposite direction
- Sideswipe, same direction
- Single vehicle crash
- Unknown
- Not reported

J. Vehicle Action Prior to Crash – The action that each vehicle was taking prior to the crash; V1 = Vehicle 1, V2 = Vehicle 2, etc.

- Travelling straight ahead
- Slowing or stopped in traffic
- Turning right
- Turning left
- Changing lanes
- Entering traffic lane
- Leaving traffic lane
- Making U-turn
- Overtaking/passing
- Backing
- Parked
- Other
- Not reported
- Unknown

K. Vehicle Travel Directions – Direction that each vehicle was traveling at time of the crash; V1 = Vehicle 1, V2 = Vehicle 2, etc.

L. Most Harmful Events – Most harmful event for each vehicle. *Only reported if the source of data was from a police report. Not reported if the only source of data was from an operator report.*

- Collision with motor vehicle in traffic
- Collision with parked motor vehicle
- Collision with pedestrian
- Collision with cyclist (bicycle, tricycle, unicycle)
- Collision with animal – deer
- Collision with animal – other
- Collision with moped
- Collision with workzone maintenance equipment

- Collision with railway vehicle (train, engine)
- Collision with other movable object
- Collision with curb
- Collision with tree
- Collision with utility pole
- Collision with light pole or other post/support
- Collision with guardrail
- Collision with median barrier
- Collision with ditch
- Collision with embankment
- Collision with highway traffic sign post
- Collision with overhead sign support
- Collision with fence
- Collision with mailbox
- Collision with impact attenuator/crash cushion
- Collision with bridge
- Collision with bridge overhead structure
- Collision with other fixed object (wall, building, tunnel)
- Collision with unknown fixed object
- Overturn/rollover
- Fire/explosion
- Immersion
- Jackknife
- Cargo/equipment loss or shift
- Other
- Other non-collision
- Unknown non-collision
- Unknown
- Reported but invalid

M. Vehicle Configuration – The type of each vehicle involved in the crash

- Passenger car
- Light truck (Van, mini-van, pick-up, sport utility)
- Motorcycle
- Bus (with seats for more than 15 people, including driver)
- Bus (with seats for 7-15 people, including driver)
- Single unit truck (2 axles, 6 tires)
- Single unit truck (3 or more axles)
- Truck/trailer
- Truck tractor (Bobtail)
- Tractor/semi-trailer
- Tractor/doubles
- Tractor/triples
- Unknown heavy truck
- Motor home/recreational

- Other
- Unknown

N. Road Surface Condition –The condition of the road's surface at the time of the crash

- Dry
- Wet
- Snow
- Ice
- Sand, mud, dirt, oil, gravel
- Water (standing, moving)
- Slush
- Other
- Unknown

O. Ambient Light – Light conditions

- Daylight
- Dawn
- Dusk
- Dark – lighted roadway
- Dark – roadway not lighted
- Dark – unknown roadway lighting
- Other
- Unknown

P. Weather Condition – A maximum of two weather conditions may be reported

- Clear
- Cloudy
- Rain
- Snow
- Sleet, hail, freezing rain
- Fog, smog, smoke
- Severe crosswinds
- Blowing sand, snow
- Other
- Unknown

Q. At Roadway Intersection – If crash location information was entered in the AT INTERSECTION side of the report, the route numbers and/or roadway names will appear in this column. The route/roadway where the crash occurred will appear first, followed by a slash (/), followed by up to two combinations of routes and/or roadway names.

R. Distance from Nearest Roadway Intersection – If crash location information was entered in the NOT AT INTERSECTION side of the report, and if the crash was referenced as occurring at some distance and direction from the nearest intersecting street, the crash location information will appear in this column. However, sometimes only a route and/or roadway name will appear, or other information such as address numbers may appear in this column.

S. Distance from Nearest Milemarker – If crash location information was entered in the NOT AT INTERSECTION side of the report, and if the crash was referenced as occurring at some distance and direction from the nearest milemarker, the crash

location information will appear in this column. However, sometimes only a route and/or roadway name will appear, or other information may appear in this column.

T. Distance from Nearest Exit – If crash location information was entered in the NOT AT INTERSECTION side of the report, and if the crash was referenced as occurring at some distance and direction from the exit or interchange, the crash location information will appear in this column. However, sometimes only a route number or other information may appear in this column.

U. Address/Distance from Nearest Landmark – If crash location information was entered in the NOT AT INTERSECTION side of the report, and if the crash was referenced as occurring at a street address or at a landmark, or at some distance and direction from them, the crash location information will appear in this column. However, sometimes only a roadway name, route number, or other information may appear in this column. There may be some data in this column that duplicates data in other crash location columns. Landmark text is limited to a maximum of 32 characters (the portion enclosed by parentheses). Beginning with year 2006 data, address information was eliminated from this column because it usually duplicated information that was already contained in column "P."

V. Non Motorist Type – For any Non Motorists that were reported as being involved in the crash, the Person Number (P1, P2, etc.) of the Non Motorist is shown, followed by that person's role: Pedestrian, Pedalcyclist (bicycle, tricycle, unicycle, pedal car), Skater, Railroad or Trolley Passenger, or Other non-motorist (wheelchair, etc.).

Crash location data as described above will only be shown in the format described above if it was correctly entered by police or operators and/or RMV. Offset and/or direction of offset may be missing, or the nearest intersecting street/milemarker/exit number may be missing.

W, X. Shown are ***X and Y coordinates for crashes that have been geocoded*** (located to a point) by the MassDOT Highway Division GIS (Geographic Information System) crash geocoding application. Coordinates are shown only for crashes that were successfully geocoded to a point or to an approximate point based on available crash location data. Users should be aware that for many crashes (especially ones located at or near an exit, highway interchange, rotary, etc.) these coordinates are only approximate, depending on the quality of the source crash location data. Crashes referenced by an exit number or interchange may in fact actually have occurred some distance from that exit or interchange. Coordinates are in Massachusetts Mainland State Plane NAD 83 meters. The X and Y coordinate columns have been excluded from the default print range in order to keep the font size of printed report pages reasonably legible.

APPENDIX F

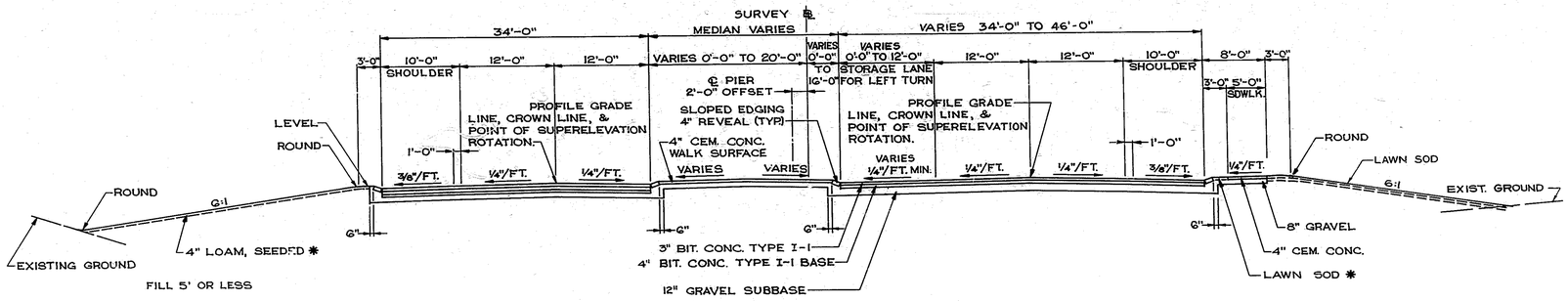
EXISTING PAVEMENT CROSS-SECTION

STERLING
ROUTE I-190

PUB. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	MASS.	I-190-6(016)108		34	743

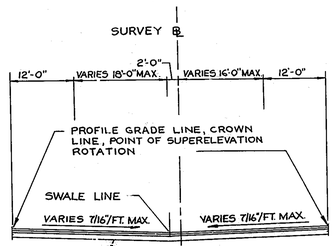
TYPICAL SECTIONS
NOT TO SCALE

8045



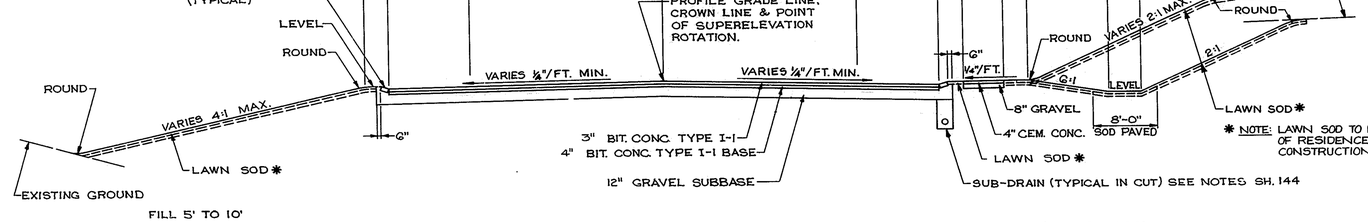
(D) NORMAL SECTION WITH MEDIAN—REDEMPTION ROCK TRAIL (ROUTE 140)

STA. 18+11± TO STA. 32+29±



(D) SUPERELEVATED SECTION WITHOUT MEDIAN REDEMPTION ROCK TRAIL (ROUTE 140)

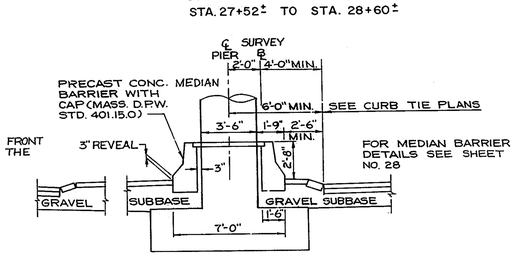
STA. 21+54± TO STA. 22+65±
STA. 27+52± TO STA. 28+60±



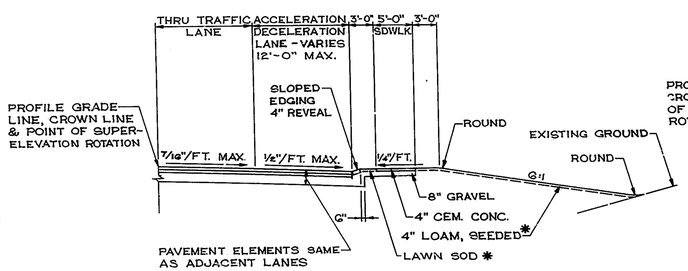
* NOTE: LAWN SOD TO BE USED IN FRONT OF RESIDENCES WITHIN THE CONSTRUCTION LIMITS.

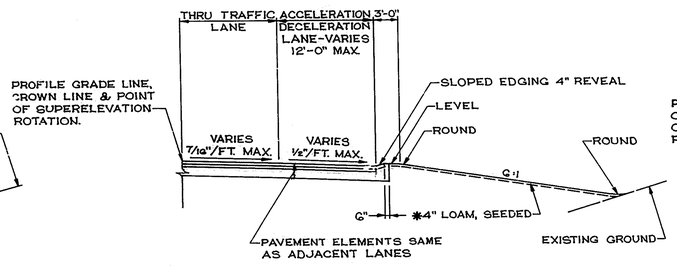
(D) NORMAL SECTION WITHOUT MEDIAN—REDEMPTION ROCK TRAIL, NORTH MAIN STREET (ROUTE 140)

STA. 5+00± TO STA. 18+11±
STA. 32+29± TO STA. 45+50±

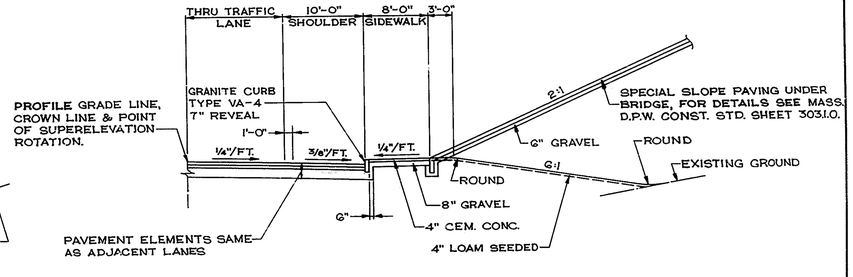


MEDIAN DETAILS UNDER BRIDGE





AUXILIARY LANE DETAILS



SIDEWALK DETAILS UNDER BRIDGE

0 1 2 3
3" SCALE

BASELINE ADJUSTED TO MASS. COORD. SYSTEM (MAINLAND ZONE)
TRACED FROM PLAN/PROFILE _____ BY _____ DATE _____
CHECKED BY _____ DATE _____

CE MAGUIRE, INC.

APPENDIX G

ESAL CALCULATION SPREADSHEET

Box 1
SB on MA-140
Lane 1

11:48 AM	0	28	3	0	2	0	0	1	0	0	0	0	0	2	36
12:03 PM	0	38	2	1	2	0	0	1	0	0	0	0	0	0	44
12:18 PM	0	24	6	3	0	1	0	0	0	0	0	0	0	1	35
12:33 PM	0	27	9	0	0	0	0	1	0	0	0	0	0	2	39
12:48 PM	0	28	2	0	1	0	0	1	0	0	0	0	0	2	34
1:03 PM	0	28	5	0	1	0	0	0	1	0	0	0	0	0	35
1:18 PM	0	29	8	1	1	0	0	0	0	0	0	0	0	0	39
1:33 PM	0	26	7	2	1	0	0	0	1	0	0	0	0	0	37
1:48 PM	1	33	6	0	1	2	0	0	1	0	0	0	0	2	46
2:03 PM	0	41	11	1	2	0	1	0	0	0	0	0	1	0	57
2:18 PM	1	30	8	0	1	0	0	0	1	0	0	0	0	1	42
2:33 PM	4	25	7	0	0	2	0	0	0	0	0	0	2	5	45
2:48 PM	1	27	5	0	1	1	0	0	0	0	0	0	1	3	39
3:03 PM	5	13	1	0	1	2	0	0	0	0	0	0	1	11	34
3:18 PM	1	23	3	0	0	7	0	0	0	0	0	0	1	12	47
3:33 PM	4	17	0	0	0	3	0	0	0	0	0	0	2	15	41
3:48 PM	3	24	2	0	0	1	0	0	0	0	0	0	1	11	42
4:03 PM	1	32	1	0	1	1	0	0	1	0	0	0	0	18	55
4:18 PM	5	24	1	0	1	3	0	0	0	0	0	0	1	11	46
4:33 PM	2	29	6	0	1	3	0	0	0	0	0	0	1	8	50
4:48 PM	2	19	4	0	0	2	0	0	0	0	0	0	0	14	41
5:03 PM	0	26	8	0	1	5	0	0	0	0	0	0	0	19	59
5:18 PM	3	24	4	0	1	4	0	0	0	0	0	0	1	15	52
5:33 PM	1	34	8	0	0	5	0	0	0	0	0	0	0	16	64
5:48 PM	2	28	8	0	0	3	0	0	0	0	0	0	0	18	59
6:03 PM	4	26	1	0	2	8	0	0	0	0	0	0	1	22	64
6:18 PM	2	20	7	0	0	4	0	0	0	0	0	0	0	21	54
6:33 PM	3	25	5	0	0	4	0	0	0	0	0	0	2	16	55
6:48 PM	0	15	4	0	0	1	0	0	0	0	0	0	0	15	35
7:03 PM	2	17	2	0	0	2	0	0	0	0	0	0	0	17	40
7:18 PM	3	17	5	0	0	1	0	0	0	0	0	0	0	7	33
7:33 PM	1	9	4	0	0	2	0	0	0	0	0	0	0	7	23
7:48 PM	0	7	0	0	0	0	0	0	0	0	0	0	0	13	20
8:03 PM	2	16	1	0	0	3	0	0	0	0	0	0	0	5	27
8:18 PM	1	15	2	0	0	1	0	1	0	0	0	0	0	6	26
8:33 PM	1	15	0	0	0	1	0	0	0	0	0	0	0	8	25
8:48 PM	1	9	3	0	0	1	0	0	0	0	0	0	0	3	17
9:03 PM	0	6	1	0	0	1	0	0	0	0	0	0	0	3	11
9:18 PM	0	5	1	0	0	0	0	0	0	0	0	0	0	6	12
9:33 PM	3	7	2	0	0	2	0	0	0	0	0	0	0	0	14
9:48 PM	1	5	4	0	0	0	0	0	0	0	0	0	0	7	17
10:03 PM	0	6	2	0	0	1	0	0	0	0	0	0	0	5	14
10:18 PM	0	6	1	0	0	2	0	0	0	0	0	0	0	9	18
10:33 PM	1	9	0	0	0	2	0	0	0	0	0	0	0	3	15
10:48 PM	0	4	0	0	0	2	0	0	0	0	0	0	0	4	10
11:03 PM	1	4	0	0	0	0	0	0	0	0	0	0	0	3	8
11:18 PM	0	4	0	0	1	3	0	0	0	0	0	0	0	1	9
11:33 PM	1	3	0	0	0	1	0	0	0	0	0	0	0	0	5
11:48 PM	1	4	1	0	0	0	0	0	0	0	0	0	0	2	8
12/16/2015	0	1	1	0	0	1	0	0	0	0	0	0	0	2	5
12:18 AM	0	2	1	0	0	0	0	0	0	0	0	0	0	1	4
12:33 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	1	3
12:48 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:03 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
1:18 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
1:33 AM	0	1	1	0	0	0	0	0	0	0	0	0	0	1	3
1:48 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:03 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:18 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:33 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:48 AM	0	3	0	0	0	2	0	0	0	0	0	0	0	0	5
3:03 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:18 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
3:33 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:48 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
4:03 AM	1	2	0	0	0	0	0	0	0	0	0	0	0	1	4
4:18 AM	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
4:33 AM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2

4:48 AM	1	1	1	0	0	0	0	0	0	0	0	0	0	2	5	
5:03 AM	1	2	0	0	0	0	0	0	0	0	0	0	0	4	7	
5:18 AM	1	2	0	0	0	0	0	0	0	0	0	0	0	0	3	
5:33 AM	1	5	2	0	0	1	0	0	0	0	0	0	0	3	12	
5:48 AM	1	7	1	0	0	2	0	0	0	0	0	0	0	5	16	
6:03 AM	0	11	4	0	0	1	0	0	0	0	0	0	0	7	23	
6:18 AM	4	25	4	0	1	4	0	0	0	0	0	0	0	10	48	
6:33 AM	4	23	8	0	1	2	0	0	0	0	0	0	0	5	43	
6:48 AM	6	30	5	0	1	3	0	0	0	0	0	0	0	6	51	
7:03 AM	5	32	10	0	1	2	0	0	0	0	0	0	1	14	65	
7:18 AM	2	58	15	0	1	9	0	0	0	0	0	0	0	20	105	
7:33 AM	14	52	13	0	0	7	0	0	0	0	0	0	0	24	110	
7:48 AM	9	55	12	1	2	7	0	0	0	0	0	0	0	14	100	
8:03 AM	9	47	7	0	1	7	0	0	0	0	0	0	0	21	92	
8:18 AM	7	63	14	0	0	11	0	0	0	1	0	0	0	19	115	
8:33 AM	10	66	12	1	1	7	0	0	0	1	0	0	0	22	120	
8:48 AM	11	76	6	0	0	3	0	0	0	0	0	1	1	26	124	
9:03 AM	4	53	6	1	0	5	0	0	0	0	0	0	2	23	94	
9:18 AM	3	53	5	0	0	6	0	0	0	1	0	0	2	24	94	
9:33 AM	8	42	5	0	1	2	0	0	0	0	0	0	0	19	77	
9:48 AM	2	33	12	0	2	9	0	0	0	0	0	0	1	13	72	
10:03 AM	3	19	3	0	0	1	0	0	0	0	0	0	0	12	38	
10:18 AM	5	25	6	0	0	3	0	0	0	0	0	0	3	9	51	
10:33 AM	1	24	8	0	1	3	0	0	0	0	0	0	0	14	51	
10:48 AM	8	26	4	0	1	3	0	0	0	0	0	0	0	12	54	
11:03 AM	2	25	2	0	1	1	0	0	0	0	0	0	1	12	44	
11:18 AM	2	18	5	0	1	3	0	0	0	0	0	0	0	6	35	
11:33 AM	0	18	7	0	0	1	0	0	0	0	0	0	0	13	39	
Total	189	1846	353	11	38	193	1	5	5	3	0	1	26	737	3408	2671
Percentage	0.07076001	0.69112692	0.13216024	0.00411831	0.01422688	0.07225758	0.00037439	0.00187196	0.00187196	0.00112317	0	0.00037439	0.00973418			
Weighted addition from unclassified vehicle category	52.150131	509.360539	97.4020966	3.03519281	10.4852115	53.2538375	0.27592662	1.3796331	1.3796331	0.82777986	0	0.27592662	7.1740921			
Adjusted Total	241.150131	2355.36054	450.402097	14.0351928	48.4852115	246.253838	1.27592662	6.3796331	6.3796331	3.82777986	0	1.27592662	33.1740921		3408	
Lane 2																
11:48 AM	0	5	4	1	0	0	0	0	0	0	0	0	0	1	11	
12:03 PM	1	3	2	0	1	0	0	0	0	0	0	0	0	1	8	
12:18 PM	1	3	3	1	0	0	0	0	0	0	0	0	0	0	8	
12:33 PM	1	3	2	1	0	0	0	0	0	0	0	0	0	0	7	
12:48 PM	0	10	3	0	3	0	0	0	0	0	0	0	0	2	18	
1:03 PM	3	6	3	0	1	0	0	0	0	0	0	0	0	0	13	
1:18 PM	0	8	3	0	1	0	0	0	0	0	0	0	0	0	12	
1:33 PM	1	3	0	0	2	0	0	0	0	0	0	0	0	4	10	
1:48 PM	1	7	1	0	0	0	0	0	0	0	0	0	1	3	13	
2:03 PM	2	6	2	0	1	0	0	0	0	0	0	0	0	3	14	
2:18 PM	1	5	3	1	0	0	0	0	0	0	0	0	0	0	10	
2:33 PM	0	0	1	1	1	0	0	0	1	0	0	0	0	4	8	
2:48 PM	0	10	3	0	2	0	0	0	0	0	0	0	0	3	18	
3:03 PM	1	1	0	2	0	0	0	1	0	0	0	0	0	14	19	
3:18 PM	1	2	0	1	1	1	0	0	0	0	0	0	0	13	19	
3:33 PM	1	0	1	0	2	0	0	0	0	0	0	0	0	11	15	
3:48 PM	1	8	1	0	1	0	0	0	0	0	0	0	0	8	19	
4:03 PM	0	1	1	1	0	0	0	0	0	0	0	0	0	4	7	
4:18 PM	3	9	2	0	2	0	0	0	0	0	0	0	0	2	18	
4:33 PM	1	6	0	0	3	0	0	0	0	0	0	0	0	9	19	
4:48 PM	2	2	4	1	0	0	0	0	0	0	0	0	0	10	19	
5:03 PM	2	4	2	0	0	0	0	0	0	0	0	0	0	8	16	
5:18 PM	0	4	3	1	0	0	0	0	0	0	0	0	0	11	19	
5:33 PM	0	7	2	2	1	0	0	0	0	0	0	0	0	13	25	
5:48 PM	1	5	2	0	0	0	0	0	0	0	0	0	0	5	13	
6:03 PM	0	7	1	1	0	0	0	0	0	0	0	0	1	11	21	
6:18 PM	1	1	0	0	1	0	0	0	0	0	0	0	0	12	15	
6:33 PM	1	5	1	0	0	1	0	0	0	0	0	0	0	5	13	
6:48 PM	3	15	1	1	2	0	0	0	0	0	0	0	0	5	27	

7:03 PM	1	2	1	0	2	0	0	0	0	0	0	0	0	9	15
7:18 PM	3	0	0	0	1	0	0	0	0	0	0	0	1	3	8
7:33 PM	3	4	3	0	0	0	0	0	0	0	0	0	0	9	19
7:48 PM	0	1	1	0	1	0	0	0	0	0	0	0	0	10	13
8:03 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	4	5
8:18 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	4	5
8:33 PM	1	2	1	1	1	0	0	0	0	0	0	0	0	1	7
8:48 PM	0	2	2	0	0	0	0	0	0	0	0	0	0	1	5
9:03 PM	1	1	1	1	1	0	0	0	0	0	0	0	0	1	6
9:18 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	3	5
9:33 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2
9:48 PM	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
10:03 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	3	4
10:18 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:33 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:48 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	7	8
11:03 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
11:18 PM	0	1	0	0	2	0	0	0	0	0	0	0	0	1	4
11:33 PM	1	1	0	1	0	0	0	0	0	0	0	0	0	2	5
11:48 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12/16/2015	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
12:18 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:33 AM	0	1	1	0	1	0	0	0	0	0	0	0	0	0	3
12:48 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
1:03 AM	1	1	0	0	0	0	0	0	0	0	0	0	0	2	4
1:18 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:33 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:48 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
2:03 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:18 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2
2:33 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:48 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
3:03 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:18 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:33 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
3:48 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:03 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:18 AM	1	1	1	0	0	0	0	0	0	0	0	0	0	0	3
4:33 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:48 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5
5:03 AM	0	2	0	1	0	0	0	0	0	0	0	0	0	3	6
5:18 AM	0	0	2	0	0	0	0	0	1	0	0	0	0	2	5
5:33 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
5:48 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	1	3
6:03 AM	2	3	0	0	1	0	0	0	0	0	0	0	0	2	8
6:18 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	8	10
6:33 AM	0	5	2	1	0	0	0	0	0	0	0	0	0	5	13
6:48 AM	0	8	4	0	0	0	0	0	0	0	0	0	0	4	16
7:03 AM	3	9	3	0	0	0	0	0	0	0	0	0	0	8	23
7:18 AM	2	6	2	1	0	1	0	0	0	0	0	0	0	13	25
7:33 AM	2	6	4	0	3	0	0	0	0	0	0	0	0	13	28
7:48 AM	0	12	4	1	0	0	0	0	0	0	0	0	0	12	29
8:03 AM	1	6	2	0	1	0	0	0	0	0	0	0	0	17	27
8:18 AM	1	8	2	1	1	0	0	0	0	0	0	0	0	19	32
8:33 AM	0	8	5	0	1	0	0	0	0	0	0	0	0	16	30
8:48 AM	0	2	0	0	1	0	0	0	0	0	0	0	0	18	21
9:03 AM	0	10	4	0	0	0	0	0	0	0	0	0	0	12	26
9:18 AM	0	5	1	0	0	0	0	0	0	0	0	0	0	18	24
9:33 AM	0	6	1	0	1	1	0	0	0	0	0	0	0	18	27
9:48 AM	1	3	3	2	1	1	0	0	0	0	0	0	0	10	21

10:03 AM	0	3	3	0	1	0	0	0	0	0	0	0	0	12	19	
10:18 AM	2	10	1	1	1	0	0	0	0	0	0	0	0	1	16	
10:33 AM	0	3	2	0	2	0	0	0	0	0	0	0	0	9	16	
10:48 AM	0	6	1	0	1	0	0	0	0	0	0	0	0	2	10	
11:03 AM	1	4	1	1	2	0	0	0	0	0	0	0	0	9	18	
11:18 AM	2	6	1	1	1	1	0	0	0	0	0	0	0	2	14	
11:33 AM	1	1	0	0	2	0	0	0	0	0	0	0	0	6	10	
Total	59	308	114	30	57	6	0	2	2	0	0	0	4	476	1058	582
Percentage	0.10137457	0.52920962	0.19587629	0.05154639	0.09793814	0.01030928	0	0.00343643	0.00343643	0	0	0	0.00687285			
Weighted addition from unclassified vehicle category	48.2542955	251.90378	93.2371134	24.5360825	46.6185567	4.90721649	0	1.63573883	1.63573883	0	0	0	3.27147766			
Adjusted Total	107.254296	559.90378	207.237113	54.5360825	103.618557	10.9072165	0	3.63573883	3.63573883	0	0	0	7.27147766		1058	
Box 2																
NB on MA-140																
Lane 1																
12:47 PM	2	109	17	1	3	0	0	2	0	0	0	0	0	2	136	
1:47 PM	1	108	19	3	3	0	0	1	1	0	0	0	1	0	137	
2:47 PM	1	149	25	2	2	2	0	2	2	0	0	0	0	2	187	
3:47 PM	0	186	28	1	4	1	0	0	1	0	0	0	0	1	222	
4:47 PM	12	189	32	1	3	6	0	0	2	0	0	0	0	41	286	
5:47 PM	17	213	14	0	0	18	3	0	0	0	0	0	4	114	383	
6:47 PM	26	243	18	0	1	11	0	0	2	2	0	0	5	79	387	
7:47 PM	18	243	6	0	0	7	0	0	1	0	0	0	2	49	326	
8:47 PM	18	136	5	0	0	1	0	0	0	0	0	0	0	24	184	
9:47 PM	7	113	1	0	0	3	0	0	0	0	0	0	0	2	126	
10:47 PM	10	86	2	0	0	4	0	0	0	0	0	0	0	10	112	
11:47 PM	8	61	4	0	0	2	0	1	0	0	0	0	0	11	87	
12/16/2015	8	52	3	0	0	1	1	0	0	0	0	0	0	5	70	
1:47 AM	1	26	0	0	0	0	0	0	0	0	0	0	0	3	30	
2:47 AM	0	12	0	0	0	1	0	0	0	0	0	0	0	3	16	
3:47 AM	0	5	0	0	0	0	0	0	0	0	0	0	0	3	8	
4:47 AM	2	4	0	0	0	0	0	0	0	0	0	0	0	2	8	
5:47 AM	1	3	1	0	0	1	0	0	0	0	0	0	0	1	7	
6:47 AM	0	17	2	0	0	2	0	0	0	0	0	0	0	1	22	
7:47 AM	3	39	6	0	1	2	0	0	1	0	0	0	0	1	53	
8:47 AM	14	107	10	0	2	7	0	0	0	0	0	0	0	8	148	
9:47 AM	12	105	6	0	1	5	0	0	1	1	0	0	0	4	135	
10:47 AM	11	87	9	0	2	2	0	0	1	0	0	0	0	7	119	
11:47 AM	10	61	8	0	2	6	0	0	0	0	0	0	0	13	100	
Total	182	2354	216	8	24	82	4	6	12	3	0	0	12	386	3289	2903
Percentage	0.06269377	0.81088529	0.07440579	0.00275577	0.00826731	0.02824664	0.00137788	0.00206683	0.00413365	0.00103341	0	0	0.00413365			
Weighted addition from unclassified vehicle category	24.1997933	313.001722	28.7206338	1.06372718	3.19118154	10.9032036	0.53186359	0.79779538	1.59559077	0.39889769	0	0	1.59559077			
Adjusted Total	206.199793	2667.00172	244.720634	9.06372718	27.1911815	92.9032036	4.53186359	6.79779538	13.5955908	3.39889769	0	0	13.5955908		3289	
Lane 2																
12:47 PM	0	43	12	1	5	0	0	0	0	0	0	0	0	6	67	
1:47 PM	1	51	16	1	4	0	0	1	1	0	0	0	0	5	80	
2:47 PM	1	54	8	2	2	2	0	1	0	0	0	0	0	7	77	
3:47 PM	0	74	16	2	3	1	0	0	0	0	0	0	0	13	109	
4:47 PM	3	93	26	3	17	1	0	7	2	0	0	0	8	33	193	
5:47 PM	5	73	19	1	8	2	1	8	0	0	0	0	15	39	171	
6:47 PM	1	50	8	0	3	0	0	4	0	0	0	0	15	19	100	
7:47 PM	2	86	13	0	7	1	0	4	0	0	0	0	15	42	170	
8:47 PM	5	123	29	0	16	0	0	5	0	0	0	0	5	27	210	
9:47 PM	1	117	21	1	18	2	0	2	0	1	0	0	1	19	183	
10:47 PM	6	82	11	1	6	1	0	0	0	0	0	0	0	28	135	
11:47 PM	2	54	7	1	15	0	0	1	0	0	0	0	1	15	96	
12/16/2015	12	45	5	0	8	1	0	0	0	0	0	0	0	13	84	
1:47 AM	3	11	3	1	2	0	0	0	0	0	0	0	0	14	34	
2:47 AM	1	16	1	0	3	0	0	1	0	0	0	0	0	2	24	
3:47 AM	0	7	1	1	1	0	0	0	0	0	0	0	0	0	10	
4:47 AM	0	4	0	0	5	0	0	0	0	0	0	0	0	2	11	
5:47 AM	1	7	0	0	3	0	0	0	1	0	0	0	0	0	12	

6:47 AM	8	6	1	0	3	2	0	0	0	1	0	0	0	2	23	
7:47 AM	3	37	6	0	8	2	1	1	0	0	0	0	0	5	63	
8:47 AM	8	59	16	5	11	3	0	1	0	0	0	0	2	25	130	
9:47 AM	12	73	21	5	8	5	0	4	1	0	0	0	2	13	144	
10:47 AM	19	54	17	3	12	3	0	2	2	0	0	0	1	21	134	
11:47 AM	6	56	10	5	27	1	0	0	2	0	0	0	2	20	129	
Total	100	1275	267	33	195	27	2	42	9	2	0	0	67	370	2389	2019
Percentage	0.04952947	0.63150074	0.13224368	0.01634473	0.09658247	0.01337296	0.00099059	0.02080238	0.00445765	0.00099059	0	0	0.03318474			
Weighted addition from unclassified vehicle category	18.3259039	233.655275	48.9301634	6.04754829	35.7355126	4.94799406	0.36651808	7.69687964	1.64933135	0.36651808	0	0	12.2783556			
Adjusted Total	118.325904	1508.65527	315.930163	39.0475483	230.735513	31.9479941	2.36651808	49.6968796	10.6493314	2.36651808	0	0	79.2783556		2389	
TOTAL	672.930124	7090.92132	1218.29001	116.682551	410.030462	382.012252	8.17430829	66.510047	34.260294	9.59319563	0	1.27592662	133.319516		10144	
MEF adjusted	666.200823	7020.0121	1206.10711	115.515725	405.930158	378.192129	8.0925652	65.8449465	33.9176911	9.49726367	0	1.26316735	131.986321		10042.56	
Growth adjusted Design Volume	6575135.64	69284711.5	11903794.7	1140094	4006368.29	3732605.04	79870.3815	649863.284	334754.044	93734.1935	0	12466.9565	1302652.19		271550.822	
ESAL Factor	0	0	0	0.57	0.26	0.42	0.42	0.3	1.2	0.93	0.82	1.06	1.39			
Design ESAL	0	0	0	649853.581	1041655.75	1567694.12	33545.5602	194958.985	401704.853	87172.8	0	13214.9739	1810686.55		5800487.17	
													Directional Split		50%	
													Design ESAL		2900243.59	