# Vendor Electronic Submission Handbook

# RMV Vendor Guide to the Electronic Submission

# March 31, 2021

**Version 3.0**

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## REVISION HISTORY

| Version Number | Date | Section | Reason for change |
|---|---|---|---|
| 3.0 | 01/03/2013 | All | Reformat document, incorporate changes for CDSXML2.dtd and new crash report form |

# 1   INTRODUCTION

The Massachusetts Registry of Motor Vehicles (RMV) is responsible under Massachusetts General Law Chapter 90 section 26 & 29 for collecting and keeping Accidents Reports for the Commonwealth. The Massachusetts Highway Department (MHD) is the major user of statistical information generated from the detailed accident reports.

State law requires persons involved in an accident to file a report with the RMV within 5 days of the accident if there is $1,000 in damage to any one vehicle or other property or if there is any personal injury.

MHD uses the information entered by the RMV to make decisions about transportation improvements, calculate statistics, and to improve roadway safety. In addition, state and local police, as well as the medical profession and Governor's Highway Safety Bureau often seek access to the Accident Record database to develop enforcement strategies, design programs to improve EMS services, and many other purposes.

# 2   TERMS AND ABBREVIATIONS USED

| Term / Abbreviation | Description |
|---|---|
| RMV | Registry of Motor Vehicles |
| MHD | Mass Highway Department |
| FHWA | Federal Highway Administration |
| NHTSA | National Highway Traffic Safety Administration |
| NAGHSR | National Association of Governor's Highway Safety Representatives |
| MMUCC | Model Minimum Uniform Crash Criteria |
| EMS | Emergency Medical Services |

# 3  OVERVIEW

In November 2001 the Massachusetts Registry of Motor Vehicles (RMV) rolled out a new system for collecting motor vehicle crash data in Massachusetts. A major component of this new system is a new paper form for police and operator reports. To help the RMS Vendors put their role in context, the main project goals for the new system are listed below:

**Project Goals**

1. Capture accurate crash location data
   - Improve collection and storage of crash data and diagrams
   - Promote accurate reporting of data with a redesigned crash form and process
   - Validate crash location captured or entered against a roadway inventory

2. Replace outdated technologies
   - On-line accessibility to multiple agencies
   - Automate and streamline file / document storage and retrieval

3. Reduce / eliminate paper processing through electronic data entry / transfers
   - Increase productivity
   - Increase accuracy
   - Reduce duplicate data entry
   - Improve document management and work flow

In conjunction with the rollout of the new paper Motor Vehicle Crash Police Report form, the Massachusetts Registry of Motor Vehicles (RMV) also implemented a process for submitting these forms electronically.  This allows for the automated submission of these reports and significantly reduces the effort and inevitable errors that are associated with making these submissions manually.  This benefits both the RMV and the individual law enforcement agencies because manual processes are currently involved on both sides of the submission.  It also should reduce the number forms that are sent back for reprocessing due to errors or insufficient information.  This document covers the details necessary for the RMS vendors to implement this electronic submission process.

# 4   THE POLICE FORM

In August 1998, the Federal Highway Administration (FHWA), the National Highway Traffic Safety Administration (NHTSA), and the National Association of Governors' Highway Safety Representatives (NAGHSR) published a set of criteria called the Model Minimum Uniform Crash Criteria (MMUCC) and recommended that MMUCC serve as the model data elements for crash reporting. The primary benefit of this is uniform reporting across the states. When designing the new form for Massachusetts, we based the data to collect on the MMUCC guidelines.

The police form is the result of many months of intense discussions on what data should be included and what should not using MMUCC as the basis. Participants in these discussions included the RMV, MHD, the Governor's Highway Safety Bureau, the Massachusetts State Police, the Massachusetts Chiefs of Police Association, and the Federal Highway Administration.

The form was piloted in July 2000 by five State Police barracks and five local police agencies producing about 200 crash reports and detailed feedback on the use of the form. The feedback was incorporated and the result is the new Motor Vehicle Crash Police Report form for the Commonwealth of Massachusetts.

On the following page is the new form as well as the overlays that the Police will use when filling out the form. Form instructions are also listed as part of the overlays.

## 4.1 Exchange Form

**Commonwealth of Massachusetts**
**Motor Vehicle Crash**
**Exchange Form**

| Date of Crash | Time of Crash 24HR | City/Town | | State Police ☐ Local Police ☐ MBTA Police ☐ Other: |
|---|---|---|---|---|

| AT INTERSECTION: | < LOCATION > | NOT AT INTERSECTION: |
|---|---|---|

Route# Direction _____ Name of Roadway/Street
At
Route# Direction _____ Name of Intersecting Roadway/Street
Also at Intersection with
Route# Direction _____ Name of Intersecting Roadway/Street

Route# Direction Address # _____ Name of Roadway/Street
_____ Feet N S E W of — — — • — or _____ Mile Marker / Exit Number
_____ Feet N S E W of Route# _____ Intersecting Roadway/Street
_____ Feet N S E W of _____ Landmark

**Please Select One of the Following:** ☐ Vehicle 1 ___# Occupants ☐ Hit/Run ☐ Moped Crash Report ID# _____

License # _____ St ____ DOB/Age _____ [19] [19]
Sex ____ Lic. Class ____ Lic. Restrictions ____ [20] CDL ____ Endorsement
Reg # _____ Reg Type _____ Reg State _____ [21]
Veh Year _____ Veh Make _____ Veh Config. _____

Operator _____ Last First Middle
Owner _____ Last First Middle
Address _____
Address _____
City _____ State ____ Zip ____
City _____ State ____ Zip ____
Insurance Company _____

### Instructions

M.G.L. Chapter 90, Section 26 requires a person who was operating a motor vehicle involved in a crash in which (i) any person was killed or (ii) injured or (iii) in which there was damage in excess of $1,000 to any one vehicle or other property, to complete and file a *Crash Operator Report* with the Registrar **within five (5) days after such crash** (unless the person is physically incapable of doing so due to incapacity).

Please obtain a copy of the operator crash report from your local police department, Registry branch office or from the RMV Website www.massrmv.com and submit the original to:

MassDOT Registry of Motor Vehicles Division
P.O. Box 55889
Boston, MA 02205-5889
Attn: Crash Records

Also, be sure to forward a copy to your insurance agency, the local police department where the crash occurred, and retain a copy for yourself.

**Please Select One of the Following:** ☐ Vehicle 2 ___# Occupants ☐ Non-Motorist A Type [15] Action [16] Location [17] Condition [18] ☐ Hit/Run ☐ Moped

License # _____ St ____ DOB/Age _____ [19] [19]
Sex ____ Lic. Class ____ Lic. Restrictions ____ [20] CDL ____ Endorsement
Reg # _____ Reg Type _____ Reg State _____ [21]
Veh Year _____ Veh Make _____ Veh Config. _____

Operator _____ Last First Middle
Owner _____ Last First Middle
Address _____
Address _____
City _____ State ____ Zip ____
City _____ State ____ Zip ____
Insurance Company _____

### Obtaining Crash Report Copies

If you would like to obtain a copy of the police report please send a letter to the address above with a check for $20.00 for each requested report made payable to: MassDOT. Reports may be obtained @www.massrmv.com. Please note that the $20.00 fee is a search fee, not for the crash report itself and therefore is non-refundable.

In addition to your name and address, the following items should be included in your letter to identify the report you are requesting:

- Date of the crash
- Time of the crash
- City/Town where crash occurred
- Registration number and/or license number of at least one vehicle involved

Please allow at least 4 weeks from the date of the crash before submitting your request.

## 4.2 Police Report



**Commonwealth of Massachusetts**
**Motor Vehicle Crash**
**Police Report**

| Police Use Only | | | | RMV Document Number |
|---|---|---|---|---|

Date of Crash | Time of Crash | City/Town | Number Vehicles | Number Injured | Speed Limit ___ | State Police ☐ / Local Police ☐ / MBTA Police ☐ / Other: |
24HR | | | | Latitude ___ | Longitude ___ |

**AT INTERSECTION:** < **LOCATION** > **NOT AT INTERSECTION:**

Route# | Direction | Name of Roadway/Street
At
Route# | Direction | Name of Intersecting Roadway/Street
Also at Intersection with
Route# | Direction | Name of Intersecting Roadway/Street

Route# | Direction | Address # | Name of Roadway/Street
___ Feet N S E W of ___ • ___ or ___
Mile Marker / Exit Number
___ Feet N S E W of Route# ___ Intersecting Roadway/Street
___ Feet N S E W of Landmark

**Please Select One of the Following:** ☐ Vehicle 1 ___ # Occupants | ☐ Hit/Run | ☐ Moped | Crash Report ID#

License # ___ St ___ DOB/Age ___ | Reg # ___ Reg Type ___ Reg State ___
Sex ___ Lic. Class ___ Lic. Restrictions ___ CDL ___ Endorsement | Veh Year ___ Veh Make ___ Veh Config. ___
Operator ___ Last / First / Middle | Owner ___ Last / First / Middle
Address ___ | Address ___
City ___ State ___ Zip ___ | City ___ State ___ Zip ___
Insurance Company ___ | Vehicle Action Prior to Crash | Damaged Area Code:
Vehicle Travel Direction: N S E W  Responding to Emergency? ___ | Event Sequence | Test Status:
Citation # (If Issued) ___ | Most Harmful Event | Type of Test:
| | BAC Test Result:
Viol. 1: Ch/Sec/Sub ___ Viol. 2: Ch/Sec/Sub ___ | Driver Contributing Code | Susp. Alcohol: / Susp. Drug:
Viol. 3: Ch/Sec/Sub ___ Viol. 4: Ch/Sec/Sub ___ | Driver Distracted by | Towed from scene?

Please fill out for operator and all occupants involved
Name (Last First Middle) | Address | DOB/Age | Sex | Seat Pos. | Safety System | Airbag Status | Eject Code | Trap Code | Injury Status | Transp. Code | Medical Facility

**Operator** | See Above | | | 1

**Please Select One of the Following:** ☐ Vehicle 2 ___ # Occupants | ☐ Non-Motorist A Type ___ Action ___ Location ___ Condition ___ | ☐ Hit/Run | ☐ Moped

License # ___ St ___ DOB/Age ___ | Reg # ___ Reg Type ___ Reg State ___
Sex ___ Lic. Class ___ Lic. Restrictions ___ CDL ___ Endorsement | Veh Year ___ Veh Make ___ Veh Config. ___
Operator ___ Last / First / Middle | Owner ___ Last / First / Middle
Address ___ | Address ___
City ___ State ___ Zip ___ | City ___ State ___ Zip ___
Insurance Company ___ | Vehicle Action Prior to Crash | Damaged Area Code:
Vehicle Travel Direction: N S E W  Responding to Emergency? ___ | Event Sequence | Test Status:
Citation # (If Issued) ___ | Most Harmful Event | Type of Test:
| | BAC Test Result:
Viol. 1: Ch/Sec/Sub ___ Viol. 2: Ch/Sec/Sub ___ | Driver Contributing Code | Susp. Alcohol: / Susp. Drug:
Viol. 3: Ch/Sec/Sub ___ Viol. 4: Ch/Sec/Sub ___ | Driver Distracted by | Towed from scene?

Please fill out for operator/non-motorist and all occupants involved
Name (Last First Middle) | Address | DOB/Age | Sex | Seat Pos. | Safety System | Airbag Status | Eject Code | Trap Code | Injury Status | Transp. Code | Medical Facility

**Operator/Non-Motorist** | See Above | | | 1

**Crash Diagram:**

➡ = Direction  [1] = Vehicle 1  [2] = Vehicle 2  ♀̊ = Pedestrian  🚲 = Bicycle

ie: ➡[1]   ➡[2]   ➡♀̊   ➡🚲

**If Crash Did Not Occur on a Public Way:**

❏ Off-Street Parking Lot

❏ Garage

❏ Mall/Shopping Center

❏ Other Private Way

**Indicate North by Arrow**

○

**Crash Narrative:**

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

**Witnesses:**

| Name (Last, First, Middle) | Address | Phone # | Statement |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |

**Property Damage:**

| Owner (Last, First, Middle) | Address | Phone # | 41-Type | Description of Damaged Property |
|---|---|---|---|---|
|  |  |  |  |  |
|  |  |  |  |  |

**Truck and Bus Information:**  Registration # _____ (From Vehicle Section)

Carrier Name _____ Bus Use [42]

Address _____ City _____ St _____ Zip _____

US DOT #: _____ State Number _____ Issuing State _____ MC/MX/ICC #: _____

Interstate [43]  Cargo Body Type Code [44]  GVWR/GCWR [45]

Trailer Reg #: _____ Reg Type _____ Reg State _____ Reg Year _____ Trailer Length [46]

**Hazmat Information:**

Placard [47]  Material 1 digit # [48]  Material Name _____ Material 4 digit # _____ Release code [49]

Police Officer Name (Please Print)    Signature    ID/Badge #    Department    Precinct/Barracks    Date

# 5    FORM WITH MAP NUMBERS

On the following page is the Motor Vehicle Crash Police Report form filled in with Map Numbers for each data element. In the sections that follow, the Map Numbers can be used to cross reference to the XML attributes in Appendix A.
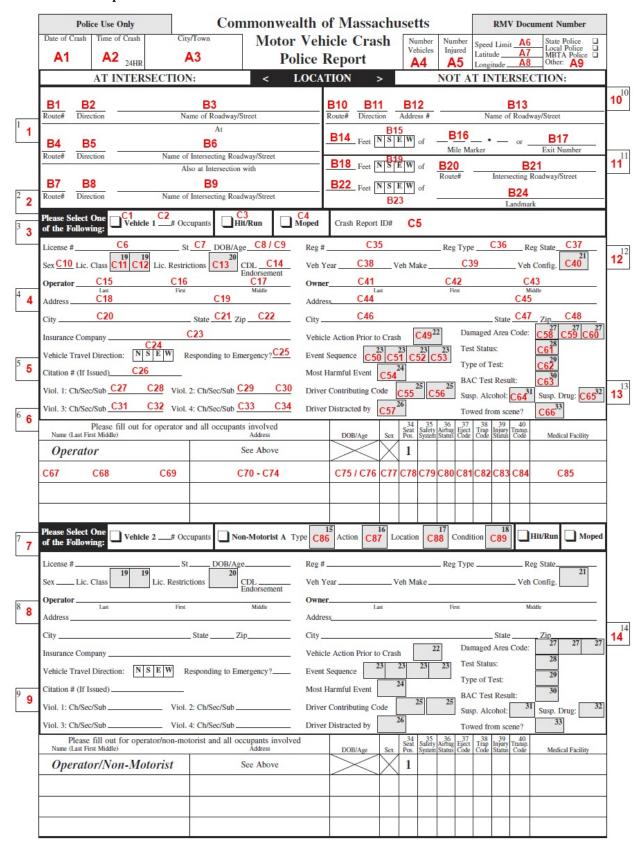
## 5.1 Exchange Form
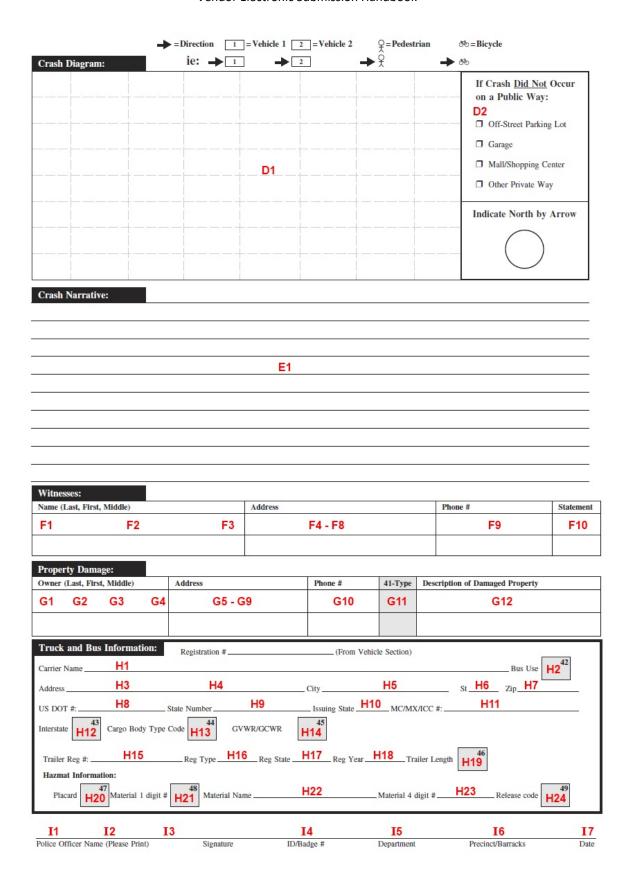
**Commonwealth of Massachusetts**

**Motor Vehicle Crash Exchange Form**

| Date of Crash | Time of Crash | City/Town |
|---|---|---|
| | 24HR | |

State Police ☐
Local Police ☐
MBTA Police ☐
Other:

| **AT INTERSECTION:** | **< LOCATION >** | **NOT AT INTERSECTION:** |
|---|---|---|

Route#  Direction  Name of Roadway/Street

At

Route#  Direction  Name of Intersecting Roadway/Street

Also at Intersection with

Route#  Direction  Name of Intersecting Roadway/Street

Route#  Direction  Address #  Name of Roadway/Street

_____ Feet N S E W of  — __ __ • __ — or _____
Mile Marker            Exit Number

_____ Feet N S E W of _____
Route#   Intersecting Roadway/Street

_____ Feet N S E W of _____
Landmark

**Please Select One of the Following:** ☐ Vehicle 1 ___# Occupants   ☐ Hit/Run   ☐ Moped   Crash Report ID#

License # _____ St ___ DOB/Age _____        Reg # _____ Reg Type _____ Reg State ___  [21]
Sex ___ Lic. Class [19][19] Lic. Restrictions [20] CDL ___ Endorsement    Veh Year _____ Veh Make _____ Veh Config. ___
Operator _____ Last  First  Middle           Owner _____ Last  First  Middle
Address _____                                Address _____
City _____ State ___ Zip _____               City _____ State ___ Zip _____
Insurance Company _____

**Instructions**

M.G.L. Chapter 90, Section 26 requires a person who was operating a motor vehicle involved in a crash in which (i) any person was killed or (ii) injured or (iii) in which there was damage in excess of $1,000 to any one vehicle or other property, to complete and file a *Crash Operator Report* with the Registrar **within five (5) days after such crash** (unless the person is physically incapable of doing so due to incapacity).

Please obtain a copy of the operator crash report from your local police department, Registry branch office or from the RMV Website www.massrmv.com and submit the original to:

> MassDOT Registry of Motor Vehicles Division
> P.O. Box 55889
> Boston, MA 02205-5889
> Attn: Crash Records

Also, be sure to forward a copy to your insurance agency, the local police department where the crash occurred, and retain a copy for yourself.

**Please Select One of the Following:** ☐ Vehicle 2 ___# Occupants   ☐ Non-Motorist A  Type [15] Action [16] Location [17] Condition [18]   ☐ Hit/Run   ☐ Moped

License # _____ St ___ DOB/Age _____        Reg # _____ Reg Type _____ Reg State ___  [21]
Sex ___ Lic. Class [19][19] Lic. Restrictions [20] CDL ___ Endorsement    Veh Year _____ Veh Make _____ Veh Config. ___
Operator _____ Last  First  Middle           Owner _____ Last  First  Middle
Address _____                                Address _____
City _____ State ___ Zip _____               City _____ State ___ Zip _____
Insurance Company _____

**Obtaining Crash Report Copies**

If you would like to obtain a copy of the police report please send a letter to the address above with a check for $20.00 for each requested report made payable to: MassDOT. Reports may be obtained @www.massrmv.com. Please note that the $20.00 fee is a search fee, not for the crash report itself and therefore is non-refundable.

In addition to your name and address, the following items should be included in your letter to identify the report you are requesting:

- Date of the crash
- Time of the crash
- City/Town where crash occurred
- Registration number and/or license number of at least one vehicle involved

Please allow at least 4 weeks from the date of the crash before submitting your request.

## 5.2 Police Report

| Police Use Only | | | Commonwealth of Massachusetts | | RMV Document Number | |
|---|---|---|---|---|---|---|

**Commonwealth of Massachusetts**
**Motor Vehicle Crash**
**Police Report**

| Date of Crash **A1** | Time of Crash **A2** 24HR | City/Town **A3** | Number Vehicles **A4** | Number Injured **A5** | Speed Limit **A6** / Latitude **A7** / Longitude **A8** | State Police ☐ / Local Police ☐ / MBTA Police ☐ / Other: **A9** |

**< LOCATION >**

AT INTERSECTION: | NOT AT INTERSECTION:

**B1** Route# **B2** Direction **B3** Name of Roadway/Street
At
**B4** Route# **B5** Direction **B6** Name of Intersecting Roadway/Street
Also at Intersection with
**B7** Route# **B8** Direction **B9** Name of Intersecting Roadway/Street

**B10** Route# **B11** Direction **B12** Address # **B13** Name of Roadway/Street
**B14** Feet **B15** N S E W of **B16** Mile Marker • — or **B17** Exit Number
**B18** Feet **B19** N S E W of **B20** Route# **B21** Intersecting Roadway/Street
**B22** Feet **B23** N S E W of **B24** Landmark

**Please Select One of the Following:** ☐ **C1** Vehicle 1 **C2** # Occupants ☐ **C3** Hit/Run ☐ **C4** Moped Crash Report ID# **C5**

License # **C6** St **C7** DOB/Age **C8 / C9**
Sex **C10** Lic. Class **C11** **C12** Lic. Restrictions **C13** CDL **C14** Endorsement
Operator **C15** Last **C16** First **C17** Middle
Address **C18** **C19**
City **C20** State **C21** Zip **C22**
Insurance Company **C23**
Vehicle Travel Direction: **C24** N S E W Responding to Emergency? **C25**
Citation # (If Issued) **C26**
Viol. 1: Ch/Sec/Sub **C27** **C28** Viol. 2: Ch/Sec/Sub **C29** **C30**
Viol. 3: Ch/Sec/Sub **C31** **C32** Viol. 4: Ch/Sec/Sub **C33** **C34**

Reg # **C35** Reg Type **C36** Reg State **C37**
Veh Year **C38** Veh Make **C39** Veh Config. **C40**
Owner **C41** Last **C42** First **C43** Middle
Address **C44** **C45**
City **C46** State **C47** Zip **C48**
Vehicle Action Prior to Crash **C49** [22]
Event Sequence **C50** [23] **C51** [23] **C52** [23] **C53** [23]
Most Harmful Event **C54** [24]
Driver Contributing Code **C55** [25] **C56** [25]
Driver Distracted by **C57** [26]

Damaged Area Code: **C58** [27] **C59** [27] **C60** [27]
**C61** [28]
Test Status: **C62** [29]
Type of Test: **C63** [30]
BAC Test Result:
Susp. Alcohol: **C64** [31] Susp. Drug: **C65** [32]
Towed from scene? **C66** [33]

**Please fill out for operator and all occupants involved**

| Name (Last First Middle) | Address | DOB/Age | Sex | Seat Pos. [34] | Safety System [35] | Airbag Status [36] | Eject Code [37] | Trap Status [38] | Injury Code [39] | Transp. Code [40] | Medical Facility |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Operator* | See Above | | | 1 | | | | | | | |
| C67 | C68 | C69 | C70 - C74 | C75 / C76 | C77 | C78 | C79 | C80 | C81 | C82 | C83 | C84 | C85 |

**Please Select One of the Following:** ☐ Vehicle 2 ___ # Occupants ☐ Non-Motorist A Type **C86** [15] Action **C87** [16] Location **C88** [17] Condition **C89** [18] ☐ Hit/Run ☐ Moped

License # St DOB/Age
Sex Lic. Class [19] [19] Lic. Restrictions [20] CDL Endorsement
Operator Last First Middle
Address
City State Zip
Insurance Company
Vehicle Travel Direction: N S E W Responding to Emergency?
Citation # (If Issued)
Viol. 1: Ch/Sec/Sub Viol. 2: Ch/Sec/Sub
Viol. 3: Ch/Sec/Sub Viol. 4: Ch/Sec/Sub

Reg # Reg Type Reg State [21]
Veh Year Veh Make Veh Config.
Owner Last First Middle
Address
City State Zip
Vehicle Action Prior to Crash [22]
Event Sequence [23] [23] [23] [23]
Most Harmful Event [24]
Driver Contributing Code [25] [25]
Driver Distracted by [26]

Damaged Area Code: [27] [27] [27]
[28]
Test Status: [29]
Type of Test: [30]
BAC Test Result:
Susp. Alcohol: [31] Susp. Drug: [32]
Towed from scene? [33]

**Please fill out for operator/non-motorist and all occupants involved**

| Name (Last First Middle) | Address | DOB/Age | Sex | Seat Pos. [34] | Safety System [35] | Airbag Status [36] | Eject Code [37] | Trap Status [38] | Injury Code [39] | Transp. Code [40] | Medical Facility |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Operator/Non-Motorist* | See Above | | | 1 | | | | | | | |

**Crash Diagram:**

→ = Direction  | 1 | = Vehicle 1  | 2 | = Vehicle 2  ⚥ = Pedestrian  🚲 = Bicycle

ie: → | 1 |    → | 2 |    → ⚥    → 🚲

D1

**If Crash Did Not Occur on a Public Way:**

**D2**
- ☐ Off-Street Parking Lot
- ☐ Garage
- ☐ Mall/Shopping Center
- ☐ Other Private Way

**Indicate North by Arrow**

**Crash Narrative:**

E1

**Witnesses:**

| Name (Last, First, Middle) | | | Address | Phone # | Statement |
|---|---|---|---|---|---|
| F1 | F2 | F3 | F4 - F8 | F9 | F10 |
| | | | | | |

**Property Damage:**

| Owner (Last, First, Middle) | | | | Address | Phone # | 41-Type | Description of Damaged Property |
|---|---|---|---|---|---|---|---|
| G1 | G2 | G3 | G4 | G5 - G9 | G10 | G11 | G12 |
| | | | | | | | |

**Truck and Bus Information:**    Registration # _____ (From Vehicle Section)

Carrier Name __ H1 _____ Bus Use H2 [42]

Address __ H3 ____ H4 ____ City __ H5 ____ St H6 __ Zip H7 __

US DOT #: __ H8 ____ State Number __ H9 ____ Issuing State H10 __ MC/MX/ICC #: __ H11 __

Interstate H12 [43]  Cargo Body Type Code H13 [44]  GVWR/GCWR H14 [45]

Trailer Reg #: __ H15 ____ Reg Type H16 __ Reg State H17 __ Reg Year H18 __ Trailer Length H19 [46]

**Hazmat Information:**

Placard H20 [47]  Material 1 digit # H21 [48]  Material Name __ H22 ____ Material 4 digit # __ H23 __ Release code H24 [49]

| I1 | I2 | I3 | I4 | I5 | I6 | I7 |
|---|---|---|---|---|---|---|
| Police Officer Name (Please Print) | Signature | ID/Badge # | | Department | Precinct/Barracks | Date |

# 6 THE PROCESS

The following scenario illustrates the steps typically taken under the current process. The crash data is collected and entered by each law enforcement agency into a system at their site. After the data is entered, it is printed out and mailed to the RMV. Once it is received by the RMV it again goes through a manual data entry process. If errors are found then it is sent back to the agency for correction. As it might be noted, this process involves significant manual intervention including multiple data entry steps which can lead to errors being introduced at several points during the process.

To help reduce the manual process of capturing crash reports and eliminate potential errors, an electronic submission method is available. The electronic submission process allows the data that has been entered by the police to be transmitted directly to the RMV in an XML (E**x**tensible **M**arkup **L**anguage) electronic format bypassing the need to print out and mail the forms, and then manually keying the information into the RMV application. XML is an industry standard for transmitting data electronically.

The following process is used by the RMV to capture crash data electronically. The data is collected and entered by the law enforcement agency into their local system (CJIS). After the data entry process is complete and verified, the officer clicks a button and the electronic submission of the crash data is handled automatically for them. Behind the scenes, files containing the crash data and crash diagram image are produced. These files are either immediately transmitted to the RMV or saved and transmitted as part of a larger batch at a scheduled time, determined by the local reporting police agency.

This process eliminates the redundant data entry and manual effort needed to print out each crash report then mail to the RMV. A significant cost and time savings has been realized since implementing this electronic submission process, along with a considerable reduction in errors. Submitting crash reports electronically has provided a great benefit for law enforcement agencies as well as the RMV.

# 7   XML OVERVIEW

## 7.1   What it is

XML stands for Extensible Markup Language.  Initially designed solely as a means to transfer data across the web, the designers were so successful that it is quickly becoming the corporate standard for all data transfer.  One XML author sums it up well - "As with most technology revolutions, the concept behind XML is deceptively simple - to provide standardization for specifying the meaning of information exchanged over networks".

XML was created because of the limitations of HTML.  HTML allows only a predefined set of tag names and attributes.  For example, to make something bold in HTML you would use the <b> tag like this:

<b>This is bold</b>

While excellent for displaying information on a web page, it does not provide the flexibility necessary to effectively represent business data.  Using XML, user defined tag names are permitted.  These tags are referred to as elements in XML.  In addition to the name, an element can contain attributes, which provide more information about the element.  Again, where HTML has only a limited number of predefined attributes for each element, XML allows users to define their own attributes which dramatically increases its usefulness for describing business data.

An example of a partial representation of witness information might look like the following:

```
<WITNESS WITNESS_PHONE_NUMBER="(617) 555-1212" WITNESS_STATEMENT_CODE="1">
        <PERSON DATE_OF_BIRTH="01/01/1950" SEX="M" PERSON_FIRST_NAME="John"
                PERSON_MIDDLE_NAME="Robert" PERSON_LAST_NAME="Doe">
        </PERSON>
</WITNESS>
```

It's easy to see how a format such as this has uses beyond just the Internet.  XML data is nothing more than formatted text.  However instead of using delimiters or positional fields, XML uses tags.  A structure file is used to define the format of the data including nesting and cardinality for each element, which greatly simplifies the interpretation of the data on the receiving side.  This structure file is called a Document Type Definition (DTD).  The DTD is used to specify which elements and attributes are allowed, the order that they should be found, and whether the elements and attributes are optional, required, or can occur multiple times.  One common use of a DTD is to help ensure that the XML created by one system can be understood by another system.

## 7.2   Benefits

**Simplifies the program**  - with delimited or positional data files, the application developer has to write potentially complex code to validate and parse the data.  With XML, the structure of the data file is defined and provided to a parser, such as one provided by Microsoft or Oracle.  The parser uses the DTD to validate and parse the XML.  Since this is usually the most complex and error prone aspect of data transfers, XML data transfer is cheaper to develop, easier to understand, and more accurate.

**Simplifies data transfer** - an XML specification comes with a defined structure.  This structure can be provided to anyone using any programming language or environment.  Since XML is just text, the structure file facilitates data transfer easily.  XML is an environment and language independent means for data transfer.

**Provides industry standard structures**  - most industries are now publishing their XML standards on a central web site (see www.w3c.org for more information).  This even further advances the standards movement because rather than just standardizing across one organization, entire industries are sharing

standards.  What better way to communicate with third parties than using a common "language"?

**Simplifies the display and reading of the data**  - parsers and style sheet languages are readily available for viewing XML data in a variety of ways.

## 7.3   Its Use at the RMV

At the RMV, the format for the XML has been structured so that the major divisions of the report are represented as elements, and the specific pieces of data are represented as attributes of those elements. This has been done so that the main divisions are instantly distinguishable and so that the relationships between them can be easily discerned.  The individual pieces of data are then kept in context of the element to which they are most closely related.

When an XML file is received by the RMV, it will be parsed to make sure that it meets the basic requirements necessary for it to be considered valid XML.  It will also be validated against the DTD.  For this validation to succeed, it is required that all of the elements and attributes found in the XML exist in the DTD and that they are in the same order.  The nesting of elements within other elements and the cardinality of the elements must also be correct.  Only after the XML has been parsed and validated will it be stored in the database at the RMV.

# 8 CREATING THE DATA

The XML is one of two pieces of data that should be produced for the electronic submission of crash reports to the RMV; the other is the diagram of the crash. The XML represents the detailed information that has been collected about the crash. The crash diagram is an electronic image file containing a graphical depiction of the crash. These two files should be sent to the RMV at the same time in two separate files. The specifics of each file are detailed in this section.

## 8.1 The XML

The XML should be created and transmitted by the vendor software. Since it is text-based, XML can be created either directly by the software or with the help of an XML parser.

**References to use while constructing XML**

| Reference | Use |
|-----------|-----|
| Main sections of this document | Overview, context, central source for all electronic submission information |
| Appendix A of this manual – Mapping of Police Form to XML attributes | Identifies XML elements, attributes, tag names and data types |
| Appendix B of this document – the DTD | Defines structure of XML |
| Appendix C of this document – Sample XML | Visualize desired output |

The XML for each crash report should be generated into a separate file before being transmitted to the RMV. These files should be uniquely named within the submitting agency. Therefore both the Boston Police Department and the Cambridge Police Department can name a crash report 12345.xml, but Boston Police Department should not have two different crash reports named 12345.xml. All XML files should have a .xml extension so that they can be easily recognized as XML. It is strongly recommended that all XML be validated against the DTD before being transmitted to the RMV. For more information concerning the DTD, see Appendix B.

The RMV is using the MSXML parser from Microsoft. RMS vendors are free to choose any parser they desire or none at all. However if other parsers are used by the vendors, then differences may exist in the implementation of the XML specifications for the parsing and validation of XML. Some parsers, called non-validating parsers, do no validation at all. Also the same information may be formatted in different ways in an XML document but still represent equivalent views of the data. For these reasons, final testing with the RMV is required before actual reports can be submitted electronically to the RMV (see Testing Procedures section below). Samples of XML for different crash reports can be found in Appendix C. It might be helpful to use information similar to these scenarios for testing before beginning testing with the RMV.

## 8.2 Crash Diagram

Image should be produced in JPEG format. JPEG is a compressed image format that was developed by the Joint Photographic Experts Group. It is considered a "lossy" format since the compression does somewhat degrade the image, but usually in ways that are not easily detectable by the human eye. This format was chosen because it produces a much smaller file than many other formats and any details that might be lost should not have a significant impact on the overall quality of the diagram.

The image should be Mime Base 64 encoded and embedded in the XML file using the "CRASH_DIAGRAM_ENCODED" attribute in the "GRAPHICS" element.  The images themselves may use any color depth, but they should not exceed 120Kb in size.

## 8.3  Encryption

Since these files will be sent over the public Internet, the option of encrypting the files for their transmission is currently under consideration.  The details concerning the type and method of encryption is still under investigation.  An addendum to this document will be distributed once these have been determined.

## 8.4  Data Mapping and Edits

The mapping of XML to Police Form fields is attached as an Excel file for ease of manipulation in Appendix A.  The data type required for each XML attribute is listed after each attribute.  While all XML is in string form, the expected data types show what will be inserting into our database. Also contained in Appendix A is a listing of state and town codes to be used.

All XML attributes that correspond to codes on the police form overlay should be taken from the overlay. By using the codes directly from the police overlay it will help ensure consistent data.

Since the RMV's system is not used directly by the law enforcement officers, we omitted many potential edits that simply would not make sense for us to catch. For example we do not flag an error when we receive a crash time of 2am and a weather condition of "sunny". The best time to catch an edit like this, a cross edit, is at the point of entry. In the interests of receiving the best possible data, we encourage RMS vendors to include any additional edits or cross edits they deem appropriate.

Below is a list of element and attributes required by the DTD:
- DTD_VERSION_NUMBER
  **This attribute will be used to maintain backwards compatibility and to allow the system to determine which version of the DTD the XML was created using.  The value of this attribute should initially be set to "2", and the Crash Data Support team will send out notification if it needs to be changed in the future.  It is important that the value of this attribute is set properly to ensure that the XML documents are processed correctly.**
- CITY_TOWN_CODE
- CRASH_DATE
- CRASH_TIME
- POLICE_OFFICER_FIRST_NAME
- POLICE_OFFICER_LAST_NAME
- POLICE_AGENCY_TYPE_CODE
- POLICE_DEPARTMENT
- PERSON_LAST_NAME
  **If a person's last name is not known, a value of "Unknown" may be used.**

Additional rules enforced by the DTD:
- Location information must be supplied in the XML, either AT_INTERSECTION or NOT_AT_INTERSECTION
- There must be at least one Vehicle supplied in the XML
- When a crash diagram is supplied, it is embedded in the XML as Mime Base 64 encoded (see Mime Base-64 encoding information)

Below is a list of data edits not enforced by the DTD but required by the RMV:
- Should have both the owner and operator information filled in

# 9   ELECTRONIC SUBMISSION PROCEDURES

## 9.1   How and Where to Send Data

Once the crash data has been collected and the XML and embedded crash diagram have been created, the XML file should be sent to the RMV via FTP.  Each department will be given a unique login ID and password, as well as their own directory in which to put the files that are transmitted.  This will allow the RMV to easily identify the originator in cases where files are received that cannot be processed for some reason.

The FTP site to which files should be transmitted is located at **146.243.245.24**.  It is necessary that the XML be transmitted in binary format and that crash diagrams are a JPEG image format that is Mime Base-64 encoded and embedded in the same XML file.  Transmitting in binary format is to ensure that unwanted conversions are not made to the XML file by the FTP process that might result in corruption of the files.

## 9.2   Error Reporting

During the electronic submission process, there are still areas where errors may occur while trying to accept the files into the system.  Examples of these errors would be if the XML is not well-formed, if the XML is not valid according to the DTD, if the image file is invalid, etc.  In these situations, there needs to be a means to report these errors back to the department that submitted the report.

Individual departments have a choice to receive report errors by either e-mail or FTP. During the integrated testing phase (see Testing Procedures below) the department should determine which notification method best suits their needs. If they choose e-mail, an address will be collected from the department and all e-mail notification will be sent there. If the FTP delivery option is chosen the error report will be placed into that department's directory on the RMV FTP site. This is the same location where the departments upload the electronic reports for RMV processing.  Should an error occur while processing an electronic crash report, an error notification containing the name of the file that contains the error, and the nature of the error, will be sent back via the delivery method chosen (Email or FTP).  For reference, the original file will also be included as an attachment.  When an error report is received, the department should correct the error or contact their vendor to have the error corrected.  The report should be resent with the correction at which point the RMV will attempt to process it again.

If an XML file is readable, contains well-formed XML, and is determined to be valid using the DTD, then it will be accepted into the system.  If an error is found in the information after the point when the file was initially stored in the RMV CDS system, it will be sent back using the regular send back procedures. An example if this would be if the location information was blank.

## 9.3   Testing Procedures

When a vendor has completed the programming necessary for submitting electronic reports, it should contact the RMV (see Contact Information) to begin integrated testing with the RMV systems.  This is the final step necessary before actual electronic crash reports can be submitted to the RMV.

When a request is received to begin integrated testing, the RMV will send paper crash report forms containing specific information to the vendor.  The information from these crash reports should be entered into the vendor system and the XML and image files should be created and electronically transmitted to the RMV FTP site.  The files will then be validated and feedback will be provided.  This feedback will include information regarding the validity and completeness of the data found in the files that were received.  Any adjustments can be made, and the files submitted again if necessary.  Once the generated files are approved, the vendor software can begin to be used to submit actual electronic crash reports.

The vendor software should also be tested at each site after installation to ensure that the site is properly configured to handle the creation and transmission of the XML files.  At this time the department will be given its private login ID, password, and directory for accessing the FTP site.  The department may also be required to provide an email address for error reporting purposes (see Error Reporting section above) depending on the delivery method chosen.  Things to check for at each installation include having the correct FTP address, generation of uniquely named files, connectivity to the internet, correct FTP login ID and password, etc.

There is no intention to make this procedure any more complicated than is absolutely necessary.  The RMV will work with the vendors as well as the individual departments throughout the entire process to make sure that the implementation of crash report electronic submission is as successful as possible.

# 10 CONTACT INFORMATION

For any questions about Vendor Electronic Submission Guide please contact the RMV using one of the following means. If you would like to speak to someone, please provide your phone number in an email or letter and someone will contact you.

**Email**
Karen.Perduyn@state.ma.us

**US Mail**
MassDOT, Registry of Motor Vehicles Division
Karen Perduyn, Accident Records Supervisor
P.O. Box 55889
Boston, MA 02205-5889

# 11 RELEASE NOTES

This document contains information for the Electronic Submission for CDSXML2.DTD.  The previous version was CDSXML.DTD (version 1).  High level changes/updates are as follows:

**Differences between CDSXML.DTD and CDSXML2.DTD**

- Additional Element requirements enforced by DTD
    - At least one vehicle supplied in XML
    - At Intersection or Not At Intersection Location required
    - Person Last name **REQUIRED**

- New attributes added:
    - Road_Contributing_Code
    - Non_Public_Way
    - Driver_Distracted_By_Code
    - Alcohol_Test_Status_Code
    - Alcohol_Type_Of_Test_Code
    - Alcohol_Test_Result_Code
    - Driver_Suspected_Alchol_Use
    - Driver_Suspected_Drug_Use
    - Bus_Use
    - Crash_Diagram_Encoded  (This is a removal of a separate JPG file and embed the diagram in the XML)

- New elements added:
    - Graphics

- Attributes removed:
    - Diagram_Name
    - Carrier_Issuing_Authority_Code
    - Underride_Override_Code

**Crash Form changes**

- Driver Contributing Codes have changed (see Box 25 on form)
    - 23,24,25,26,27 codes have been removed

- Towed from Scene codes have changed (see Box 33 on form)
    - 1 and 2 have been changed to 1,2,3,99

- New fields added to Crash form
    - Road Contributing Circumstances (see Box 14 on form)
    - Driver Distracted by (see Box 26 on form)
    - Test Status (see Box 28 on form)
    - Type of Test (see Box 29 on form)
    - BAC Test Result (see Box 30 on form)
    - Susp. Alcohol (see Box 31 on form)
    - Susp. Drug (see Box 32 on form)
    - Bus Use (see Box 42 on form)

# 12 APPENDIX A

## 12.1 Mapping of XML to Data Dictionary / State Town Codes

The Mapping of XML to Police Form fields is attached as an Excel file for ease of manipulation.  This mapping can be used to link the paper form to the XML.  See included excel file, DataMapv2.0.xls.

**"Police Form Fields" worksheet**
The columns in the mapping file are defined as the following:

| | |
|---|---|
| Map # | The number of the field on the paper police form (See Police Report ) |
| XML Element | The tag name for the element in the XML |
| XML Attribute | The attribute name from the XML |
| DB Datatype | The expected date type of the value |
| Comments | Miscellaneous information out the XML element |

**"State" worksheet**
A list of the State codes used for XML generation

**"Town" worksheet**
A list of the Town codes used for XML generation

# 13 APPENDIX B

## 13.1 The DTD

The DTD is attached in electronic format. This is the actual DTD that is being used by the RMV. It is strongly recommended that the DTD be used to verify the XML that is created for testing purposes as well as to validate each XML file before it is transmitted to the RMV. This will find any errors in the XML formatting and reduce the time and effort involved processing send backs.

# 14 APPENDIX C

Several sample XML files have been attached in electronic format to be used as examples to better understand how the XML should be structured in different situations. They can also be used as a basis for creating some of the various test scenarios to validate that the XML is being created correctly. Please note that different XML can be created from the same data and still be valid and equivalent. This is primarily due to the different ways that empty elements can be formed using XML.

The sample XML files have been included in electronic form. The major features of each of the samples are described below.

**Sample 1**
cdssample1.xml
- occurs at an intersection
- 2 vehicles
- 1 with driver and passenger, a citation issued
- 1 with driver and injured passenger
- 2 non-motorists
- 2 witnesses

**Sample 2**
cdssample2.xml
- occurs at an intersection
- 2 vehicles
- 1 with driver and passenger
- 1 truck with trailer, hazmat, and driver
- 2 damaged property

**Sample 3**
cdssample3.xml
- occurs not at an intersection
- 3 vehicles
- 1 with driver and 3 passengers
- 1 with driver only
- 1 moped
- 3 non-motorists
- 3 witnesses
- 3 damaged property

**Sample 4**
cdssample4.xml
- occurs at an intersection
- 1 vehicle with driver only and citation

**Sample 5**
cdssample5.xml
- occurs at an intersection
- 2 vehicles
- 1 with driver and passenger
- 1 vehicle Hit & Run, Driver Unknown