

# MassDOT Crash Geocoder Solution

## GIS- T

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Offices located throughout the east coast

# Presentation Overview

- Solution Overview
- System Components
  - Crash Geocoding Engine
  - Crash Geocoder API
  - Crash Data Bridge
  - Interactive Crash Locator
  - Crash Data Portal
- Technical Aspects

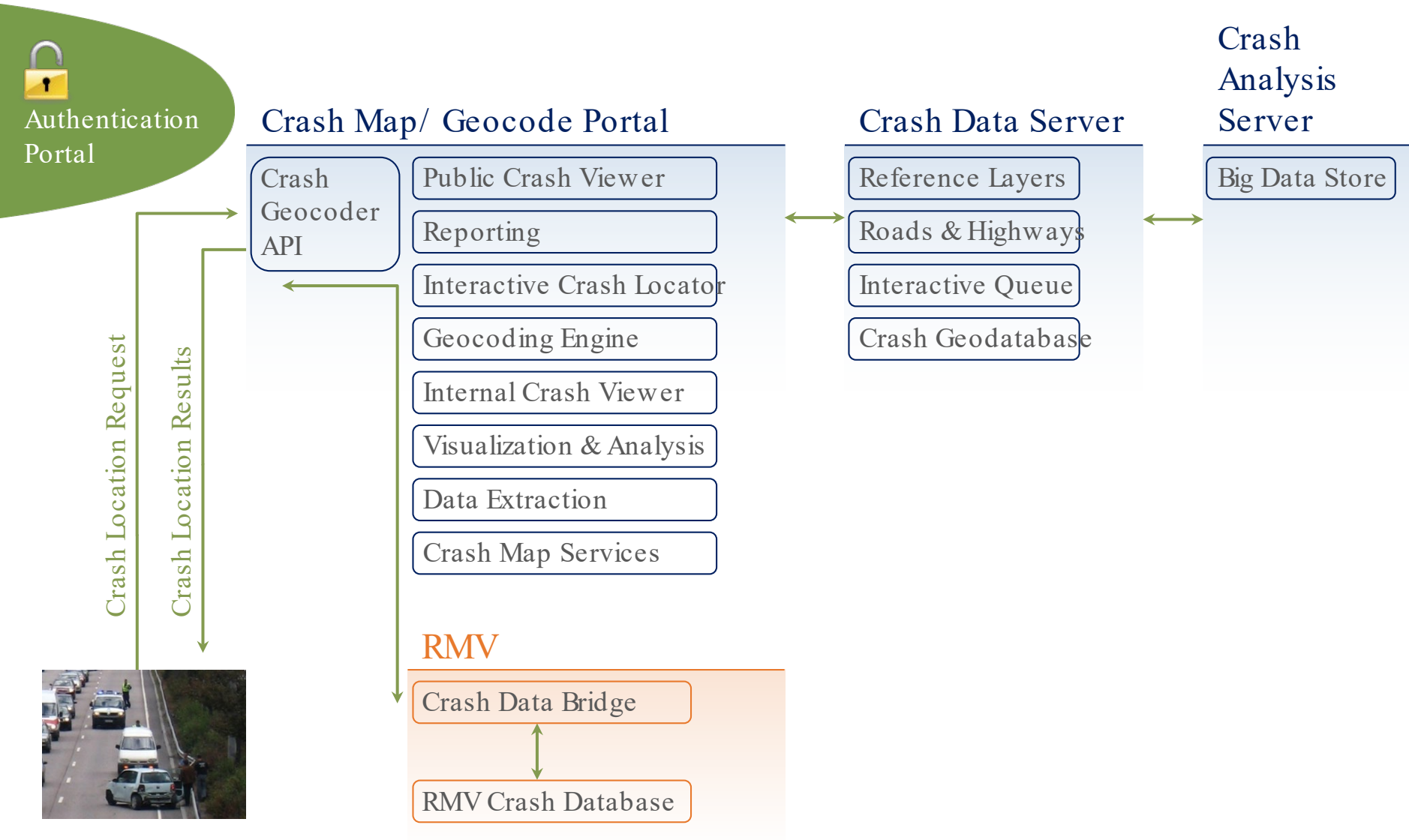


# Key Objectives

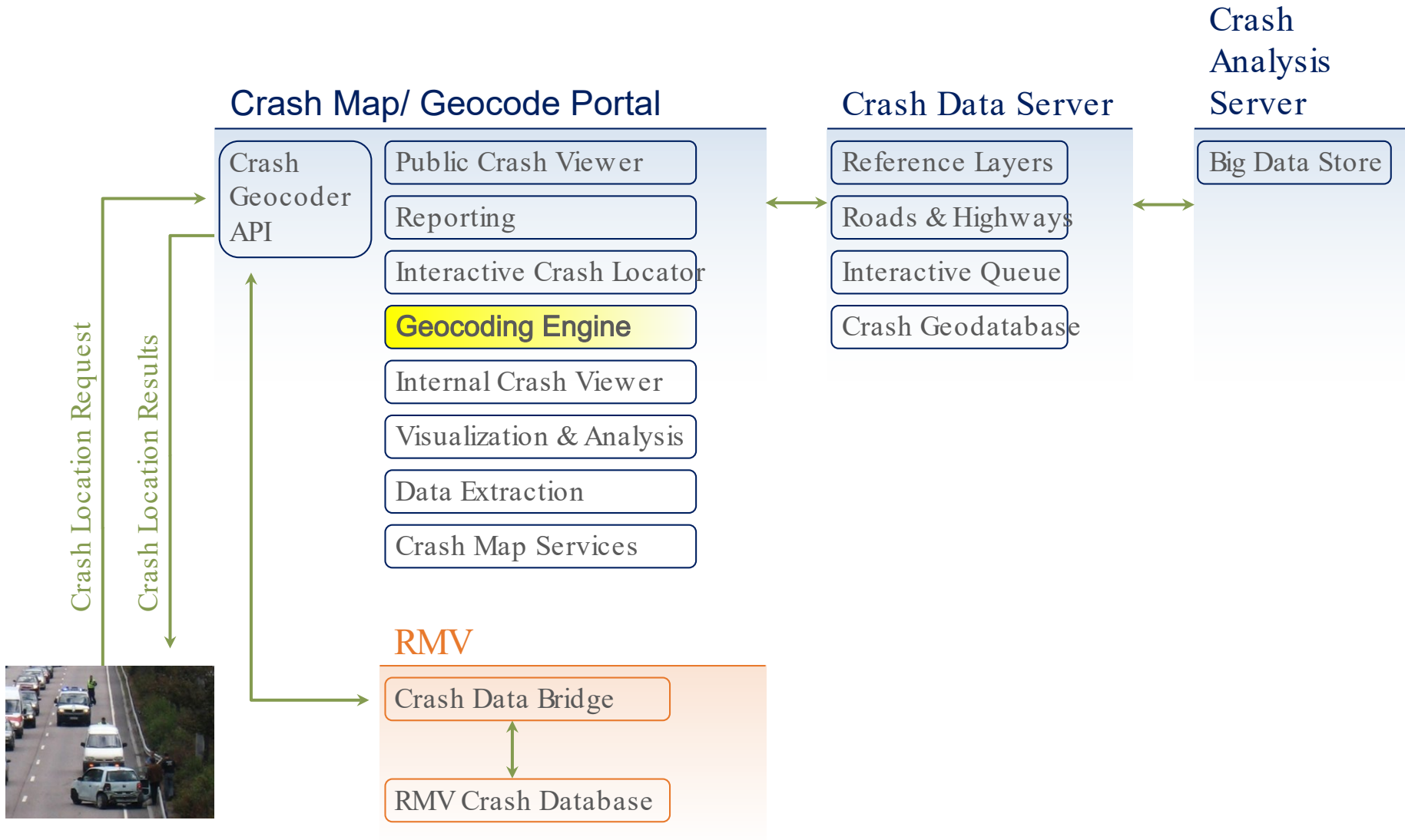
- Replace and enhance the existing crash geocoder and validator system
- Leverage Planning's move to use of Esri Roads and Highways
- Provide web services to validate and geo-locate crash data in real time
- Develop a new crash database that will:
  - interface with the new geocoder and validator system
  - be the system of record for crash locations
  - support a new, public-facing crash data portal
  - provide real-time synchronization with the RMV Crash Database
  - provide relevant data redaction within key workflows
- *Provide comprehensive reporting & analytics tools for both public and authorized users*



# Solution Overview



# Geocoding Engine



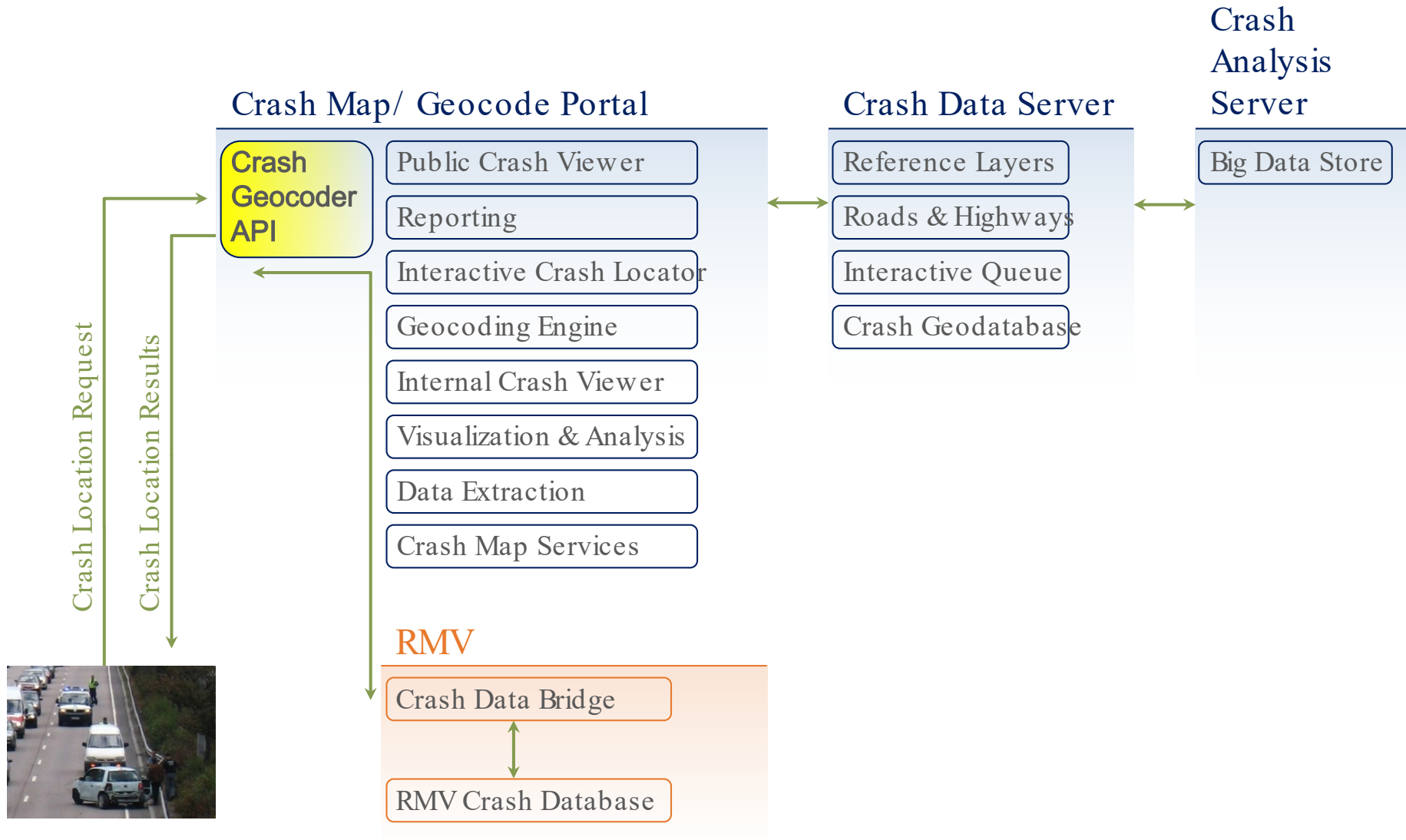
# Geocoding Engine

- Multi-tiered, composite, geocoding algorithm
- Validates locational input to determine if geocoding can be conducted
- Leverages all reference data (Streets/ Addresses, R&H, Landmarks)
- Geocodes using all inputs in a tiered, rule-based, configurable environment
- Returns coordinate, status, source, score/confidence, linked/derived data (e.g., R&H data))

# Geocoding Methods Supports

1. At- intersection
2. Near- intersection
3. Address
4. Route and Exit Number
5. Route and Milemarker
6. Learned Point
  - a. Intersection
  - b. Segment
  - c. Landmark
7. Rotary
8. Field Coordinates

# Crash Geocoder API



# Crash Geocoder API

- Web service for real-time geocoding of crashes
- Accepts multiple locational input parameters
- Invokes the Geocoding Engine
- Returns geocoding results to caller
- Operational Modes
  - Geocoding only (return location/results) (LEAs)
  - Geocoding and subsequent processing
- Capabilities
  - Adds Point Feature/Record to Crash Geodatabase
  - Adds Record to Interactive Queue
  - Records geocoding results for performance reporting
  - Provides feedback to police officers (30 mph on I-90)

# Law Enforcement Agency (LEA) Web Form

Geocode

Reverse Geocode

Map

City/Town Name

MIDDLETON

AT INTERSECTION:			NOT AT INTERSECTION:		
<div>[Select]</div>	<div></div>	BELLINGHAM COURT	<div>[Select]</div>	<div></div>	<div>[Select]</div>
Route#	Direction	Name of Roadway/Street	Route#	Direction	Address#
At			Name of Roadway/Street		
<div>[Select]</div>	<div></div>	MEETING HOUSE SQUARE	<div></div>	<div>N</div> <div>S</div> <div>E</div> <div>W</div>	<div>[Select]</div>
Route#	Direction	Name of Intersecting Roadway/Street	Route#		
Also At Intersection With			Intersecting Roadway/Street		
<div>[Select]</div>	<div></div>	<div>[Select]</div>	<div></div>	<div>[Select]</div>	<div></div>
Route#	Direction	Name of Intersecting Roadway/Street	Route#		
			Mile Marker		
			Exit Number		
			Landmark		

Output Coordinate System

Decimal Degrees

Submit

Reset

Results

Candidate description

Score: 92

X / Y: -71.0116894834989 / 42.58027123605413

-71.011689483

42.580271236

# LEA- Reverse Geocoding

Geocode Reverse Geocode Map

## Coordinates

-71.25574275874514

42.371016763118085



Submit Reset

Click any field to copy contents to the clipboard

City/Town Name WALTHAM



## AT INTERSECTION:

Route# N FISKE AVENUE

Route# Direction Name of Roadway/Street

At

Route# E VILLA STREET

Route# Direction Name of Intersecting Roadway/Street

Also At Intersection With

Route# Direction Name of Intersecting Roadway/Street

Route# Direction Name of Intersecting Roadway/Street

## NOT AT INTERSECTION:

Route# Direction 169 FISKE AVENUE

Route# Direction Address# Name of Roadway/Street

feet of Mile Marker Exit Number

feet of VILLA STREET

Route# Intersecting Roadway/Street

feet of Landmark

-71.2557427587451

Longitude

42.3710167631181

Latitude

# LEA– Map-based Assistance

Geocode

Reverse Geocode

Map

Place Point on Map

Reset Map

+

-



ACTON

MassGIS esri

Geocoded Coordinates (From geocoding tabs)

X Coord

Y Coord

Interactive Coordinates (From 'Place Point on Map' Function)

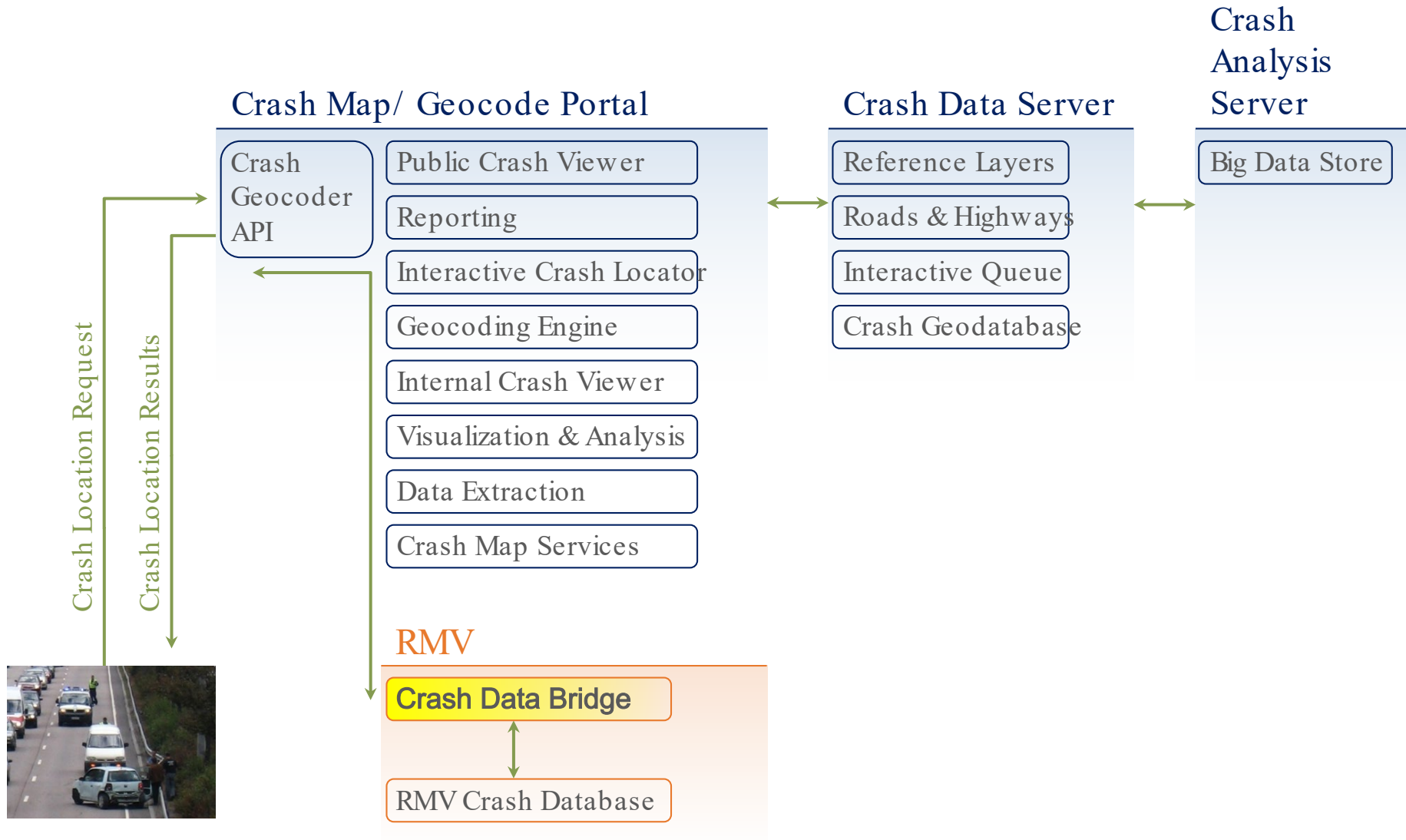
Output Coordinate System

Decimal Degrees

-71.437364771

42.483337475

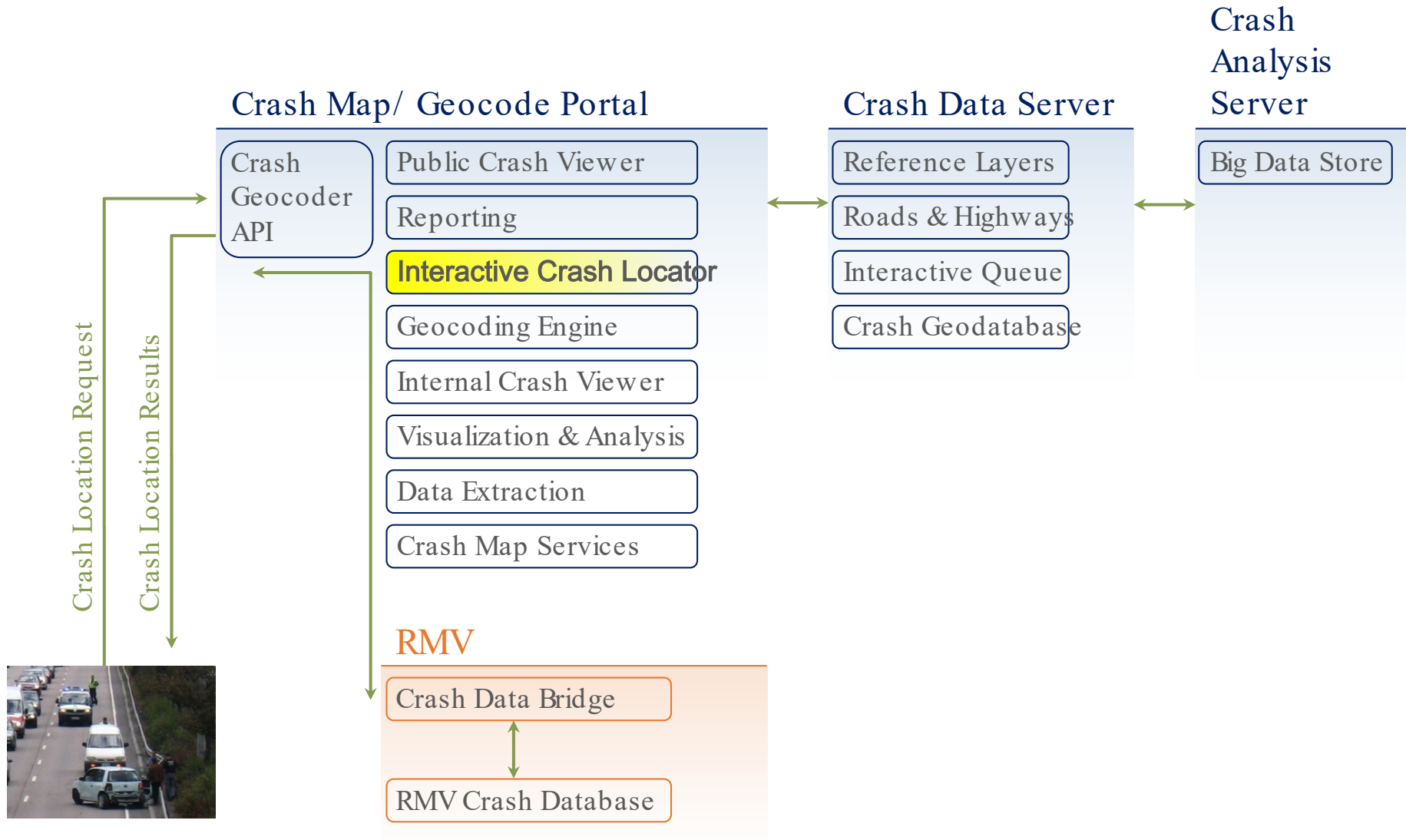
# Crash Data Bridge



# Crash Data Bridge

- Synchronizes RMV Database with Crash Geodatabase
- Identifies crashes for geocoding
- Submits crashes to Geocoding API
- Updates RMV database with results
  - Crash Location (Coordinates)
  - Crash Status/Metadata
  - Roadway Data (e.g., Roads & Highways)
- Handles crashes added to RMV database WITH a location or W/O a location

# Interactive Crash Locator



# Interactive Crash Locator

- Interactive, operator-assisted geocoding/location of crashes
  - Processing of geocoding “rejects” (interactive queue)
  - Refine/ Adjustment of existing crash locations
- Adjust locational input parameters
- View and analyze all candidates (and select)
- Manually locate the crash (visually)
- Improved workflow using an “assigned work” queue
- *Built-in communication capabilities for providing feedback for police, RMV, Planning, etc... fostering good communication between end users and other departments or external agencies*

# Interactive Crash Locator (ICL)

IMPACT

SearchSpatial

Master Search

Town  
ALL

Police Agency Type  
ALL

Date From  
1/1/2017

Date To  
5/30/2017

Crash Geocoding States

☒ No Candidates

☒ Low Confidence

☒ Multiple Candidates

☒ One Candidate Not Geocoded

☐ Successfully Geocoded

Options

☐ Only Show Crashes with Narrative or Diagram

☐ Include 'Not Enough Information'

☐ Include 'Not Reportable'

☐ Restrict to Fatal Crashes Only

☐ Restrict to Crashes Where Speed Limit is Suspended

☐ Restrict to Crashes Where Location was GPS-Valid

☐ Restrict to Crashes Where Junction Type is Signalized

☐ Restrict to Crashes Where Location Occurred

SearchReset

Search by Crash Number

Find by Document Number

Search by Crash Report Id

Resolution Queue

Load Crashes from File

Find Address or Location

ANDOVER

200 ft

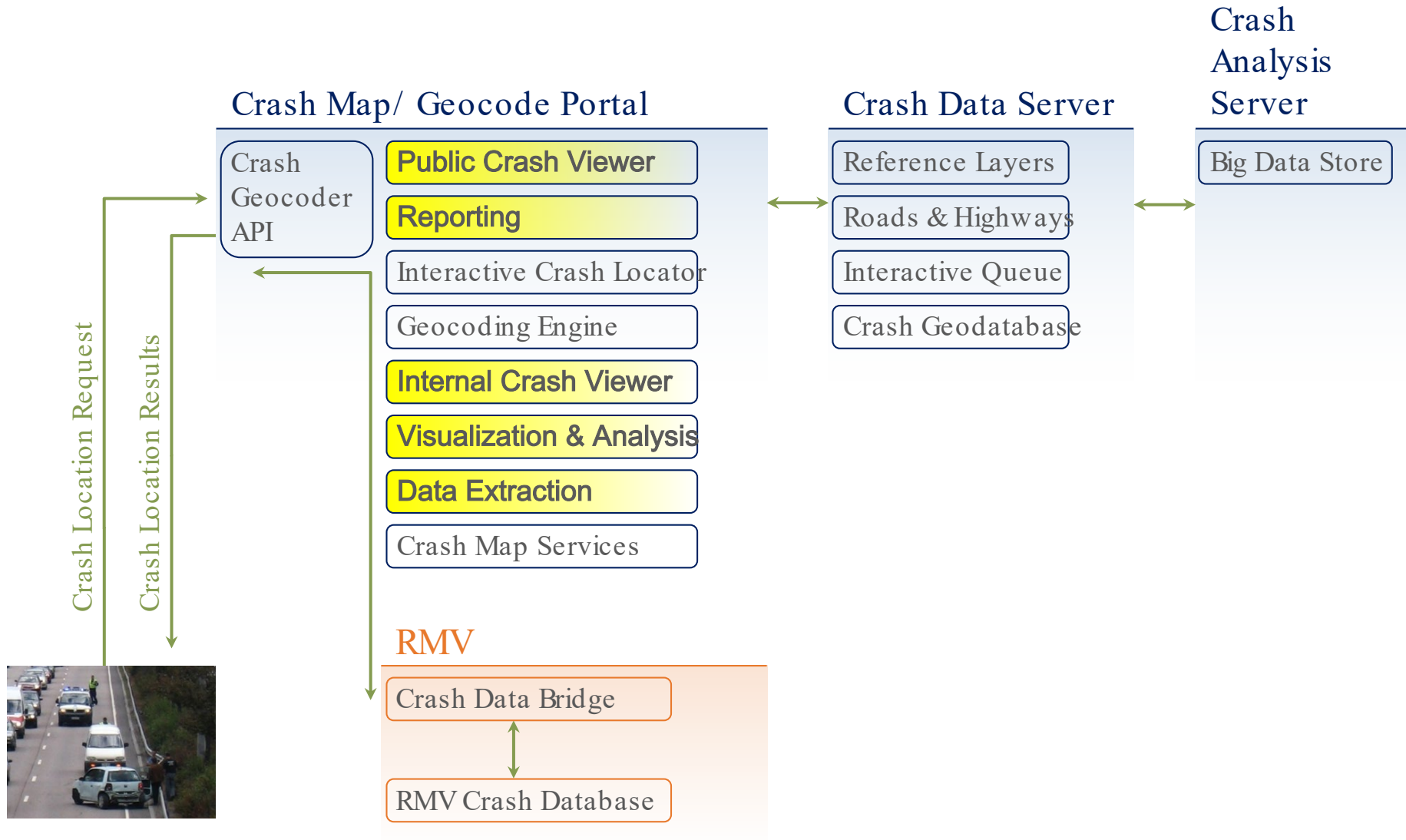
Map data © OpenStreetMap contributors, Imagery © Mapbox

My InboxSearch ResultsLocationLocation HistoryCandidatesNarratives/DiagramsScanned Docs

Results: 1,910

<input checked="" type="checkbox"/> Crash Number 2 ↓	City Town	Crash Date 1 ↓	Crash Severity	Assigned To	Assigned By	Assigned On
<input type="checkbox"/> 2589976	ANDOVER	3/14/2019	Property damage only (none injured)	none	batch	3/24/2019
<input type="checkbox"/> 2591376	CHELMSFORD	3/3/2019	Non-fatal injury	none	batch	4/5/2019
<input type="checkbox"/> 2590175	ANDOVER	3/2/2019	Not Reported	none	batch	3/21/2019
<input checked="" type="checkbox"/> 2589777	ANDOVER	2/28/2019	Fatal injury	none	batch	3/19/2019
<input type="checkbox"/> 2590374	ANDOVER	2/15/2019	Property damage only (none injured)	none	batch	3/22/2019
<input type="checkbox"/> 2588888	ANDOVER	2/7/2019	Property damage only (none injured)	none	batch	3/24/2019
<input type="checkbox"/> 2588585	ANDOVER	2/5/2019	Fatal injury	massdot_id_test	Warren.Dunigan	2/22/2019
<input type="checkbox"/> 2589174	WESTFORD	2/5/2019	Fatal injury	none	batch	3/27/2019
<input type="checkbox"/> 2588886	ANDOVER	2/4/2019	Property damage only (none injured)	none	batch	2/22/2019
<input type="checkbox"/> 2589074	WESTFORD	2/1/2019	Fatal injury	none	batch	3/24/2019
<input type="checkbox"/> 2588475	ANDOVER	1/15/2019	Fatal injury	none	batch	3/27/2019
<input type="checkbox"/> 2588887	ANDOVER	1/14/2019	Unknown	none	batch	2/22/2019
<input type="checkbox"/> 2588682	ANDOVER	1/13/2019	Non-fatal injury	none	batch	2/13/2019
<input type="checkbox"/> 2588885	ANDOVER	1/13/2019	Fatal injury	none	batch	2/22/2019
<input type="checkbox"/> 2588679	ANDOVER	1/12/2019	Non-fatal injury	none	batch	2/13/2019
<input type="checkbox"/> 2588884	ANDOVER	1/12/2019	Non-fatal injury	none	batch	2/22/2019
<input type="checkbox"/> 2588677	ANDOVER	1/11/2019	Non-fatal injury	none	batch	2/13/2019
<input type="checkbox"/> 2588883	ANDOVER	1/11/2019	Fatal injury	none	batch	2/22/2019
<input type="checkbox"/> 2588678	ANDOVER	1/10/2019	Property damage only (none injured)	none	batch	2/13/2019
<input type="checkbox"/> 2588882	ANDOVER	1/10/2019	Fatal injury	none	batch	2/22/2019
<input type="checkbox"/> 2588681	ANDOVER	1/9/2019	Property damage only (none injured)	none	batch	2/13/2019

# Crash Data Portal



# Crash Data Portal

Single point of entry for public and authorized users

- Provides guided workflows
- Adheres to the Commonwealth of Massachusetts' branding styles and statewide agency navigation
- Dashboard and report preview panels and galleries
- *Simple metrics made available on the front page to peak interest in available crash information*

# Crash Data Portal

MassDOT: Query & Visualization

MassDOT: Crash Data Portal

JavaScript UI Framework & HTML


Mass.gov

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massDOT

IMPACT Home

WELCOME




IMPACT is designed to encourage public safety initiatives and awareness specific to crash information. Within IMPACT you can engage with crash related data through easy to understand pre-built reports or conduct your own self-driven analysis. Please explore the various options and find what is right for you.




**Interactive Data Dashboards**  
IMPACT dashboards provide advanced location intelligence. They tell powerful data stories using maps, charts and tables based on complex analyses. These pre-built dashboards allow for interactive analysis and data exploration specific to a given data theme in a range of categories.

INTERACT




**Data Query and Visualization**  
Using the Data Query and Visualization tool you can conduct simple to sophisticated data queries to generate subsets of the crash data. Once generated you can then visualize the data in three core ways: on charts, on tables, or spatially on a map. Though noted separately, these elements all work in tandem providing the ability to switch between the visualization methods seamlessly.

EXPLORE




**Data Extraction**  
Using the data extraction service, you can request publicly available closed year data by municipality and date range in several formats. In addition, a link is provided to MassDOT's Open Data Portal for more large-scale data download capabilities. The standard data request form should be used when trying to obtain datasets of town-wide crash data for specific years.

EXTRACT



**Reports**  
IMPACT provides a suite of pre-built reports for rapid access to clearly organized information across a spectrum of categories. Some reports are configurable given desired date ranges and all are downloadable in several formats.

REPORTS



**Crash Tabulation and Charting**  
IMPACT provides this tool to aggregate selected data in a matrix to display two or more variables. The crosstab provides summary data and can be used to summarize the full crash database as well as subsets of the data, based on the user selected variables.

EXPLORE

**Reported Crashes YTD**

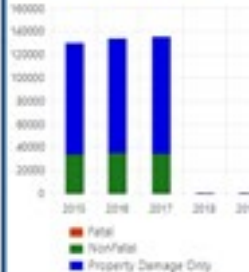
163

As of: Tue Apr 09 2018

**Reported Pedestrian Crashes YTD**

48

As of: Tue Apr 09 2018

**Reported Crash Severity By Year**

Year	Fatal	Nonfatal	Property Damage Only
2015	~10,000	~30,000	~100,000
2016	~10,000	~30,000	~100,000
2017	~10,000	~30,000	~130,000
2018	~10,000	~30,000	~100,000

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Site Policies  
State Data  
Public Records Requests


Feedback

# Dashboards

MassDOT: Query & Visualization x MassDOT: Crash Data Portal x JavaScript UI Framework & HTML x +

← → ↻ 📄 🔍 ☆ 🌈 📱 🗺️ ⓘ

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 IMPACT Home > Dashboard Categories > Operations Dashboards

Welcome, Guest User ⓘ ? Log In

## Operations Dashboards

This grouping of dashboards provides information on general crash statistics at the crash level.

### Geocoding Performance Metrics

Geocoding Performance Metrics - IN PROGRESS - PLACEHOLDER ONLY

### SHSP Fatal and Serious Injury Trends and Safety Performance Measures

Fatal and Serious Injury Trends in SHSP Emphasis Areas - IN PROGRESS - PLACEHOLDER ONLY

### RMV Fatality Information (INDIVIDUAL YEAR)

Users can filter to a specific Region, Town, Type, Sex, Age, Year, Month, and/or Day. Select preliminary data for an INDIVIDUAL YEAR (ONLY). The data presented shows motor vehicle fatalities for the ENTIRE YEAR (by default). Filters can be used to refine your search. For example: MOTORCYCLE OPERATOR fatalities in the CAPE COD-COMMISSION Region in 2017 for the months of JUNE, JULY & AUGUST. Additional data available includes fatality information on Seatbelt Usage, Distracted Driving, Police suspect Drug Use, Police suspect Alcohol Use, Day of Week, and Time of Day.


### RMV Fatality Information (MULTI-YEAR)

Users can filter to a specific Region, Town, Type, Sex, Age, Year, Month, and/or Day. Select preliminary data for a MULTI-YEAR comparison (DEFAULT) or view an INDIVIDUAL YEAR. The data presented compares YEAR-TO-DATE values using the filters you select. For example: PEDESTRIAN fatalities in BOSTON from 2017, 2018, & 2019 YTD that occurred on FRIDAY, SATURDAY, & SUNDAY where the ages were 75+. Additional data available includes fatality information on Seatbelt Usage, Distracted Driving, Law Enforcement suspects Drug Use, Law Enforcement suspects Alcohol Use, Day of Week, and Time of Day.

### Statewide Crashes by Severity and Year

Users can filter by a municipality and/or year (or multiple years) to view crash data statistics on various charts, graphs and maps.

MassDOT makes no representation as to the accuracy, adequacy, reliability, availability or completeness of the fatality records or the data collected from them and is not responsible for any errors or omissions in such records or data. Under no circumstance will MassDOT have any liability for any loss or damage incurred by any party as a result of the use of the fatality records or the data collected from them. Furthermore, the data contained in this dashboard is not an official record of what transpired in a particular incident or for a particular incident type. Notwithstanding any other provision of law, records and data posted on this website 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 identified or addressed in such records or data.



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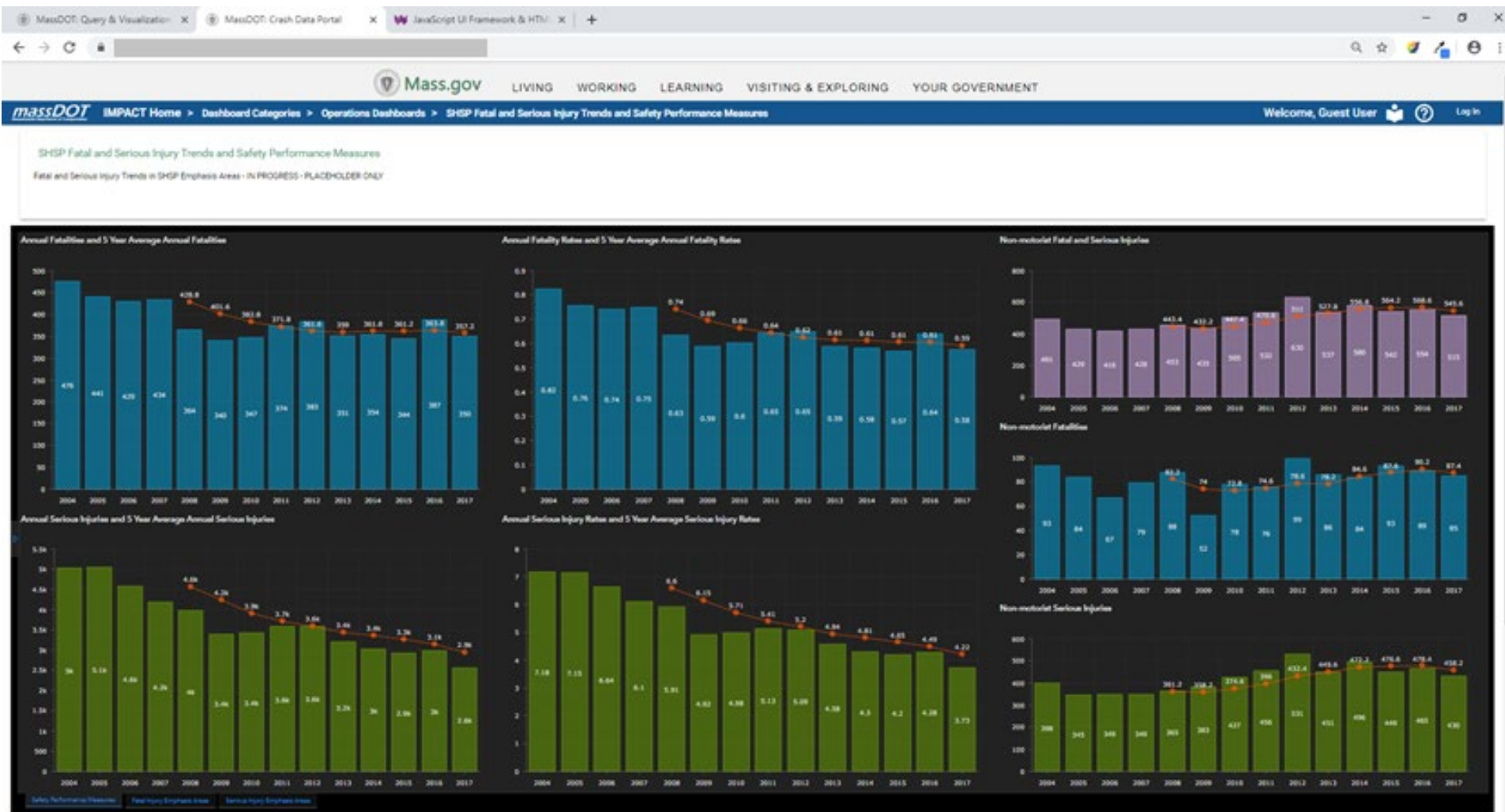
Site Policies

State Data

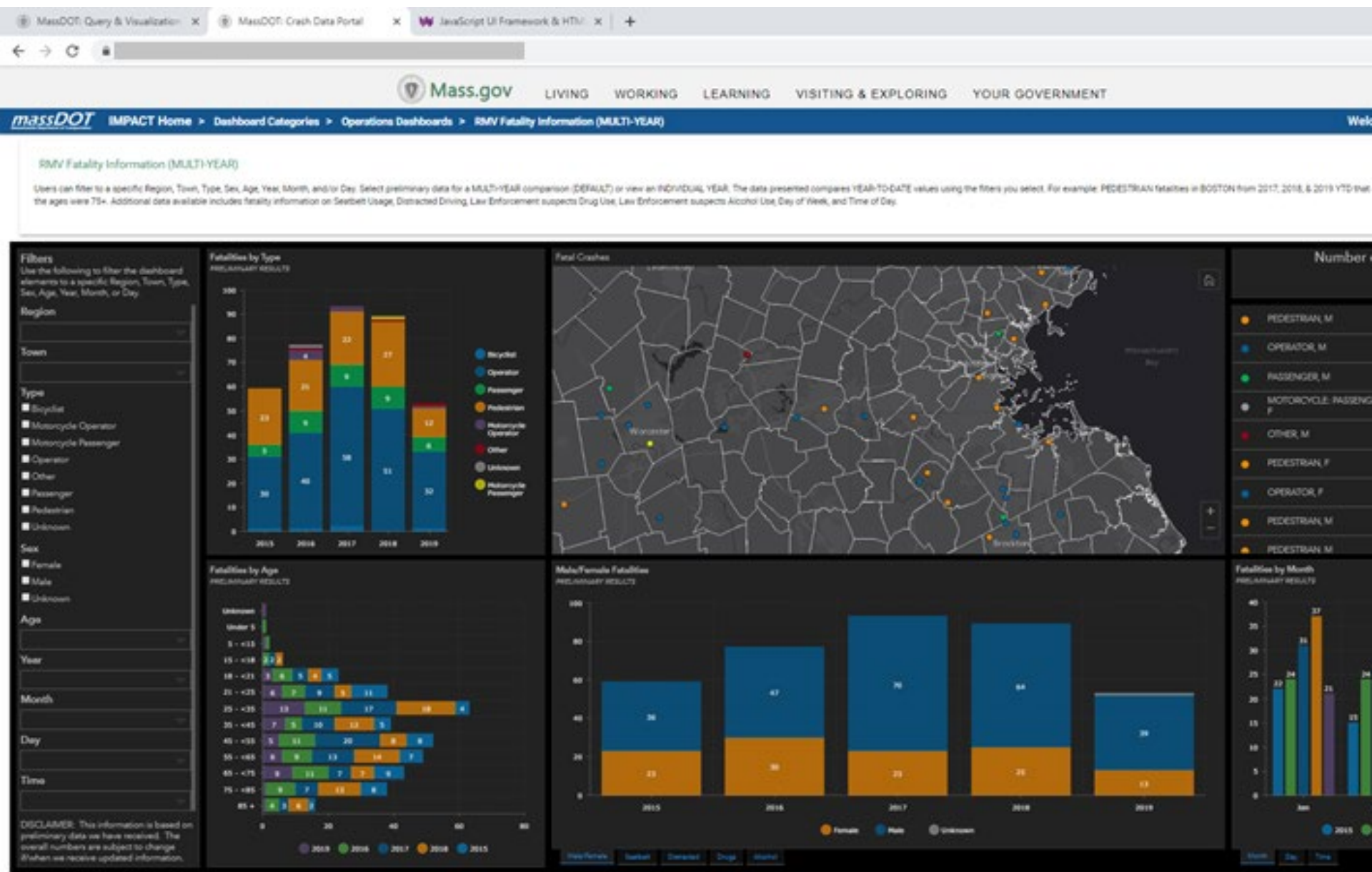
Public Records Requests

Feedback

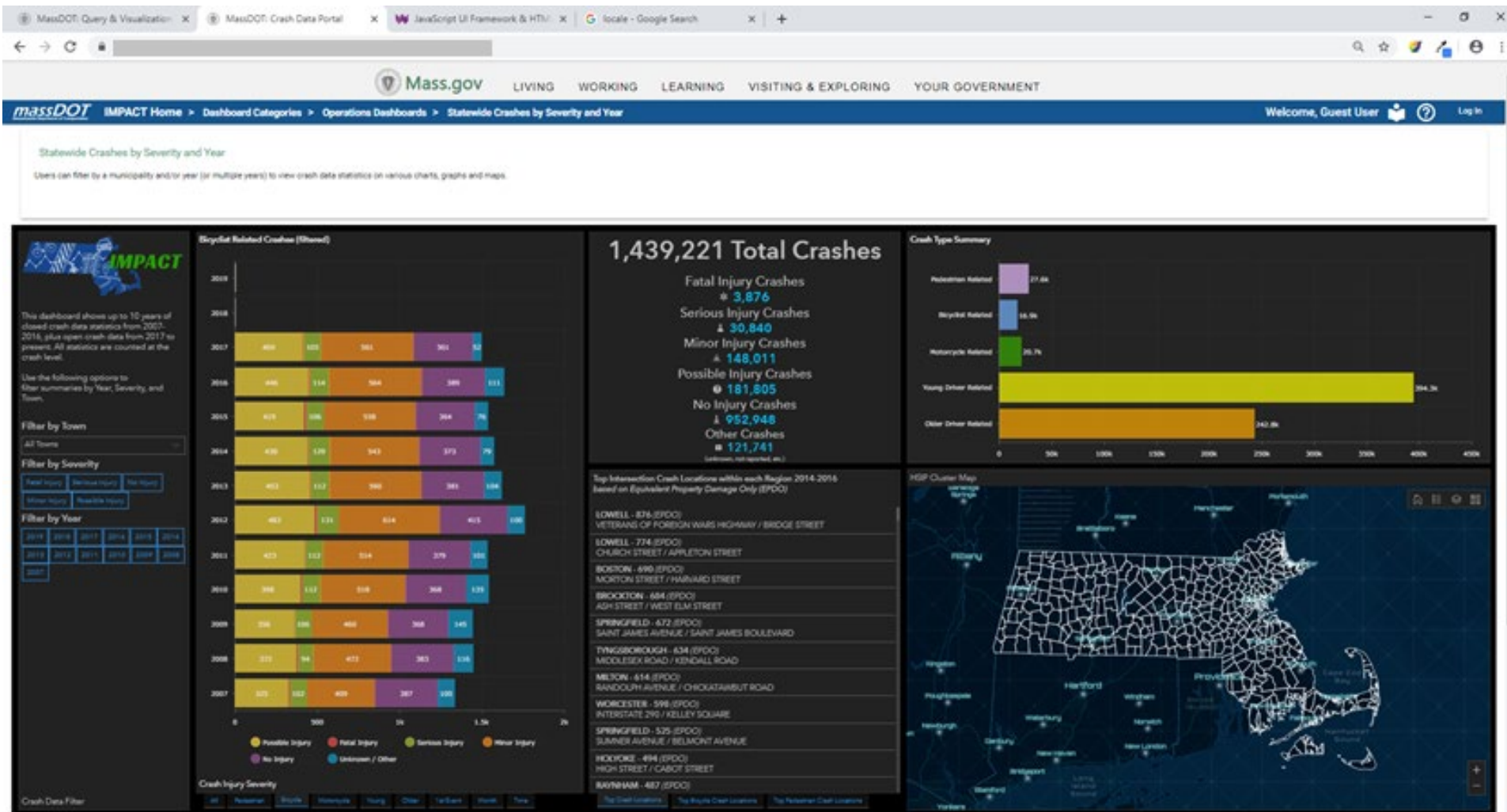
# SHSP Fatal and Serious Injury Trends Dashboard



# RMV Fatality Information Dashboard



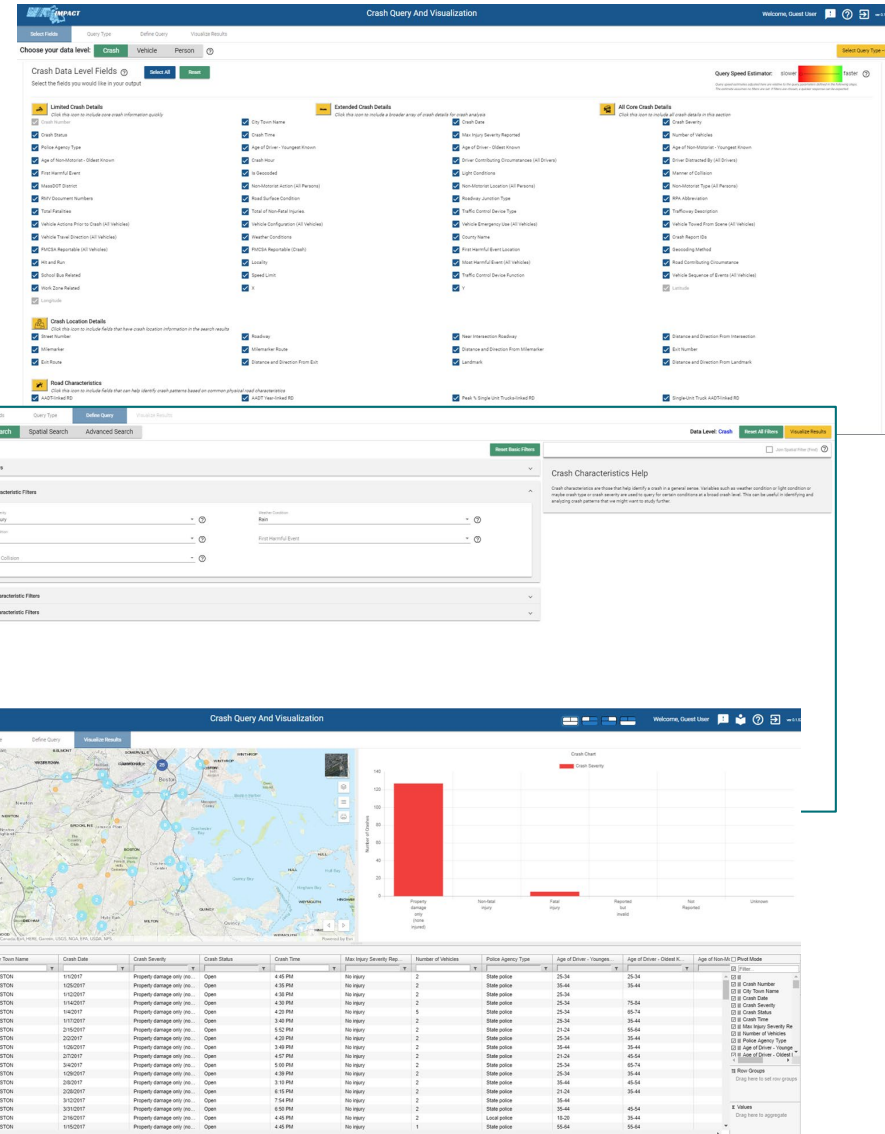
# Statewide Crashes by Severity and Year



# Query and Visualization Tool

## Crash data review and analysis

- Ability to query crash, vehicle, and person level crash data
- View crash data in tables, on maps or in dynamic charts
- Queries can occur in both a basic, parameterized fashion or using an advanced, integrated SQL query builder
- *Data usage tracking for improvements and enhancements*



# Query and Visualization (Q&V) tool

The screenshot shows a web browser with multiple tabs open, including 'MassDOT: Query & Visualiza...', 'MassDOT: Crash Data Portal', 'MassDOT Crash Tabulation', 'JavaScript UI Framework &...', 'tort protection - Google Se...', and 'New Tab'. The browser's address bar is empty. The page header features the 'Mass.gov' logo and navigation links: 'LIVING', 'WORKING', 'LEARNING', 'VISITING & EXPLORING', and 'YOUR GOVERNMENT'. Below the header is a dark blue banner with the 'IMPACT' logo on the left, the title 'Crash Query And Visualization' in the center, and a help icon and version number 'ver 0.1.50' on the right. The main content area has a light gray background with the 'IMPACT' logo and the title 'Crash Query And Visualization'. The 'Welcome' section explains that the tool is a web application for providing crash-related data, maps, and charts for the state of Massachusetts. It notes that the tool is primarily for public safety initiatives and awareness, and that analysis of crash data is a complex undertaking. It suggests that users should approach the information as a tool rather than an end in itself and that they should cross-check their results with other data sources. Below the text are two buttons: 'Enter As Guest' and 'Sign In'. A disclaimer states that by clicking either button, the user agrees to the disclaimer. The 'Disclaimer' section states that MassDOT makes no representation as to the accuracy, adequacy, reliability, availability or completeness of the crash records or the data collected from them and is not responsible for any errors or omissions in such records or data. It also states that under no circumstance will MassDOT have any liability for any loss or damage incurred by any party as a result of the use of the crash records or the data collected from them. Furthermore, the data contained in the web-based crash report tool are not an official record of what transpired in a particular crash or for a particular crash type. If a user is interested in an official copy of a crash report, contact the Registry (<http://www.mass.gov/rmv/>).

MassDOT: Query & Visualiza... MassDOT: Crash Data Portal... MassDOT Crash Tabulation... JavaScript UI Framework &... tort protection - Google Se... New Tab

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IMPACT Crash Query And Visualization ? ver 0.1.50

**Welcome**

The **Query and Visualization Tool** is a web application built to provide crash-related data, maps, and charts for the state of Massachusetts. Providing crash data and the ability to analyze this information will encourage public safety initiatives and awareness. It is primarily for this reason that this tool has been made available. Analysis of the crash data is a complex undertaking, one that may require trial and error on the part of users. It is suggested you approach this information as a tool rather than an end in itself and that you cross-check your results with other data sources.

Upon entering the tool, you will first be asked to select your data level of interest (crash level, vehicle level or person level) and will next be asked to select the fields you want to include in your query results.






[Enter As Guest](#) [Sign In](#)

*By clicking 'Enter As Guest' or 'Sign In' above, I agree to the disclaimer*

**System Information**

The system is currently available.

**Supported Browsers**

*This site is best viewed at a screen resolution of 1600 x 900 or greater.*

**Disclaimer**

MassDOT makes no representation as to the accuracy, adequacy, reliability, availability or completeness of the crash records or the data collected from them and is not responsible for any errors or omissions in such records or data. Under no circumstance will MassDOT have any liability for any loss or damage incurred by any party as a result of the use of the crash records or the data collected from them. Furthermore, the data contained in the web-based crash report tool are not an official record of what transpired in a particular crash or for a particular crash type. If a user is interested in an official copy of a crash report, contact the Registry (<http://www.mass.gov/rmv/>).

# Q&V – Selecting Fields

MassDOT: Query & Visualization | MassDOT: Crash Data Portal | MassDOT Crash Tabulation | JavaScript UI Framework & | tort protection - Google Search | New Tab

**Crash Query And Visualization** Welcome, Guest User ? ? ? ver 0.1.50


Select Fields | Query Type | Define Query | Visualize Results


Choose your data level: **Crash** | Vehicle | Person ? [Select Query Type ->](#)

### Crash Data Level Fields ?


Select the fields you would like in your output

**Select All** **Reset**


**Query Speed Estimator:** slower  faster ?  
Query speed estimates adjusted here are relative to the query parameters defined in the following steps. The estimate assumes no filters are set. If filters are chosen, a quicker response can be expected.

 **Limited Crash Details**  
*Click this icon to include core crash information quickly*

- ☒ Crash Number
- ☐ Crash Status
- ☐ Police Agency Type
- ☐ Age of Non-Motorist - Oldest Known
- ☐ First Harmful Event
- ☐ MassDOT District
- ☐ RMV Document Numbers
- ☐ Total Fatalities
- ☐ Vehicle Actions Prior to Crash (All Vehicles)
- ☐ Vehicle Travel Direction (All Vehicles)
- ☐ FMCSA Reportable (All Vehicles)

 **Extended Crash Details**  
*Click this icon to include a broader array of crash details for crash analysis*

- ☐ City Town Name
- ☐ Crash Time
- ☐ Age of Driver - Youngest Known
- ☐ Crash Hour
- ☐ Is Geocoded
- ☐ Non-Motorist Action (All Persons)
- ☐ Road Surface Condition
- ☐ Total of Non-Fatal Injuries
- ☐ Vehicle Configuration (All Vehicles)
- ☐ Weather Conditions
- ☐ FMCSA Reportable (Crash)

 **All Core Crash Details**  
*Click this icon to include all crash details in this section*

- ☐ Crash Date
- ☐ Max Injury Severity Reported
- ☐ Age of Driver - Oldest Known
- ☐ Driver Contributing Circumstances (All Drivers)
- ☐ Light Conditions
- ☐ Non-Motorist Location (All Persons)
- ☐ Roadway Junction Type
- ☐ Traffic Control Device Type
- ☐ Vehicle Emergency Use (All Vehicles)
- ☐ County Name
- ☐ First Harmful Event Location

- ☐ Crash Severity
- ☐ Number of Vehicles
- ☐ Age of Non-Motorist - Youngest Known
- ☐ Driver Distracted By (All Drivers)
- ☐ Manner of Collision
- ☐ Non-Motorist Type (All Persons)
- ☐ RPA Abbreviation
- ☐ Trafficway Description
- ☐ Vehicle Towed From Scene (All Vehicles)
- ☐ Crash Report IDs
- ☐ Geocoding Method

# Q&V – Basic Query

MassDOT: Query & Visualizati...MassDOT: Crash Data Portal...MassDOT Crash Tabulation...JavaScript UI Framework &...tort protection - Google Ser...New Tab

IMPACTCrash Query And VisualizationWelcome, Guest User! ? ? ? ? ver 0.1.50

Select FieldsQuery TypeDefine QueryVisualize Results

Basic SearchAdvanced SearchSpatial Search

Data Level: CrashVisualize Results -->

Reset Filters

Basic Filters

crash date from1/1/2016

crash date to4/9/2019

City/TownAGAWAM

Time Of Day

From: 12 00 AM

To: 11 59 PM

☐ Not Located

RPA

District

Crash Characteristic Filters

Vehicle Characteristic Filters

Person Characteristic Filters

Basic Search Help

The basic query is a parameter-driven search. This search supports selecting criteria specific to a crash but also vehicle and person-type details as well. Results for this search can be displayed on a crash level identifying all crashes meeting the selected criteria, on a vehicle level for all vehicles involved in crashes, or on a person level for all persons involved in crashes.

Upon submitting the search, the results screen will display showing all records meeting the search criteria. The related crashes will display as points on the map based on the location they occurred. After reviewing the results, the search can be refined by returning to the basic search form. Otherwise, by navigating to the spatial tab, the results can be refined to a specific area on the map based on several location types.

- Step 1: Select Criteria in one of the collapsible panels
- Step 2: Submit the search
- Step 3: View results
- Step 4: Refine search parameters

## Q&V – Spatial Query

Crash Query And Visualization

Welcome, Guest User




ver 0.1.54

Select Fields

Query Type

Define Query

Visualize Results

Basic Search

Spatial Search

Advanced Search

Data Level: Crash

Reset All Filters

Visualize Results

Reset Spatial Filters

☐ Join Basic Filter
☐ Join Advanced Filter

crash date from

1/1/2016

crash date to

4/26/2019

Find

Draw

Address

Step 1: Select Location Type

Street

?

Step 2: Select Street(s)

Choose City/Town

ACUSHNET

?

Option A: by name

Choose Streets

SOUTH MAIN STREET

?

Option B: by map selection

Click to activate map selection tool

?

Step 3: Define Buffer (Required)

buffer distance

600

buffer units

Feet

?

Buffer

Step 4: Run Query

Click the "Visualize results" button above

+

-

Home

Layers

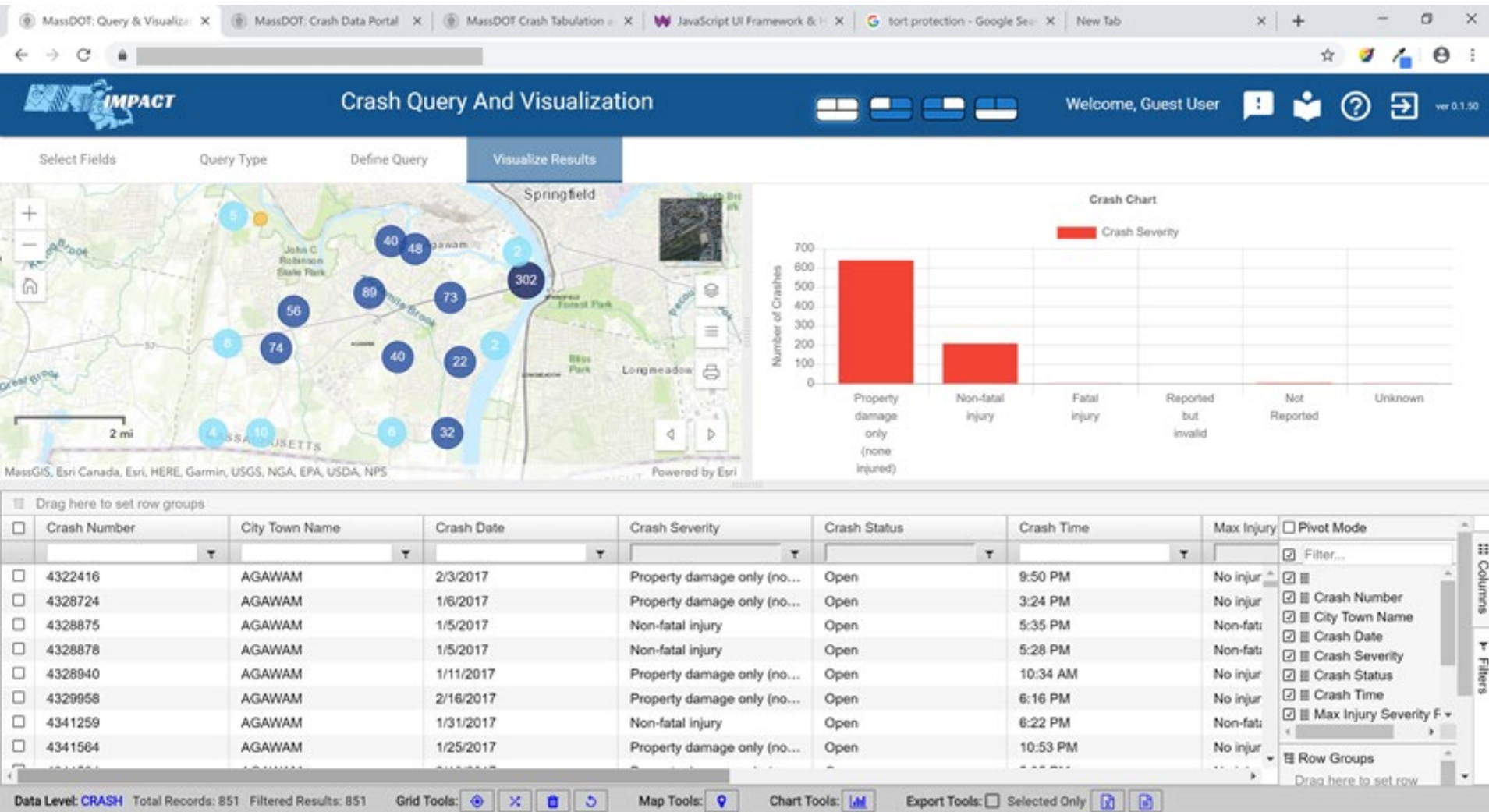
Full Screen

600 ft

MassGIS, Esri, HERE, Garmin, INCREMENT P, Intermap, USGS, METI/NASA, EPA, USDA

Powered by Esri


# Q&V – Visualize Results



# Crash Data Reporting

## Robust report authoring and delivery platform

- Current users are restricted by MS Excel's limitations
- Deployed SQL Server Reporting Services
- *Using this technology, we're able to provide report definition configurability, scheduling, and email distribution that didn't exist in existing system*



2012-2016 CDS Police Agency Report  
Created Date: 7/19/2018

Name	Average	2012	2013	2014	2015	2016
(Campus Police)	4.8	5	5	0	9	5
(Non-police)	6.4	7	1	12	5	7
(Other Police)	18.4	24	30	6	8	24
(State Police)	19,767.2	18,160	19,521	20,316	22,679	18,160
(Transit Police)	109.4	134	81	94	104	134
ABINGTON	475.8	427	476	504	545	427
ACTON	251.2	234	233	240	315	234
ACUSHNET	128.2	94	137	151	165	94
ADAMS	195.6	179	201	194	225	179
AGAWAM	435.6	418	426	432	484	418
AMESBURY	262.6	296	281	181	259	296
AMHERST	357.4	372	256	366	421	372
ANDOVER	536.8	522	543	549	548	522
ARLINGTON	545.6	548	568	533	531	548
ASHBURNHAM	77.0	68	76	95	78	68
ASHBY	41.0	33	35	50	54	33
ASHFIELD	9.4	15	8	7	2	15
ASHLAND	229.0	238	229	229	211	238
ATHOL	189.2	197	168	192	192	197
ATTLEBORO	852.0	862	716	879	941	862
AUBURN	437.6	450	425	447	416	450
AVON	126.4	119	118	131	145	119
AYER	104.8	103	102	110	106	103
BARNSTABLE	1,176.4	1,199	1,105	1,141	1,238	1,199
BARRE	74.4	80	75	76	61	80
BECKET	29.8	38	28	22	23	38
BEDFORD	245.4	248	264	249	218	248
BELCHERTOWN	232.6	223	206	258	253	223
BELLINGHAM	480.8	467	443	500	527	467
BELMONT	302.2	282	305	313	329	282
BERKLEY	62.6	48	52	85	80	48
BERLIN	92.4	86	105	93	92	86
BERNARDSTON	22.0	22	18	23	25	22
BEVERLY	540.6	547	507	549	553	547
BILLERICA	536.2	488	540	564	601	488
BLACKSTONE	121.2	110	119	133	134	110
BOLTON	128.0	127	127	132	127	127
BOSTON	1,066.8	1,210	1,039	1,026	849	1,210
BOURNE	412.2	413	397	409	429	413
BOXBOROUGH	41.0	37	44	44	43	37
BOXFORD	77.0	86	64	67	82	86
BOYLSTON	78.0	83	61	85	78	83
BRAINTREE	422.6	384	447	430	468	384
BREWSTER	122.2	118	110	127	138	118
BRIDGEWATER	422.4	396	399	445	476	396
BRIMFIELD	14.4	31	8	1	1	31
BROCKTON	2,115.0	2,048	2,141	2,148	2,190	2,048
BROOKFIELD	33.8	35	23	29	47	35
BROOKLINE	291.2	296	168	345	351	296

# Reports Gallery

MassDOT: Query & Visualization x MassDOT: Crash Data Portal x JavaScript UI Framework & HTML x Google - Google Search x +

Mass.gov LIVING WORKING LEARNING VISITING & EXPLORING YOUR GOVERNMENT

massDOT IMPACT Home > Report Categories > Standardized Reports Welcome, Guest User ? Log In

## Standardized Reports

Description coming soon...

<b>Police Agency TEST UPDATE</b>	This report displays the number of Crash Reports entered into RMV's Crash Data System (CDS), broken down by police agency. Reports cover a four year range. You will be asked to select a year range.	<b>Crashes by Severity</b>	This report displays the number of Crash Reports entered into RMV's Crash Data System (CDS), broken down by crash severity. Reports cover a five year range. You will be asked to select a year range.
<b>Older, Younger, and JOL Driver Related Crashes by Injury Type</b>	This report displays the number of crash Reports entered into RMV's Crash Data System (CDS) involving older drivers (65+) and younger drivers (< 21) , broken down by year. Reports cover a 5 year range. You will be asked to select the date range.	<b>Pedestrian, Cyclist and Motorcyclist Crashes by Injury</b>	This report displays the number of crash Reports entered into RMV's Crash Data System (CDS) involving bikes, motorcycles, pedestrians, broken down by year. Reports cover a 5 year range. You will be asked to select the date range.
<b>Fatal Crashes by Town</b>	This report displays the number of fatal Crash Reports entered into RMV's Crash Data System (CDS), broken down by police agency (state or town). Reports cover a ten year range. You will be asked to select a year range.	<b>Persons Involved in Crashes by Age Group</b>	Description coming soon...
<b>Reports Entered by Police Agency by Month</b>	Description coming soon...	<b>Grant Application - Crashes at a Glance</b>	A report that facilitates applications for community grants involving traffic and safety issues
<b>Driver Distractions in Crashes</b>	Description coming soon...	<b>Injury Severity and Safety Systems by Person Type Involved in Crashes</b>	Description coming soon...

# Pedestrian, Cyclist and Motorcycle Crash by Injury

MassDOT: Query & Visualization x MassDOT: Crash Data Portal x JavaScript UI Framework & HTML x locale - Google Search x +

Start Year 2015 End Year 2019 [View Report](#)

1 of 1 Find | Next

**2015-2019 Pedestrian, Cyclist and Motorcyclist Crashes by Injury** Created Date: 4/9/2019

Bicycle, Pedestrian, Motorcycle Injury Type	2015	2016	2017	2018	2019
Cyclist: Fatal injury	11	8	8	0	1
Cyclist: Non-fatal injury	1,038	1,081	1,014	1	0
Cyclist: Not Reported	49	76	36	0	0
Cyclist: Property damage only (none injured)	302	324	304	0	0
Cyclist: Reported but invalid	0	0	0	0	0
Cyclist: Unknown	4	6	7	0	0
<b>Cyclist: Total</b>	<b>1,404</b>	<b>1,495</b>	<b>1,369</b>	<b>1</b>	<b>1</b>
Motorcycle: Fatal injury	53	41	49	0	1
Motorcycle: Non-fatal injury	1,440	1,465	1,297	0	3
Motorcycle: Not Reported	52	57	43	0	0
Motorcycle: Property damage only (none injured)	441	443	361	0	1
Motorcycle: Reported but invalid	0	0	0	0	0
Motorcycle: Unknown	10	12	0	0	0

# Grant Application– Crashes At-A-Glance Report

MassDOT: Query & Visualization | MassDOT: Crash Data Portal | JavaScript UI Framework & HTML | locale - Google Search

Town Name: AGAWAM | Start Year: 2015 | End Year: 2019 | [View Report](#)

1 of 1 | 200% | Find | Next

## 2015-2019 AGAWAM Crashes at a Glance

Created Date: 4/9/2019

	2015	2016	2017	2018	2019
Total Fatal crashes	1	1	3	0	0
Total Serious Injury crashes	3	6	12	0	0
Total crashes entered into RMV crash system	554	589	602	0	0
Total Pedestrian crashes	7	1	6	0	0
Total Pedestrian fatalities	0	0	1	0	0
Total Pedestrian injuries	4	0	3	0	0
Total Bicyclist crashes	1	4	6	0	0
Total Bicyclist fatalities	0	0	0	0	0
Total Bicyclist injuries	1	2	4	0	0
Total Motorcycle crashes	7	12	11	0	0
Total Motorcycle fatalities	0	0	0	0	0
Total Motorcycle injuries	5	8	10	0	0
Total young driver (age 16-20) crashes	119	145	133	0	0
Total older driver (age 65 and older) crashes	107	98	89	0	0

MassDOT makes no representation as to the accuracy, adequacy, reliability, availability or completeness of the crash records or the data collected

# Crash Tabulation Tool

### Data Selector

Configure your data elements below.

Choose fields to add to report:

- Person Measures
  - Person Count
- Crash Measures
  - Crash Count
- Person Attributes
  - Age
  - Age of Driver - Oldest Known
  - Age of Driver - Youngest Known
  - Age of Non-Motorist - Oldest Known

Drag fields between areas below:

**Filters**

**Columns**

Crash Severity

**Rows**

Non-Motorist Type

**Values**

Crash Count (Sum)

☐ Defer Updates UPDATE

### Pivot Data Grid:

Data will populate here once you have configured your data elements in the Data Selector.

[Export Grid Data](#)

Non-Motorist T...	Fatal injury	Non-fatal injury	Not Reported	Property damage c	Unknown	Crash Count
Cyclist	133	14,485	1,097	4,657	123	20,495
Not reported	98	3,332	1,446	3,602	111	8,589
Other	37	1,011	250	1,307	48	2,653
Pedestrian	1,101	22,996	1,688	5,591	348	31,724
Reported but inval		4	1	3		8
Skater	5	274	20	73	3	375
Train/trolley passe	1	28	1	21	1	52
Unknown	2	106	59	164	9	340
Grand Total	1,361	41,932	4,544	15,335	643	63,815

### Chart Type:

The chart will render once you have configured your data elements in the Data Selector.

[Download Chart Image](#)

Bar

Use the text box below to create a custom label for your chart. Leaving the textbox below blank will cause your chart to use its default values.

My presentation chart

[Update Chart With Custom Title](#) [Use Default](#)

# Crash Tabulation Field Filtering

The screenshot displays the MassDOT Crash Tabulation web application. A modal window titled "Field settings: [Person Attributes].[Non-Motorist Type]" is open, showing configuration options for a pivot data grid. The settings include:

- Header: Non-Motorist Type
- Summary: Count
- Show As: No calculation
- Weigh by: (none)
- Sort: Ascending
- Filter: EDIT... CLEAR
- Format: Show items where the value **Does not equal**
- Sample: Blank
- Logic: ☒ And ☐ Or
- Value: (not set)

The background interface shows a "Data Selector" on the left with categories like Person Measures, Crash Measures, and Person Attributes. The "Pivot Data Grid" on the right displays a table with columns: Reported, Property damage, Unknown, and Crash Count. The table data is as follows:

	Reported	Property damage	Unknown	Crash Count
Cyclist	1,097	4,657	123	20,495
Not Reported	1,446	3,602	111	8,589
Other	250	1,307	48	2,653
Pedestrian	1,688	5,591	348	31,724
Rep	1	3		8
Sk	20	73	3	375
Trail	1	21	1	52
Unk	59	164	9	340
Grand Total	4,544	15,335	643	63,815

Below the table, there are buttons for "Export Grid Data", "Download Chart Image", and "Update Chart With Custom Title". A chart titled "My presentation chart" is partially visible at the bottom, showing a bar for "Cyclist".

# Crash Tabulation— exporting data

AutoSave Off GridData.xlsx - Protected View - Excel Stevens, Gary

File Home Insert Draw Page Layout Formulas Data Review View Add-ins Help ACROBAT Team Tell me what you want to do Share

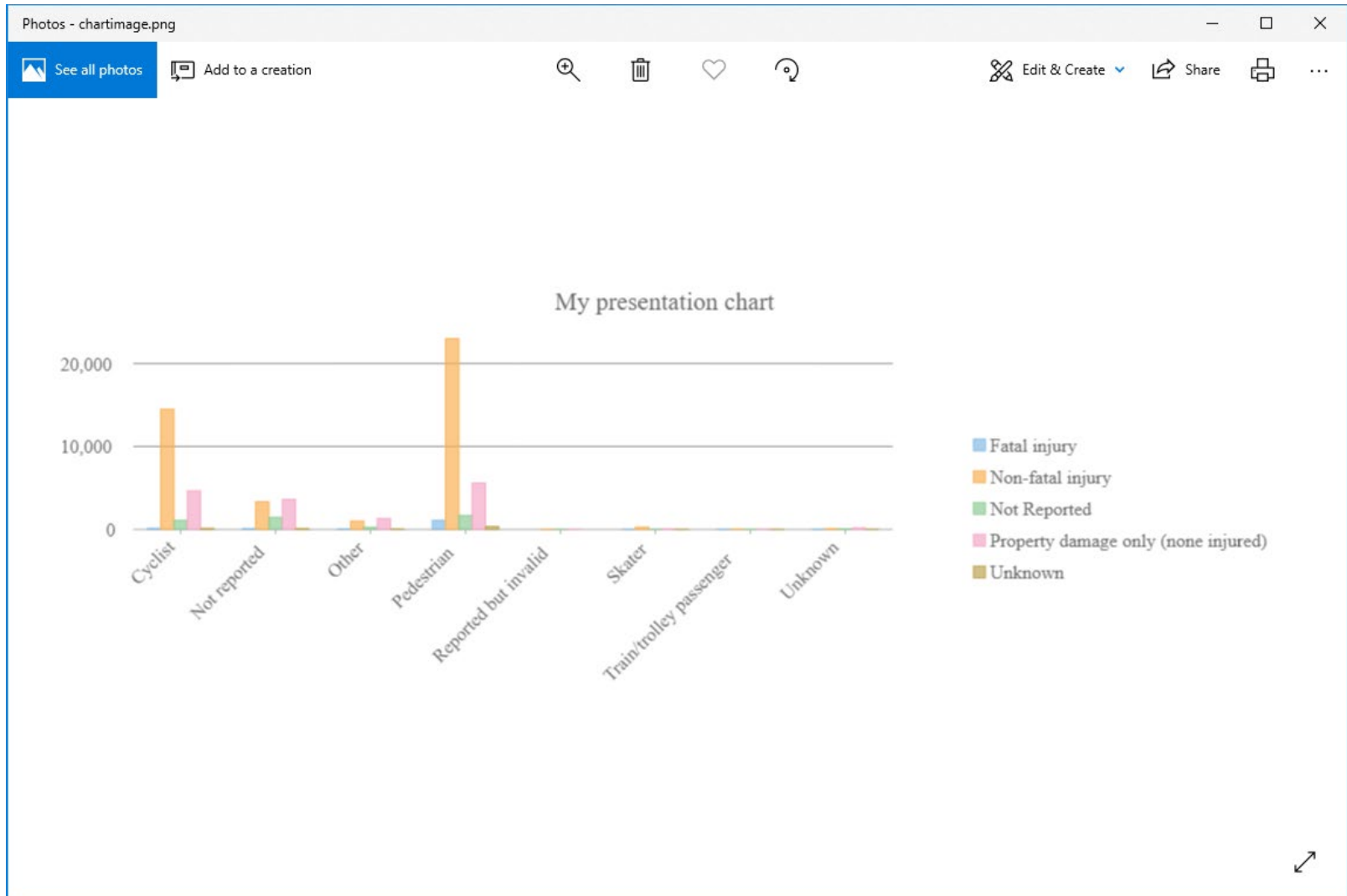
**PROTECTED VIEW** Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. [Enable Editing](#)

	A	B	C	D	E	F	G	H	I
1	<b>Non-Motorist Type</b>	<b>Fatal injury</b>	<b>Non-fatal injury</b>	<b>Not Reported</b>	<b>Property damage only (none)</b>	<b>Unknown</b>	<b>Crash Count</b>		
2	<b>Cyclist</b>	133	14,485	1,097	4,657	123	20,495		
3	<b>Not reported</b>	98	3,332	1,446	3,602	111	8,589		
4	<b>Other</b>	37	1,011	250	1,307	48	2,653		
5	<b>Pedestrian</b>	1,101	22,996	1,688	5,591	348	31,724		
6	<b>Reported but invalid</b>		4	1	3		8		
7	<b>Skater</b>	5	274	20	73	3	375		
8	<b>Train/trolley passenger</b>	1	28	1	21	1	52		
9	<b>Unknown</b>	2	106	59	164	9	340		
10	<b>Grand Total</b>	1,361	41,932	4,544	15,335	643	63,815		
11									
12									
13									
14									
15									
16									

Grid Data

Ready Display Settings 100%

# Crash Tabulation— saving charts



# Cloud Based Deployment

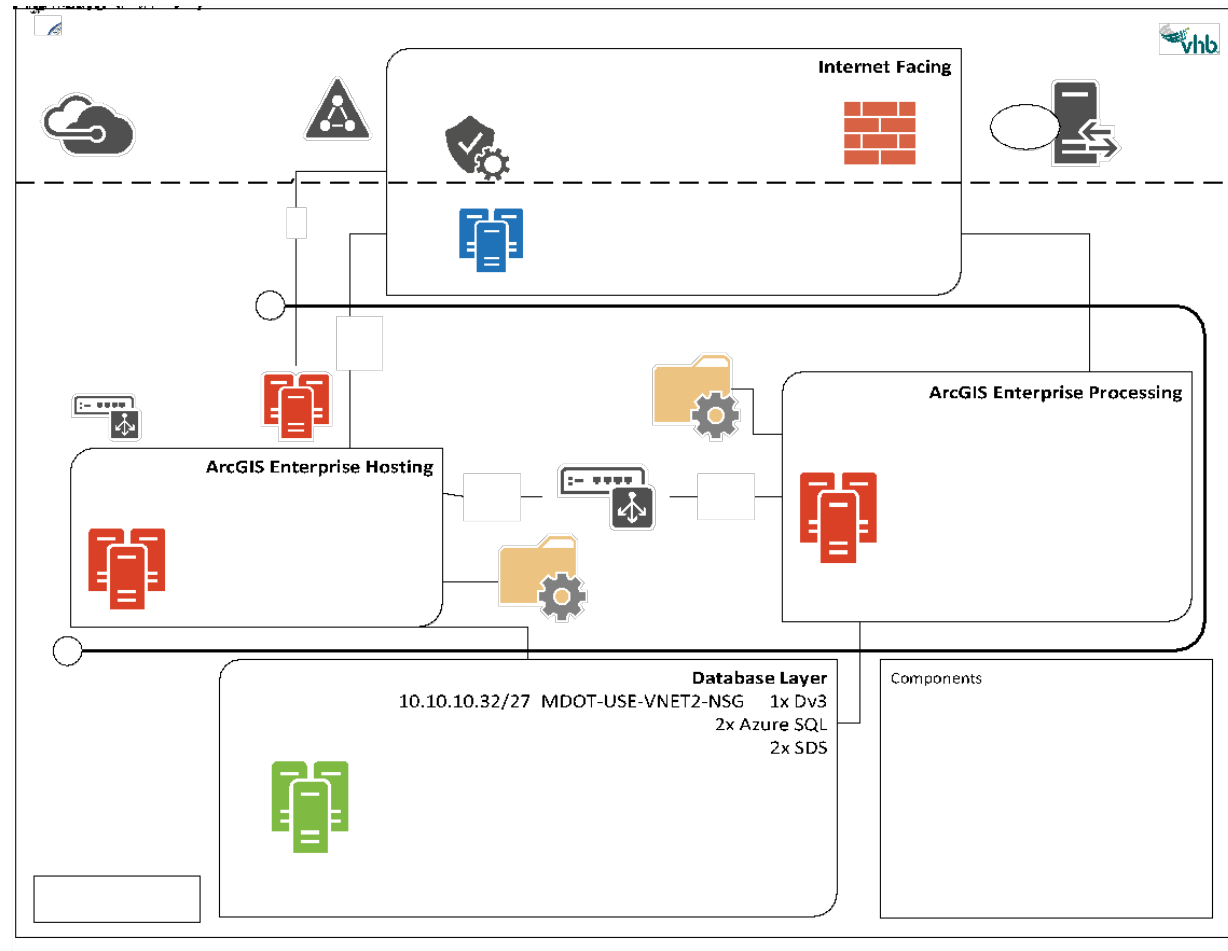
Centrally located solution using Microsoft's Azure cloud environment

- Ensures a stable, secure, and performant suite of tools
- Supports public access to query, analyze, report, and extract the data
- Performant design that provides:
  - no more waiting for emails or data mailed on disc
  - ability to “slice and dice” crash, vehicle, and person level data in many ways
  - enhanced analytics for staff, public, & researchers



# Technology Used

- Microsoft:
  - Windows
  - IIS
  - *SQL Server*
  - *SSRS*
- *Esri:*
  - *ArcGIS Enterprise*
  - *Portal for ArcGIS*
  - *Roads & Highways*
  - *Open Data Portal*
  - *WebApp Builder*
- *Angular & Kendo*



# Key Successes

- Improved geocoding processes
- Enhanced access to LEA's for better data quality
- Integration with Esri's Roads & Highways
- Improved enterprise data model
- Leverage COTS components wherever possible
- Cloud-based solution providing stability and consistent up-time

# Q&A

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