



# Digitizing Municipal Transportation Workflows

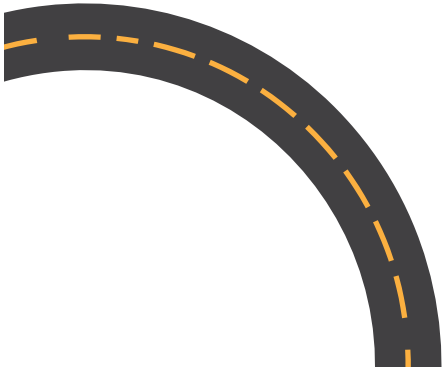
# MAssDOT GIS

## ABOUT

- Office of Transportation Planning
- Managed by Kevin Lopes
- Team of ~10 analysts, developers, & coordinators
- Produces GIS data to acquire federal funding through HPMS

## MODERNIZATION

- ▶ GIS has experienced phenomenal & unanticipated change in the past five years
- ▶ MassDOT has used this opportunity to change to the way we use transportation data in Massachusetts
- ▶ Moving from a siloed, desktop editing environment to an online, server-based environment has allowed us to create new & more productive workflows



# Mission

Maintain the accuracy of the Road Inventory and other datasets.

Provide a centralized platform for Mass-DOT's geospatial activity on the web.

Enable partner access to consistent and equitable tools.

Increase public participation in transportation activities through technological advancements.

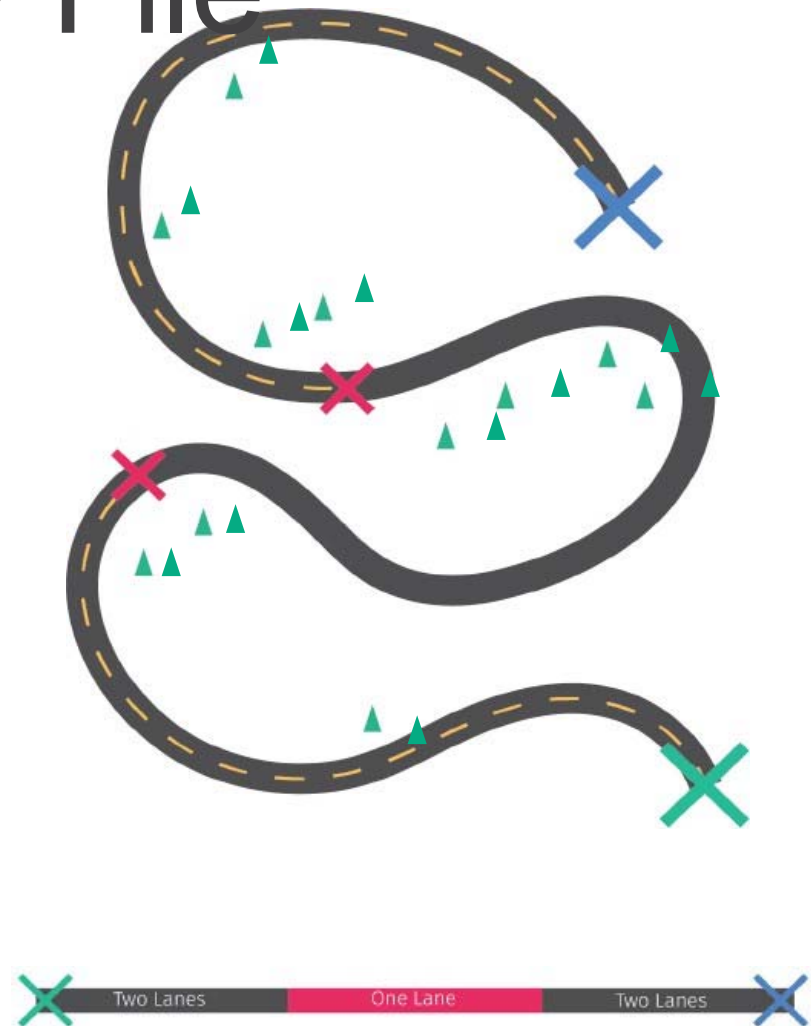
# Road Inventory File

## DETAILS

Maintained as a function of HPMS, the RIF is finalized and published once annually as a summary of the year before.

Exists as a linear referencing system (LRS): a geometry network that relies on a series of relational tables.

Updates are happening continuously throughout the year with many of the +100 data attributes that exist changing frequently.



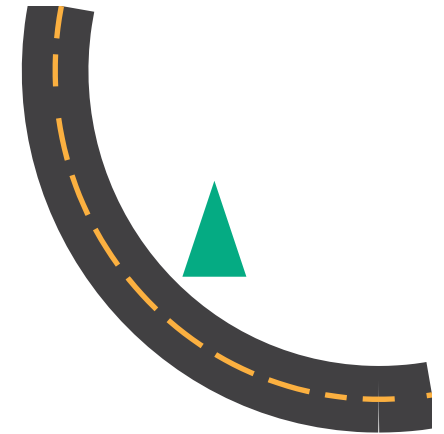
# Limitations

## DATA SILOS

- ▶ Local data owners have a better understanding of road conditions.
- ▶ Many local and regional governments maintain their own transportation datasets independent of the RIF.
- ▶ Groups within MassDOT use data differently, maintain only state roads, at different time periods, to a varied degree of specificity.

## TECHNOLOGY

- ▶ Multiple user groups editing the same data at the same time.
- ▶ Unclear update procedures.
- ▶ Limited/inconsistent access to software.



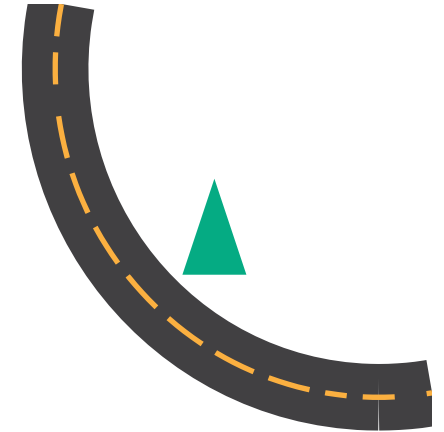
# Engaging local Gvts

## INITIAL CONTACT

- ▶ There is one GIS Coordinator for the 351 municipal governments in the Commonwealth.
- ▶ Every region has a unique political structure to promote ideal state-municipal interactions.
- ▶ The GIS group is always interested in pursuing new local partnerships.

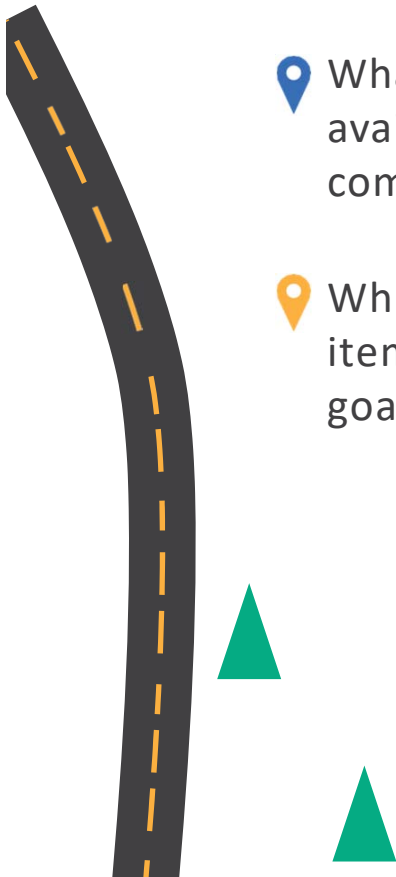
## RESOURCES

- ▶ Local planning, highway, utility, engineering, or environmental departments.
- ▶ Regional Planning or Transit Agencies
- ▶ The MassDOT GIS Team

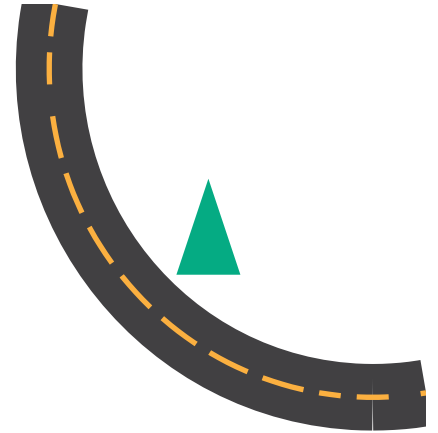


# Identifying Goals

- 📍 What are you trying to better accomplish?
- 📍 What resources are available to your community?
- 📍 Which specific data items are relevant to this goal?



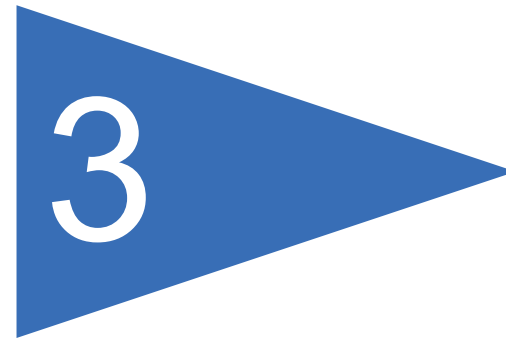
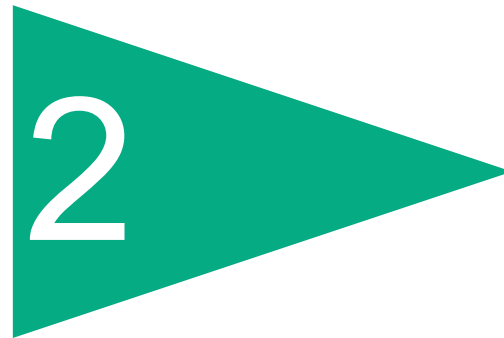
# Building a workflow



Identify your goals

Contact your RPA or  
MassDOT GIS

Keep active momentum





# Chapter 90



- ▶ A funding mechanism tied to the road inventory product.
- ▶ Encourages municipalities to participate in data maintenance activities as updates may lead to an increase in funding.

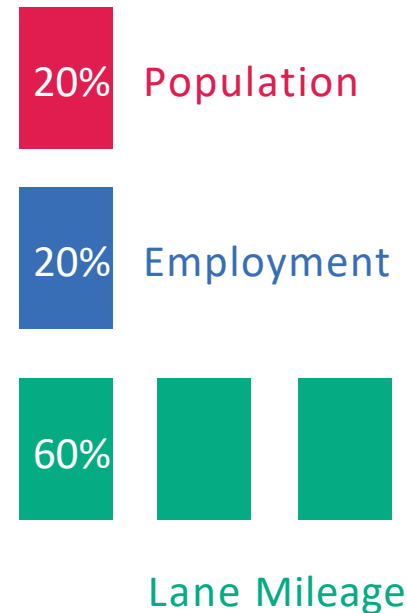
## RULES

If a road isn't in our database, it will not be in the final mileage total.

If a town is maintaining a road, it should be owned by the town.

Our database should be confirmed by each town semi-annually.

## FORMULA



# Update PProcess

2005 - 2017

Redundant work flows

Lack of tracking, no accountability

Outreach efforts are largely ignored >:(

Reliant on physical mail



2018 - FORWARD

Digital interface

Robust annual reporting tools

Ability to make frequent edits

Customizable tools

Automated notifications




COMMONWEALTH OF MASSACHUSETTS  
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION  
OFFICE OF TRANSPORTATION PLANNING

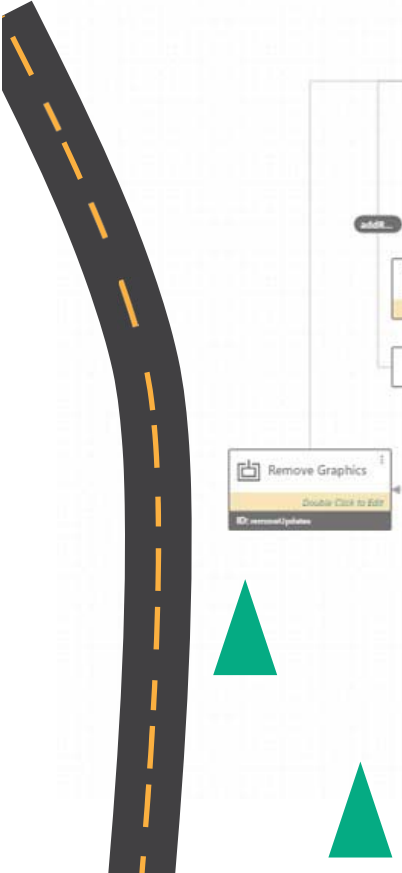
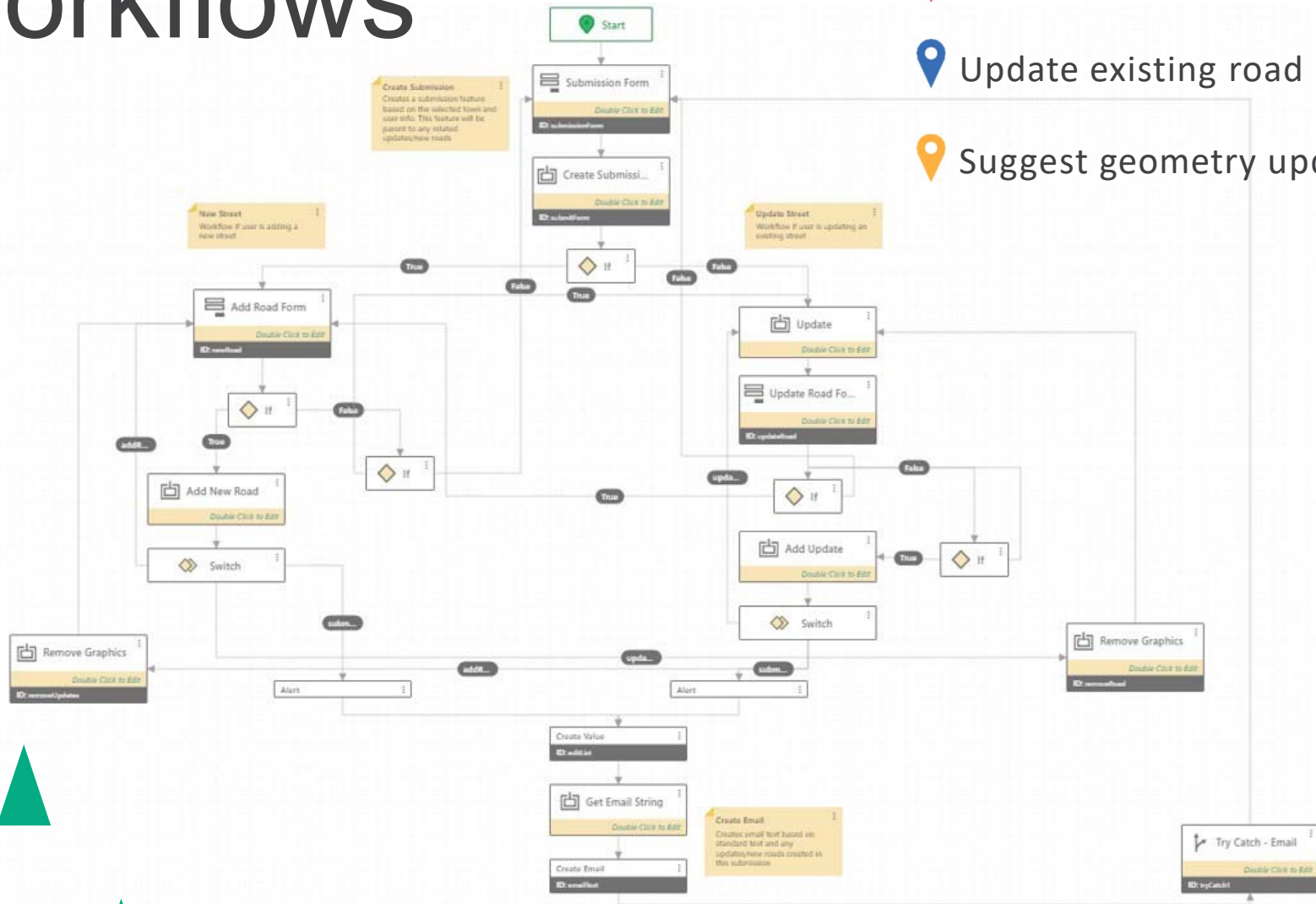
# Example

NEW ROAD ENTRY FORM FOR ROAD INVENTORY FILE

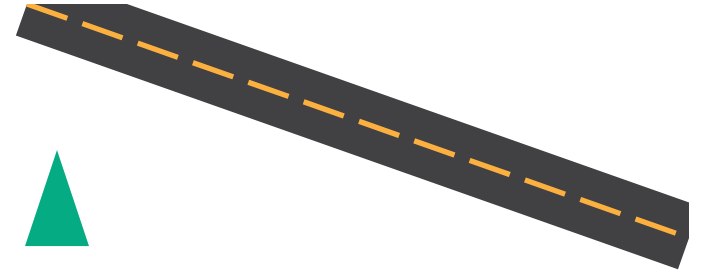
- 1 CITY/TOWN: Acton
- 2 STREET NAME: Blueberry Path (include suffix)
- 3 FROM LOCATION: Marshall Path [street, cul-de-sac, dead-end, town/state line, private property]
- 4 TO LOCATION: Canterbury Hill Road (see above)
- 5 RELATIVE OFFSET: See Attached Map  
\_\_\_\_\_  
(distance/ description from another intersection)
- 6 JURISDICTION: (check the appropriate category)  
 [city/town accepted]  [unaccepted]  [private]  [other]
- 7 LEFT SIDE SHOULDER: (check the appropriate type) [opposing side shoulder for undivided roadways only]  
TYPE:  [none]  [paved]  [unpaved - stable]  [unpaved - unstable]  
WIDTH: 13 feet
- 8 SURFACE WIDTH: 24 feet
- 9 SURFACE TYPE: (check the appropriate type)  
 [unimproved, graded earth, or soil surface]  [gravel or stone]  
 [brick]  [block]  [surface treated]  
 [bituminous concrete]  [portland cement]  [composite; flexible over rigid]  
 [composite; rigid over flexible or rigid over rigid ('white topping')]
- 10 RIGHT SIDE SHOULDER: (check the appropriate type)  
TYPE:  [none]  [paved]  [unpaved - stable]  [unpaved - unstable]  
WIDTH: 13 feet
- 11 NUMBER OF LANES: 2
- 12 CURBS: (check the appropriate type)  
 [none]  [left side only]  [right side only]  
 [both sides]  [along median only]  [all curbs (divided road)]
- 13 SIDEWALK WIDTH: left side 5 feet; right side \_\_\_\_\_ feet
- 14 STREET OPERATION: (check the appropriate type)  [1-way]  [2-way]
- 15 TERRAIN: (check the appropriate type)  [level]  [rolling]  [mountainous]
- 16 STRUCTURAL CONDITION: (check the appropriate type)  
 [good]  [fair]  [deficient]  [intolerable]
- 17 RIGHT OF WAY WIDTH: 50 feet
- 18 SPEED LIMIT: Not Posted miles per hour

# Workflows

-  Add new road
-  Update existing road
-  Suggest geometry update



# Add New Road



**massDOT** Road Inventory Submission Application  
Massachusetts Department of Transportation

Cancel and Update Road

Road Name  
Bowens Pond Road

Attach Documentation  
+ Add File

Road Geometry [X]  
+ Draw Road Shape

From Location  
Wendell Depot Road

To Location  
Dead End

Length  
in miles  
0.413

Jurisdiction  
Private

Left Side Shoulder

Find address or place

**Legend**

Updates and New Roads

- ROAD UPDATE
- NEW ROAD

Submissions

Road Inventory

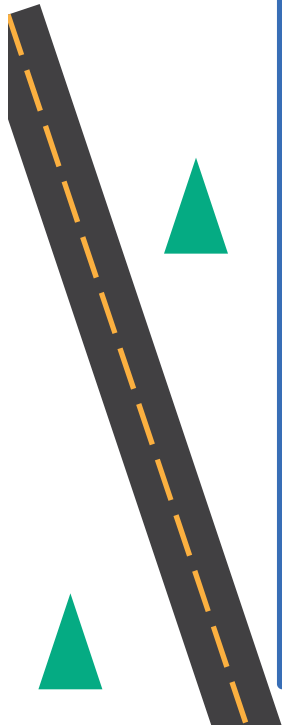
- Massachusetts Department of Transportation
- City or Town accepted road
- Unaccepted by city or town
- Department of Conservation and Recreation
- State Park or Forest
- Private
- US Air Force
- State Institutional
- Massachusetts Port Authority
- State college or university
- Other

Pictometry  
05/20/2017 1 of 7 Select Date

USDA FSA



# Update Existing



[Road Inventory Data Dictionary](#)

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Select the road to update by choosing a road name from the drop down menu or by using the road picker to click a road on the map

Road Name

Road Picker

LRS Route ID

---

Attach Documentation

---

From Mile

To Mile

Length  
in miles

Attribute(s) to Update  
Hold Ctrl/Shift to select multiple items

Comments or Notes



# Internal



**massDOT** Road Inventory Submission Application - Reviewer Portal

Submission: 329 - BazegianM\_Mun-329-2018-11-8 14:19

Accept Entire Submission

Updates: L139564 EB - GREEN PINE LANE

New Roads

To modify this road before accepting it, do the following:

1. Click the road in the map
2. Click the ellipsis ("...") in the popup
3. Click "Edit"
4. Make any edits necessary
5. Click "Save"

Reviewer Comments

Save Reviewer Comments Accept Reject

Street Name: GREEN PINE LANE

Route ID: L139564 EB

From Measure: 0

To Measure: 0.245

Comments:

**Edit**

Select a template to create features

Updates and New Roads

DEV\_RH.D  
BO\_Pradu  
pdateEditB

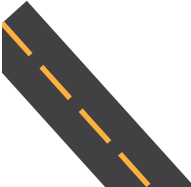
**Updates and New Roads**

Attributes Edited: Updated: Jurisdictn

Reviewer Comments:

Type of Update: ROAD UPDATE

Attachments:  
[Order 1353 - Green Pine Lane.pdf](#)





## WEBSITES

RISA

[gisdev.massdot.state.ma.us/risa](http://gisdev.massdot.state.ma.us/risa)

GeoDOT

[massdot.maps.arcgis.com](http://massdot.maps.arcgis.com)

Open Data site

[geo.massdot.opendata.arcgis.com](http://geo.massdot.opendata.arcgis.com)

MassDOT

[mass.gov/massdot](http://mass.gov/massdot)

More Information

[www.mass.gov/service-details/submit-road-inventory-updates](http://www.mass.gov/service-details/submit-road-inventory-updates)

## CONTACTS

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Thanks for your attention!!