ROAD INVENTORY SUBMISSION APPLICATION
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 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
GOALS

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.
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
- Data needs and understanding

Moving from a siloed, desktop editing environment to an online, server-based environment has allowed us to create
UPDATE PROCESS

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
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.

R U L E S

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.

F O R M U L A

Population: 20%

Employment: 20%

Lane Mileage: 60%
DEVELOPMENT

C A R L H U G H E S

- Developed in an Esri Enterprise environment, and included as part of our ArcGIS Online organizational account, geoDOT.

- Leverages Geocortex by Latitude Geographic, a tool for streamlined GIS development that relies on building business processes as workflows.

- Geocortex communicates directly with AGOL web application builder, MassDOT’s LRS environment and Roads & Highways infrastructure.
WORKFLOWS

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

- Consists of several forms completed by the user.
- Form are used to create submission features with related child records for each road update or new road being submitted.
- Features are stored in intermediary feature class before LRS edits are applied and they show up in the RIF.
  - For new roads, a new LRS route is created in ArcMap before attributes can be applied.
  - Route ID is generated within the workflow.
  - User only needs to copy the geometry into the LRS feature class.
- Utilizes LRSServer functionality, such as geometryToMeasure and measureToGeometry, and queryAttributeSet.
BETA TESTING

Group of 25 local and regional government users.

Provided critical insights to how we should restructure our user experience.
**Update Existing**

**Road Inventory Data Dictionary**

**Cancel and Add New Road**

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**

**BAKER ROAD**

**Road Picker**

+ **Click a road on the map**

**LRS Route ID**

**L200666 EB**

**Attach Documentation**

+ **Add File**

+ **Add From/To Points**

**From Mile**

0.000

**To Mile**

0.737

**Length**

in miles

0.737

**Attribute(s) to Update**

Hold Ctrl/Shift to select multiple items

- **Street Name**
- **Jurisdiction**
- **Left Side Shoulder - Type**
- **Left Side Shoulder - Width**
- **Surface Width**
- **Surface Type**
- **Right Side Shoulder - Type**

**Update Attributes**

**Comments or Notes**
ADD NEW ROAD
INTERNAL PROCESSING
LOOKING FORWARD

- Host workshop for municipal and local users at the MassDOT Moving Together Conference on 11/1.
- Host a webinar for potential users or other interested states by the end of the year.
- Improve functionality and widen scope to include state employee projects.
- Integrate with MA Highway Project Intake Tool.
WEB SITES

RISA
gisdev.massdot.state.ma.us/risa

GeoDOT
massdot.maps.arcgis.com

Open Data site
geo.massdot.opendata.arcgis.com

MassDOT
mass.gov/massdot

More Information
www.mass.gov/service-details/submit-road-inventory-updates

CONTACTS

Quinn Molloy
GIS Municipal Coordinator
Quinn.Molloy@state.ma.us
857-368-8841

Kevin Lopes
GIS Services Manager
Kevin.Lopes@state.ma.us
857-368-4447

Thanks for your attention!!