RIO

What is RIO
Office of Information Technology (OIT)

- MaineDOT IT Services Division consolidated into Maine OIT in 2006
- Application Services group continues to be co-located with MaineDOT
- Partner closely with MaineDOT/RIO to develop IT Strategy and Architecture
- Work managed with a quarterly IT portfolio update process
Conception of Data Governance 2006

- Organizational Model of Governance
- Leadership – OneDOT concept
- System Managers, Data Managers, Data Stewards
OneDOT Architectural Principles

- MaineDOT is a single enterprise.
- Total cost of ownership and the OneDOT vision are driving factors in all IT decisions.
- Meaningful information is available and accessible to all stakeholders.
- Core systems must be adaptable to change.
- **Data is managed as an asset.**
Location is at the Center of it ALL

Assets
- Asset Group
- Asset Type
- Asset ID

Feature, or Portion of Asset Affected

Location

Money
- Transaction
- Line Item
- Account
- Application

Resource Utilized
- Work Group
- Units

The “WIN” – Work Identification Number
Flux Capacitor???
Development of Spatial Program

- Part of larger program area approach to Information Management
  - Organize IT systems and governance under logical areas (Work, Assets, Money and Location)
- GIS Services reorganized under RIO
- Design Spatial Program IT Architecture using the OneDOT Architectural Principals
  - Expand on previous Web GIS Strategic Plan developed in 2007
MaineDOT Spatial Program - Architecture Overview

GIS Web Architecture
- ArcGIS Online (AGOL)
  Custom maps and applications built and configured by MaineDOT staff and partners using the AGOL web interface.
- Open Data
  Open data platform utilized for data discovery and distribution.

Web Application Framework - JavaScript framework to build custom applications
- Map Viewer
  Common mapping application, providing core functionality and data. Integrated applications extend the core functionality.
- Focused Applications
  Custom applications designed for a particular use as part of the Map Viewer, embedded or stand alone.
- Mobile Applications
  Applications built specifically for small form factors, touch screens and disconnected usage.

GIS Web Services (ArcGIS Server - AGS)
- Dynamic
  Map images created by request with current data
- Tiled
  Map images pre-tiled to use as a basemap
- Vector Tile
  Compressed vector based service with multiple styles.
- Feature
  Stream data as vectors to AGOL users and to apps
- LRS
  Linear referencing functions using SOE
- Network
  Provide network based functions (eg. routing)
- Geoprocess
  Custom geoprocesses to support map applications

GIS Database (ArcSDE)
- The MaineDOT Enterprise GIS Databases are stored and maintained in Oracle and use ArcSDE to make data available to GIS Web Services and ArcGIS Desktop users.

GIS Data Processing (ArcGIS)
- Batch Processing
  * ETL Process for Asset Data Warehouse
  * Spatial data created from MaineDOT Databases
  * External data from web services (Waze, 511, USGS)

Large GeoModels
- * Customer Service Levels (CSL)
- * Traffic Count Flowing
- * Recent Pavement Treatment
- * Highway Safety Screening
- * Network dataset with restrictions

Synchronization
- * ProjEX RLM locations
- * Crash - Element Offset
- * MATS - (Web Service Sync)

Utilities
- * Scheduling
- * Notifications
- * Logging
- * Data Backup
- * Wiki integration

Linear Referencing System (LRS)
- Foundational system that manages the location of our road network, characteristics and assets.
  * Includes rail and trail networks
  * Location Syncing via METRANS API

MaineDOT Databases
- Asset Data Warehouse
- Vision
- CRASH
- PROJEX
- BDOT
- MDOTRPRD
### Spatial Data from Business Systems

#### Map Viewer

**MaineDOT Map Viewer**

- **Search...**

**Map Layers**

- **Cross Culverts RLM**

**Layer Info**

Small culverts that run under a state roadway. Refreshed and located nightly from any MATS culvert that has a milestone along the specified route, but DOES NOT have coordinates (latitude/longitude) within 100 feet of the specified route's centerline. A Cross Culvert is defined as a pipe or structure that has a span of less than 5 feet on multiple pipes or other structures with a combined opening of less than 20 square feet in area. Contact: Jim Saban - Jim.Saban@maine.gov

- Last updated: 04/21/2019 at 10:20PM
- Contact for questions and comments:
  - Jim Saban
  - Phone: 207-624-3303

**View Full Metadata**

**Cross Culverts RLM**

<table>
<thead>
<tr>
<th>Asset ID</th>
<th>Condition</th>
<th>Crew</th>
<th>Depth</th>
<th>Description</th>
<th>Element</th>
<th>Height</th>
<th>Last Inspection</th>
<th>Length</th>
<th>MP</th>
<th>Notes</th>
<th>OFFSET</th>
<th>Region</th>
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<th>Route</th>
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<td>9/23/05 8...</td>
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<td>71307</td>
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<td>0019X 35...</td>
<td>XC-1023...</td>
<td>35</td>
<td>4x6x60'</td>
<td>35</td>
<td>4x6x60'</td>
<td>3</td>
<td>3</td>
<td>11/6/18 7...</td>
<td>0015X</td>
<td></td>
</tr>
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</table>
Wiki Integration

Major Signs QC

- Assigned Town is NULL
- Townname Listed not in METWP
- Point Doesn't Intersect State of Maine
- Town Different than that assigned
- Town Different than that assigned Under Distance Threshold
- Route assigned not a member of closest roadway feature
- Closest Numbered Route is different than Numbered Route Assigned
- Closest Maintenance Route is different than Maintenance Route Assigned
- Number Route assigned, but there is a Maintenance Route that is closer
- Snap Distance greater than offset for Dataset

Assigned Town is NULL
There are a total of 0 features(rows) in Major Signs that have a NULL BEGIN_TOWN in MATS. A Town could however be derived using the coordinates and METWP24P. The concern would be for users querying the BEGIN_TOWN in the dataset. The results could potentially be incomplete.

Townname Listed not in METWP
There are a total of 0 features(rows) in Major Signs that have a BEGIN_TOWN listed, that is NOT in METWP24P. This doesn't mean the BEGIN_TOWN is wrong, but there could be a potential issue between the towns available in MATS and METWP24P.

Point Doesn't Intersect State of Maine
There are a total of 2 features(rows) in Major Signs that DON'T Intersect METWP24P Polygon Boundary of Maine
External Web Services

Flooding Now
2
Station has reached flood stage
Last update: 2 minutes ago

Potential Flooding
1
Station > 80% and Increasing
Last update: 2 minutes ago

Stations by Flood Stage
01017000 Aroostook River at Washburn, Maine
Percent to Flood Stag 1.18 Trend - I

01030500 Mattawamkeag River near Mattawamkeag, Maine
Percent to Flood Stag 1.04 Trend - D

01010070 Big Black River near Depot Mtn, Maine
Percent to Flood Stag 0.85 Trend - I

01021000 St. Croix River at Baring, Maine
Percent to Flood Stag 0.84 Trend - S

01018500 St. Croix River at Vanceboro, Maine
Percent to Flood Stag 0.78 Trend - D

01066000 Saco River at Last update: 2 minutes ago

Last update: a few seconds ago

MaineDOT
Complex GeoModels
ETL Processing to Data Warehouse

Current Highway CSL Miles by Priority
Updated for projects with Con Complete Actual dates on or before Friday, January 04, 2019.

### Condition

<table>
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<tr>
<th>HCP</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
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### Safety

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<td>259</td>
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<td>1,980</td>
<td>1,153</td>
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### Service

<table>
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<tr>
<th>HCP</th>
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<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>Total</th>
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<td>358</td>
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<td>Total</td>
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<td>825</td>
<td>2,469</td>
<td>328</td>
<td>27</td>
<td>8,689</td>
</tr>
</tbody>
</table>
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ArcGIS Desktop/Pro Users

File Geodatabases

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MaineDOT Databases

Asset Data Warehouse

Vision

CRASH

PROJEX

MDOTPRD

Helper Web Services (IIS)

User Management

Non-Spatial Data Functions
Maine’s population centers are a particular pedestrian safety concern.

Based on pedestrian crash concentrations, MaineDOT has identified 10 population centers made up of 21 communities:

- Augusta/Hallowell
- Bangor/Brewer
- Bath/Brunswick/Topsham
- Biddeford/Saco
- Camden/Rockland
- Lewiston/Auburn
- Old Town/Orono
- Portland/South Portland/Westbrook
- Sanford
- Waterville/Winslow

Click on any of the links above to see Pedestrian Crashes reported during the years 2012 - Current Year (As crash reports become available).
### Embedded Maps in Business Systems

<table>
<thead>
<tr>
<th>Location Type</th>
<th>Location Name</th>
<th>Common Name</th>
<th>Route Code</th>
<th>BMP</th>
<th>EMP</th>
<th>Begin Lat/Lon</th>
<th>End Lat/Lon</th>
<th>Length</th>
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<tbody>
<tr>
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<td>Route 197</td>
<td>0197X</td>
<td>0</td>
<td>10.53</td>
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<td>Route 135</td>
<td>0135X</td>
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<td>44.238675, -70.035562</td>
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<td>Route 135</td>
<td>0135X</td>
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<td>Road</td>
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<td>Whitten Road</td>
<td>C44BL</td>
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<tr>
<td>Road</td>
<td>MAINT C44BL DIV 4</td>
<td>Pond Road and Neck Road</td>
<td>C44BL</td>
<td>0</td>
<td>8.41</td>
<td>44.217378, -69.930563</td>
<td>44.324494, -69.861632</td>
<td>8.41</td>
</tr>
</tbody>
</table>

#### Map Details

- **Location Type**: Road
- **Route**: C44BL
- **Common Name**: Pond Road and Neck Road
- **Begin**: 44.217378, -69.930563
- **End**: 44.324494, -69.861632
- **Calc Length**: 8.41 miles
Superload Router

<table>
<thead>
<tr>
<th>Analysis Results</th>
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<tr>
<td>Route Input</td>
<td>Route Results</td>
<td>Analysis</td>
</tr>
<tr>
<td>Analysis Results</td>
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<td></td>
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<tr>
<td>Colle - (Auburn - Freeport) - 5 Axle Crane - Tom Lynch</td>
<td>Vorticon</td>
<td>Using Date: 08/22/2016 - 08/22/2016</td>
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<tr>
<td></td>
<td></td>
<td>Show vertical clearances only</td>
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<tr>
<td>Under 0564</td>
<td></td>
<td></td>
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<tr>
<td>Bridge Name: WATER STEET UNDERPASS</td>
<td>Street Name: WATER</td>
<td>Posting Type: Underclearance Limit</td>
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<td></td>
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<td>Clearance Sign Posting: 12 FT 9 IN</td>
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<td></td>
<td></td>
<td>Add to directions</td>
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<td></td>
<td>Add as barrier</td>
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<tr>
<td>Over 3073</td>
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<td>Street Name: BRIDGE</td>
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<td>Over 2682</td>
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<td>Add to directions</td>
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<tr>
<td></td>
<td></td>
<td>Add as barrier</td>
</tr>
</tbody>
</table>

Clear
Extending the Network Service
Things to Consider

- IT is not the Enemy (or the Business)
- Relationships matter (governance)
- Build systems and processes for change
- Realistic approach based on your business culture and resource capabilities
Questions?