

# *Roadway Classification LRS Comparison Tool for Enhancing Data Integrity*

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**METRIC  
ENGINEERING**

## Team Profile

Who:

FDOT D3 (District 3) Planning Staff,  
Internal GIS Staff and GIS Consultants  
(VHB, Metric)

Where:

District Three represents Florida's Panhandle (16 counties). Its 1,402,000 residents are spread over 16 counties and 11,500 square miles. Each day motorists travel more than 26.1 million miles on state roads.

Centerline miles - 2,396

Lane miles - 6,464



## Project Context

Why this tool is important?

Staff

- Changes in the LRS are made without Coordinators knowledge then data
- Nothing to validate between both sources
- Using Excel tables didn't allow for cleanup of roadway topology
- Chance of misinformation and accuracy

Technical Bonuses

- Allows quicker access for distributed teams to view and manage
- Long term view of data management and knowledge transfer
- Reduce chance of data file loss
- Time saving and redundancy
- Increased TTL of system network
- Historical data review
- Allows direct error review between RCI and Roadway Characteristics

## Project Context

Goal: Build a GIS tool that validates asset topology across various linear sources and must utilize legacy systems.

### Roadway Characteristics Inventory layers

- Access Management
- Functional Classification
- National Highway System (NHS)
- Strategic Intermodal System (SIS)

By comparing data from the

- Intersections
- Urban boundaries
- State Roads
- Roadway Status

It's imperative to understand where topological constraints exist with miscoded assets, and where issues in the spatial relationship between the different asset systems require further review and updates.



# SharePoint and Data Access

HOME PAGE

FDOT  
FLORIDA DEPARTMENT OF TRANSPORTATION

Home Damage Assessment DEMO Enhancements/IRP GIS I-10 Master Plan Legislative Briefing Sheets PTO Planning Studies Safety SIDS Transit **Roadway Classification** Planning Consistency Planning 2015 FTR/SIS

Quick Links  
Department Contacts  
Department Resources  
Public Notices  
Technology Resources

Libraries  
RCI Validation Documents  
D3 Road Transfers, Deviations, Realignments  
Site Pages

Lists  
RCI Validation Tool Links  
Recent

EDIT LINKS

Intermodal Systems Development > Roadway Classification  
Roadway Classification Tool  
The Roadway Classification Tool has been created to assist the District with the collection and display of miscoding or updates to the Roadway Characteristics Inventory that impact the mile point locations of the following layers Access Management, Functional Classification (Funclass), National Highway System (NHS), and Strategic Intermodal System (SIS). The tool performs a comparison process to identify potential errors which evaluate the RCI Roadway ID, Beginning, and Ending Milepost data field information.

Excel

Master Edit Tables	Exclusions Tables
<a href="#">Access Management Spreadsheet</a>	<a href="#">Access Management Exclusions Spreadsheet</a>
<a href="#">Functional Classification Spreadsheet</a>	<a href="#">Functional Classification Exclusions Spreadsheet</a>
<a href="#">NHS Spreadsheet</a>	<a href="#">NHS Exclusions Spreadsheet</a>
<a href="#">SIS Spreadsheet</a>	<a href="#">SIS Exclusions Spreadsheet</a>
<b>Error Output Tables</b>	
<a href="#">Access Management</a>	
<a href="#">Functional Classification</a>	
<a href="#">National Highway System</a>	
<a href="#">Strategic Intermodal System</a>	

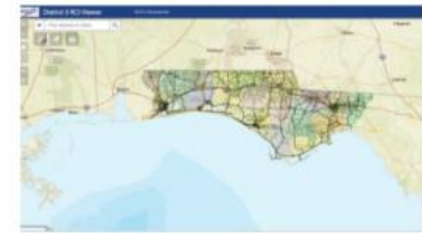
SharePoint is the primary access site to the Excel tables and Map Viewers.

Overview:

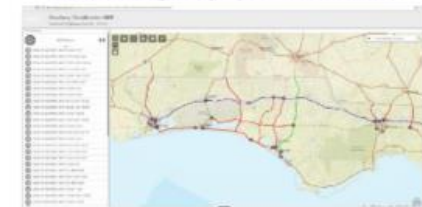
- Data is hosted on Local ArcGIS Server
- Scripts are scheduled to run weekly
- Organization ArcGIS Online via HTTPS
- Use Enterprise Services for Imagery, Basemap gallery tiles

**Map Viewers**  
Click the image below to launch the desired Roadway Classification Validation

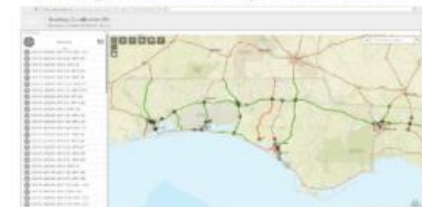
RCI Viewer



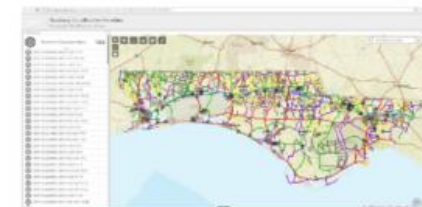
National Highway System Validation



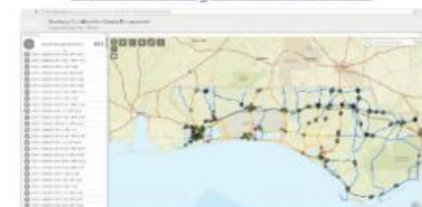
Strategic Intermodal System Validation



Functional Classification Validation



Access Management Validation



## Process and User Needs

Use current Excel tables with an automated analysis tool written in Python

+

Browser visualization dashboard of transportation assets in their real-world location

+

Performs a comparison to identify topology (50ft tolerance) of the beginning and ending milepost information along with the asset classification.

=

The results are streamlined to evaluate and to determine the updates to the asset network.



# Outline of the Workflow

- LRS Tables & Exclusions
- Roadway ID
- Beg Mile Post
- End Mile Post

Tbl to FC

FC to Web

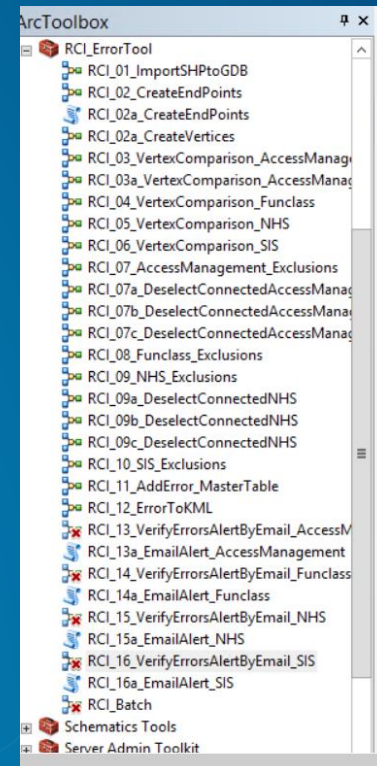
- Python
  - Import datasets
  - Create Vertices
  - Comparison/Deselect
  - Output to GDB FC

- Script FC to Excel
- Publish services
  - ArcGIS Online
  - WMS
  - KML
  - Email Notification

Viewer

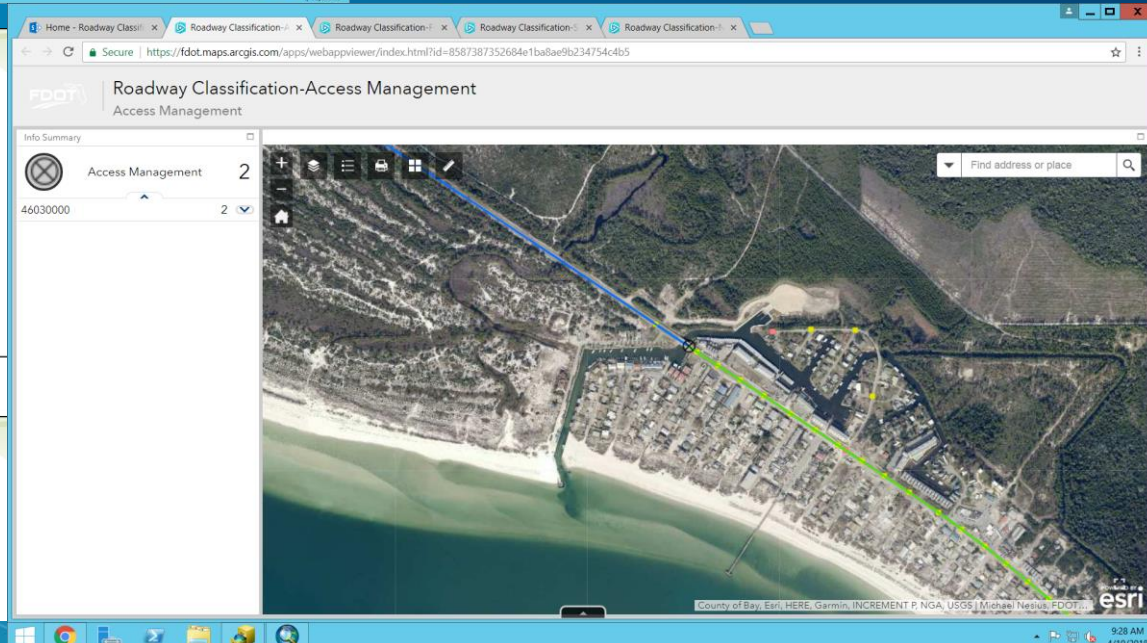
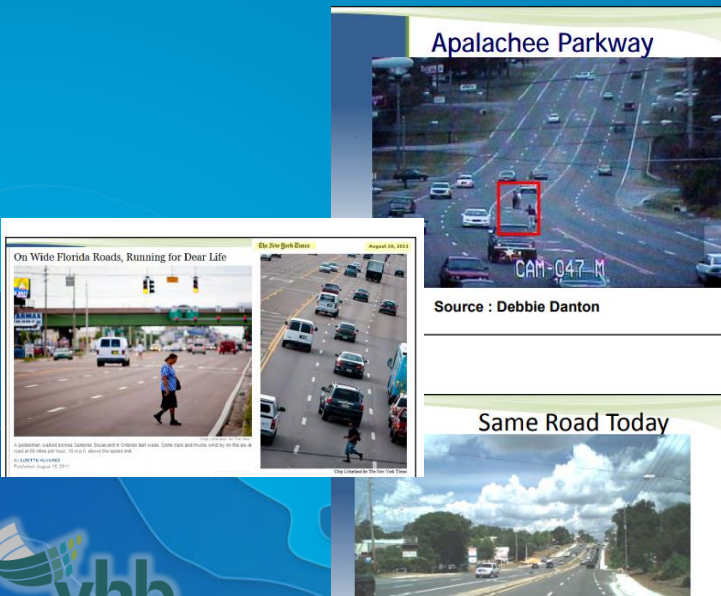
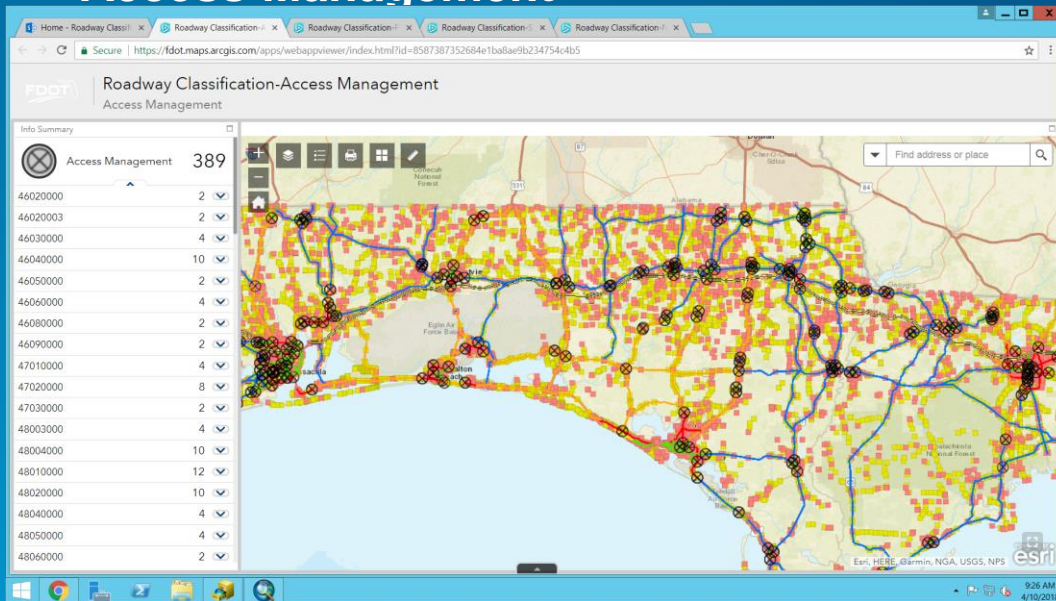
# Technology – Tools & Template

- **Started as Model Toolbox**
- **Python**
  - Feature Management Create Vertices from Start/End Points
  - Calc Distance between Comparison Datasets and select all greater than 50ft
  - Create Errors Feature Class
  - Publish Web Service
- **Database**
  - Enterprise Source to Local Geodatabase
- **AGOL Hosted App Viewers**
  - Info Summary
  - Basemap
  - Customized Search
  - Local Print Utility





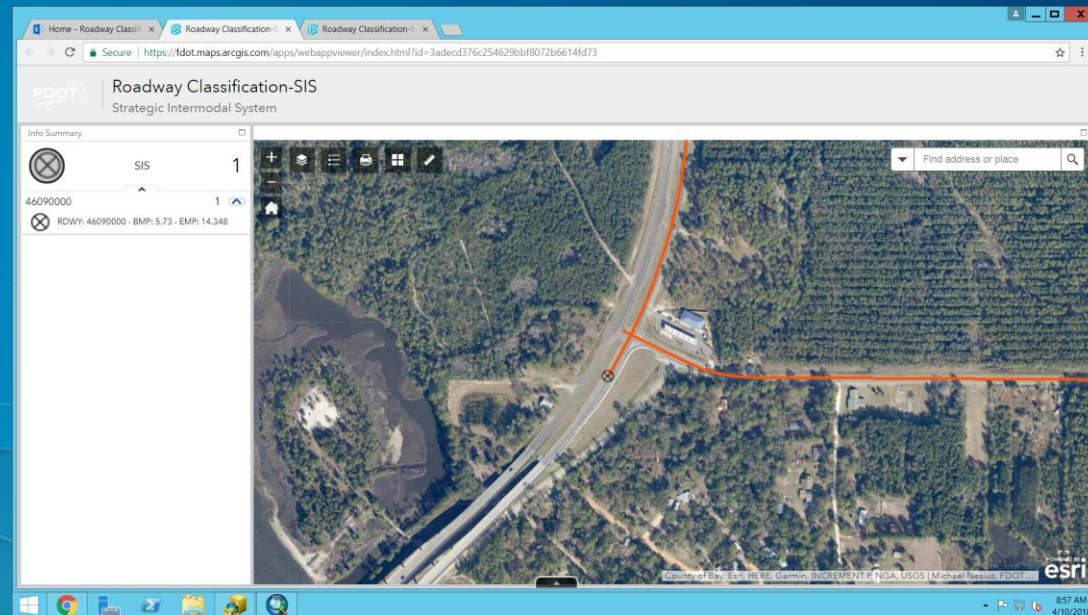
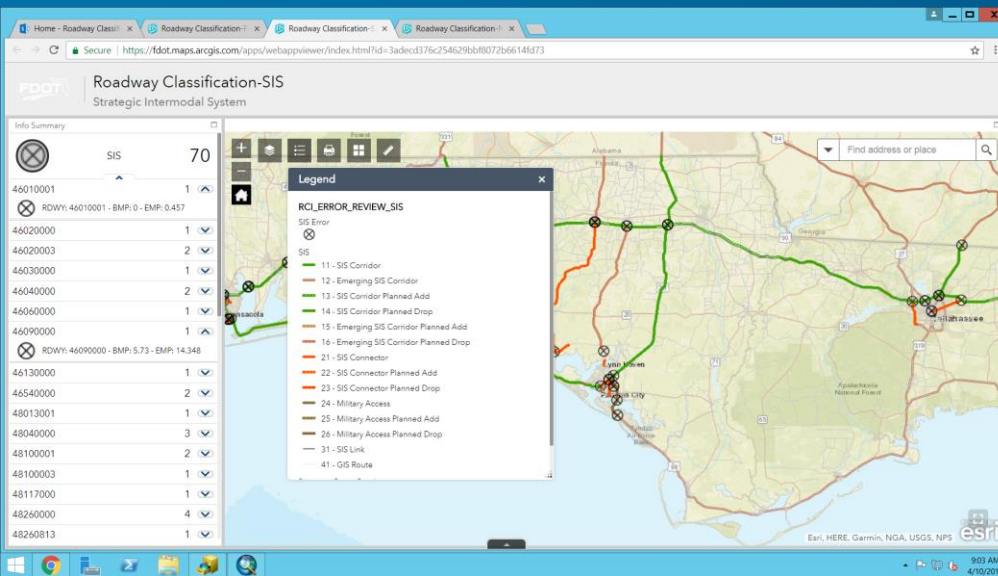
# Access Management



# SIS

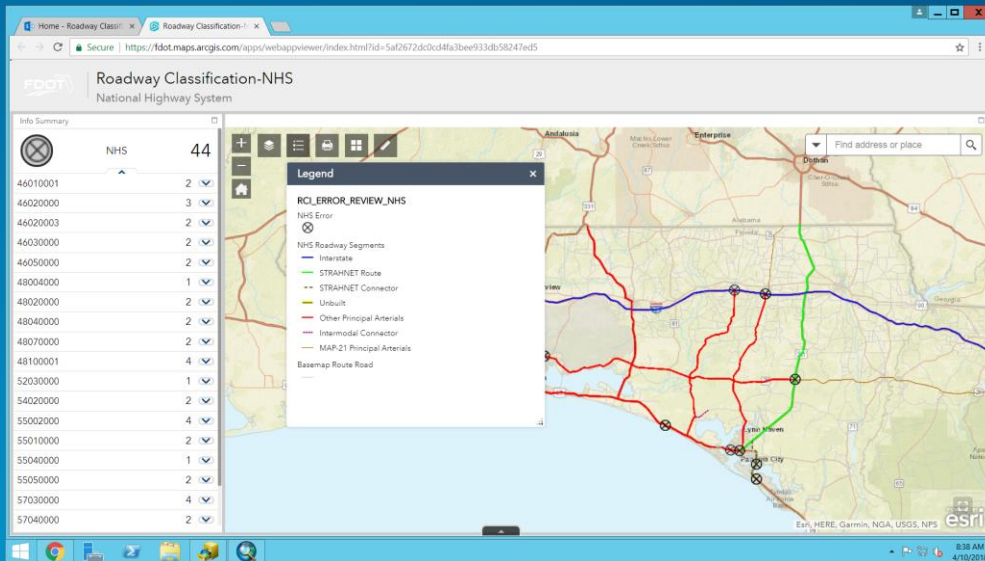
Strategic Intermodal System (SIS) is Florida's high priority network of transportation facilities important to the state's economy and mobility and to focus the state's limited transportation resources on the **facilities most significant for interregional, interstate.**

Validation of LRS EMP



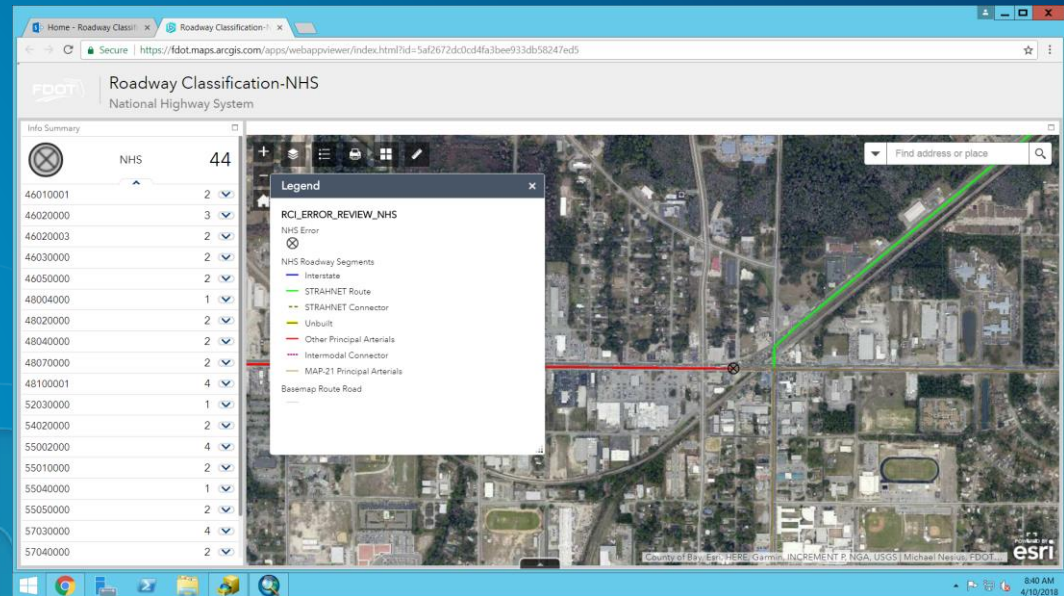


# NHS

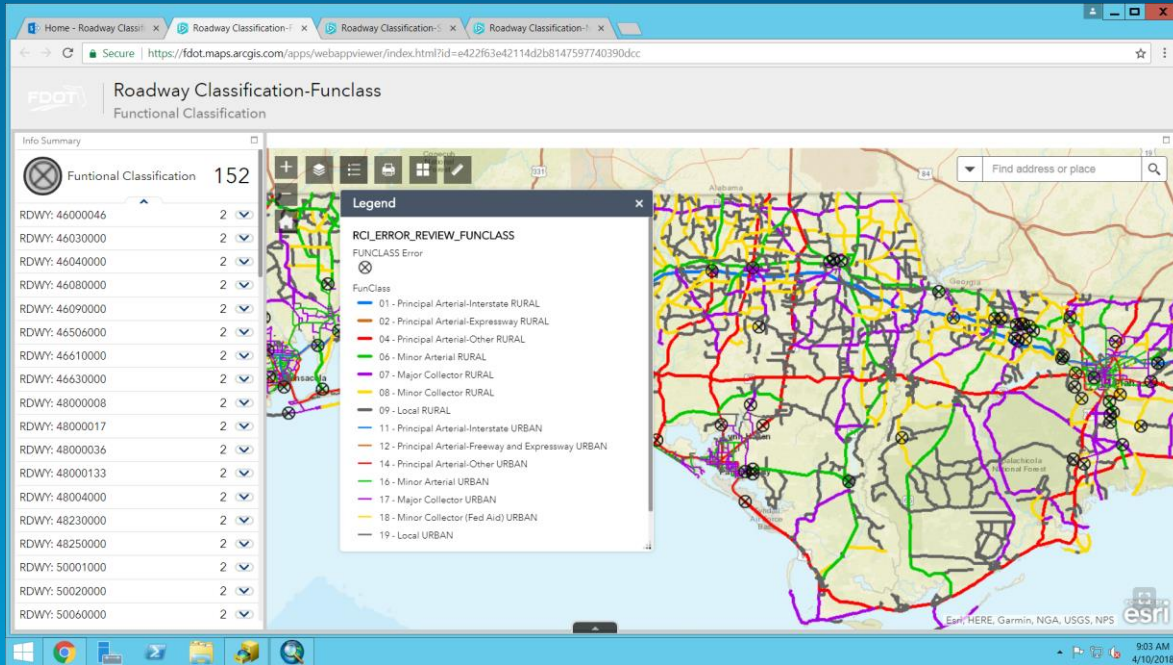


Consists of roadways important to the nation's economy, defense, and mobility.

## Validation of Realignment



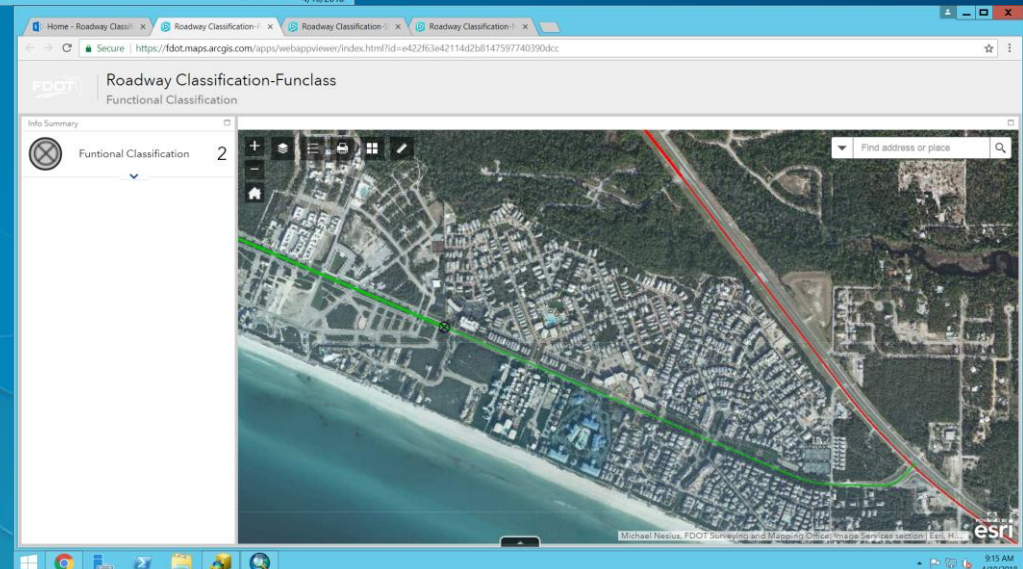
# Functional Classification



Functional Classification is the assignment of roadways into systems according to the **character of service** they provide in relation to the total roadway network.

Validation of Urban/Rural Class Boundary

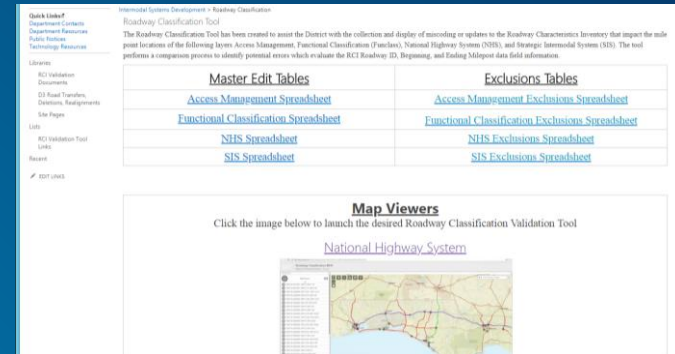
Urban Boundaries designate if a roadway segment is located in a **rural or urban area** and whether or not it is within a municipality.





# FDOT D3 – Technology

- Windows Server 2012 R12
- SharePoint
- ArcGIS Suite of Solutions
  - ArcGIS Desktop/Server 10.3.1
  - ArcSDE 10.3 SQL
  - SQL Server/Oracle RDBMS
  - Mobile Devices with Collector for ArcGIS
  - ArcGIS Online
    - Web Maps
    - Web Apps
    - Collector for ArcGIS
    - Survey123
    - Portal for ArcGIS
    - ArcGIS Open Data Hub



# Potential Future Enhancements

- **Dynamic ArcGIS Online Editor**
  - Roads and Highways Extension for ArcGIS Server
  - Live Linear Event editing to update, delete, insert record
  - Snapping enabled to intersections and boundary layers
  - Versioning and historical logging
  - Built to scale so other regions can utilize and standardize

# Lessoned Learned



## Project Considerations:

- Simplify
- User centric solutions
- Use existing data schema and data formats
- Controlled migrate to new system tools
- Define the technology advantages and disadvantages
- Define best data management practices and gaps in data inputs where biggest ROI can be gained
- Managing expectations and provide continuous outreach



# Presentation Summary



- Problem/Issue:
  - Potential data loss and need for GIS integration, system upgrades provides a good opportunity to advance technology
- Solution:
  - Easy access through data portals and SharePoint
  - Use existing data schema when required
  - Esri Open GIS data resource / Enterprise Esri GIS SDE
  - Use Extensions (if available) to save on customized development

# Thank You!

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- **ArcGIS Online web maps**  
<https://fdot.maps.arcgis.com/home/index.html>
- **Open Data**  
<https://gis-fdot.opendata.arcgis.com/>

