



LESSONS LEARNED MAINTAINING MULTIPLE LRM'S WITH ESRI ROADS AND HIGHWAYS

GIS-T 2019



Multiple LRMs

- **ALL HISTORIC DATA** was associated with the **LRSID_Routes**
 - **Control Sections** – generalized corridor model
 - **Route** – state highways model
- **NOW** LaDOTD has two linear referencing system networks
 - **LRSID_Routes** – Original expanded control section & local road linear referencing model
 - **StatewideRoutes** – New state highway & local road linear referencing model

2000 - SINGLE LINE STATE HIGHWAY CONTROL SECTIONS





2015 – Enter Roads & Highways

The screenshot shows the DOTD software interface for entering roads and highways. The interface is divided into three main sections: a top toolbar, a left sidebar, and a main map area.

Top Toolbar: Includes tabs for 'Map', 'Edit', and 'Review'. The 'Edit' tab is active, showing various editing tools like 'Select', 'Rectangle', 'Point Events', 'Line Events', and 'Edit Events'. There are also buttons for 'Realign Route', 'Realign Overlapping', and 'Create Route'.

Left Sidebar: Contains the 'Add Linear Events' panel. It has buttons for 'New Edit' and 'Next Edit'. The 'Network (LRM)' is set to 'MilePoint (miles)'. The 'Route ID' is '27558801'. The 'From' and 'To' sections are set to 'MilePoint' with measures of '0.01' and '0.2' miles respectively. The 'Dates' section shows 'Start Date: 9/23/2013' and 'End Date: ' with checkboxes for 'Use route start date' and 'Use route end date'. There are also checkboxes for 'Retire overlaps', 'Merge coincident events', and 'Prevent measures not on route'. A 'Next >' button is at the bottom of the sidebar.

Main Map Area: Displays a map of a road network with various roads and highways. The map shows a complex interchange with multiple lanes and directions. Labels on the map include '46th Street', '51st Road', '57th Street', '48th Street', 'IN 495', 'IN 495 SR EAST', 'IN 495 SR WEST', 'IN 49500N501M to', 'IN 495', '495N502', '100423', and '10042302'. There are also labels for 'Roman Catholic Church' and 'Duke's Mill Creek Expressway'.

Bottom Table: A table titled 'MilePoint' showing a list of records. The table has columns: OBJECTID, From Date, To Date, Route Name, Alternate Route Name, DOT_ID, COUNTY_ORDER, and ROUTE_ID.

OBJECTID	From Date	To Date	Route Name	Alternate Route Name	DOT_ID	COUNTY_ORDER	ROUTE_ID
1556	2012-07-05	<null>	IN 495 SR EAST		257357	01	25735701
2572	2012-07-05	<null>	Ramp 049500N501M to		275088	01	27508801
3992	2012-07-05	<null>	IN 495 SR WEST		257358	01	25735801
7548	2012-07-05	<null>	47TH ST		277607	01	27760701
14403	2012-07-05	<null>	IN495	495N502	100423	02	10042302

Page 1 of 1 | Record 1 to 9 | Total 9 Records

2017 – Multiple LRMs

- Examples of LaDOTD two linear referencing networks
 - StatewideRoutes
 - Highway Route and Street Name based
999_LA 956_1_1_010
019_CALDWELL ST_1_1_010
 - LRSID_Routes
 - Control Section and Street Name based
319-30-1-010
019900431902992010

Issues with Individually Supporting Multiple Networks

- **Duplication of effort**
 - Route edits must be repeated for each subsequent network simultaneously
- **Synchronization of Geometries**
 - There is a strong potential for the different networks to become unsynchronized
 - Well intentioned editors may be required to defer edits on secondary networks to meet deadlines
- **Quality Control**
 - Repeating the same edit with different constraints can lead to data quality issues

Roads & Highways Multiple LRM Management Cycle

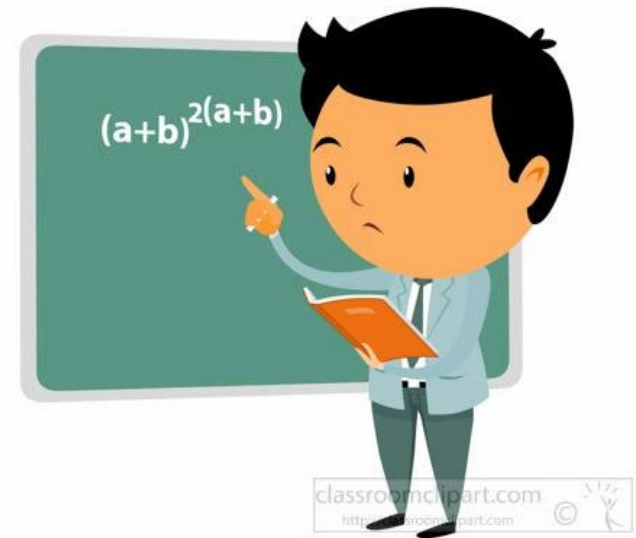
- **ALL DATA** was loaded into Roads & Highways associated with the “new” StatewideRoutes LRS Network
- StatewideRoutes is maintained as the only Route Network for Roads & Highways
- The LRSID_Routes is being maintained as a registered event in Roads and Highways called LRSID_Events
- A geo-processing tool has been set up to take the LRSID_Events and through a series of steps develop a polyline_m route feature named LRSID_Routes

Why is this so Critical?

- **ALL DATA** within LaDOTD **INCLUDING Construction, Maintenance, and Financial data** is still being maintained as it is associated with the **LRSID_Routes**
- **It is Mission Critical that we maintain both LRM's "in sync" so that data can be translated between the two easily and efficiently.**

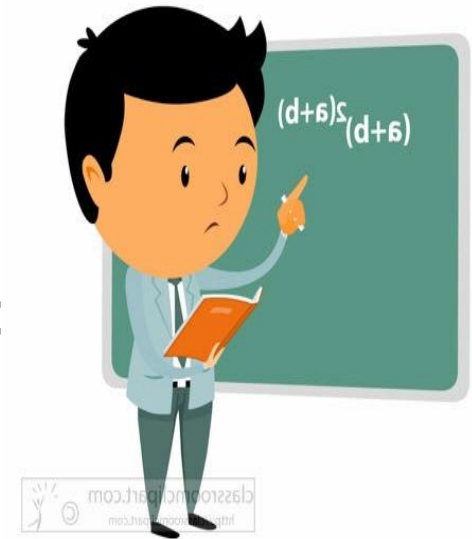
What Have We Experienced?

- The Concept is **PERFECT** in Theory but not so great in Reality!
- We determined Geo-Processing tools were not working due to the old saying “garbage in = garbage out”
- We conducted an Extensive Review of our “centerline” data and found:
 - Gaps, Overlaps, “Short Segments”, Duplicate Vertices, and Non-Monotonicities in the data



What Have We Done?

- We conducted this Extensive Review on: Centerlines, StatewideRoutes, LRSID_Events, and on LRSID_Routes
- We are reviewing the Geo-Processing tools to confirm the results at each step.
- Current results have over 500 “routes” that need to be flipped on the state system. No testing has been done on the non-state system yet.
- Hopefully next week we will find the solution to the questions about the geo-processing tools.



What about Future Edits?

1. Keep improving the geo-processing tool to create the routes
2. Update StatewideRoutes in accordance with Route editing rules
3. Update all registered events including the LRSID_Events and perform Quality Control checks
4. Run a batch process to export updated LRSID_Events and process them into LRSID_Routes
5. Load and replace the new and modified LRSID_Routes back into the target network

