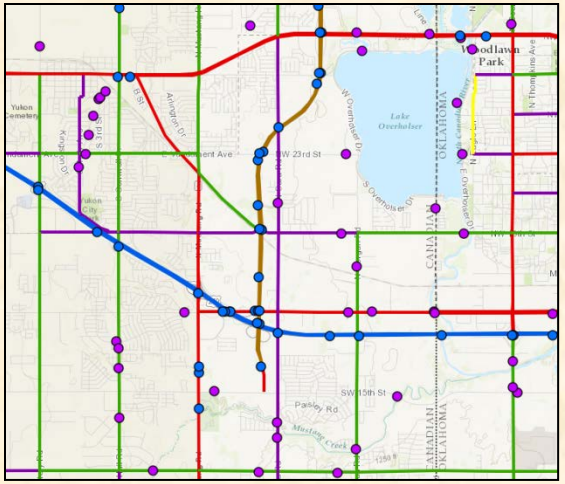
GIS & System Integration

Jeremy Planteen, GISP
GIS Branch Manager

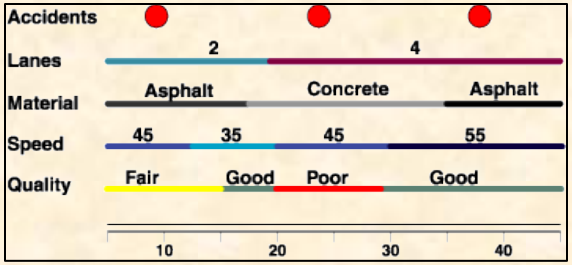
Overview

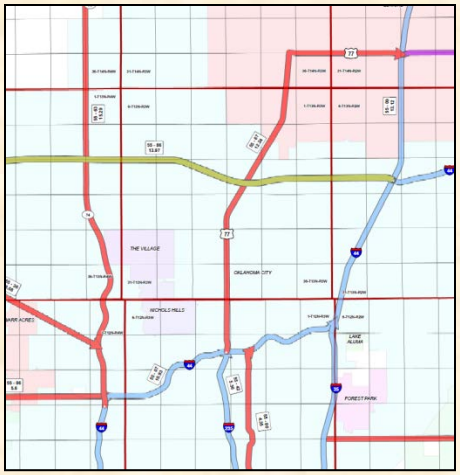
- ODOT maintains data on a wide variety of transportation data
- Bridge, billboards, roadway data, etc.
- Construction and maintenance info
- Project, asset, and financial data tied to a specific section of road



SUBSECTION	NLF_ID	NEW_NLF_ID	HPMS_SECTI	HPMS_SAMPL	LRS_ROUTE	LRS_SUBROU	CONGRESS_D	HOUSE_DIST	SENATE_DIS	MAINTENANC	HWWAY_COMM	COUNTY_NO
1010 00000000	1010 0000		1010 xx0000			0	0	0	0	8	8	10
1206 00000000	1206 0000		1206 xx0000			0	0	0	0	2	2	12
1036 00000404	1036 0000	0225	1036 xx0404	000000000225		0	0	0	0	7	7	10
1036 00000472	1036 0000	0226	1036 xx0472			0	0	0	0	7	7	10
1036 00000720	1036 0000	0228	1036 xx0720			0	0	0	0	7	7	10
1036 00000923	1036 0000	0230	1036 xx0923			0	0	0	0	7	7	10
1626 00000000	1626 0000		1626 xx0000			0	0	0	0	7	7	16
1626 00000012	1626 0000		1626 xx0012			0	0	0	0	7	7	16
1626 00000029	1626 0000		1626 xx0029			0	0	0	0	7	7	16
1626 00000533	1626 0000		1626 xx0533			0	0	0	0	7	7	16
7318U 00000000	7318U 0000		7302C xx0000			0	0	0	0	1	1	73
1916 00000841	1916 0000		1916 xx0841			0	0	0	0	8	8	19
1916 00000850	1916 0000		1916 xx0850			0	0	0	0	8	8	19
1916 00001847	1916 0000		1916 xx1850			0	0	0	0	8	8	19
1918 00000074	1918 0000		1918 xx0074			0	0	0	0	8	8	19
1918 00000153	1918 0000		1918 xx0153			0	0	0	0	8	8	19
2134 00000000	2134 0000		2134 xx0000			0	0	0	0	8	8	21
2136 00000828	2136 0000		2136 xx0828			0	0	0	0	8	8	21
2140 00000000	2140 0000		2140 xx0000			0	0	0	0	8	8	21
2140 00000025	2140 0000		2140 xx0025			0	0	0	0	8	8	21
1034 00000047	1034 0000		1034 xx0047			0	0	0	0	7	7	10
1035 00000555	1035 0000	0226	1035 xx0555			0	0	0	0	7	7	10
2402U 03970606	2402U 0397		2402U xx0504			0	0	0	0	4	4	24
1035 00000122	1035 0000	0223	1035 xx0122			0	0	0	0	7	7	10
2405 00000542	2405 0000		2405 xx0537			0	0	0	0	4	4	24
2405 00000642	2405 0000		2405 xx0637			0	0	0	0	4	4	24
2405 00001151	2405 0000		2405 xx1143			0	0	0	0	4	4	24
2544 00000000	2544 0000		2544 xx0000			0	0	0	0	3	3	25
2546 00000000	2546 0000	0500	2546 xx0000			0	0	0	0	7	3	25
2546 00000695	2546 0000	2561	2546 xx0695			0	0	0	0	3	3	25
2004 00001641	2004 0000	0413	2004 xx1604	000000003824		0	0	0	0	5	5	20
2006 00000100	2006 0000		2006 xx0100			0	0	0	0	5	5	20
2010 00000000	2010 0000		2010 xx0000			0	0	0	0	5	5	20
2006 00000261	2006 0000		2006 xx0259			0	0	0	0	5	5	20
2618 00000746	2618 0000		2618 xx0746			0	0	0	0	7	7	26
2618 00001506	2618 0000		2618 xx1506			0	0	0	0	7	7	26
1202 00000000	1202 0000		1202 xx0000			0	0	0	0	2	2	12

Managing Roadway Data

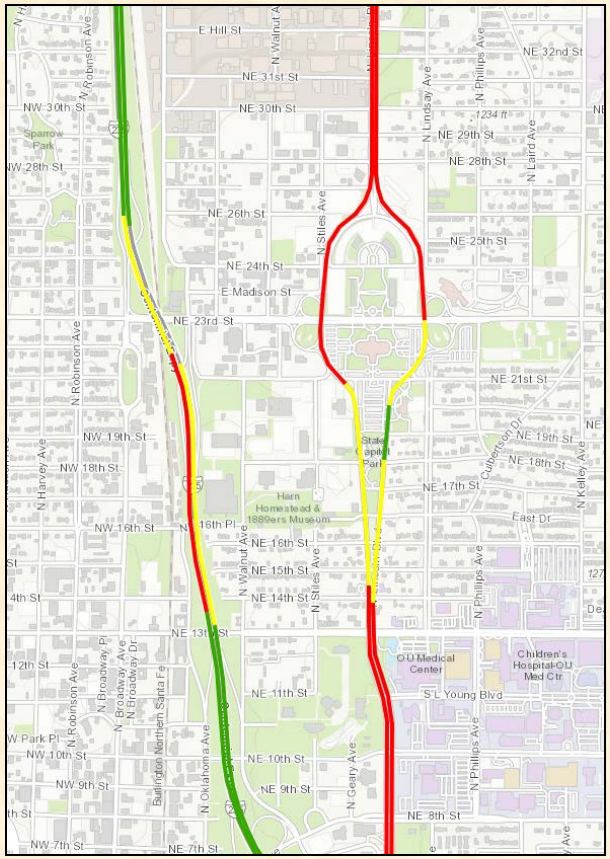




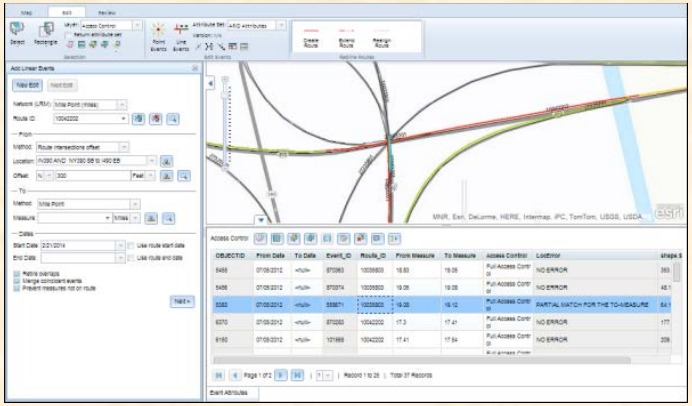
- Roadway data managed using an LRS (linear referencing system)
- Roadway network broken into arbitrary segments called ‘control sections’
- Allows us to specify milepoint(s) along a route where a given attribute or asset is
- Further broken into ‘subsections’ based on a change to one of a variety of attributes
- Can get problematic if alignments change
- Can be hard and inexact for non-Roadway Inventory people to work with

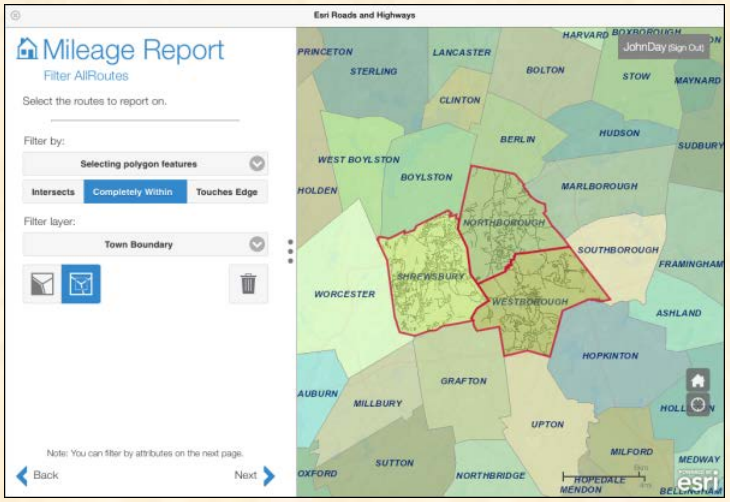
Managing Roadway Data

- Currently the data is ‘denormalized’
- All attributes are in one giant table
- Lots of redundancy
- High-resolution data, such as pavement condition, has to be smoothed and information lost in order to mesh with lower-resolution data like traffic, etc.



Managing Roadway Data

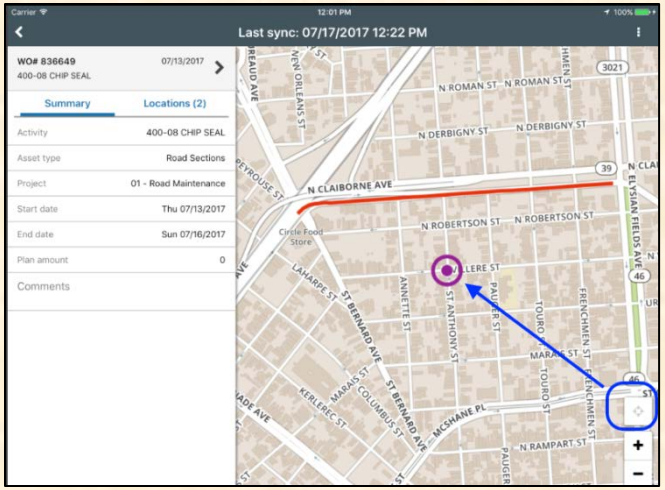




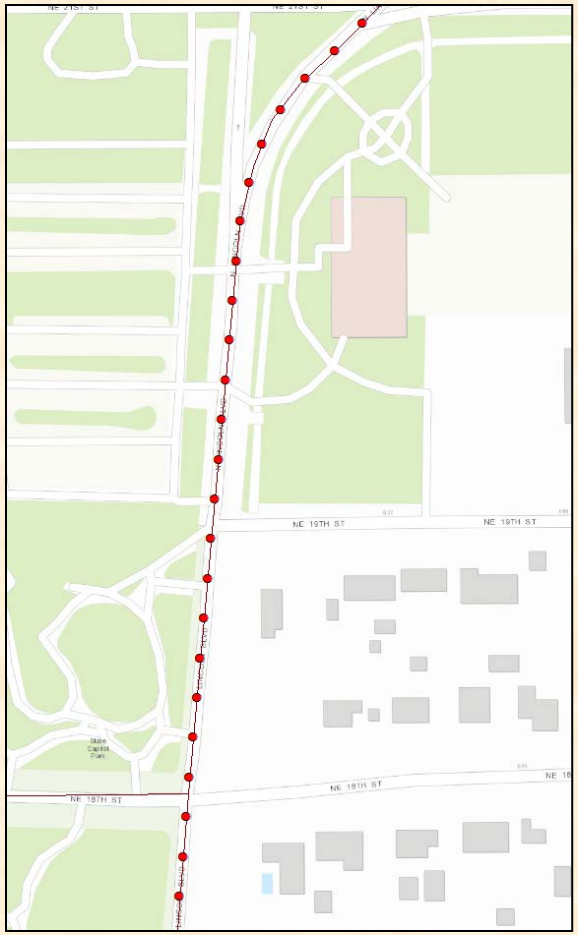
- New system breaks all attributes into separate datasets and the interface manages it as a single unit
- Allows much better snapshots of small road segments
- Has a web-based component to let data owners manage their own data
- Because of the way the data is now constructed, much easier to run automated spatial tools to find problem areas or sample sections

Bringing it Together

- Agile Assets
- Used by our maintenance group
- Current system has no map, locations manually translated from ‘real world’ (e.g. intersection of highway 20 and 5th St.) to our inventory numbers
- Error prone, difficult to manage
- New system integrates directly with Road Inventory data and has a map interface
- Dynamic generation of ODOT ‘Red Book’



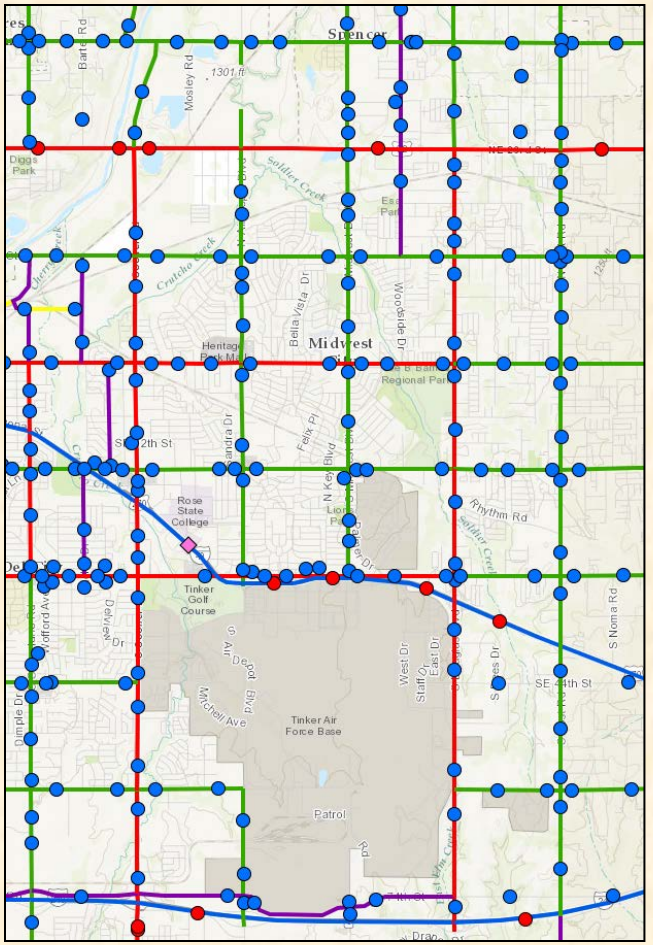
Bringing it Together



- Pavement
- Data collected at 100th of a mile increments
- Now can be left in original format, enabling better analysis
- Analysts can create their own, data-driven aggregations

Bringing it Together

- Traffic
- Currently data aggregated to our inventory sections, which cross intersections and aren't logical for traffic analysis
- New system allows traffic group to maintain their own aggregation system for better analysis



Conclusion

- Old system was difficult to interface with other systems
- New system fixes many of the data disconnects
- Results in much more flexible and intelligent datasets
- Roadway centerline becomes a true ‘base’ upon which assets and attributes are placed in a way that makes sense for each business system