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Introduction

- According to the National Highway Traffic Safety Administration, in 2012:
 - 45,637 fatal crashes across the United States
 - 27.3% were intersection, or intersection related
 - Out of all crashes, 47.6% were intersection, or intersection related
- Roadway data inventory databases for decision making
 - Intersection-specific data inventories
- Model Inventory of Roadway Elements (MIRE)
- Moving Ahead for Progress in the 21st Century Act (MAP-21)
- Importance of geo-located data
- Potential correlations with existing crash data

Objectives

- Use Geographic Information Systems (GIS) linear referencing methods and remote sensing
- Collect and record geo-referenced intersection characteristic data
- 3-leg and 4-leg non-signalized intersections along state routes in Alabama
- Develop:
 - a data collection methodology
 - an online GIS data collection tool
 - a level of effort for statewide implementation

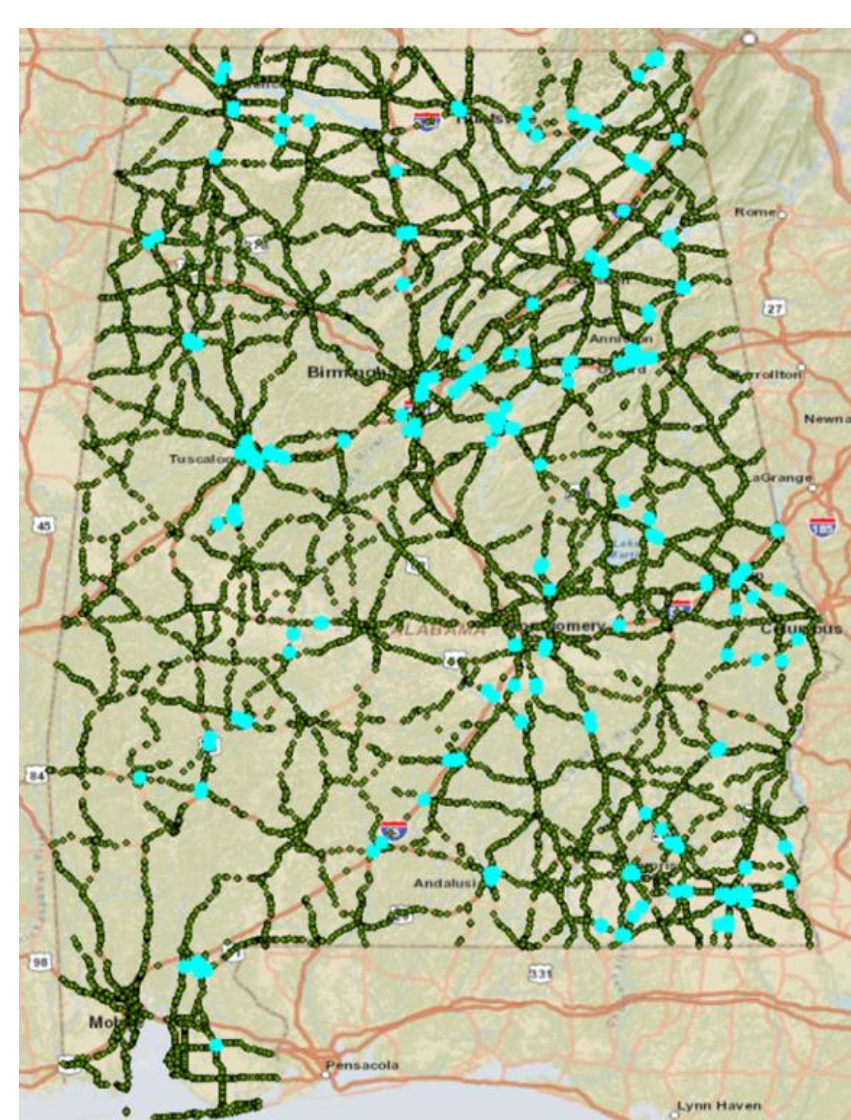
Project Scope

- Classify Non-Signalized Intersection Types - 9 total

Number Of Legs	Rural		Urban	
	Number of Lanes	Multi-lane	Number of Lanes	Multi-lane
3	2 lanes, 3 legs	Multi-lane, 3 legs	2 lanes, 3 legs	Multi-lane, 3 legs
4	2 lanes, 4 legs	Multi-lane, 4 legs	2 lanes, 4 legs	Multi-lane, 4 legs

Crossroad Ramp Terminals

- Select 270 Random Intersections
 - Perform a spatial analysis of municipalities
 - Covered 42 counties and 90 municipalities
- Develop Leg Numbering Convention
 - Standardized convention: Major road first, followed by the minor road North to South, West to East



Data Collection Methodology

- Parameter Selection
 - Based on ALDOT requests, Model Inventory of Roadway Elements, and safety relevance

Intersection Attributes Examples	Leg Attributes Examples	Ramp Terminal Attributes Examples
Intersection ID Node ID Intersection Category Traffic Control Type Lighting Milepost Latitude & Longitude County & City Terrain Skew Angle Offset & Offset Distance	Leg ID Link ID Leg Number Intersection ID Leg Type Leg Route Type Leg Speed Leg Width Number of Lanes Pavement Type Median Type & Width	Leg Traffic Control Type Number of Turn Lanes Turn Lane Widths Channelized Right Turn Right Turn Lane Movement Control Pedestrian Crossing Control One Way Turn Prohibitions Limited Sight Distance AADT

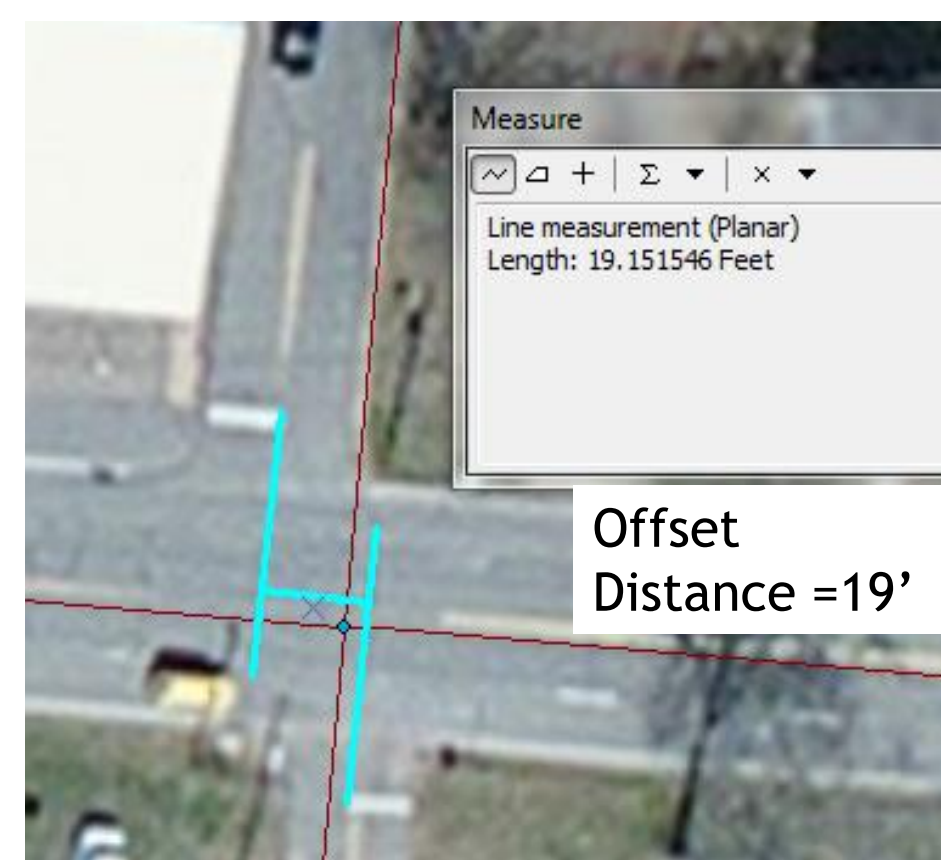
- Develop Individual Collection Methods - 4 methods
 - Prototyped collection methodology on Desktop with ArcMap 10 and Excel

Method:	Pull from Existing Datasets	Assigned by Visual Observation or Count	Measured Through Remote Sensing	Investigated Using Street View Imagery
Examples:	Intersection Milepost, County, City	Number of Legs, Median Type, Number of Turn Lanes	Skew Angle, Lane Widths	Speed Limits, Leg Traffic Control, Limited Sight Distance

Skew Angle



Offset & Distance

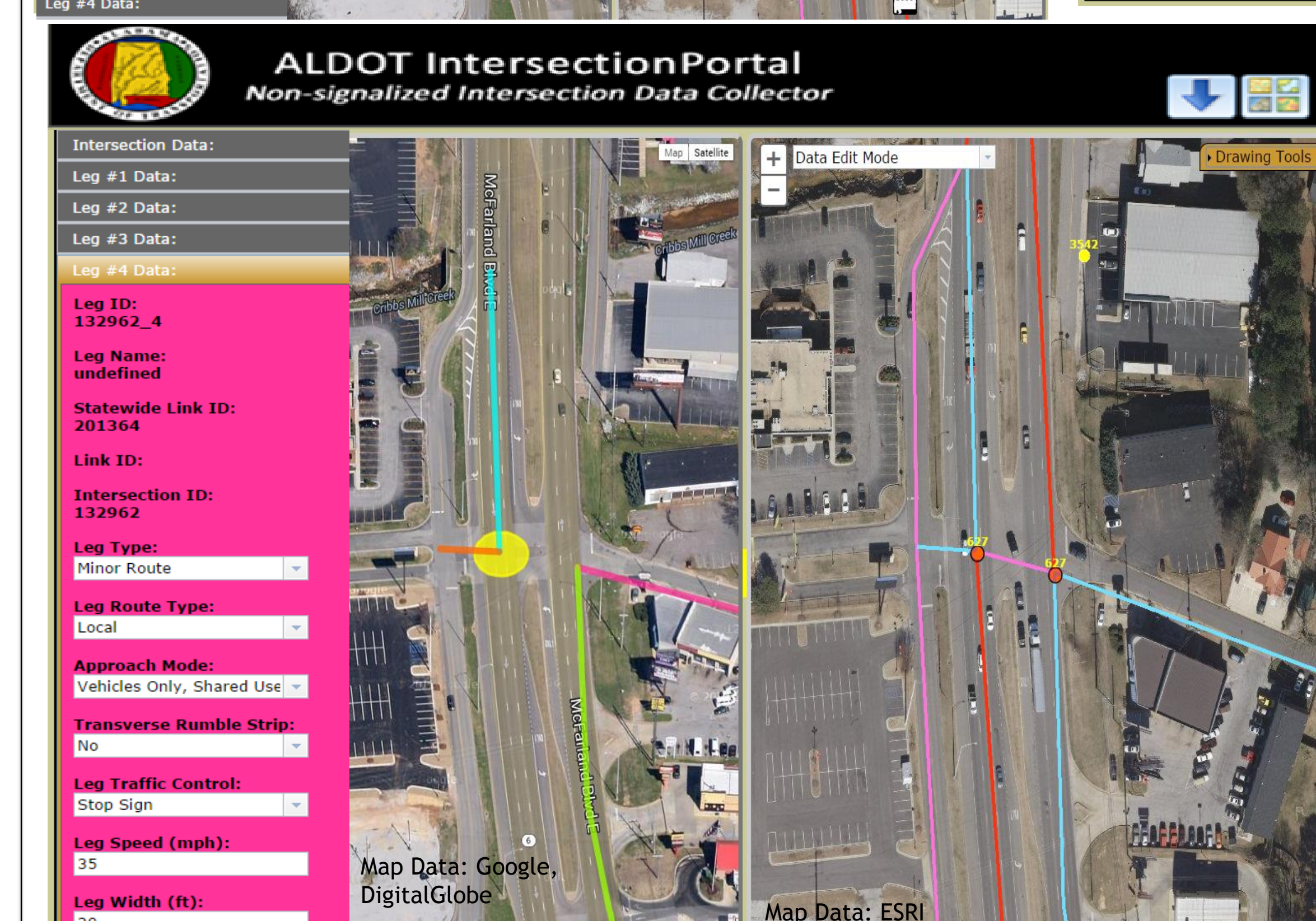
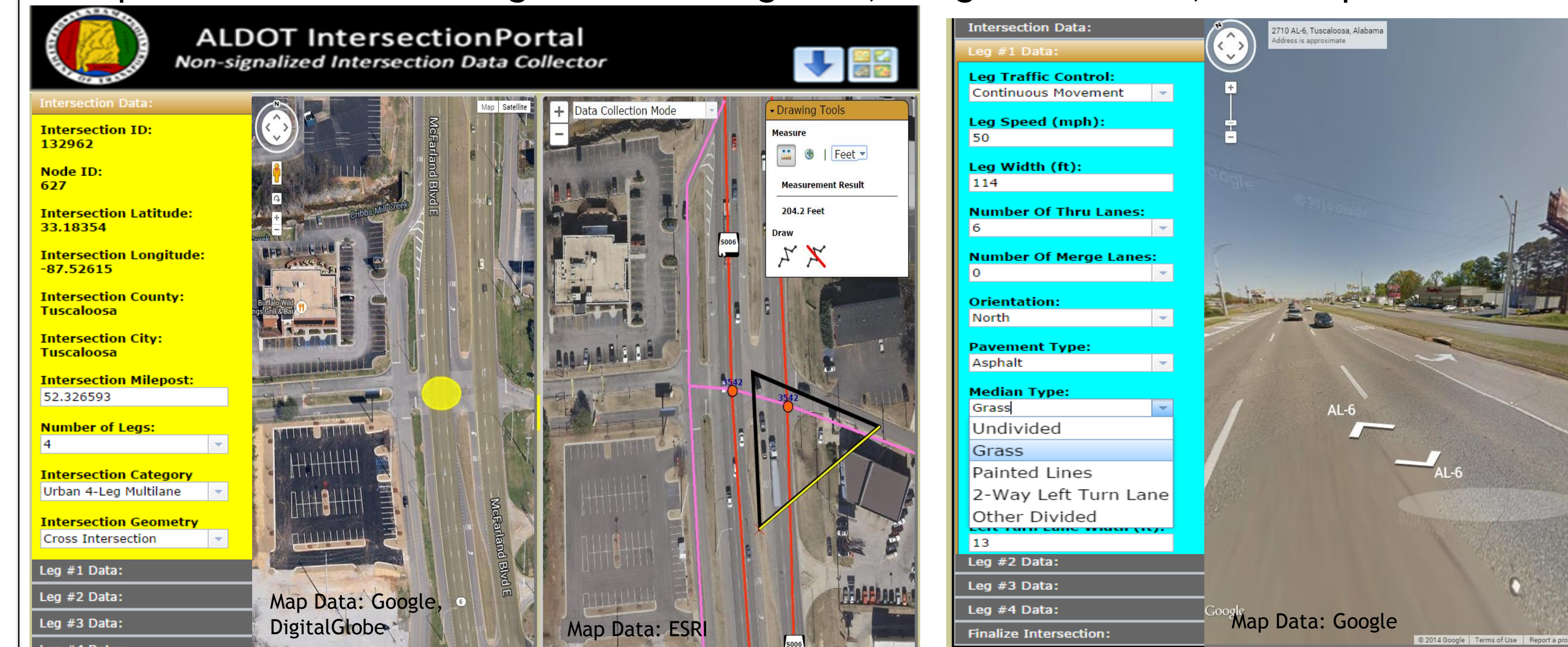


Limited Sight Distance



GIS Based Data Inventory Web Portal Cont.

Data Collection Mode uses color matching of data entry screens to intersection or leg elements. Examples below show drawing and measuring tools, Google StreetView, and drop down menus.



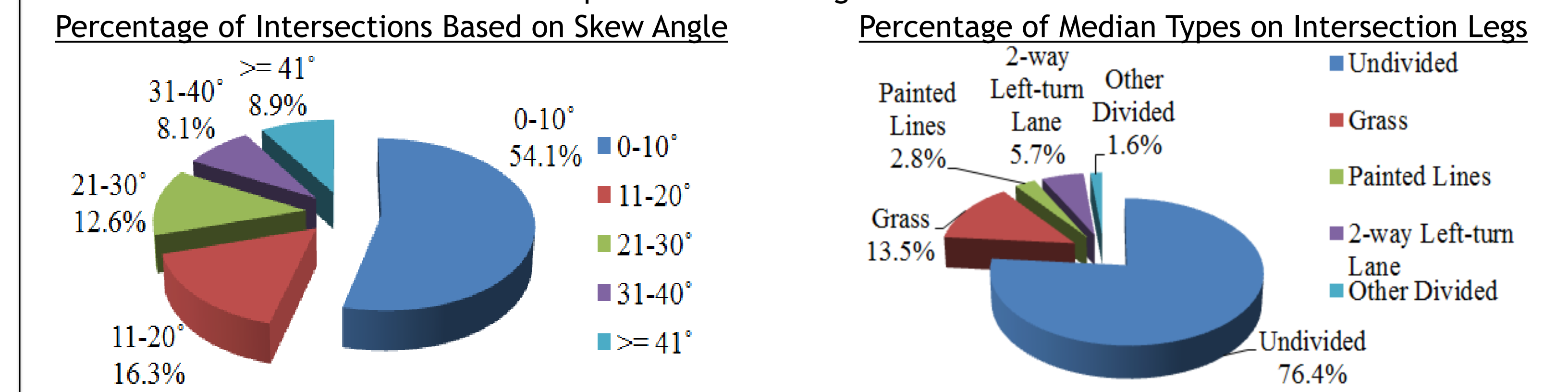
The intersection node (yellow) and all four leg elements (blue, green, orange, and pink) are color coded with the data entry screens.

Data Edit Mode allows editing capabilities for any elements associated with the previously catalogued intersection of interest.

Results

Data collection methodology and web portal: extensible to other states. Valuable intersection data inventory with a wide range of MIRE compliant data parameters. Statistics can be generated from the inventory database: (of the 270 intersections investigated)

17.4% have limited sight distance on at least one of the intersection legs
12.2% of the intersections have a pedestrian crossing control



Future Work

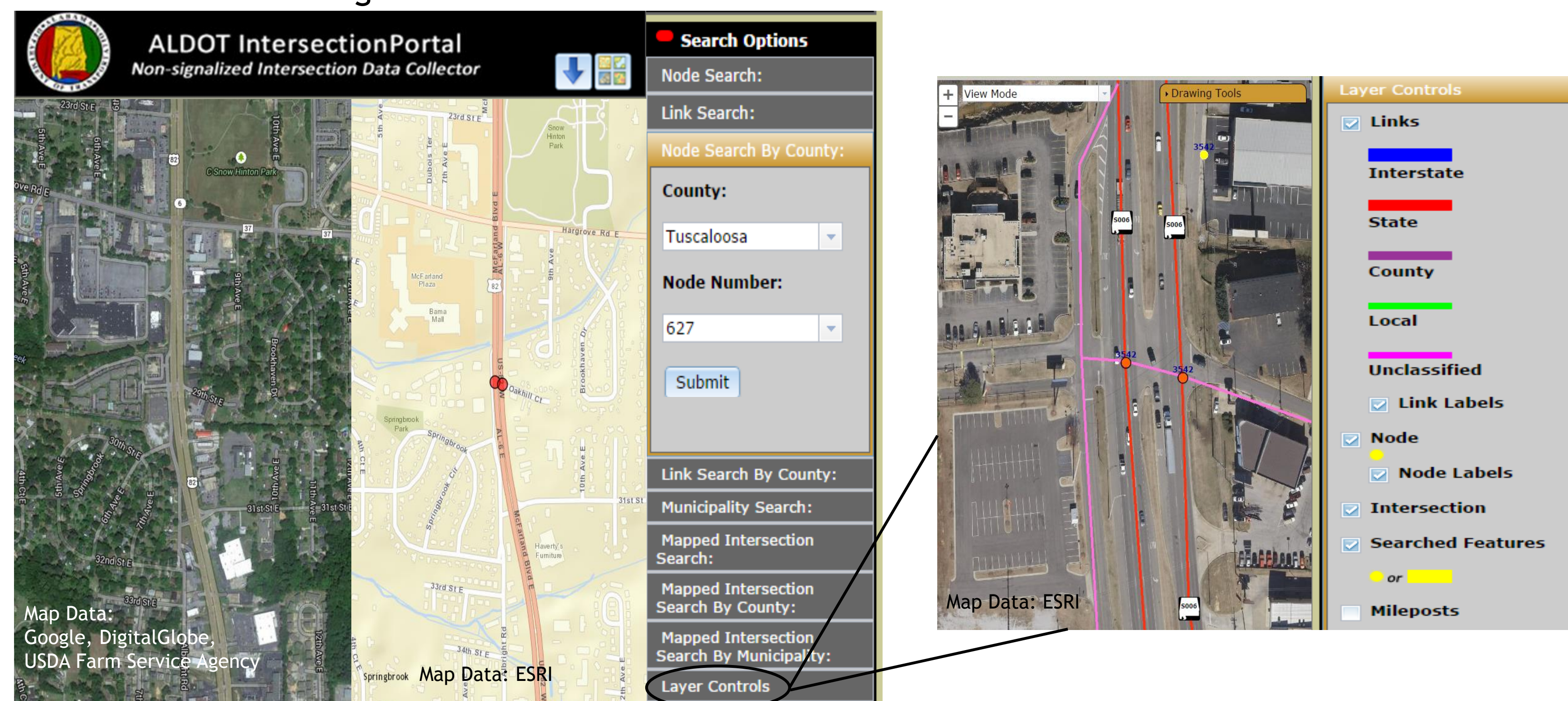
- Investigating statewide implementation
- Correlating intersection parameters with crash data to determine if characteristics led to higher crash frequencies

Acknowledgments

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GIS Based Data Inventory Web Portal

Deliverable: ALDOT Intersection Data Inventory Web Portal Data Collection Tool
-A dual view GIS tool with a "download to shapefile" button (upper right downward pointing arrow) and searching capabilities using Google Maps and ESRI basemap with the Alabama linear referencing methods and an automatic "zoom to element" feature in View Mode



-Additional imagery (using four square button in top right corner) and color coded layer control options on the ESRI basemap