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Crash Locating in the State of Alabama: Improving Safety on Rural Roads

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The Center for Advanced Public Safety (CAPS) at The University of Alabama is partnered with The Alabama Department of Transportation (ALDOT) in an effort to improve the quality of location data available for rural crashes on local roads. The state of Alabama has been recording crash location data since the mid 90's. A route-milepost linear referencing method is employed to locate crashes on state roads and Interstates, while a node-link-offset methodology is employed for local roads. CAPS and ALDOT have used the Critical Analysis Reporting Environment (CARE) software for more than six years to thematically map and analyze hotspots for state route crashes. The current partnership focuses on local road crashes, which when complete will enable complete statewide crash mapping and analysis.

Node-link maps are maintained centrally by ALDOT and provided in PDF format to officers. The node-link-offset methodology relies on officers using the PDF node-link maps to identify and hand enter the node-link information on electronic crash forms. The node-link maps do not provide a complete statewide linear referencing system nor are the nodes and links spatially aligned to a geographical coordinate system.

CAPS and ALDOT are in a partnership creating a complete geo-referenced and linear-referenced local road network. Initial work began in late 2009 geo-locating all nodes based on the node-link maps. A local road basemap was processed creating a node at every intersection and end point of every link. CAPS manually added node identification information to each point based on the node-link PDF maps. To date, 100% of the State Routes are geocoded while ~95% of local road nodes have been geocoded. A QA/QC procedure was employed to find potential errors. Results of the QA/QC process indicated that nodes identifiers are ~90% accurate. A set of procedures have been developed to correct the errors..

As node geocoding completes, a crash record data mining procedure is being employed using over 15 years of historical CARE data to add link information. Link crash data is recorded with node identifiers, a link identifier, and an offset. Knowing the node locations, a link can be produced and automatically populated with the link ID mined from the crash records.

CAPS, in partnership with the Alabama Department of Public Safety (DPS), created and maintains the State's electronic crash reporting environment (eCrash) used by law enforcement. The results of the node-link locating effort from ALDOT is utilized in eCrash to provide officers with nearest Nodes and Links roadside for verification at the crash scene. This process is being evaluated at this time. It is believed that the results are reducing officer risk at crash scene by reducing their time on the roadside while simultaneously improving the State's crash location consistency.

Through this partnership, Alabama will become one of the few states to have a complete statewide crash map containing both local road and state route crashes for both historic and current crashes.