7.2.3 A Re-engineered Roadway Inventory System Using GPS/GIS and Image Pattern Recognition Technologies

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The Georgia Department of Transportation (GDOT) collects and maintains an inventory of all public roads within the state. This inventory serves as the official record of the state, county, and city roadways. These roadway systems include over 118,000 centerline miles of roads in 159 counties and over 512 municipalities. The current inventory is composed of over 52 different data items with multiple codes and classes. A total of 14 field technicians in 7 offices throughout the state perform the inventory of these roadway systems on a 4-year collection cycle. Technicians record such items as number of lanes, lane width, surface type, shoulder type, posted speed limit, and medians. Other features, such as intersections, at-grade railroad crossings, weigh stations, and bridges, are also recorded. The inventory is the most comprehensive source for assessing the official mileage, condition, status, type, and use of all public roads in Georgia. Within GDOT, the inventory is an essential resource for reporting, analysis, and decision support and is the primary data source for completing the annual Highway Performance Monitoring System (HPMS) report for submission to the Federal Highway Administration (FHWA).

A research project to develop a GPS/GIS-based road inventory system to re-engineer the existing paper/pencil operation has been conducted by Georgia Tech since 2000. This paper presents the development of the system to re-engineer the current road inventory operations. This system incorporates various mature technologies, including Global Position System (GPS), Geographic Information System (GIS), Distance Measuring Instrument (DMI), and data management into the system. The re-engineered system has completed its Beta test and is currently in its final refinement before state-wide implementation. The proposed system could significantly improve the productivity and the data quality for field operations and expedite the analyzing and reporting processes. The benefits of using the re-engineered system for GDOT road inventory will be presented in this paper, and the associated challenges for developing such a system will be discussed. Finally, future automatic road inventory practices using GIS and videolog image pattern recognition technologies will also be discussed.