Athtapan Umpririt 2008: Geographic Information System and Pavement Condition Database. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Mr. Suphawut Malaikrisanachalee, Ph.D. 97 pages.

Thailand Department of Highways (TDOH) currently uses an automatic data collection vehicle to perform road condition survey. A vehicle equipped with multiple sensors including digital cameras, Global Positioning System (GPS) receiver, Distance Measurement Instrument (DMI), and gyroscope was used to collect rutting and International Roughness Index (IRI) data as well as pictures of road pavement and assets, GPS coordinates and traveling distances of the vehicle. This study aimed to design and develop a road condition database and Geographic Information System (GIS) application to support data query, analysis, and map generation of road condition in the central region of Thailand. Scope of this study includes: 1) database and system architecture design; 2) TDOH road network development; 3) automatic data manipulation for data exchange with external systems; and 4) GIS application development. The database and GIS application developed in this study can support both two-dimensional geographic locations and one-dimensional linearly referenced locations to provide operational flexibility and maintain logical consistency of the data.

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