Pavement Management system (PMS) is a planning tool that is able to evaluate pavement condition and deterioration due to the traffic and environmental effects, and contains a series of decision units to determine how and when to maintain and/or rehabilitate the pavement based on condition survey results and with optimized the budget requirement. Pavement Management System for the URI campus road network is being studied by me using the microcomputer software named MicroPaver (Version 6.1.2). The whole URI road network has been hierarchically divided into zones, branches, sections and sample units. This division is done on the bases their characteristics. And the then the pavement sections were categorized into the ranks viz Primary, Secondary and Tertiary. The section ranks represents the individual characteristics of pavement. Then the distress survey was done for each section on sample units of typically 25x100 sqft. There are 19 types of distresses in the pavement and they were recorded with their severity level and quantity. The MicroPaver then translate these distresses into the PCI (Pavement Condition Index). This PCI ranges from 0 to 100, 0 being failed and 100 being excellent condition of section. Using PCI values the various (M&R) maintenance and rehabilitation policies were applied to the pavement network, future forecasting /prediction of the individual section as well as whole network for 10 years from now was done and the budget analysis for current condition as well as for future condition was also done in this study. The application of GIS to the URI PMS is to be done and being studied. The GiS may help PMS in various ways like:

Data collecting and Processing: Using GIS and global position system the coordinate data and related distress data can be collected which is can become very tedious for a big network if done manually. This data with the help of color coded maps can be used for getting essential information about the section. These data will convert to point, line, polygon and pixel in order to create different features.

Data Integration- This spatial data can be integrated using DBMS and can be used to create inventories, PCI, traffic analysis, and maintenance history and for prediction modeling.

Incorporation of spatial data into the PMS analysis – Various spatial GIS tools allows creating and overlying data points and area data, with pavement network for modeling. The data can be modeled like the use of traffic information for Pavement Performance. This data can also be shared among the different users to do group projects on any road network system.

Output Representation: The user can generate using these data, various color coded maps for various attributes like pavement condition, maintenance and rehabilitation policies. Scheduling for any particular section, branch or whole network depending on need. GIS can be used for the computation of pavements statistics and be stored for future usage.

Since the data used in decision making is having the spatial component and almost flawless, Therefore, the use of spatial technologies like GIS is very reliable. The spatial technologies in this way can enhance the analysis of several transportation budget relate issues which requires various recourses and may improve the quality of decision- making process.

   In this research TxDOT compared the application of GIS technology for Pavement Management System (PMS) with their existing PMS. They studied their base maps that were supplied by USGS for their adequacy and compared with GIS implementation. The base maps were digitized from quad sheets using Intergraph Microstation CAD application. They used Differential GPS with WAAS for data collection. In order to test the accuracy the data was collected at various roadways and was compared with the orthophotographs available to the researchers. They also pointed out some recommendations and the limitations of using GIS using some receiver like Omnistar 3000L 12 and 3000 L 8 alone for automatic correction of data. Some of the recommendations are like need of the area office, division levels and executive levels having the experienced persons for data entry, integration, analysis and display of results and reporting according to the their power.


   This report includes firstly the over view of the Pavement Management System (PMS) and GIS and then provides the information for collecting, integration, analysis, handling and storing the various pavement data. The author introduces term GIS-T by merging GIS with Transportation Information System in order to enhance capability. They presented different data collection methodologies using automated equipments like van fitted with GPS, laser sensor, cameras etc. They provided some information of case studies for data collection and integration like Tennessee DOT, Illinois DOT, Florida DOT, Iowa DOT, Ohio DOT, and Arizona DOT for their PMS. The data obtained some of the DOT is eventually used in the U.S. Census Bureau’s roadway feature layer (TIGER) in order the other applications will contain the same source data as depicted by author. The author also pointed that with many advantages of GPS system for data acquisition, it also creates some challenges with the interoperability and compatibility with existing system.


   This synthesis includes the literature review of the GIS and its historical development and use of GIS in transit planning and operation. This synthesis includes no. of case studies and various resources for data collection and provides some lessons learned from various case studies. Study conducted for GIS in transit surveys conducted by Bridgewater State College (Bridgewater, Massachusetts) is presented in detail. This synthesis gives the idea
of systematic organization in three levels of GIS based business in transit system is discussed.


This is an excellent report providing the simple procedure of implementing GIS with Airport Pavement Management System (APMS) using both Network and Project level of PMS. Since airports are the main assets for consideration about regular maintenance and rehabilitation, an efficient GIS technology is required for them. This report includes the benefit and cost incurred in APMS. This report provides the idea of map generation by dividing the whole Airport Pavement Network into branches, section and sample units. It also provides the idea of database development, data analysis. And in the last the authors’ talks about the major challenges associated with the implementation of GIS like obtaining support, funding, managing etc.


This report is an important case study of implementation of GIS in PMS. In this research the distress data was used to find out the PCI (Pavement Condition Index) as well as IRI (International Roughness Index) of selected pavement network. The integration of PMS with GIS is shown in a good schematic diagram. PCI calculation was done as usual but the locations were recorded using GPS. IRI was done using a van equipped with Profilometer and GPS. The results were presented in ArcGIS for further analysis.


This circular is a peer exchange organized by TRB, Geographic Information and Application Committee and supported by RITA of USDOT. This is jointly prepared by 6 different state agencies. This circular provides the comparative idea of the implementation of the spatial information system among different agencies. Presentation is in the form of questionnaire with comprehensive explanation. Questions are based on the goals and the issues associated with implementation like GIS need, history, data quality issues, data collection issues, metadata, asset management needs. The descriptive answer explained by every agency is summaries in the end.

Other Publications/Reports:

