New Jersey Department of Transportation
Bureau of Research

Technical Brief

Drainage Identification Analysis and Mapping, Phase 2

This research studied, tested and rectified the compatibility issue related to the recent upgrades of NJDOT vendor inspection software, and uploaded all collected data to make Drainage Identification Analysis and Mapping System (DIAMS) current and fully functional. The research also assessed the current status of DIAMS at NJDOT to ensure that there is consistency with the installation and training.

Background

DIAMS is a computerized database that captures and stores relevant information associated with all aboveground and underground hydraulic structures owned by NJDOT. It retrieves relevant performance and financial information so that NJDOT can remain compliant with Phase II of the Government Accounting Standards Board Statement 34. It also retrieves all relevant environmental information to comply with the Clean Water Act and reporting requirements of NJDEP. DIAMS was initially developed based upon the NJDOT contractors using WinCAN7. However, some of the inspection contractors have already begun to utilize the newly released version, i.e., WinCAN8, which reportedly may not be entirely compatible with the DIAMS front-end MS™ Access database. Consequently, the ability of NJDOT personnel to upload data into the DIAMS was restricted to data produced by the earlier version. Hence, DIAMS was upgraded to be compatible with the current versions of NJDOT vendor pipeline inspection software packages.
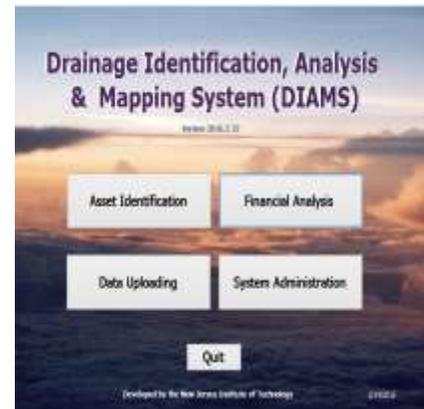
Research Objectives and Approach

There were several objectives of the Phase II research. The first objective was to upgrade DIAMS to rectify the identified compatibility issue related to the recent upgrades of NJDOT vendor software updates. The second objective involved making DIAMS compatible with both WinCAN7 and WinCAN8 and any other pipeline inspection software packages such as Granite XP, PipeLogix etc. This resolved compatibility allows for a seamless transition as contractors update their inspection software packages and access to archival data. The third objective was to ensure consistency with the installation of DIAMS and the training of NJDOT staff. The fourth objective was to upload all collected data and update the Current Inspection Data Inventory at NJDOT to make DIAMS current. The fifth objective was to address the inconsistencies in the milepost data that was a reoccurring problem throughout Phase 1 and 2 of DIAMS. The NJIT Research team checked and updated the current inventory of inspection data at NJDOT by uploading it into the upgraded DIAMS.

Findings

The DIAMS consists of three major computer software components: databases, user interfaces and functionality modules. DIAMS addresses the problems of archiving, accessing, analyzing and optimizing drainage infrastructure asset data for a highly efficient reporting system. The DIAMS capabilities include identifying drainage infrastructure, maintaining inspection history, mapping locations, predicting service life based on the current condition states, and assessing present asset value. In addition, the DIAMS contains several different repair, rehabilitation and replacement options to remedy the drainage infrastructure. The DIAMS can analyze asset information and determine decisions to inspect, rehabilitate, replace or do nothing at the project and network levels. In addition, the financial analysis module outputs data into categories including inspection, cleaning, repair, and condition states. Among the significant performance features of DIAMS is its proactive nature, which affords decision makers the means of conducting a comprehensive financial analysis to determine the optimal proactive schedule for the proper maintenance actions and to prioritize them accordingly.

DIAMS structure is laid out to simplify the process of using the system to allow efficient and productive sequential flow of the information performance system. It includes four modules: asset identification, vendor upload, financial analysis and system administration. The vendor upload module has various sub-nodes to ensure that the contractor-supplied field collection data uploaded to the database is unified and consistent. The asset identification module performs key attribution of the various physical components, and assigns functionality attributes of the huge inventory of a drainage infrastructure. The system administration module supports low-level data reviews and editing. The final module is the financial analysis module for maintenance and repair costs, in addition to design and extension of the drainage network. Financial analyses of assets are performed by comparing inspection and/or rehabilitation costs with associated risks of failure. Benefits of DIAMS include long-term savings that accrue by adopting optimized preventive maintenance strategies and facilitating compliance with governmental accounting standards bureau (GASB-34) and federal stormwater regulations.

For More Information Contact:

NJDOT Project Manager:	Ms. Stefanie Potapa
	New Jersey Department of Transportation
	P. O. Box 600; 1035 Parkway Avenue, Trenton, NJ 08625
Principal Investigator:	Dr. Jay N. Meegoda
	New Jersey Institute of Technology
	(973)-596-2464
	Meegoda@NJIT.edu
Research Center:	Research Foundation – City University of New York
	U.S.D.O.T. Region 2, University Transportation Research Center

A final report is available online at: http://www.state.nj.us/transportation/refdata/research/.
If you would like a copy of the full report, send an e-mail to: Research.Bureau@dot.nj.gov

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