



# RESEARCH PROJECT CAPSULE [15-1GT]

December 2015

TECHNOLOGY TRANSFER PROGRAM

## pLog Enterprise-Enterprise GIS-Based Geotechnical Data Management System Enhancements

### JUST THE FACTS:

**Start Date:**

July 31, 2015

**Duration:**

24 months

**End Date:**

August 1, 2017

**Funding:**

SPR: TT-Fed/TT-Reg

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### POINTS OF INTEREST:

Problem Addressed / Objective of  
Research / Methodology Used  
Implementation Potential

[WWW.LTRC.LSU.EDU](http://WWW.LTRC.LSU.EDU)

### PROBLEM

Recent efforts by the Louisiana Department of Transportation and Development (DOTD) and the Louisiana Transportation Research Center (LTRC) have developed a Geotechnical Information Database, with a Geographic Information System (GIS) interface. The application connects many DOTD data sources in a single application. For the first time, roughly 2,000 boring logs are available via the DOTD Intranet and GIS server technology.

LTRC Project 03-1GT, "Development of a Geotechnical Information Database," uploaded boring log and cone log PDF files to DOTD's Electronic Document Management System (Content Manager). A GIS page provides the location of the documents and access. Other GIS layers include bridge scour data, average daily traffic, surface geology, quadrangle maps, and soil survey maps ([www.ltrc.lsu.edu](http://www.ltrc.lsu.edu), Final Report #446).

LTRC Project 10-2GT, "Geotechnical Information Database – Phase 2," established a digital database for boring log data. This project expanded the utilization of the DOTD gINT database by developing specific and customized templates to import, analyze, and plot the data. This phase developed and implemented a digital system to improve and streamline the Department's collection and storage methods of existing and future geotechnical data. Other Phase 2 features included a web-based system to access deep boring data, and a joint server for the Pavement & Geotechnical Design and Materials Laboratory Sections (Sections 67 & 22, respectively) for the collection, testing, reporting of results, and to provide continuity between sections ([www.ltrc.lsu.edu](http://www.ltrc.lsu.edu), Final Report #498).

This third phase is necessary to address additional DOTD Pavement and Geotechnical needs and expand on work developed during previous phases. Digitizing the data will require a programming effort using the basic systems already in place. New modules will be added and provide the similar functionality (as the existing deep borings module) by allowing data to be added, reviewed, plotted, and added to the plans, via standardized templates accessible to districts and designers for analysis. There will likely be some linkage to ongoing work by the Materials Lab on Materials Manager/ Laboratory Information Management System (LIMS) in order to access the data without replication or duplication of data. Shallow subgrade information, DCP, pile load test data, driving records, ground penetrating radar (GPR), and other information will be added/linked to the database, and be made digitally available and accessible via GIS systems.

### OBJECTIVE

The objective of this research is to expand the development and functionality of the Geotechnical Database System to include the management of shallow boring data, DCP data, driven pile load test data, drilled shaft load test data, and borrow pit data. A secondary objective is to explore and develop the ability to share information via the internet in a secure manner.

## METHODOLOGY

After identifying key users and managers of DOTD geotechnical data, a questionnaire survey and a series of meetings will be used to specifically document the types of geotechnical data needed during day-to-day operations. Existing data will be reviewed and specific data requirements for the expanded Enterprise system will be identified and prioritized. Flowcharts that define the existing and recommended processes will be developed. A work plan will be created to serve as the scope for expanding the Enterprise system.

Database design will be initiated to provide an integrated system for future data management needs. Development of the expanded system will proceed in a phased manner to provide the opportunity for DOTD personnel to review and evaluate smaller components of the system.

Training is critical to ensure proper usage and adoption of the data management system. Initially, a demonstration of the system will be conducted to acquaint users with the system. A more detailed training session will be needed for key personnel that will be using the system on a day-to-day basis.

## IMPLEMENTATION POTENTIAL

Implementation of this work will have significant implications for the manner in which DOTD and its consultants/contractors plan for and undertake all phases of engineering projects in the future. Storage and access to this valuable, current and historical data in a GIS-based geotechnical management systems will benefit the geotechnical design section and the Department in both the short and long term.

