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INTRODUCTION

The Louisiana Department of Transportation and
Development (DOTD) has collected information
on scour around bridges for years; but compiling,
referencing, and maintaining the information has
long been a daunting task. Scour information, in
the form of fathometer logs, has been collected by
DOTD since the 1970's. A tremendous amount of
scour data for 120 bridges throughout Louisiana
already exists in traditional paper files. Manual
and visual analysis of the data by location and
survey section, hydraulics section, district offices,
and contract companies has consequently been
tedious work. The department was sorely in need
of a better method to access the data in an
efficient, modern way.

OBJECTIVE

The objectives of the project were to:
- Develop a database with manipulation
  capabilities such as data retrieval,
  visualization, and update;
- Input the existing scour data from DOTD
  files into the database

RESEARCH APPROACH

DOTD has long recognized the need for ready-to-
use computer software using modern database
technology to perform scour data management. In
an effort to address that need, LTRC researchers
have recently developed a new computer program
that compiles scour information in an easily
accessible, convenient database. The system
stores scour data in a Microsoft Access™
database program. A Visual BASIC™ computer
program is used as a front end to allow the user to
access the database. The bridge scour program
automates data retrieval, visualization, update,
additions, and deletions.

Scour data for a specific bridge can be searched
and retrieved using one or a combination of
indices such as bridge number, state project
number, recall number, district code, parish code,
river, and route. The database software tabulates
the basic bridge information, pier data, and
hydrographic data of the cross-sections and
longitudinal sections at a specific location and
time.

The program also provides survey plans of the
bridges. The plans show locations of bridges,
pier distances, base line stations of the
hydrographic readings, and the locations of the
monitored cross-sections along the river. In
addition to the survey information, the program
displays soil-boring data near the pier locations.
Plots of the cross-sections, longitudinal sections,
and contours are displayed for the selected
locations and survey dates. Contour plots can
also be exported for use in other graphical
programs. The history of scour at a specific
location is plotted in hydrographic-time plots.

The scour software allows for new scour data to be added to the existing bridge data and for the entry of data on new bridges. Bridge and scour data can also be modified or deleted from the database. These operations are accessible to DOTD personnel with an authorized password.

As part of the new software package, researchers have also developed a manual that explains in detail the capabilities and applications of the database management software developed at LTRC for storage and retrieval of scour data on the Louisiana highway bridges.

CONCLUSIONS

The new program provided a categorical, systematic approach for accessing existing information and inputting new information for each of the scour monitored bridges. The new software significantly reduced the time spent on data retrieval and bridge scour analysis. It eliminated the need for maintaining large paper copy files and improved the efficiency of reproducing and distributing the results to the districts. By providing easy access of data through networking, district maintenance engineers can easily monitor changing conditions and provide timely assessments of scour critical bridges.

IMPLEMENTATION

LTRC researcher with the help of LSU student workers entered the historical data for the existing 120 monitored bridges. This task was completed in October 2000.

Location and survey personnel are responsible for maintaining and updating the data as new information is obtained. Hydraulic personnel are responsible for the input of new bridges and bridge information as well as for the overall distribution of the program and control of password access codes. Password access is only required for data entry and file manipulation. Open access is allowed for data retrieval, plotting, and exporting.

DOTD personnel having access to the design server are able to utilize the attributes of the program. This server is presently accessible throughout the headquarters office and the majority of the district main offices.

Future implementation of the program will include networking the database for users access through the DOTD intranet. Further plans will focus on networking the database into the DOTD GIS strategy and allowing a more global access to the program throughout DOTD.