PROJECT OVERVIEW REPORT

1. Center Identifying Number
   176 RU6598

2. Project Title
   Transportation Management System Data Validation and Data Quality Assessment

3. Principal Investigator
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4. NJDOT Principal
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5. Project Objective
   This is an academic-industry collaborative project aiming at providing an independent and quantitative assessment of the data validity, quality, and integrity for the existing eight NJDOT Transportation Management Systems.

6. Project Abstract
   In accordance to the scope of work issued by the New Jersey Department of Transportation, the proposed work will focus on data validity, quality and integrity. Data validity ensures that data are collected and stored into the corresponding database according to appropriate planning documents and SOPs. Data quality ensures that data are properly maintained, aggregated, summarized and utilized by higher level decision support functions. Data integrity ensures that data values are not improperly modified from the time that they are collected to the time that they are utilized by decision support functions.

   We will assume that each of the above management systems has already been operationally qualified, that is, given a valid input data set, these systems would generate a valid output data set. Furthermore, we will assume that the qualitative and quantitative nature of the data fields utilized by these management systems have already been tested and
validated. In other words, we will assume that the data types and their range of values in the various databases have been defined properly according to already approved functional and design specifications.

7. Task Descriptions

For each Transportation Management System

1. Safety Management System
2. Traffic Management System
3. Drainage Management System
4. Pavement Management System
5. Congestion Management System
6. Highway Maintenance Management System
7. Bridge Management System
8. SLD Management System

The following tasks will be performed:
Task 1 – Review of planning and engineering documents/system Specification /SOPs, preparation of questionnaires and background information for interviews. This task may require one or more meetings with the NJDOT project manager and his/her technical staff.
Task 2 – Interview with selected NJDOT engineers and staff, and also users identified by the NJDOT and program management team. The NJDOT project manager will coordinate the scheduling and contact information for the interviews.
Task 3 – Development of qualitative and quantitative test plans for data validity, data quality and data integrity. For quantitative tests, statistical hypotheses will be formulated and statistical tests will be developed. The test plans will take into account inputs, outputs, controls and mechanisms for each function in the overall process. They will also include data hand off from one function to another. These test plans will be reviewed and approved by the program technical committee. Following the approval by the technical committee, the test plans will be submitted to the advisory committee for review and final approval.
Task 4 – Development of test data to support test plans (developed in Task 3).
Task 5 – Test plan execution. The execution of these tasks will be contingent on the final approval of the test plans by the advisory committee.
Task 6 – Development and execution of regression tests whenever necessary, as determined by the technical committee.
Task 7- Recommendations and establishment of guidelines and QA/QC standards and best practices in data collection and data maintenance.
8. Milestones/Dates
   2. Traffic Management System    12/2005
   3. Drainage Management System    01/2006
   5. Congestion Management System    03/2006
   7. Bridge Management System    05/2006
   8. SLD Management System    06/2006

9. Yearly and Total Budget
   Year One & Total
   NJDOT Sponsorship        (11/01/2005-12/31/2006)  $241,200

10. Student Involvement
    One (1) Part-time Graduate Student Researcher
    Eight (8) Undergraduate Student Researchers

11. Relationship to Other Research Projects
    • Safety RU4474 Seed Project Transportation Safety Resource
    • 144 RU9063 Transportation Safety Professional Development Clearinghouse (TSPDC)

12. Technology Transfer Activities
    None to date

13. Potential Benefits of the Project
    To provide decision making support for the various DOT management and planning functions. To ensure that data is collected and stored according to appropriate planning documents and SOPs.

14. TRB Keywords
    Traffic Management, Drainage, Pavement Management, Management Engineering

15. TRB Code Words
    Dcmth=, Jdbh, Fmmmp=, Ttkn=