

## Research Project Description Form

Project Number: (Assigned By RTI)

Project Title: WVDOH Web-Accessible Crash Database Deployment

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Project Objective:

The specific objectives of this project are:

- Design and deploy an SQL database for archiving West Virginia crash records that are collected and stored in ReportBeam as a Microsoft Access database
- Develop a procedure for automatically importing data from ReportBeam into the SQL database
- Develop a secure web interface for approved users to access static crash data reports, as well as the ability to create, run, and save for future reuse custom queries and reports
- Provide training on how to use the web interface to the crash database
- Evaluate the electronic crash report business rules implemented by ReportBeam
- Develop a quality control procedure for evaluating the crash location information collected by officers in the field, as well as the post-processing completed by a 3rd party in ReportBeam.
- Provide a strategy for long-term maintenance and operation of the crash database

## Abstract:

Electronic crash reports that are completed by state, county, and local police officers in West Virginia are transmitted electronically to a central system provided by VS Visual Statement Inc. The crash reports can be accessed using their ReportBeam collision reporting system. Due to the limitations of the ReportBeam system for analyzing the crash data for safety applications, the West Virginia Division of Highways downloads the crash records from ReportBeam and utilizes Microsoft Access to generate various reports and conduct analysis. As the amount of crash records in the database continue to increase, the ability of Microsoft Access to manage this data decreases. In order to maximize the value and accessibility of the available crash data, the WVDOH has initiated this project to deploy an online relational SQL database.

## Task Descriptions:

1. Kickoff Meeting with Project Team and WVDOH
  - Subtasks:
    - a. Finalize tasks, schedule, and milestones
    - b. Define mechanisms for crash data exchange
    - c. Explain system for tracking database development and revisions
2. Existing Access Database Analysis
  - Subtasks
    - a. Determine Table, Field Relationship, Primary Keys of Access database
    - b. Document all associated information
    - c. Analyze reports, codes, and queries to ensure complete understanding of how information is accessed.
    - d. Review and document all access types, data and processes used by existing clients accessing crash data.
    - e. Discuss and document all potential access means not already identified as existing clients to ensure compliance in developmental/conversion phase.
3. Develop SQL Database and Import Existing Access Database
  - Subtasks
    - a. Create SQL Database
    - b. Copy data from Access database preserving original integrity of data
    - c. Import current tables and data structure into SQL

- d. Verify data integrity against documented tables and structure from Task 2.
  - e. Identify primary keys, setup foreign key and associated relationships.
  - f. Determine queries and create stored procedures based on documented customer requirements.
  - g. Create insert queries based on customer requirements.
  - h. Automate import of data
4. Develop Permissions and Access to SQL Database
    - Subtasks
      - a. Develop and deploy strategy for access to crash data
      - b. Setup local users using domain credentials for access control
      - c. Setup local table within database for offsite/external users
      - d. Developing security protocols for user access levels
5. Develop Portal (User Interface) to SQL Database
    - Subtasks
      - a. Define and design forms for data input based on client needs
      - b. Define and design forms for query results
      - c. Define and design forms for user management
      - d. Define and design forms for reports based on user requirements
6. Develop Web Access to SQL Database
    - Subtasks
      - a. Develop web interface for input of data based on needs
      - b. Develop web interface for data queries based on needs
      - c. Deploy strategy and test
7. Quality Control and Assurance of Crash Data
    - Subtasks
      - a. Evaluate business rules implemented in electronic crash form. The initial evaluation will be conducted in a sample crash form and verified by examining historical records for any discrepancies discovered.
      - b. Evaluate crash location information in the database (initially collected by law enforcement and subsequent coding by a 3<sup>rd</sup> party) and recommend a procedure/strategy for ongoing evaluation of this data. A sample of crash reports will be analyzed with a GIS network that includes roadway and milepost information, as well as business locations. If feasible, this

procedure will be automated to require minimal intervention from WVDOH to complete the evaluation.

## 8. Training and Database Maintenance

- Subtasks
  - a. Develop training materials for different user types
  - b. Define a strategy for long-term database hosting and maintenance
  - c. Deliver training as needed throughout the duration of this project

Milestones, Dates, Schedule:

Assuming a start date of September 1, 2011, the schedule in Table 1 is proposed for this project. The WVDOH will be given access to the SQL database upon completion of Task 3, which is scheduled to be completed November 18, 2011.

Task	Start	End	1	2	3	4	5	6	7	8	9	10	11	12
1	9/1/11	9/9/11												
2	9/1/11	9/30/11												
3	10/3/11	11/18/11												
4	10/31/11	1/13/12												
5	12/5/11	2/17/12												
6	2/20/12	3/9/12												
7	1/2/12	4/30/12												
8	4/2/12	8/31/12												

Yearly and Total Budget: Total: \$328,847.50

Student Involvement: None

Relationship to Other Research Projects:

Many research projects within the ITS program area rely on the analysis of crash data. This project will facilitate that analysis allowing those projects to be completed.

Technology Transfer Activities:

User training will be provided for the online database within this project.

Potential Benefits of this Project:

Crash data available to select users online will allow for increased utilization of crash data in West Virginia for safety analysis and project selection.

TRB Keywords:

Crash data analysis, database, GIS, safety