# Exploring Rapid Repair Methods for Embankment Slope Failure (Project No. 5-6957-01)

OVERVIEW OF INNOVATION

Recurring slope failures are common in Texas due to the extreme weather and soil conditions. The Texas Department of Transportation (TxDOT) annually spends millions of dollars to repair embankment slope failures along the state roads and highways. The proactive maintenance of highway embankments and cut slopes can significantly reduce the cost of emergency stabilization and improve highway operations. The slope repair and maintenance management system (SRMMS) helps TxDOT personnel to identify the critical slopes and facilitate proactive slope maintenance decisions.

The geospatial data on soil properties, precipitation, historical slope failures, slope geometry, and landcover in the TxDOT Paris district slopes were collected and integrated into a geodatabase using a geotechnical model to assess the stability of the slopes along the highway corridors. Based on the minimum duration of rainfall required to trigger the slope instabilities, color-coded slope failure susceptibility maps were prepared: Highly critical (< 3 days), Critical (3-10 days), Moderately critical (10-45 days), and Non-critical (>45 days). A multi-criteria decision support system was developed to recommend a list of methods for maintenance and repair of critical slope segments. A map-based interface was developed to visualize the collected geospatial data entities and color-coded slope failure susceptibility maps.
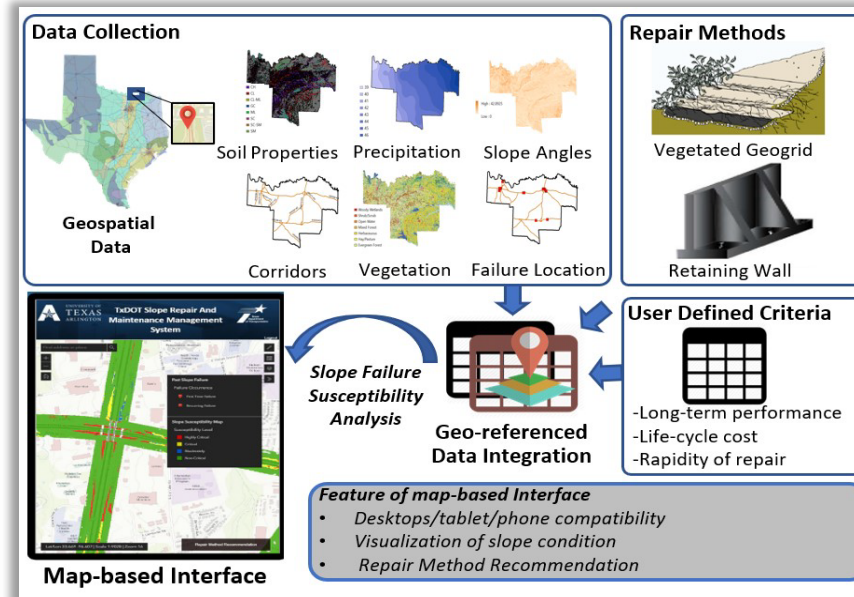
Source: TxDOT Research Project 5-6957-01, UTA

BENEFITS

- This system helps to minimize the slope failures and enhance safety, customer satisfaction, infrastructure conditions and service life, environmental sustainability, and transportation system reliability.

- Assuming an annual budget of $28.5 million for slope repairs in Texas, the implementation of the findings of this research project is expected to lead to a cost savings of $15.6 million per year.

- The validation results showed that slope failure susceptibility maps could effectively identify the slope segments highly susceptible to slope failures.

FIND OUT MORE . . .

- Texas DOT Research Library http://library.ctr.utexas.edu/Presto/home/home.aspx

- Texas STIC Website http://txstic.org/

- Texas DOT Video https://youtu.be/EDkA6bDPI2M

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