USING GREEN INFRASTRUCTURE
TO IMPROVE COASTAL TRANSPORTATION RESILIENCE

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Technical Review
I. Background
  Purpose
  Study Area
  History

II. Methods
  Level 1 Assessment
  Level 2 Assessment
  Level 3 Assessment

III. Next Steps
  Alternatives
  Evaluation
  Design & Costing

Navigation

Green Infrastructure for Coastal Resilience – What Can Transportation Agencies Offer?
Henderson Point Pilot

1. Background
I. Background

Study Purpose

Resilience

NEED: To improve the resilience of bridge approaches and approach spans by specifically addressing a substantial vulnerability: bridge elements in the dynamic storm surge and wave hazard zone.

PURPOSE: To demonstrate how green infrastructure can be appropriately used to mitigate storm surge and wave damage to coastal bridge abutments and approach spans under future sea level rise scenarios.
I. Background

Study Area

Henderson Point

US HWY 90

Henderson Point

SE of St. Louis Bay
I. Background

Study Area

Henderson Point

Bridge Built 2000

Simply Supported Bridge

Feature Intersection with CSX RR and a small tributary
I. Background
II. Methods
II. Methods

Forensic Analysis

*Katrina Failure Investigation*

Unique Failure

Protected but Displaced

Flow/Drag Related?

Definitely not Waves Alone
II. Methods

Level 1 Assessment

Existing Data

1% Flood Data

Wave Height Estimates

Flow Velocity Estimates

Sea Level Rise Scenario

HEC-25 Vol 2 – Highways in the Coastal Environment: Assessing Extreme Events
II. Methods

Level 2 Assessment

Scenario Modeling

ADCIRC+SWAN

Katrina Hindcast

Katrina + SLR Scenario
II. Methods

Level 3 Assessment

Probabilistic Data

CHS Database

AEP Data

Risk & Reliability
Henderson Point Pilot

III. Next Steps
III. Next Steps

Analysis & Design

Green Infrastructure

Develop Alternatives
• Gray (conventional)
• Green
• Hybrid Approach
III. Next Steps

Analysis & Design

Green Infrastructure

Benefits:
• Level of Protection
• Vulnerability Reduction
• Potential Life-Cycle Costs

Evaluate Alternatives
• Feasibility
• Cost

Conceptual Plans
III. Next Steps

Analysis & Design

Potential Project Constraints:

1) one side of the roadway borders 4f property;
2) established tidal marsh under portions of the bridge;
3) ROW acquisition could be costly and will need to be minimized.
Key Points

- Improve Resilience
- ID Gray & Green Alternatives
- Vulnerability (HEC-25 v2) Sensitivity Analysis
- Use of Green Infrastructure
- Actionable, Realistic Plans

Pilot Goals

Analysis Methods

Pilot Outcomes

Green Infrastructure for Coastal Resilience – What Can Transportation Agencies Offer?