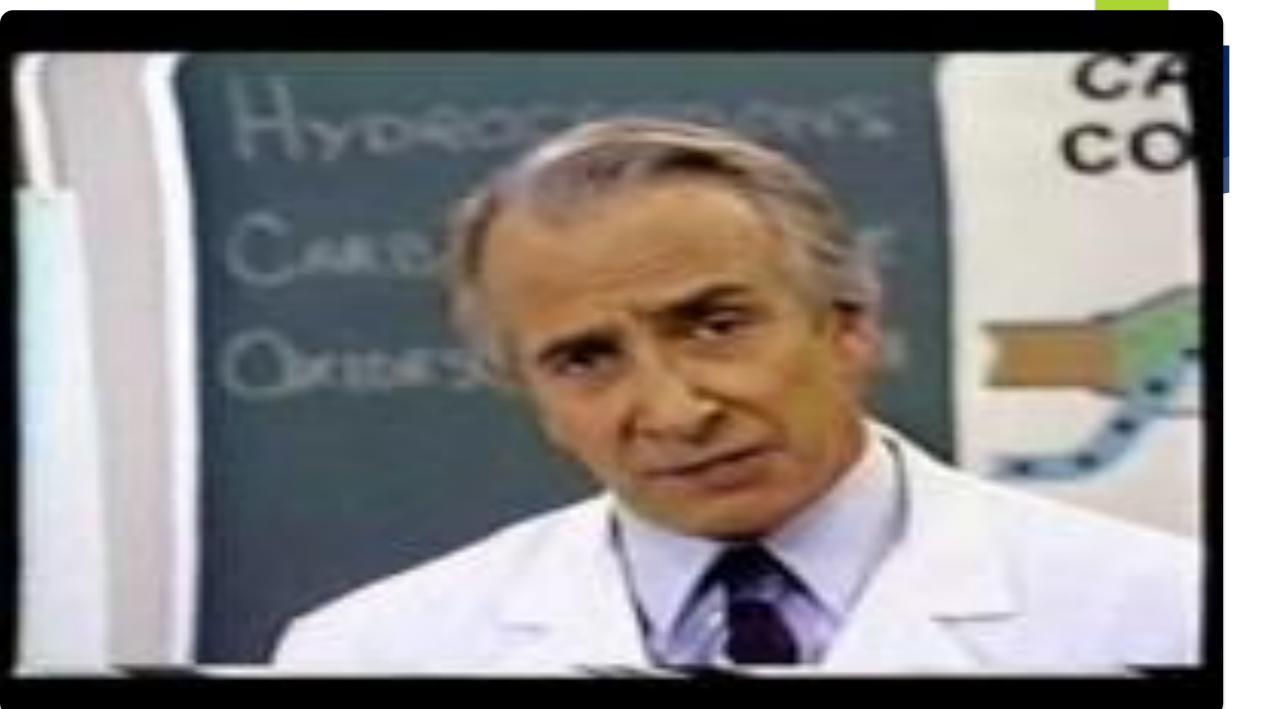
Dam! Where Did that Come From?

When Earthen Dams Become Transportation Infrastructure





Question: Do Departments of Transportation Own Dams?

Answer: Typically, No.

Question: Do DOT Owned Roads Cross Privately Owned Dams?

Answer: Typically, Yes.

Question: Could This Present a Problem for DOT's?

Answer: Typically, I Never Really Thought About It...

Transitioning
From Earthen
Dams to
Transportation
Infrastructure

SOUTH CAROLINA 2015 A CASE STUDY

Dam Diagram

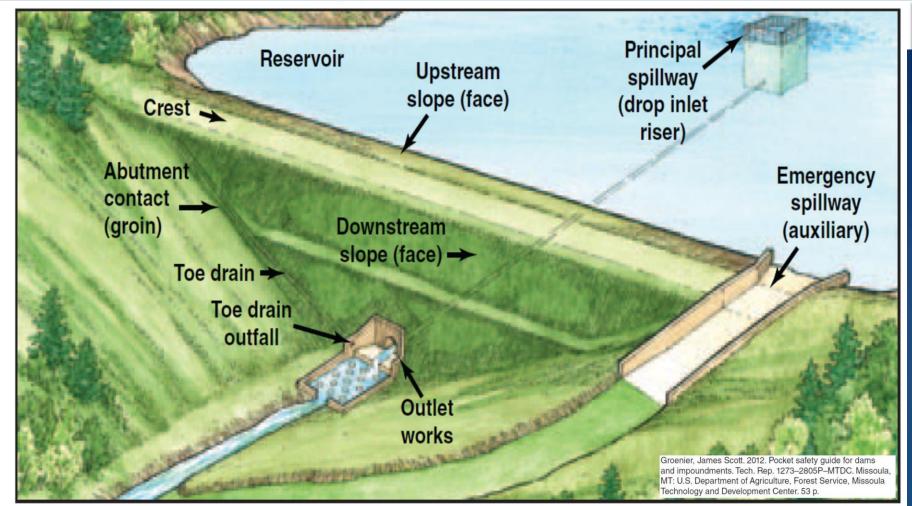
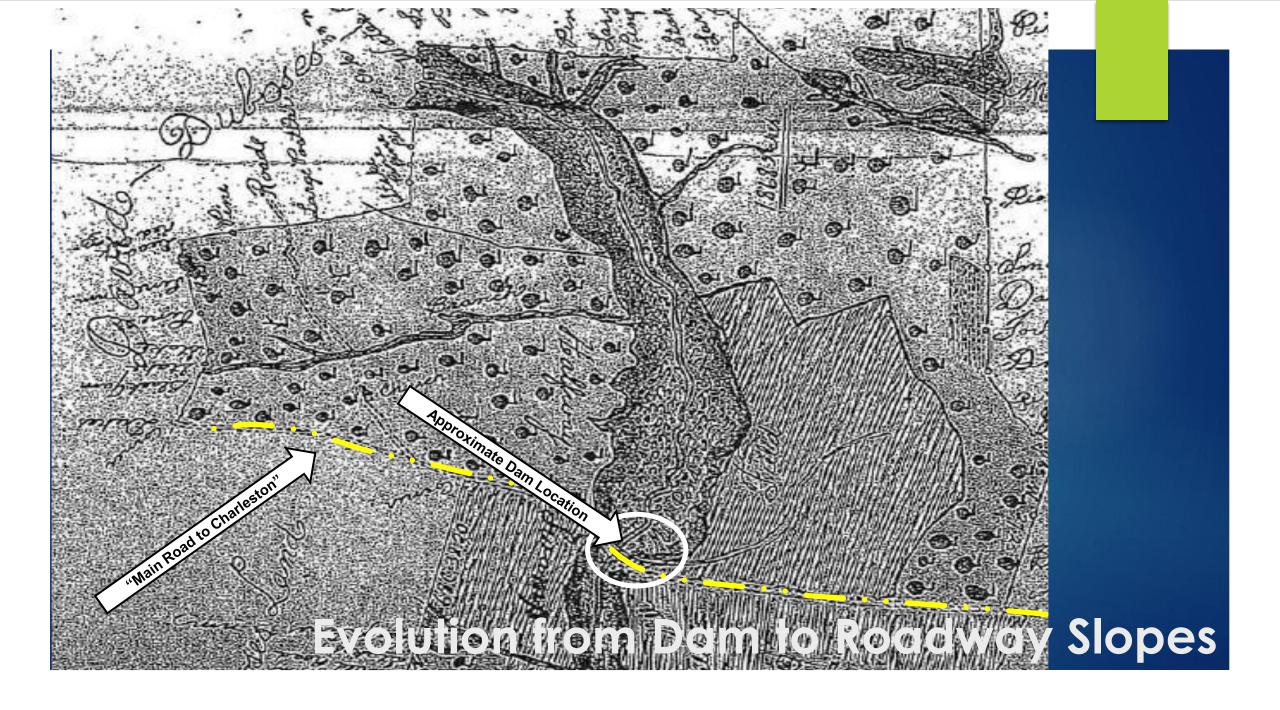


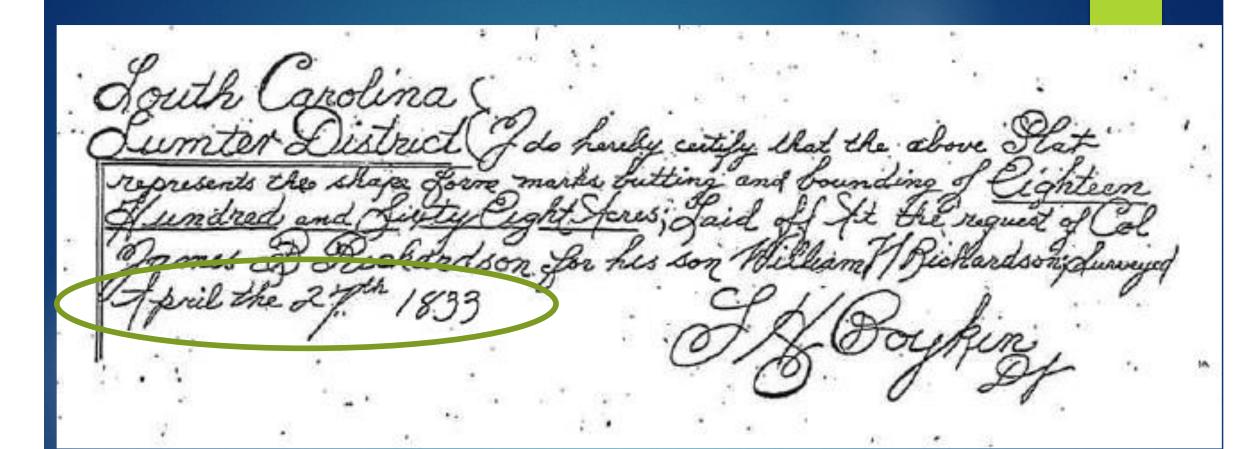
Figure 1—Typical dam diagram showing common terms.

Dam Nomenclature

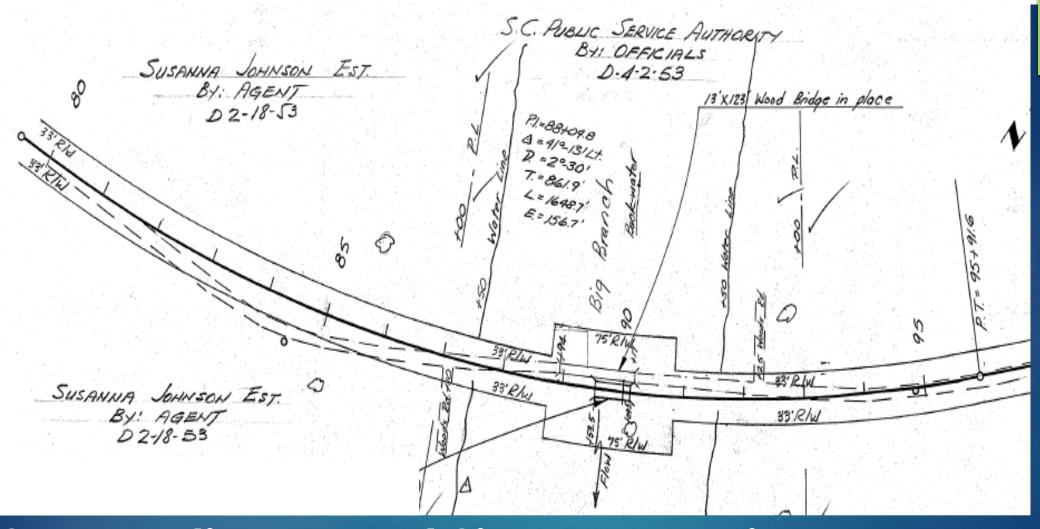
Safe, Stable Earthen Embankment Dams

- > Sound Design
- > Fully Functional Spillway System
- > Well Vegetated Slopes WITH NO TREES
 - Well-Developed and Implemented Maintenance Programs





The Beginning of Dams for Transportation



Surrounding Parcel Size Decreasing

Transportation Use Increasing—Dam Untouched



Complacency

DAM IS THERE,
ROAD IS THERE,
NO VISIBLE ISSUES,
NO PROBLEM
MAINTAIN AS NEEDED

Accepted Maintenance Procedures (DOT ROW)



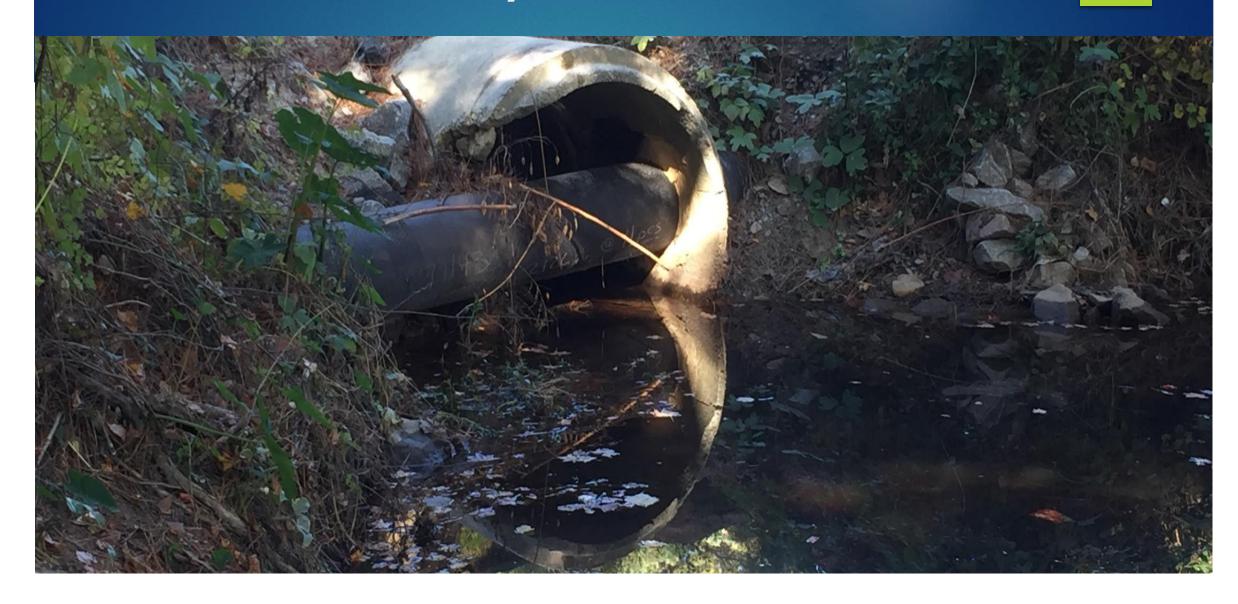
Lack of Maintenance (Dam Owner)



Modifications

UNFORESEEN, UNAPPROVED, UNSANCTIONED,

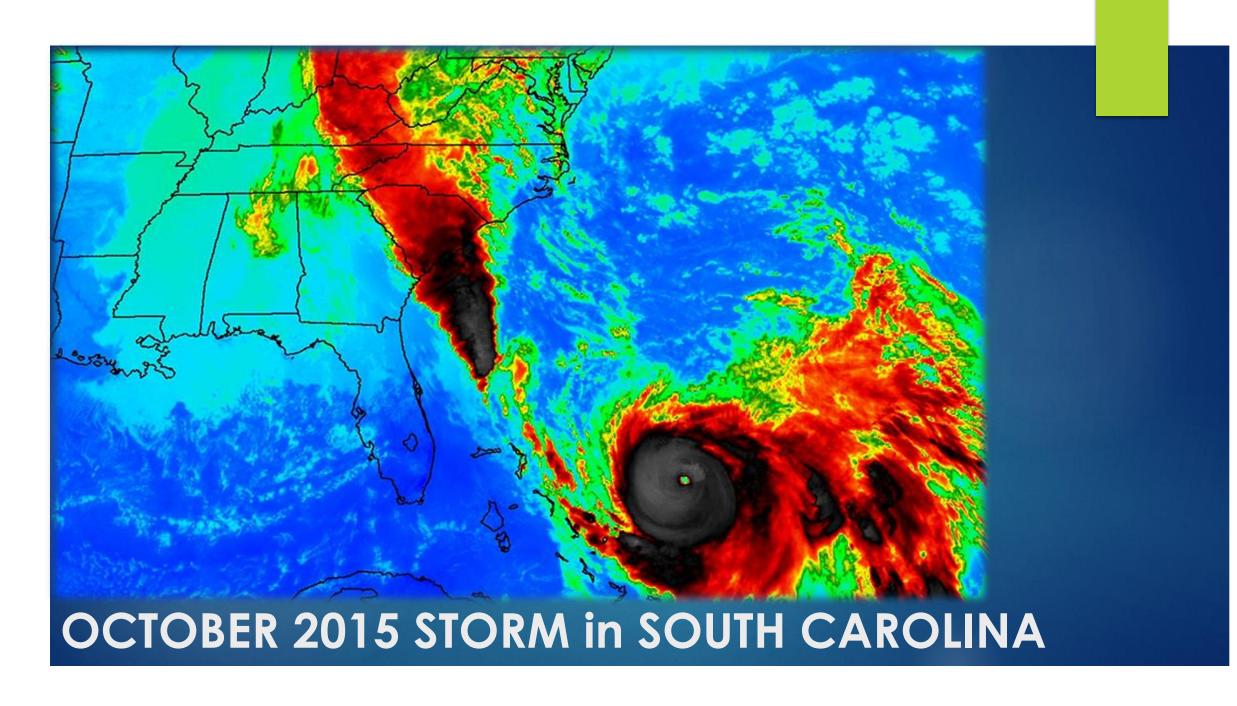
Poor Utility Installations

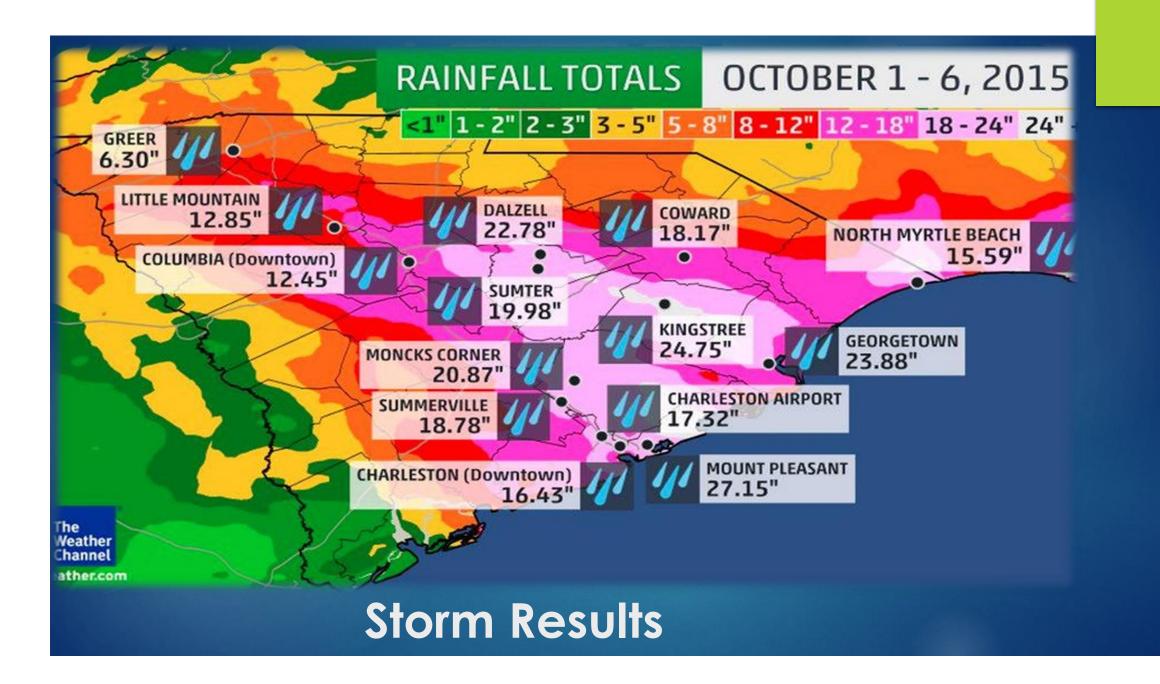




JUDGEMENT DAY

NATURAL DISASTERS



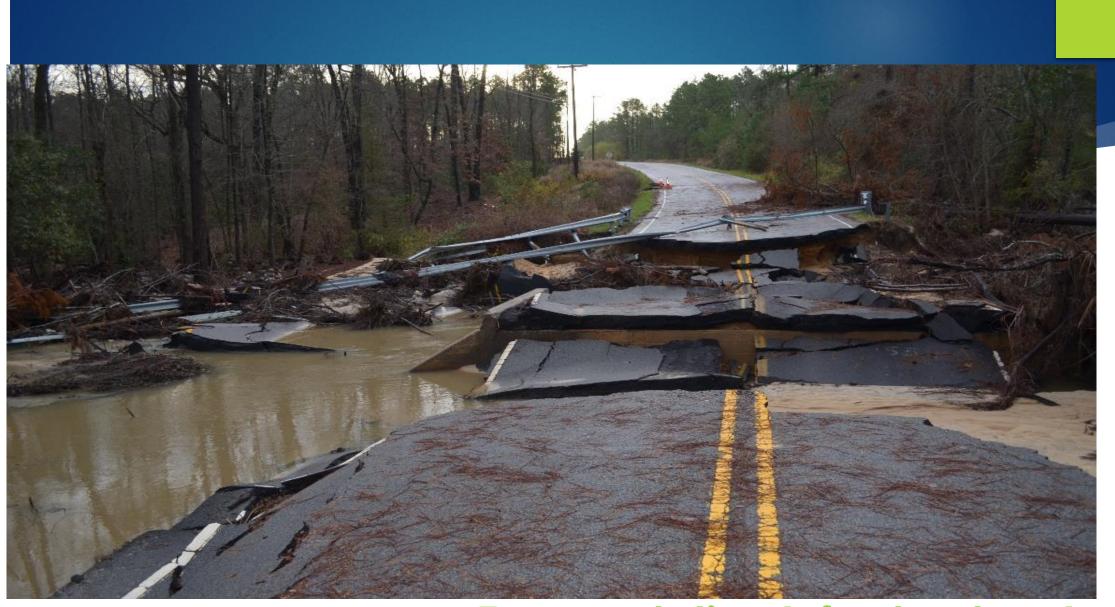


REVEALING ALL

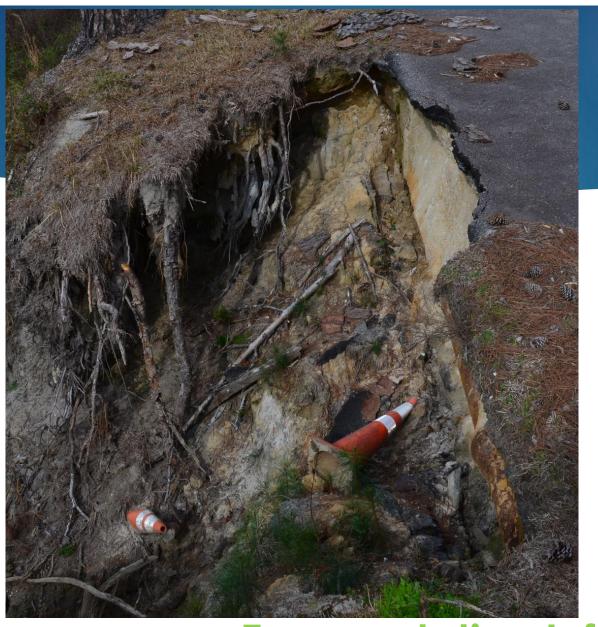
THE AFTERMATH

Storm Statistics

- > 19 deaths
- > 75 dams failed
- > ~250 dams significantly damaged
- > 541 SCDOT roads and bridge closures
- Columbia Canal Breach
- Damage estimates ~\$2 Billion



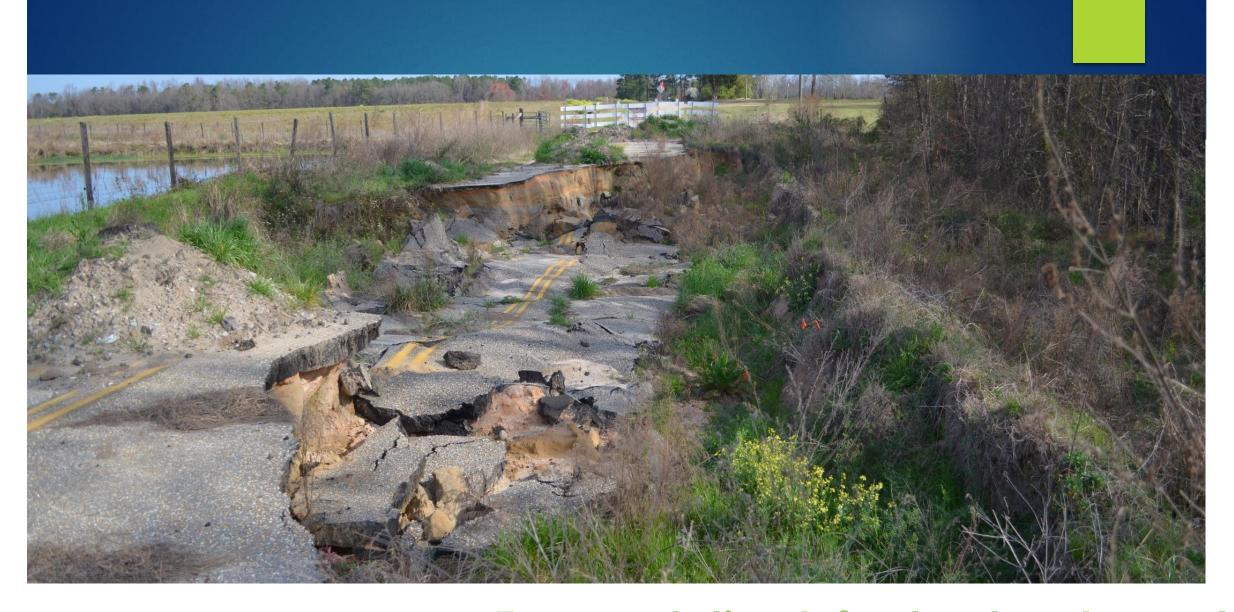
Transportation Infrastructure Impacts



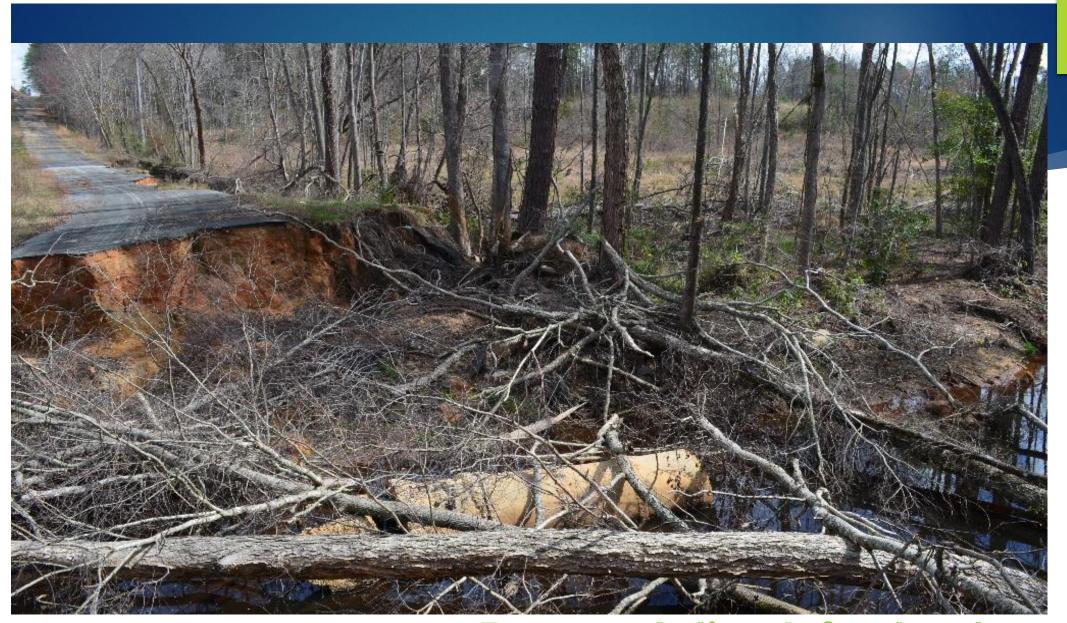
Transportation Infrastructure Impacts



Transportation Infrastructure Impacts



Transportation Infrastructure Impacts



Transportation Infrastructure Impacts



Transportation Infrastructure Impacts



Transportation Infrastructure Impacts



Transportation Infrastructure Impacts

LESSONS LEARNED for DEPARTMENTS of TRANSPORTATION

MITIGATING POTENTIAL DAMAGE

Mitigating and Preventing Damage

Understand the Economic Implications of Privately Owned Dam Failure – Road Closure, Utility Damage, & Dam Repair

Transportation/Geotechnical Asset Management Plan?

Assess and Identify DOT Roads over Privately Owned Earthen Dams

Owner Engagement – Maintenance Requirements

Inspect Installed Utilities

Gage DOT Roadway Maintenance Practices

Evaluate Unauthorized Modifications

Pre-Storm Spillway System Evaluation

Questions?

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ANSWERS