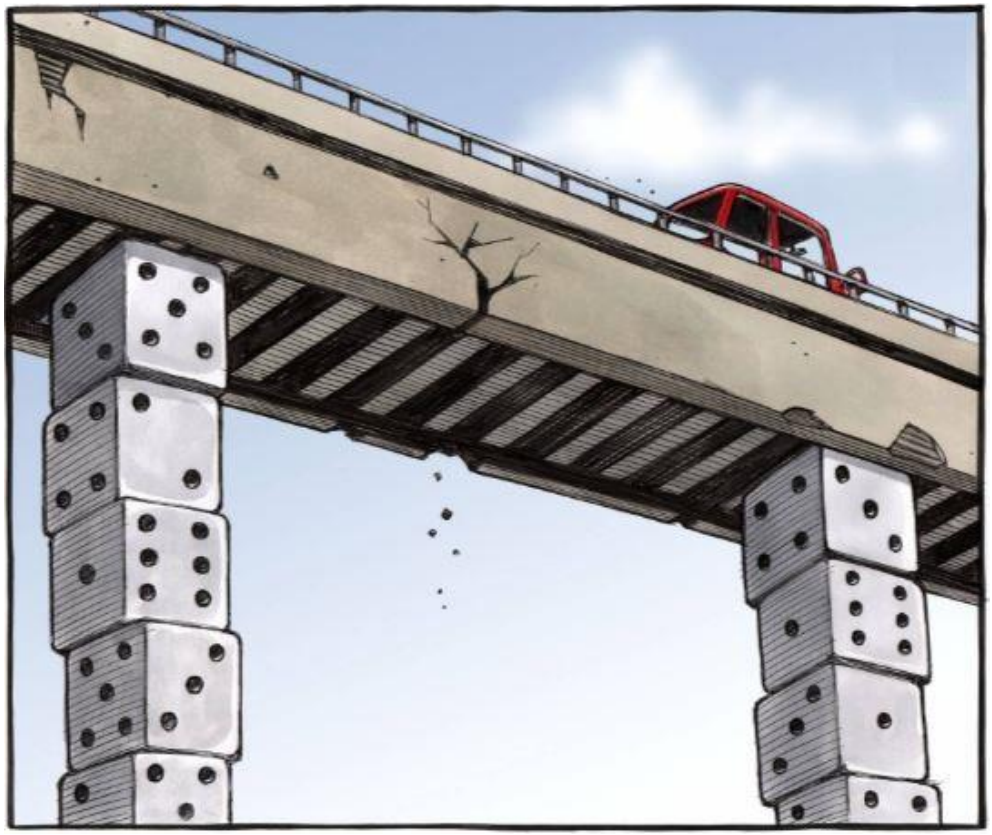
Best Practices in Bridge Management



Joey Coco, P.E

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Best Practices in Bridge Management

Major Points

- Unprecedented Funding for Rural Bridges
- Inventory Management Considerations
- Risk Based Methodology

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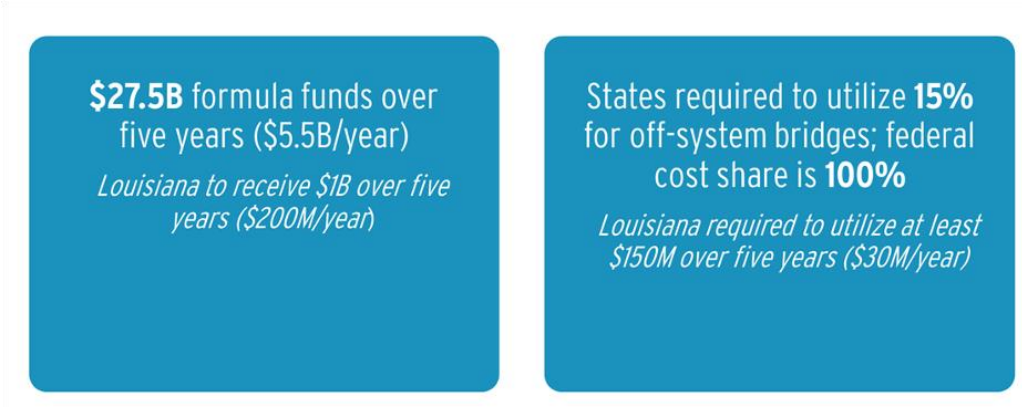
Future Funding – IIJA and Other

Funding Sources

- Off-System Bridge Program + IIJA B.I.P. Program
  - Formula and Grant Component, Designed to oust poor bridges
- HB 514 – Vehicle Sales Tax for Transportation
- American Rescue Plan Stimulus, State Surplus
- Other programs slated toward drainage



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Management

Which to Replace?

- Historically consider Sufficiency Rating
- Pick bridge from List with SR < 50
- Condition, Importance, Political Interests all factors

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Risk-Based Approach

“Consequence”

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Risk-Based Management Approach

Terms:

Hazard – Thing imparting forces

Vulnerability – Things ability to take on forces

Exposure or Consequences – Thing that happen as a result of forces being imparted on vulnerable things

Risk – The cost/priority/rank of imparting forces on vulnerable things with resulting consequences

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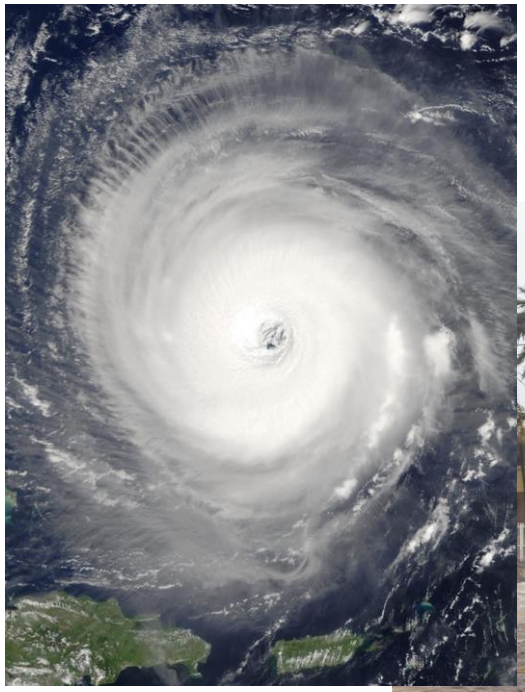
Risk-Based Management Approach



Hazard

Vulnerability

Consequence

Risk = Hazard x Vulnerability x Consequence

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Risk-Based Management Approach

Example

Hazard – Bad Windstorm

X

Vulnerability – Poorly Constructed Critical Care Bldg.

X

Consequences – Critical Care Is Important

= **Damaged Structure**

Risk – Structure Damaged, But Care was Ceased Because Windows Blown In and Power Went Out, Therefore, People Died and Disruption In Services. Human and Financial Loss

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Risk-Based Management Approach

Example

Hazard – Wide Range of Storms and Probability

X

Vulnerability – Wide Range of Possible Bldg. Damages

X

Consequences – Wide Range of Resulting Issues

Risk – Probabilistic Estimation to Steer Decisions

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Risk-Based Management Approach

Hazard

Vulnerability

Consequence

Risk = Hazard x Vulnerability x Consequence

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Risk-Based Management Approach

Bridges

Hazard – Trucks/Cycles

X

Vulnerability – Aging Timber Structure

X

Consequences – Serves 150 $$$ producing Well Sites

=

Load Rating

Risk – Truck loads > Bridge capacity to handle, therefore posted bridge prevents trucks from servicing well sites. Financial Loss

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Risk-Based Management Approach

Bridges

Consequence Considerations for Bridges

1. **Isolate road condition, assume perfect condition**
2. **ADT a dependent variable**
3. **A variety of independent variables (infinite)**
   - Alternative Route Length
   - Dead End Route
   - Collector Route
   - Life Safety Considerations
     - Fire/Police
     - Hospitals
   - Economic Factors (and now Social)
     - Industry in Proximity
     - Farming

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Risk-Based Management Approach

Bridges

Take-Aways:

1. **Hazard x Vulnerability = Load Rating**

2. **Consider Consequences to Accelerate or Attenuate Bridges in a List**

3. **Use Prioritized List for Replacement/Repair Priority and Focused Management**

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