Using HEC-RAS to Model Bridge Alternatives

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Let's build some bridges!!
Key Topics

- Bridge type selections
- Design Requirements
- Roadway Deck
- Single Span
- Multiple Spans/Piers
- Circular Culverts
- Box Culverts
- Reinforced Concrete Arches
- Bridge Modeling Approach
- Conclusions / Q&A
ODOT Design Requirements

- Headwater Freeboard
- Design Storm analysis
- Floodplain regulations and Self Permit process
- Culvert vs. bridge
- Adjacent or surrounding structures and property.
Bridge Structure Types

- Single Span
- Multiple Span
- Circular Culverts
- 4 Sided Box Culverts
- Reinforced Concrete Arches
Bridge and Culvert Editor
Deck/Roadway Data Editor

![Deck/Roadway Data Editor](image)

The image shows a data editor for deck or roadway data with a table containing distance, width, and weir coefficient values. There is also a graphical representation of the data with labels for upstream, bridge width, and downstream distances.
Single Span Bridge
Single Span Bridge
Single Span Bridge
Multiple Span/Piers
Multiple Span/Piers
Multiple Span/Piers
Sloping Abutments
Circular Culverts
Circular Culverts
Circular Culverts
4 Sided Box Culverts
4 Sided Box Culverts
4 Sided Box Culverts
Reinforced Concrete Arches
Conspan Arch Culvert
Reinforced Concrete Arches
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Reinforced Concrete Arches
Roadway Deck Model
Reinforced Concrete Arches
Roadway Deck Model
Bridge Modeling Approaches

- Low Flow Methods
- Energy – Single Span, Circular Culverts, Box Culverts
- Momentum – Multiple Spans with Piers
- Yarnel – Multiple Spans with Piers
- Highest Energy Answer
Bridge Modeling Approaches

- High Flow Methods
- Energy Only
- Pressure
- Weir
Ineffective Areas
Questions?

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