A study of the Effects on Bridge Behavior from Implements of Husbandry on Farm-to-Market Roads during Harvest Season

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Background

• A current pooled fund project, led by the Iowa DOT, aims to assess the impact of IOH on bridges
• Efforts have produced valuable information especially as is relates to lateral load distribution
• Project completed using database of virtual vehicles
Scope

• Determine frequency of crossings
• Capture bridge behavior under various dynamic IOH loads
• More closely define the characteristics of husbandry vehicles
Bridge Info

- Simple span I-beam bridge
- 55’ Span
- 28’ roadway
- 4 steel girders and concrete deck
- Timber piles w/ concrete cap
- ADT = 1240
- V13-1-64 Iowa DOT Historical Bridge Standard
- Constructed in 1967
Data Collection

• Bridge monitored September through November
• 24 strain gages placed at various superstructure locations
• Motion-triggered camera for image capture of IOH
1st Week of November
That’s a lot of liquid manure!
• Over the course of 59 days...
  • 15,860 total vehicles
  • 368 IOH (2.3%)
• Max strain levels from IOH did not exceed that of loaded 5-axle semis, with one exception...
• Max strain levels increased nearly 25% with the crossing of Honeywagons
Ongoing

• Further define strain signatures of IOH
• Validate other ongoing research
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Justin Dahlberg
ISU Bridge Engineering Center
dahlberg@iastate.edu