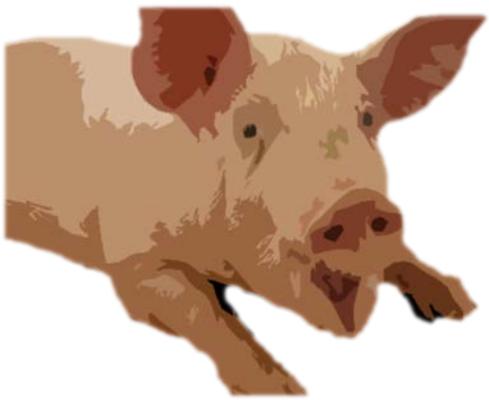


A study of the Effects on Bridge Behavior from Implements of Husbandry on Farm-to-Market Roads during Harvest Season

Midwest Transportation Research Symposium

August 19, 2015



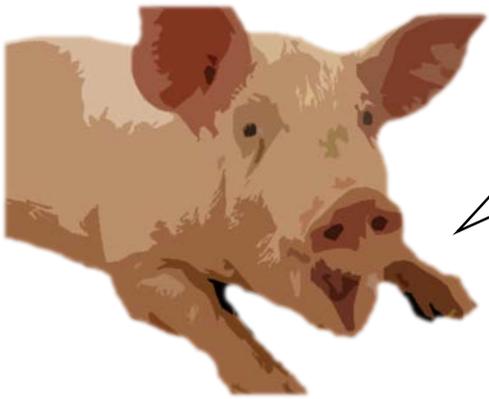
Background

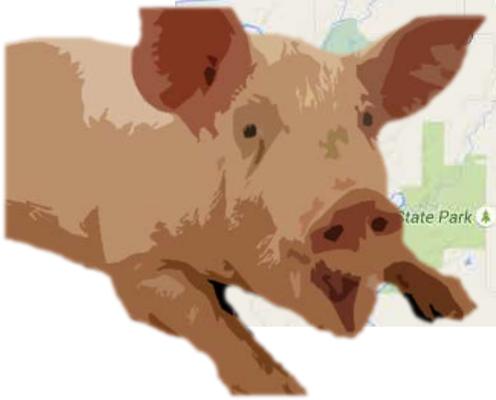
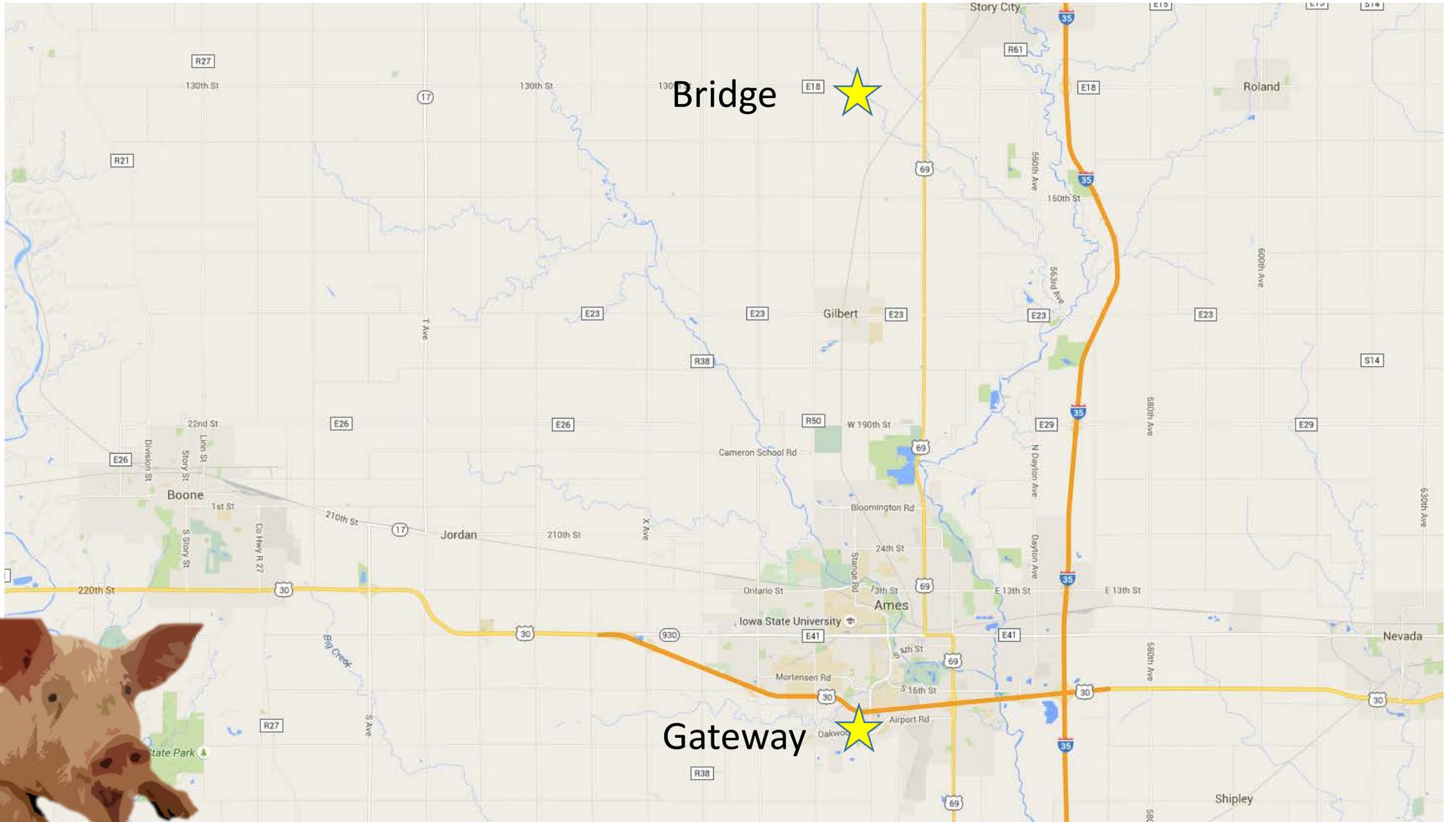
- A current pooled fund project, led by the Iowa DOT, aims to assess the impact of IOH on bridges
- Efforts have produced valuable information especially as it relates to lateral load distribution
- Project completed using database of virtual vehicles



Scope

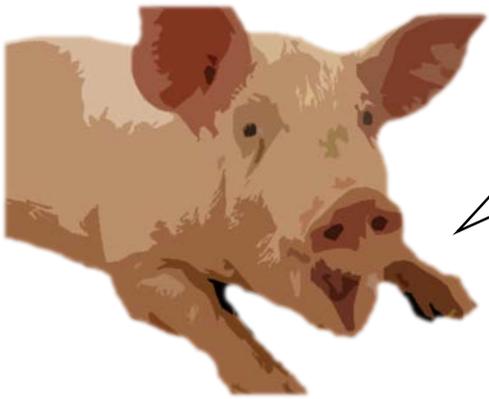
- Determine frequency of crossings
- Capture bridge behavior under various dynamic IOH loads
- More closely define the characteristics of husbandry vehicles

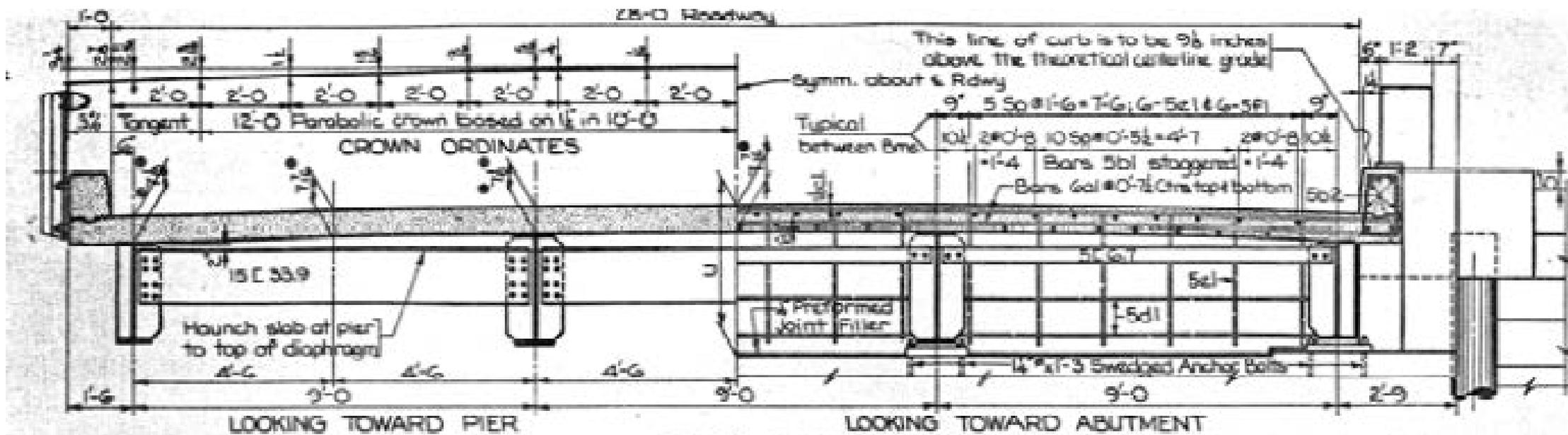




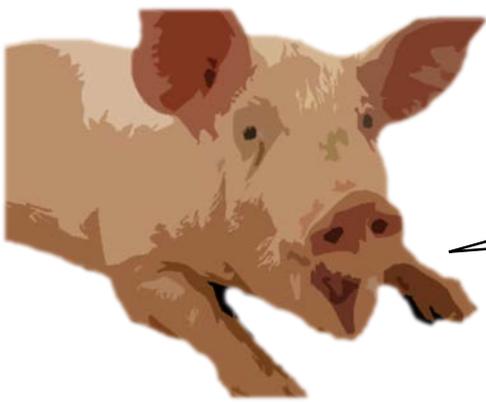
Bridge Info

- Simple span I-beam bridge
- 55' Span
- 28' roadway
- 4 steel girders and concrete deck
- Timber piles w/ concrete cap
- ADT = 1240





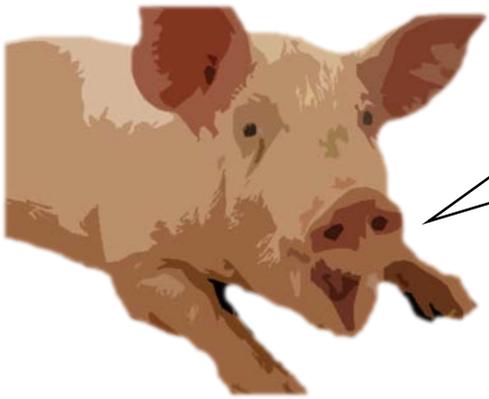
- V13-1-64 Iowa DOT Historical Bridge Standard
- Constructed in 1967





Data Collection

- Bridge monitored September through November
- 24 strain gages placed at various superstructure locations
- Motion-triggered camera for image capture of IOH







29.17 inHg - 37°F 10/10/2014 09:09AM BEC WIM



28.92 inHg - 68°F (10/20/2014 12:22PM BEC WIM



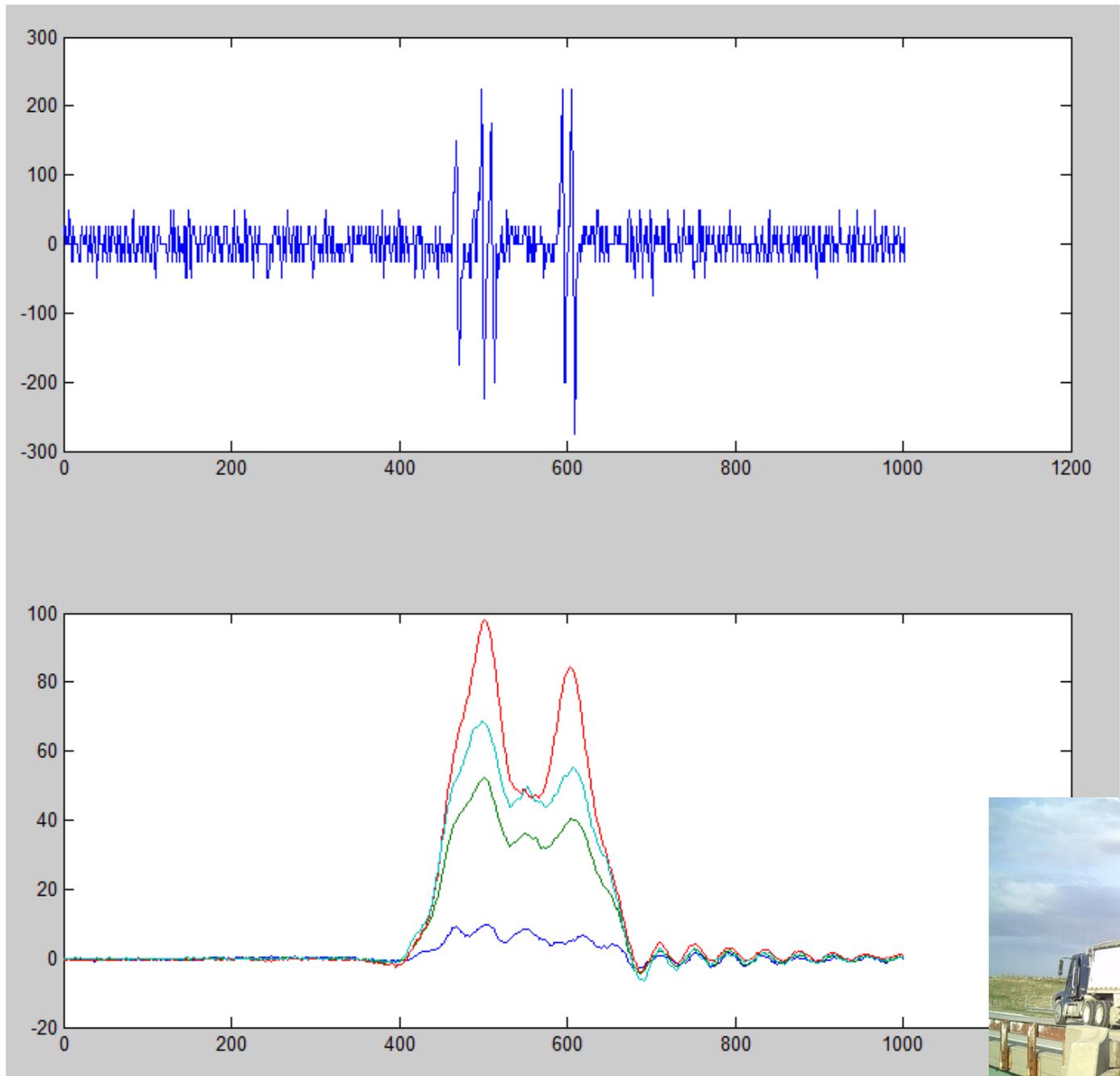
29.14 inHg - 57°F 10 / 10 / 2014 12 : 39 PM BEC WIM

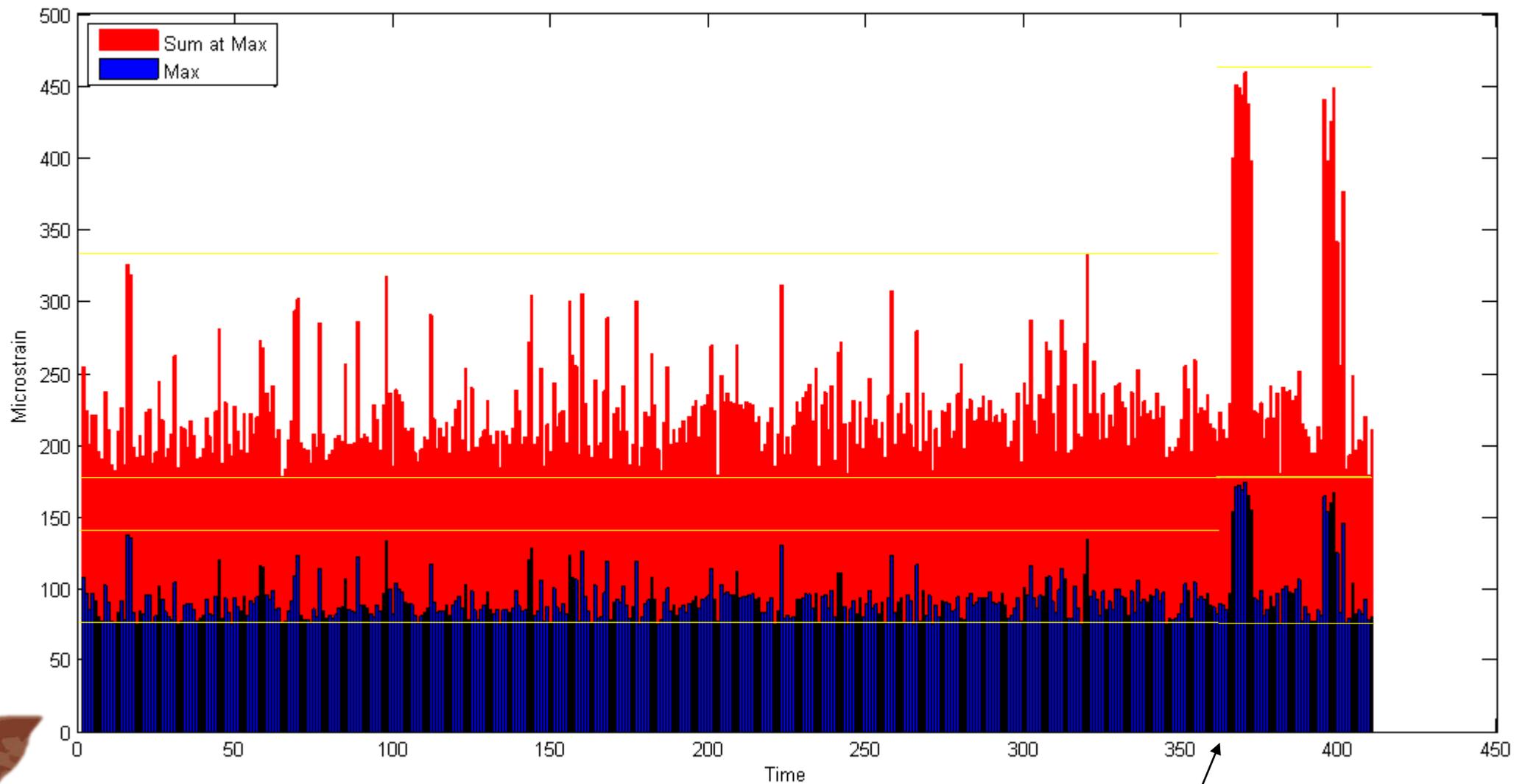


28.68 inHg - 48°F 10/12/2014 04:05PM BEC WIM

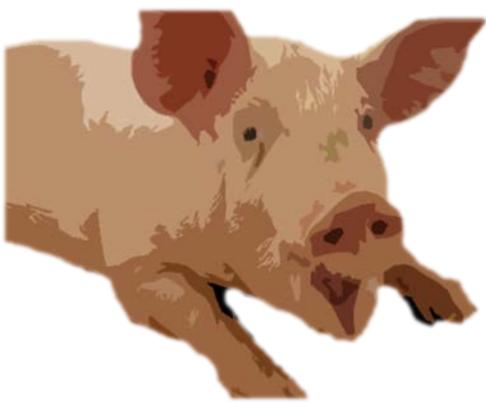


29.13 inHg - 43°F (10/22/2014 09:09AM BEC WIM





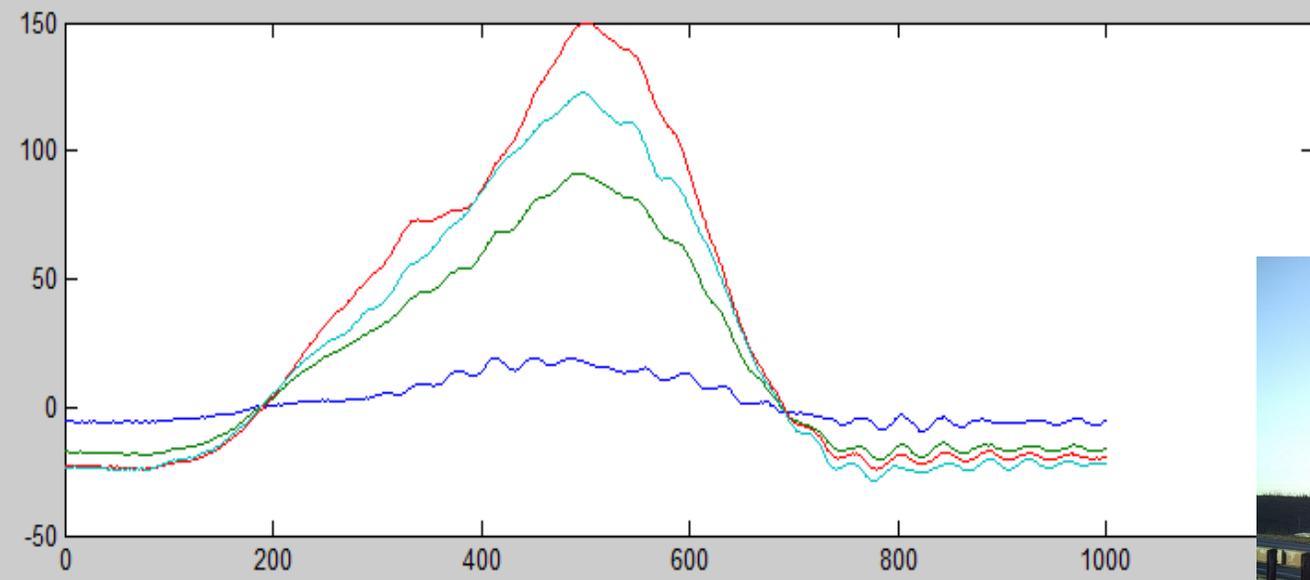
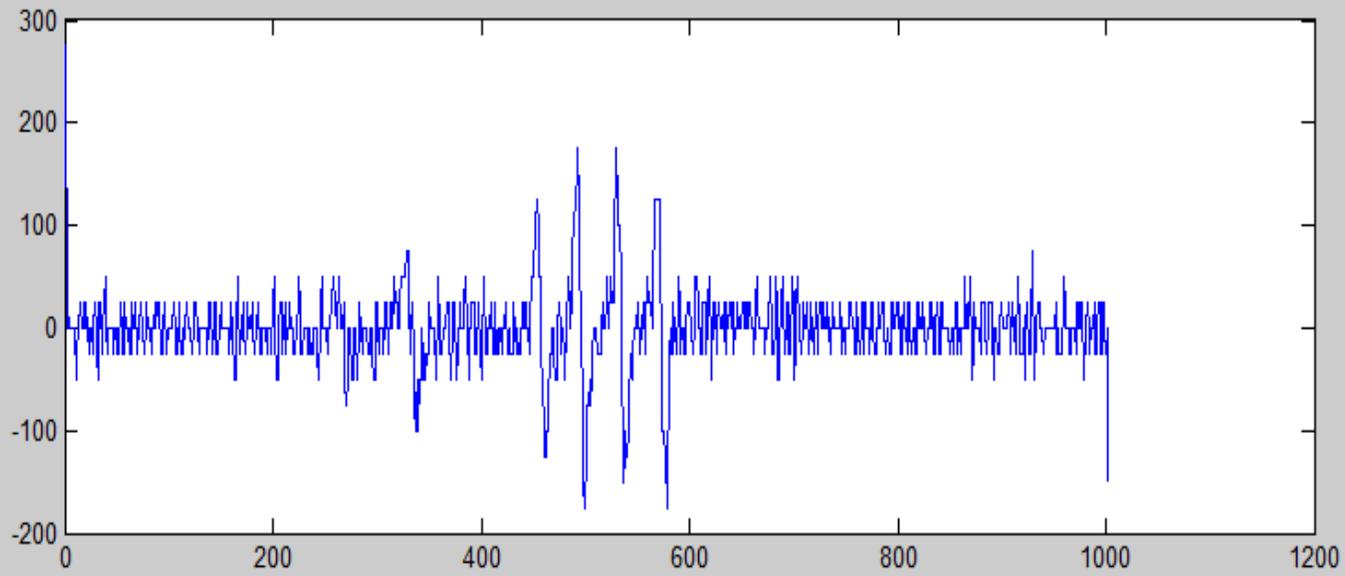
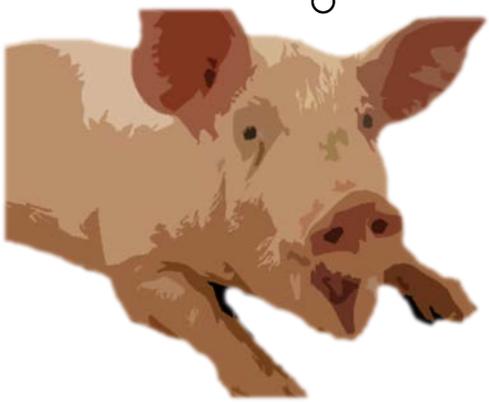
1st Week of November





29.18 inHg - 50°F 11/06/2014 05:32PM BEC WIM

That's a lot of liquid manure!



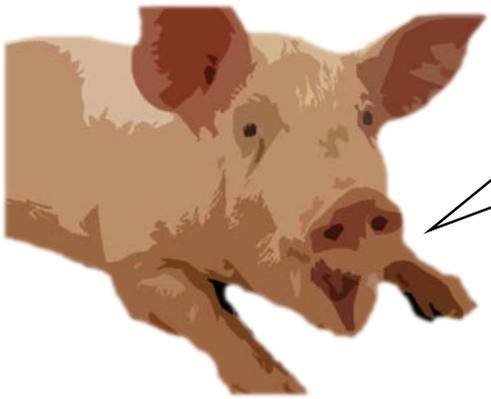
Takeaways

- 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

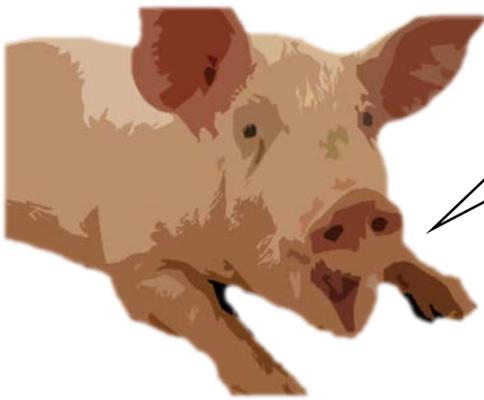
- Further define strain signatures of IOH
- Validate other ongoing research



Acknowledgements

- Midwest Transportation Center
- Iowa Department of Transportation
- Story County





Thank You!

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