



NTSB National Transportation Safety Board

Office of Highway Safety

Highway Factors

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Introduction

- General highway information
 - Highway design
 - Accident history
- Cross-median crash risk
- Median barrier design
- Median barrier selection

General Highway Information

- I-65 had four lanes separated by a 60-foot-wide median
- Straight roadway with 2.6% grade
- Departed travel lane at 5 degrees
- Struck barrier at 15 degrees

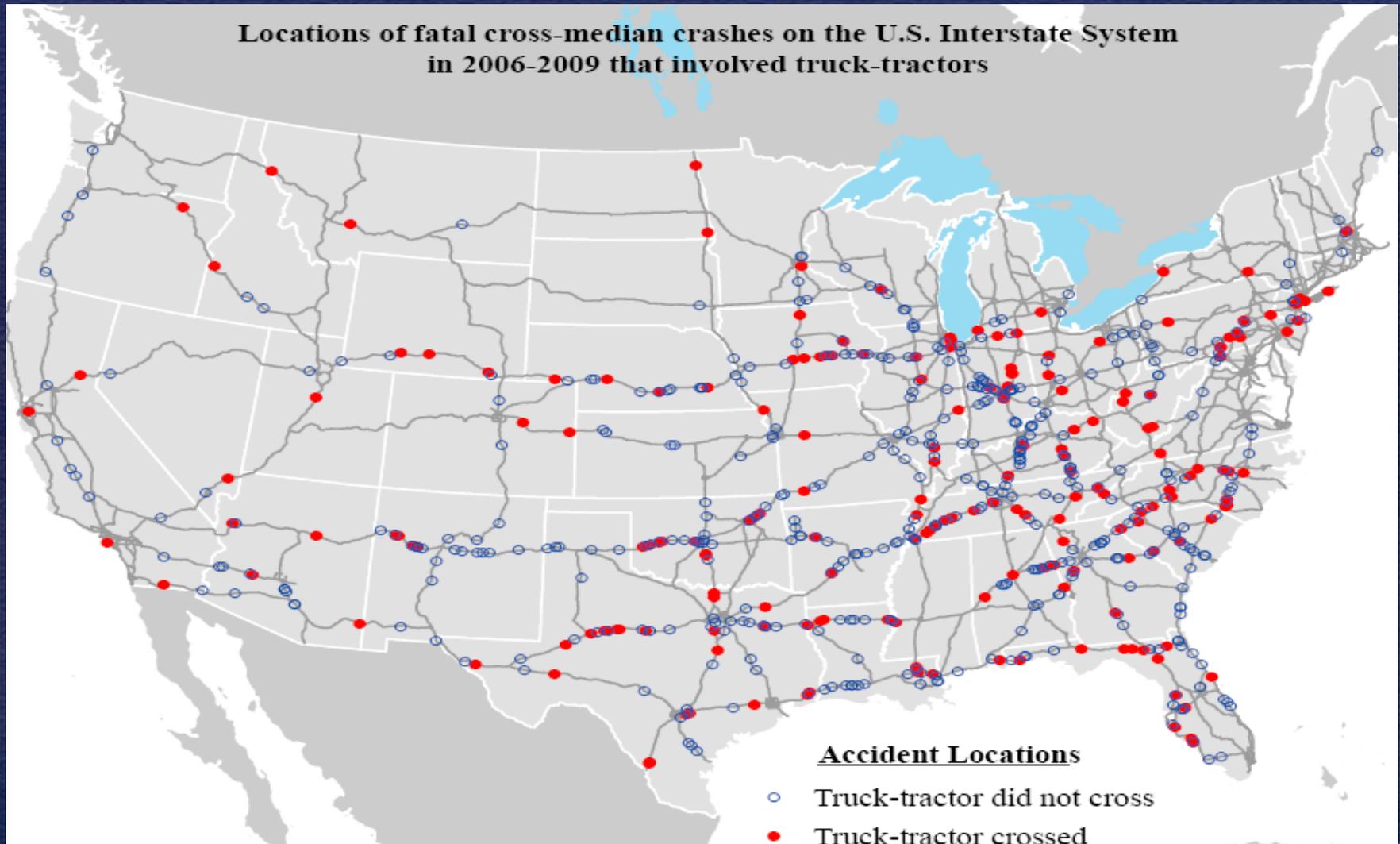
Highway Design Information

- Speed
 - Design speed and speed limit 70 mph
 - 85th percentile speed was 76 mph
 - 85th percentile truck speed was 70 mph
- Truck was traveling at highway speed
- Average daily traffic (ADT) on I-65 was 36,800
- 35 percent of traffic was heavy trucks

I-65 Cross-Median Accident History

- Evaluation period 2003-2010
 - 123.9-mile segment
 - 50 cross-median crashes
 - 37 resulted in fatalities
 - 10.5-mile segment
 - 19 cross-median crashes
 - 4 resulted in fatalities
- First cross-median crash following installation of the barrier system

Fatal Cross-Median Accidents



Cross-Median Crash Severity

- 2005-2009 fatal accidents (FARS)
 - 57 heavy truck cross-median crashes compared to
 - 574 passenger vehicles
- 2008 among all vehicles in cross-median crashes
 - 19.2% heavy trucks, even though they account for only about 1% vehicles registered and about 10% miles traveled

Barrier Design Information

- Test Level Four (TL-4) four-strand high-tension cable median barrier
- Placement on median slope reduced performance to TL-3
- 10-foot post spacing
- Alternating post design
- Anchor installation length 9,500 ft.
- Design deflection 6 ft. 8 in.



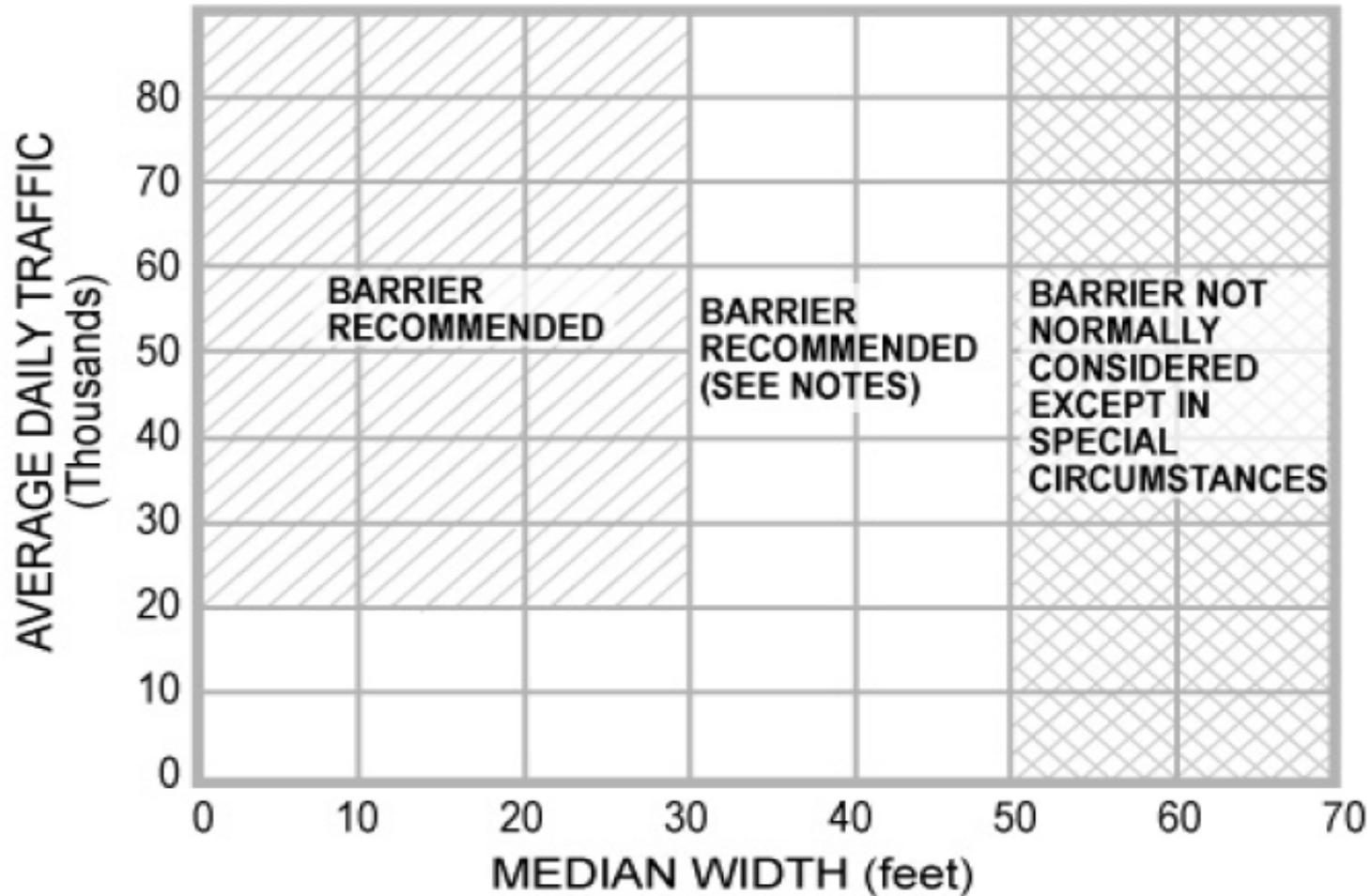
Damage to I-65 Barrier System



Median Barrier Standards

- Bridge hazard – railing required
- Roadside hazard – no standard
- Median barrier – no standard
 - Guidelines - *Roadside Design Guide*
 - Other state DOT guidelines
 - Application of engineering judgment
 - Minimum of TL-3 required

Median Barrier Guidelines



Kentucky Median Barrier Guide

- Barrier recommended when:
 - 30 foot median and ADT of 20,000
 - 30 to 72 foot median and ADT of 40,000
 - 30 to 72 foot median, regardless of traffic, if crash rate is exceeded
 - Cross-median crash rate of 0.50 per mile per year
 - Fatal cross-median crash rate of 0.12 per mile per year

Issues

- Not designed to capture a heavy truck
- No guidelines for when to install a TL-4 or TL-5 median barrier
- No definition of “heavy truck traffic”
- No definition of “cross-median crash”
- Deflection distances in field installations may be greater than those found during testing



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