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Bridge Strikes and Possible Countermeasures  
Transportation Research Board  
Research and Technology Coordinating Committee  
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# Outline

- Introduction
- Understanding the Bridge Strike Issue
- Bridge Strikes Causes
- Bridge Strike Research
- Current Initiatives
- Partnerships and Coordination



# Understanding the Bridge Strike Issue

- Trucks routinely strike bridges and tunnels, causing:
  - Injuries and fatalities
  - Significant damage to highway and railway infrastructure
  - Traffic delays
  - Rerouting of traffic
  - Loss of goods
  - Costs related to response and recovery efforts



Source: NYSDOT



# Understanding the Bridge Strike Issue

- National studies on the issue of bridge strikes are rare due to limitations in data collection.
- In 2011, the New York State Department of Transportation (DOT) analyzed bridge failure data from 1969 to 2006.
- The study found that collisions were the number two cause of bridge failures in the United States.



# Understanding the Bridge Strike Issue

- 2013 Interstate 5 Skagit River Bridge Collapse
  - The National Transportation Safety Board (NTSB) investigated and found that part of the cause was an oversize load striking the bridge's overhead support beams.
  - The NTSB recommended development of a guide for States to prevent bridge strikes by over-height vehicles.



# Bridge Strikes Causes

- Several factors need to be considered in addressing the bridge strike issue, including:
  - Non-centralized and non-standardized data collection at state and local level
  - Type of infrastructure (roadway, pedestrian bridge, or rail)
  - Passive countermeasures, such as signage
  - Active technologies, such as Intelligent Transportation Systems (ITS) and in-vehicle systems
  - Enforcement, driver training, routing, and permitting
  - Use and accuracy of navigation systems by drivers



# Bridge Strike Research

- Supports DOT and Federal Highway Administration (FHWA) strategic goals
- Supports the FHWA Office of Operations, Office of Freight Management's (HOFM) Annual Modal Research Plan (AMRP) Programs
  - Freight Management and Operations
  - Truck Size and Weight Research, Development, and Technology



# Bridge Strike Research

- State DOTs and Industry
  - American Association of State Highway Transportation Officials (AASHTO)
  - Several industry groups have asked FHWA to take a leadership position, including:
    - Commercial Vehicle Safety Alliance
    - Specialized Carriers & Rigging Association
    - North American Pilot Vehicle Safety Alliance





# Bridge Strike Research (cont.)

- Permitting processes for oversized/overweight loads
- Bridge strike reporting and tracking
- Driver routing compliance
- Passive countermeasures (crash beams, hanging chains, signs, etc.)



Source: Abhishek Singhal, Ph.D. City College of New York

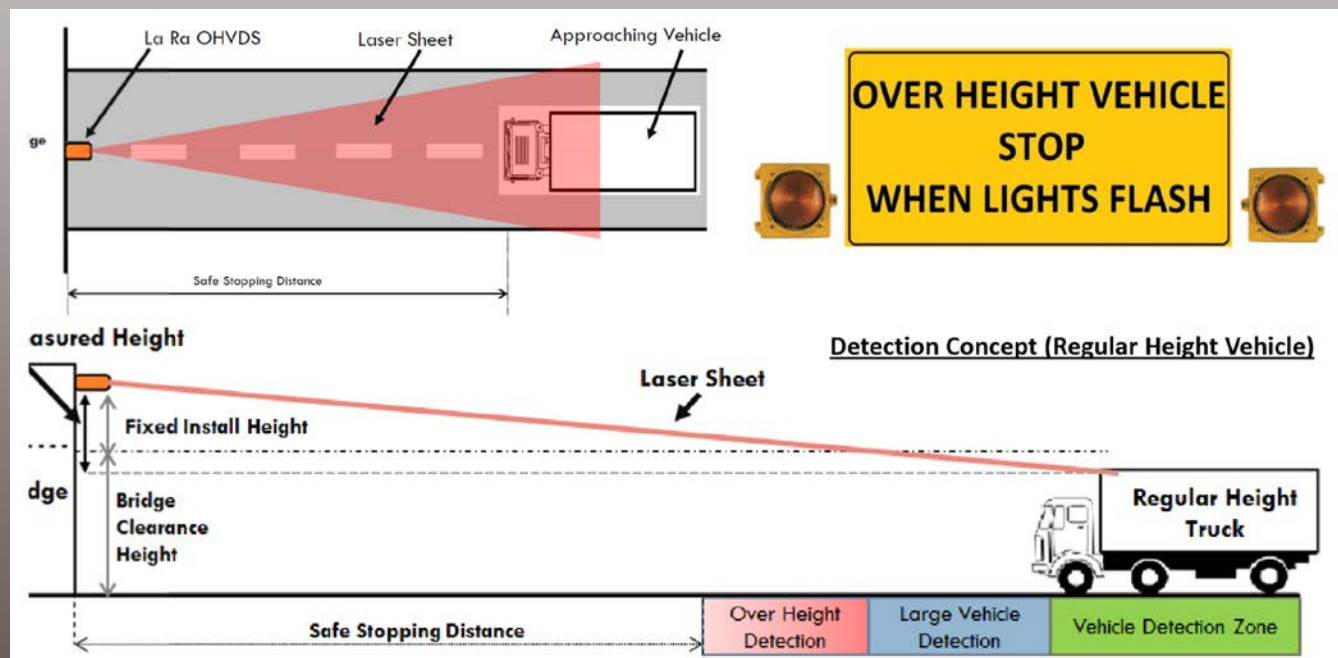


Source: Abhishek Singhal, Ph.D. City College of New York



# Bridge Strike Research (cont.)

- GPS enhancements that include bridge information
- Active ITS and technology countermeasures (sensors, cameras, in-vehicle notifications, and signage systems)



# Bridge Strike Research (cont.)

- Systems to detect noncompliant vehicles prior to any bridge strike
- Vehicle-to-infrastructure connectivity for vehicle-based warnings
- Strategies for rapid response and incident management when strikes occur
- Railroad infrastructure design, reporting, and resiliency
- Measuring effectiveness of countermeasures through safety, resiliency, efficiency, and cost savings



# Current Initiatives

- FHWA
  - Development of Pilot/Escort Vehicle Operators Training and Manuals (2017)
  - FHWA coordination meetings, including Office of Operations, Office of Safety, and Office of Infrastructure
  - Partnerships with National Highway Traffic Safety Administration (NHTSA), Federal Motor Carrier Safety Administration (FMCSA), Federal Railroad Administration (FRA), and Maritime Administration (MARAD)



# Current Initiatives (cont.)

- FHWA
  - Office of Transportation Operations: Preventing Over-Height Vehicle Collisions with Low-Clearance Bridges: State of the Practice Guide
  - Emergency Route Working Group Recommendations and Implementation
  - Research into international practices on measures to prevent bridge strikes



# Current Initiatives (cont.)

- AASHTO
  - Two members submitted National Cooperative Highway Research Program (NCHRP) Proposals on bridge strike research
  - Research proposals were combined into a single NCHRP bridge strike study: *Methods to Prevent Bridge Strikes by Trucks*
  - Funded at \$800,000, which includes a \$400,000 contribution from FHWA



# Current Initiatives (cont.)

- New York City DOT Bridge Strike Reduction Resource Guide
  - Identify best practices in local and state agencies.
  - Document the extent of the challenge in understanding the issue, and the full range of solutions to reduce bridge strikes
  - Survey questions focus on four key areas:
    - Mitigating bridge strikes
    - Data collection and management
    - Policies (restricted roadways or truck routes)
    - Education and outreach



# Partnerships and Coordination

- State processes for bridge and tunnel strike reporting and tracking
- Successful practices for communicating data
- Data to support the development of bridge strike countermeasures and operational changes for oversize load permits
- Countermeasures, emerging practices and technologies in use
- Other State strategies currently in practice





# Partnerships and Coordination (cont.)

- Partner with FRA, FMCSA, NHTSA, AASHTO, academia, Transportation Research Board (TRB), technology providers, and the railroad/trucking industries.
- Disseminate information, lessons learned, and research results.
- Research, advance, demonstrate, deploy, and transfer countermeasures, technologies, and practices that are proven successful.



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