FHWA Update – Joey Hartmann
Director, Office of Bridges and Structures
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Bridges and Structures

Acronyms

- CBS: Committee on Bridges and Structures
- CE: Categorical exclusion
- CFR: Code of Federal Regulations
- D/D: Data-driven
- ESW: Electroslag welding
- FC: Fracture critical
- FMIS: Financial Management Information System
- GRS-IBS: Geosynthetic reinforced soil-integrated bridge system
- HS: High-strength
- IR: Inventory rating
- LRFD: Little Rock Fire Department
- MAP-21: Moving Ahead for Progress in the 21st Century Act
- MASH: Manual for Assessing Safety Hardware
- MBE: Manual for Bridge Evaluation
- NBI: National Bridge Inventory
- NCHRP: National Cooperative Highway Research Program
- NDE: Nondestructive evaluation
- NEPA: National Environmental Policy Act
- NHI: National Highway Institute
- NHS: National Highway System
- NTIS: National Tunnel Inspection Standards
- R/B: Risk-based
- TAMP: Transportation Asset Management Plan
MAP-21 Implementation

• National Bridge Inspection Standards
• Risk-Based Prioritization
NBIS Update

• Establish risk-based, data-driven frequency of inspections
• Establish procedures for reporting critical findings and monitoring corrective actions
• Nationally Certified Bridge Inspectors

• Current timeline...this Fall!? 
R/B, D/D Inspection Intervals

- A first step (?)
- Deploys methodology of NCHRP 12-82 (Report 782)
- Limited to Routine Inspection and the current Extended Inspection Interval limit of 48 months
- Not applicable for FC bridges
Risk Based Approach to Bridge Inspection Frequency

• NCHRP Report 782 (Project 12-82)
  – Washer, Nasrollahi, Connor, others
  – Available online

• Inspection intervals that consider the reliability of bridge elements and the consequences of damage
Extended Routine Inspection Intervals

Technical Advisory 5140.21

- Condition Rating > 6
- IR > State’s Legal Load
- Spans ≤ 100-ft
- Clearances ≥ 14-ft
- Typical bridge types

Risk-Based...Memorandum

- Risk Assessment Panel
- Risk Levels and Categories
  - Probability Levels
  - Consequence Levels
- Develop supplemental inspection procedures
Inspections that consider
- The reliability of bridge elements
  - Likelihood of deterioration and damage
    - Condition, design, materials and loading
- The consequences of that damage
  - Minor serviceability issues, safety issue?

Inspection interval and scope
- Match inspection requirements with inspection needs for a bridge
Developing Implementation Strategies for Risk Based Inspection

- TPF-1470 (State led by MO)
- 1(b): Develop a handbook for implementation of Risk Based Inspection describing key processes, key attributes and scoring methodologies for implementation.
CRITICAL FINDINGS

• “Establish procedures for reporting critical findings and monitoring corrective actions.”
  – Procedures and definitions
  – Reporting = collecting...database
  – Database = data-driven programs
Proposed CF Program

- States/Agencies/Tribes will be required to have written procedures addressing CFs for highway bridges
  - Procedures could be part of Bridge Inspection Manual or a stand-alone document
- Critical Findings Definition:
  - “A critical finding is a structural or safety related deficiency that requires immediate follow-up inspection or action”.
- Notification time frames to FHWA
  - Within 24 hours of discovering the CF
Proposed FHWA Critical Findings Database

- Updated quarterly by Division for reported CFs
- There are 20 pieces of data collected for each CF
  - NBI cross-walk identifiers
  - Written description of CF
  - Classification of follow-up action
  - Condition data
  - Deficient member or component
  - Probable Cause
  - Operating Status
  - Attachments
Data Driven Programs

- #1 cause of bridge failure?
- How many scour related CFs last year?
- What is the trend for deterioration CFs?
- Damage CFs?
- Defect CFs?
- Target research efforts and program development towards the cause of CFs.
- White paper for comment...
MAP-21 Implementation

• Risk-Based Prioritization
  – Classify all bridges according to serviceability, safety and essentiality.
  – Based on that classification, assign each a risk-based priority for preventative maintenance, replacement or rehabilitation.

• TAMP(?)
  – NHS
CHANGING THE LANGUAGE OF THE FEDERAL AID BRIDGE PROGRAM

Almost there!

- Sufficiency Rating
- Functionally Obsolete
- Structurally Deficient → Poor
- Fracture Critical → NBIS Update
FAST Act Emergency Vehicles (EV)

- **23 U.S.C. 127**
  - A State shall not enforce against an EV using the Interstate System (and w/i reasonable access)

- **23 U.S.C. 144**
  - Establish procedures to conduct evaluation or load rating of highway bridges

- **23 CFR 650**
  - Load rate for all legal and unrestricted loads using the AASHTO MBE
Load Rating for Emergency Vehicles

• Single Rear Axle Emergency Vehicle
  – Front Single Axle: 24,000 pounds
  – Rear Single Axle: 33,500 pounds
  – Wheelbase: 15 ft.

• Tandem Rear Axle Emergency Vehicle
  – Front Single Axle: 24,000 pounds
  – Rear Tandem Axle: 62,000 pounds (two 31,000 pound axles spaced at 4 ft.)
  – Wheelbase: 17 ft. (distance from front axle to the centerline of rear tandem axle)
Memorandum

Subject: ACTION: Load Rating for the FAST Act’s Emergency Vehicles

Date: November 2, 2016

From: Original signed by: Joseph L. Harman, P.E., P.E.
Director, Office of Bridges and Structures

To: Division Administrators
Federal Highway Administration Directors

On December 4, 2015, the President signed into law the Fixing America’s Surface Transportation Act (FAST Act) (Pub. L. 114-94), Section 1403 of the FAST Act amended 23 U.S.C. 127, Vehicle weight limitations—Intermediate System, by revising the weight limits for certain vehicles on the Interstate System. The purpose of this memorandum is to provide guidance on maintaining compliance with the load rating and posting requirements of 23 CFR Part 650—specifically for the amended weight limits in 23 U.S.C. 127(b), Emergency Vehicles, for bridges on the Interstate System and within reasonable access to the Interstate System. Reasonable access is defined in a September 30, 1992, non-regulatory supplement to 23 CFR Part 650 as at least one route from a point in one county to a point in another county, and to extend the facilities beyond reasonable access.

An emergency vehicle as defined in the FAST Act is designed to be used under emergency conditions to transport personnel and equipment to support the improvement of firefighting efforts and mitigation of other hazardous situations (23 U.S.C. 127(b)(2)). The gross vehicle weight limit for emergency vehicles is 80,000 pounds under section 1270. The section imposes the following additional limits, depending upon vehicle configuration:

- 24,000 pounds on a single steering axle
- 33,500 pounds on a single drive axle
- 62,000 pounds on a tandem axle
- 52,000 pounds on a tandem rear drive steer axle

Emergency vehicles are typically operated by fire departments and are primarily equipped for firefighting, but are also used to respond to and mitigate other hazardous situations.
Memo

• Analysis (Options from the MBE)
  – Multiple Presence: one lane of the traffic stream
  – Load Factor: 1.3 for unrestricted permit loads

• Group 1 Bridges: re-rate when warranted

• Group 2 Bridges: re-rate by 12.31.2019
Concerns

• 5000+ postings on the Interstate System (v. 37 in 2017)
• Posting of approximately 40% of bridges w/i reasonable access to the Interstate
• Reasonable access: min. of 1 road mile to as much as an entire State
• Freight industry
Covered Heavy-Duty Tow and Recovery Vehicles

- Interstate vehicle weight limits do not apply.
- A vehicle that is transporting a disabled vehicle from the place where it became disabled to the nearest appropriate repair facility, and
- Has a gross vehicle weight that is equal to or exceeds the gross vehicle weight of the disabled vehicle being transported.
The vehicles defined in this section as (EV) or (HD Tows) shall be allowed by a non-divisible load or vehicle permit by a State to operate safely on the Interstate Highway System when the vehicles are not considered legal based on the gross vehicle weight or axle weight limits set forth in this section.

Obligates a State to issue a permit.
FY2018 Omnibus
Competitive Highway Bridge Program
Statutory Requirements

- $225M for highway bridge replacement and rehabilitation projects on public roads.
- Projects must demonstrate cost savings through bundling.
- Funding comes from the General Fund and requires a match (Standard 80%/20% or Sliding Scale).
- Funds must be obligated by September 30, 2021 (must be expended by September 30, 2026).
- Funding is eligible to States with a population density of less than 100 people per square mile based on the 2010 census and a State’s total land area.
States **Eligible** for the FY18 Omnibus Competitive Highway Bridge Program
Other Considerations?

• **Are bridges bundled...**
  – In poor condition?
  – Posted or restricted for load?
  – Through NEPA or are a likely CE but are not yet authorized for construction in FMIS?
  – Others?
Working Timeline

- **End of June**: Publish the NOFO in the FR.
- **End of August**: Applications due from States.
- **End of September**: Complete review of applications and make funding recommendations to Office of the Secretary.
- **End of October**: Award grants to States.
- **FY19?**
MASH Eligibility Letters

- AASHTO/FHWA technical committee was formed November 2017
- FHWA shared a draft paper with AASHTO
  - Current FHWA eligibility process
  - 6 potential methods that could facilitate State review and assessment of crash test results to determine eligibility
  - Continuing the process of FHWA eligibility letters is still under review.
- AASHTO website for Q and A’s: https://design.transportation.org/mash-implementation/
Odds and Ends

• Recent Policy Memos
  – Adhesive Anchors (recognizes new ACI procedures)
  – HS Bolts (clarity and ASTM F3125)
  – ESW (updated for AWS 1.5 procedures)

• Recent NHI Courses
  – Strut and Tie Modeling
  – Design/Evaluation of Bridges for Fatigue and Fracture
NHI STM and FF Course Incentives

- **For limited time!**...DOT’s who host the course can receive 15 seats at no cost.
- **However, to meet the 20-participant minimum at least five (5) additional seats must be purchased at regular price, either by the DOT or by outside participants.**
National Tunnel Inspection Standards

• Inventory Data
• Inspection Data...Thank you!
• NTIS Metrics (15?)
  – Implemented in 2019
  – Piloted by (CO), (MA), (MI), MO, OR, PA, TN, TX, VA, WA and WV
  – Seek review/comment from CBS
  – Publish in Federal Register
• EOY 2019
Ultra-High Performance Concrete

- FHWA-HRT-18-036
- Mechanical, durability, and structural properties

5 different UHPCs characterized
Design and Construction Guidelines for Geosynthetic Reinforced Soil Abutments and Integrated Bridge Systems (FHWA-HRT-17-080)

- Supersedes the *GRS-IBS Interim Implementation Guide* published in 2011
- Additions and updates, including:
  - Revised material specifications
  - LRFD
  - Expansion of the limits on the GRS-IBS
  - Updated hydraulic and seismic guidance for scour countermeasure design
  - New construction details
- Included in FHWA’s Policy & Guidance Center
Every Day Counts - 5

- **Hydraulics:** CHANGE

- **Advanced Geotechnical Exploration Methods**
  - Improved solutions and NDE methods for generating the geotech profiles used in project design

- **Unmanned Aerial Systems**
  - Working with partners to facilitate advancement and appropriate integration
Questions?

joey.hartmann@dot.gov