Long-Term Bridge Performance (LTBP) Program

Meeting—AASHTO SCOBS
June 19-20, 2013
Portland, Oregon

Sue Lane, P.E.
Outreach and Development Engineer
Long-Term Bridge Performance Program
Federal Highway Administration

Hamid Ghasemi, Ph.D.
Team Leader & Program Manager
Federal Highway Administration

Robert Zobel, Ph.D., P.E.
Technical and Development Engineer
Federal Highway Administration

Tom Saad, P.E.
Federal Highway Administration
Long-Term Bridge Performance (LTBP) Program
Current Activities

- Meetings with State DOTs
- Bridge Selection
- Data Collection
- Automated Data Collection
Meeting with State DOTs

- Partnerships With States in Selecting Bridges for Long-Term Data Collection
  - FHWA Selects Initial Candidate Bridges for Each State in Clusters—Uses NBI
  - State Reviews Lists of Bridges
    - Plans for Rehab/Repair/Replacement
    - Access
    - Priority to the State (H, M, L)
  - State Provides Ideas & Timelines
  - FHWA Obtains Prioritized List from each State and Creates Meaningful Clusters
14 Suggested Clusters

Climate Zones
ZNUM
- Hot-Humid
- Mixed-Humid
- Mixed-Dry
- Hot-Dry
- Cold
- Marine
- Very Cold

Long-Term Bridge Performance Program
Corridor Candidates
4890 bridges of all types meeting other selection criteria
1 Steel Cluster in Mid-Atlantic Region
Data Collection Begun

1 Steel Cluster in Gulf Region
RFP Issued

Rocky Mtn Region
Bridge Selection Initiated

Selection of Steel Girder/Slab Bridge Clusters
Selection of Prestressed Girder/Slab Bridge Clusters

- Mid-Atlantic Region: Data Collection Begun
- Pacific NW Region: RFP Issued
- Rocky Mtn Region: Bridge Selection Initiated
- East Central Region: Bridge Selection Initiated
- Gulf Region: RFP Issued
Selection of Adjacent Box Beam and CIP Box Girder Bridge Clusters

- Prestressed Adjacent Box Beam Cluster East Central Region
- Prestressed Adjacent Box Beam Cluster Mid-Atlantic Region
- Post-Tensioned CIP Box Girder Cluster in SW Region
- Bridge Selection Underway
- Bridge Selection Initiated

RFP Issued
Initial Bridge Corridor Study Areas

- **North South Corridors**
  - East Coast
  - Central

- **East/West Corridors**
  - North Central
  - South Central

Bridge Corridors will contain a variety of bridge types and materials – ADT to remain fairly constant
Interstate Highway 35 Corridor

Initial Central N/S Bridge Corridor
Interstate Highway 70 Corridor

Initial North Central E/W Bridge Corridor
Interstate Highway 40 Corridor

Initial North Central E/W Bridge Corridor
Selection of Bridges for All Clusters and Corridors to be Completed in 2013
LTBP Program Current Activities

• Meetings with State DOTs To Date—

Bridges with Untreated Decks:

- Mid-Atlantic States—Sep & Oct 2012
- Gulf States—February 2013
- NW States—March 2013
- SW States—March 2013
- East Central States—April 2013
- Corridor States—April 2013
- Rocky Mountain States—June 2013
LTBP Program Current Activities

• Plan for Future Meetings with State DOTs:
  ➢ Mid-West (Great Lakes) States—anticipated July 2013
  ➢ Remaining Rocky Mountain, Great Lakes, and Corridor States—anticipated Aug. & Sep. 2013
LTBP Candidate Bridge Selection Procedure

• Bridge Selection for Clusters
  ➢ Initial Criteria Applied to NBI Data – See next Slide
LTBP Candidate Bridge Selection Procedure

Remember – Below are the Initial Selection Criteria

- State Owned (also representative of local bridges)
- Eliminate if service under is RR
- $10 \text{ m} \leq \text{Max Span Length} \leq 50\text{m}$
- Maximum of 4 lanes on bridge
- $\text{ADT} \leq 50,000 \text{ VPD}$ (limitation removed for Corridors)
- Built after 1960
LTBP Candidate Bridge Selection Procedure

• Bridge Selection for Clusters
  ➢ Initial Criteria Applied to NBI Data
  ➢ Meetings with States to Get Preferred Bridges
  ➢ Perform Statistical Analysis
  ➢ Analyze Distributions of Secondary Variables
    (Simple vs. Cont., Rebar Coating, Skew, Condition Ratings for Deck, Super, and Sub)
  ➢ Verify Deck
  ➢ Select Bridges
LTBP (Corridor) Candidate Bridge Selection Procedure

- Bridge Selection for Corridors
  - Remove ADT Criteria
  - Perform Similar Steps for Clusters
  - Examine Distribution of Environments for Corridor Bridges
LTBP – Long-Term Data Collection Activities

• Began Long-Term Data Collection in March 2013
  — 2 Bridge Clusters in Mid-Atlantic Region
    ➢ Steel Multi-Girder Bridges with CIP Deck
    ➢ Prestressed Concrete Multi-Girder Bridges with CIP Deck
Mid-Atlantic Cluster—Rutgers & Parsons Brinckerhoff Contracting Team Collect Manual NDE Data on Route 7 Bridge over the South Fork of Catoctin Creek, Virginia.
LTBP – Long-Term Data Collection Activities

• Mid-Atlantic Clusters—Beta Testing Functionality of Data Import to Bridge Portal

• Bridge Portal – Initiating Second Phase of Certification – Implementation on FHWA Servers Immediately Following Phase II Certification

• Long-Term Data Collection – Automation – RABIT™ Bridge Inspection Tool
LTBP Program Current Activities

- Automated Data Collection
  - Collaboration Between FHWA and Rutgers University
  - *RABIT*™ -- Robotic Assisted Bridge Inspection Tool
  - Multiple NDE Technologies
  - Demos in VA and at TFHRC
  - Data Collection NJ
  - Data Collection VA
FHWA in collaboration with Rutgers University envisioned, planned, designed, and constructed a novel (robotic) system, by integrating multiple non-destructive evaluation (NDE) technologies, for condition assessment of concrete bridge decks. **RABIT™ – Robotic Assisted Bridge Inspection Tool.**
RABIT™ COMPONENTS

- Two GPS Antennas
- Panoramic (360 degree) Camera with Mirror
- High-Resolution Imaging
- Two Cameras
- Two GPR Arrays
- Laser Scanners for Obstacle Avoidance
- Water Tanks for Resistivity
- Two Acoustic Arrays
- USW (Modulus)
- IE (Delamination)
- Four Resistivity (Wenner) Probes
Key Contacts—LTBP Program

- **Website:**

- **Federal Highway Administration:**
  - Hamid Ghasemi: [hamid.ghasemi@dot.gov](mailto:hamid.ghasemi@dot.gov)
  - Rob Zobel: [robert.zobel@dot.gov](mailto:robert.zobel@dot.gov)
  - Sue Lane: [susan.lane@dot.gov](mailto:susan.lane@dot.gov)
  - Tom Saad: [thomas.saad@dot.gov](mailto:thomas.saad@dot.gov)
Thank You!

Questions?