



Long-Term Bridge Performance (LTBP) Program Update

LTBP Workshop
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Presentation Outline

- **News and Milestones**
- **Meetings with the States**
- **Publications**
- **Timelines of Bridge Practices**



Presentation Outline

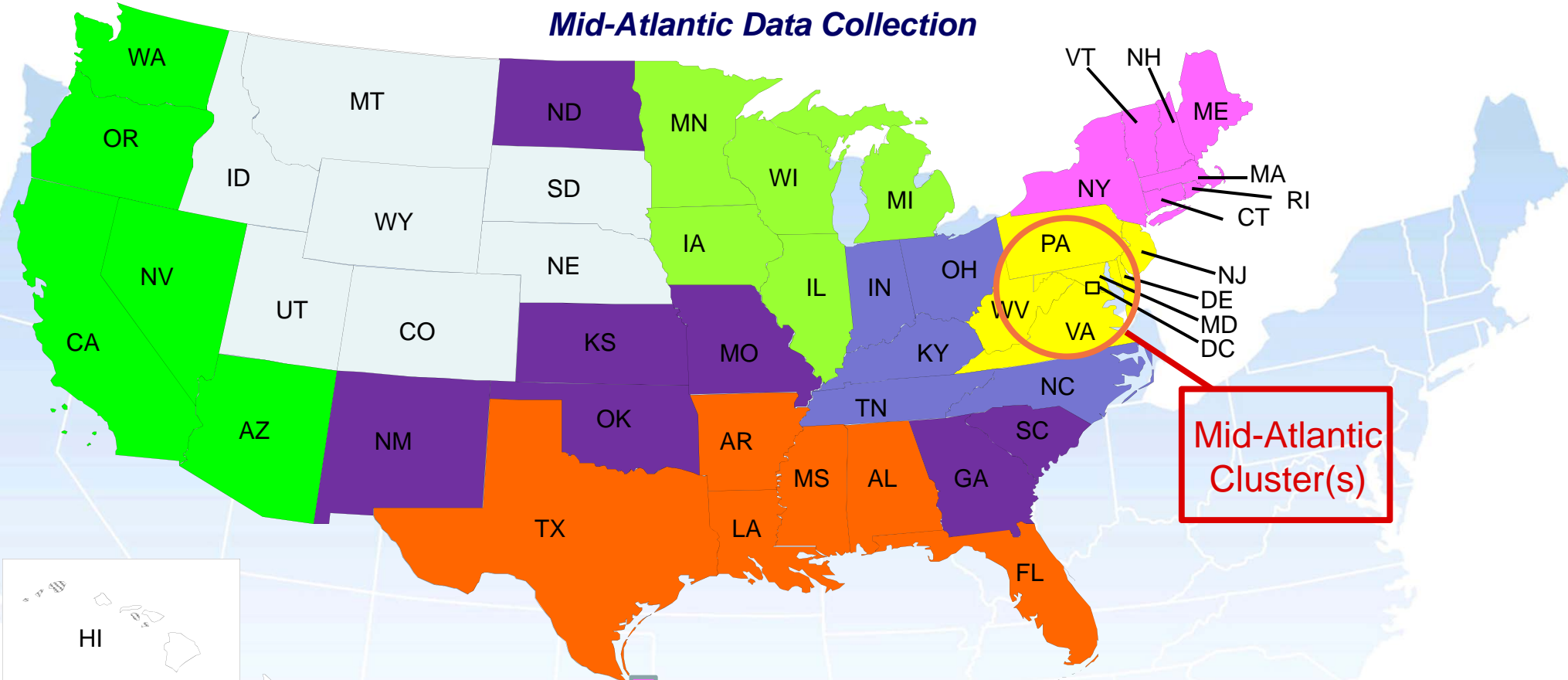
- **News and Milestones**
 - **Data Collection in Mid-Atlantic Clusters**
 - **IDIQ Contract**
 - **LTBP Strategic Bridge Performance Matrix**

LTBP Cluster States

TURNER-FAIRBANK
HIGHWAY RESEARCH CENTER



Mid-Atlantic Data Collection



Mid-Atlantic
Cluster(s)

- Northeast: CT, MA, ME, NH, NY, RI, VT
- Mid-Atlantic: DC, DE, MD, NJ, PA, VA, WV
- Mixed Humid (Country Music): IN, KY, OH, TN, NC
- Mid West (Central): IA, IL, MI, MN, WI
- Gulf Coast: AL, AR, FL, LA, MS, TX
- Rocky Mountains: CO, ID, MT, NE, SD, UT, WY
- NW-SW: AZ, CA, NV, OR, WA
- Corridor: GA, KS, OK, MO, ND, NM, SC (states not included in other clusters)



Mid-Atlantic Cluster Bridges

Untreated/Bare Cast-In-Place Concrete Deck

State	Steel Multi-Girder, Bare Deck	PS Concrete, Bare Deck	Total
Delaware	3	2*	5
Maryland	1	1	2
New Jersey	2	3	5
Pennsylvania	2	3*	5
Virginia	3	2	5
West Virginia	1	1*	2
Total	12	12*	24

*Several factors require the new selection of 3 Prestressed Concrete Multi-girder bridges:

- Construction on I-95 prevented access (DE)
- Current rehab includes LMC overlay (PA)
- Original construction included an LMC overlay (WV)



Long-Term Data Collection

Mid-Atlantic States:

- Steel Multi-Girder with Untreated Deck Bridge Cluster
- Prestressed Concrete MG with Untreated Deck Cluster
- Conducted by Rutgers University with Assistance from DE, MD, NJ, PA, VA, and WV DOTs/SHA.
- Visual Inspection of Decks, Bearings, Joints; NDE for Decks
- 24 Bridges Total to Date
 - *12 From Steel Bridge Cluster*
 - *9 From Prestressed Concrete Cluster*
 - *3 Prestressed Concrete Not Suitable Due to Unknown Conditions at Time of Selection—Selection of 3 Replacement Bridges is Ongoing*
- Status: Began March 2013—21 Completed to Date



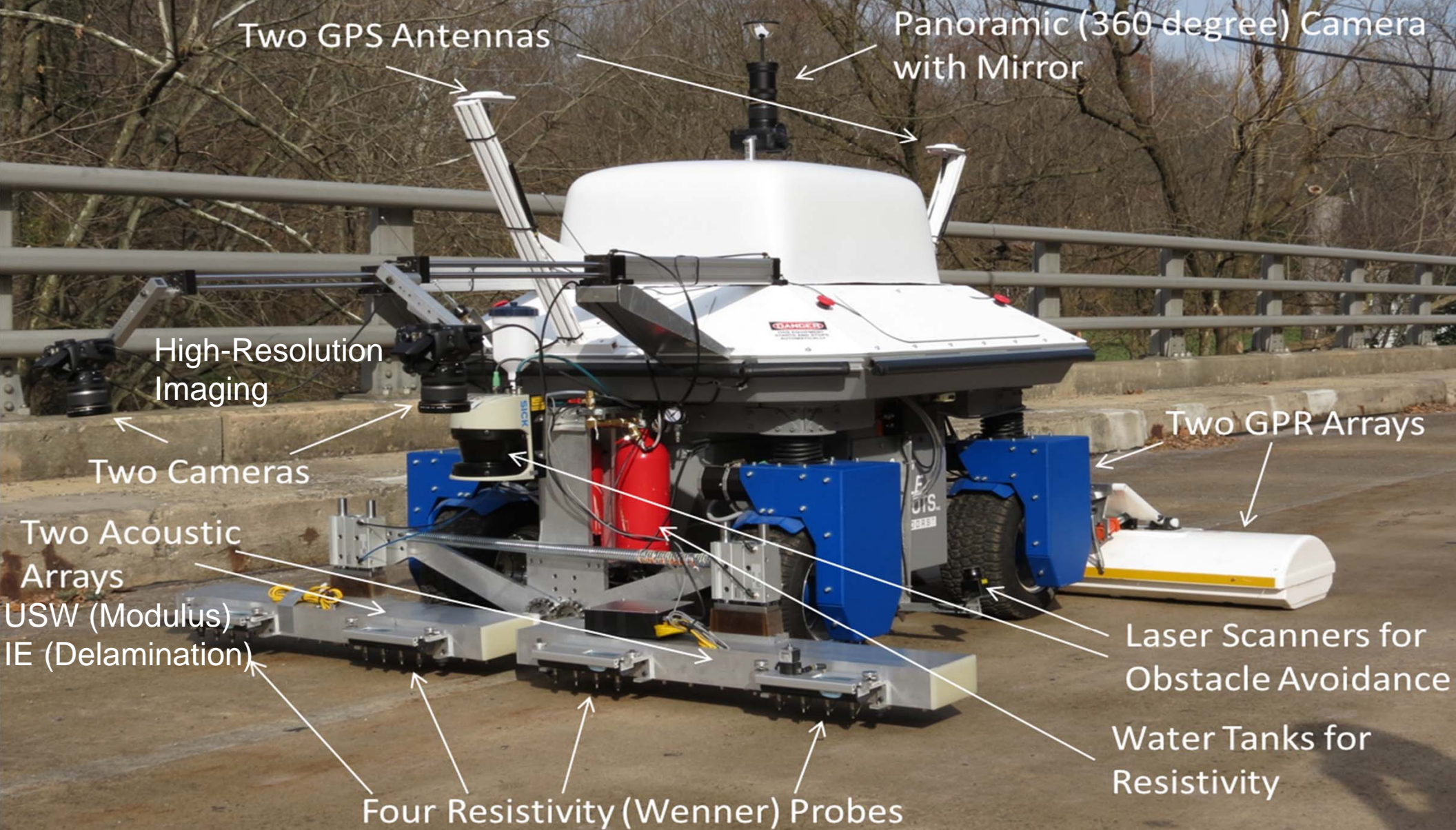
Need For Automated Data Collection

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.**



Patent Pending

RABIT™ COMPONENTS





IDIQ Contract

- **Performance Management of Bridges Indefinite Delivery Indefinite Quantity (IDIQ) Contract**
- **Used in Support of the LTBP Program**
- **4 contractors were selected**
 - *Michael Baker Jr., Inc.*
 - *Parsons Brinckerhoff, Inc.*
 - *Pennoni Associates, Inc.*
 - *Professional Service Industries, Inc. (PSI)*



IDIQ Contract - Pennoni Associates

- **Onsite Staff for Technical Assistance**
 - *Outreach/presentations/meetings/publication/webinar/website*
- **Development, Validation, and Maintenance of Protocols**
- **Validation of NDE Tools and the RABIT™**
- **Develop Quantitative Bridge Traffic Database**
 - *Funds from SAFETEA-LU Earmark*
 - *Pooled-Funds for Study TPF-5(283)*
- **Develop Accelerated Testing Database (SAFETEA-LU Earmark)**
- **Data-Driven Bridge Condition Index (IRT)**
- **QA/QC**



LTBP Strategic Bridge Performance Matrix

- **Developing LTBP Strategic Bridge Performance Matrix in Conjunction with Rutgers**
- **Replaces “Tablecloth”**
- **Also Developing an “Operational Matrix”**



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- **Meetings with the States**



State Coordinators

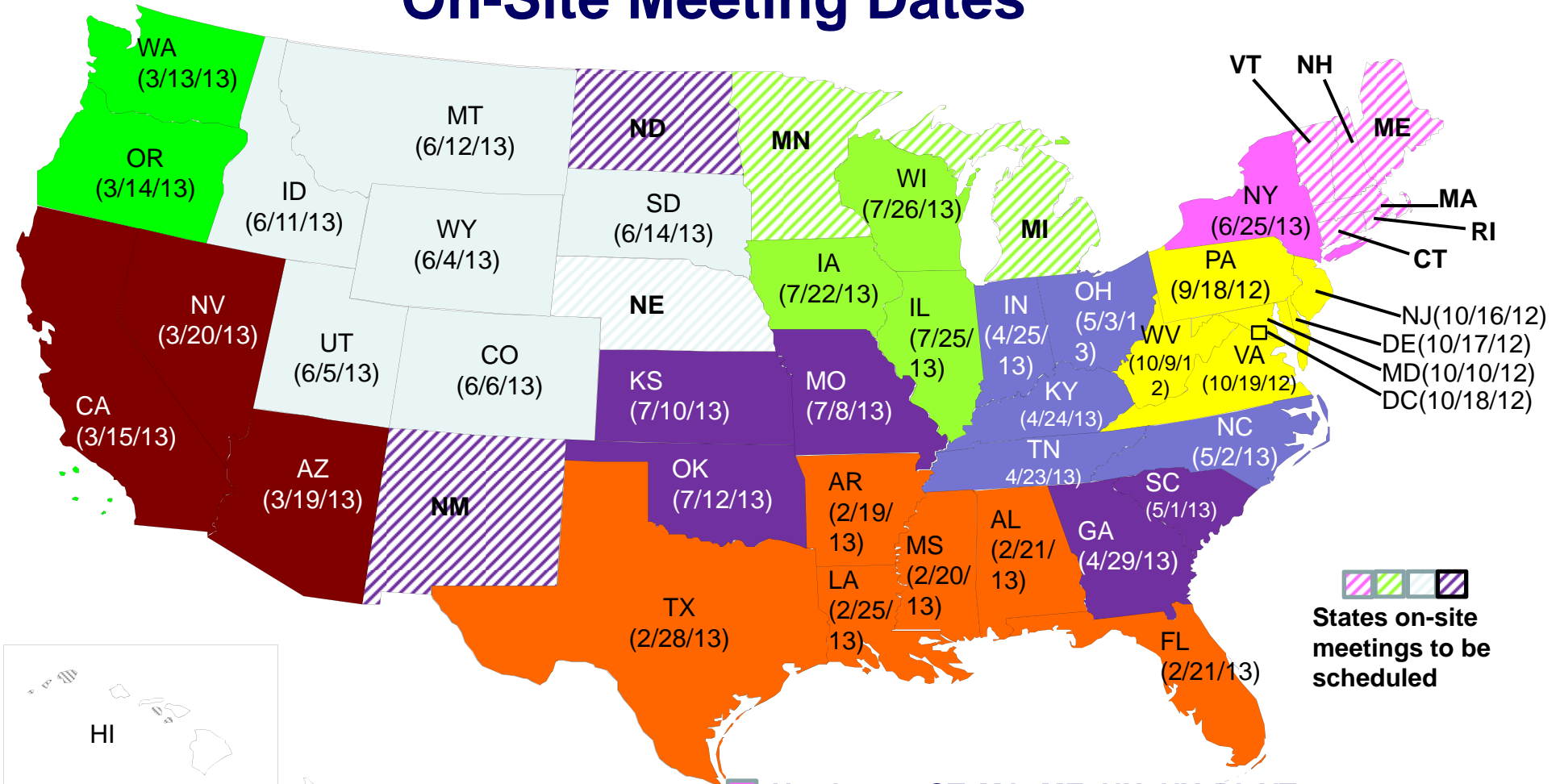
- August 28-29, 2013—Held Annual Meeting of LTBP State Coordinators
 - *Showcased the RABIT™ Bridge Deck Assessment Tool in the Hotel*



Meetings with States - Status Update

- **Met with 38 States (incl. DC) to Date; 14 Remaining**
- **FHWA Division Bridge Engineers Attended**
- **Two-Way Conversation:**
 - *LTBP Objectives and Summary*
 - *What Are State's Key Bridge Issues?*
 - *Create DOT's Bridge Practices Timeline*
 - *Discuss Specific Candidate Bridges*

On-Site Meeting Dates



States on-site meetings to be scheduled

- Northeast:** CT, MA, ME, NH, NY, RI, VT
- Mid-Atlantic:** DC, DE, MD, NJ, PA, VA, WV
- East Central:** IN, KY, OH, TN, NC
- Mid West (Central):** IA, IL, MI, MN, WI
- Gulf Coast:** AL, AR, FL, LA, MS, TX
- Rocky Mountains:** CO, ID, MT, NE, SD, UT, WY
- NW:** OR, WA
- SW:** AZ, CA, NV
- Corridor:** GA, KS, OK, MO, ND, NM, SC





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- **Publications**



LTBP Products - Publications

Recently Published Documents:

- Robot Brochure
- Report: *FHWA LTBP Workshop to Identify Bridge Substructure Performance Issues (NTIS Only)*
- TechBrief: *FHWA LTBP Workshop to Identify Bridge Substructure Performance Issues (Web and Print)*
- Newsletter: *2 Issues*



LTBP Products - Publications

Documents Due Out In Next 6 Months:

- Report: *LTBP Bridge Performance Primer*
- TechBriefs:
 - *LTBP Bridge Performance Primer*
 - *FHWA LTBP Industry Day*
 - *LTBP High Priority Bridge Performance Issues*
- Newsletters:
 - *Issue #3*
 - *Issue #4*



Protocols—Identification and Publishing

- **Needed for Consistent Data Collection**
- **115 Identified or Written to Date**
- **Protocols = Living Documents**
- **Publish New Report Every 2 Years**
- **Publish Interim on Web Between Reports**
- **Encourage State DOTs & Academia to Use**



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- **Timelines of Bridge Practices**



Bridge Practices Timeline

(LTBP Low-Hanging Fruit)

Creating National Bridge Practices Timelines:

Standalone Reports (1960 to Present)

- Met with Steel Industry
 - Changes in Composition of Steel
 - Changes in Coatings/Paint for Steel Bridges
 - Changes in Steel Bridge Detail



Bridge Practices Timeline

(LTBP Low-Hanging Fruit)

Creating National Bridge Practices Timelines:

Standalone Reports (1960 to Present)

- Met with Concrete Industry
 - Changes in Mix Components—Cement, Cementitious Materials, and Additives
 - Changes in Coatings/Types of Rebar
 - Changes in Concrete Bridge Details—Ex: Curing



Bridge Practices Timeline

(LTBP Low-Hanging Fruit)

Creating National Bridge Practices Timelines:

Standalone Reports (1960 to Present)

- Working with Each State
 - When Did State Adopt/Change Steel and Concrete Bridge Practices?
 - How and When Have Deck Practices Changed?
 - When Did State Use Overlay Types?
 - When Did State Use Different Types of Bearings and Deck Joints?

Georgia DOT Deck Cover

Pre 1970	2"
1970-1985	2 ½" – Northern Half 2" – Southern Half
1985-Present	* 2 ¾" – Northern Half * 2 ¼" – Southern Half



*** ¼" added to facilitate deck grinding and grooving**



***Thank You!
Questions?***