Long-Term Bridge Performance Program

An Update* for the Bridge TWG @ AASHTO SCOM, 2016

* Incomplete, Incoherent, Off-the-Cuff & Wholly Unauthorized

Program Background

LTBP Program

Long-Term Bridge Performance Program

Program Background

LTBP Program

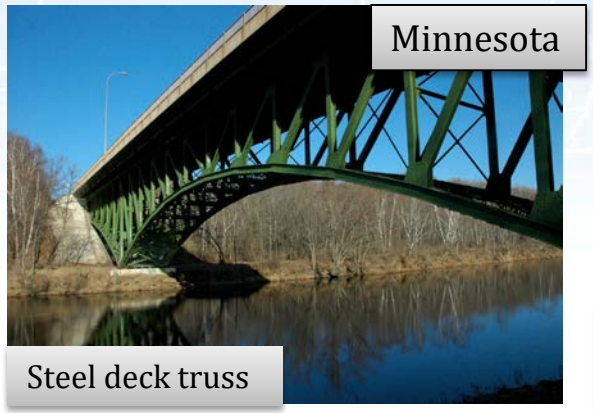
Pilot States and Bridge Types

California

2-span prestressed post-tensioned continuous CIP box girder

New York

Two simple spans of adjacent concrete box beams



Minnesota

Steel deck truss

Florida

Precast, segmental post-tensioned concrete box beams

Long-Term Bridge Performance Program

U.S. Department of Transportation
Federal Highway Administration

Long-Term Bridge Performance Program

Scope of LTBP—Main Study

Program Background

LTBP Program

I. Synthesis of Existing Information
II. Create Bridge Portal with NBI Data
III. Survey 15 States
IV. Determine High-Priority Issues
V. Establish Data Gathering Protocols
VI. Verify Data Protocols on Pilot Bridges
VII. Add Pilot Bridge Data and State Element-Level Data to Bridge Portal

Long-Term Bridge Performance Program

Scope of LTBP—Main Study

Program Background

LTBP Program

VIII. Select Bridges for Long-Term Data Gathering

IX. Gather Long-Term Data

X. Analyze all Data

XI. Develop/Refine Models (DMM and CAMM)

XII. Make Models Available for States' Bridge Management Systems

XIII. Create Suite of "Best Practice" Publications

LTBP Program – Bridge Portal Update

LTBP Bridge Portal

Data Management

- Version 1 of the LTBP Bridge Portal was integrated with UPACS system and is available through FHWA network
- Will discuss future development and will address questions/concerns pertaining to access this afternoon

Version 1 available as of October 1, 2015

Long-Term Bridge Performance Program

Program Background

LTBP Program

Bridge Performance – High Priority Topics

Based on input from stakeholders and considering current resources of the program, the following key topics will initially be addressed:

Category	Issue
Decks	Untreated Concrete Bridge Decks
Decks	Treated Concrete Bridge Decks
Joints	Bridge Deck Joints
Bearings	Bridge Bearings
Steel Bridges	Coatings for Steel Superstructure Elements
Concrete Bridges	Prestressing Wire, Strands, & Tendons

Long-Term Bridge Performance Program

LTBP Program | Research Methodology

Data Collection Approach

Candidate Bridges – Legacy Data Mining

- **Selected to provide context, assess variability, and ensure that the cluster bridges are representative**
- **Performance tracked through standard element-level inspection**

Cluster Bridges

- **Selected to allow the investigation of various input and attribute influences on performance**
- **Performance tracked through targeted use of technology and enhanced visual inspection procedures**

Reference Bridges

- **Representative of the most common inputs and attributes of selected bridge type**
- **Rendered completely transparent through the application of the state of the art assessment and monitoring approaches**

Long-Term Bridge Performance Program

Representative Bridges

Based upon an analysis of the National Bridge Inventory Database:

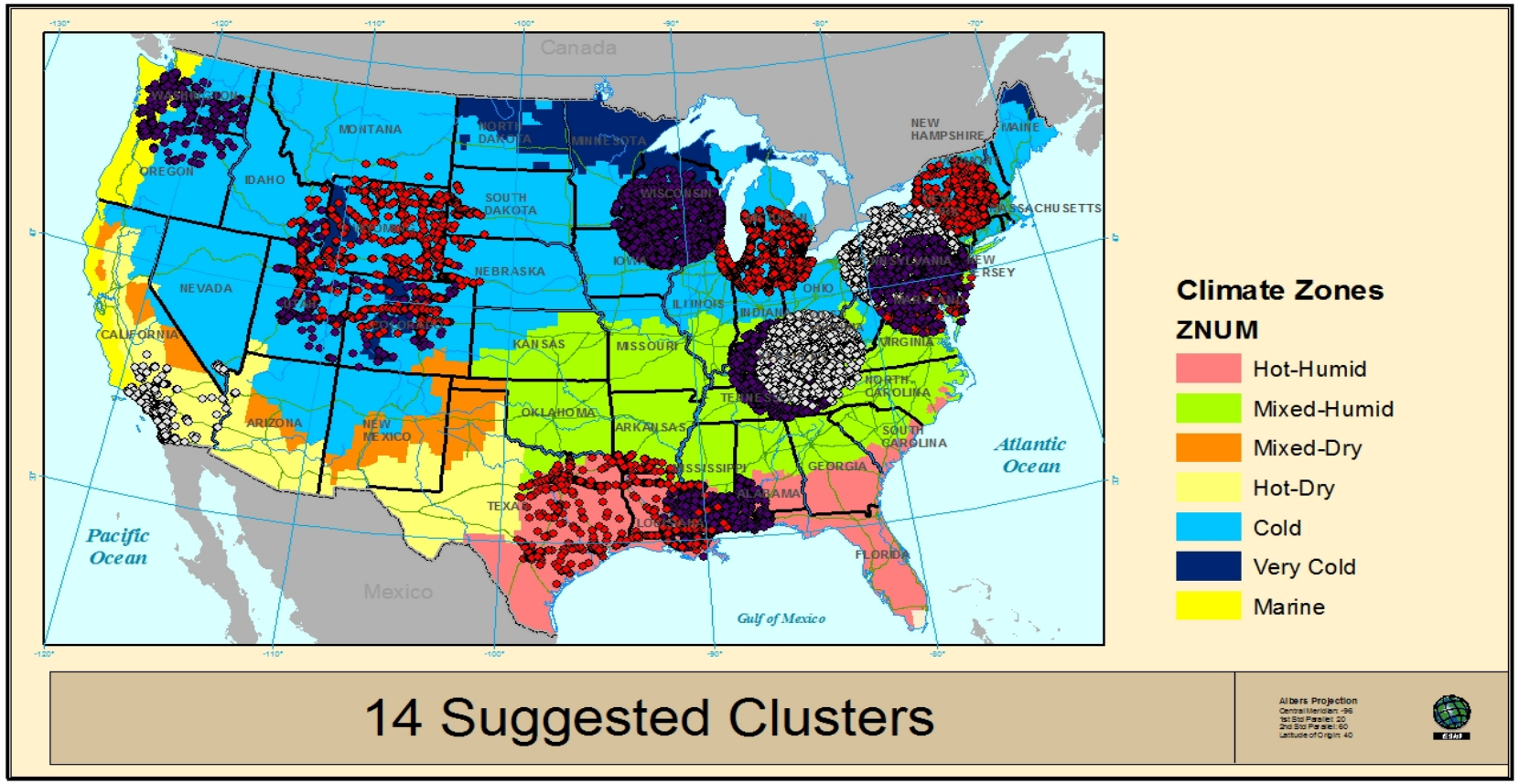
- **Steel stringer**
- **Prestressed Concrete Multi-girder**
- **Prestressed Concrete Box Girder**
- **Adjacent Box Beam Bridges**

were selected as the most representative

Long-Term Bridge Performance Program

LTBP Program

Research Methodology



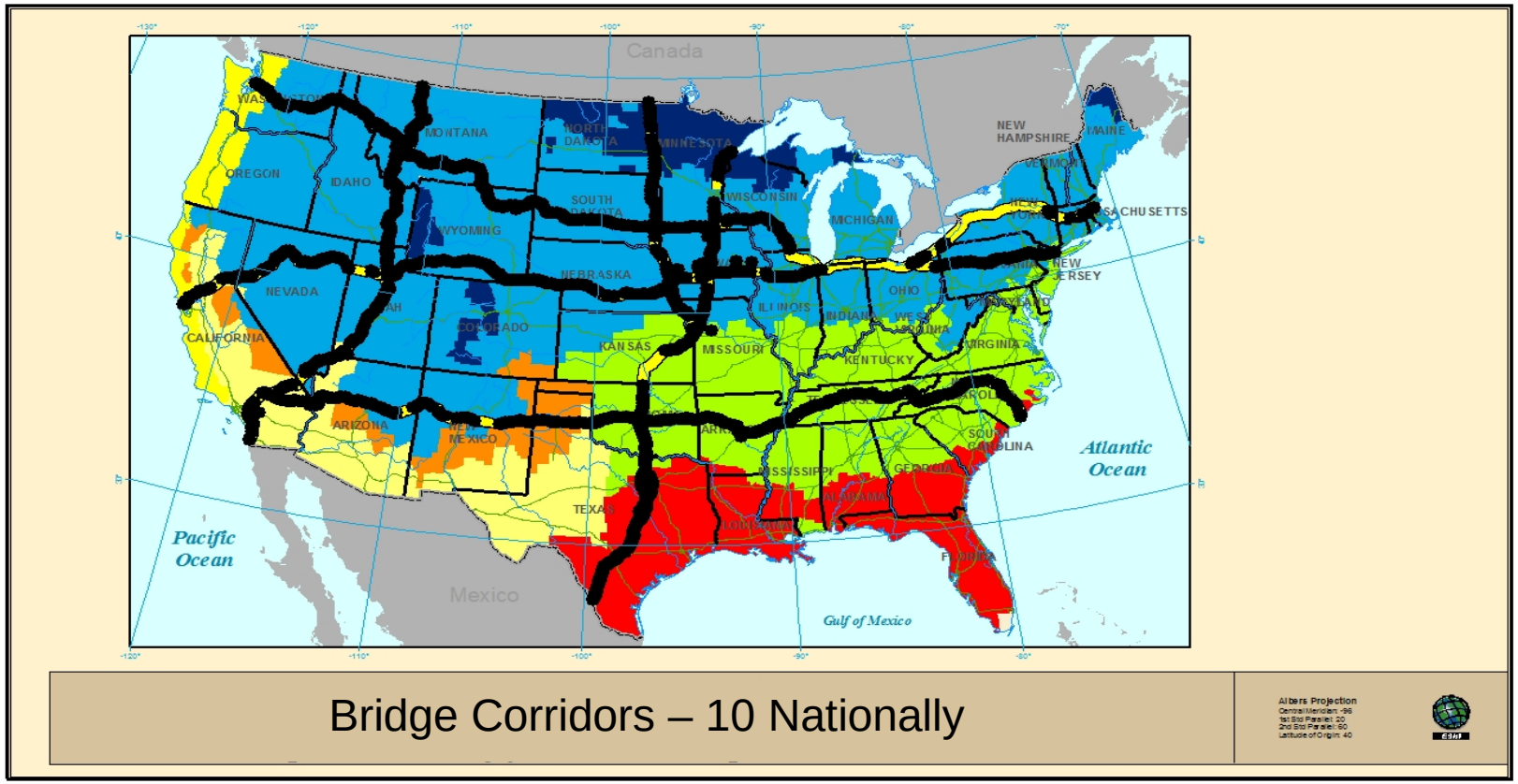
Long-Term Bridge Performance Program

U.S. Department of Transportation
Federal Highway Administration

Long-Term Bridge Performance Program

LTBP Program

Research Methodology

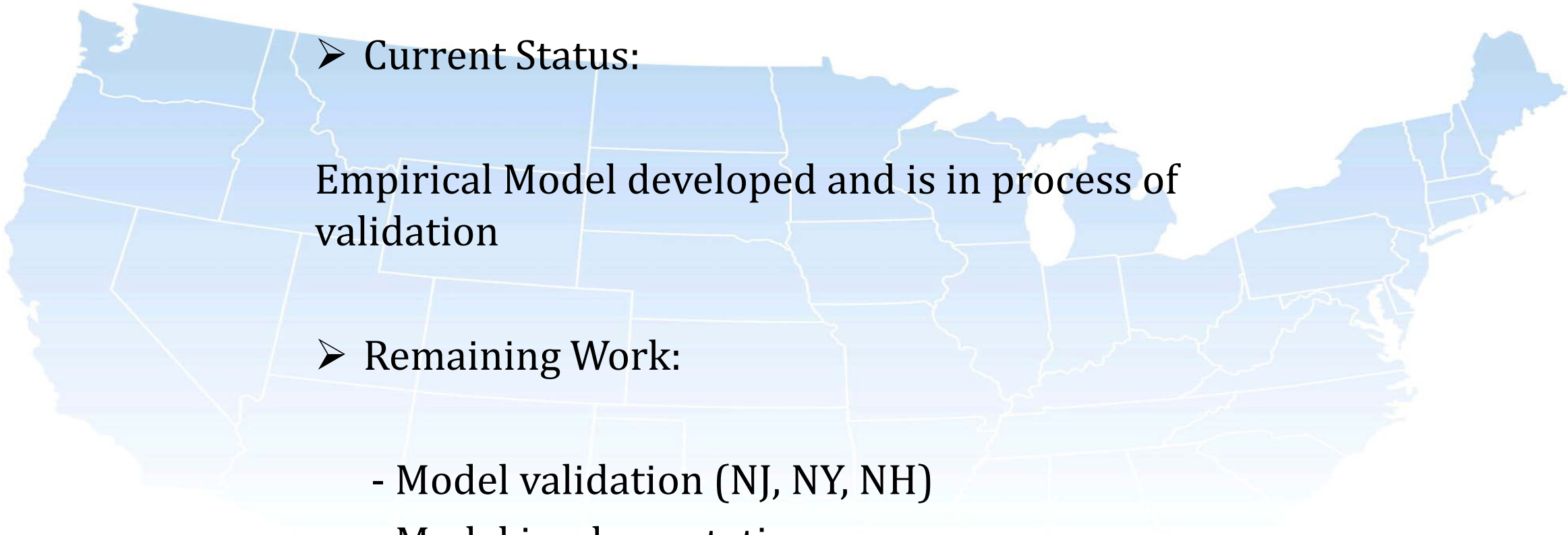


Bridge Corridors – 10 Nationally

Long-Term Bridge Performance Program

U.S. Department of Transportation
Federal Highway Administration

LTBP Data-Driven Deterioration Model - Rutgers



- Current Status:

Empirical Model developed and is in process of validation

- Remaining Work:

  - Model validation (NJ, NY, NH)
  - Model implementation
  - Model integration with Bridge Portal