



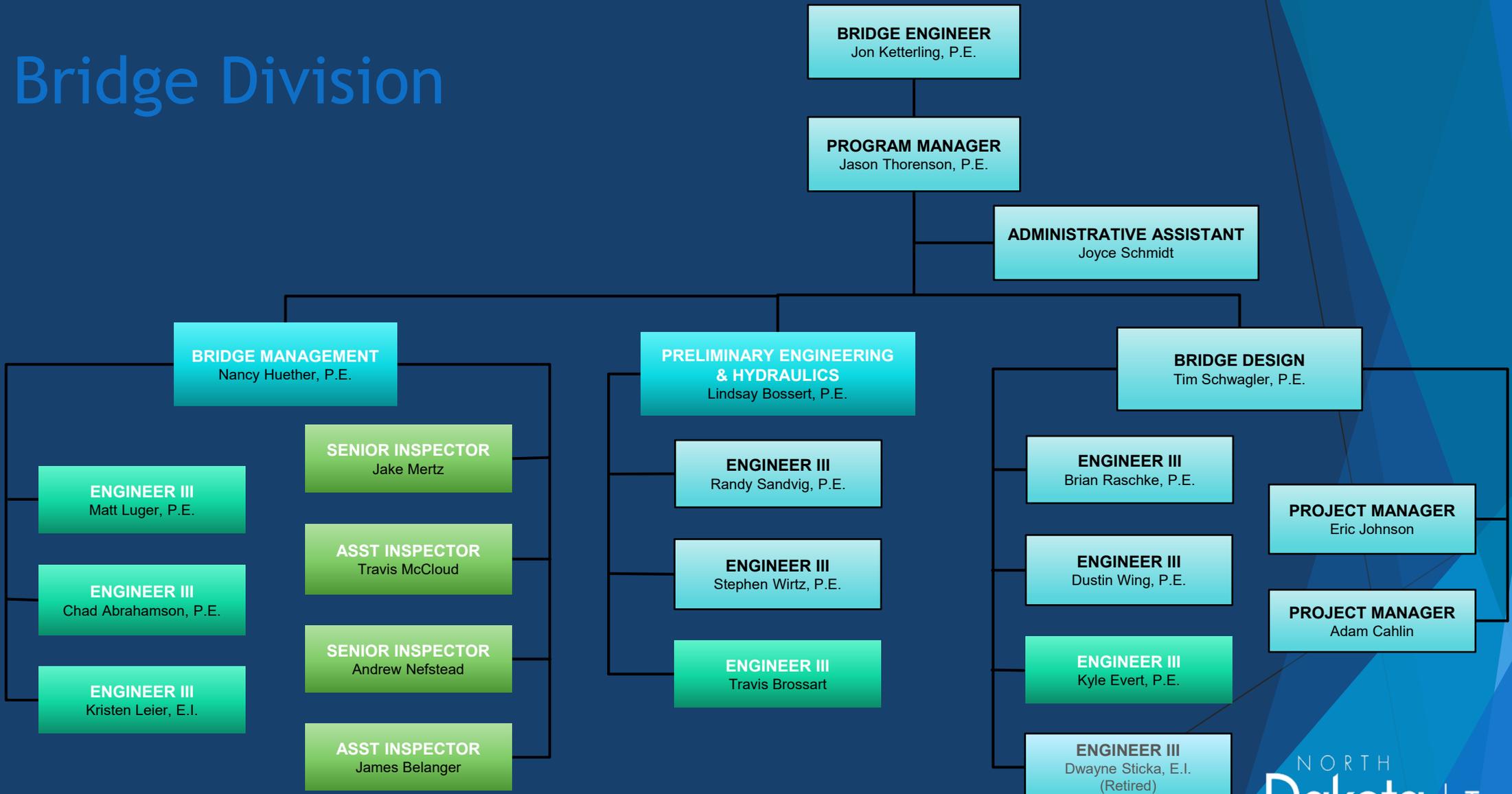
# Bridge Management at the NDDOT

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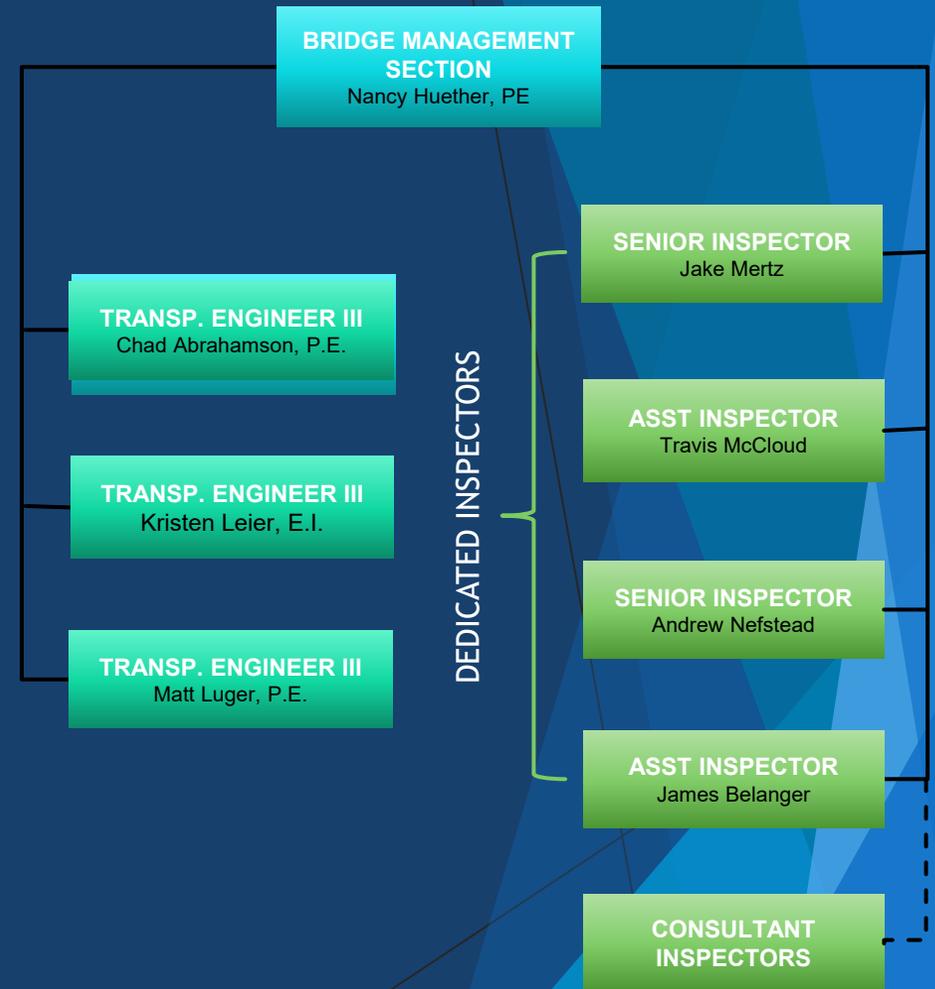
Matt Luger, P.E.

# Bridge Division



# Changes in Bridge Management Section

- ▶ Retirements - 3 of 4 staff < 1 year
- ▶ New Bridge Management Staff
  - ▶ Bridge Management System
  - ▶ Bridge Inspection
  - ▶ Load Rating
  - ▶ Bridge Preservation
  - ▶ Dedicated Bridge Inspectors - State System
    - ▶ Consultant Bridges Inspectors - Local System



# Life of a Bridge

We Need a Bridge!

*Bridge Management*  
Inspect - SAFETY & Condition  
Load Rate - SAFE Capacity  
Maintain Inventory; Manage Bridges  
Preserve (w/Maintenance & Districts)  
Life of the bridge - 50 to 100 Years!

*Prelim. Eng. & Hydraulics*  
Environmental - Keep critters safe & happy!  
Hydraulics - How much water needs to pass?

*Construction*  
Build it right!  
In compliance with Specs  
According to Plans

*Design*  
Use Concrete or Steel?  
How many piers?  
Can we make it look cool?

# What's Changing?



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

**DRAFT**

*Specifications  
for the National  
Bridge Inventory*



Office of Bridges and Structures

Draft 10/10/2019

- ▶ New Manuals
  - ▶ Bridge Inspection Manual (Draft)
  - ▶ Load Rating Manual (Draft)
- ▶ FHWA NPRM (Notice of Proposed Rule Making)
  - ▶ National Bridge Inspection Standards (NBIS)
    - ▶ 23 CFR Part 650, Subpart C
  - ▶ Replace the FHWA Coding Guide
  - ▶ Specifications for National Bridge Inspections (SNBI)
  - ▶ Anticipate Final Rule early 2021 . . . or later

# What's Changing?



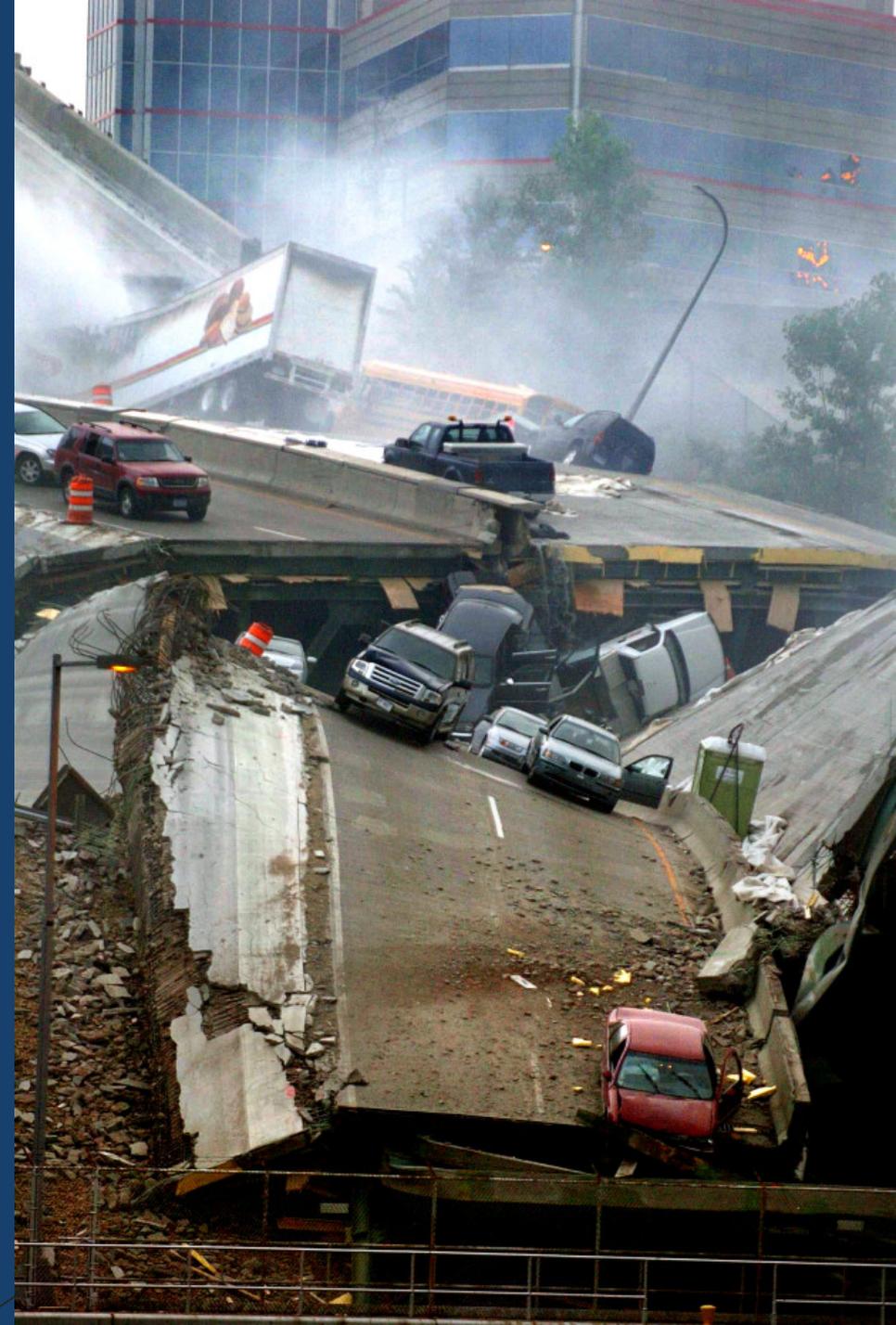
- ▶ Bridge Inspection Program
  - ▶ Dedicated State Inspectors
    - ▶ Compliance w/ FHWA Metrics; timelines
    - ▶ Improved Detail needed for Managing Bridge Assets
  - ▶ Consultant Local Agency Inspectors
    - ▶ 4 Regions
    - ▶ 4 Consultants (HDR, AECOM, Collins/SRF, Stantec)
    - ▶ Inspections and Load Ratings
    - ▶ NDDOT guidelines; NDDOT responsible for records, timelines
- ▶ Different Inspection App (inspectX)

inspectX



# FHWA 23 Metrics

- ▶ I-35W Bridge, Minneapolis, MN
  - ▶ Collapsed August 1st, 2007
- ▶ FHWA - Metrics for the Oversight of the National Bridge Inspection Program





# FHWA 23 Metrics

- ▶ FHWA’s Compliance Review of Bridge Safety Inspection Program
- ▶ Metrics are assessed for compliance with NBIS
- ▶ 23 Metrics
- ▶ Four levels of Compliance
  - ▶ Compliant (C)
  - ▶ Substantially Compliant (SC)
    - ▶ Improvement Plan (IP)
  - ▶ Non-Compliant (NC)
    - ▶ Plan of Corrective Action (PCA)
  - ▶ Conditionally Compliant (CC)
    - ▶ Meet PCA requirements

Personnel Qualifications

Inspection Frequency

Inspection Procedures

## National Bridge Inspection Program Metrics

- Introduction .....
- NBIP Metrics Glossary .....
- Metric #1: Bridge inspection organization .....
- Metric #2: Qualifications of personnel – Program Manager.....
- Metric #3: Qualifications of personnel – Team Leader(s) .....
- Metric #4: Qualifications of personnel – Load Rating Engineer .....
- Metric #5: Qualifications of personnel – UW Bridge Inspection Diver ...
- Metric #6: Inspection frequency – Routine – Lower risk bridges.....
- Metric #7: Inspection frequency – Routine – Higher risk bridges.....
- Metric #8: Inspection frequency – Underwater – Lower risk bridges .....
- Metric #9: Inspection frequency – Underwater – Higher risk bridges.....
- Metric #10: Inspection frequency – Fracture Critical Member.....
- Metric #11: Inspection frequency – Frequency criteria .....
- Metric #12: Inspection procedures – Quality Inspections.....
- Metric #13: Inspection procedures – Load Rating .....
- Metric #14: Inspection procedures – Post or Restrict .....
- Metric #15: Inspection procedures – Bridge Files .....
- Metric #16: Inspection procedures – Fracture Critical Members.....
- Metric #17: Inspection procedures – Underwater.....
- Metric #18: Inspection procedures – Scour.....
- Metric #19: Inspection procedures – Complex Bridges.....
- Metric #20: Inspection procedures – QC/QA .....
- Metric #21: Inspection procedures – Critical Findings .....
- Metric #22: Inventory – Prepare and Maintain .....
- Metric #23: Inventory – Timely Updating of Data .....

## Metrics for the Oversight of the National Bridge Inspection Program



May 2017

[ToC](#)

# What else do we do?

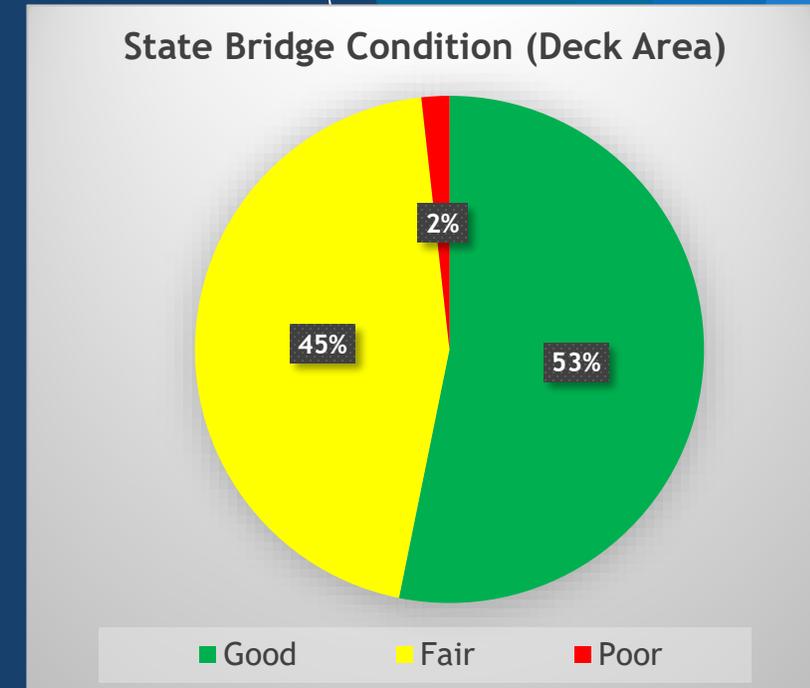
## ▶ Bridge Inventory Management

### ▶ Maintain Inventory - All public bridges in State\*

- ▶ 4955 Bridges (1755 State; 3200 County/Urban/Other Public)
- ▶ >130 Data items per Bridge
  - ▶ Location, Condition, Structure Type & Material, Date Built, Length, Width, Owner, Feature Crossed, etc.
- ▶ Elements, Defects, Protective Systems
- ▶ Submitted to FHWA

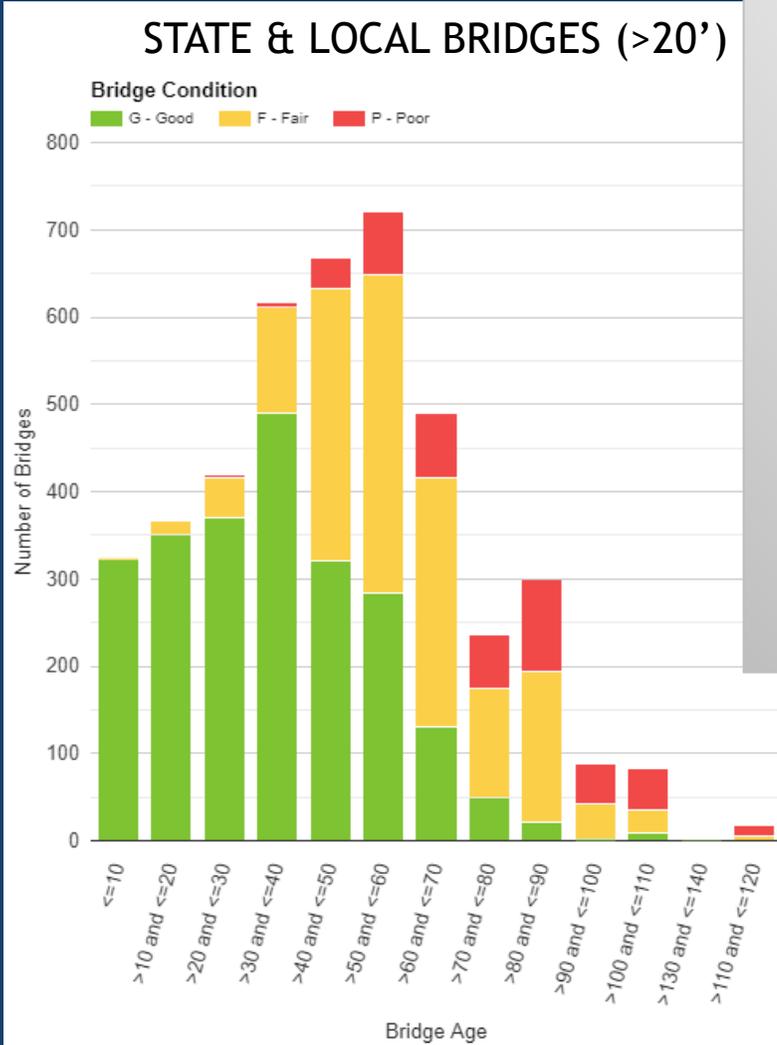
## ▶ Asset Management (AASHTOWare BrM) - State Bridges

- ▶ *Operate, maintain, and improve assets . . . based on quality information . . . through maintenance, preservation, repair, rehabilitation, and replacement . . . maintain state of good repair . . . at minimum cost*
- ▶ Performance Measures
- ▶ FHWA Transportation Asset Management Plan (TAMP)
- ▶ Deterioration Modeling & Condition Forecasting
- ▶ Program & Project Planning & STIP

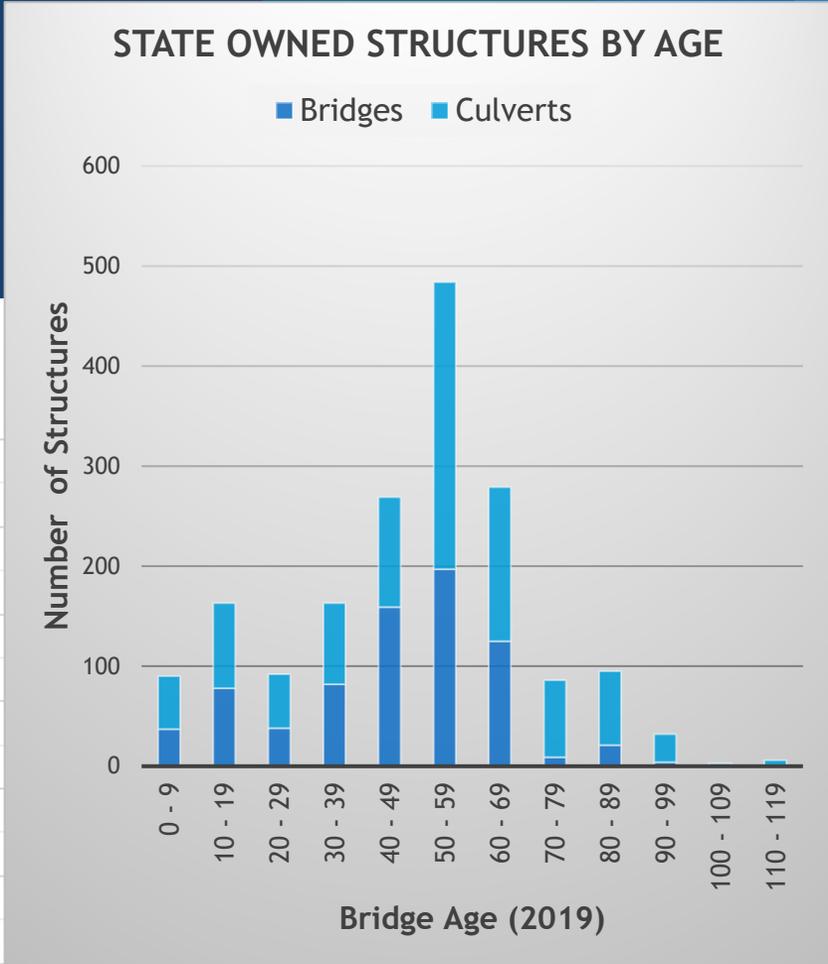


# Challenges - Aging Bridges

- ▶ Design life
  - ▶ Past typically 50 yrs
  - ▶ Current - 75 yrs +
- ▶ Current Bridge Age
  - ▶ State & Local Bridges >20'
  - ▶ State Owned Bridges
    - ▶ Includes Box Culverts & Structural Plate Pipes  $\geq 8'$
- ▶ Manage
- ▶ Maintain/Preserve



Courtesy of LTBP FHWA InfoBridge website



## ▶ Bridge Preservation

- ▶ Actions/Policies that cost effectively keep bridge in good condition and increase the life of the bridge
- ▶ Work with Maintenance Division & Districts
  - ▶ Clean, Sweep, Flush
  - ▶ Crack Seal
  - ▶ Silane Treat (Water Repellent)
  - ▶ Completing Repairs - Minor to Moderate Rehab
- ▶ Keep small problems from becoming big problems

Keep Bridges in Good Condition;  
Make them Last



# NDDOT Bridge Management . . .

- ▶ Inspect
- ▶ Load Rate
- ▶ Manage
- ▶ Preserve



*Safely Move People and Goods*