



BrMUG



September 16, 2014



SD Bridge Inventory Statistics





Number of NBIS Structures in SD (As of March 2014)

1797 State Owned (SDDOT) Structures

- 1260 bridges
- 537 culverts

3953 Local Government Structures

- 3145 bridges
- 808 culverts

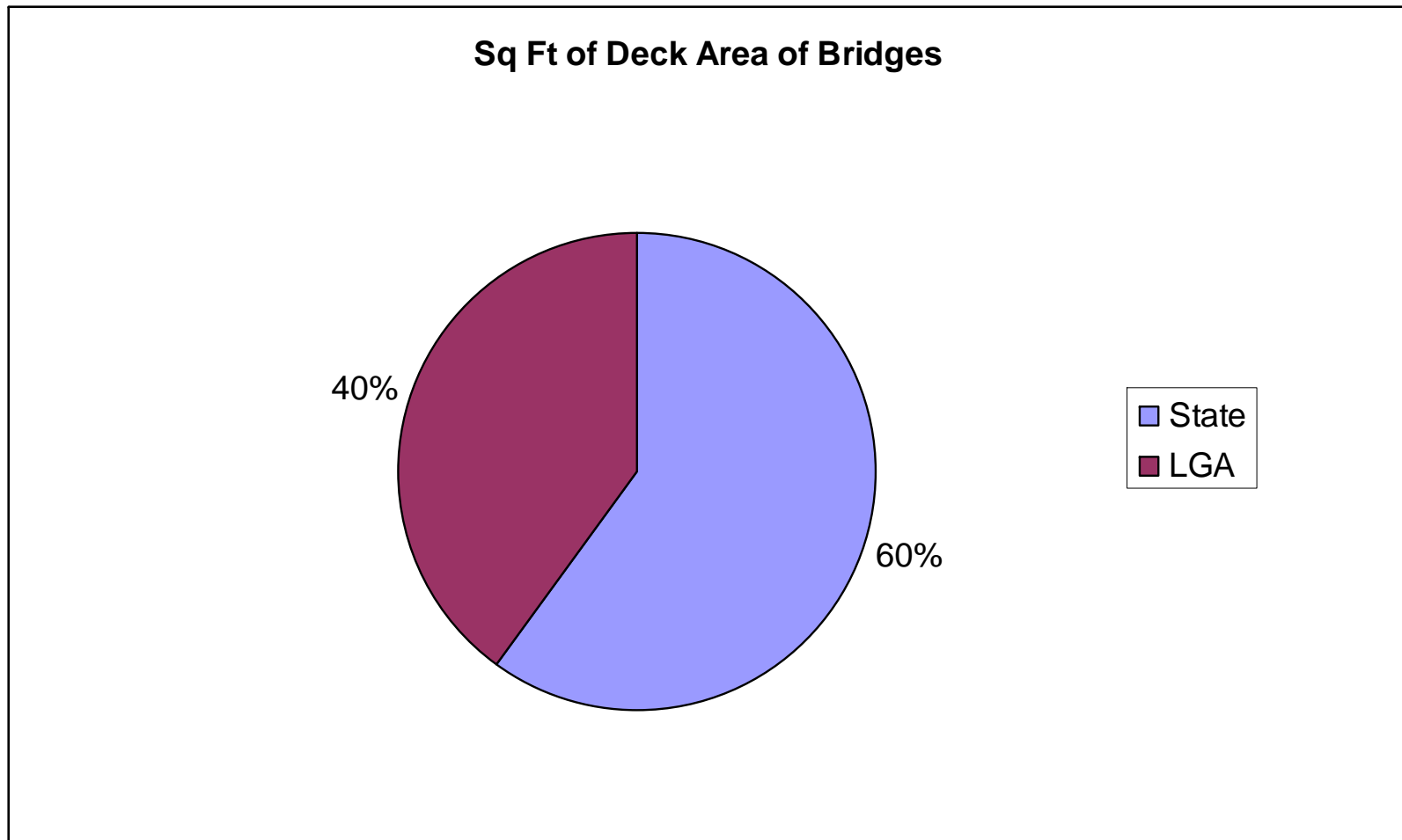


State vs. Local Government Inventory (LG)

- Number: LG bridges, about twice as many
- Deck Area: State bridges, about 1-1/2 times as much
- Traffic: State bridges, about six times more



State vs. Local Government Inventory (LG)



South Dakota

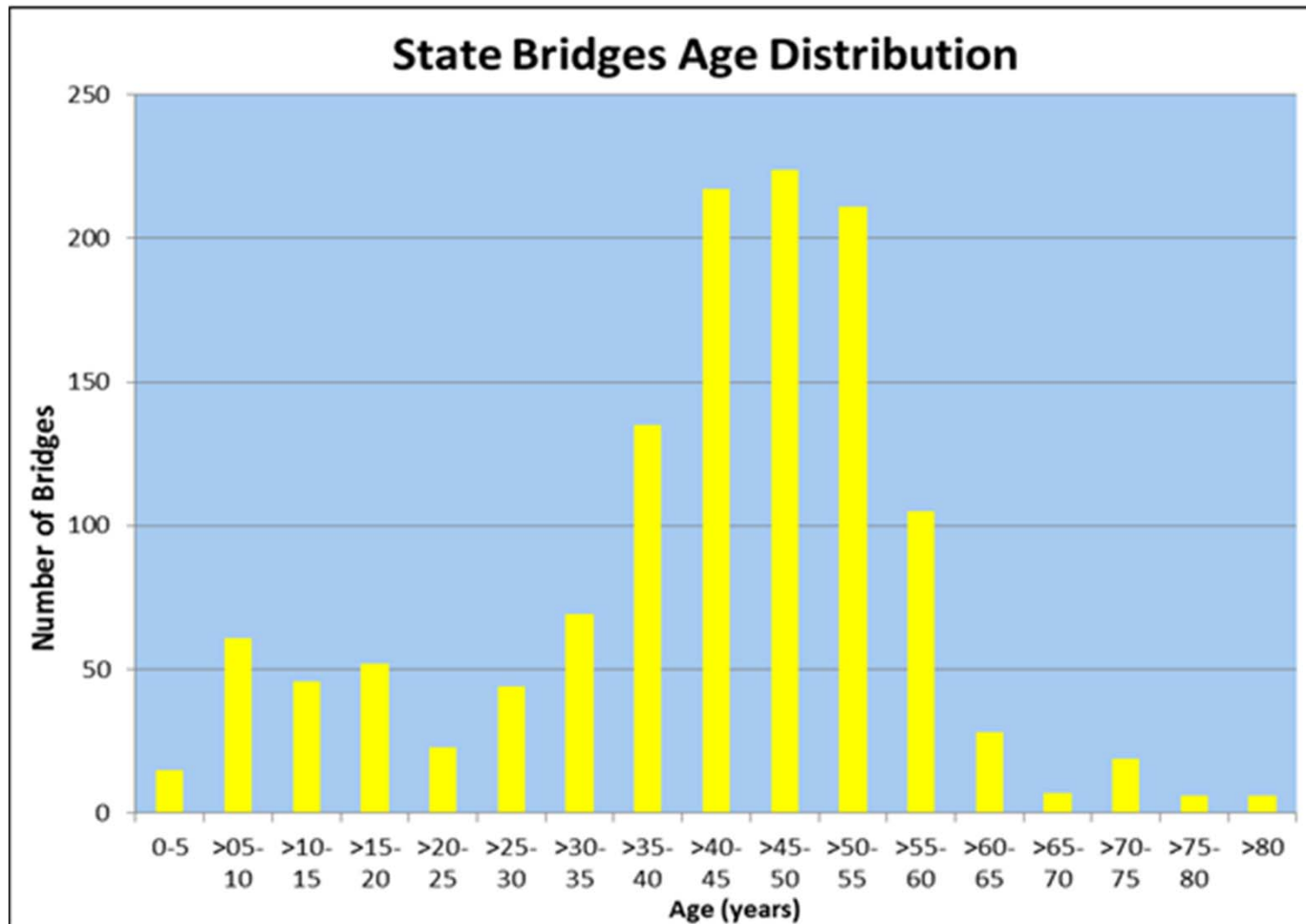


Typical State Owned Bridge

- About 8,300 sq ft
- About 210 ft long by 40 ft wide
- Average year built is 1970



Bridge Age Distribution





Misc. Bridge Info

- Longest Bridge –
 - *Platte-Winner bridge on SD 44*
 - *5656 ft long and 171,354 sq ft of deck area*
- 7 Missouri River Bridges in SDDOT Inventory
 - *Total 904,621 sq ft of deck area*
 - *Average length = 3,350 feet long*
 - *Account for about 9% of state bridges by deck area*

South Dakota



Platte – Winner Bridge





Condition Status of South Dakota Bridges





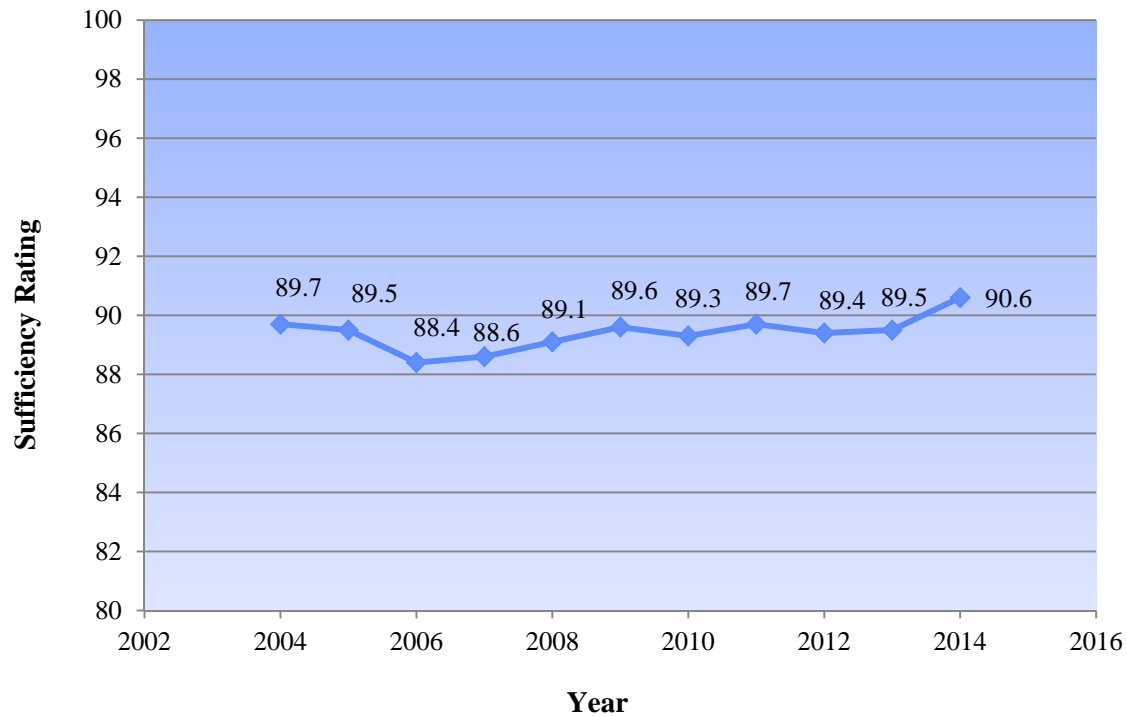
Bridge Condition Measures

- NBIS Federal Sufficiency Rating
- Deficiency Classification (Structurally Deficient / Functionally Obsolete)
- Health Index



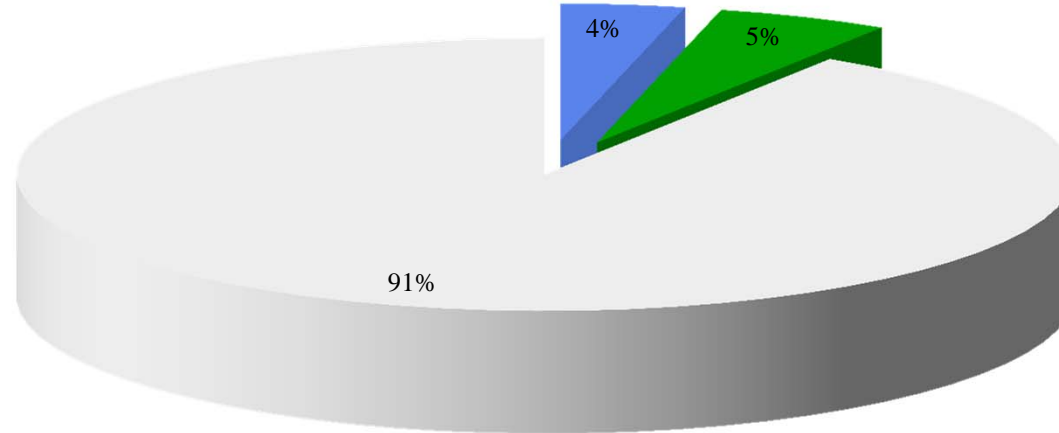
Federal Sufficiency Rating

Average Sufficiency Rating Index - State Bridges





Deficiency – State Owned

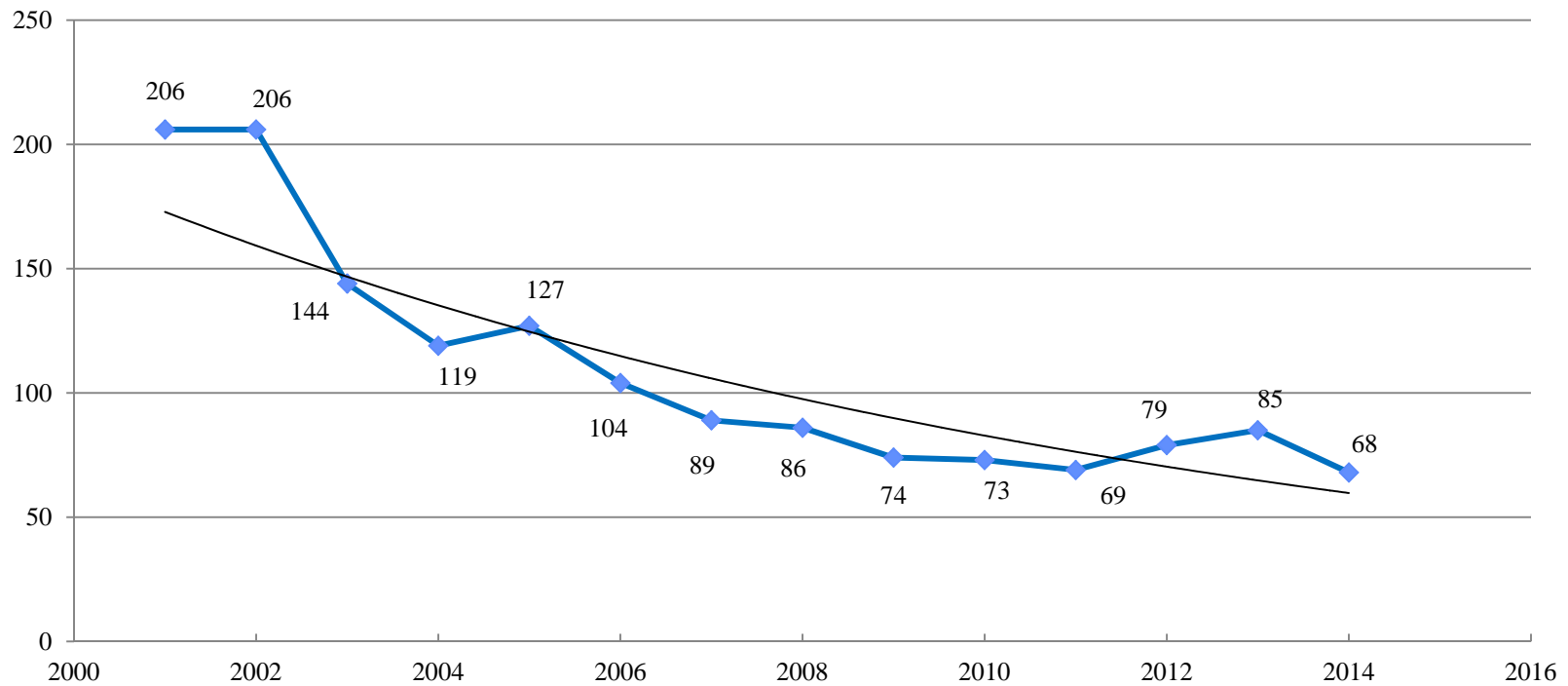


■ Structurally Deficient ■ Functionally Obsolete ■ Not Deficient



Structural Deficiency

**Number of Structurally Deficient Structures
(SDDOT Owned)**



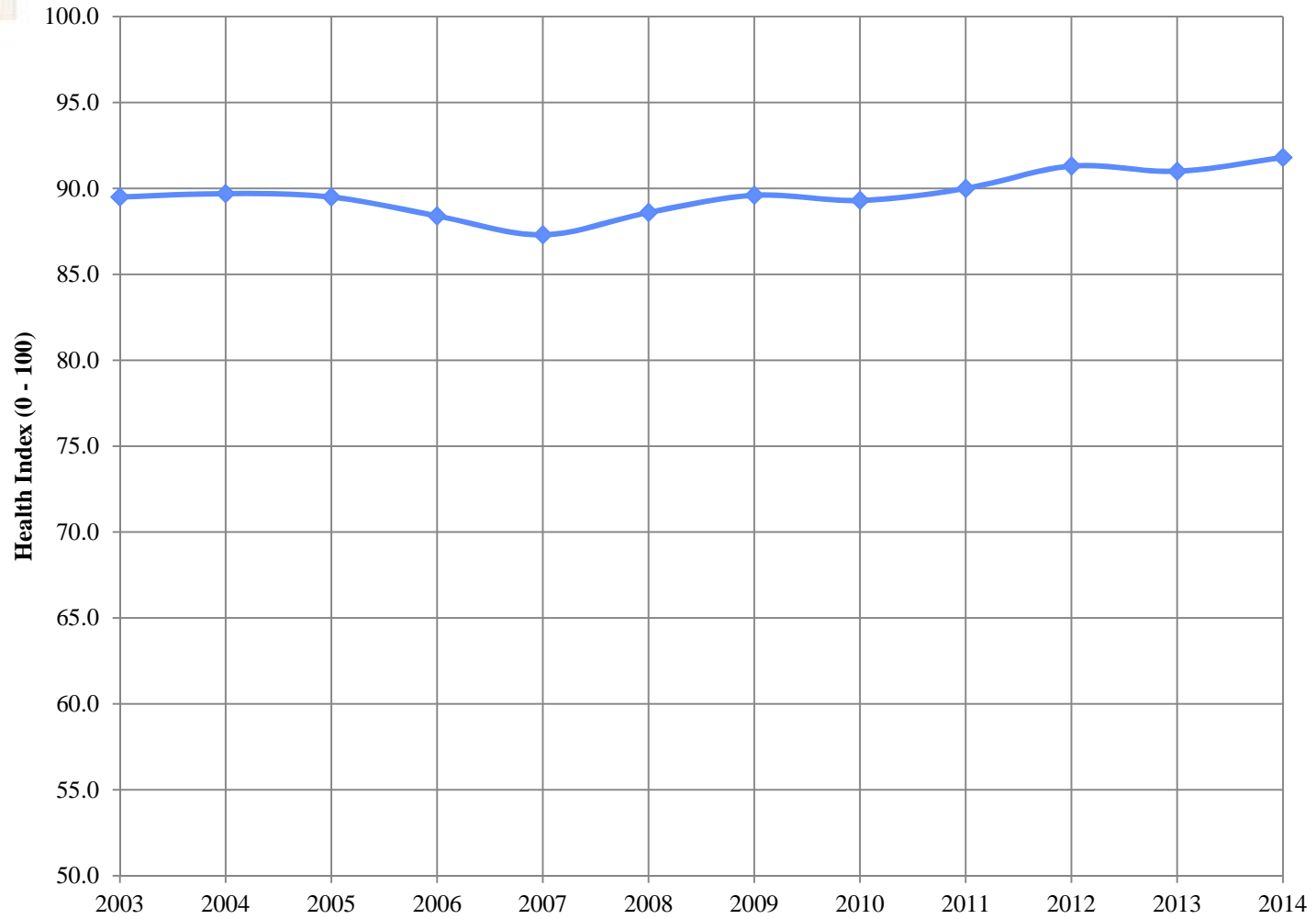


Structural Deficiency

- MAP-21 requires NHS bridges to have less than 10% by deck area to be Structurally Deficient
 - SDDOT is at 4.4%



Health Index





SD Bridge Management





Bridge Project Priorities

- Protection of bridge deck/slabs
- Minimize risk – scour countermeasures
- Waterproof Joints
- Upgrade bridge rail for safety
- Replace or repair deteriorated elements
- Replace structures when needed
- Coordination with mainline projects



Bridge Preservation Practices

- Rigid concrete overlay program for decks with black resteel (ongoing since 70's)
- Deck joint retrofitting to eliminate or better waterproof existing joints (also since 70's)
- Routine deck crack sealing (epoxy)
- Thin polymer deck overlays (typically two coats of epoxy with broadcast aggregate)
- Fatigue retrofitting of category E details on steel superstructures
- Patching and protection of substructure units



New Bridge Design Longevity Practices

- Jointless deck design with integral abutments (ongoing since 70's)
- Increased top clear cover (2 1/2") and use of ECR type deck resteel (since late 70's)
- Silane sealer deck application @ completion of construction
- Stainless and dual coated rebar (metalized + epoxy coated) considered on limited basis



Bridge Project Programming

- Inspector recommendations
- Region/Area recommendations
- Guidelines based upon proven standard bridge preservation practices
- Bridge Management System (BMS) recommendations
- Coordination with other projects for timing



Bridge Programming Considerations

- Balance work/needs with available funds
- Coordinate with grading/surfacing projects
- Cost effectiveness of structure work
 - *Life cycle cost analysis methods*



Programmed Spending Levels (average per year on State structures)

- Interstate 3R – varies around \$8 - 10 million
- Bridge Program - \$15.5 million
 - Includes structure replacement, rehabilitation and preservation projects
- Other - Variable depending on number of structures included in grading and resurfacing projects.



BMS Capabilities (Pontis/BrM)

- Inventory & Inspection Database
- Performance Implications of Investment & Preservation Strategies
 - *Given specified budget, estimate future health index*
- Generate Candidate Bridge Projects
- Develop Project Scope of Work



SDDOT History with BrM

- Been active with AASHTO products of Pontis and now Bridge Management since mid-1990's
- Some initial work in Pontis 2.0
- Production with Pontis 3 in 1997
- Developed element deterioration models
- Been using Pontis as part of project planning and programming
- Have entire STIP and all past projects in the application



SDDOT Future BrM

- Migration of CoRe Elements to 2013 AASHTO Elements
- Migration from Sybase to SQL Server database
- Migration from Pontis 4.4.3 to Bridge Management 5.2.1 SP2



Questions?

