Bridge Expansion Joint Committee Interim Report

Midwest Bridge Preservation Partnership Conference

Kansas City, Missouri, Sept 30 – Oct 2 ,2015

Committee Objectives

- Develop Bridge Expansion Joint Matrix and document “Prevailing Practices” utilizing National Elements as a common platform to communicate
- Committee Members
  - Debbie Steiger (Chair) – Watson Bowman Acme
  - Ted Hopwood - Kentucky Transportation Center
  - Herb McDowell – Idaho Department of Transportation
  - Mike Lee – California Department of Transportation
  - Bruce Thill – Washington Department of Transportation
  - Lisa Zentner– Crafco
  - Joe Becker – RJ Watson
  - Jeremy Koonce – Collins Engineering
  - Jaime Tuddao – Nevada Department of Transportation

Bridge Expansion Joint Matrix

- ❑3 Joint Types
- ❑National Survey
- ❑Document *"Prevailing Practices"*

Bridge Joints: Generic Joint Type	ELI (Element Level Inspection)
Strip Seal Expansion Joint	300
Pourable Joint Seal	301
Compression Joint Seal	302
Assembly Joint with Seal	303
Open Expansion Joint	304
Assembly Joint without Seal	305
Other Joint	306

Bridge Expansion Joint Matrix

- 5 Tab Matrix
  - General : Joint Type and Manufacturer information
  - Installation Practices
  - Current Practices to Avoid
  - Design Practices
  - Life Expectancy

Designed to be user friendly, informative to the owner (DOT) in key discipline areas

Data Collection

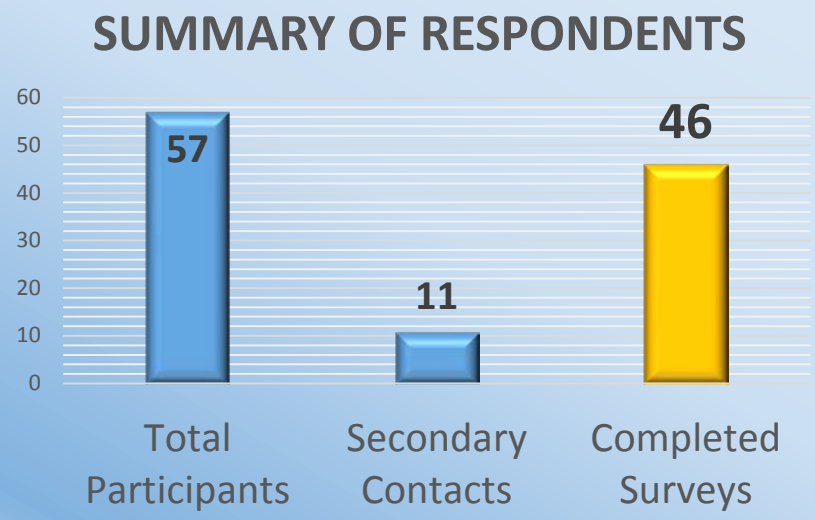
- SurveyMonkey: developed to gain an understanding of current joint use by DOTs within the WBPP both from the design and maintenance perspective and to determine selection, installation and maintenance factors that affect joint performance. (Capture regional differences)

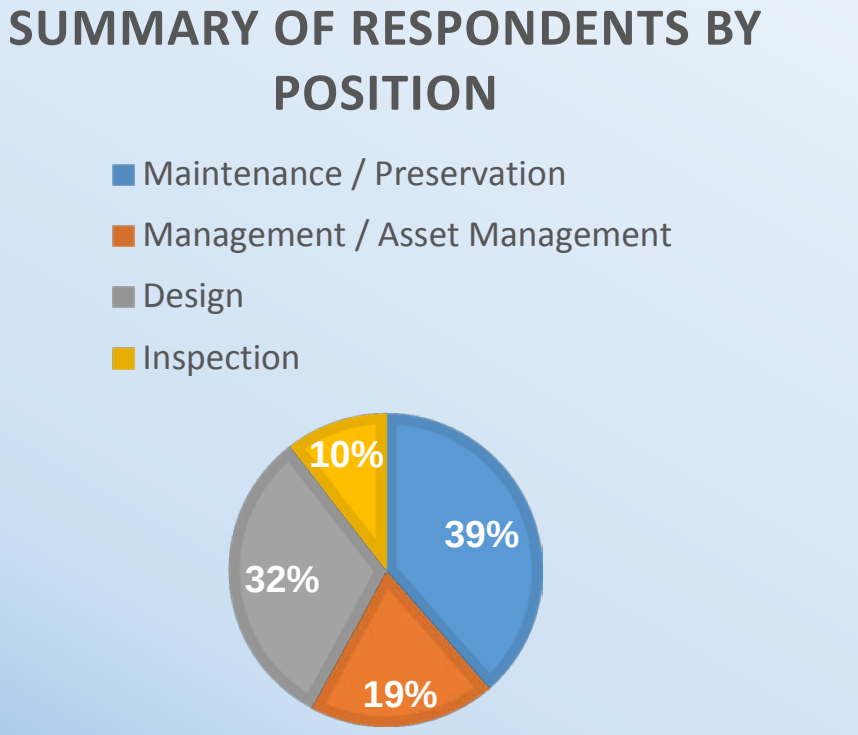
- Focus areas:
  - Usage / limitations
  - Life expectancy
  - Constructability
  - Maintenance
  - Design and configurations
  - Field conditions and installation
  - Movement
  - Informational Needs

Bridge Expansion Joint SurveyMonkey

- ❑ Distributed by the WBPP
- ❑ Sent to all 4 Bridge Preservation Partnership members
- ❑ 25 State agencies represented

Survey Respondents





300 – STRIP SEAL EXPANSION JOINT

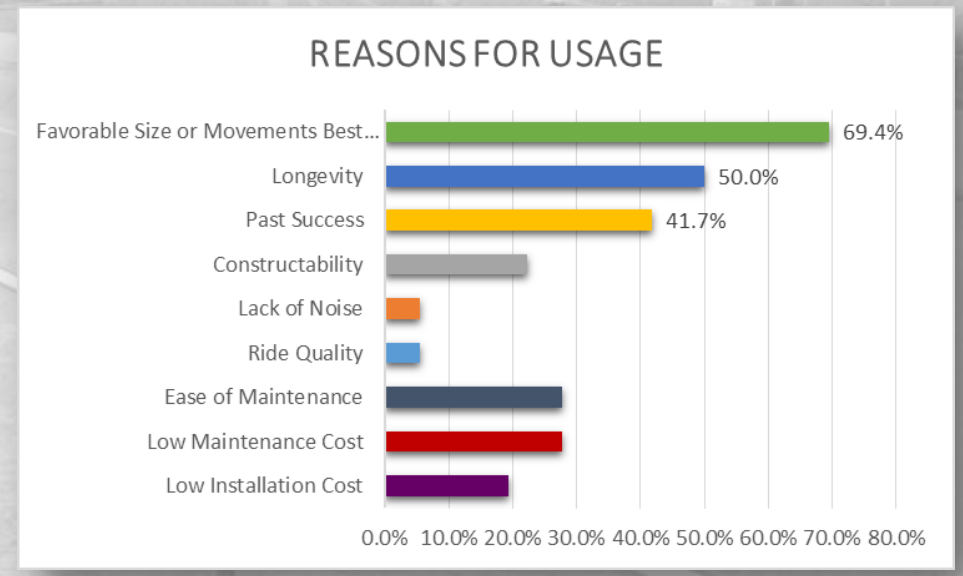
Q: Does your state commonly use Strip Seal joints as described under element 300 in the AASHTO Manual for Bridge Element Inspection

* 40 Respondents

300 – STRIP SEAL EXPANSION JOINT

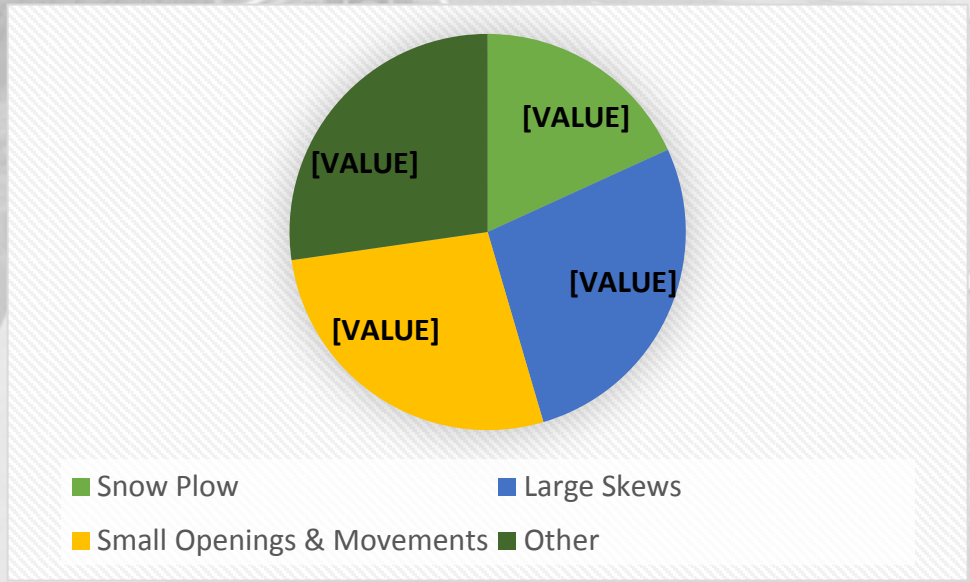
STRIP SEAL PREVAILING PRACTICES:

- Favorable Movements & Specific Sizes
- Longevity and history of success



300 – STRIP SEAL EXPANSION JOINT

- ❑ AREAS STRONGLY DISCOURAGED:
  - 38 respondents
  - 51% Noted limiting usage in particular areas



300 – STRIP SEAL EXPANSION JOINT

❑ MAINTENANCE ISSUES :

- Debris Impaction - 67.57%
- Seal Damage - 62.16%
- Leakage - 59.46%
- Do not regularly clean or re-seal - 76%

❑ LACK OF CONSISTENCY :

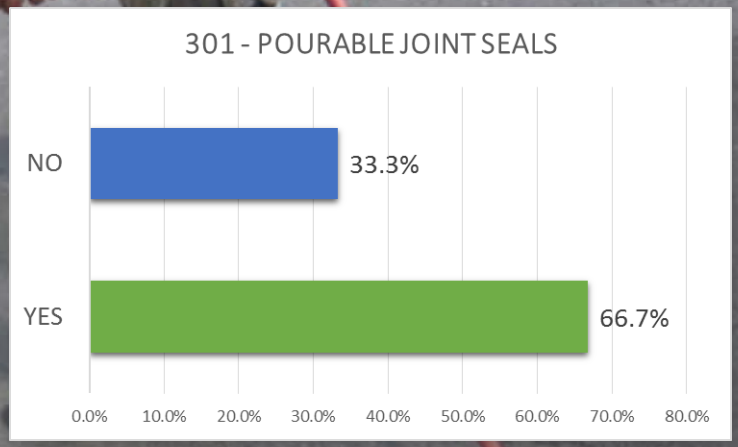
- Skewed conditions
- Anchorage Types
- Coatings
- Determining Movements

❑ CONSTRUCTABILITY & FIELD CONDITIONS:

Prevailing Practices

- Formed blockouts - 72%
- Allowance of rail splices - 86%
- No splicing of the gland - 71%
- State Inspections - 86%
- NOT used : Difficult to Maintain 60%

301 – POURABLE JOINT SEALS



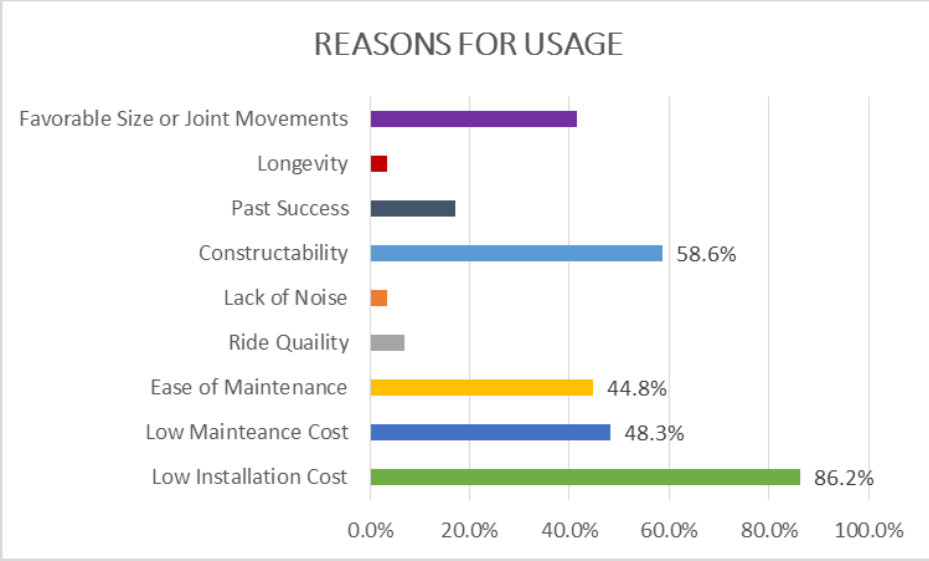
* 39 Respondents

Q: Does your state commonly use Pourable Joint Seals as described under element 301 in the AASHTO Manual for Bridge Element Inspection

301 – POURABLE JOINT SEALS

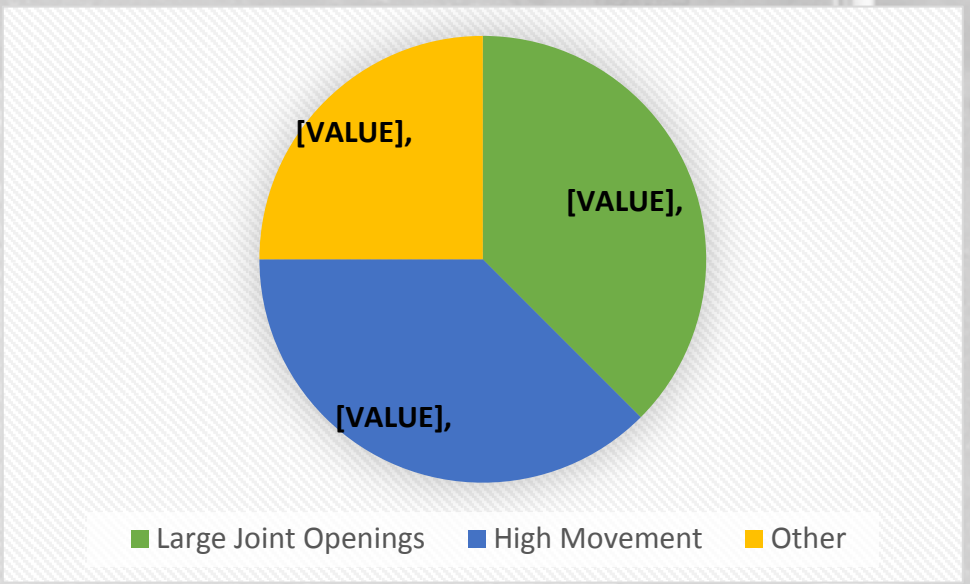
POURABLE JOINT SEAL PREVAILING PRACTICES:

- Low Installation Cost
- Constructability
- Low Maintenance Cost
- Ease of Maintenance



301 – POURABLE JOINT SEALS

- AREAS STRONGLY DISCOURAGED:
  - 32 respondents
  - 65.6% Noted limiting usage in particular areas



301 – POURABLE JOINT SEALS

❑ MAINTENANCE ISSUES:

- Seal Adhesion – 85.3%
- Leakage – 79.4%
- Debris Impaction - 67.57%
- Do not regularly clean or re-seal – 75.8%

❑ LACK OF CONSISTENCY :

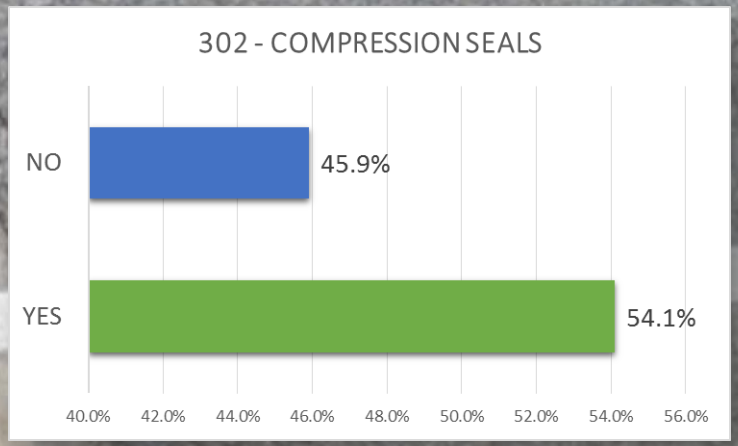
- Joint preparation – cleaning of substrate
- Skew conditions
- Gap openings
- Movement Rating
- Determining Movements

❑ CONSTRUCTABILITY & FIELD CONDITIONS:

Prevailing Practices

- Limit skews to 0-10 degrees - 58%
- Sawcutting of joint opening NOT required – 66.7%
- NOT used : Seal Adhesion 93.8%

302 – COMPRESSION SEALS



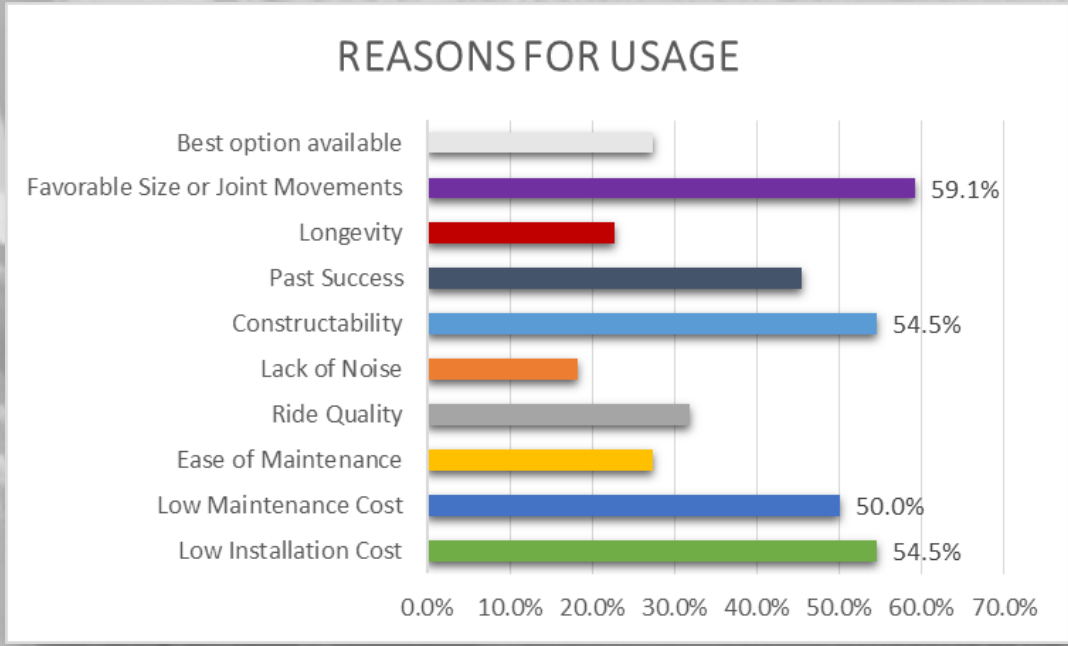
Q: Does your state commonly use Compression Joint Seals as described under element 302 in the AASHTO Manual for Bridge Element Inspection

* 37 Respondents

302 – COMPRESSION SEALS

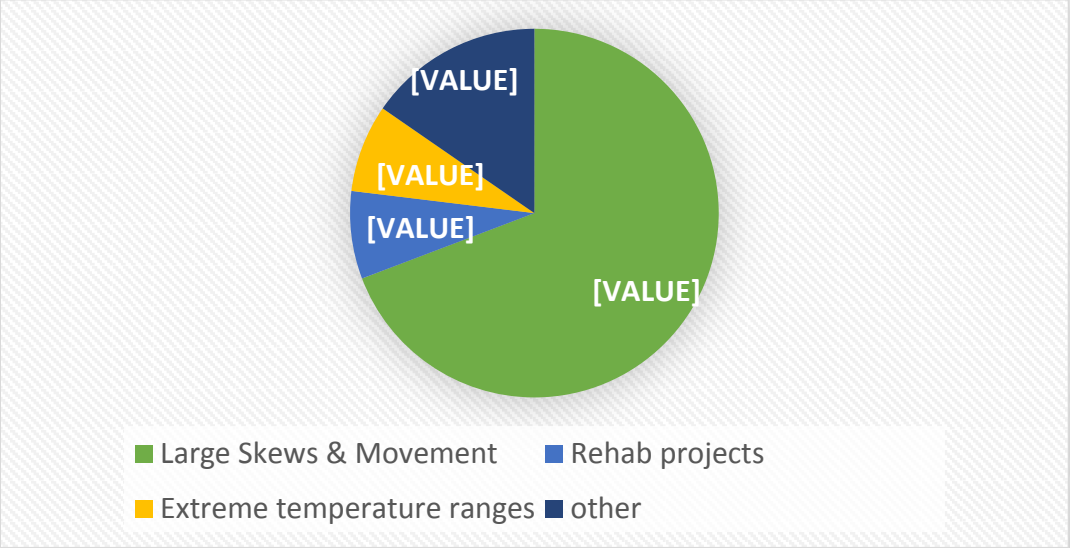
COMPRESSION SEAL PREVAILING PRACTICES:

- Favorable Size or Joint Movements
- Constructability
- Low Maintenance Cost
- Low Installation Cost



302 – COMPRESSION SEALS

- AREAS STRONGLY DISCOURAGED:
  - 26 respondents
  - 73.1% Noted limiting usage in particular areas



302 – COMPRESSION SEALS

❑ MAINTENANCE ISSUES:

- Leakage – 75.9%
- Seal Adhesion – 65.5%
- Seal damage – 41.4%
- Debris Impaction – 37.9%
- Do not regularly clean or re-seal – 75.8%

❑ LACK OF CONSISTENCY :

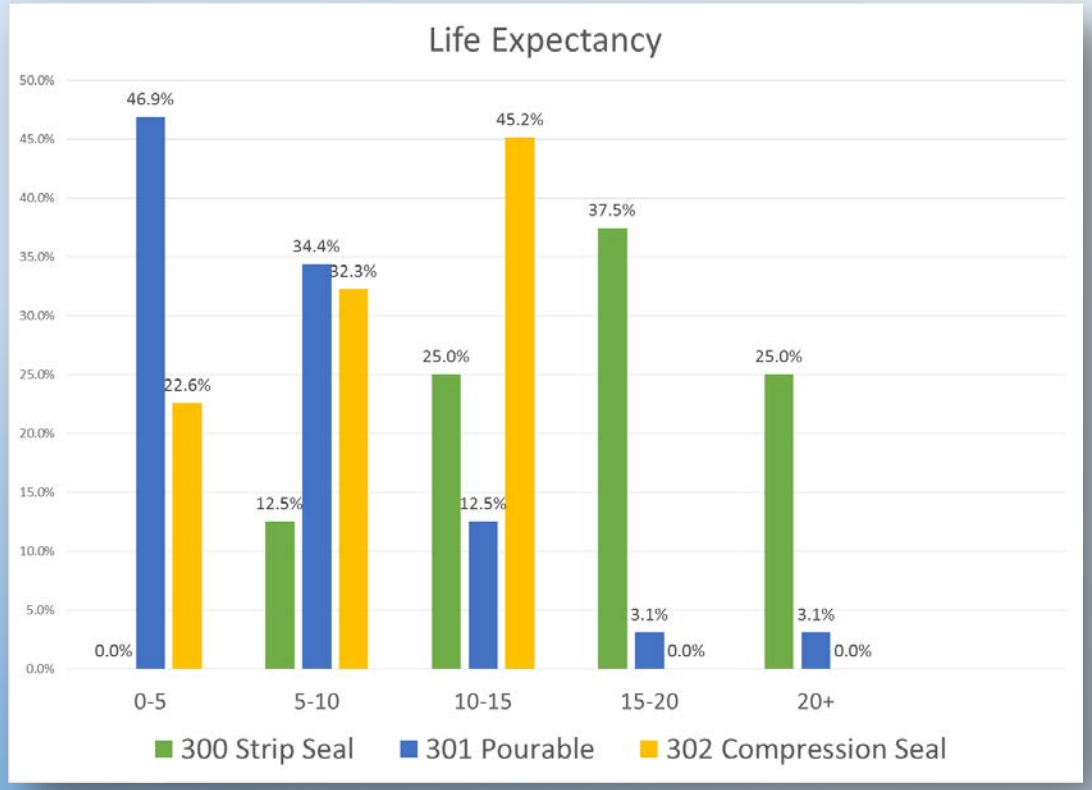
- Surrounding Substrate
- Joint preparation – cleaning of substrate
- Proper depth setting of seals
- Determining Movements

❑ CONSTRUCTABILITY & FIELD CONDITIONS:

Prevailing Practices

- Limit skews to 0-10 degrees - 92.3%
- Field splicing of seal allowed - 61.5% at the lane lines 53.3%
- Sawcutting of joint opening NOT required – 72.7%
- Product requirements: Certificate of compliance 69.6% State testing 52.2%

LIFE EXPECTANCY



MOVING FORWARD

NEXT STEPS

- Kentucky Transportation Center assisting with Large volume of data - Capture Prevailing Practices into Matrix for 3 joint types
- Work on next Element Level Inspection Monkey Survey- 303 Assembly Joint with Seal
- Investigate feasibility of correlating data with findings of other partnerships

Thank you !

MWBPP Bridge Expansion Joint Committee

Questions ?