



# Bridge Expansion Joint Committee Interim Report

Western Bridge Preservation Partnership Conference

Portland OR, May 18-20 ,2015

## Committee Objectives

❑ Develop Bridge Expansion Joint Matrix and document “Best Practices” utilizing National Elements as a common platform to communicate

### ❑ Committee Members

- Debbie Steiger – Watson Bowman Acme
- Ted Hopwood II - Kentucky Transportation Center
- Herb McDowell – Idaho Department of Transportation
- Mike Lee – California Department of Transportation
- Josh Sletten – Utah Department of Transportation
- Bruce Thill – Washington Department of Transportation
- Wally Smith - Crafc0

# Bridge Expansion Joint Matrix

## ❑ 3 Joint Types

## ❑ 4 Tab Matrix

- Manufacturer information
- Performance Data
- Condition Status
- Life Cycle Cost

## ❑ SurveyMonkey

## ❑ Document “Prevailing Practices”

| Bridge Joints:<br>Generic Joint Type | ELI<br>(Element Level<br>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                                  |

# 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

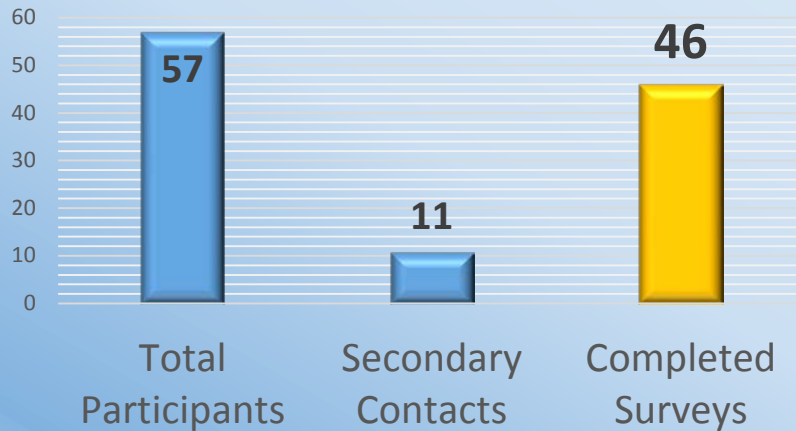
# Bridge Expansion Joint SurveyMonkey

- ❑ Distributed by the WBPP
- ❑ Sent to all 4 Bridge Preservation Partnership members
- ❑ 25 State agencies represented
- ❑ 11 of 13 WBPP States participated



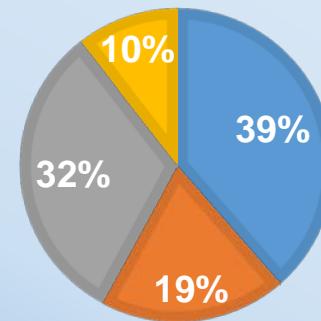
# Survey Respondents

## SUMMARY OF RESPONDENTS



## SUMMARY OF RESPONDENTS BY POSITION

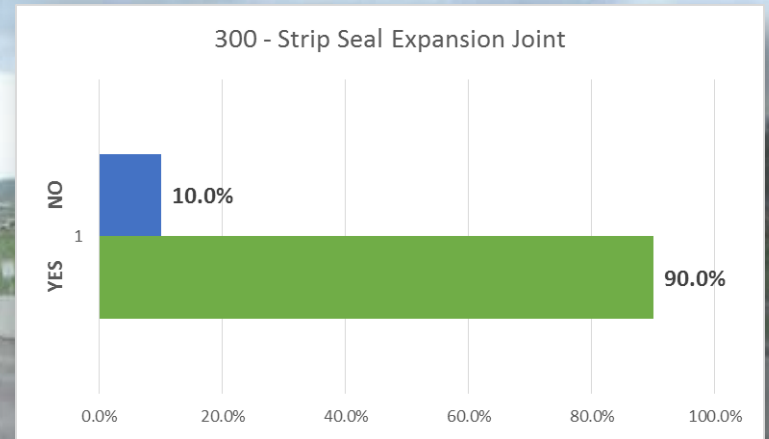
- Maintenance / Preservation
- Management / Asset Management
- Design
- Inspection



## 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

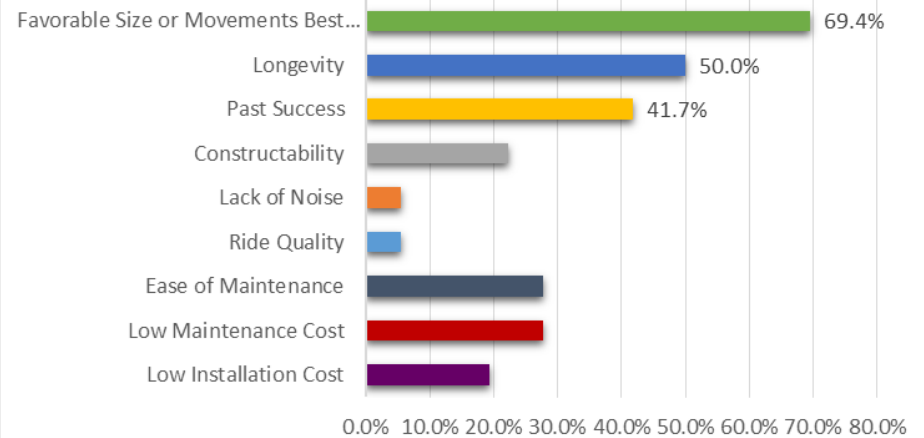


# 300 – STRIP SEAL EXPANSION JOINT

## STRIP SEAL PREVAILING PRACTICES:

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

## REASONS FOR USAGE

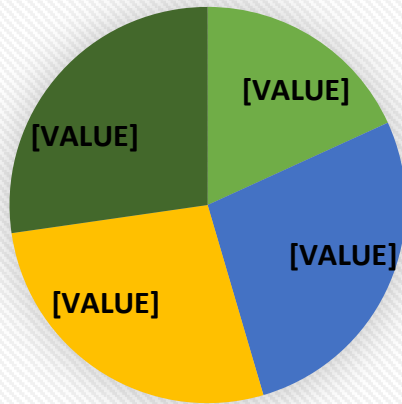




# 300 – STRIP SEAL EXPANSION JOINT

## ☐ AREAS STRONGLY DISCOURAGED:

- 38 respondents
- 51% Noted limiting usage in particular areas



■ Snow Plow

■ Large Skews

■ Small Openings & Movements

■ Other

# 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

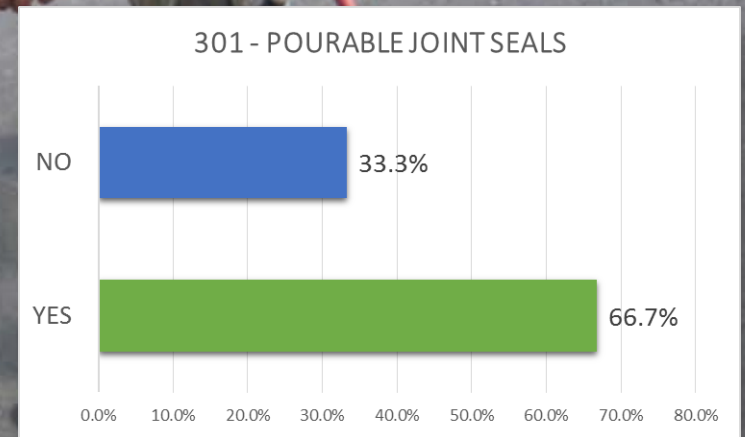
## ❑ CONSTRUCTABILITY & FIELD CONDITIONS:

### 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

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



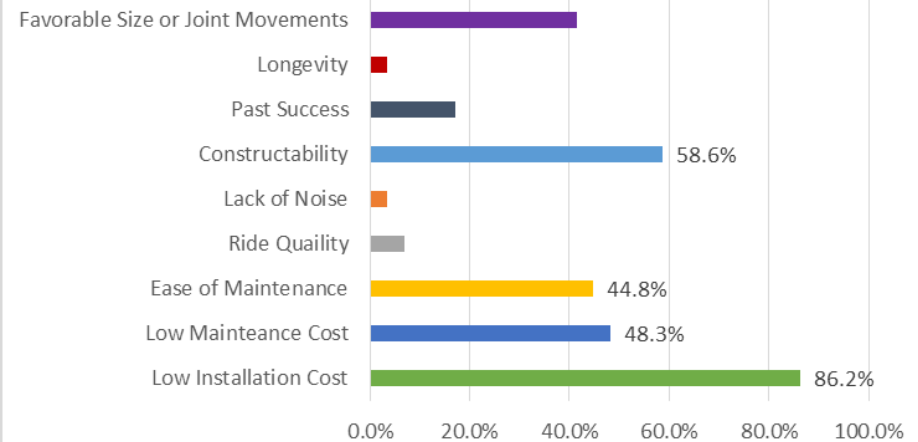
\* 39 Respondents

# 301 – POURABLE JOINT SEALS

## POURABLE JOINT SEAL PREVAILING PRACTICES:

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

### REASONS FOR USAGE

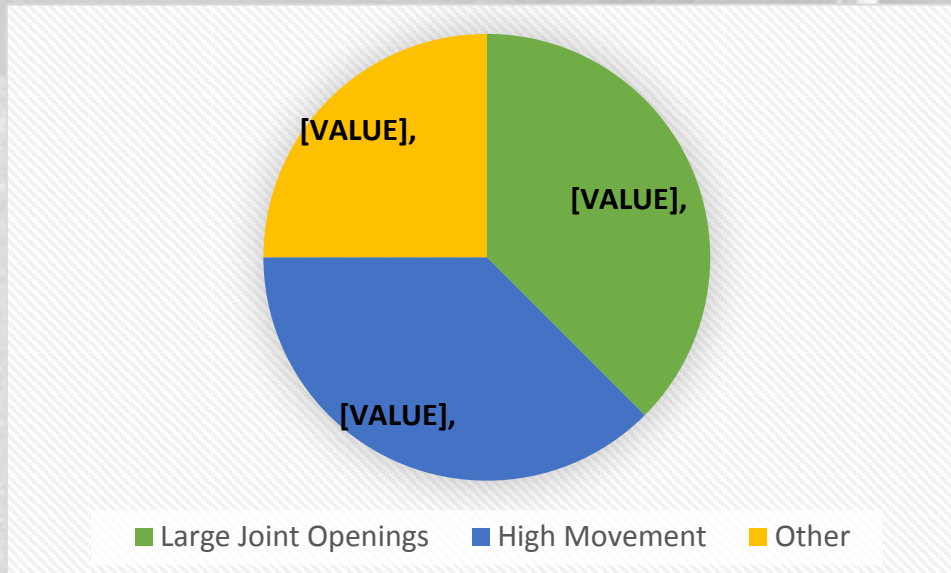




## 301 – POURABLE JOINT SEALS

### ☐ 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%

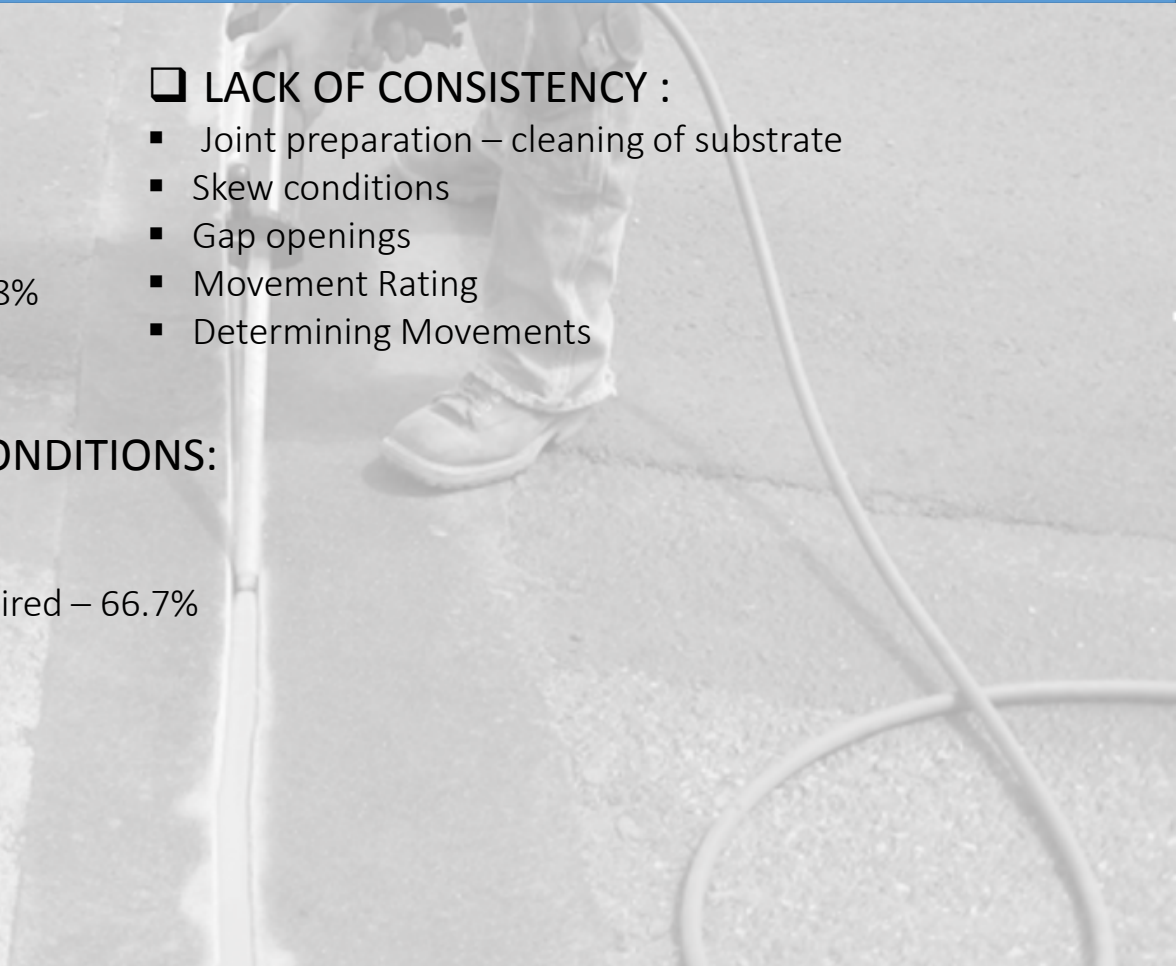
### ❑ CONSTRUCTABILITY & FIELD CONDITIONS:

#### Prevailing Practices

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

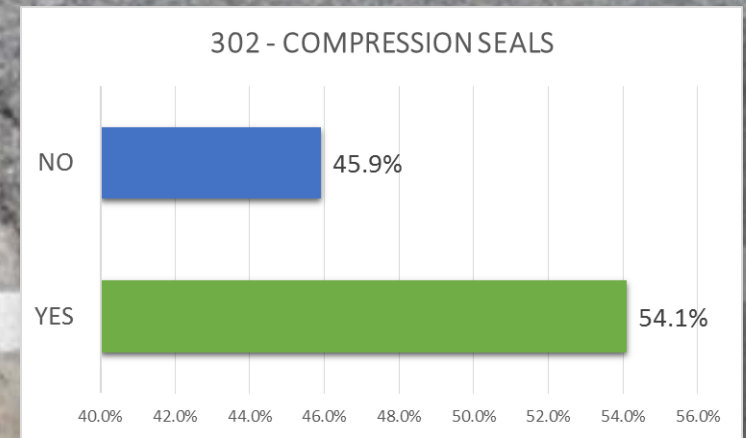
### ❑ LACK OF CONSISTENCY :

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



## 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

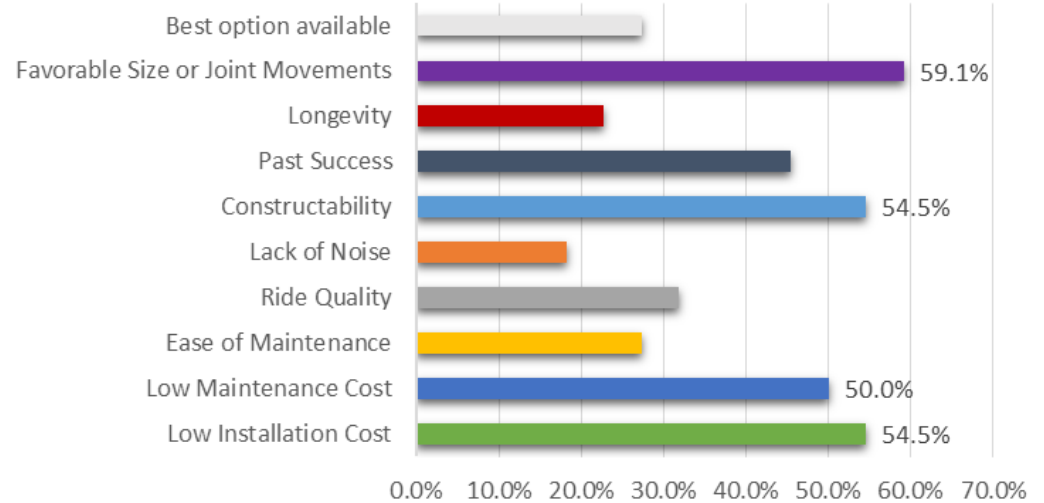


# 302 – COMPRESSION SEALS

## COMPRESSION SEAL PREVAILING PRACTICES:

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

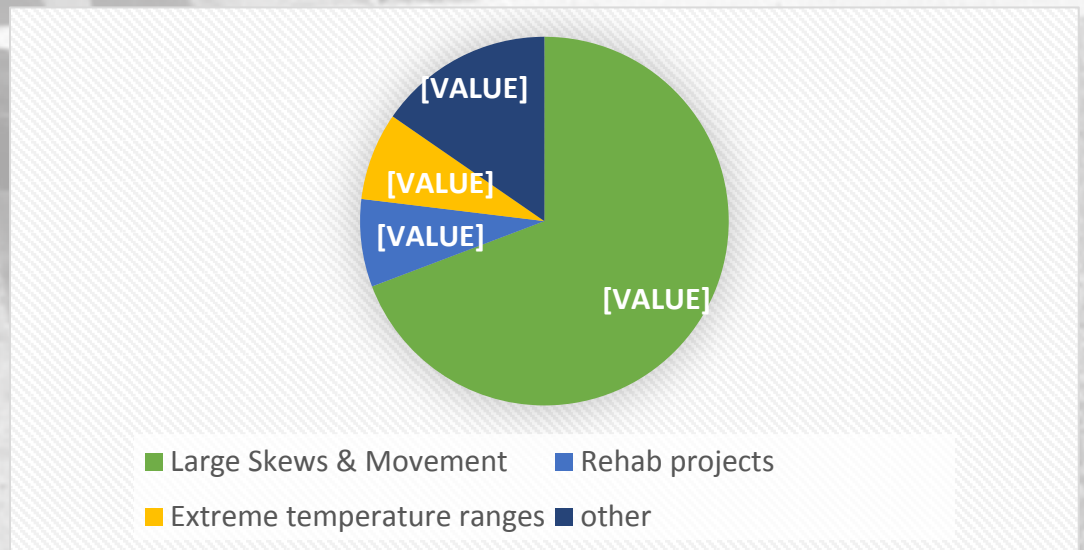
## REASONS FOR USAGE



## 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 :

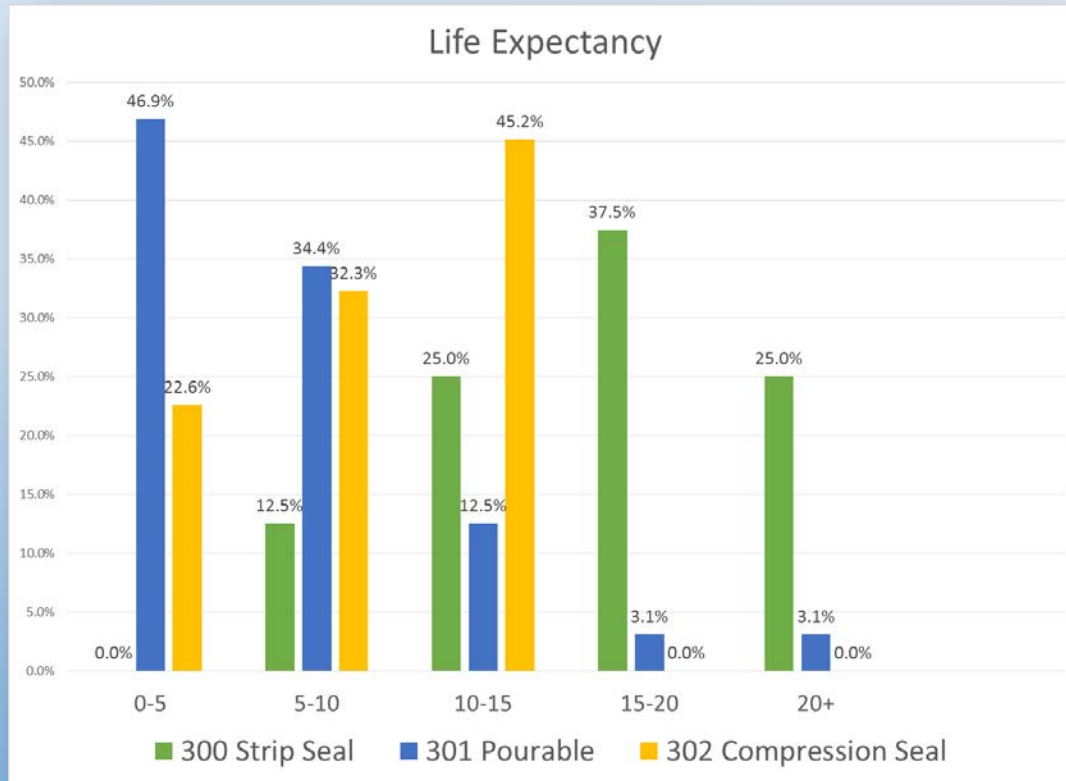
- Surrounding Substrate
- Joint preparation – cleaning of substrate
- Proper depth setting of seals
- Determining Movements

### ☐ 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

- Finalize matrix of 3 types with performance data, condition status and life cycle costs
- Post findings to TSP2 site
- Investigate feasibility of correlating data with other partnerships findings
- Begin work on next Element Level Inspection - 303 Assembly Joint with Seal

Thank you !

WBPP Bridge Expansion Joint Committee

**Questions ?**