

# PennDOT Rapid Bridge Replacement (RBR) Project Results

October 29, 2019

# OVERVIEW

- **Rapid Bridge Replacement (RBR) Project Summary**
- **Interstate Bridge Bundling P3**
- **Questions / Discussion**





# **RAPID BRIDGE REPLACEMENT (RBR) PROJECT SUMMARY**

# PURPOSE

- ✓ Accelerated replacement of 558 poor-condition bridges throughout Pennsylvania
- ✓ Minimized impact to traveling public
- ✓ Transferred maintenance activities to private sector for a 25-year term



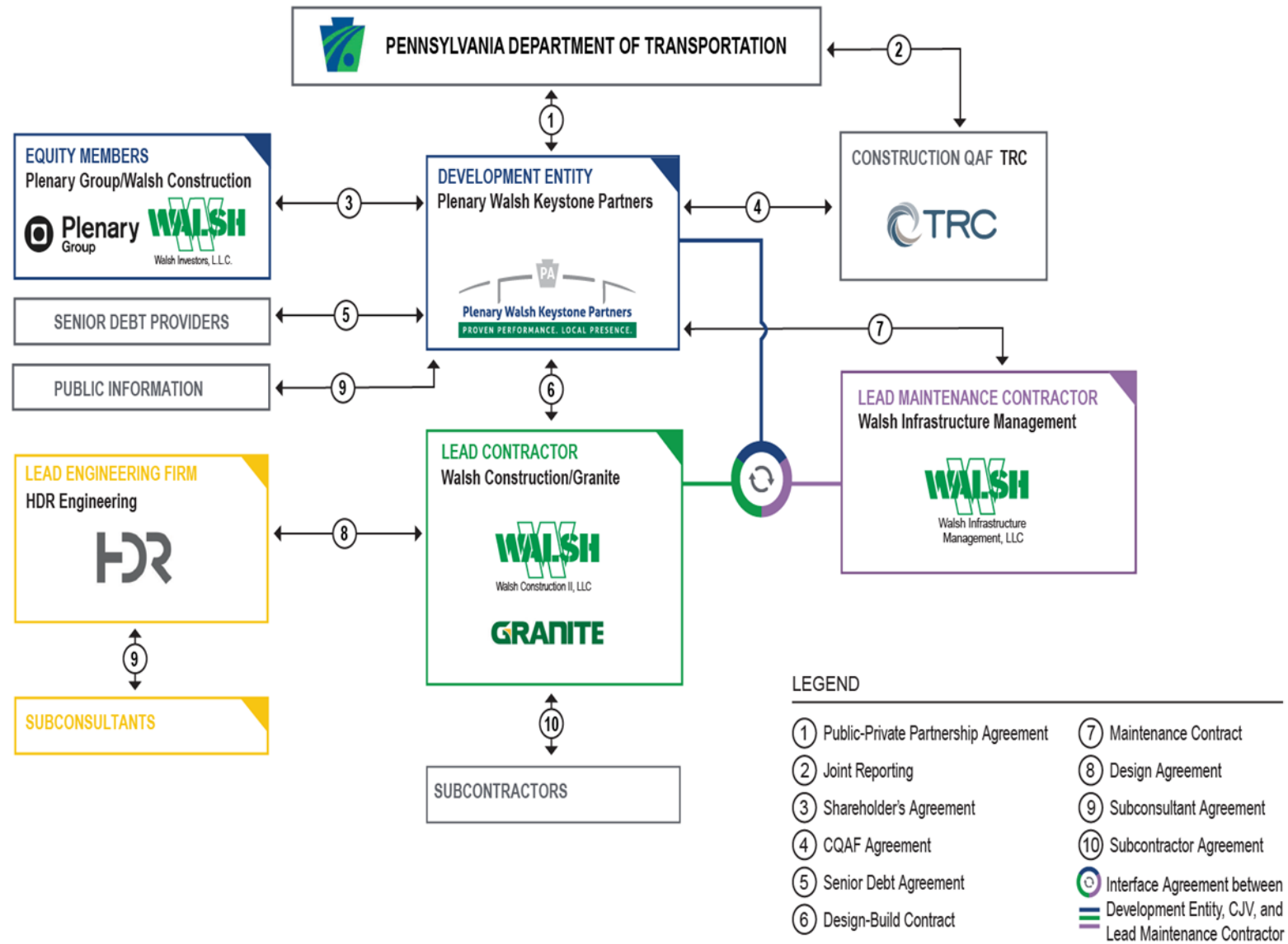
# ANTICIPATED PROJECT BENEFITS

- ✓ Replaced poor condition bridges more quickly
  - Standardization of design techniques and construction methods
- ✓ Better value to taxpayers
  - Higher construction quality
  - Economy of scale savings (through standardization)
  - Lower maintenance costs expected
- ✓ Allowed for fiscal certainty
- ✓ Use of PA-based contractors and designers



# RBR PROJECT OVERVIEW

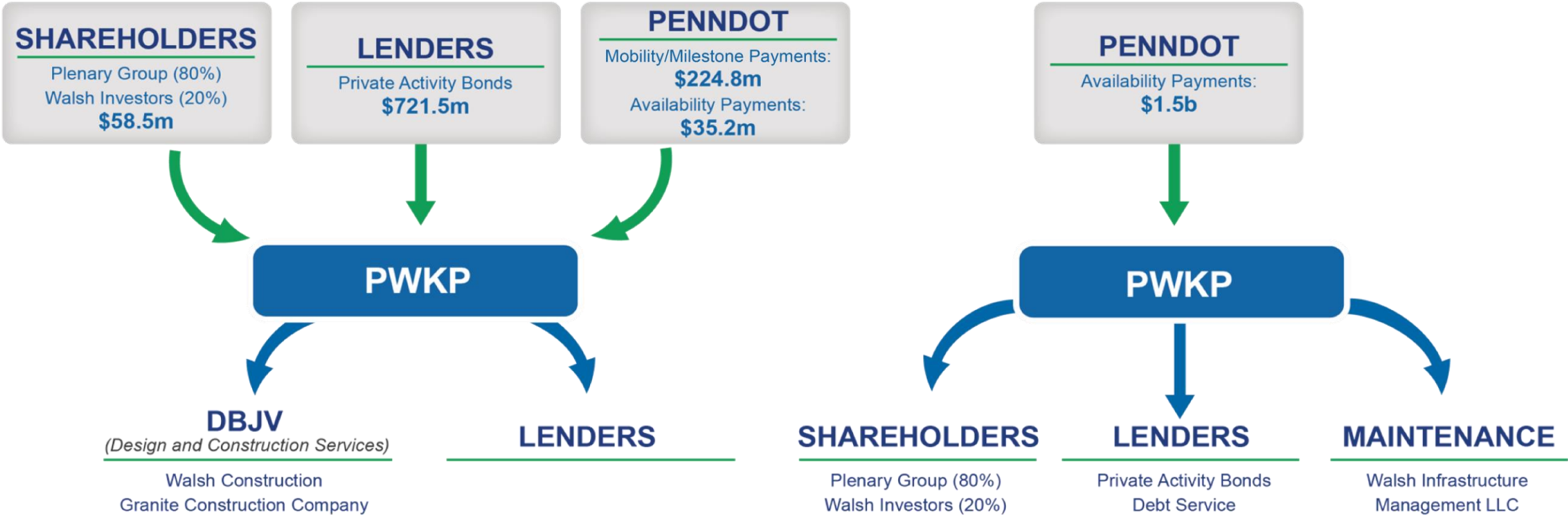
Authority	Pennsylvania Department of Transportation
Consortium	Plenary Walsh Keystone Partners (PWKP)
Financial Close	March 2015
Substantial Completion	December 2018
Status	Construction
D&C Contract	US \$899 million



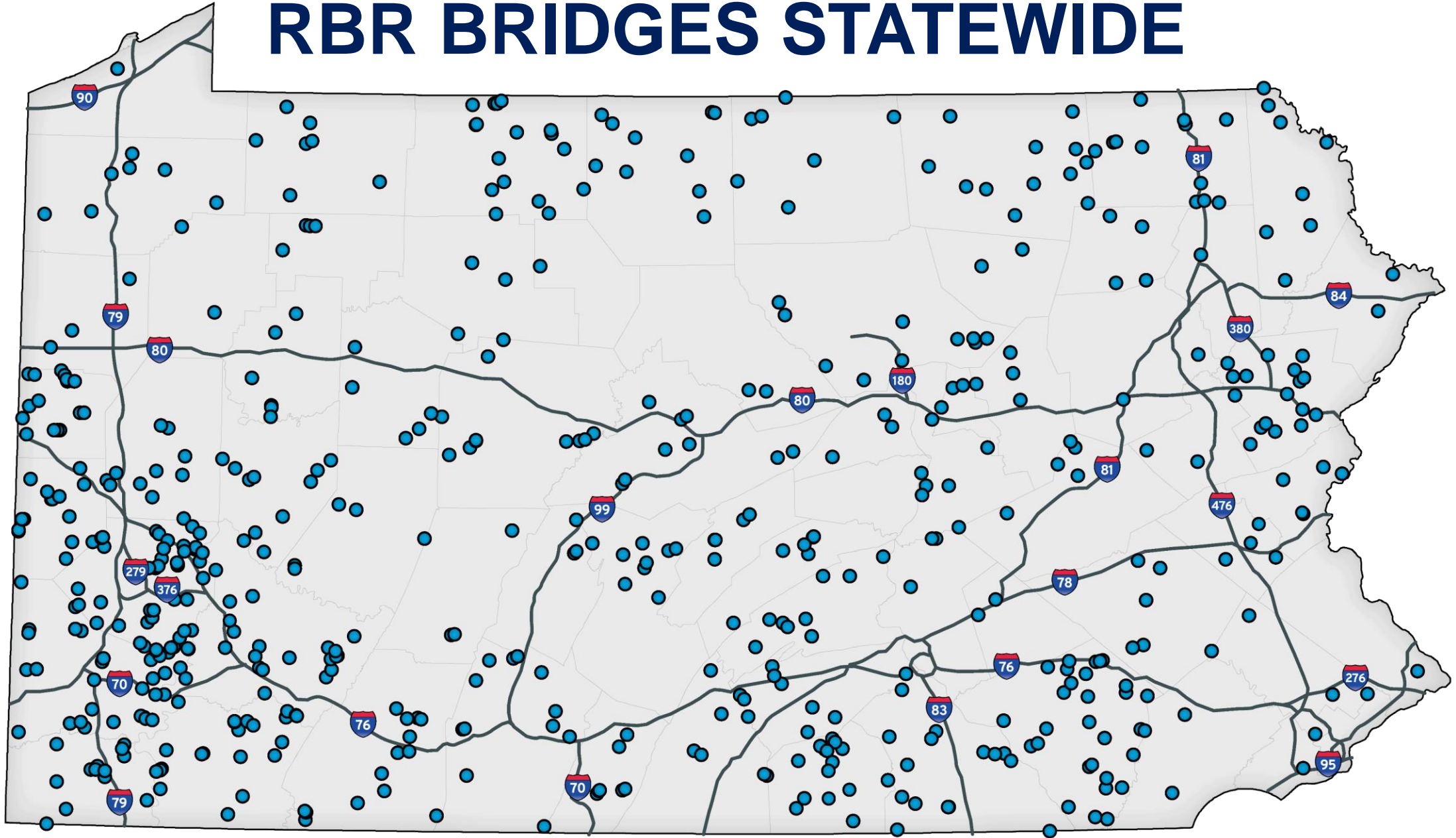
# RBR PROJECT APPROACH

**DESIGN & CONSTRUCTION PHASE (5 years)**

**MAINTENANCE TERM (25 years)**

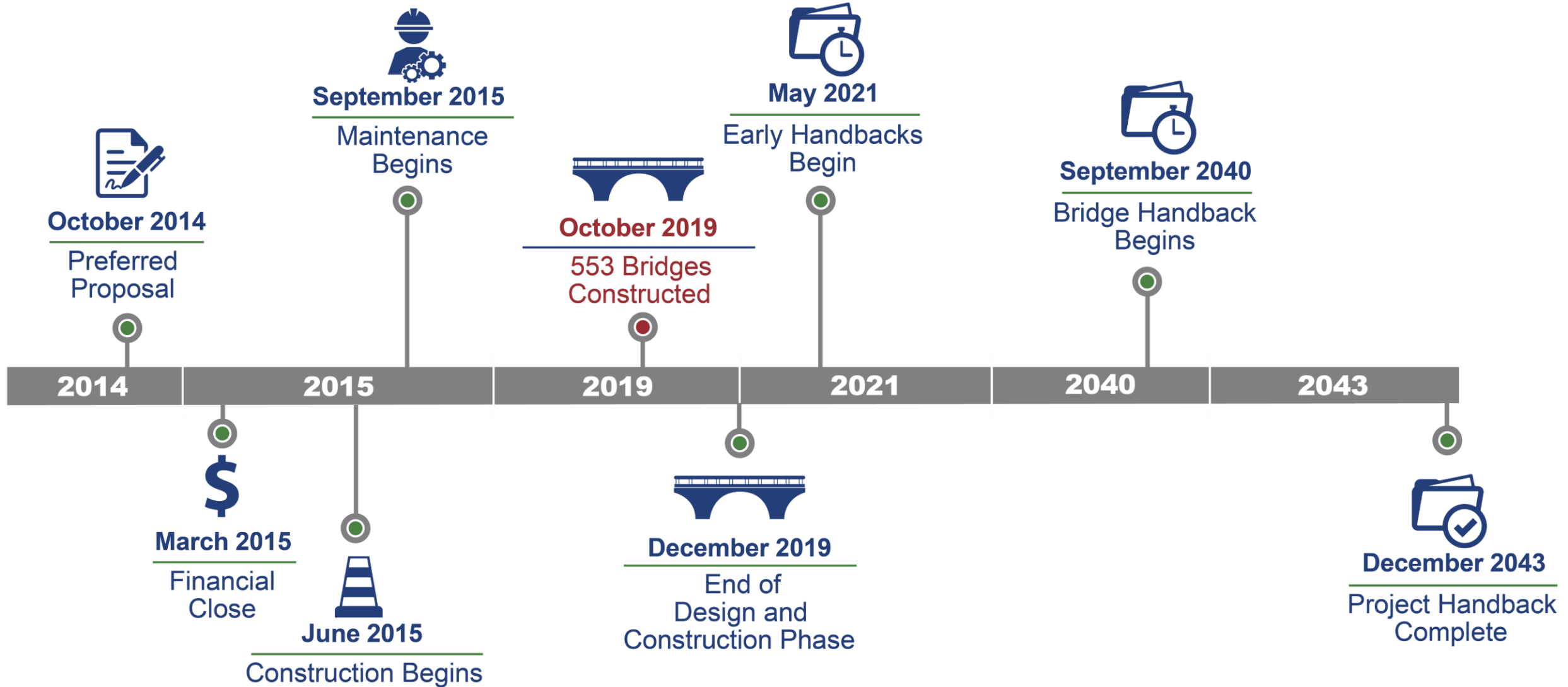


# RBR BRIDGES STATEWIDE





# RBR PROJECT TIMELINE



- ✓ 558 poor condition bridges will be replaced
- ✓ Utilization of SEP-15 allowed the DE to develop the NEPA documents in a streamlined, efficient manner
- ✓ Implemented processes to ensure all design submissions were automated and set up tracking processes that can be utilized on future projects

## PROJECT SUCCESSES



# INNOVATIONS



- ✓ Polyester Polymer Concrete (PPC) overlay
  - Applied on all RBR bridge structures (371 bridges)
  - Protects bridge decks from the infiltration of deicing salts
  - Extends useful life in a single application
  - Reduces long-term maintenance costs
- ✓ Bridge-In-A-Backpack™ (Composite Arch Bridge System)
  - Accelerated bridge construction time and reduced life cycle costs
- ✓ Folded Steel Plate Girder (FSPG) design
  - Utilized cold-bent steel plates to form an innovative girder shape that provides strength with lighter weight



# LESSONS LEARNED

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# PRIMARY LESSONS LEARNED THEMES

1. PennDOT Procurement Process & Asset Selection
  2. Post-Procurement (Administration and Management of Project)
    - PennDOT and Development Entity (DE) Shared Requirements
    - Development Entity Performance
    - PennDOT Requirements for Project Management
- 
- The background image shows a highway construction site. In the foreground, a concrete barrier runs along the edge of a road. Several cars are visible on the road, including a dark SUV and a silver sedan. In the background, a bridge spans across the road, and there are trees and utility poles. The scene is dimly lit, suggesting dusk or dawn.

# PENNDOT PROCUREMENT PROCESS & ASSET SELECTION



## Perform Due Diligence

- ✓ Asset Selection
  - Select bridges that can be designed and constructed easily
  - Use a multi-discipline approach to develop selection criteria
- ✓ Asset Categorization and Prioritization
  - Identify/categorize assets based on complexity
  - Ensure most complex elements are started early in project to minimize schedule impacts
- ✓ Risk Allocation
  - Perform risk assessment to understand the risks and which party is best equipped to manage them

# PENNDOT PROCUREMENT PROCESS & ASSET SELECTION

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## Exercise Patience

- ✓ Ensure ample time is set aside for thorough project scoping, documentation and review by subject matter experts
- ✓ Understand that coordination among stakeholders to develop the project scope and performance requirements may initially result in conflicting opinions

# PENNDOT PROCUREMENT PROCESS & ASSET SELECTION

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## Performance Criteria Development

- ✓ Create a multi-discipline team to determine performance criteria required for the project
- ✓ Retain responsibilities of managing the Construction Quality Acceptance Firm (CQAF)
- ✓ Ensure contract language outlines roles, responsibilities and expectations for all key personnel
- ✓ Non-compliance
  - Establish for design, construction and management activities
  - Establish criteria with reasonable cure periods and penalties to ensure best outcome for safety, quality and schedule





# POST-PROCUREMENT

## Allow Adequate Time for Project Setup

- ✓ Develop thorough project management plans
- ✓ Establish design submission and Requests for Information (RFI) protocol as soon as possible
- ✓ Utilize a single document management system
- ✓ Mandate co-location of DE and owner staff

## PENNDOT AND DEVELOPMENT ENTITY SHARED REQUIREMENTS



# DEVELOPMENT ENTITY PERFORMANCE



- ✓ Require analysis of complex/high-risk activities and development of a schedule that can be monitored from project start
- ✓ Develop sufficient timeframes for design submissions and resubmissions
- ✓ Ensure DE fully understands the importance of its role in public outreach

- ✓ Clearly define roles and responsibilities of the PennDOT project team
- ✓ Clearly communicate expectations of PennDOT personnel who are providing direct or indirect support of the project
- ✓ Establish a process to capture lessons learned early in the project

# PENNDOT REQUIREMENTS FOR PROJECT MANAGEMENT



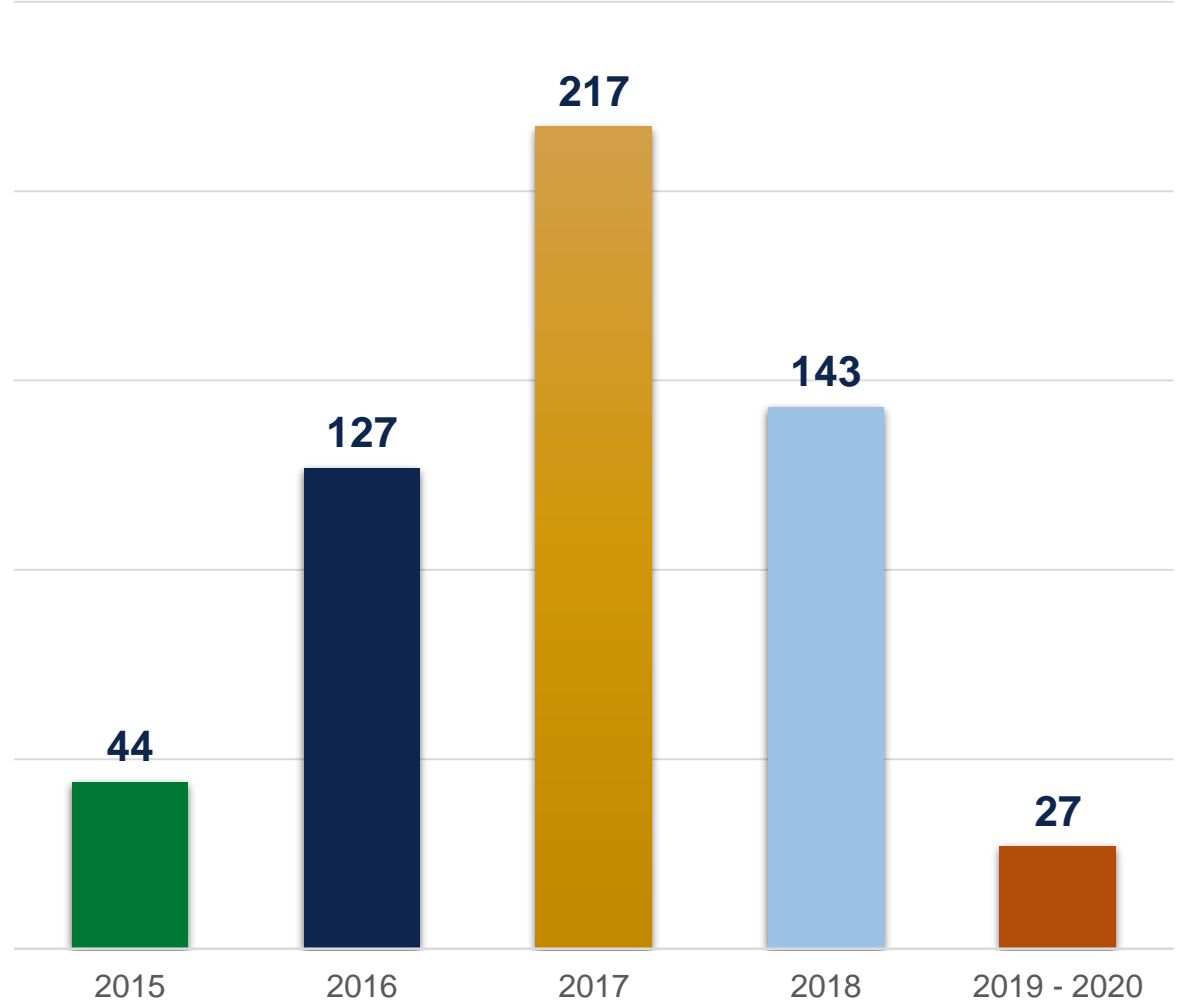
# RBR CURRENT STATUS

Year	RBR Bridges Constructed
2015	44
2016	127
2017	217
2018	143
2019	22
2019 <i>(remaining)</i>	3
2020	2

Construction Completed	<b>553</b>
Under Construction	<b>5</b>

*Over 99% of bridges built as of Oct. 1, 2019*

## RBR Bridges Constructed by Year



# INTERSTATE BRIDGE BUNDLING P3



# PA INTERSTATE SYSTEM



- ✓ PA interstate system makes up 6% of lane miles statewide, yet carries 26% of daily vehicle miles traveled
- ✓ Roughly 57% of PA interstates are more than 40 years old
- ✓ PA should be rebuilding 32 miles of interstates each year
- ✓ 51% of PennDOT-owned interstate bridges have exceeded their original 50-year design life

# PA INTERSTATE SYSTEM

## Annual Funding Need\*

**\$460 million**

- Current Interstate Funding
- Safety Projects

**\$1.2 billion**

- Safety & Cyclic Asset Based Need
- Maintain existing highway and bridges

**\$1.5 - 3 billion**

- Address Safety & Reconstruction Needs
- Modernization
- Strategic Investments

\*Needs are based on current dollars, unadjusted for inflation

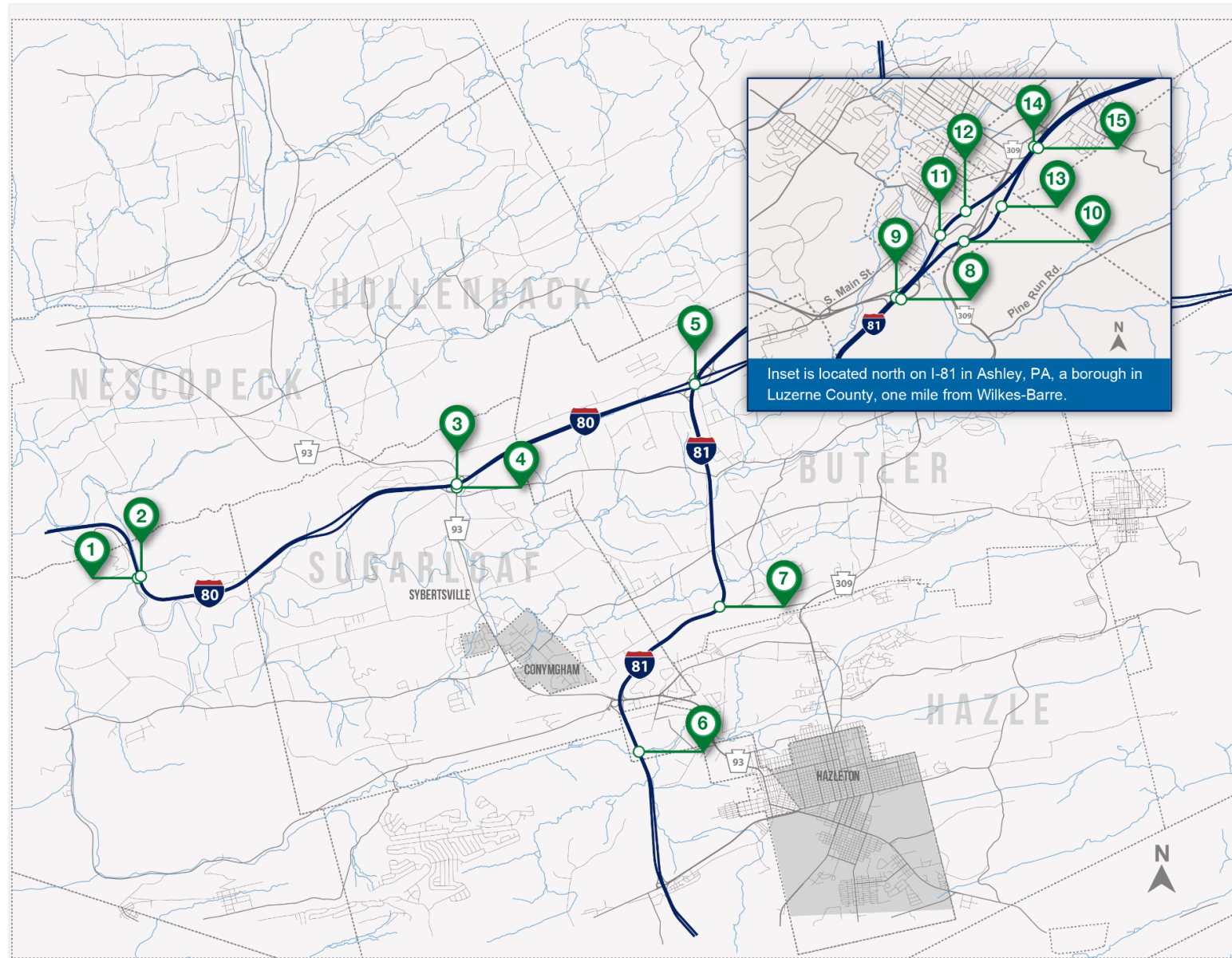


- ✓ Interstate needs
  - Ease financial load for maintenance of aging, deteriorating structures
  - Savings created frees up funding for other interstate jobs
- ✓ Bundling benefits
  - Savings realized through technical, administrative, schedule and resource efficiencies
- ✓ Build upon lessons learned from Rapid Bridge Replacement Project

## WHY ALTERNATIVE DELIVERY FOR INTERSTATE BRIDGES?



# DISTRICT 4-0 INTERSTATE BRIDGE BUNDLE



# WHY P3 ALTERNATIVE DELIVERY?

## Transportation Issue:

- ✔ 15 bridges identified for reconstruction by PennDOT District 4-0
  - 10 bridges along I-81 over a 25-mile section
  - 5 bridges along I-80 over a 10-mile section

## P3 Solution:

- ✔ P3 Board approval allows for innovation in delivery method
  - PennDOT is currently evaluating multiple P3 alternative delivery options to determine the best way to deliver new bridges

# ACCEPTING PROPOSALS THROUGH OCTOBER 31, 2019



*Submit Your*  
**UNSOLICITED  
PROPOSALS**



**pennsylvania** **P3**  
DEPARTMENT OF TRANSPORTATION  
PUBLIC-PRIVATE PARTNERSHIPS

# QUESTIONS

**Michael Bonini**  
**Director, PennDOT P3 Office**

**For more information on  
Public-Private Partnerships:**

**[www.p3.pa.gov](http://www.p3.pa.gov)**

