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Project Bundling

WEBINAR SERIES: INNOVATION IN PRACTICE

February 12, 2020

2:00PM – 3:00PM EST

Webinar Logistics

PowerPoint Presentation available on BATIC Website

Submit questions in Q&A box

Webinar will be available on BATIC website

BATIC website: http://www.financingtransportation.org/
Webinar location:
http://www.financingtransportation.org/capacity_building/event_details/webinar_project_bundling_021220.aspx

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Webinar Overview

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U.S. Department of Transportation
Federal Highway Administration

On-Ramp to Innovation
every day counts





Project Bundling:

A Strategic Program Delivery Solution

BATIC WEBINAR SERIES: INNOVATION IN PRACTICE

David Unkefer, FHWA, david.unkefer@dot.gov

Source: FHWA; Culverts, Delaware DOT; Accessible Curb Ramp, U.S. Access Board

Today's Presentation

- Overview – What's EDC Project Bundling?
- Benefits – Why do more advanced bundling?
- Advanced Bundling 'How-To'
  - Bridge Bundling Guidebook
  - Case Studies from Around the Nation
- Resources/FHWA Support
- Q&A

What is Project Bundling?

- **Project bundling is a process by which a single contract award is used to deliver multiple preservation, rehabilitation, or replacement projects**

…and so much more….

Source: FHWA

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Why Project Bundling?

- **Bundling projects leverages design and construction expertise and achieves economies of scale.**

Sources: FHWA; Culverts, Delaware DOT; Accessible Curb Ramp, U.S. Access Board

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Why Project Bundling? Address program goals!

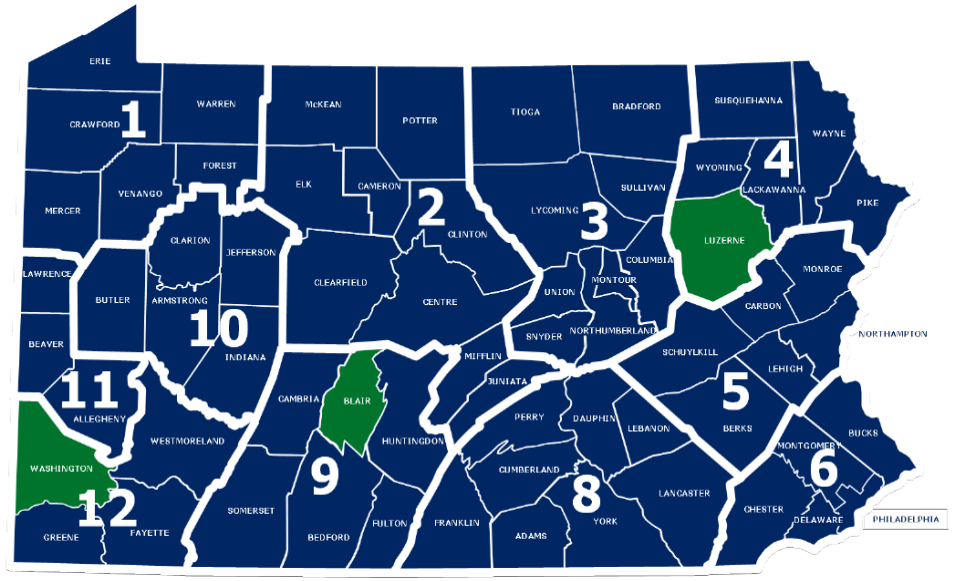
- ✓ Address infrastructure asset needs/backlog (pavements, bridges, safety hardware)
- ✓ Improve system performance measures

Project Bundling helps to:

- ➢ Reduce design and construction costs with economies of scale
- ➢ Improve project and program delivery time
- ➢ Take advantage of financing opportunities
- ➢ Utilize agency staff more efficiently
- ➢ Deliver transportation benefit to public faster

Project Bundling Saves Bundles

- **PennDOT Local Bridges – Pilot Project**
- **Design & Construction in less than 18 months**
- **Similar details in 3 bundling contracts**
- **Saved up to 50% on design cost**
- **Saved up to 15% on construction cost**



Source: PennDOT

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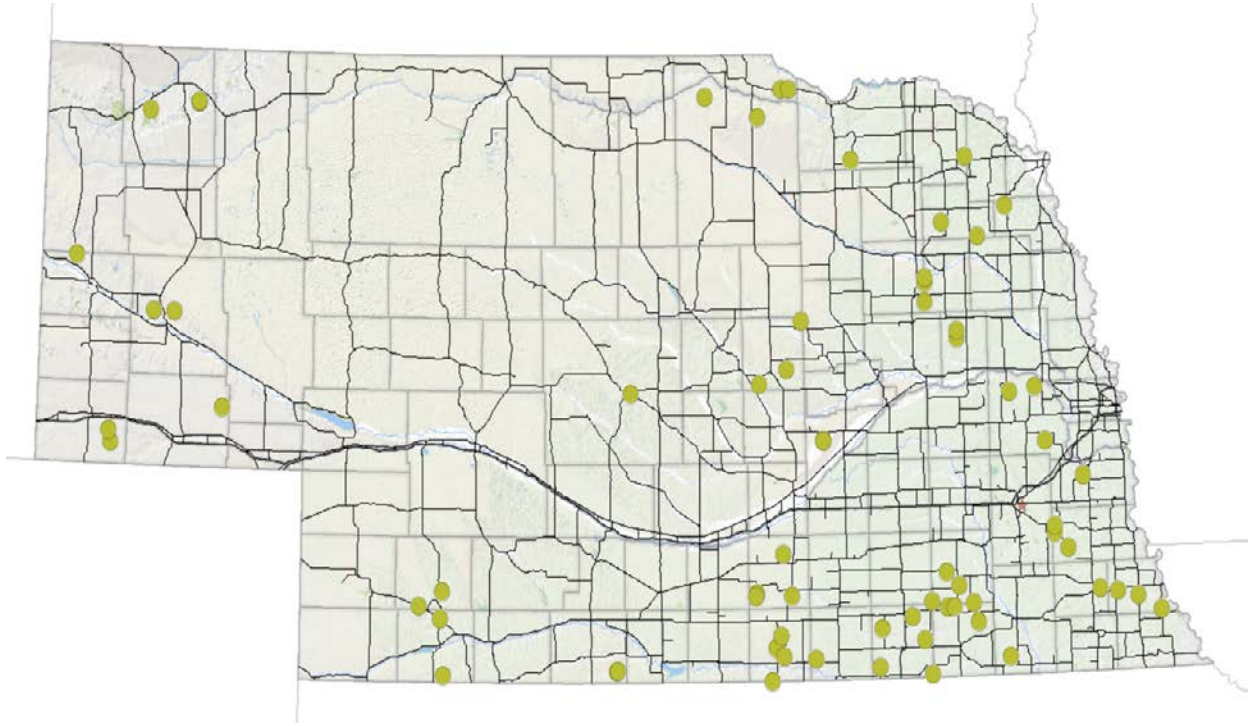
Additional Benefits of Project Bundling

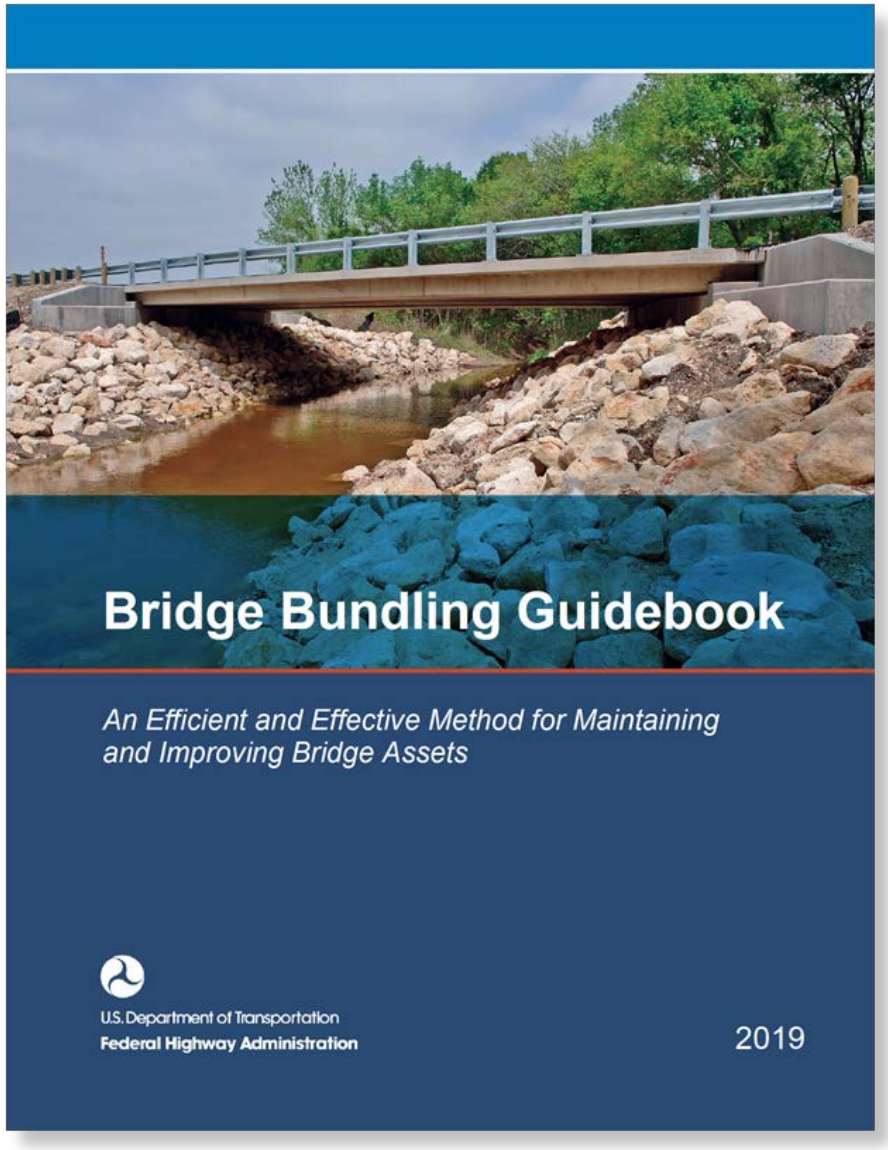
- **Small agencies can partner for economies of scale**
- **With one another**
- **With their State Agency**



NDOT County Bridge Match Program sites.

Source: NDOT

How to? Bridge Bundling Guidebook



https://www.fhwa.dot.gov/ipd/alternative_project_delivery/defined/bundled_facilities/

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Bridge Bundling Guidebook

Funding or Financing Strategies

Objective:

- To identify funding sources or a finance strategy

Tools:

- Table of available funding options
- Table of financing strategies
- Federal funding programs

Outcome:

- Documented funding sources or financing strategy

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Bridge Bundling Guidebook

FUNDING STRATEGIES	FINANCING STRATEGIES

• State and Local Funds
• Federal-aid Highway Program
  o National Highway Performance Program
  o Surface Transportation Block Grant Program
  o National Highway Freight Program
• Highway Infrastructure Program
 	
Potential New Revenue Sources
• Value Capture
 	
Federal-aid Cash Management Tools
• Advance Construction
• Partial Conversion of Advance Construction
• Tapered Match
• Soft Match
 	
Revenue Streams
• Federal Motor Fuel Taxes
• State Motor Fuel Taxes
• Alternative Fuel Taxes
• Fees–Tolling and Pricing
• Traditional Funding Strategies
	• General Obligation Bonds
	• Revenue Bonds
	• GARVEE Bonds
	• State Infrastructure Banks
	• Federal Credit Assistance–TIFIA
	• Private Activity Bonds Program
	• Section 129 Loans
	• Public-Private Partnerships (DBF, DBOM, DBFOM)
	• Railroad Rehabilitation and Improvement Financing Program

Bridge Selection/Screening Criteria

- Geographic location and proximity
- Road type, geometry, traffic, and work zone control
- Bridge size
- Similar bridge types
- Similar work types
- Environmental permitting
- Hydrology and hydraulics
- Geotechnical conditions
- Utilities/Third parties
- Right-of-Way
- Railroads

Bridge Bundling Guidebook

Number of Bridges per Contract Bundle

AGENCY	FUNDING SOURCE	D-B-B	IDIQ[1]	CM/GC	D-B	P3
Delaware DOT	Federal – State	2-20	22	-	28	-
Erie County, NY	Federal – Local	3-25	-	-	-	-
Georgia DOT	State	-	-	-	5-7	-
Missouri DOT	Federal reimbursement bonds	2-10	-	-	554	-
Nebraska DOT	SIB – Local	2-7	-	-	-	-
New York State DOT	Federal – State	2-19	6-200	-	6-16	-
Northampton County, PA	Private – Local	-	-	-	-	33
Ohio DOT	GARVEE bonds	2-3	-	-	2-6	-
Oregon DOT	State	-	-	3	-	-
Osceola County, FL[2]	Local	-	-	13	-	-
Pennsylvania DOT	State, Private – Federal	7-18	-	-	-	558
South Carolina DOT	Federal – State	3-5	-	-	3-13	-
RANGE	-	2-25	6-200	3-13	2-554	33-558

Bridge Bundling Guidebook: Appendices

A. Bridge Bundling Process Flow Chart

B. Bridge Bundling Implementation Checklist

C. Case Studies

D. National Bridge Condition and Bridge Asset Management

E. Finance Mechanisms

F. Risk Management Process Overview

G. Bridge Selection Matrix

I. Alternative Technical Concepts

J. Sample Contract Documents

K. Other Bridge-Related Innovation

L-1. Research: Capital Program Cost Optimization through Contract Aggregation Process

L-2. Research: Quantification of Cost, Benefits, and Risks associated with ACMs and Accelerated Performance Specifications

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Bridge Bundling Guidebook: Case Studies

- Scope of work
- Ownership
- Funding & Finance
- Project Delivery Methods
- Project Procurement Methods

Bridging Kentucky Goals

- Improve safety/soundness of current Kentucky bridges
- State, county and municipal bridges
- Estimated $700 million over six years
- Rehabilitate, repair, or replace bridges
- Deliver all bridges for construction by 2024

$700M

1,000 bridges

6 years

BridgingKentucky.com

Source: Kentucky Transportation Cabinet

Challenges

Streamlined Project Development

- Standardized design
- Risk-based Geotech
- Expedited utility relocations
- State funds for ROW
- Bundling similar work

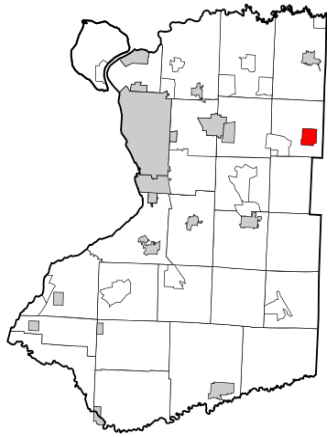
Source: Kentucky Transportation Cabinet

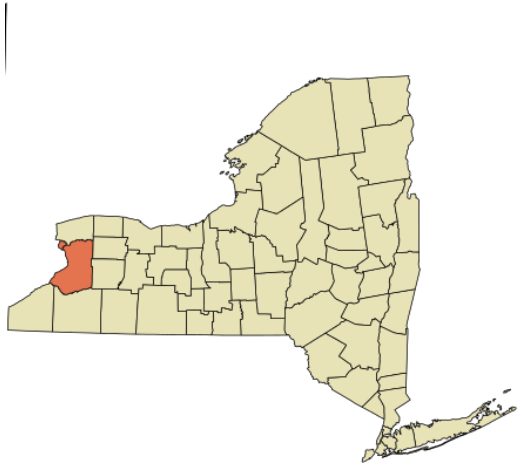
Indiana DOT- Case Study Summary

- Bundle various project types: bridge/culvert, road/pavement
- Efficiencies in environmental approval and permitting
- Standardization of design and construction methods
- Shared resources: workforce, equipment, facilities
- INDOT Admin. savings (e.g. contracting, letting)
- Cost effective MOT
- Efficiencies in contractor overhead
- Scheduled acceleration
  - CFO gives $50M back to the budget due to expected PB savings

Erie County, NY

- **Bundling Preventative Maintenance Activities by Work Type and Location**
- **Steel Repairs - $1M every 2 years**
- **Deck Repairs - $1M every 2 years**
- **Bridge Washing - $250K every 2 years**
- **Deck Sealing - $200K per year (6-year cycle)**



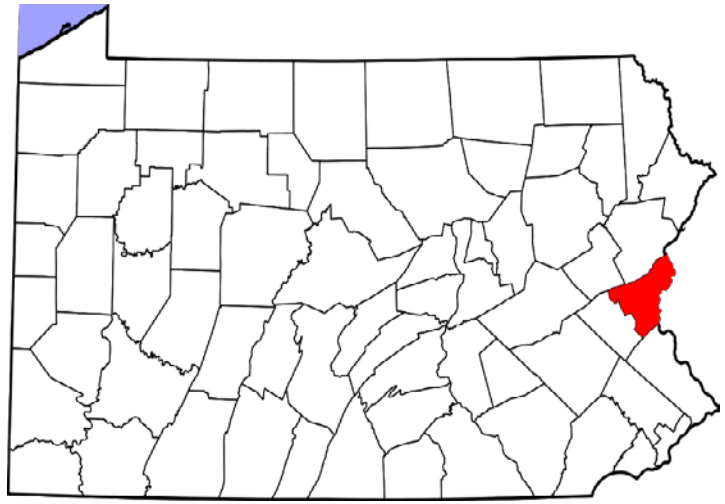


Source: Erie County, NY

Northampton County, PA

- Owns 119 bridges
- Significant % in poor condition
- Estimated 20 years to replace
- Public Private Partnership (P3)
- $37.5M in Construction paid over 12 years
- $1M Maintenance for 10 years starting in year 5
- 33 Bridge Replacements over 14 years

Year	Costs of Construction	Maintenance Costs*	Annual Payments
2017	$3,625,000		$3,625,000
2018	$3,875,000		$3,875,000
2019	$4,125,000		$4,125,000
2020	$3,875,000		$3,875,000
2021	$3,875,000	$99,500	$3,974,500
2022	$2,586,629	$99,500	$2,686,129
2023	$2,586,629	$99,500	$2,686,129
2024	$2,586,629	$99,500	$2,686,129
2025	$2,586,629	$99,500	$2,686,129
2026	$2,586,629	$99,500	$2,686,129
2027	$2,586,629	$99,500	$2,686,129
2028	$2,586,629	$99,500	$2,686,129
2029		$99,500	$99,500
2030		$99,500	$99,500
TOTAL	**$37,481,403**	**$995,000**	**$38,476,403**



Source: Northampton County, PA

Ohio Bridge Partnership Program

- **Invested $120M to replace 200 local bridges in 3 years**
- **Garvee Bonds and Toll Credits – 100% Federal**
- **Bundled for finance. Unbundled into smaller DB contracts. Partnership with FHWA to make it work.**

- SFY 14 – 30 bridges in 9 packages
- SFY 15 – 80 bridges in 31 packages
- SFY 16 – 84 bridges in 39 packages
- SFY 17 – 21 bridges in 11
- SFY 18 & 19 - 11 bridge replacements

Source: Ohio DOT

MnDOT - Case Study

- **ADA Bundle Project**
- **$2.5M**
- **200 +/- ramps and sidewalk**
- **DB Project Delivery**
  - Integrate Design & Construction
  - Better quality
- **Issues encountered**
  - Contractor not used to being a prime
  - Scoping RFP well without over specifying
- **Progressive DB would have worked better**

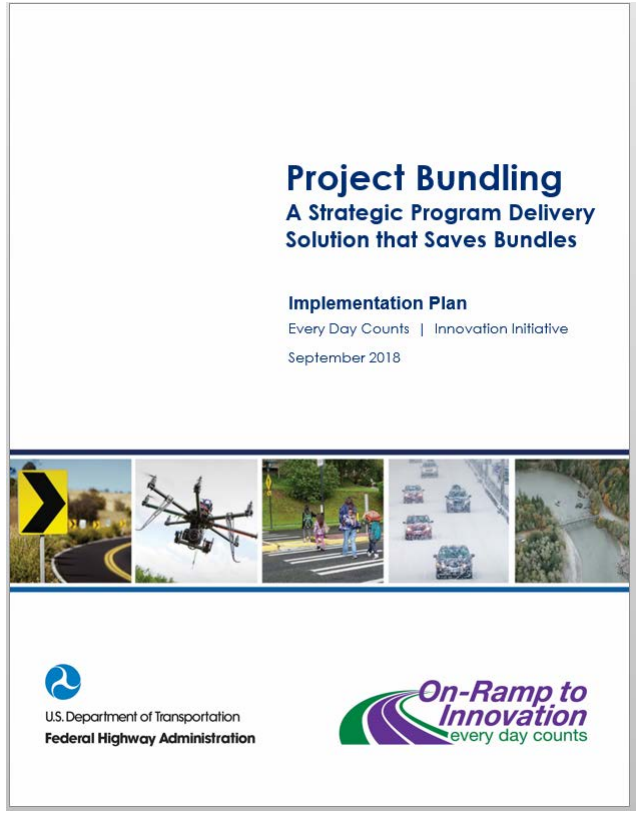
Source Accessible Curb Ramp, U.S. Access Board

Project Bundling Resources

- **Bridge Bundling Guidebook**
- **EDC web site https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/project_bundling.cfm**
- **FHWA Implementation/Technical Assistance contract**
- **Recent webinar for Accelerated Bridge Construction https://abc-utc.fiu.edu/mc-events/fhwa-bridge-bundling-guidebook-bbg/?mc_id=508**

FHWA Implementation/Technical Assistance

- **Webinars**
- **Workshops**
- **Peer Exchanges/Reviews**
- **Case Studies**
- **Presentations (local, regional, & national events)**
- **Consultant support blocks**



Source: FHWA

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David Unkefer: David.Unkefer@dot.gov

Source: FHWA; Culverts, Delaware DOT; Accessible Curb Ramp, U.S. Access Board

Build America Transportation Investment Center

AASHTO/BATIC

Safe & Sound Bridge Project

Kenyon R. Warbritton, P.E. – Project Director

MISSOURI DEPT. OF TRANSPORTATION

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Safe & Sound

800 Better Bridges by 2013

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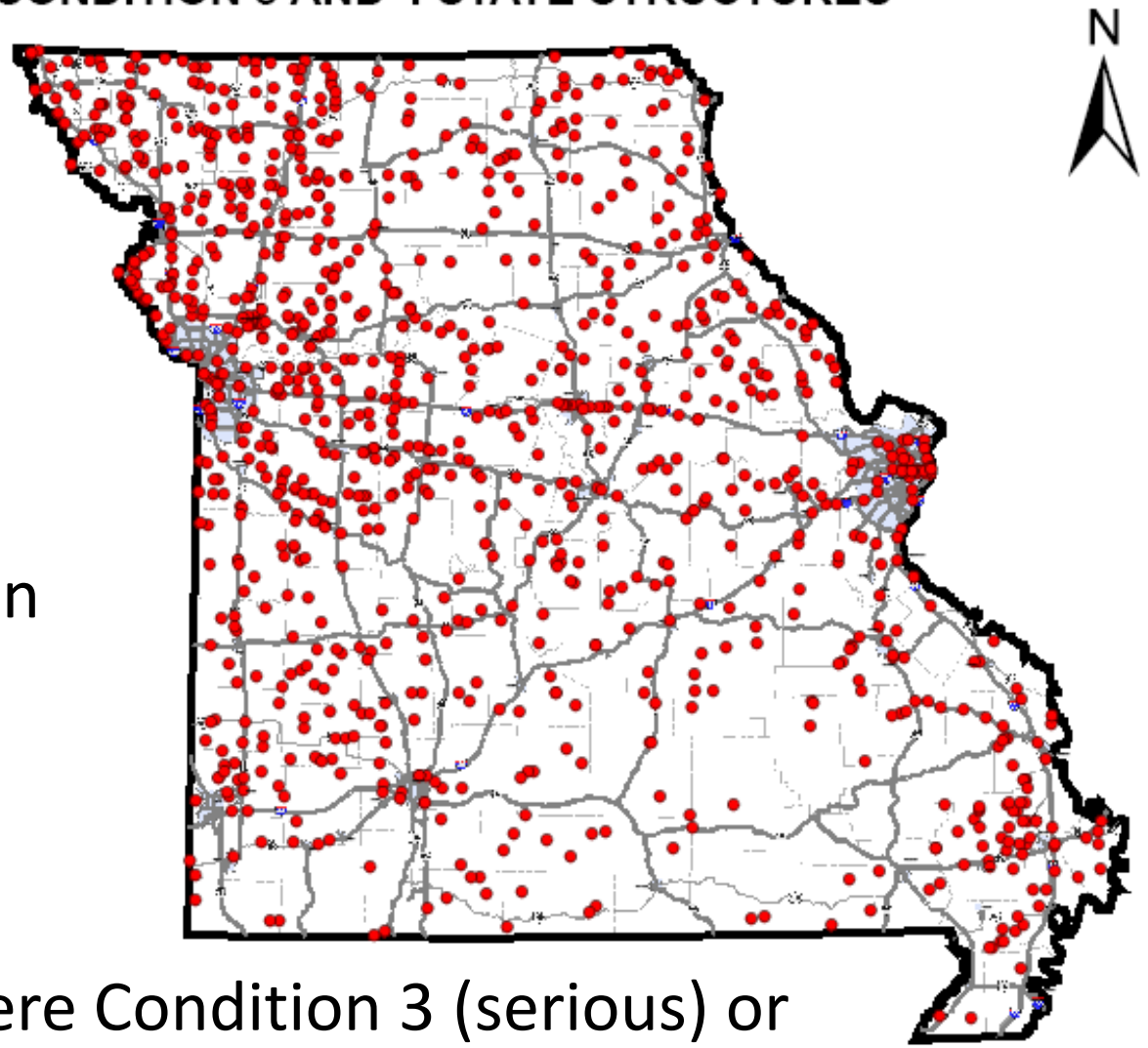
Overview

- Brief History
- Team Organization and Communications
- Results
- Public Acceptance
- Lessons Learned

CONDITION 3 AND 4 STATE STRUCTURES



10,405 bridges on MoDOT system

1,093 were Condition 3 (serious) or Condition 4 (poor) in 2007

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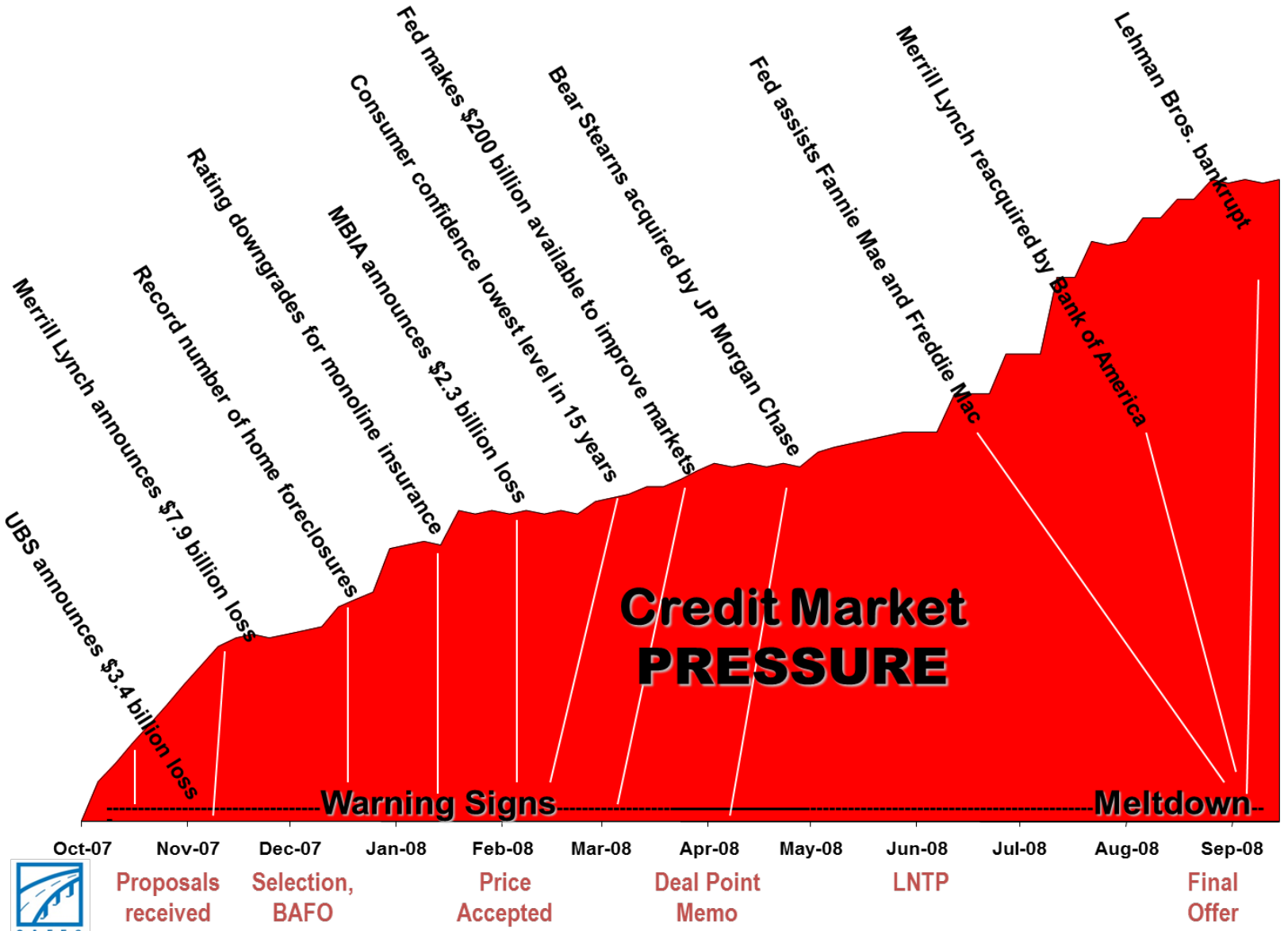
Bridge Deterioration

Design-Build-Finance-Maintain

- Envisioned as a DBFM contract.
- Performance Requirements
- Contractor was to finance construction (5 years), then maintain bridges over 25 years.
- MoDOT would repay contractor during maintenance period.
- MoDOT received 2 proposals.

Financial Issues



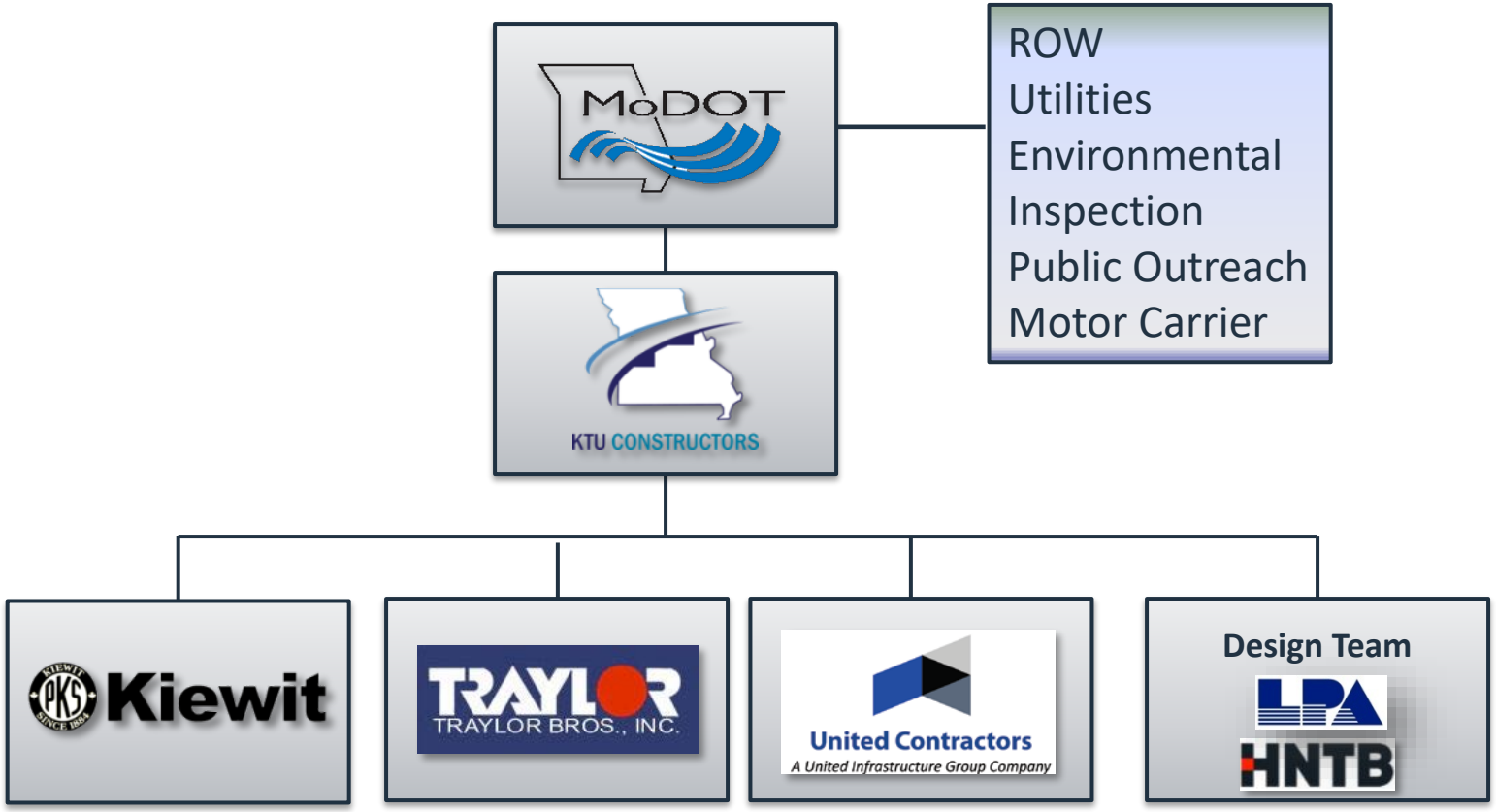
DBFM Lessons Learned

- Use of Internal Staff to Procure
- Can be done – Two Proposals
- Developer / Equity Roles
- Surety Bonding
- Ideas to make statewide program more affordable

Restructure, Fall 2008

- **Design-Build**
  - 554 complete replacements
- **Modified Design-Bid-Build**
  - 248 rehabilitation projects

Design-Build Partners



Risk Assignment

MoDOT

- ROW
- Environmental
- Community Relations
- Inspection
- Utilities

KTU

- Design
- Suppliers
- Subcontractors
- Schedule

Team Organization/Communications

- Executive — Met 3-4 times/year
- Central — Daily Calls/Weekly Meetings
- Regional — Daily Calls/Weekly Meetings
- Bridge — Daily On-Site Coordination
- Specialist — Variable – Based on Need

Project Results

1. GOAL: *Deliver good bridges at a great value.*
   - RESULT: **UNDER BUDGET**
2. GOAL: *Minimize public inconvenience through increased construction speed & flexible schedule.*
   - RESULT: **AVG. CLOSURE – 42 DAYS**
3. GOAL: *Complete by Oct. 31, 2014.*
   - RESULT: **2 years ahead of MoDOT requirement.**
   - RESULT: **14 months ahead of KTU commitment (12/31/13).**

Speed

- Total project duration
  - 3 years, 7 months, 23 days
  - 1 bridge every 1-1/2 days
- Avg. bridge closure
  - 42 days – half the time of a typical bridge replacement
- Multiple bridges under single closure – saved 400 days

Fastest by Type

- Box culvert – 27 impact hours
- Single span – 8 days
- Two span – 31 days
- Three span – 28 days
- Four span – 33 days
- Concrete deck – 13 days

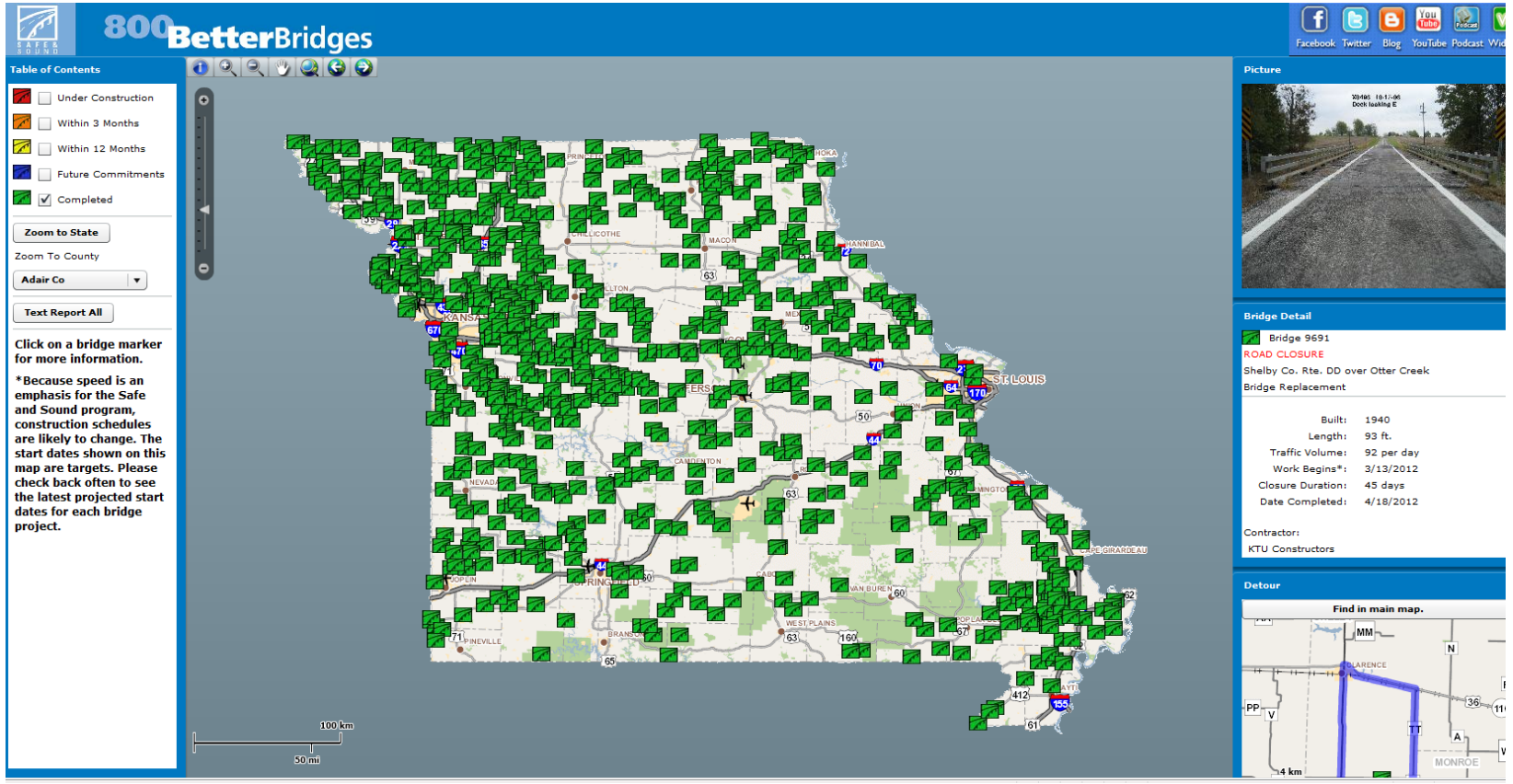
Flexibility

- Sensitivity to community events
  - Adjusted schedules for local events at more than 60 sites

- Coordination with school districts, EMS, others

Communication

- 100s of community briefings
- Interactive map to communicate schedule and detours



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Emphasis on Speed and Flexibility

- A+B Bidding for high priority sites
- Total Project Incentive/Damage
- Individual Bridge Incentive/Damage
- Environmental Pre-Screening, Conditions spelled out during bid
- Schedule adjustment by Flex-Move process
- Bridge Substitution Process
- Public Outreach and Communication
- Standardized bridge Components = Interchangeable Parts
- Teamwork Teamwork Teamwork

Lessons Learned

- Speed + Flexibility = Road Closure Acceptance
- Turn challenges into opportunities; Adapt to improve
- Safety & Quality Program
- Best Practices Manual
- Top-to-bottom teamwork produces great results

Financing

- GARVEE Bonding
- Avg. Payment, $43 million/year over 24 years
- Funded:
  - Design-Build, 554 Bridge Replacements
  - Modified Design-Bid-Build, 250 Bridge Rehabs

Statewide Teamwork Produced Results

tors – Local

Completed as Promised!

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PENNDOT RAPID BRIDGE REPLACEMENT PROJECT

February 12, 2020

pennsylvania
DEPARTMENT OF TRANSPORTATION

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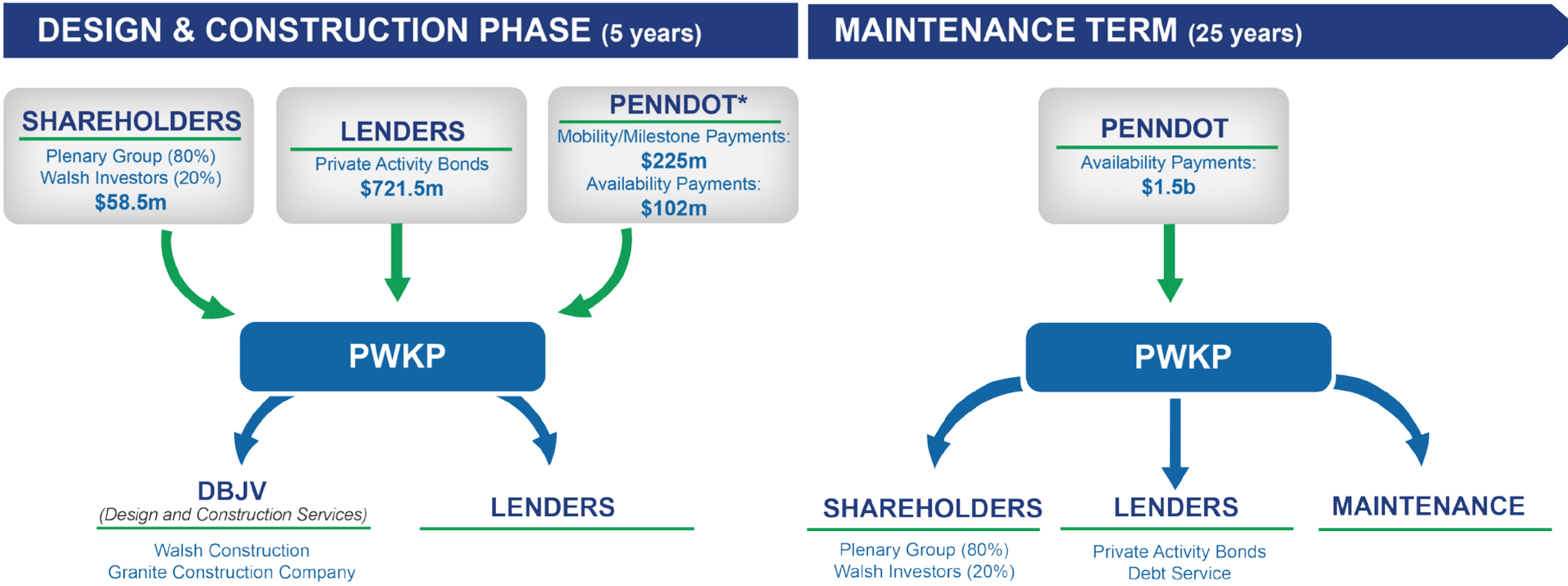
RAPID BRIDGE REPLACEMENT (RBR) PROJECT PURPOSE

- Replaced 558 poor condition bridges more quickly
- Utilized standardization of design techniques and construction methods
- Addressed bridge needs in mostly rural regions in all 11 statewide PennDOT Engineering Districts

PROJECT BENEFITS

- Better value to taxpayers
  - Higher construction quality
  - Economy of scale savings
  - Lower maintenance costs expected
- Transferred maintenance activities to private sector for a 25-year term
- Risk allocated to best-suited entity
- Use of PA-based contractors and designers

RBR PROJECT APPROACH



*** Total cost for D&C phase: $1.1b**
Total cost paid by PennDOT: $327m

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BRIDGE SELECTION

- Analyzed inventory of poor condition bridges statewide

  (6,000 at the time of project inception)

- Evaluated over 2,000 poor condition bridges with similar characteristics / criteria
  - Minimal ROW takes
  - Minimal environmental impacts
  - Limited utilities
  - Non-complex structures
    (culverts, single-span, simple multi-span)

- Selected 558 bridges for the project

BRIDGE CONSTRUCTION PRIORITIZATION

87 Early Completion Bridges (ECBs)

- **PennDOT provided (similar to D/B):**
  - Type, Size and Location
  - H&H
  - NEPA
  - Right-of-Way
  - Utility Clearance
  - Permits
- Development Entity performed Final Design
- Construction started in 2015

471 Remaining Eligible Bridges (REBs)

PennDOT provided:

- Scoping documents
- Minimum bridge width
- Detour or staged
- 2 borings per bridge
- ROW acquisition
- Utility relocation costs

Development Entity provided:

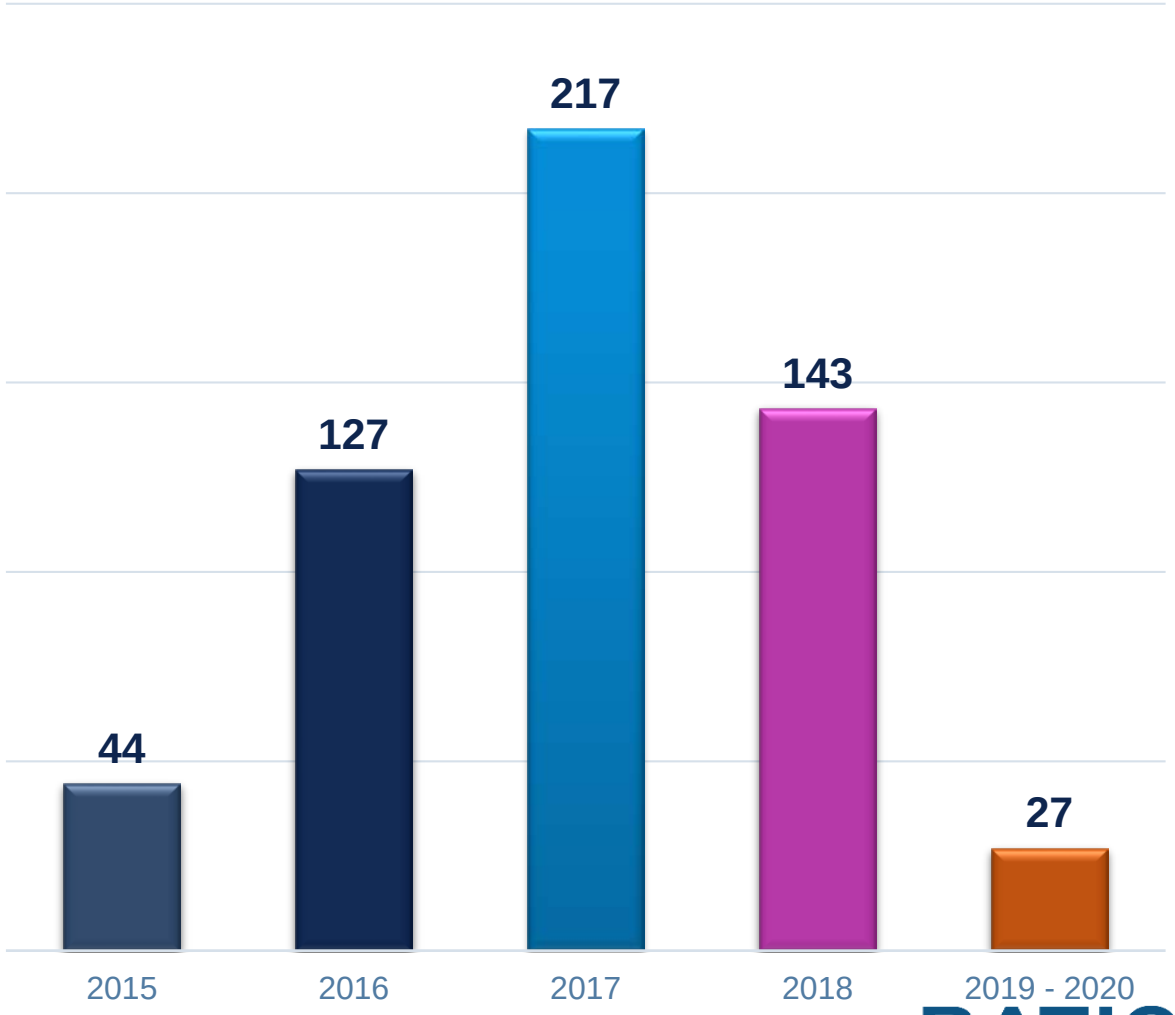
- NEPA
- Type, Size and Location
- H&H
- Survey
- ROW Plan
- Permits
- Final Design

RBR CURRENT STATUS

Year	RBR Bridges Constructed
2015	44
2016	127
2017	217
2018	143
2019	25
2020	2

Construction Completed	**556**
Under Construction	**2**

Over 99.6% of bridges built and open to traffic



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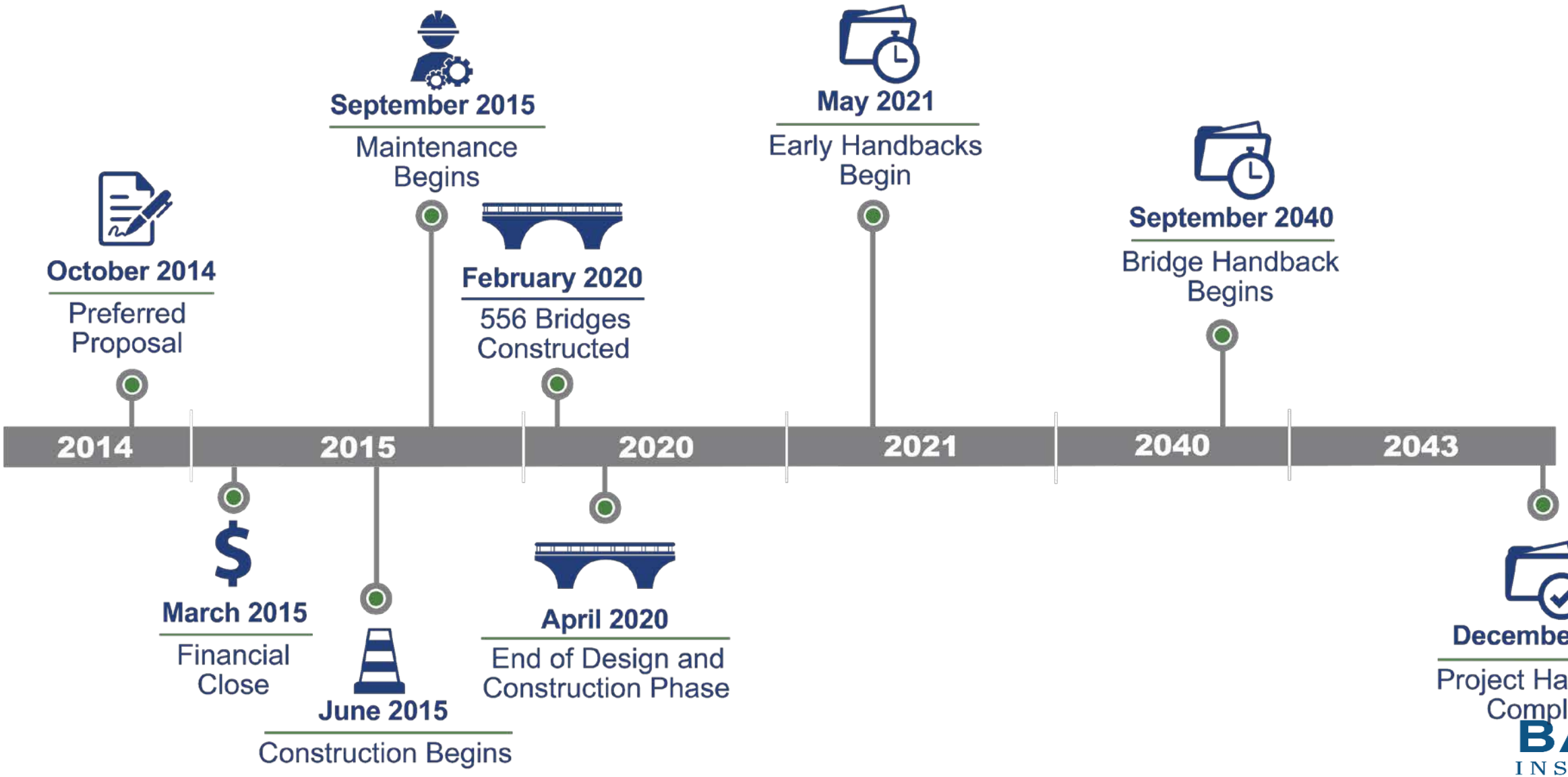
RBR PROJECT TIMELINE



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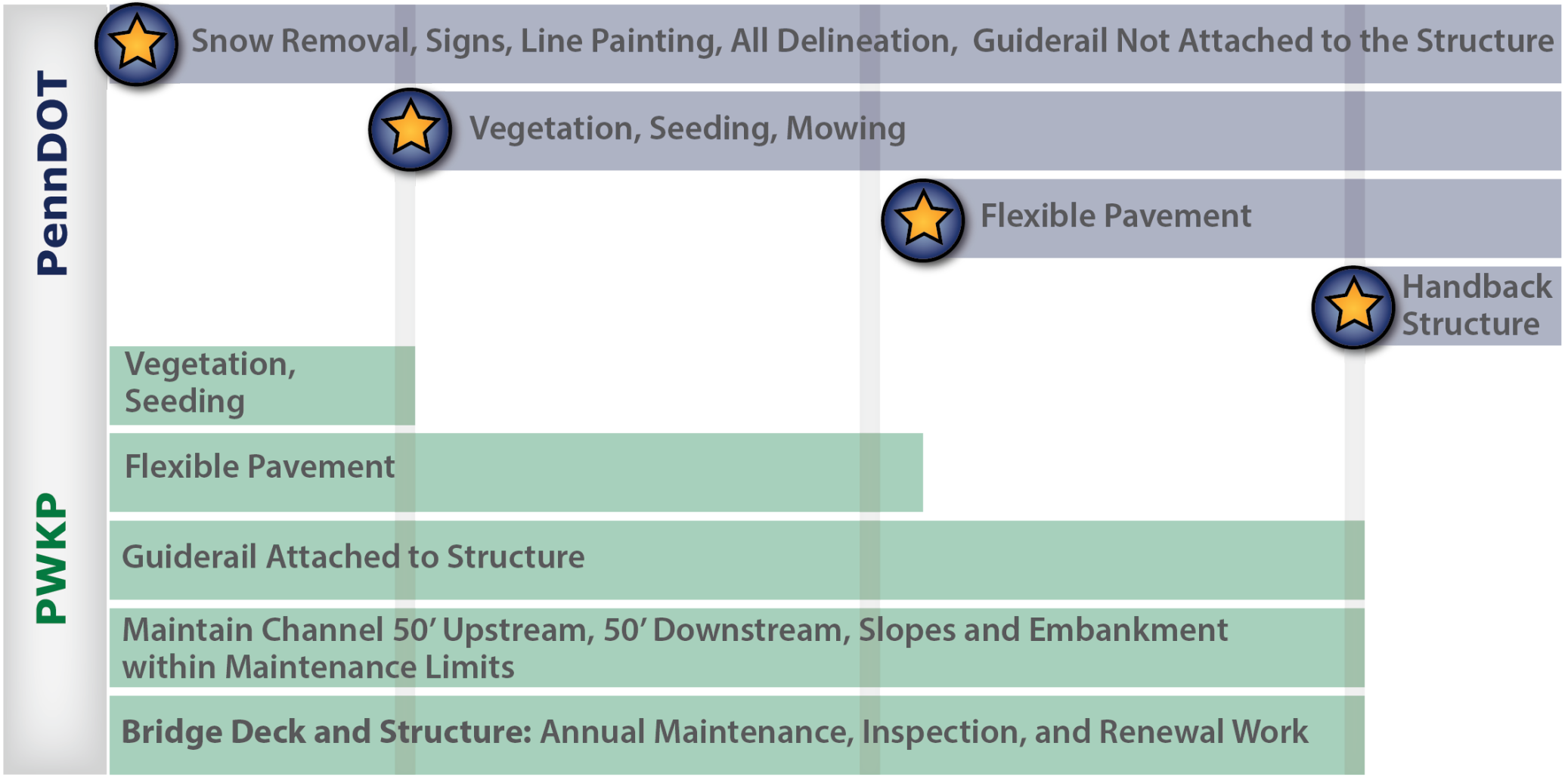
HANDBACKS



- Conditions Assessment Prior to Handback

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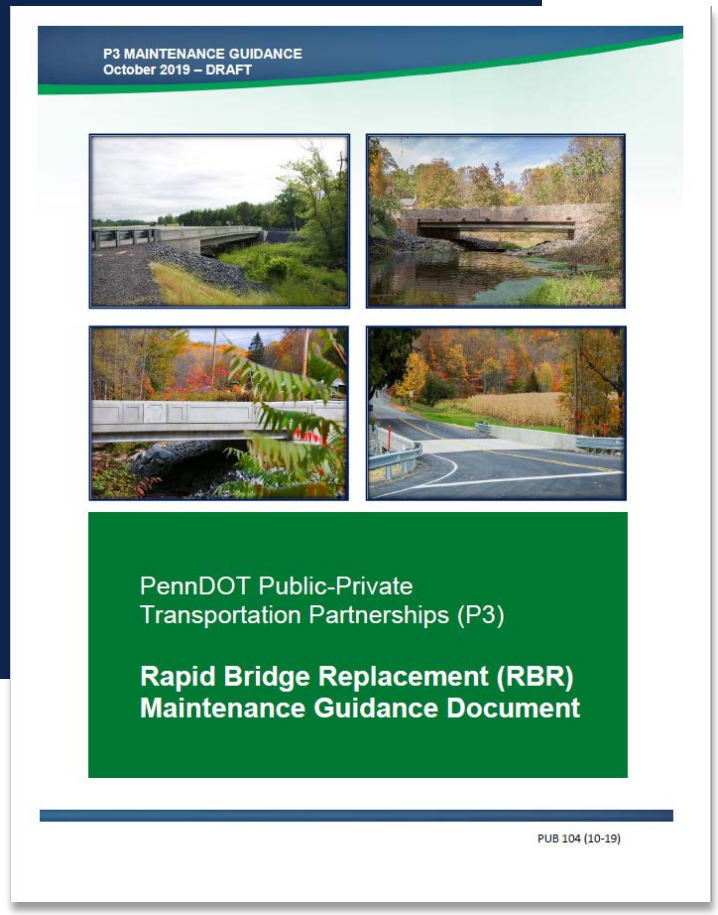
MAINTENANCE FOCUS



RBR Maintenance Guidance Document (Pub. 104)

- Comprehensive, user-friendly field guide
- Consolidates PennDOT's post-construction responsibilities and expectations
- Dynamic document, updated as needed

LESSONS LEARNED

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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

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

Performance Criteria Development

- Create a multi-discipline team to determine performance criteria required for the project
- Ensure contract language outlines roles, responsibilities and expectations for all key personnel
- Quality / 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
- Retain responsibilities of managing the Construction Quality Acceptance Firm (CQAF)

INNOVATIONS & SUCCESSES

- Utilization of SEP-15 allowed the DE to develop the NEPA documents in a streamlined, efficient manner

- Polyester Polymer Concrete (PPC) overlay
  - Applied on all RBR bridge structures (371 bridges)
  - Reduces long-term maintenance costs

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INNOVATIONS & SUCCESSES

- 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

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OUTCOMES & BEST PRACTICES

- Commitment to communication at all levels
- Appropriate risk allocation
- Proper balance of performance and prescriptive requirements
- Project-specific business plan

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OUTCOMES & BEST PRACTICES

- Systems and tools developed for use in PennDOT's standard program
  - ROW / utilities acquisition management
  - Automated design submission tracking
- Develop issues resolution process
- Audits for project performance
- Coordination with outside agencies

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QUESTIONS

Michael Bonini
Director, PennDOT P3 Office

For more information on Public-Private Partnerships and to view the RBR Lessons Learned Report:

www.p3.pa.gov

Let’s hear from you

Thank you for attending today's webinar

The BATIC Institute will post responses
to all questions received today on its website

The recorded webinar will also be available
on the BATIC Institute website:

www.financingtransportation.org

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