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

Webinar location: [http://www.financingtransportation.org/capacity_building/event_details/webinar_project_bundling_021220.aspx](http://www.financingtransportation.org/capacity_building/event_details/webinar_project_bundling_021220.aspx)
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TRANSPORTATION FINANCE
- Bond Financing
- Federal Credit
- Public Private Partnerships
- Other Finance Tools

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Webinar Overview

Intro  |  FHWA  |  Missouri  |  Pennsylvania  |  Q&A
Project Bundling:
A Strategic Program Delivery Solution

BATIC WEBINAR SERIES: INNOVATION IN PRACTICE

David Unkefer, FHWA, david.unkefer@dot.gov
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
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
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
Additional Benefits of Project Bundling

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

Source: NDOT

NDOT County Bridge Match Program sites.
How to? Bridge Bundling Guidebook

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

- State and Local Funds
- Federal-aid Highway Program
  - National Highway Performance Program
  - Surface Transportation Block Grant Program
  - National Highway Freight Program
- Highway Infrastructure Program

## FINANCING 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

## 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
Bridge Bundling Guidebook

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

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¹ IDIQ: Indefinitely Delinquent Invoice Quota
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
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

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

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
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
Contacts:

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David Unkefer: David.Unkefer@dot.gov
Build America Transportation Investment Center
AASHTO/BATIC

Safe & Sound Bridge Project
Kenyon R. Warbritton, P.E. – Project Director
MISSOURI DEPT. OF TRANSPORTATION
Safe & Sound
800 Better Bridges by 2013
Overview

• Brief History
• Team Organization and Communications
• Results
• Public Acceptance
• Lessons Learned
10,405 bridges on MoDOT system

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

Credit Market PRESSURE

Warning Signs

Meltdown

Oct-07 Nov-07 Dec-07 Jan-08 Feb-08 Mar-08 Apr-08 May-08 Jun-08 Jul-08 Aug-08 Sep-08

- Proposals received
- Selection, BAFO
- Price Accepted
- Deal Point Memo
- LNTP
- Final Offer

- UBS announces $3.4 billion loss
- Merrill Lynch announces $7.9 billion loss
- Rating downgrades for mortgage insurance
- MBIA announces lowest level in 15 years
- Bear Stearns acquired by JP Morgan Chase
- Fed assists Fannie Mae and Freddie Mac
- Lehman Bros. bankrun
- Fed raises $200 billion available to improve markets
- Merrill Lynch acquired by Bank of America
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

MoDOT

KTU Constructors

ROW
Utilities
Environmental Inspection
Public Outreach
Motor Carrier

Kiewit
TRAYLOR
United Contractors
Design Team

HNTB
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

   • RESULT: 2 years ahead of MoDOT requirement.
   • RESULT: 14 months ahead of KTU commitment (12/31/13).
Speed

• Total project duration
  o 3 years, 7 months, 23 days
  o 1 bridge every 1-1/2 days

• Avg. bridge closure
  o 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
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

Completed as Promised!
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

DESIGN & CONSTRUCTION PHASE (5 years)

SHAREHOLDERS
Plenary Group (80%)
Walsh Investors (20%)
$58.5m

LENDERS
Private Activity Bonds
$721.5m

PENNDOT*
Mobility/Milestone Payments:
$225m
Availability Payments:
$102m

PWKP

DBJV
(Design and Construction Services)
Walsh Construction
Granite Construction Company

MAINTENANCE TERM (25 years)

PENNDOT
Availability Payments:
$1.5b

PWKP

SHAREHOLDERS
Plenary Group (80%)
Walsh Investors (20%)

LENDERS
Private Activity Bonds
Debt Service

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

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<td>Scoping documents</td>
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<td>Detour or staged</td>
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<tr>
<td>2 borings per bridge</td>
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<tr>
<td>ROW acquisition</td>
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<td>Utility relocation costs</td>
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## RBR CURRENT STATUS

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Over 99.6% of bridges built and open to traffic

![RBR Bridges Constructed by Year](chart.png)
RBR PROJECT TIMELINE

- **October 2014**: Preferred Proposal
- **March 2015**: Financial Close
- **June 2015**: Construction Begins
- **September 2015**: Maintenance Begins
- **February 2020**: 556 Bridges Constructed
- **April 2020**: End of Design and Construction Phase
- **May 2021**: Early Handbacks Begin
- **September 2040**: Bridge Handback Begins
- **December 2043**: Project Handback Complete
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
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
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.
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)
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
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
Commitment to communication at all levels

Appropriate risk allocation

Proper balance of performance and prescriptive requirements

Project-specific business plan
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
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