Boone County, Indiana
A Case Study in Asset Management Plan Implementation

Infrastructure → Asset Management → Funding

Purdue Road School
Tuesday, March 16th, 2022
2020 Asset Condition Snapshot

- Boone County actively documenting and inspecting assets
- 739 miles public road (416 paved, 323 unpaved/gravel)
- Average County road rating 6.39 for paved roads
- 208 miles paved road rated 7 or higher (50%)
- 70.5 miles paved road rated less than 5 (17%)
- 190 bridges, 28 load-limited
- 341 small structures, 16 load-limited
Roadway System

- Roads rated annually by Boone County Highway Department
- PASER rating system
- Maintenance based on rated road condition

CR 1100 E
PASER 3

CR 100 S
PASER 7
Bridge Conditions

- Multiple bridges have restrictions
  - 28 Load-restricted bridges
  - 21 Inadequate width

- Multiple bridges coded as needing work
  - 27 Coded for replacement
  - 8 Coded for rehabilitation

Bridge 192
Rated 11 Tons

Bridge 87
Rated 15 Tons, Inadequate Width
Small Structure Conditions

• 2020 draft Small Structure Inspection Report identified 16 load-limited small structures.

• Additional number of small structures near end of service life and being monitored by Highway Dept staff.
First Step was Asking the Questions

• Pavement, Bridge, and Small Structure maintenance is an investment in the future of the County’s infrastructure
  • Maintain or Replace? - {Lower $ to maintain; higher $ to replace}
  • Understanding importance of maintenance? - {Provide education}
• What is the desired service level & which assets are critical?
  • Pavement condition? - {Work towards PASER 7 average, 5 minimum}
  • Load-limited bridges and structures? - {Improve to eliminate limits}
  • Minimum safety level? - {Eliminate/widen narrow structures & roads}
  • Gravel road conversion? - {Further research and discussion needed}
First Step was Asking the Questions - II

• When is the best time to invest?
  • Cost/benefit to acting now vs later? - **{Now as conditions will worsen & costs will increase over time}**

• How much should we invest?
  • What is cost to meet goals over defined time frame? - **{Amount(s) are identified by analysis}**

• How do we determine where to invest?
  • Data-driven process, review every road segment, bridge, and small str? - **{Repair/replace critical structures; maintain rest to preserve}**
    • Roads – to 2031, Bridges – to 2102, Small Structures – to 2064
Asset Management Plan Basis

- Asset Management Plan - Fact-based, Data-Driven, Defensible
- Bridge and Small Structure Plan
  - Maintenance needs based on inspection reports
  - Maintenance projected over several decades (long asset lifespan)
- Pavement Preservation Plan
  - Starting point based on Boone County’s existing road ratings
  - Pavement Ratings projected over 10 years for long-term analysis
  - Maintenance treatments applied based on Boone Co experience
  - Total miles of annual maintenance limited by minimal (“low”) budget and preferred (“high”) budget scenarios
## Bridge Plan Snapshot

- Multi-year Bridge Maintenance Plan
- Based on existing funding and proposed bonds (bonds 1-3 as approved in 2020)
- Small Structure Maintenance Plan is similar

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<tr>
<th>Structure</th>
<th>Structure Name</th>
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<th>RW</th>
<th>CN</th>
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**Total Cost in 2021**

- $612,478.00
- $326,000.00
- $2,197,000.00
- $329,550.00
- $3,465,028.00
## Bridge Plan Data

- Replacement Schedule
- Rehabilitation Schedule
- Replacement Cost
- Rehabilitation Cost
- Evaluated 2020-2102

### Bridge Plan Data Table

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<th>Year</th>
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2023-2032 with Potential Outside Funding

2023-2032 Total Projected with Funding Sources
Bridges and Small Structure Cost
$36,552,655.06 (27 Bridges & 131 Small Str.)

CCMG
$8,404,977.43
Cumulative Bridge Fund
$10,000,000.00
Federal Aid
$6,688,868.03
Shortfall
$11,458,809.60

CCMG (10 Year Avg.)
$29,863,787
Supports (82%)
• 22 Bridges
• 107 Small Str.

Federal Aid (10 Year Avg.)
$10,000,000.00
$8,404,977.43

Cumulative Bridge Fund
Shortfall (18%)
• 5 Bridges
• 24 Small Str

Cumulative Bridge
Federal Aid
CCMG
Shortfall
2020 Bonds (1 - 3)

- Bond 1 ($2 Mil) Approved
- Bond 2 ($2 Mil) Approved
- Bond 3 ($1.3 Mil) Approved

Shortfall (18%)
- 5 Bridges
- 24 Small Str

Cum Bridge

$6,688,868.03

Federal Aid

CCMG

Pie chart showing distribution of funds:
- 2020 Bonds
- Cum Bridge
- Federal Aid
- CCMG

Timeline:
- 2020: Bond 1 Paid Off
- 2021: Bond 2 Paid Off
- 2022: Bond 3 Paid Off
Bonds Projected

2023-2032 = $13,259,984.00

Bond 1 ($2 Mil) Approved
Bond 2 ($2 Mil) Approved
Bond 3 ($1.3 Mil) Approved
Bond 4 ($2.43 Mil) To Be Approved
Bond 5 ($2.51 Mil) To Be Approved
Bond 6 ($1.69 Mil) To Be Paid Off
Bond 7 ($2.86 Mil) To Be Approved
Bond 8 ($2.95 Mil) To Be Approved
Bond 9 ($1.98 Mil) To Be Paid Off
Bond 10 ($3.36 Mil) To Be Approved
Bond 11 ($3.47 Mil) To Be Approved
Bond 12 ($2.33 Mil) To Be Paid Off
Bond 13 ($3.95 Mil) To Be Approved
Bond 14 ($4.08 Mil) To Be Approved
Bond 15 ($2.74 Mil) To Be Paid Off

Bond 1 ($2 Mil) Paid Off
Bond 2 ($2 Mil) Paid Off
Bond 3 ($1.3 Mil) Paid Off
Bond 4 ($2.43 Mil) To Be Paid Off
Bond 5 ($2.51 Mil) To Be Paid Off
Bond 6 ($1.69 Mil) To Be Paid Off
Bridge Funding Levels
Minimal vs Preferred Funding

Minimal funding - local amount at current level plus only approved bonds (1-3)
Preferred funding - local amount at higher level plus all proposed bonds (1-9)

- Local Funds
- Bonds 1-3
- Bonds 4-6
- Bonds 7-9
- CCMG
Small Structure Funding Levels

Minimal vs Preferred Funding

Minimal funding - local amount at current level plus only approved bonds (1-3)
Preferred funding - local amount at current level plus approved bonds (1-3) and funds from a maintenance budget

- Local Funds
- Bonds 1-3
- Maintenance Funds
Road Maintenance and Preservation Funding

- **Annual Budget Based on Long-Term Preservation Plan**
  - Previously - current funding vs Highway Dept budget requests
  - Now - anticipated annual cost/mile necessary to maintain the County's paved road mileage over an extended life-cycle
  - Improves all paved roads to 5+ (7+ average) over next 7-10 years

- **Maintenance and Preservation Budget Focuses on Roads**
  - Budget only for highway maintenance/preservation efforts
  - Does not include gravel conversion (should be separate additional amount set by Council & Commissioners)
  - Does not initially include small structures (Currently funded using other sources but could be funded through future maintenance fund)
## Comparison of Minimal and Preferred Annual Budget Results

### 2022 Low

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<th>Miles</th>
<th>$/Mile</th>
<th>Total</th>
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**Paved miles:** 66.178

### 2022 High

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**Paved miles:** 99.757

### 2023 Low

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**Paved miles:** 69.096

### 2023 High

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**Paved miles:** 104.701

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**Boone County Highway Department**

**BF&S CIVIL ENGINEERS**
Estimated Ave PASER Ratings for Minimum and Preferred Budgets

Boone County PASER Ratings Paved - Projections

Preferred Budget Includes:
- 74.5 Miles Converted Gravel,
- 18 Small Structures/Culverts

Desired Average Rating

Minimal Average Rating

Historical Average

Minimal Maintenance Program

Preferred Maintenance Program
Next Steps

- 10-Year Rolling Preservation Plan
  - Data-driven based on asset condition
  - Supports annual and long-term budget planning
- When is the best time to invest?
  - The sooner the better; delay only costs additional dollars
- How much should be invested?
  - Maintain all roads to average of PASER = 5 or Higher
  - No road closures, load restrictions, one lane structures.
- Review and implement funding strategies
Next Steps
Part II

• What are possible long-term funding strategies
  ✔  • Continue using Federal Aid
  ✔  • Continue using Community Crossings Matching Grant Program
  ✔  • Utilize a repeating series of bonds
  ✔  • Increase cumulative bridge fund from the current $760K±
  ✔  • Establish a wheel tax
  ?  • Work with County’s financial consultant to identify other options
• Re-evaluate maintenance plans/schedules based on new funding levels/sources
THANK YOU

Questions?

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