

TODAY...



INFRASTRUCTURE

ASSET MANAGEMENT

HOW TO PAY FOR THIS?

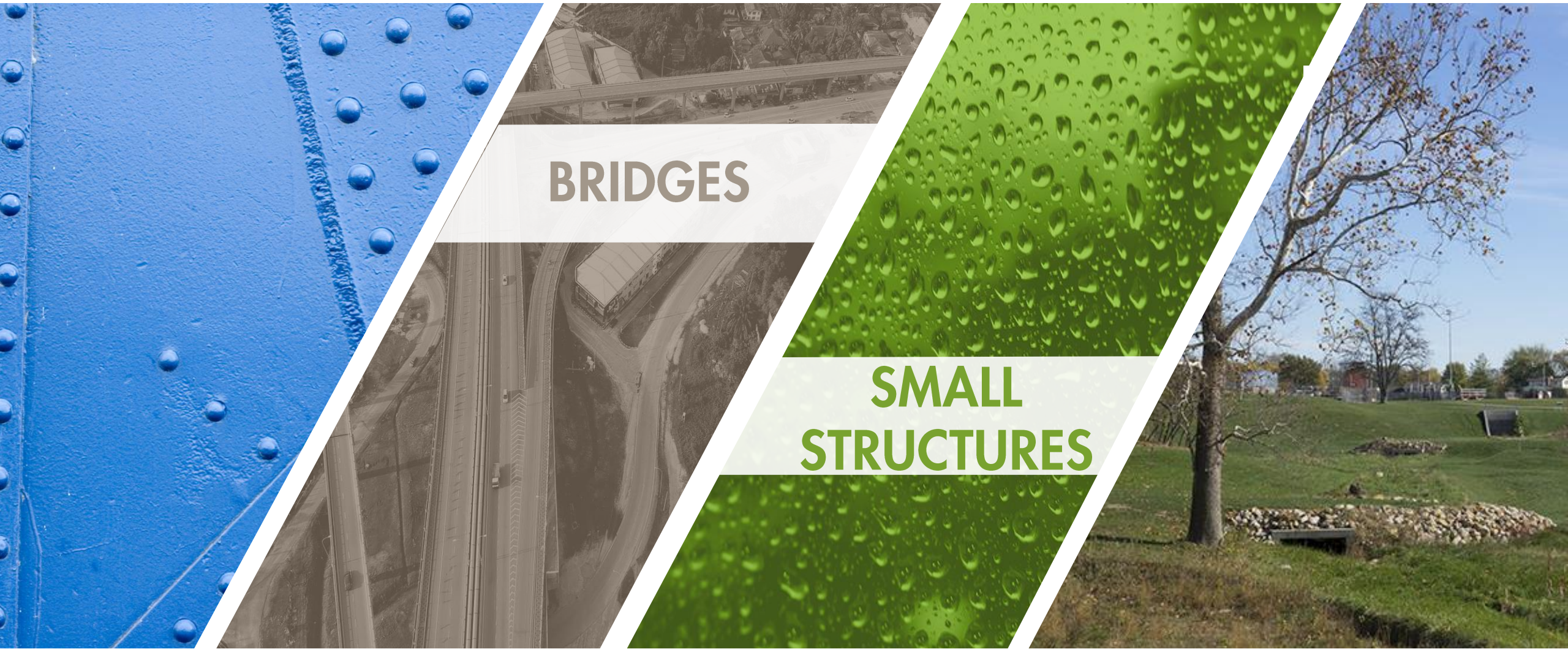


ROADS



STORMWATER





BRIDGES

**SMALL
STRUCTURES**

THE PRIMARY CHALLENGE FACED WHEN OWNING AND MAINTAINING INFRASTRUCTURE ASSETS IS KNOWING WHEN TO:





UNMANAGED ASSETS CAN BECOME
LIABILITIES



**Communities that properly implement
Asset Management Plans have been
shown to have strong Technical,
Managerial and Financial capacity.**





What is the current state of my system's assets?

What is my required "sustainable level of service?"

Which assets are critical to sustained performance?

What are my minimum life cycle costs?

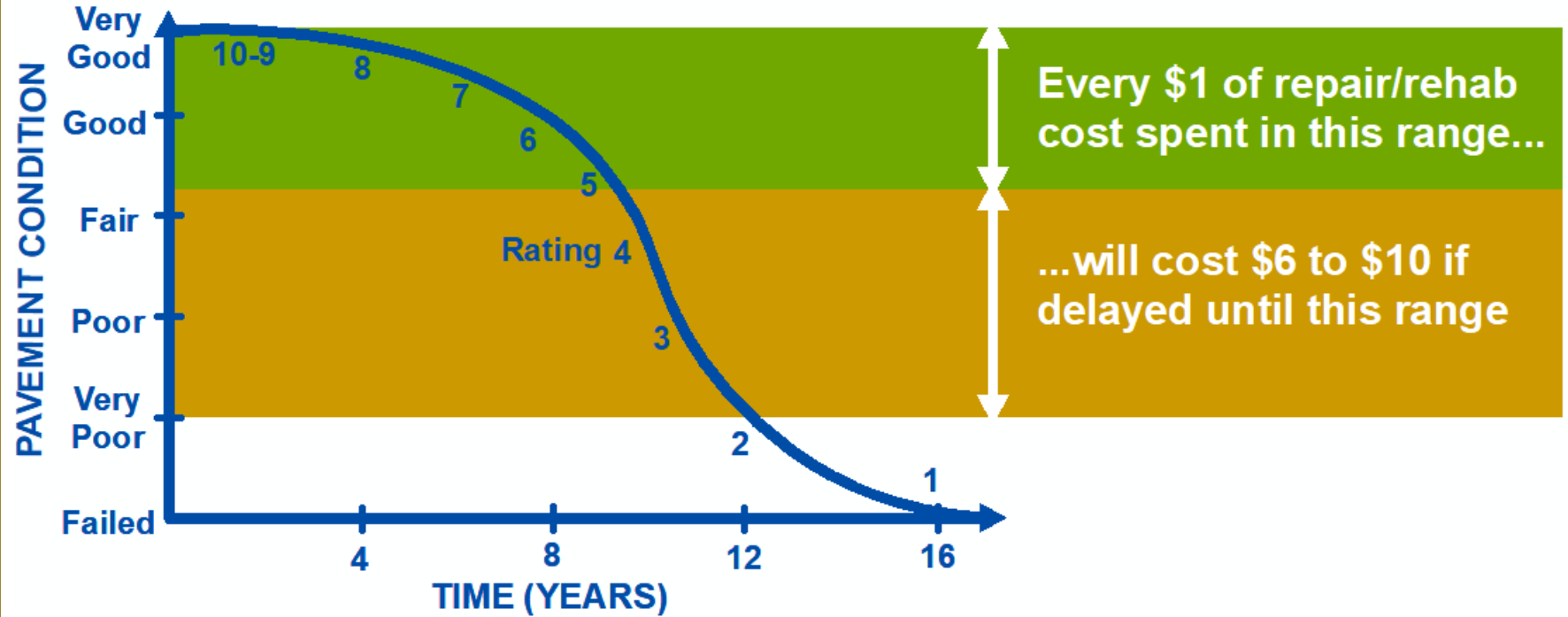
What is my best long-term funding strategy?

PASER

PAVEMENT SURFACE EVALUATION and RATING

Cost of Pavement Maintenance

PAVEMENT LIFE - NO MAINTENANCE

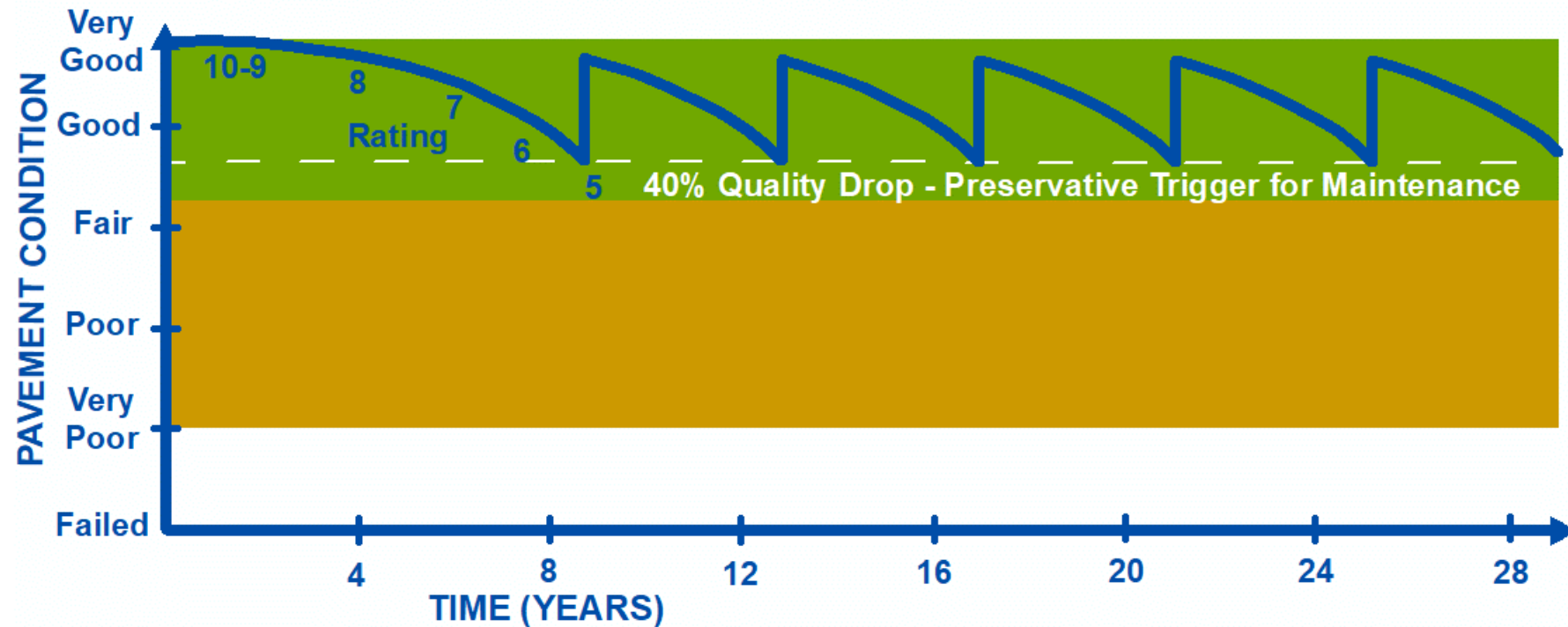


PASER

PAVEMENT SURFACE EVALUATION and RATING

Ideal Maintenance Schedule

PAVEMENT LIFE - PROPER MAINTENANCE



Asset Condition Snapshot

- Boone County doing excellent job documenting 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, 1 closed

Questions Answered

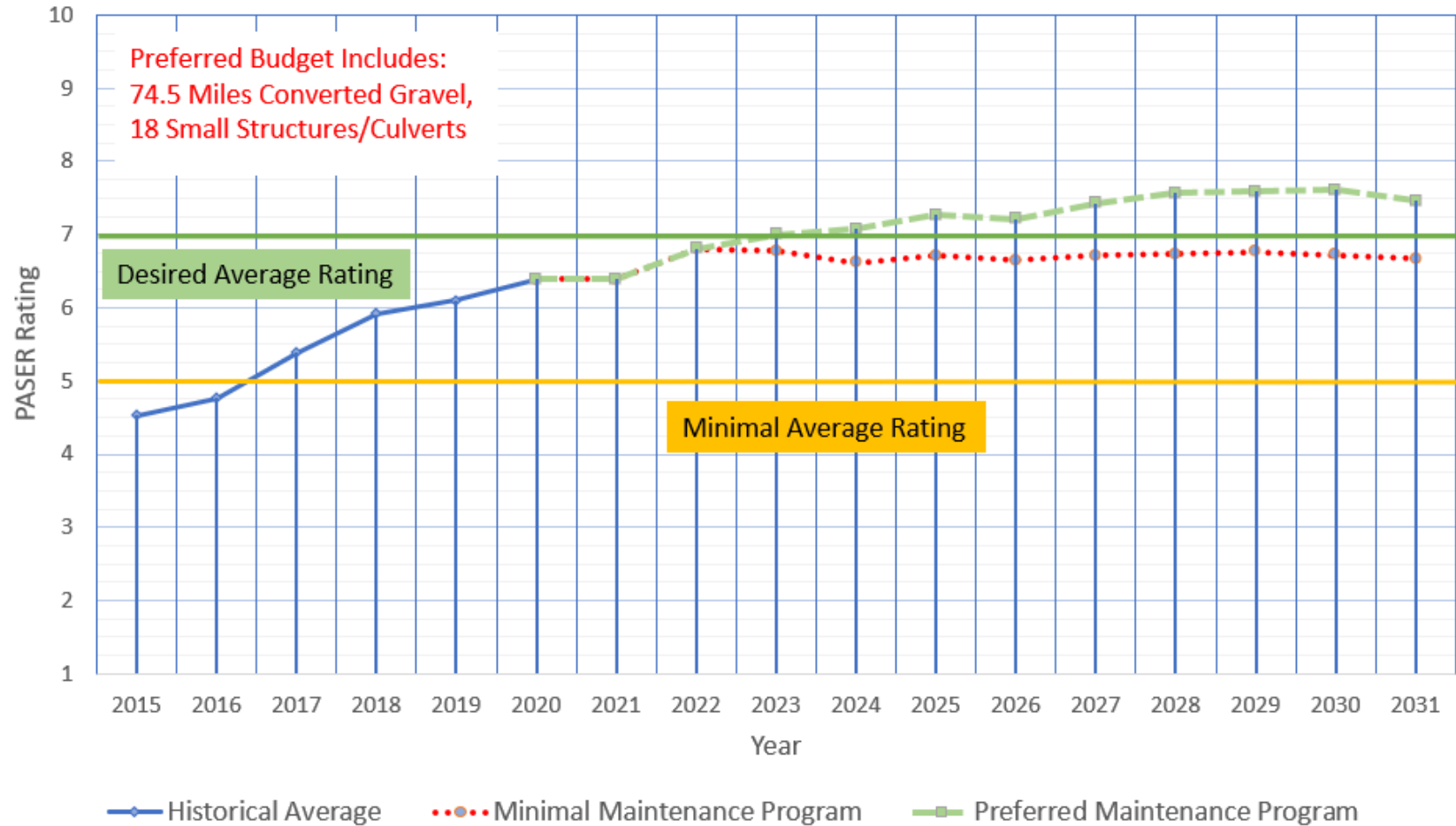
- Pavement, Bridge, and Small Structure maintenance is an investment in the future of the County's infrastructure
- What is the desired level of service & critical assets?
 - Pavement condition? Load-limited bridges and structures? Gravel road conversion? Minimum safety level?
- When is the best time to invest?
 - Cost/benefit to acting now vs later
- How much should we invest?
 - Cost to meet goals over defined time frame
- How do we determine where to invest?
 - Data-driven process

Looking Ahead

- 10-Year Pavement Preservation Plan
 - Fact-based, Data-Driven, Defensible
 - Starting point based on Boone County's existing road ratings
 - 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

Roadway Condition Forecast

Boone County PASER Ratings Paved - Projections

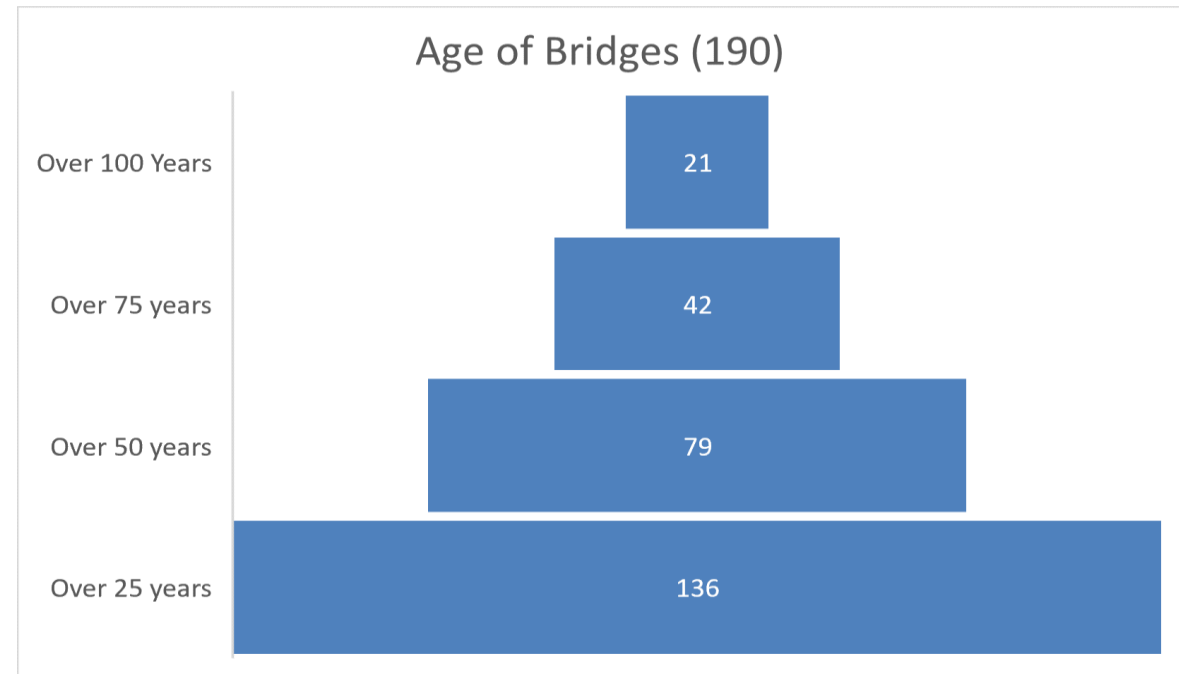


Snapshot of Bridge Plan Data

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

| Year | Current Yr. Cost | Projected Cost | Cumulative Bridge Fund |
|------|------------------|------------------|------------------------|
| 2022 | \$ 541,537.92 | \$ 541,537.92 | \$ 700,000.00 |
| 2023 | \$ 1,036,981.44 | \$ 1,071,201.83 | \$ 723,100.00 |
| 2024 | \$ 3,271,813.78 | \$ 3,491,316.49 | \$ 746,962.30 |
| 2025 | \$ 2,108,623.43 | \$ 2,324,341.80 | \$ 771,612.06 |
| 2026 | \$ 485,844.48 | \$ 553,220.87 | \$ 797,075.25 |
| 2027 | \$ 2,195,148.38 | \$ 2,582,055.01 | \$ 823,378.74 |
| 2028 | \$ 610,346.88 | \$ 741,615.26 | \$ 850,550.24 |
| 2029 | \$ - | \$ - | \$ 878,618.39 |
| 2030 | \$ 1,023,200.64 | \$ 1,326,671.43 | \$ 907,612.80 |
| 2031 | \$ 2,330,984.30 | \$ 3,122,067.17 | \$ 937,564.02 |
| 2032 | \$ 4,541,866.56 | \$ 6,284,020.39 | \$ 968,503.64 |
| 2033 | \$ 2,510,481.60 | \$ 3,588,067.29 | \$ 1,000,464.26 |
| 2034 | \$ - | \$ - | \$ 1,033,479.58 |
| 2035 | \$ 6,094,107.36 | \$ 9,294,248.51 | \$ 1,067,584.40 |
| 2036 | \$ - | \$ - | \$ 1,102,814.69 |
| 2037 | \$ - | \$ - | \$ 1,139,207.57 |
| 2038 | \$ - | \$ - | \$ 1,176,801.42 |
| 2039 | \$ 1,097,535.60 | \$ 1,906,005.20 | \$ 1,215,635.87 |
| 2040 | \$ 7,677,516.53 | \$ 13,772,936.57 | \$ 1,255,751.85 |
| 2041 | \$ 685,238.40 | \$ 1,269,836.49 | \$ 1,297,191.66 |
| 2042 | \$ - | \$ - | \$ 1,339,998.99 |
| 2043 | \$ - | \$ - | \$ 1,384,218.95 |
| 2044 | \$ - | \$ - | \$ 1,429,898.18 |

Age of Inventory



| Bridge Age | Number | Percentage |
|----------------|--------|------------|
| Over 100 Years | 21 | 11% |
| Over 75 years | 42 | 22% |
| Over 50 years | 79 | 42% |
| Over 25 years | 136 | 72% |

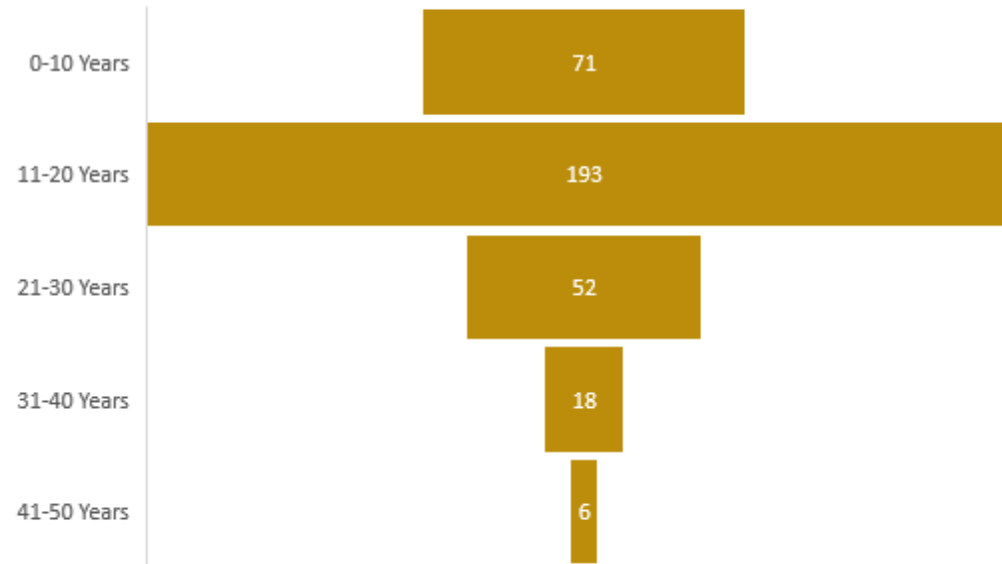
Snapshot of Small Structure Plan Data

- Replacement Schedule
- Replacement Cost
- Rehabilitation Cost
- Evaluated 2020-2064

| Year | Current Year Cost | Projected Cost |
|------|-------------------|------------------|
| 2022 | \$ 215,766.51 | |
| 2023 | \$ - | \$ - |
| 2024 | \$ 2,926,209.45 | \$ 3,122,525.92 |
| 2025 | \$ - | \$ - |
| 2026 | \$ 1,160,410.85 | \$ 1,321,335.39 |
| 2027 | \$ - | \$ - |
| 2028 | \$ - | \$ - |
| 2029 | \$ 6,415,433.61 | \$ 8,052,454.25 |
| 2030 | \$ - | \$ - |
| 2031 | \$ - | \$ - |
| 2032 | \$ - | \$ - |
| 2033 | \$ - | \$ - |
| 2034 | \$ 8,268,895.71 | \$ 12,208,192.61 |
| 2035 | \$ - | \$ - |
| 2036 | \$ - | \$ - |
| 2037 | \$ - | \$ - |
| 2038 | \$ - | \$ - |
| 2039 | \$ 3,232,026.48 | \$ 5,612,810.46 |
| 2040 | \$ - | \$ - |
| 2041 | \$ - | \$ - |
| 2042 | \$ - | \$ - |
| 2043 | \$ - | \$ - |
| 2044 | \$ 1,178,019.89 | \$ 2,406,354.99 |

Small Structure Remaining Life

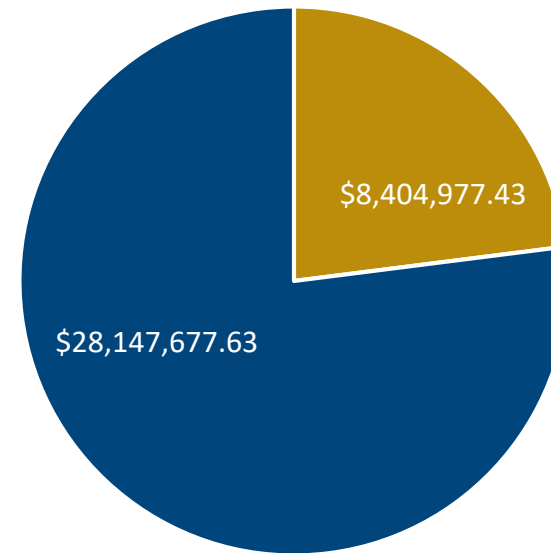
Small Structures Remaining Life (340)



| Small Structure Remaining Life | Number | Percent | 20 Year Totals | |
|--------------------------------|--------|---------|----------------|-------|
| 0-10 Years | 71 | 20.9% | 264 | 77.5% |
| 11-20 Years | 193 | 56.6% | | |
| 21-30 Years | 52 | 15.3% | | |
| 31-40 Years | 18 | 5.3% | | |
| 41-50 Years | 6 | 1.7% | | |

Bridges & Small Structures 10-year Cost Analysis

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

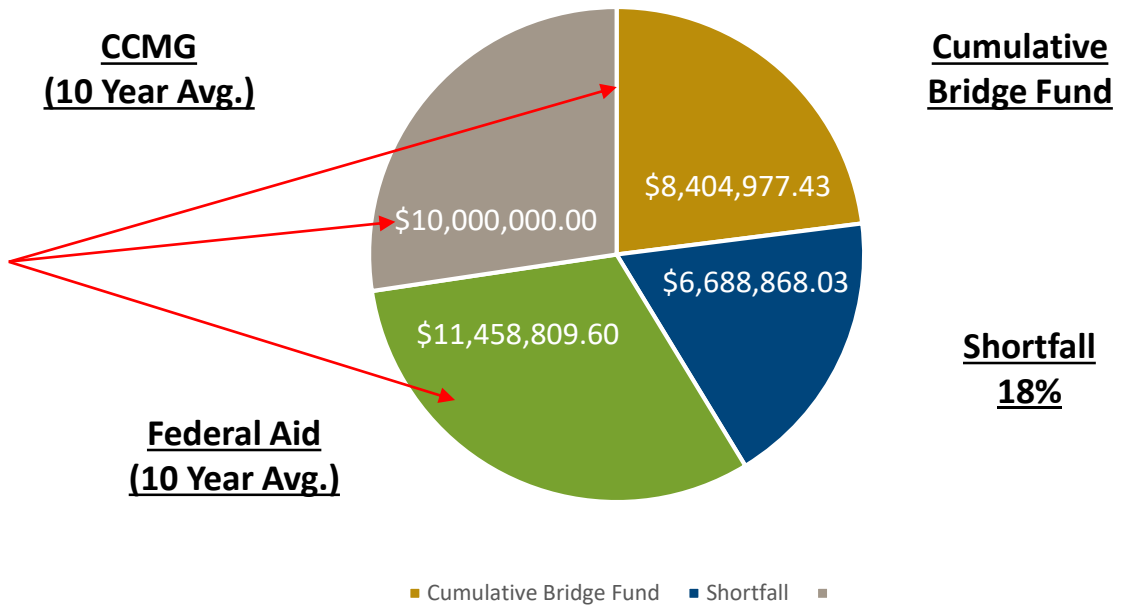


■ Cumulative Bridge Fund ■ Shortfall

Bridges & Small Structures 10 year Cost Analysis with other funding sources

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

- Supports (82%)**
- 22 Bridges
 - 107 Small Str.



ASSET MANAGEMENT



ROADS

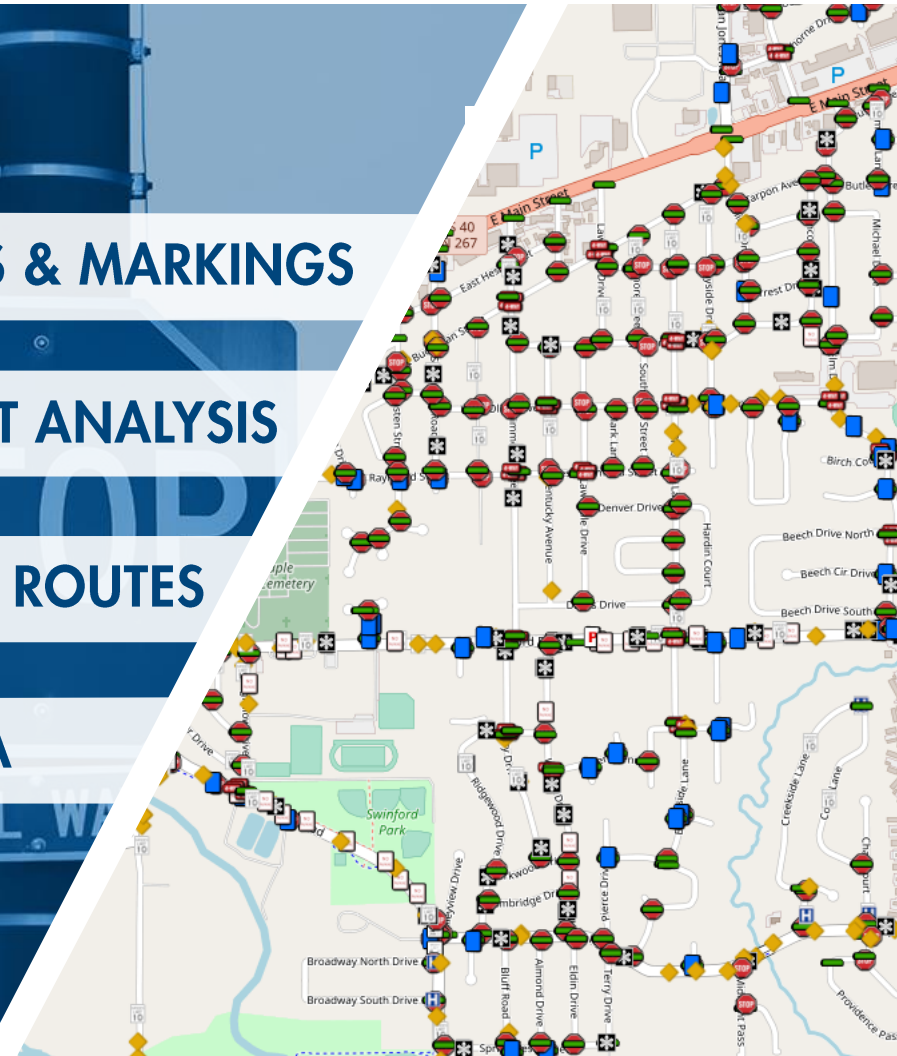


SIGNS & MARKINGS

PAVEMENT ANALYSIS

SNOW PLOW ROUTES

TRAFFIC DATA

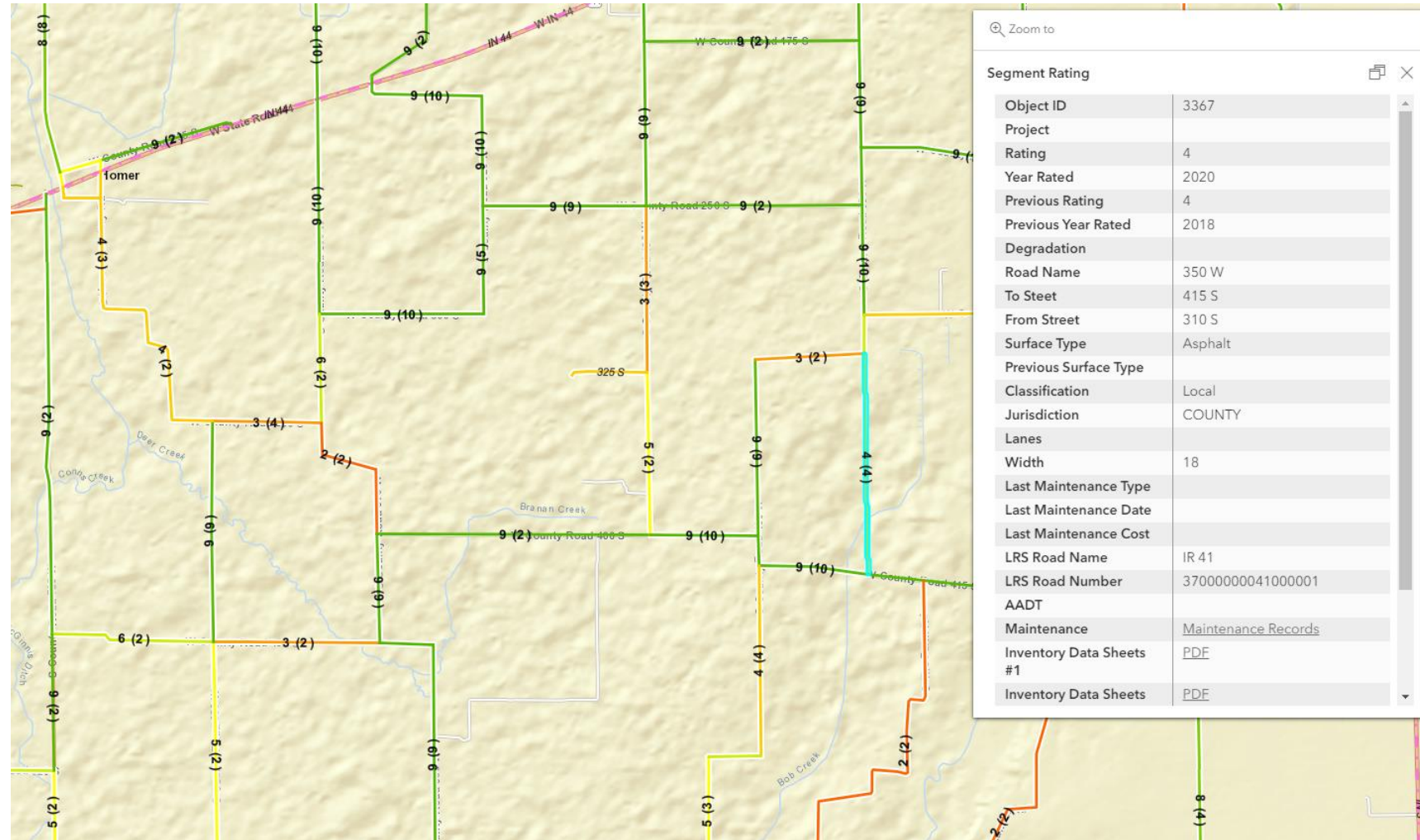


ASSET MANAGEMENT



Inspect and Rate Assets – Best Way to Determine Current Conditions

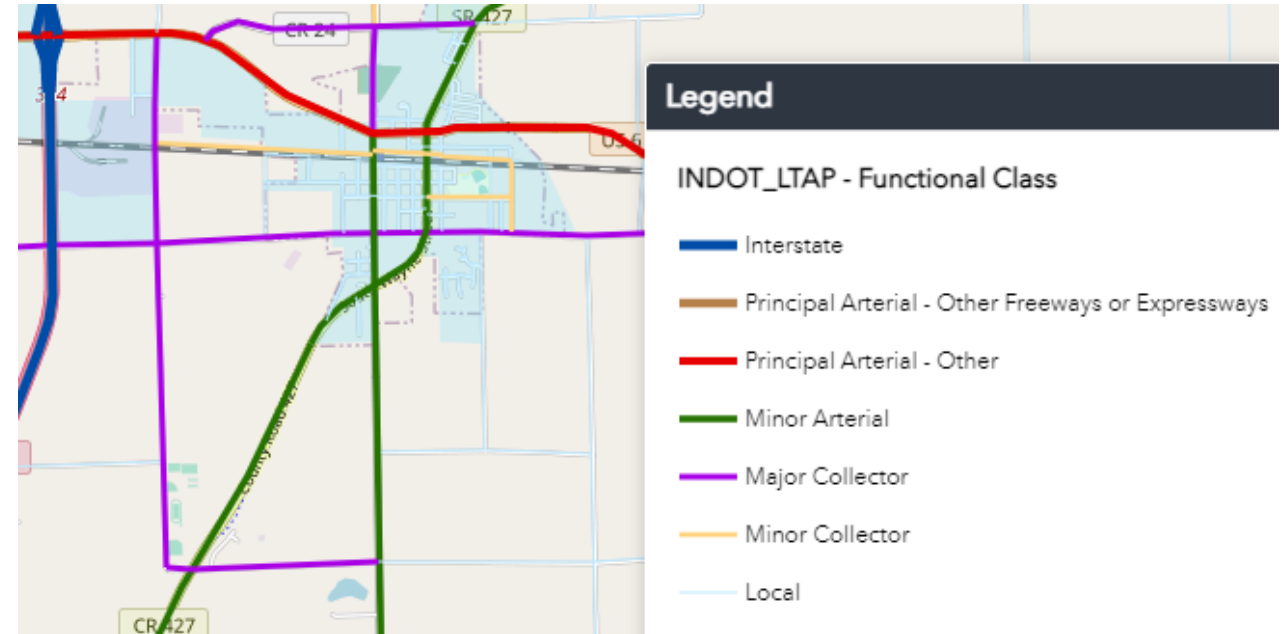
Asset Conditions Serve as the Foundation for Maintenance Decisions



Establish Goals
 Prioritize Assets
 Determine Costs
 Identify Limiting Factors

- Funding
- Time

| 2021 ratings | # of miles | % of Total |
|--------------|---------------|----------------|
| 1 | 0.18 | 0.04% |
| 2 | 20.21 | 5.03% |
| 3 | 6.66 | 1.66% |
| 4 | 69.13 | 17.21% |
| 5 | 91.74 | 22.84% |
| 6 | 51.07 | 12.71% |
| 7 | 39.93 | 9.94% |
| 8 | 39.03 | 9.72% |
| 9 | 71.72 | 17.86% |
| 10 | 12.01 | 2.99% |
| Total | 401.68 | 100.00% |



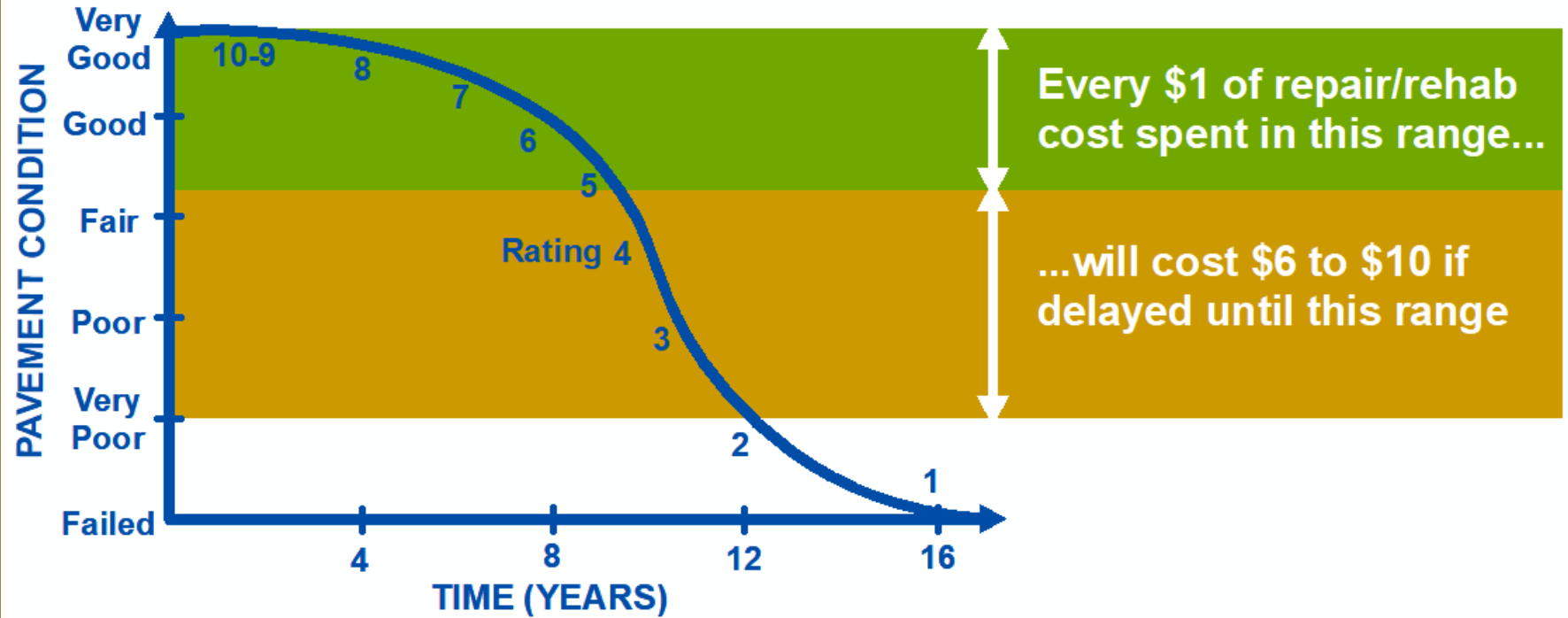
| 2020 Actual | \$/Mile |
|-----------------|-----------|
| Reconstruction | \$295,000 |
| HMA Overlay | \$155,000 |
| CMA Overlay | \$120,000 |
| Microsurface | \$35,000 |
| Dbl Chip & Seal | \$29,600 |
| Chip & Seal | \$16,100 |
| Crack Seal | \$6,200 |
| Road Conversion | \$110,000 |

PASER

PAVEMENT SURFACE EVALUATION and RATING

Cost of Pavement Maintenance

PAVEMENT LIFE - NO MAINTENANCE

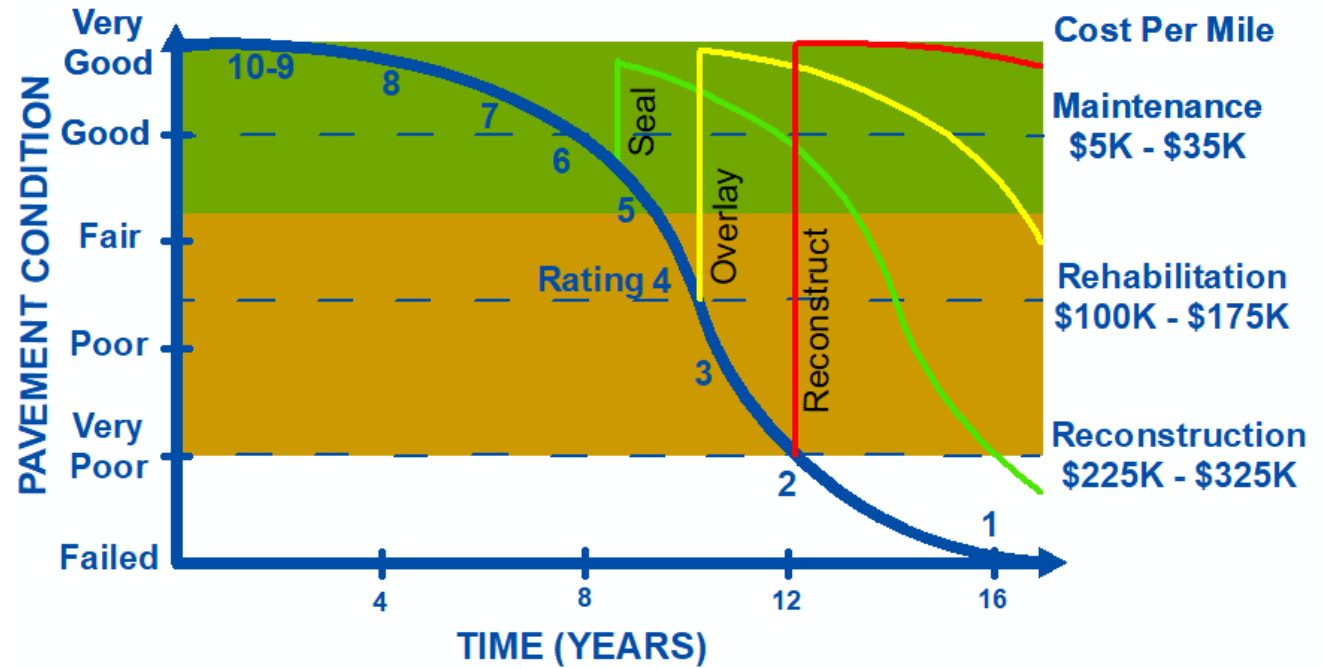


PASER

PAVEMENT SURFACE EVALUATION and RATING

Cost of Pavement Maintenance

PAVEMENT CONDITION AND MAINTENANCE COST OVER TIME

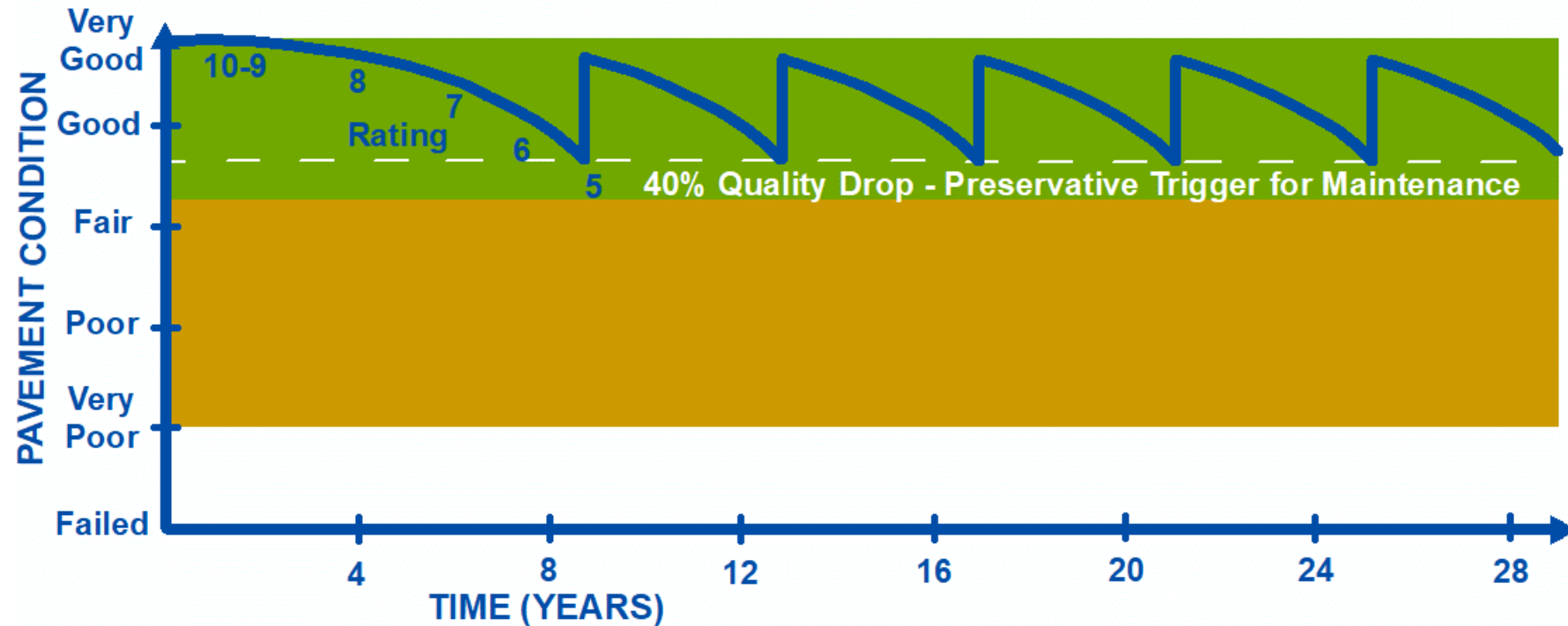


PASER

PAVEMENT SURFACE EVALUATION and RATING

Ideal Maintenance Schedule

PAVEMENT LIFE - PROPER MAINTENANCE



Road Rating and Maintenance Treatment Cost Projections

| 2020 Actual | \$/Mile |
|-----------------|-----------|
| Reconstruction | \$295,000 |
| HMA Overlay | \$155,000 |
| CMA Overlay | \$120,000 |
| Microsurface | \$35,000 |
| DbI Chip & Seal | \$29,600 |
| Chip & Seal | \$16,100 |
| Crack Seal | \$6,200 |
| Road Conversion | \$110,000 |

| | | Rating year of and years after treatment | | | | | | | | | | |
|----------------------------|-----------------|--|----------|----------|----------|----------|-----------------|----------|----------|----------|----------|--|
| Treatment (rating) | \$/Mile | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | |
| Reconstruction (2-3) | \$295,000 | 10 | | | | | | | | | | |
| HMA Overlay (3-4) | \$155,000 | 9 | | | | | | | | | | |
| CMA Overlay (3-4) | \$120,000 | 9 | | | | | | | | | | |
| Microsurface (5-6) | \$35,000 | 8 | | | | | | | | | | |
| DbI Chip Seal (4-5) | \$29,600 | 8 | | | | | | | | | | |
| Sgl Chip Seal (5-6) | \$16,100 | 8 | 8 | 7 | 7 | 6 | 8 (ChpS) | 8 | 7 | 7 | 6 | |
| Crack Seal (7) | \$6,200 | 8 | | | | | | | | | | |
| CMA Road Conversion | \$110,000 | 10 | | | | | | | | | | |
| | | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | |

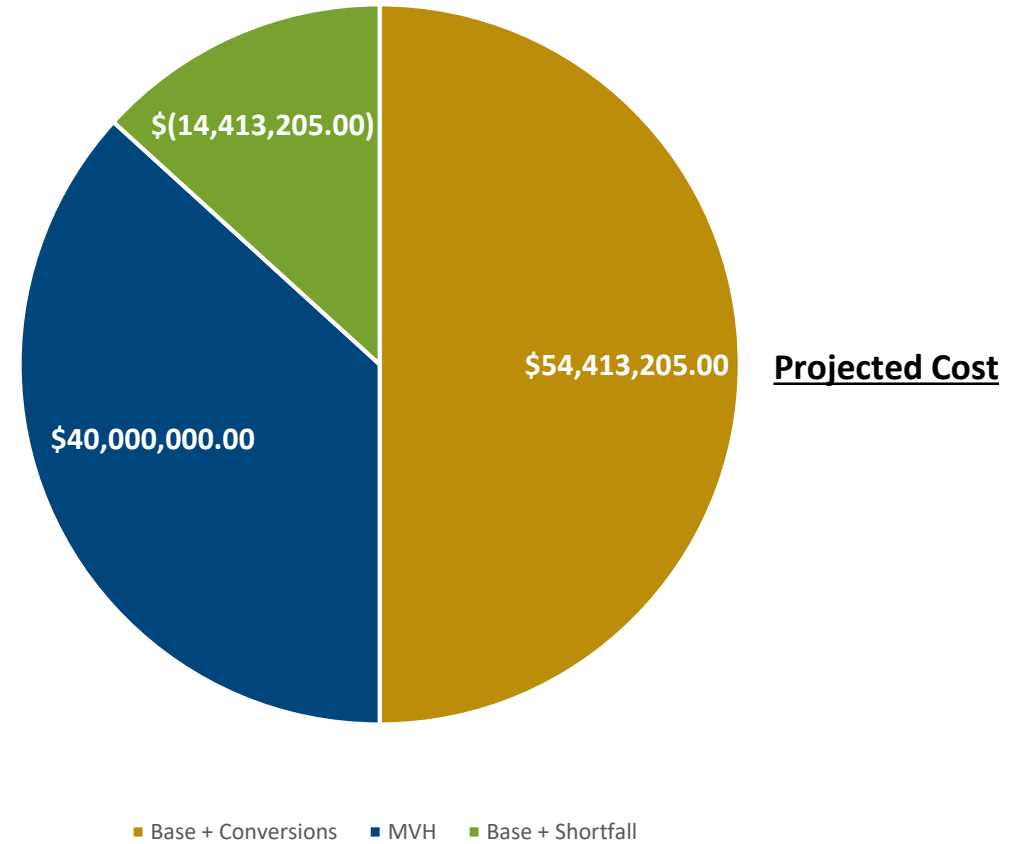
| | | | | | | | | | | |
|------------------------------------|------|-------|---|---|---|---|---|---|---|-----|
| Current Road Rating | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| Time Before Decline to Next Rating | 1 Yr | 2 Yrs | ? | ? | ? | ? | ? | ? | ? | n/a |

The background of the slide features a green-tinted image of several stacks of gold coins. Each stack is topped with a small, vibrant green plant growing out of a mound of dark soil. A red dashed line is drawn across the scene, connecting the tops of the plants and coins, suggesting a trend or forecast.

Unlike annual municipal budgets,
Capital Improvement Plans
forecast infrastructure project
needs for 5 years or more

2023-2032 Roadway
Maintain Avg of PASER 7 w/ Conversions
(1090 Miles) (88 Miles Converted)

Roadway Cost Analysis Example with Goals Included



QUESTIONS?

Contact BF&S:
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Brad Stump
GISP

OFFICE LOCATIONS

