Pavement Maintenance- 6th Penny/ Engineering Updates

October 23, 2025

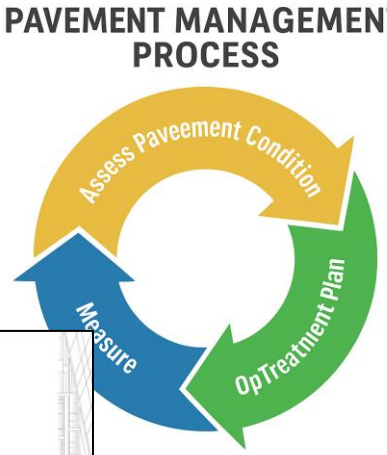
CITY OF CHEYENNE — ENGINEER —

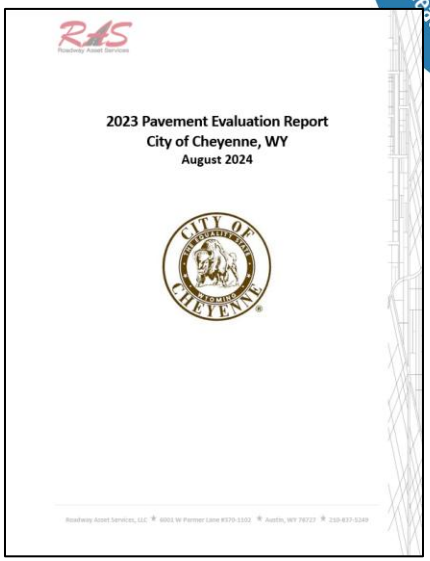
Agenda

- Pavement Maintenance Stabilization
  - Overview of Pavement Management Program
  - Key Terms
  - Where are we today with aging infrastructure?
  - What will happen without additional funding?
  - Funding History
  - Work Plan Scenarios
  - Pavement Maintenance Strategy
  - Recommendation
  - Questions?
- Engineering Update
  - Overview Summer 2026
  - Questions?

Overview of Pavement Management Program

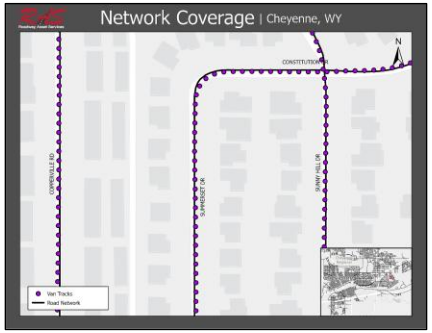
- Inspection & Data Collection
  - Conducted every 4 years (5th Penny Ballot)
  - City-wide pavement condition survey
- Condition Analysis
  - Assessment of **current pavement conditions**
  - Identification of surface distresses and structural issues
  - **Predictive modeling** for future condition trends
- Maintenance & Repair Planning
  - Recommendations for pavement maintenance and rehabilitation
  - Development of work plan scenarios
  - Prioritization based on condition, usage, and budget
- Reporting & Documentation
  - Summary report with findings and recommendations

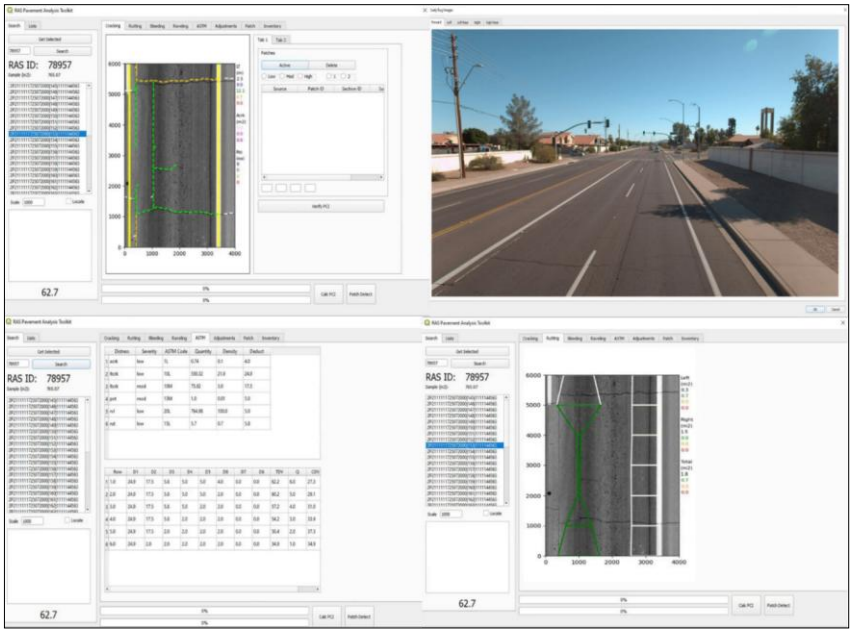



2023 Pavement Evaluation Report
City of Cheyenne, WY
August 2024

Overview of Pavement Management Program – Key Terms

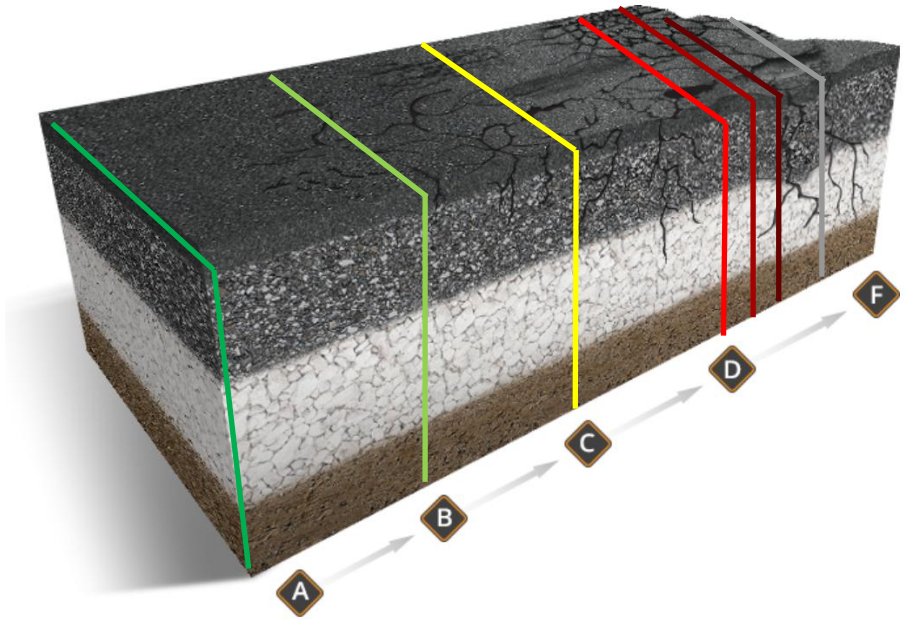
- Inspection and Data Collection
  - Automated Pavement Imaging
    - RAS RAC vehicle captures images every ~25 ft
    - Uses Road TRIP™ for automated distress detection
  - Ride Quality Measurement
    - IRI & profiles collected ICC inertial profiler – “Ride Quality”
    - Line lasers improve accuracy; 98%+ cross-correlation on certification sites
  - ROW & Asset Imaging
    - 360° Ladybug 5+ camera captures ROW images every ~20 ft
    - Post-processed with GPS/inertial data for accurate asset extraction
  - Pavement Width & Area Calculation
    - Width measured using Ladybug + LCMS-2 + GPS
    - Accurate edge-to-edge and cul-de-sac area calculations





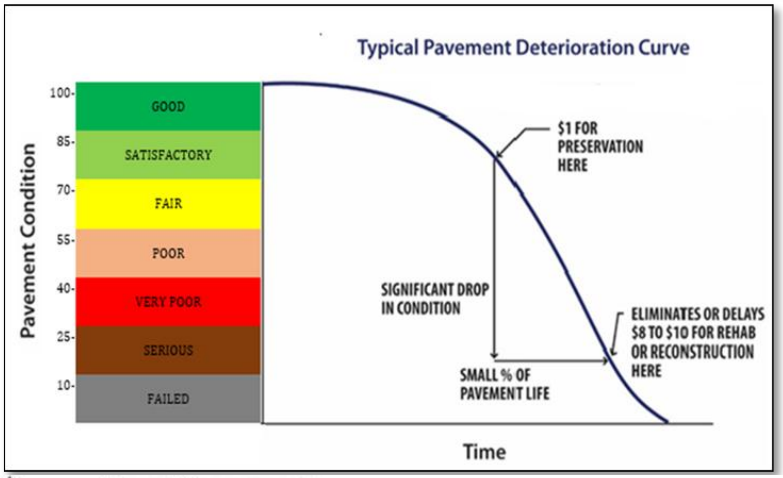
Overview of Pavement Management Program – Key Terms

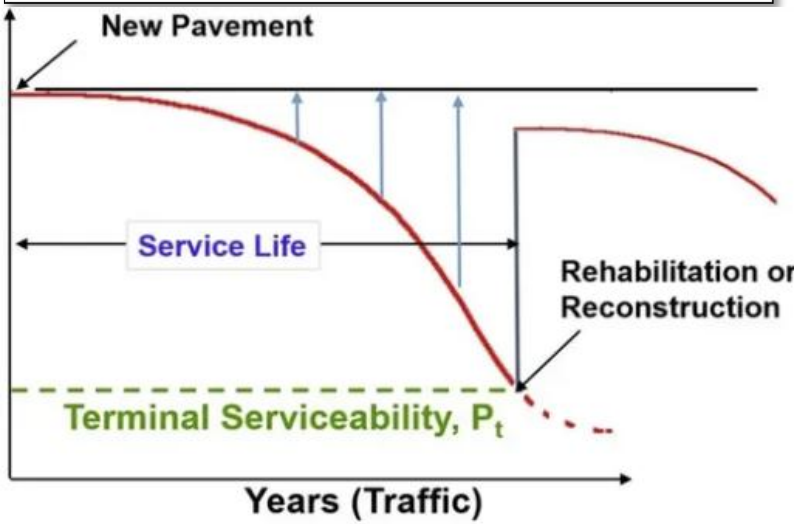
- Pavement condition is typically calculated and described in terms of Pavement Condition Index (PCI)
- PCI Levels
  - A (PCI 86 - 100) Good
  - B (PCI 71 - 85) Satisfactory
  - C (PCI 56 - 70) Fair
  - D (PCI 41 - 55) Poor
  - F (PCI 26 - 40) Very Poor
  - F (PCI 11 - 25) Serious
  - F (PCI 0 – 10) Fail



Overview of Pavement Maintenance – Key Terms

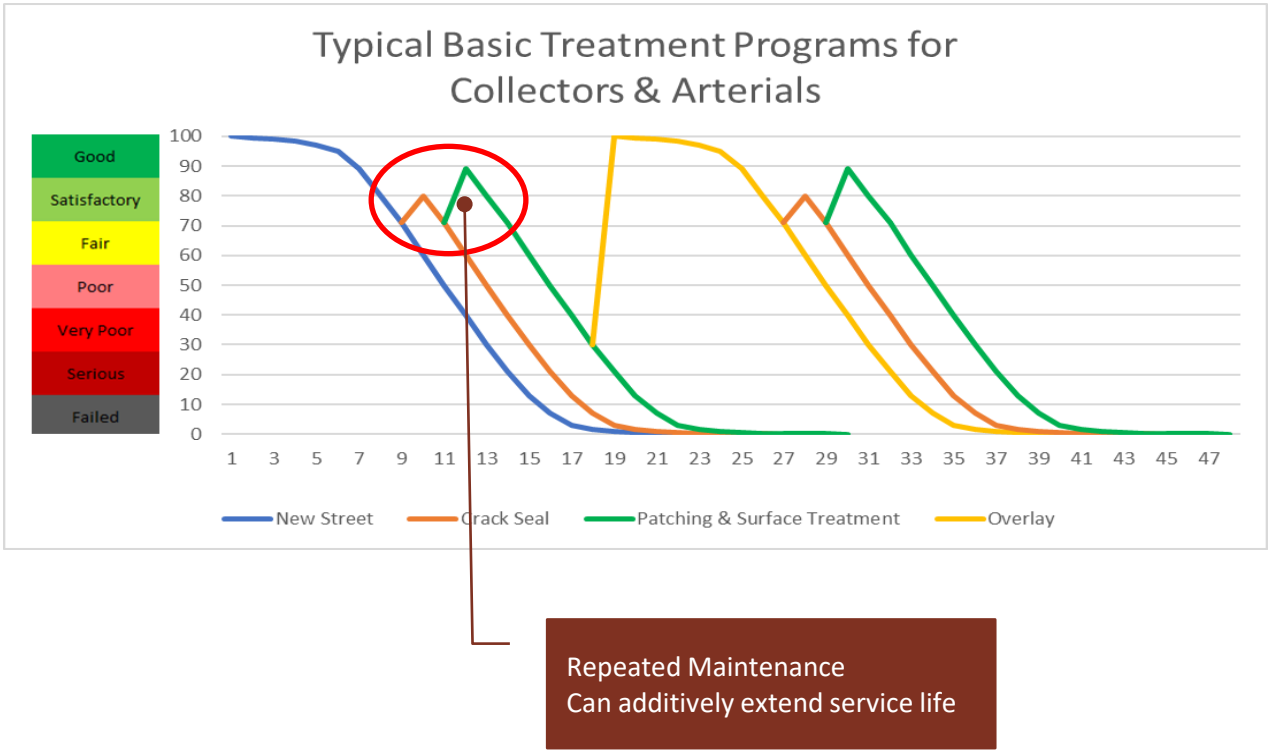
- Pavement Life Cycle: Performance Overview
  - Service Life approximately 20 years
  - Why Pavement Deteriorates?
    - **Traffic loading**: Heavy vehicles cause repeated stress and cracking
    - **Moisture infiltration**: Water enters cracks, weakens base and subgrade
    - **Temperature changes**: Freeze–thaw cycles expand cracks and strip asphalt
    - **Oxidation**: Sunlight and air harden asphalt, making it brittle
    - **Delayed maintenance**: Small cracks become potholes if left untreated





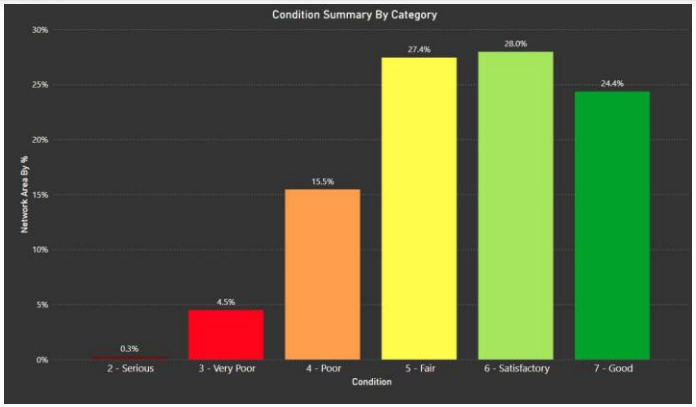
Overview of Pavement Maintenance – Key Terms

- How Do Treatments Improve Pavement Conditions?
  - Crack Seal
    - 10 Point Reset Value
  - Patch and Seal
    - 15 Point Reset Value
  - Wearing Course
    - 25 Point Reset Value
  - Mill and Overlay
    - Resets Pavement to 80 to 95



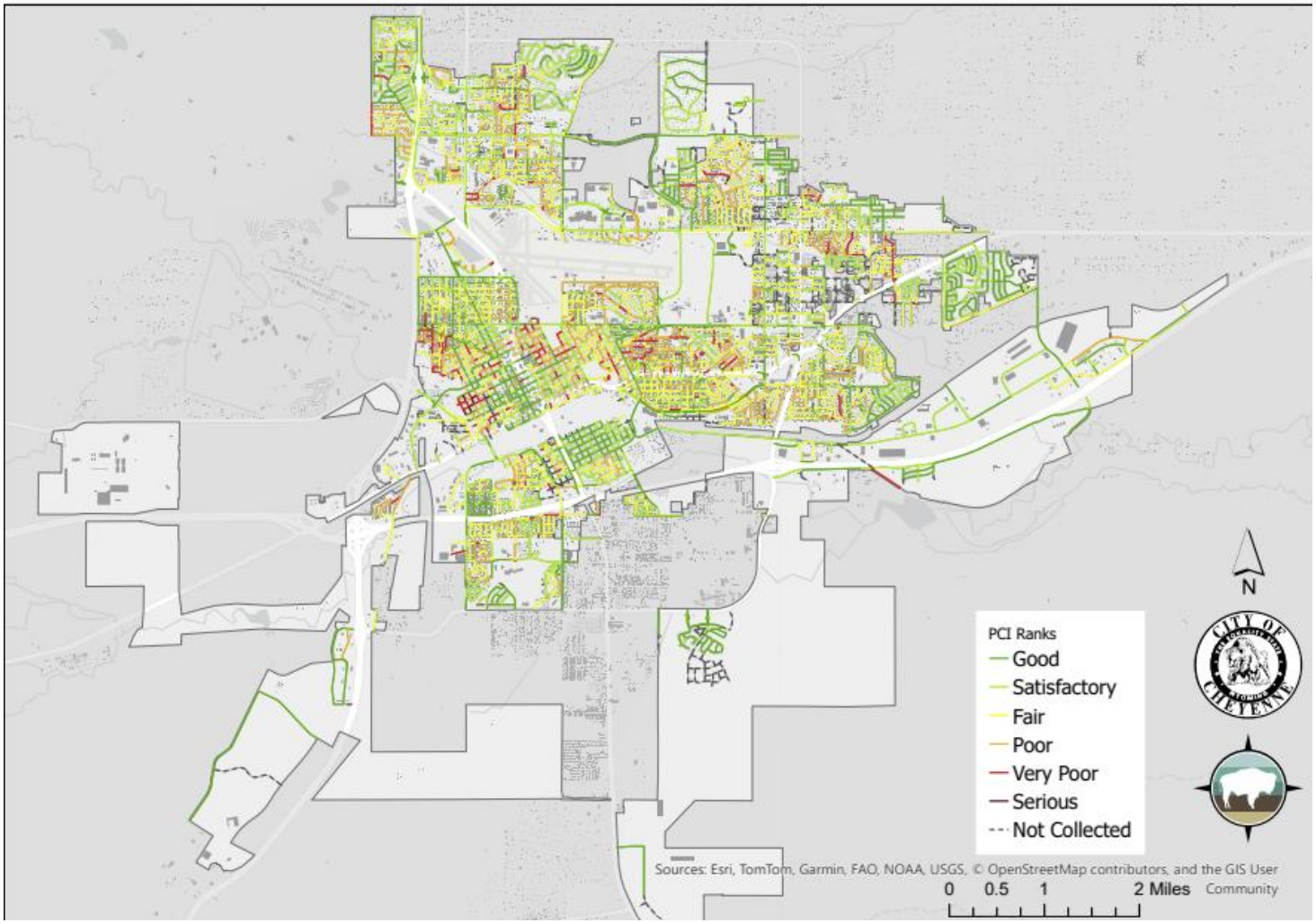
Where are we Today with Aging Infrastructure?

- Key Highlights 2023 Inventory
  - Average PCI: 68
    - Above the national average of 60–65
    - Reflects a proactive and effective pavement management strategy
  - Shape of Distribution:
    - PCI distribution is right-shifted, peaking between 56–70
    - Indicates ongoing maintenance and major rehabilitation investments
  - Good Condition Roads:
    - 25.11% of the network is rated Good
    - Surpasses the national average of 15%
  - Backlog (PCI < 40):
    - **4.4%** of roads fall into **Very Poor, Serious, or Failed** categories
    - Considered acceptable, but requires monitoring to prevent rapid growth
- Key Takeaways
  - Continued investment is essential to maintain this trajectory and prevent backlog growth.



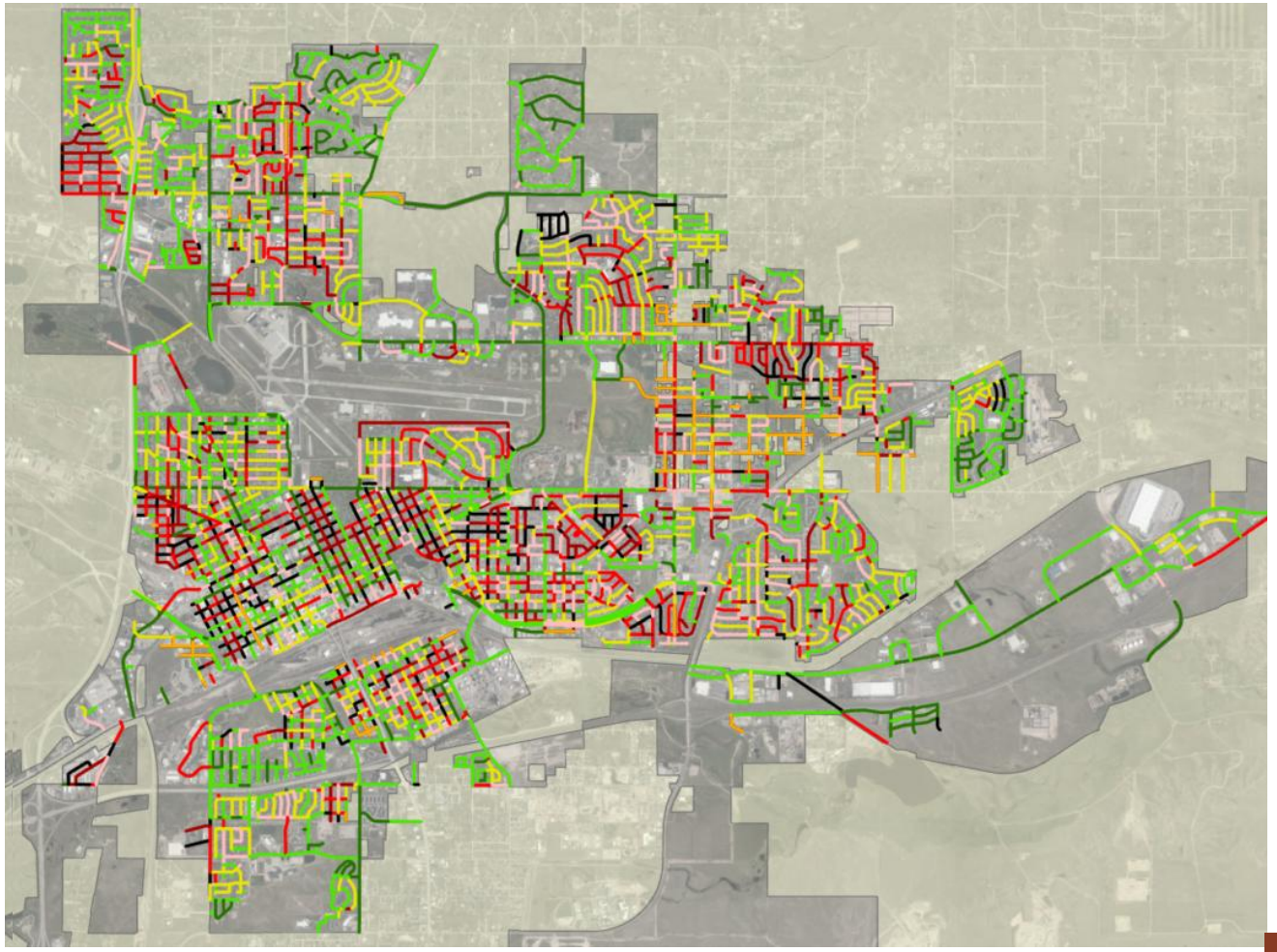
Pavement Condition Index (PCI) Range	Condition Description	Total Distance (Miles)	Total Area (Sq. Yd.)	Percent of Network (Area)
86-100	Good	92.71	1,992,926	25.11%
71-85	Satisfactory	99.08	2,168,048	26.83%
56-70	Fair	105.18	2,186,865	28.49%
41-55	Poor	56.10	1,168,925	15.19%
26-40	Very Poor	15.34	316,388	4.15%
11-25	Serious	0.72	15,805	0.20%
0-10	Failed	0.09	1,847	0.03%
Total of Rated Segments		369.11	5,655,674	100%

Where are we Today with Aging Infrastructure?



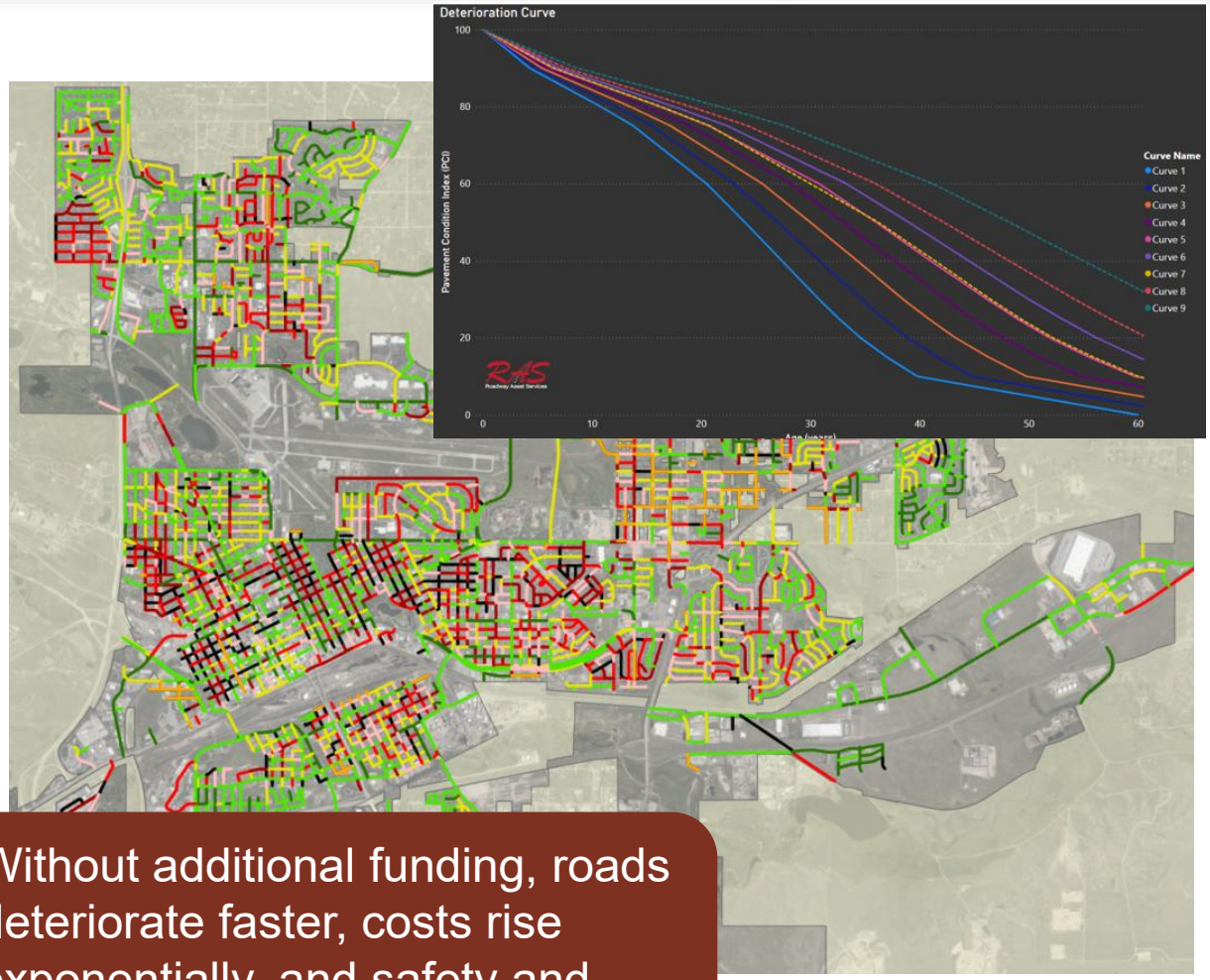
What will happen without additional funding?

- Baseline 2023
- Project 2035
- Projected 2040



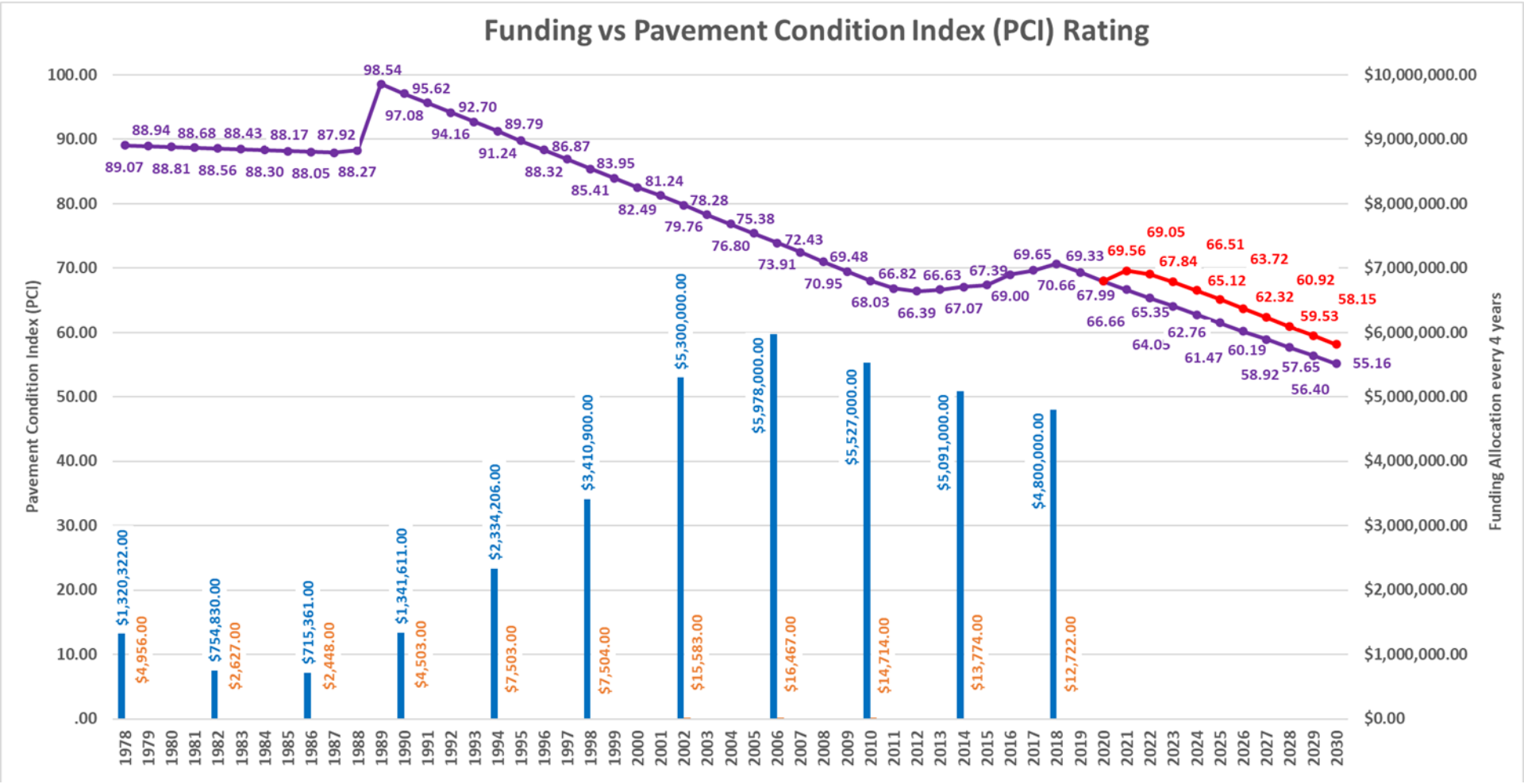
What will happen without additional funding?

- Impact of Insufficient Funding on Roadway Pavement
  - **More Potholes & Cracks** - Unsafe and uncomfortable driving
  - **Faster Roadway Deterioration** - Increased reconstruction needs
  - **Higher Long-Term Costs** - Delayed maintenance multiplies future expenses
  - **Reduced Lifespan of Pavement Assets** - More frequent full rebuilds
  - **Negative Community Impact** - Complaints, lower quality of life, reduced economic competitiveness

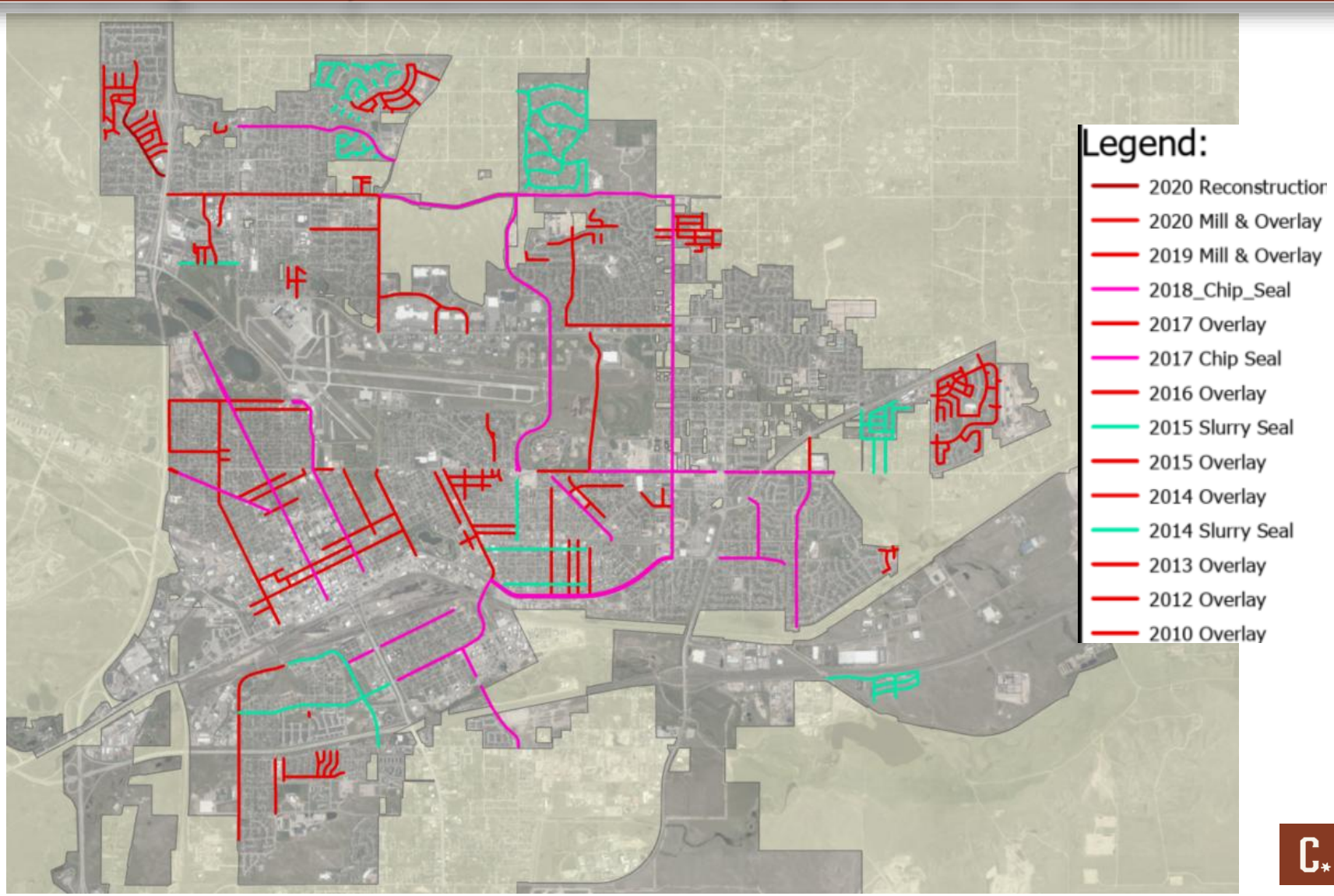


Without additional funding, roads deteriorate faster, costs rise exponentially, and safety and mobility are compromised.

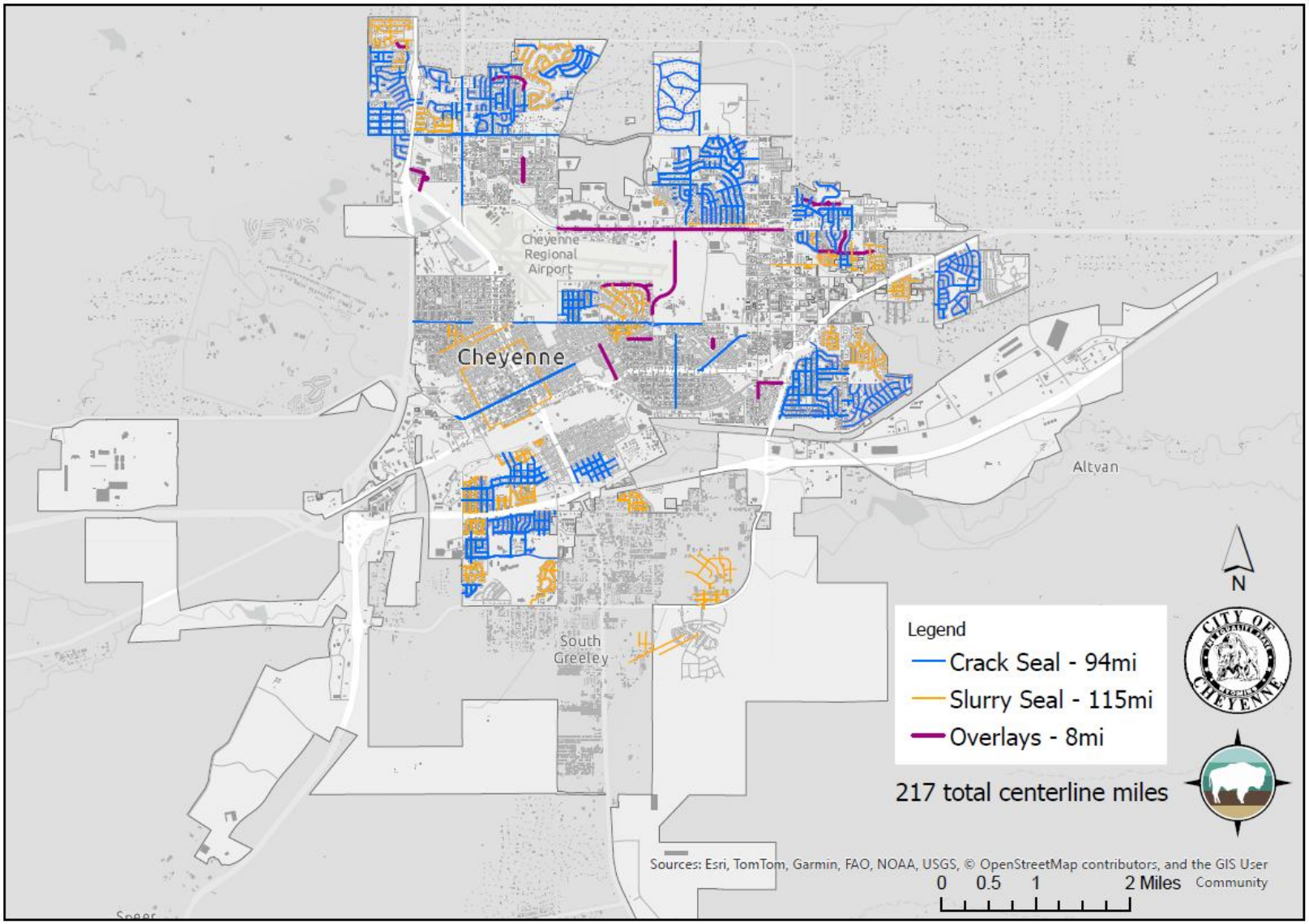
Funding History vs Pavement Condition Index?



Funding History Maintenance Projects 2010 – 2020



Funding History Maintenance Projects 2022 - 2025



Funding History Budgets

- **2022 - 2026**
  - Overage plus
  - 6th Penny Pavement Maintenance ($14 M over 5 Years: $2.8 M/ YR)
- **2027 – 2031**
  - $5.5 M Maximum per year

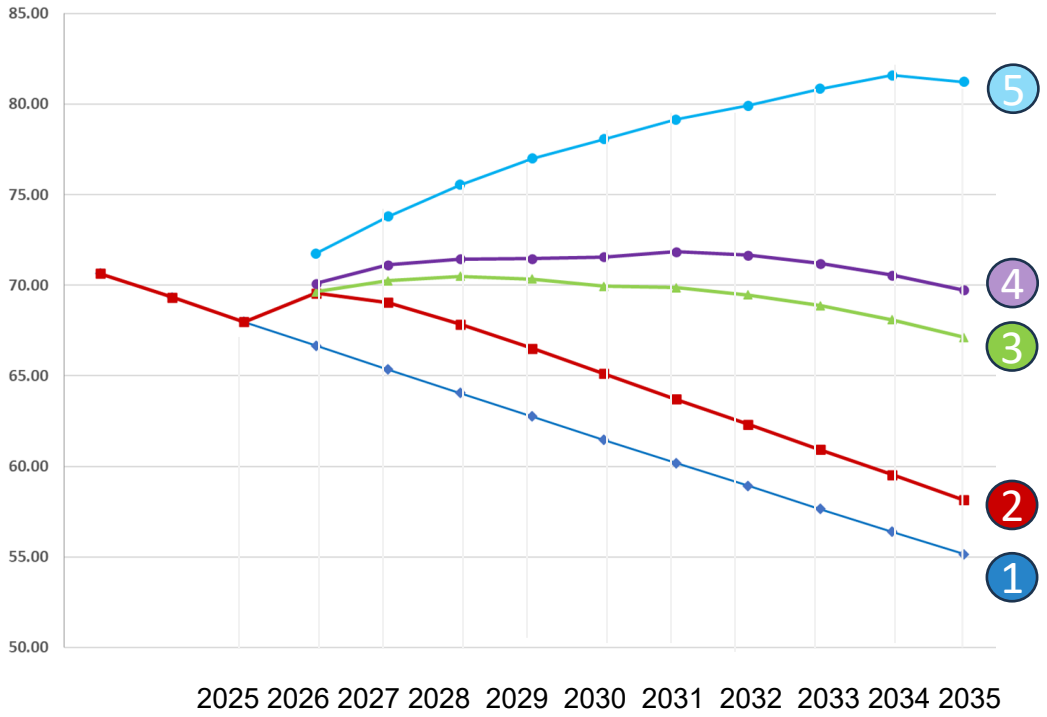
PAVEMENT MAINTENANCE BUDGET AND HISTORY (2022-2031) IN MILLIONS

Pavement Management Component	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
City Mill and Overlay Program	$ 5.20	$ 5.40	$ 5.60	$ 4.60	$ 6.50	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00
Patch and Seal Maintenance Program	$ 2.50	$ 2.50	$ 3.80	$ 2.30	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50	$ 2.50
Crack Seal Maintenance Program	$ 1.20	$ 0.50	$ 0.50	$ 0.40	$ 0.60	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50
Miscellaneous Concrete	$ 1.20	$ 0.50	$ 0.97	$ 0.64	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50
Totals	**$ 10.10**	**$ 8.90**	**$ 10.87**	**$ 7.94**	**$ 10.10**	**$ 5.50**	**$ 5.50**	**$ 5.50**	**$ 5.50**	**$ 5.50**

Work Plan Scenarios

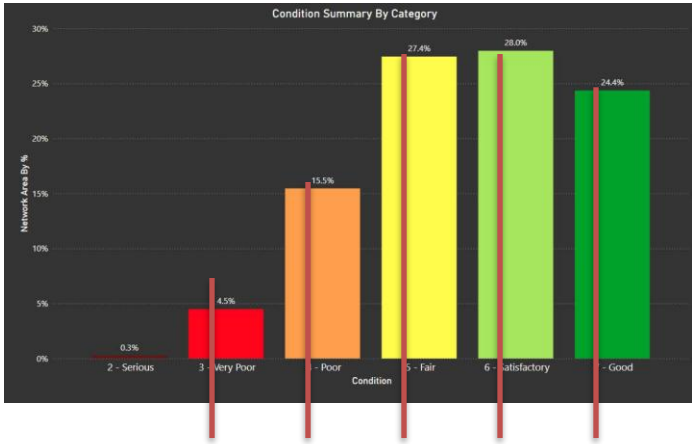
- **Scenario 1 (blue)** 1
  - $5.5 million/year for 10 years (blue)
- **Scenario 2 (red)** 2
  - $10 million in 2026
  - $5.5 million last 9 years
- **Scenario 3 (green)** 3
  - $10.0 million/ year for 10 years
- **Scenario 4 (purple)** 4
  - $13.0 million/year for 10 years
  - Increase PCI to 72 plan
- **Scenario 5 (light blue)** 5
  - Backlog Elimination plan (light blue)
  - $21.7 million for 9 years
  - $16.3 million last year





Pavement Maintenance – Strategy

- **Stabilize Pavement Network Health**
  - Maintain or improve the current average PCI of 68
  - Prevent roads in Fair condition from slipping into Poor
- **Focus on Preservation**
  - Prioritize preventive maintenance to extend pavement life
  - Emphasize early intervention over costly reconstruction
- **Optimize Treatment Planning**
  - Use a complementary treatment approach:
  - Example: Concrete panel repair followed by asphalt overlay
  - Select treatments based on Cost-Benefit Value (CBV), not just condition

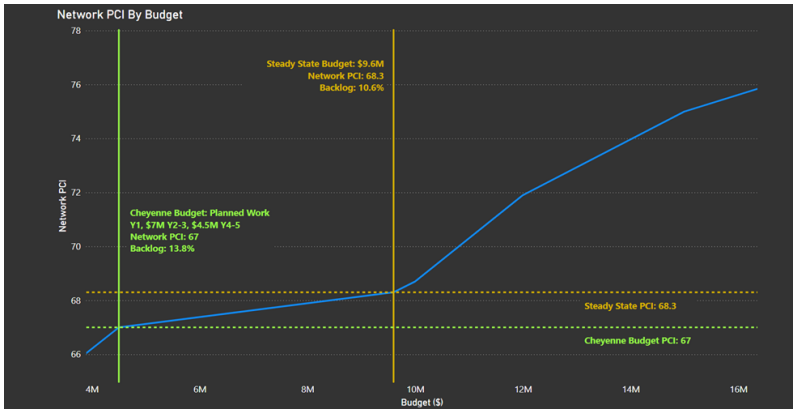


Pavement Maintenance – Strategy

- **Avoid "Worst-First" Strategy**
  - Do not allocate most of the budget to a few severely deteriorated roads
  - Balance investment across the network for maximum return on investment
- **Consider Local Construction Capacity**
  - Evaluate how much work local contractors can complete in a single season
  - Align project scope with realistic delivery timelines
- **Steward of Taxpayer's Money**
  - Fiscally responsible to maintain or increase are PCI index on our roadway network

Recommendation

- **Current Status**
  - Cheyenne's pavement network is in **Fair condition**
  - Average PCI of 68 (above national average)
  - Reflects a solid foundation and ongoing maintenance efforts
- **Key Challenge**
  - Preservation is critical:
    - Roads above PCI 60 must be maintained before they deteriorate into costly reconstruction categories
    - Without proactive preservation, network **conditions will decline**, and **costs will escalate**
- **Funding Recommendation**
  - Need: $22M/year ($4.5 M/ year) additional:
    - Preserve roads in Good/Fair condition
    - Avoid costly reconstructions
    - Sustain a higher level of service for residents
  - Request $15 M ($3.0M/Year) additional



Budget	Network PCI
$10,000,000	69
$11,000,000	70
$12,000,000	71
$13,000,000	72
$14,000,000	73
$15,000,000	74
$16,000,000	75

Thank you!!

Scenario	Annual Budget	Outcome
Current Budget	$7.0M avg/year	PCI drops to **47** over 5 years
Optimal Need	**$23M/year**	Fully preserves network, avoids backlog growth
Requested Increase	**$15M total** ($3.0M/year additional)	PCI improves to **69**, maintains higher service level

Additional Questions?

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Engineering Update – Anticipated Summer 2026

- **Maintenance**
  - Dell Range Overlay Phase II: (Powderhouse Road to Sunset)
  - Mill and Overlay 1 & 2
  - Crack Seal
  - Patch and Seal
- **Capital Construction**
  - 5th and Deming Blvd. Bridge Replacement Project
  - Dell Range Blvd. at Yellowstone Road
  - Dell Range Blvd. (Whitney Road to U.S. 30) & Whitney Road (Dell Range Blvd. to U.S. 30)
  - Storey Blvd. Extension Project
  - Miller Lane and Sunset Improvements
- **Drainage Maintenance**
  - Dredging Projects Phase II
  - Vegetation Management
- **Design**
  - Dell Range Blvd. at Yellowstone Road
  - Converse Avenue at Dell Range Blvd. (Masonway to Dutcher Field Entrance)
  - Dell Range East (College Drive to Van Buren Avenue)

Thank you !!

Additional Questions?

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