



Integrating Preservation into Local Agency Pavement Programs



June 30, 2021

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FACERS Annual Conference, Orlando, FL

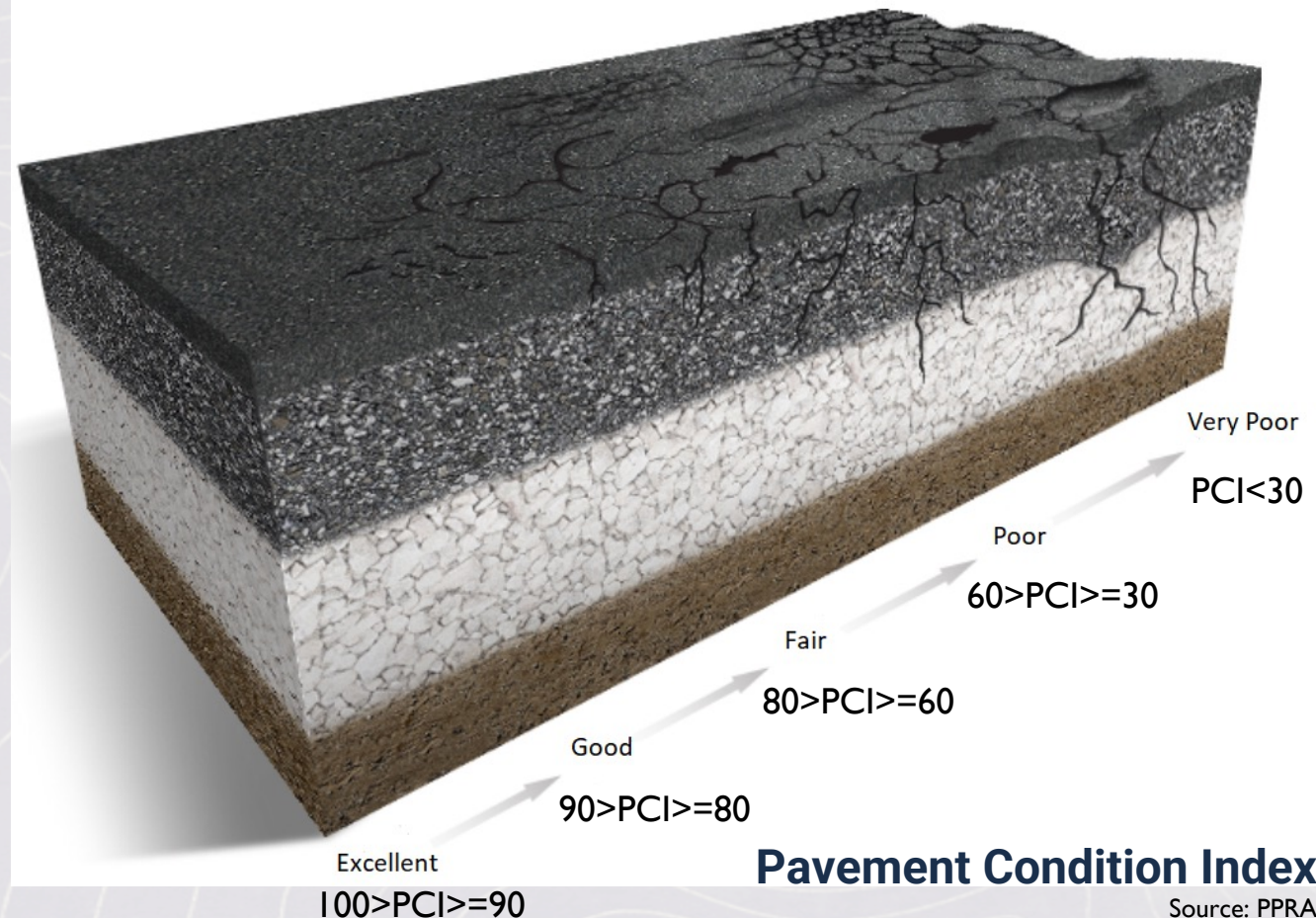
INTRODUCTION

- What strategies can Local Agencies adopt to improve their chances of adoption of a pavement preservation management approach?
- Leveling the preservation program across all years helps agency management and industry preparedness
- Group preservation projects geographically to appeal to public acceptance and take advantage of economies of scale
- What are the impacts to the network condition when these adjustments to the preservation program are made?

EXPAND THE TREATMENT TOOLBOX AS PART OF IMPROVED BUSINESS PROCESSES



- 3Rs
- Right Treatment
- Right Place
- Right Time

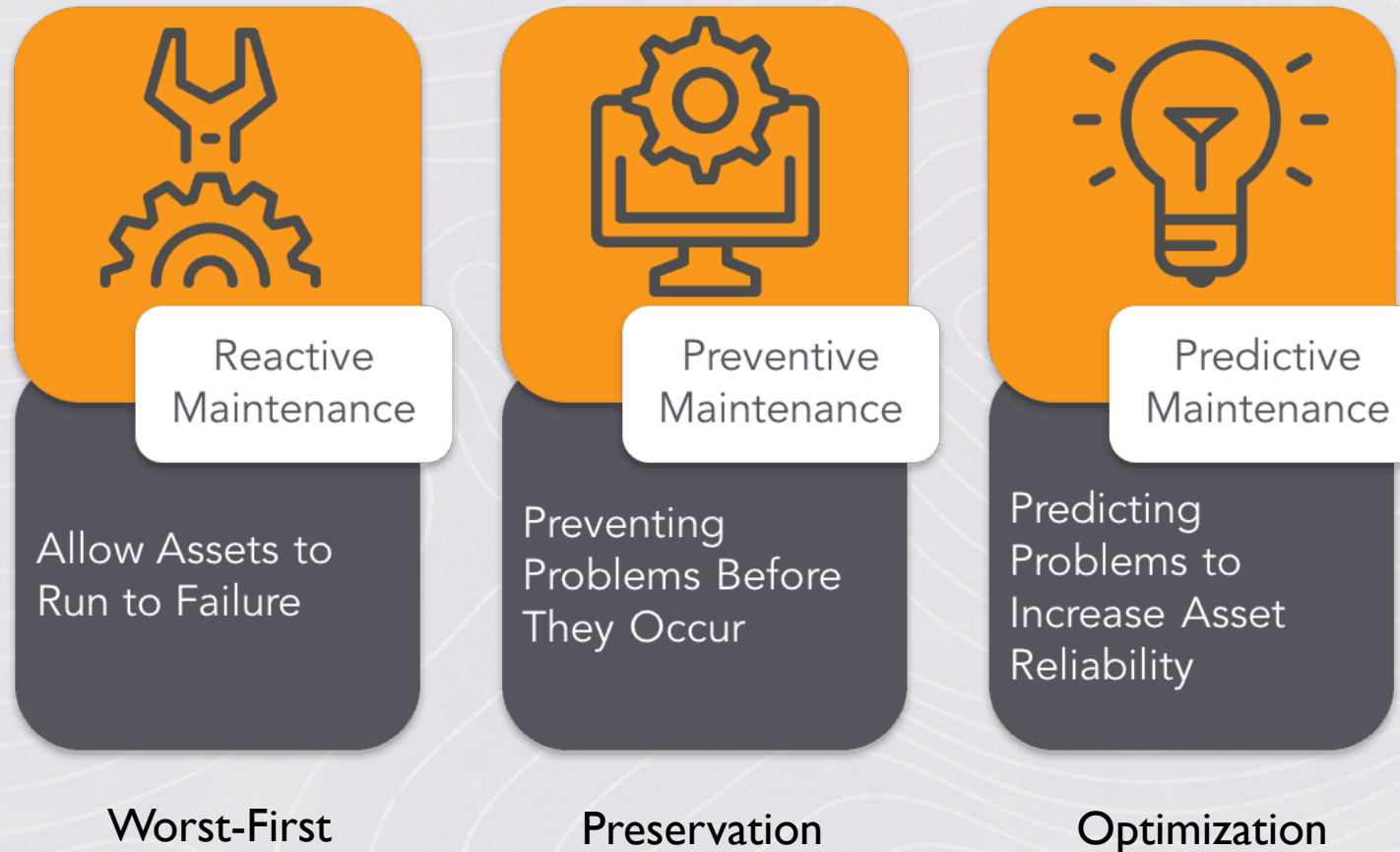


PAVEMENT PRESERVATION MANAGEMENT



- Proper preservation management can dramatically reduce capital expenditures on pavement infrastructure.
- With timely evaluation, agency can strategize their expenditures to balance cost and pavement performance.
- **Getting More From Budget:** Allocating funds is a challenge when budget won't cover all the work to be done. However, through preservation and optimization, agency can make better funding decisions and get a higher return on infrastructure investments.

MAINTENANCE AND MANAGEMENT APPROACHES



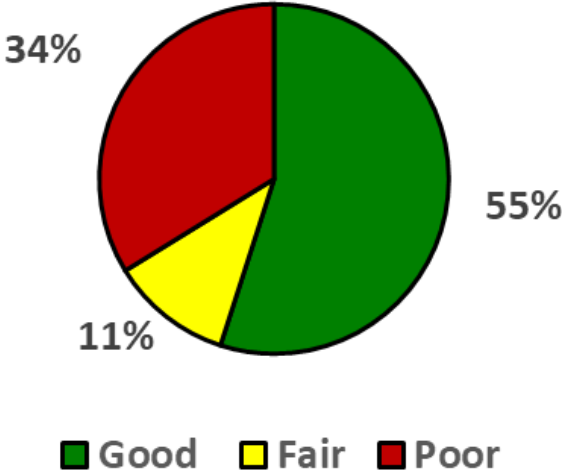
Worst-First

Preservation

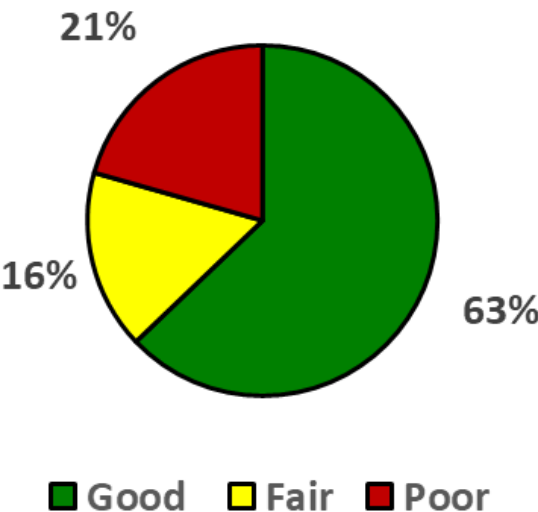
Optimization

NETWORK CONDITION (10-YEAR ANALYSIS)

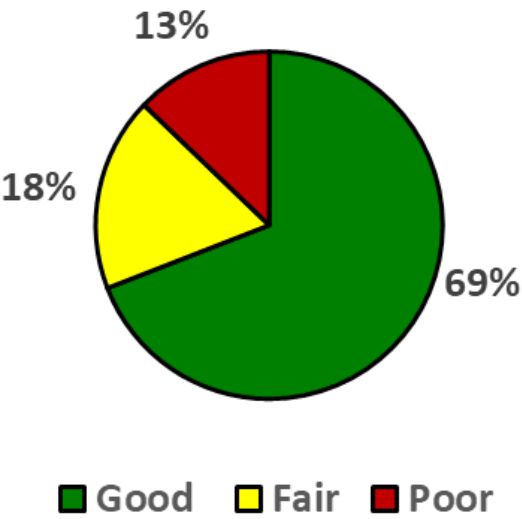
Scenario #1 - Current Budget - WF



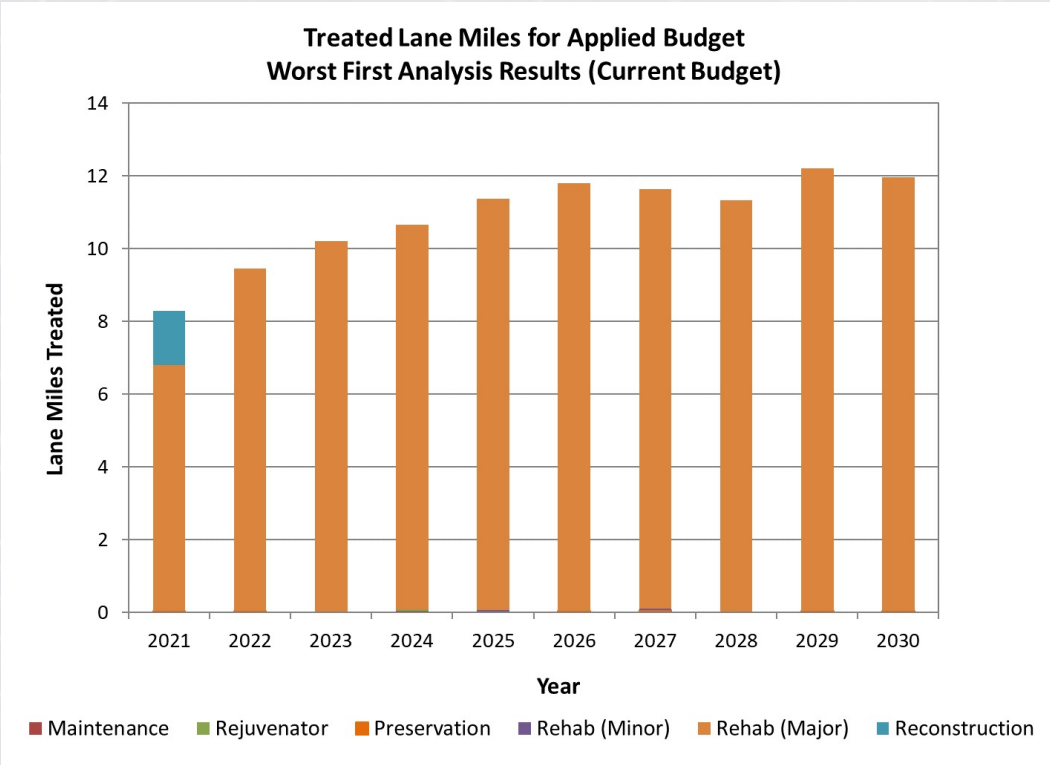
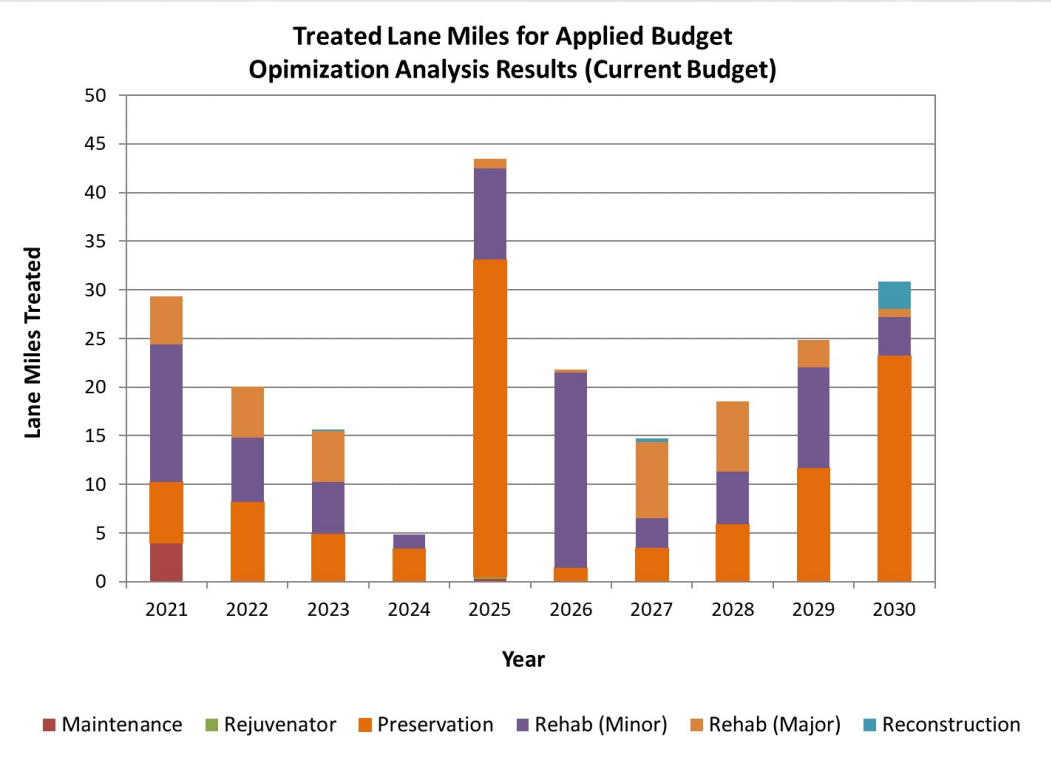
Scenario #2 - Current Budget - OPT



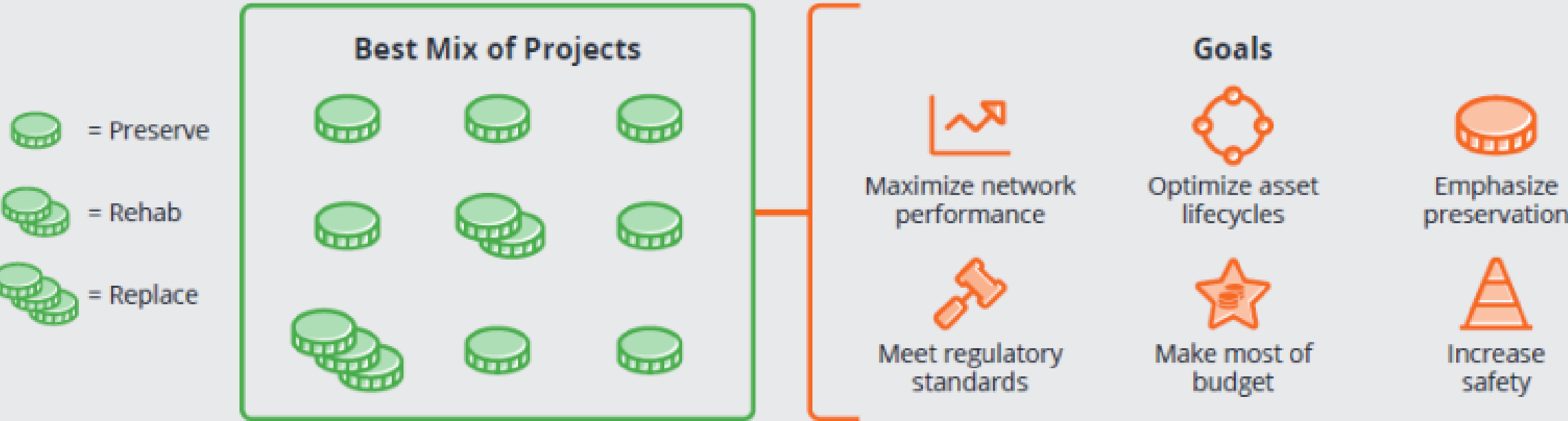
Scenario #3 - Maintain Curent Condition



LANE MILE COMPARISON



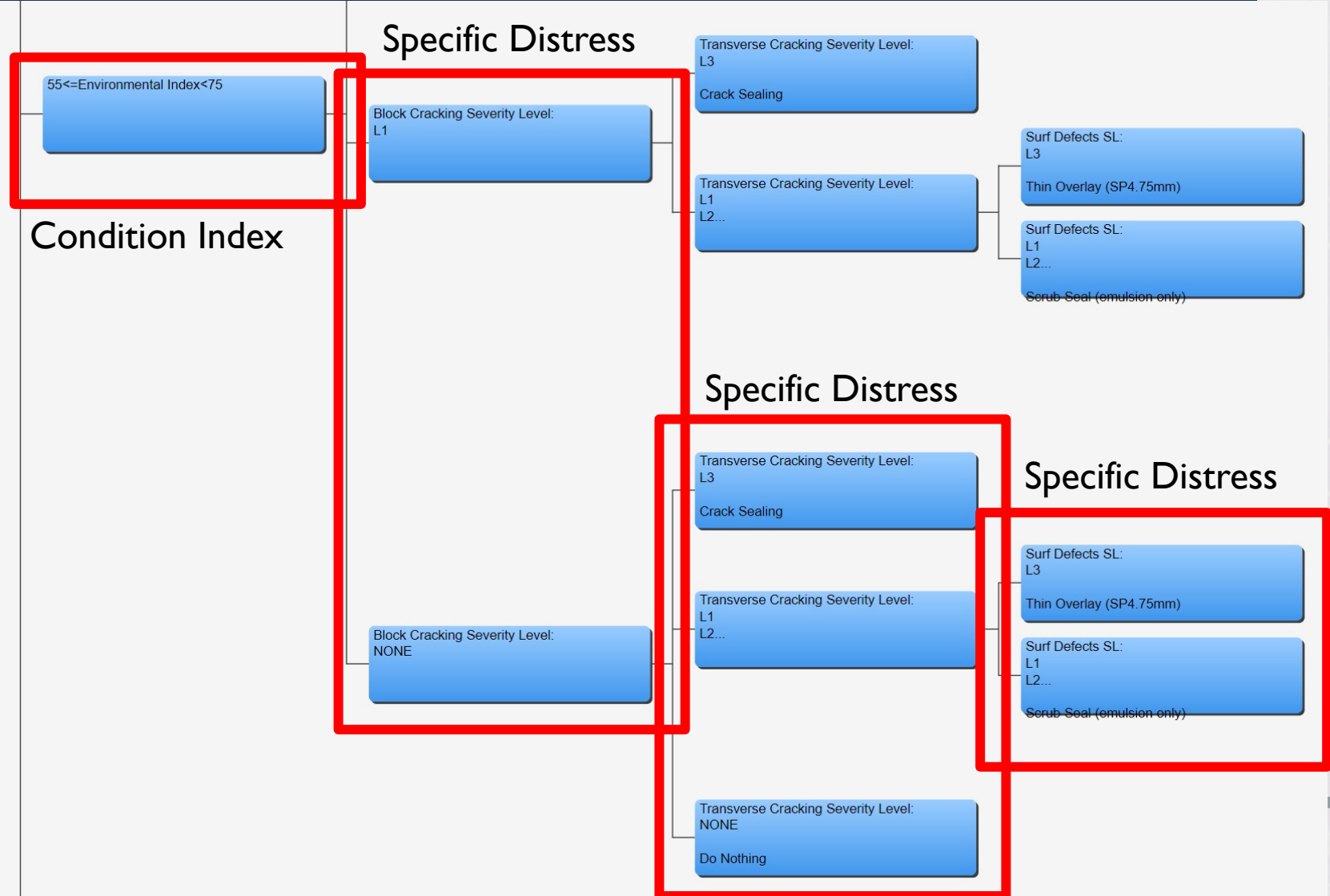
PRESERVATION AND OPTIMIZATION



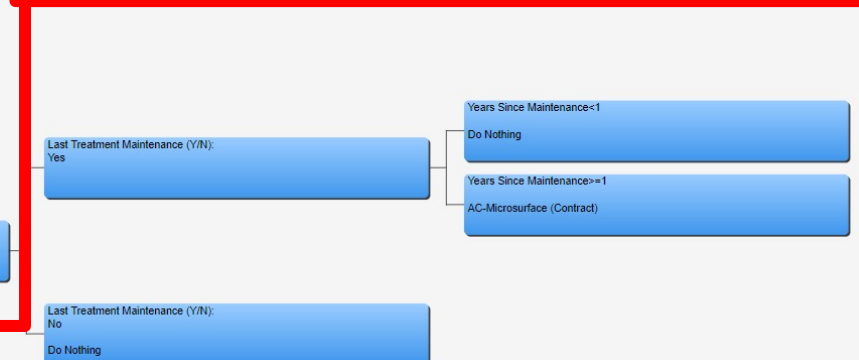
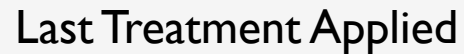
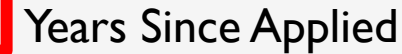
STRATEGIC CONSIDERATION FOR SUCCESS

- Starts with knowing what you own and the condition of the network
- Implement a robust Pavement Management System
 - Ideally, its output is a detailed project work plan (treatment specific)
 - Should have the ability to compare competing analysis scenarios
 - Optimization is a plus; provides ability to “prove” benefit of preservation
- Implement preservation treatment selection criteria
 - Decisions based on condition data metrics
 - Construction history data (pavement age, last treatment, treatment timing)
 - How do you implement this? Need software capabilities

PRESERVATION TREATMENT SELECTION CRITERIA USING CONDITION DATA



Years Since Applied



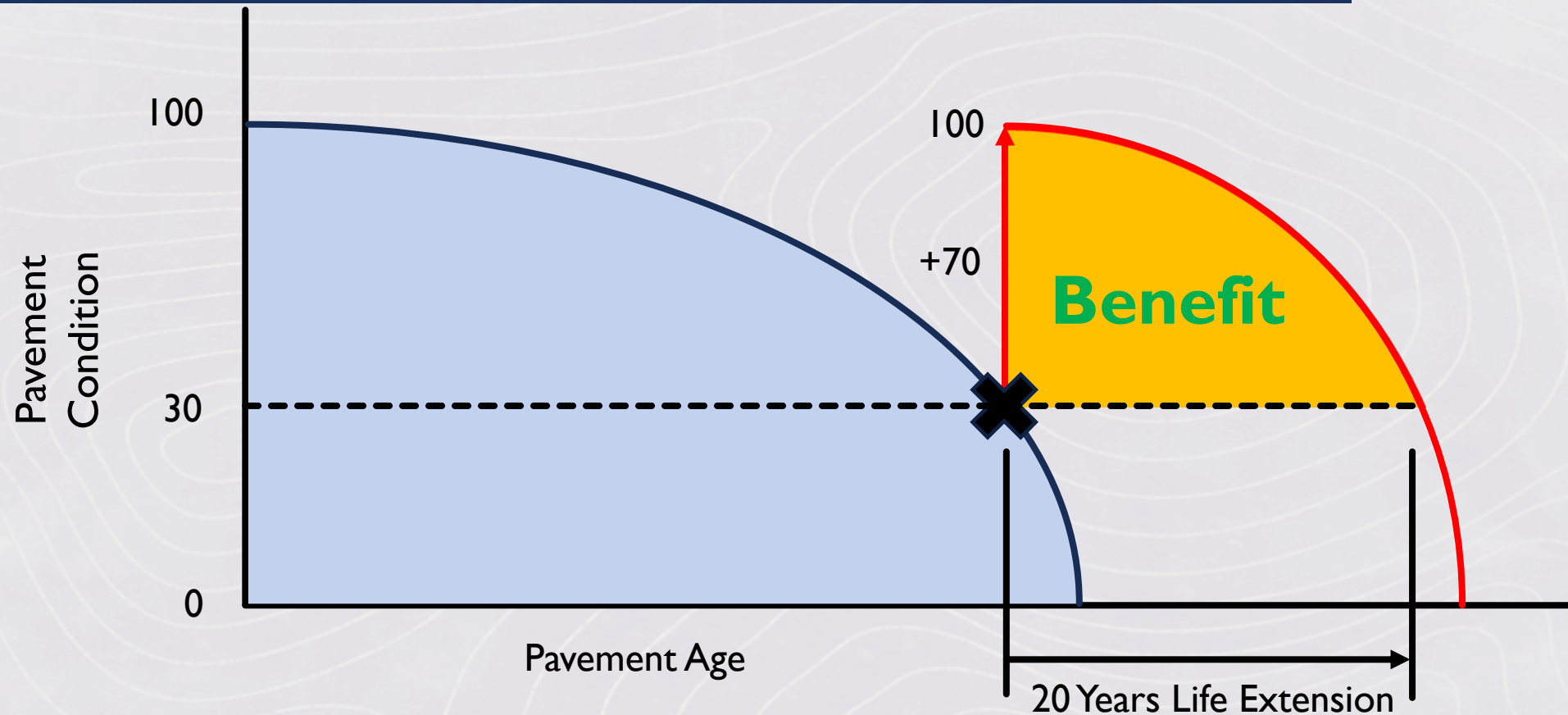
SPEAKING OF OPTIMIZATION, WHAT IS BENEFIT?



Condition Improvement = 70 PCI Points (100-30)
Life Extension = 20 Years

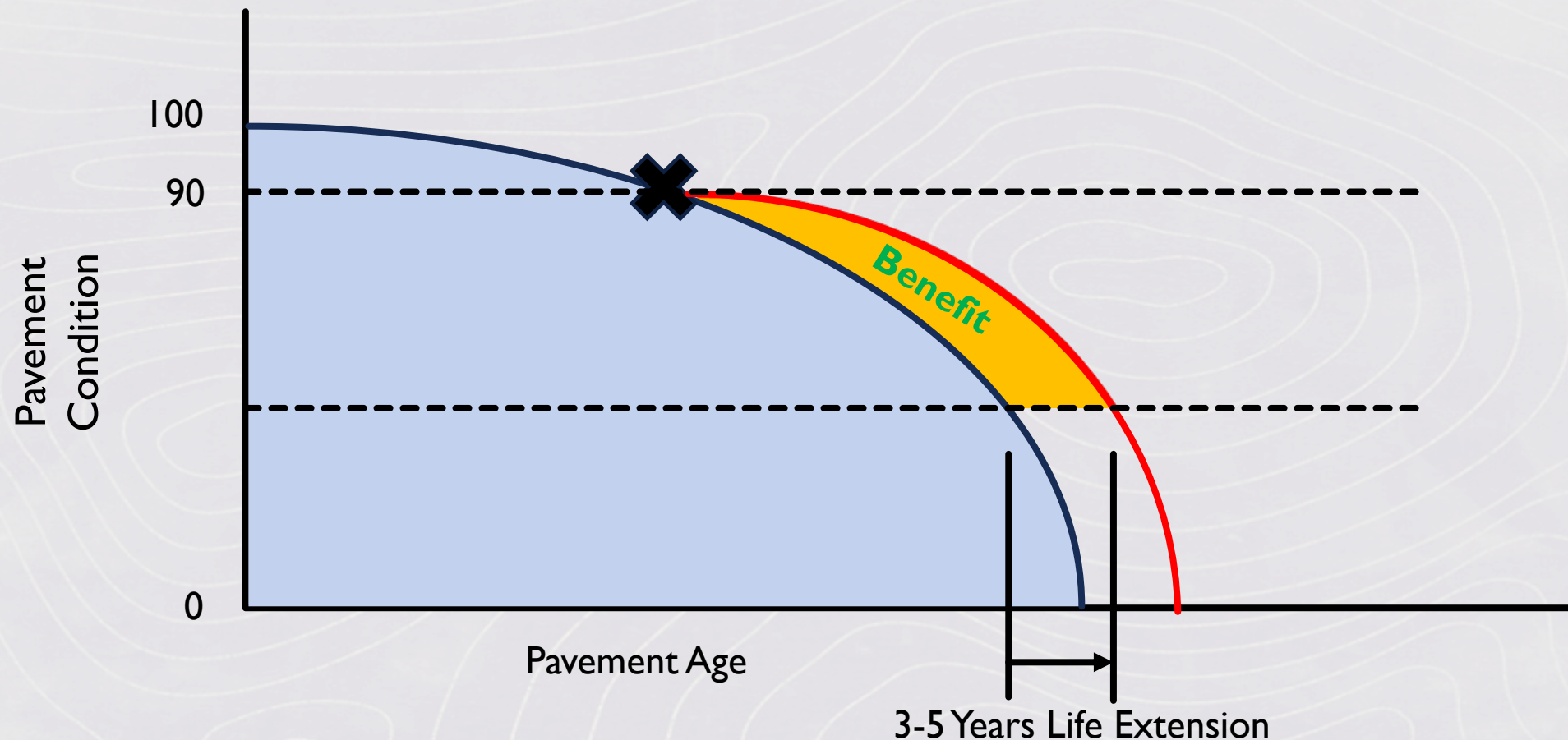
Benefit = Condition Improvement * Life Extension

WHAT IS BENEFIT? RECONSTRUCTION EXAMPLE



$$\text{Benefit} = \text{Condition Improvement} * \text{Life Extension}$$

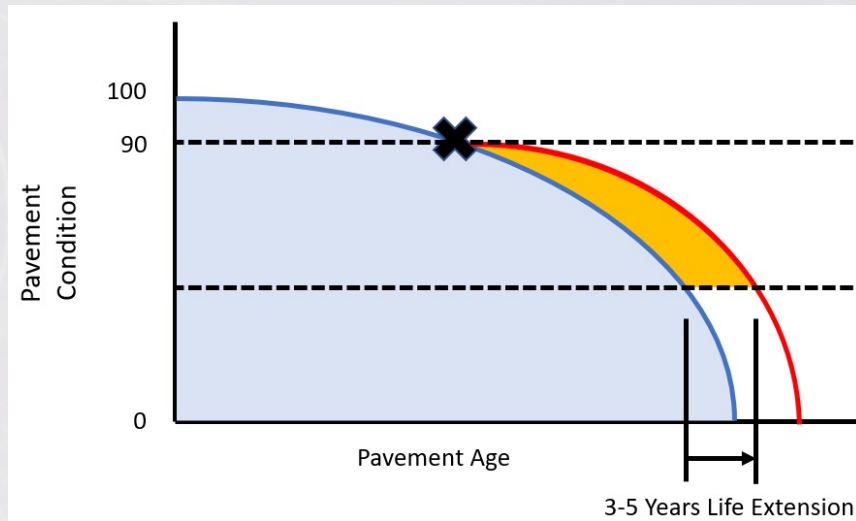
WHAT IS BENEFIT? PRESERVATION EXAMPLE



Benefit = Life Extension

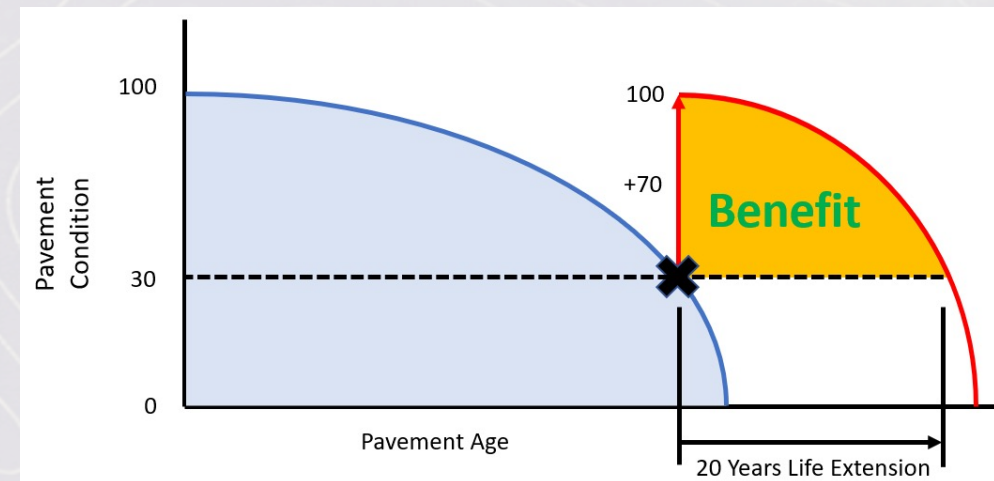
COMPARE BENEFIT/COST FROM PREVIOUS EXAMPLES

Preservation



Benefit = 150
Cost = \$4.00/SY
B/C = 37.5

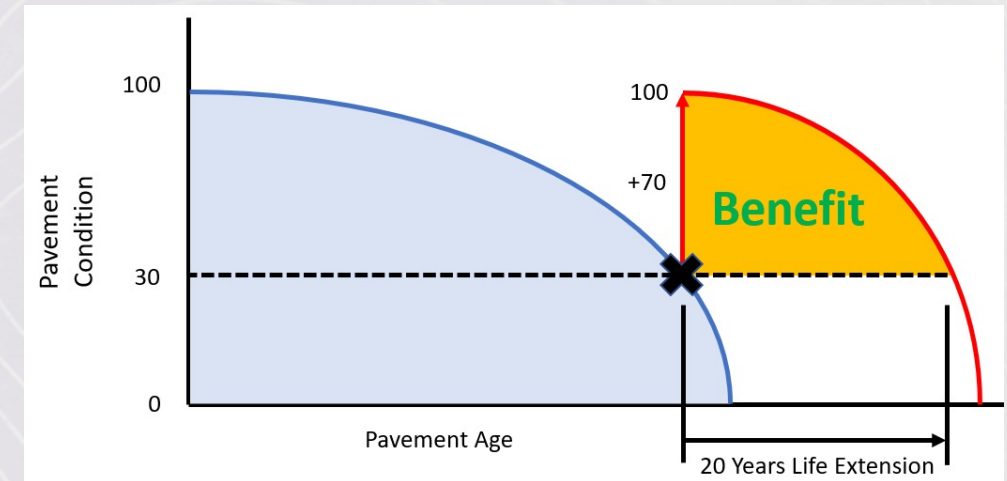
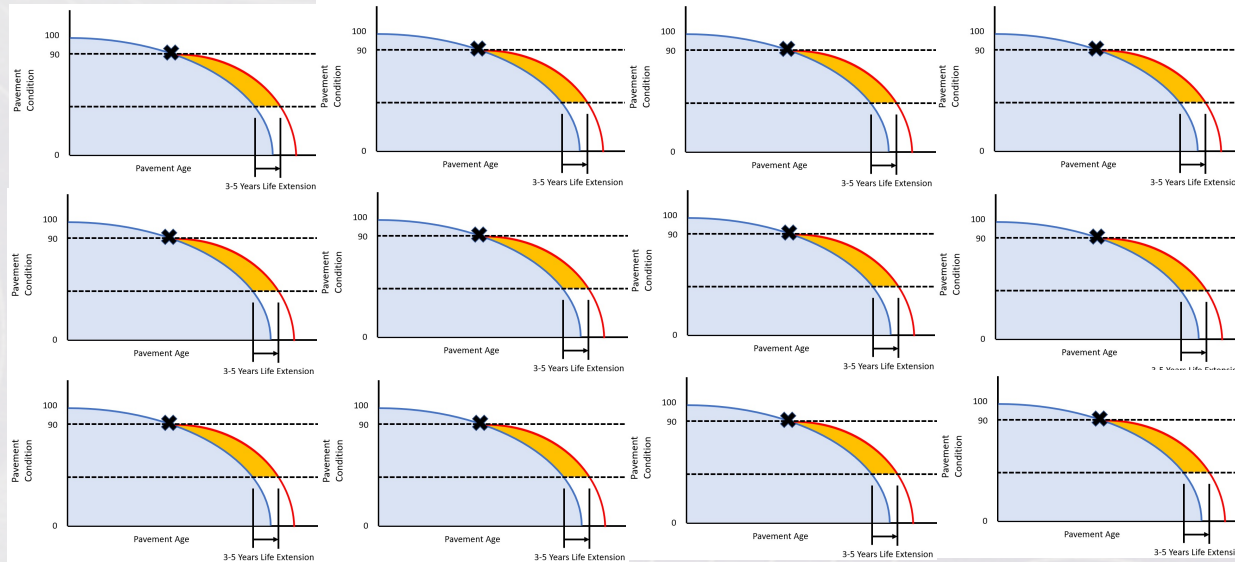
Reconstruction



Benefit = 700
Cost = \$50/SY
B/C = 14

To Compete with Preservation, Benefit of Reconstruction would need to be nearly 3 times more, or Cost would need to be 3 times less

HOW DOES THIS EQUATE IN PROJECT SELECTION?



What that means practically, is that you can treat 12 times* the lane miles with Preservation for equal budget!

***This is based on Unit Cost ratio $\$50/\text{SY} / \$4.00/\text{SY} = 12.5$**

DETERMINING RIGHT MIX OF PRESERVATION IN THE WORK PLAN

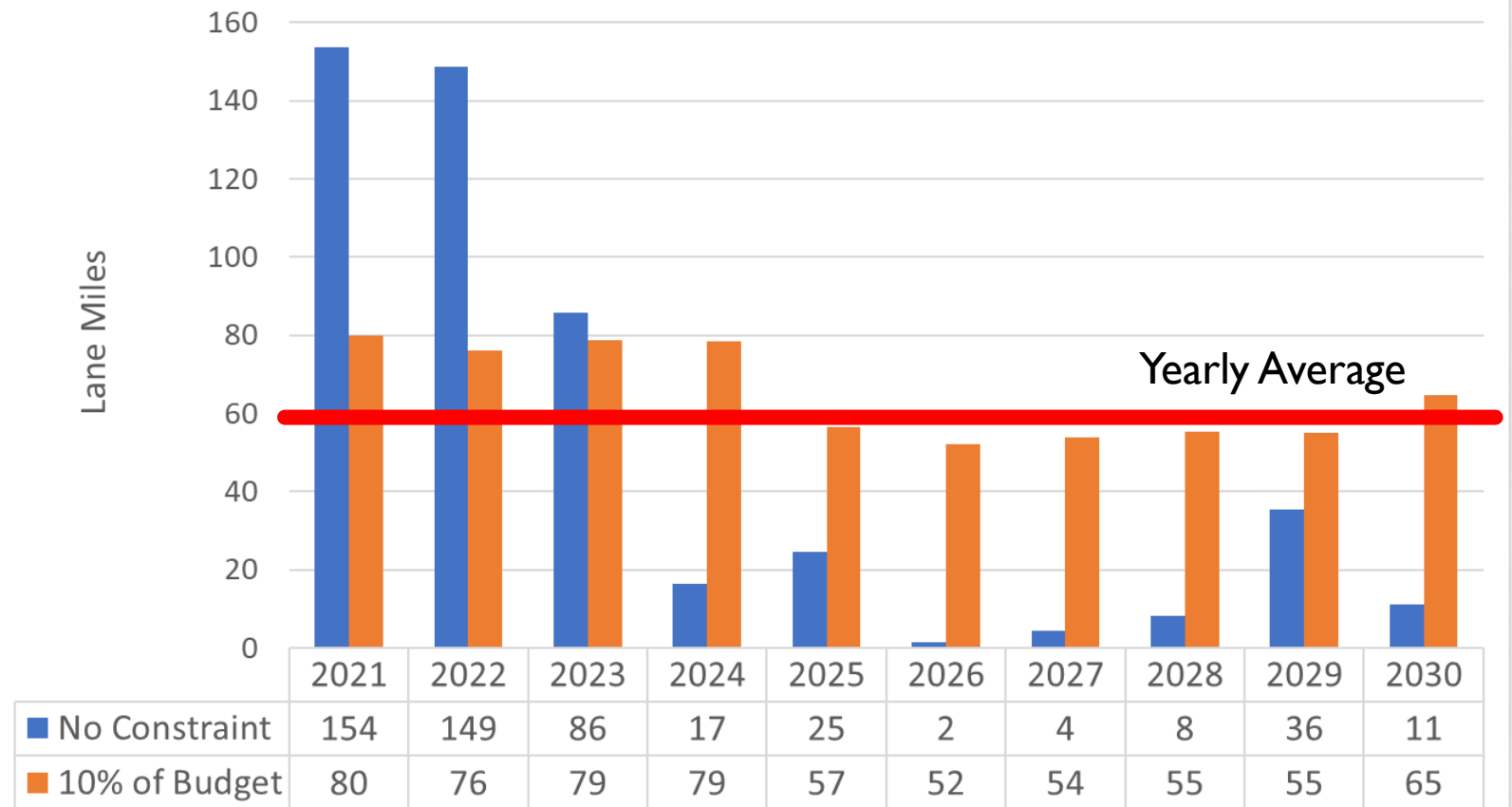
- Pure Optimization has limitations for practical application for project work planning, even if it is quantified best use of funds
- An Agency needs to consider those constraints outside of pure network need in developing work plans
 - Contractor availability (competitive pricing, experience, capacity, etc.)
 - Material availability (treatment alternatives, quality, durability, etc.)
 - Seasonal constraints (how much can actually be placed in a season?)
 - Agency capacity for inspection/contract management
- The goal is to create a preservation program that the agency can manage, and the industry can predict and plan for

PMS ANALYSIS COMPARISON PRESERVATION WORK PLAN LEVELING

■ Scenario Setup:

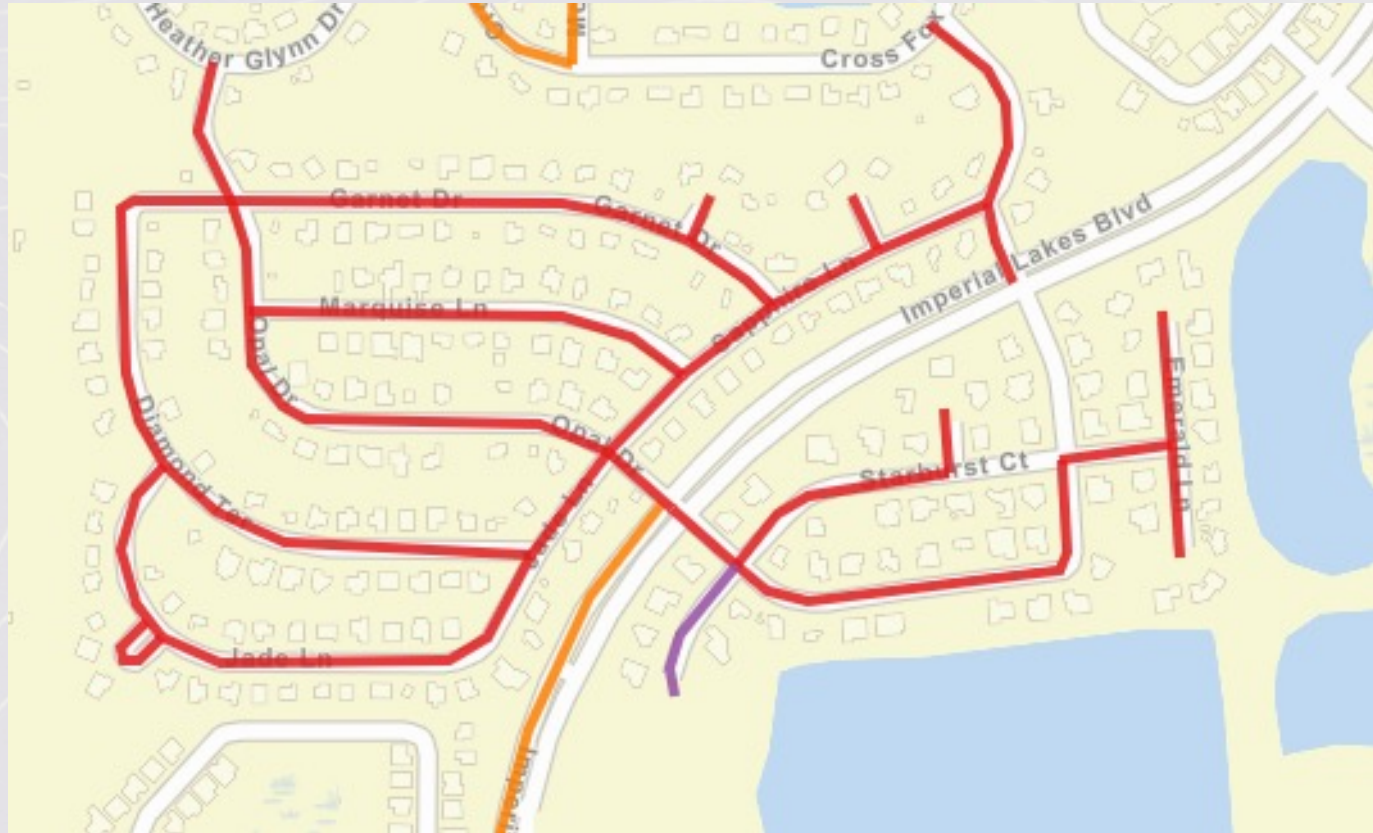
- Run full optimization with no constraints on project selection
- Determine average yearly lane miles
- Run 2nd scenario constraining preservation funds to achieve average lane mile targets

Preservation Treatment - Work Plan Leveling



PROJECT GROUPING FOR PUBLIC ACCEPTANCE

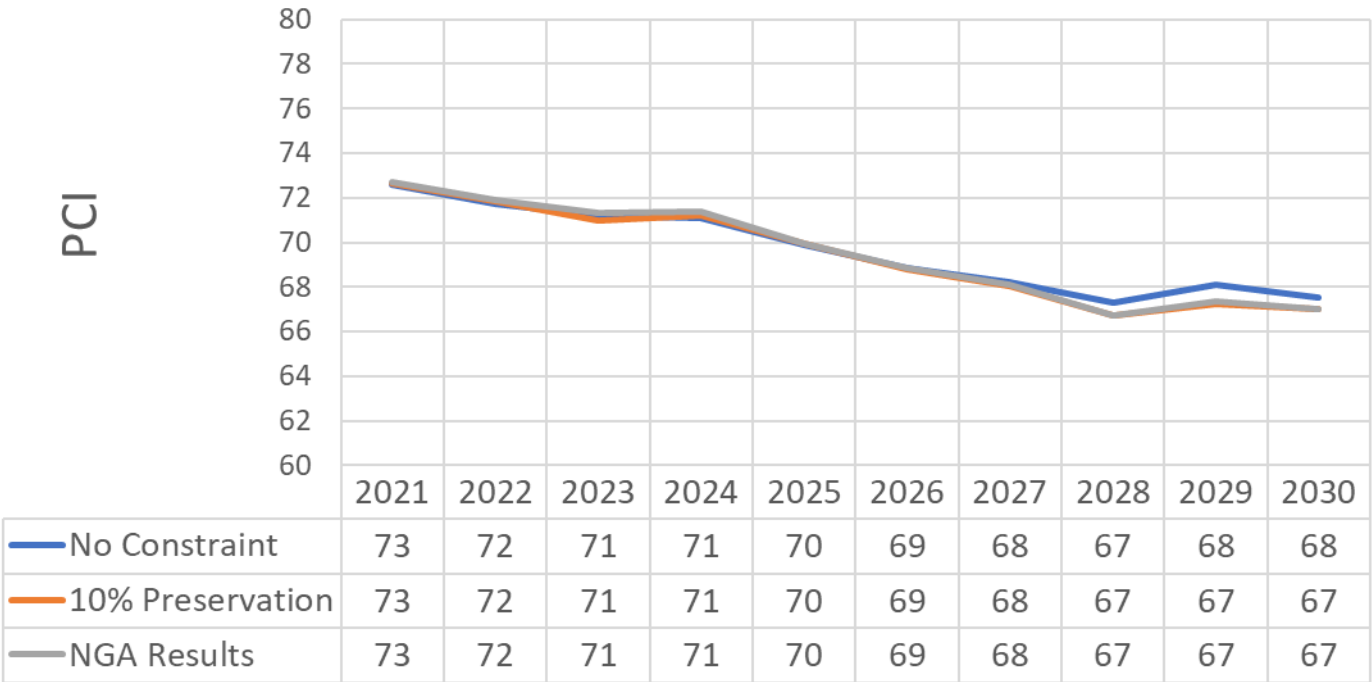
- Scenario Setup:
 - Run scenario constraining preservation funds to achieve average lane mile targets
 - Run Neighborhood Grouping Analysis (NGA) to create grouped projects

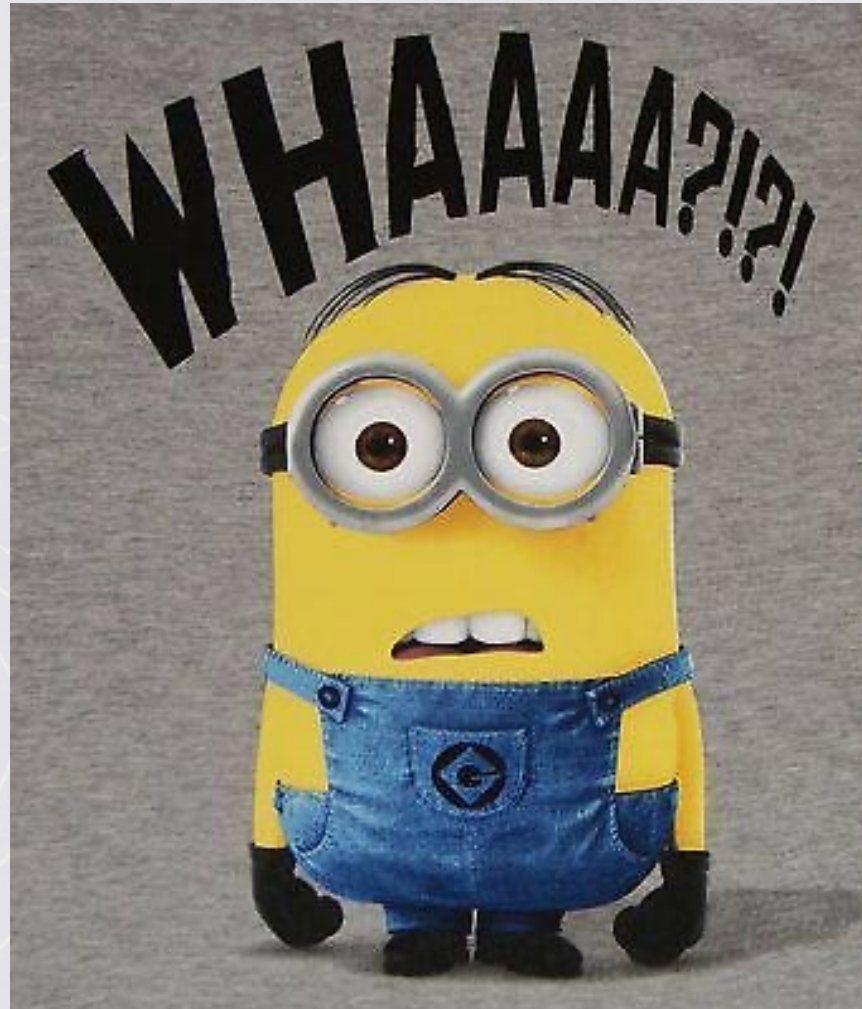


IMPACT ON NETWORK CONDITION

- Implementing work plan leveling and project grouping has minimal impact on network PCI
- Provides public appeal
- Provides industry predictability
- Provides agency consistency

Optimization Analysis - PCI Comparison
No Constraint vs. 10% Preservation Constraint vs.
Grouping Analysis Results





SELLING PRESERVATION TO PEERS, ELECTED OFFICIALS AND THE PUBLIC




■ Turn on the CHARM



- **C** – Communicate: Phone, emails, social media, announcements etc.
- **H** – Help: Ask and offer as needed.
- **A** – Active discussion: engage at the project sites.
- **R** – Relationships: Know your audience and establish a connection.
- **M** – Motivate: Empathy – make it matter!

IMPORTANT – POLICY FOR SELECTING PROJECTS



Reactive Maintenance

Allow Assets to Run to Failure



Preventive Maintenance

Preventing Problems Before They Occur



Predictive Maintenance

Predicting Problems to Increase Asset Reliability





SUSTAINABILITY = BALANCED DECISION MAKING



Source: APWA