

Practical Examples of Combining Maintenance and Rehabilitation Activities in a PMS Analysis

Presentation to:
Southeastern Pavement Management & Design Conference
Louisville, KY
June 24, 2003

Presentation by
Robert Piane, P. Eng.





Presentation Agenda

- Definitions to consider,
- Rehabilitation vs. Maintenance,
- Typical analysis steps,
- What is the “best” budget split?,
- Questions / Discussion.



Definitions to Consider

■ Treatment

- A single action taken by an agency to slow deterioration down (maintenance) or repair the effects of deterioration (rehabilitation).

■ Treatment Strategy

- a course of action to be taken over the analysis period,
- A strategy consists of one or more treatments,
- One strategy may differ from another simply because the same rehabilitation treatment is applied in different years.



Definitions to Consider (cont)

■ Budget Scenario

- used to examine the effects on the network of changing the amount of budget available to optimization,
- Each budget scenario has a different target budget and may result in the optimization procedure selecting a different treatment strategy.

■ Budget Category

- a category defined to isolate the costs of a group of treatments during optimization.



Definitions to Consider (cont)

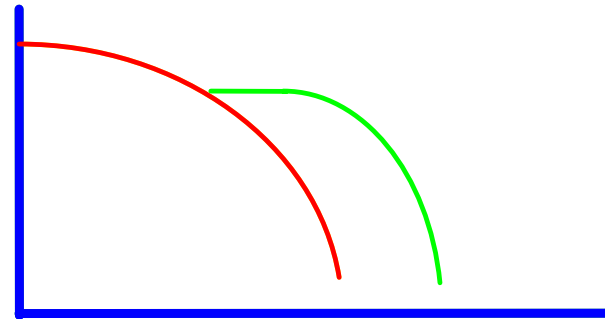
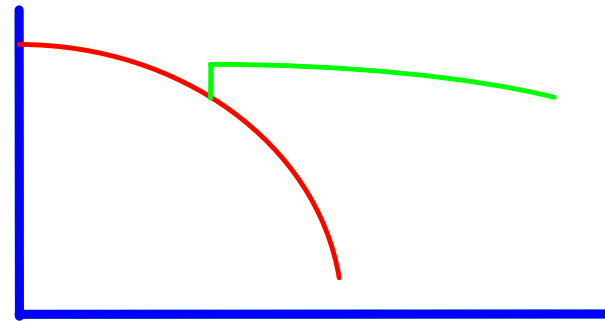
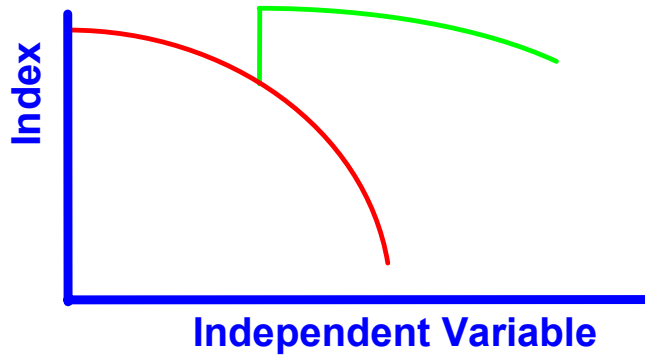
■ Rehabilitation

- Typically a major treatment that is triggered in response to a particular condition index,
- Has the effect of resetting many indexes to their original value, or there about.

■ Maintenance

- More minor treatment,
- Can be triggered in response to a condition index or periodic policy,
- Has the effect of resetting some indexes relatively slightly or not at all.

Rehabilitation vs. Maintenance

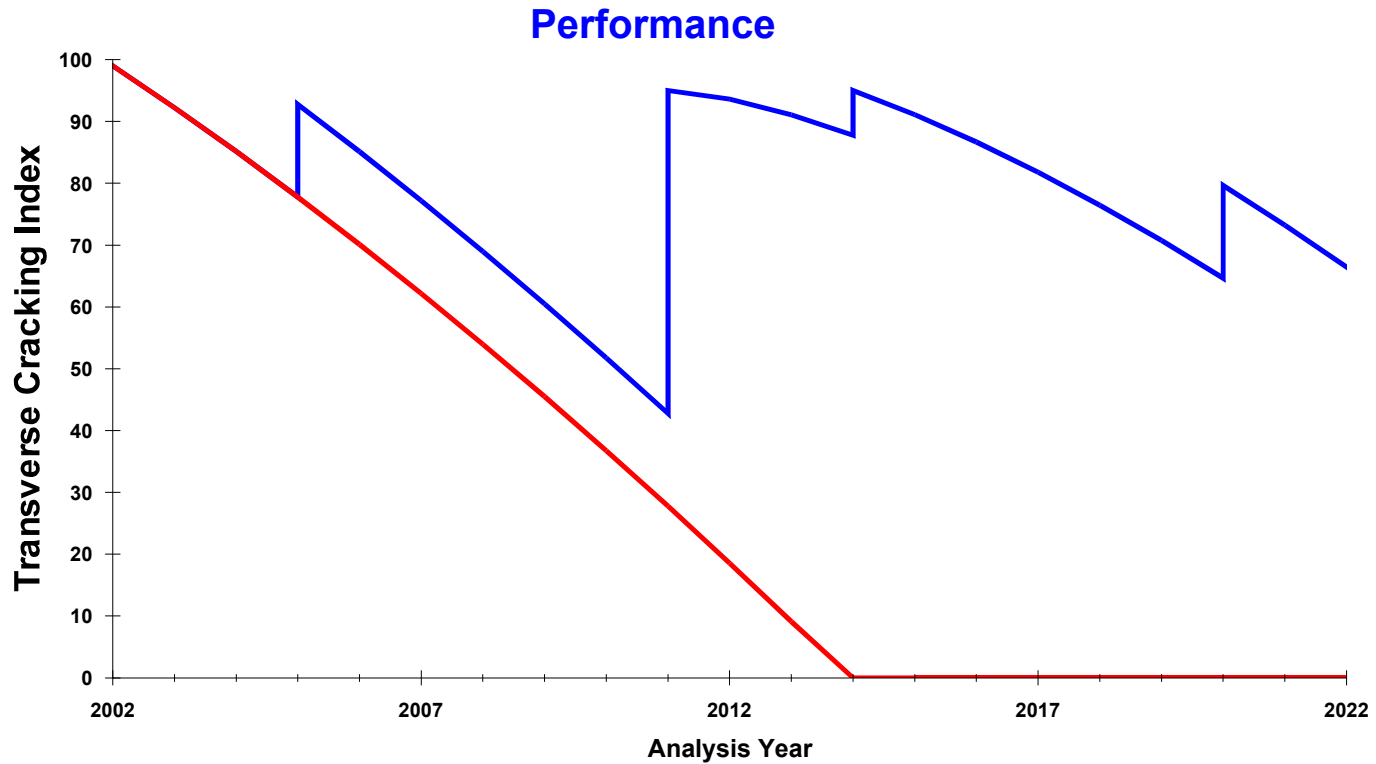




Steps in an Analysis

1. Transform data to indexes,
2. Transform indexes to analysis sections,
3. Apply performance expressions to current index values (Do-nothing),
4. Decision logic triggers treatments and creates several treatment strategies for every analysis section,
5. Budget scenarios are defined,
6. Optimization used to select the best strategy to satisfy an objective function for the network.

Typical Treatment Strategy





Example Network

■ Network Definition

- 90 miles arterial
- 60 miles collectors
- 240 miles residential

■ Treatments Considered

- Crack Seal **
- Slurry Seal **
- Thin Overlay <2"
- Medium Overlay 2"
- Fabric Overlay
- Inlay Fabric & Overlay
- Cold In Place
- Remove & Replace



Example Analysis

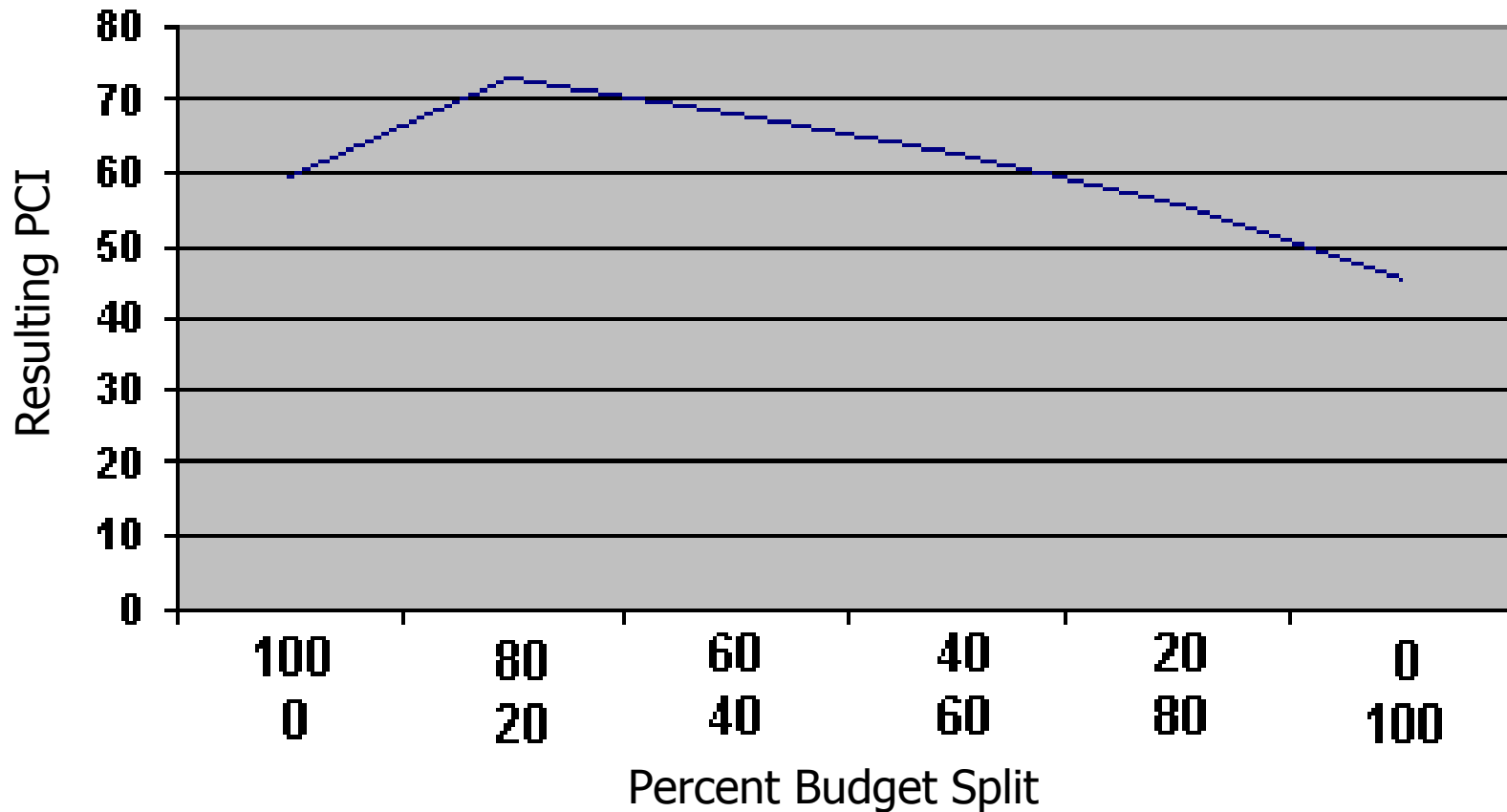
■ \$ 5m Budget Scenario

- Rehab Category
- Maint Category

■ Analyses Run

- \$5m R - \$0m M
- \$4m R - \$1m M
- \$3m R - \$2m M
- \$2m R - \$3m M
- \$1m R - \$4m M
- \$0m R - \$5m M

What is the Best Budget Split?





Summary

- Maintenance activities included in PMS analysis,
- The influence of manipulating available funds is investigated,
- Optimum split of overall budget determined,
- Application to Asset Management.