Integrating Bridge Preservation into Your TAMP

Written by: Erin Van Zee, PE
Presented by: Mark Faulhaber
KYTC

Outline

- Kentucky's Past
- Kentucky's Present
  - Initial TAMP
- Kentucky's Future
  - Future TAMPs

Kentucky's Past

- Worst First Mentality
  - We used "preservation actions" as repairs
    - Latex overlays were done when the deck was in Poor condition
    - Leads to overruns and change orders
      - Full depth patching

Kentucky's Past

- Replacement and Rehab Projects
  - Data driven with Engineering Judgment
    - Bridges with "Poor" designation
      - Sent out to District level for prioritization
      - Central Office prioritization
  - No Life Cycle or Benefit Cost Analysis

Kentucky's Present

- Preservation/Preventative Actions
  - Latex overlays now on "Fair" bridges
  - Scour Countermeasure Projects on Culverts
  - Corridor Level Preventive Maintenance Projects

Kentucky's Present

- Pilot Preservation Project
  - 2 year, $5M project focusing on joints and bearings
  - Develop and test a statewide Bridge Preservation Policy and Guide
    - Quantify staffing needs
    - Verify productivity rates of work item
    - Establish best practices
    - Well-defined Preservation Policy
  - Work Items
    - Joint replacement/elimination/seal replacement
    - Cleaning/greasing bearings
    - Cleaning/coating pier caps and abutment seats
    - Cleaning/coating beam ends
    - Cleaning gutter-line

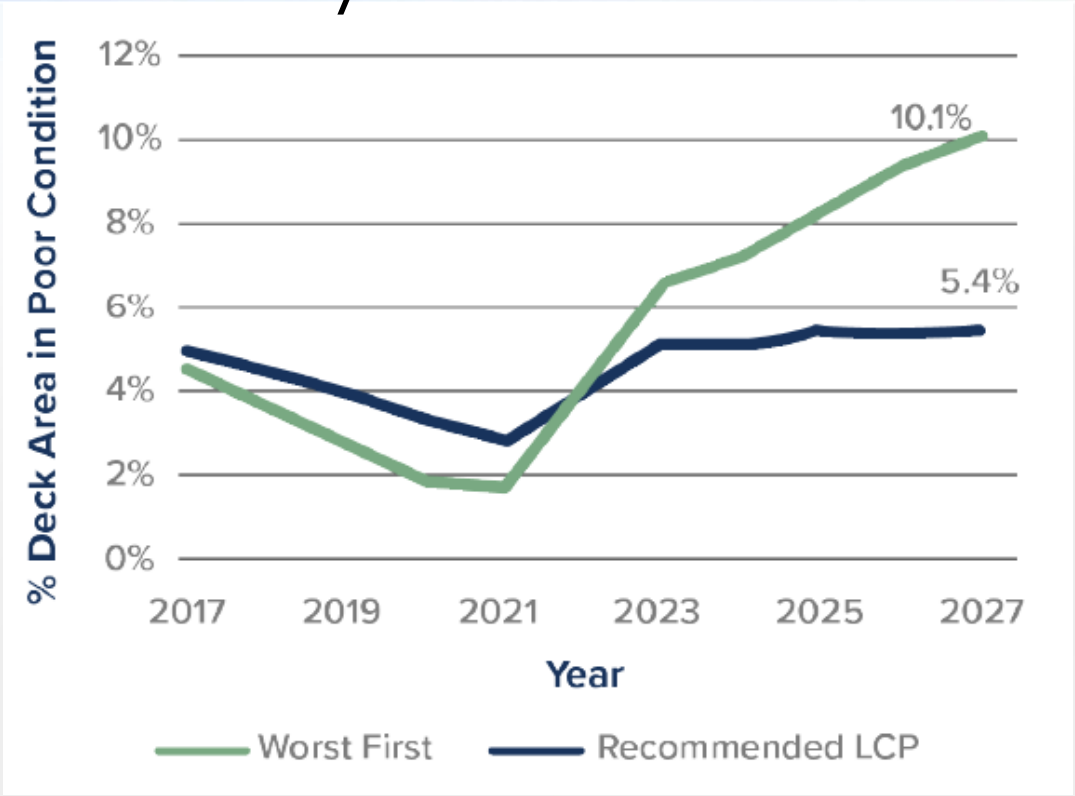
Kentucky's Present

- Pilot Preservation Project
  - Performance Measure based on "Good" and "Fair" Element Conditions
    - Maintain 90% of expansion joints in CS 2 or better
    - Maintain 95% of steel bearings in CS 2 or better
  - Tracking work items and costs in OMS
  - Expectations of completing work on ~120 bridges/year
    - Half by contract/half by in-house crews

Kentucky's Present-TAMP

- At the time of drafting of our initial TAMP, we weren't far along in developing the information for the Optimizer in BrM 5.3
  - Life Cycle Planning Chapter
    - Refers to KYTC's change in "worst first" to "state of good repair" and preservation/preventative mindset
    - Refers to opportunities to improve LCP based on work completed in BrM 5.3 for Program Optimization
      - Agency specific deterioration models
      - Life cycle cost analysis
      - Prioritization models

Kentucky's Present-TAMP



- Recommended LCP
  - Routine preventative maintenance on Fair and Good bridges
    - Corridor Level Projects
  - Condition-based preventive maintenance
    - Pilot Project
  - Rehab for Fair bridges
  - Major Rehab/Replacement for Poor Bridges
  - Functional Improvements
    - Addressing Posted Bridges

Kentucky's Present- TAMP

- Changed % of money spent on different types of work with our investment strategies by year as we implement our Statewide Bridge Preservation Policy

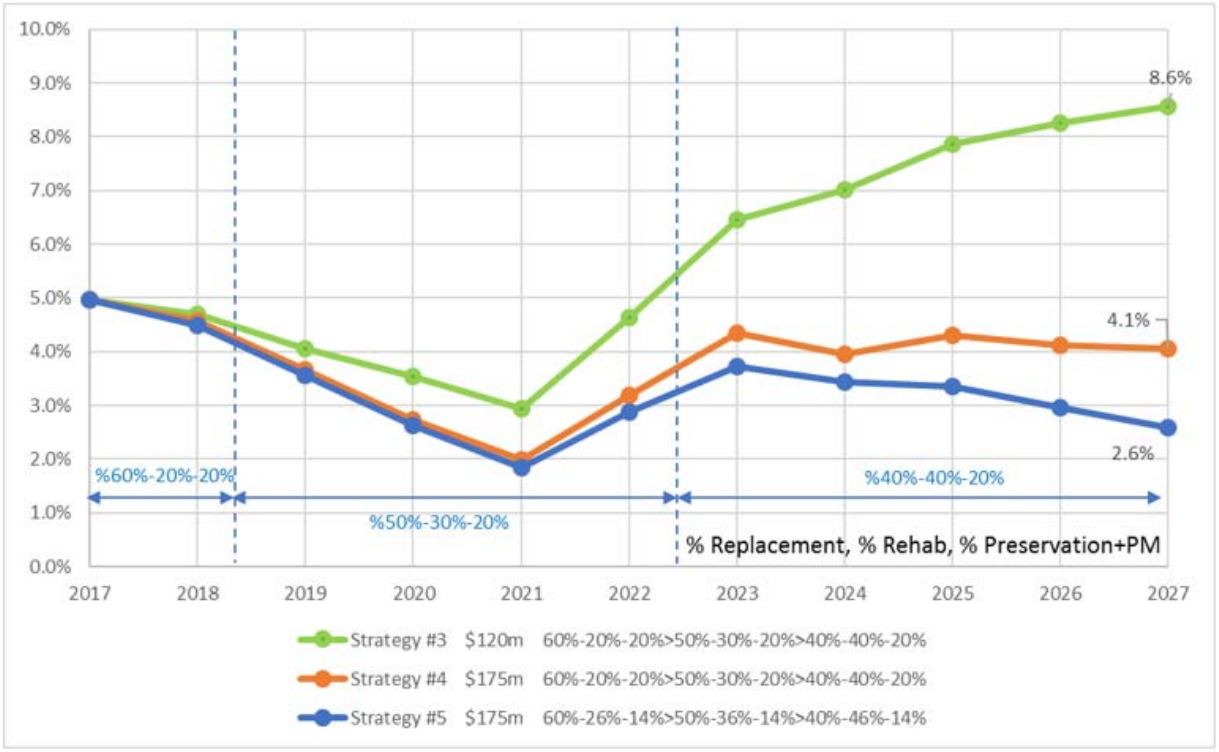


Figure 3 – Increasing Budget from $120m / year to $175m/year
Strategy #4 increases the budget allocations proportionally and keeps the Maintenance and Preservation at %20 of the budget
Strategy #5 Keeps the Maintenance and Preservation Budget at $25m/Year in $175m/year annual budget

Kentucky's Future- Future TAMPs

- With "substantial" completion of the initial input into the Optimizer in BrM 5.3, we already have a list of items to change in subsequent TAMPs
  - NBI deterioration models Bridge Asset Valuation

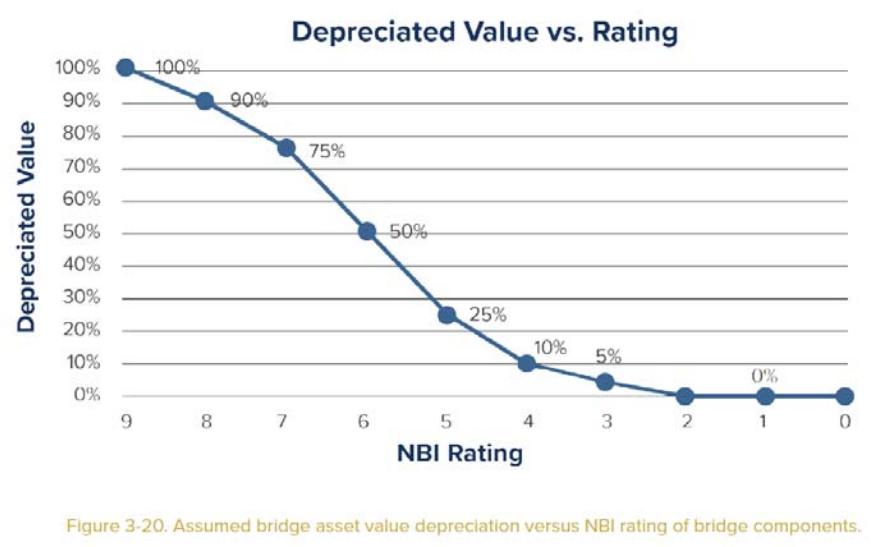
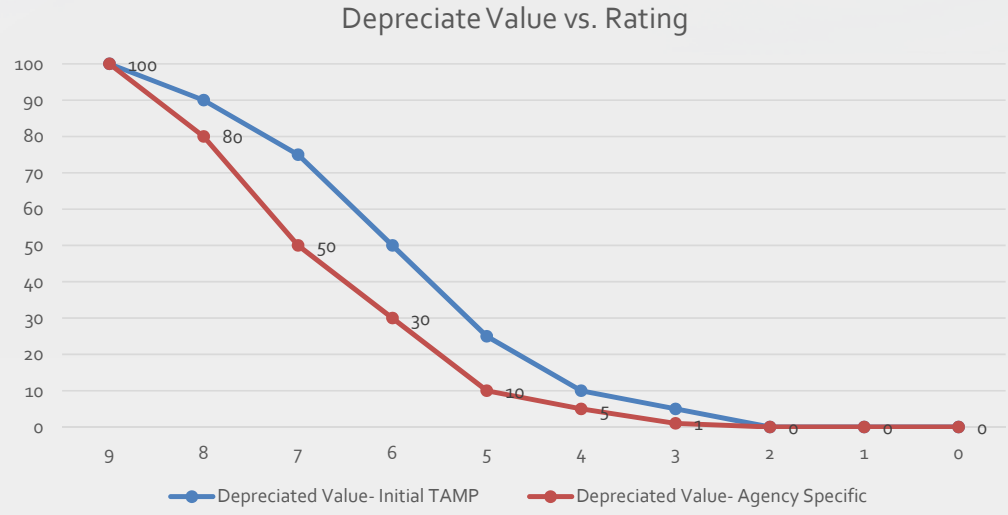
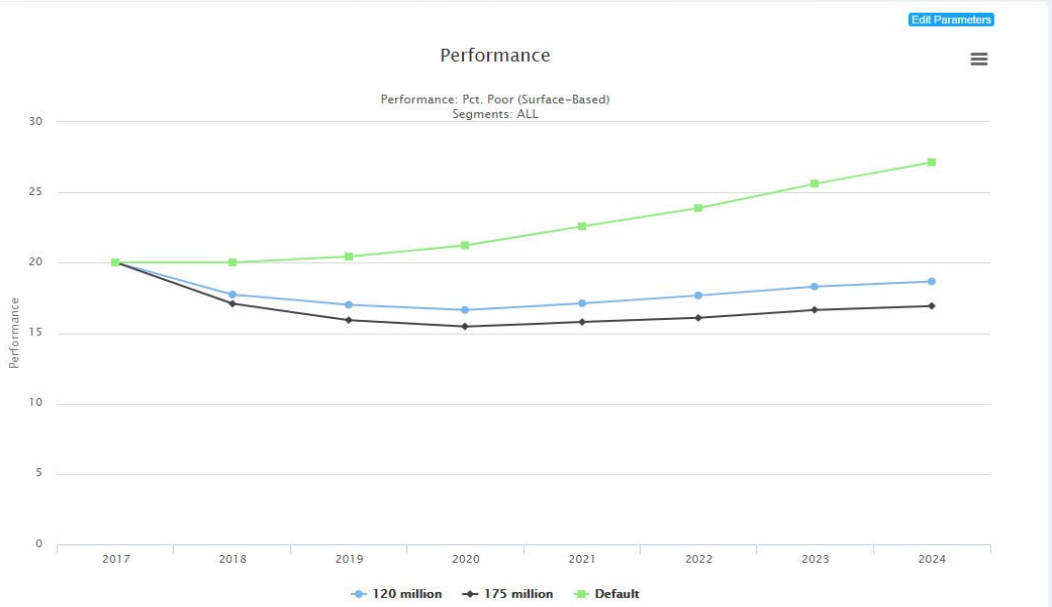


Figure 3-20. Assumed bridge asset value depreciation versus NBI rating of bridge components.



Kentucky's Future- Future TAMPs

- Finished defining our Element Level Deterioration models
  - Bentley and the University of Kentucky have completed work on these models



Kentucky's Future- Future TAMPs

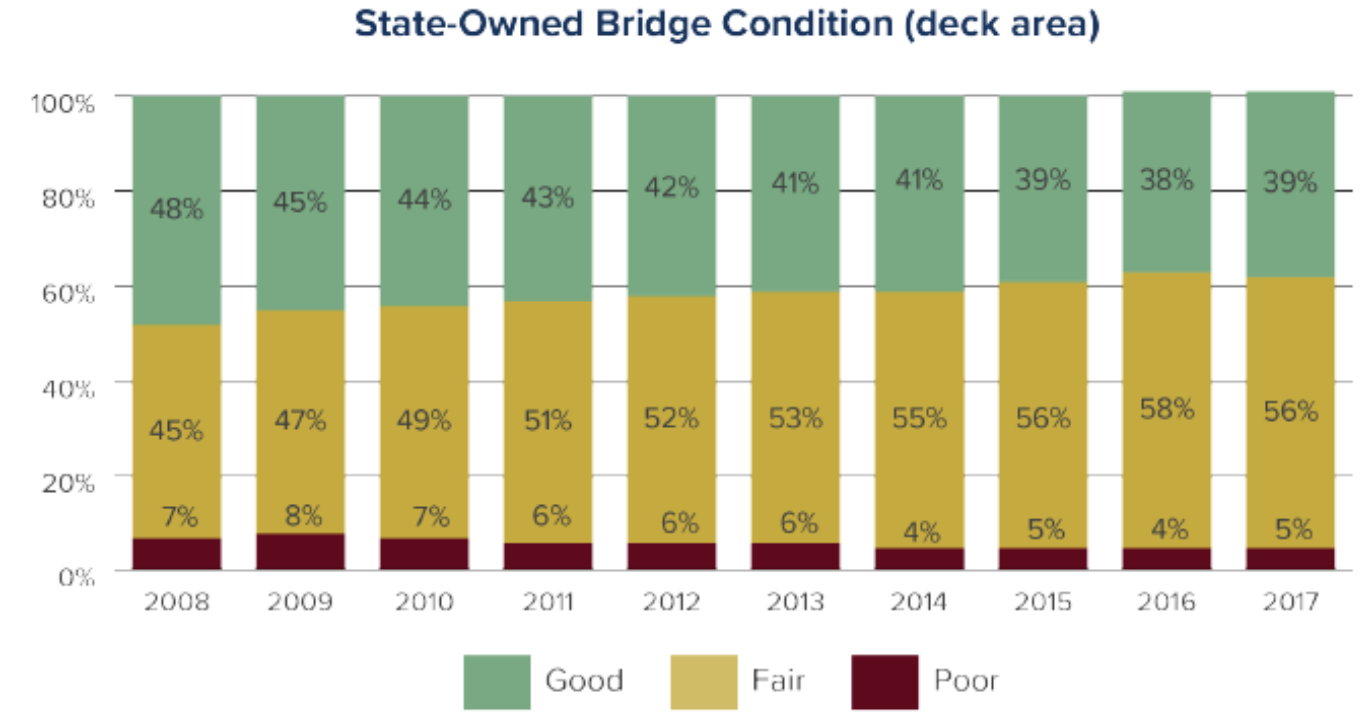


Figure 3-19. Historic Inventory and Condition Trend for State-Owned Bridges (Deck Area).

Kentucky's Future- Future TAMPs

- Continue to update Action Definitions
  - Refine Costs
    - Replacement Costs
      - Need to update to include Environmental, Design, Right of Way and Utility Costs
      - Currently is just replacement costs
    - Preservation/Preventative Costs
      - Refine costs using information learned from Pilot Project
- Continue to update Life Cycle Cost Analysis
  - As we implement our Bridge Preservation Policy and Guide, we can really figure out when we want to perform certain actions.

Kentucky's Future- Future TAMPs

- Continue to update Funding Allocation to run Optimization in BrM for expected bridge needs

Table 6-8. Expected 10-Year Bridge Needs ($ Millions)

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	10-Year Total
Routine Maintenance	5	5	5	5	5	5	5	5	5	5	50
Preservation and Preventive Maintenance	26	26	26	26	26	35	35	35	35	35	306
Rehabilitation	44	53	53	70	70	70	70	70	70	79	648
Replacement	105	96	96	79	79	70	70	70	70	61	796
Total Bridge Needs/Year	180	180	180	180	180	180	180	180	180	180	1800

Kentucky's Future- Future TAMPs

- KYTC is excited to use the capabilities in BrM to help us complete a fully compliant TAMP using data that is Kentucky specific.

Any Questions?