Integrating Bridge Preservation into Your TAMP

Erin Van Zee, PE
KYTC

Outline

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

Kentucky's Past

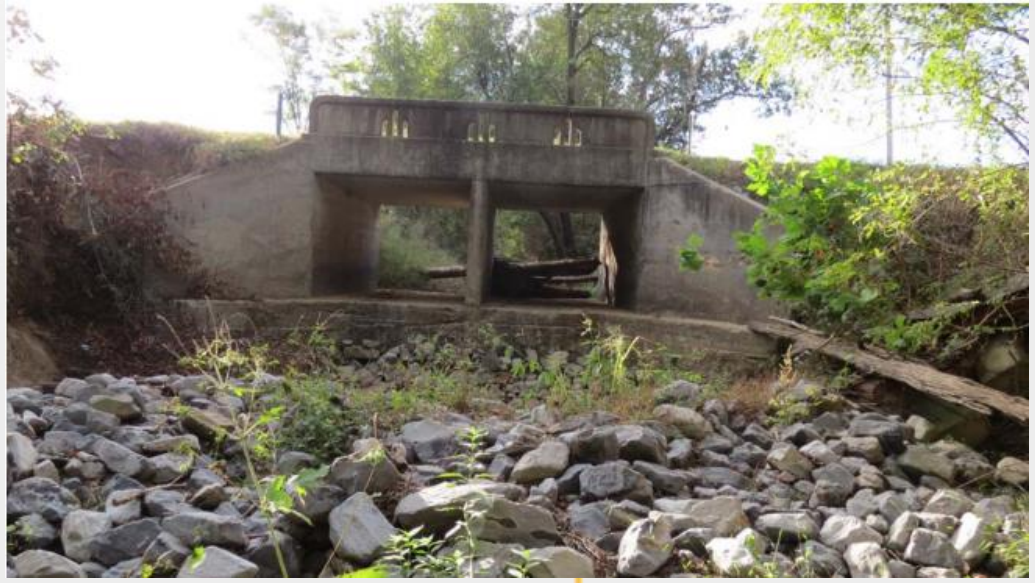
- Worst First Mentality
  - We used "preservation actions" as repairs
    - Latex overlays were done when the deck was in Poor condition
    - Leads to overruns and change orders
      - Full depth patching

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

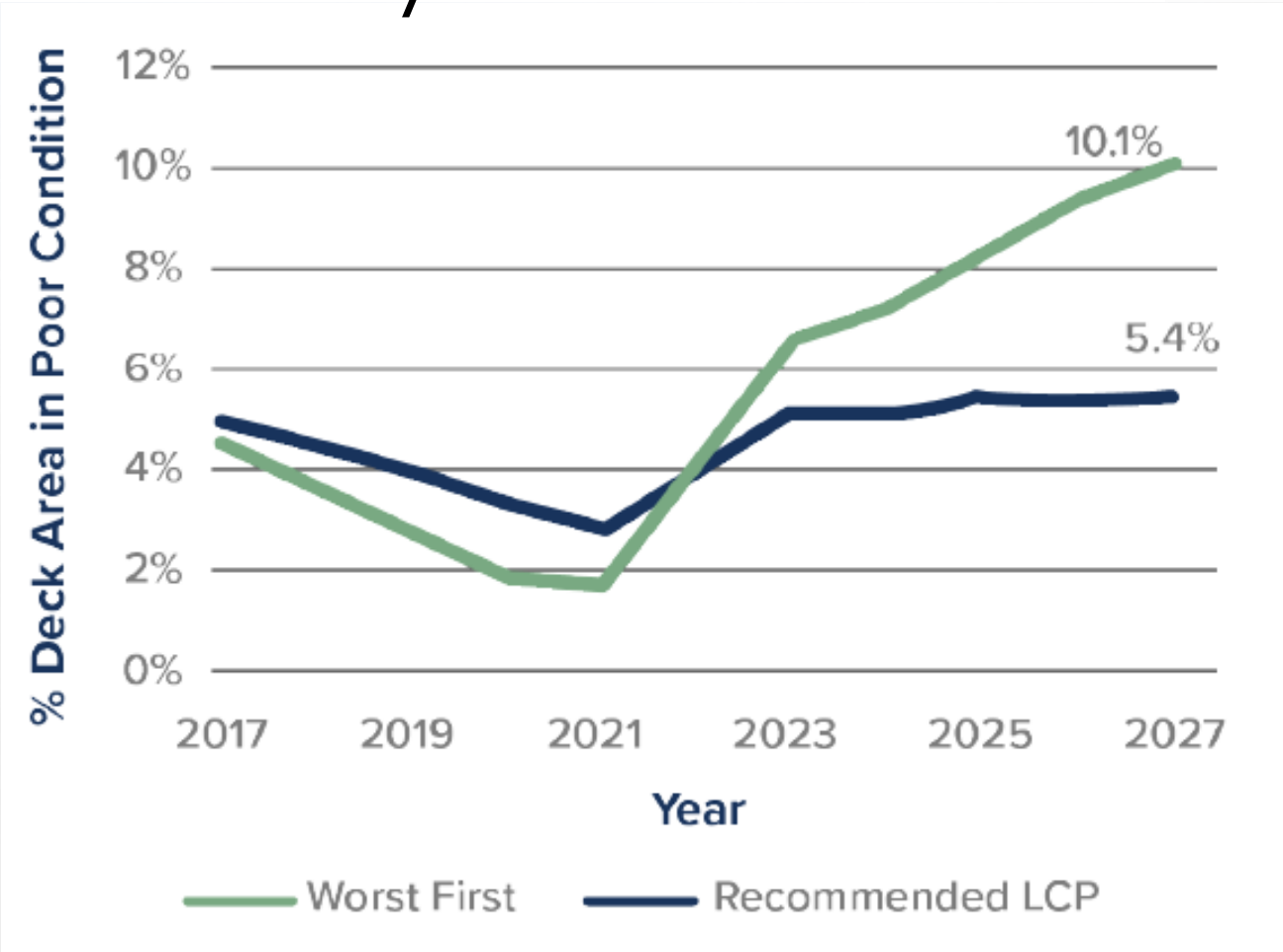
Kentucky's Present

- 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
  - Live 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

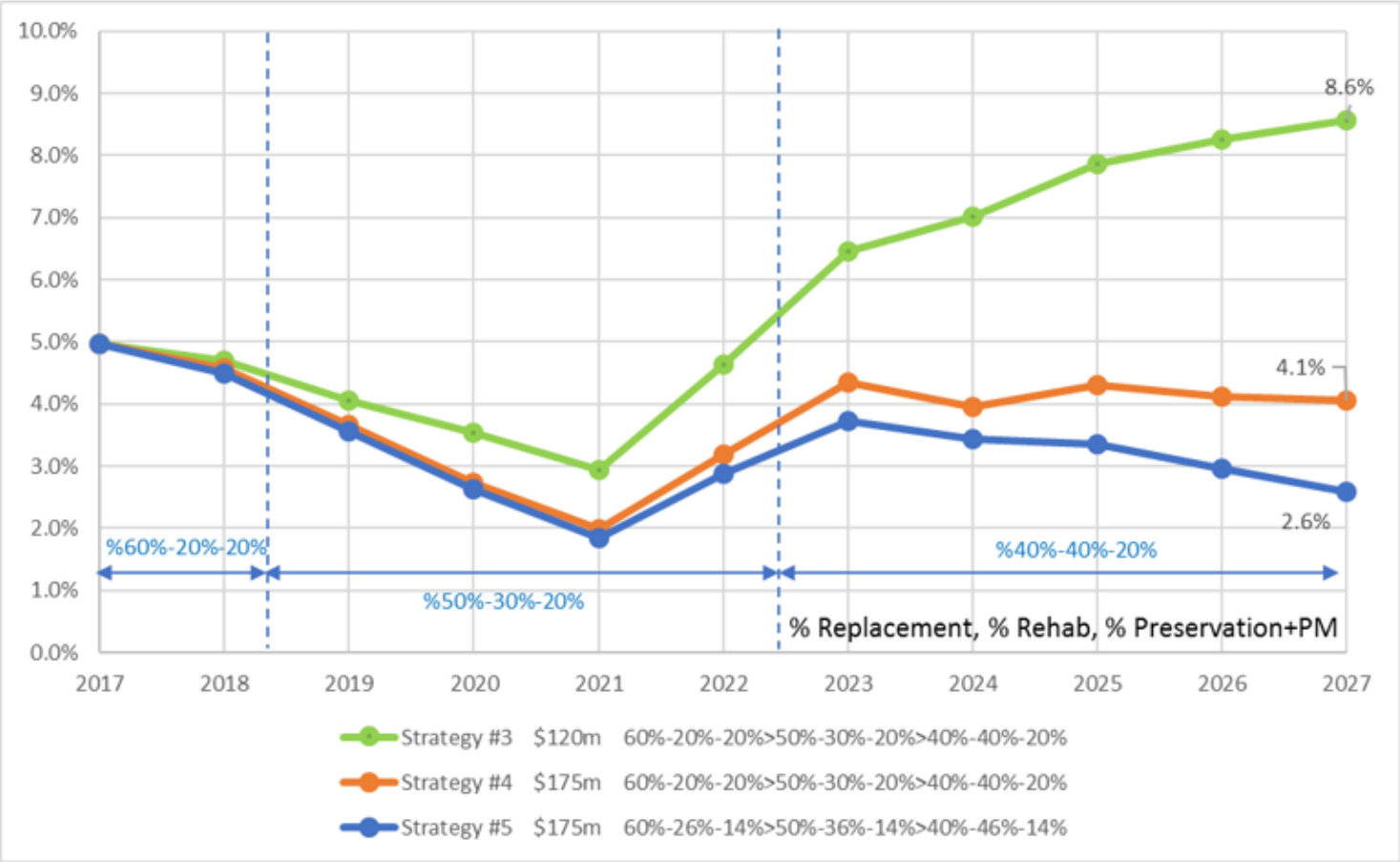


Figure 3 – Increasing Budget from $120m / year to $175m/year
Strategy #4 increases the budget allocations proportionally and keeps the Maintenance and Preservation at %20 of the budget
Strategy #5 Keeps the Maintenance and Preservation Budget at $25m/Year in $175m/year annual budget

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

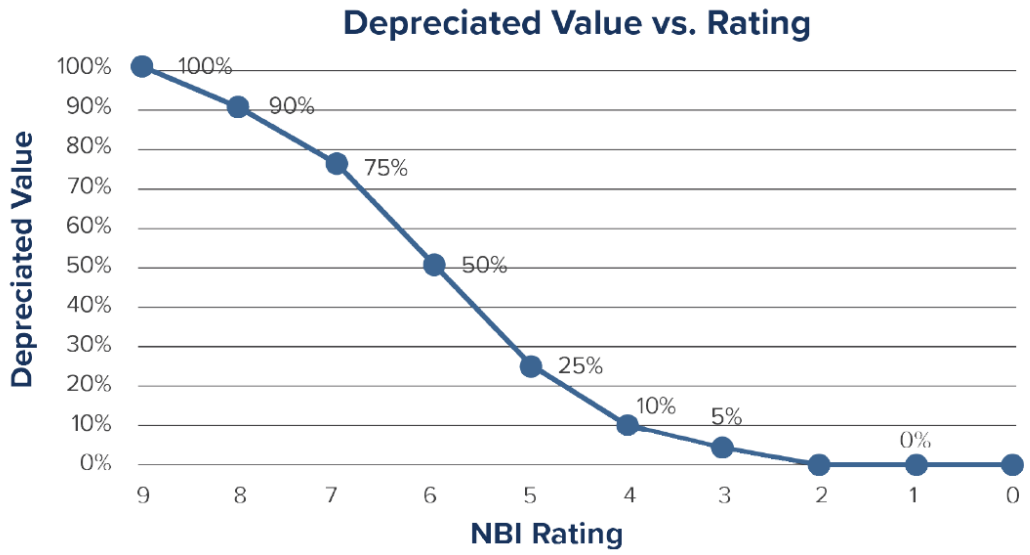
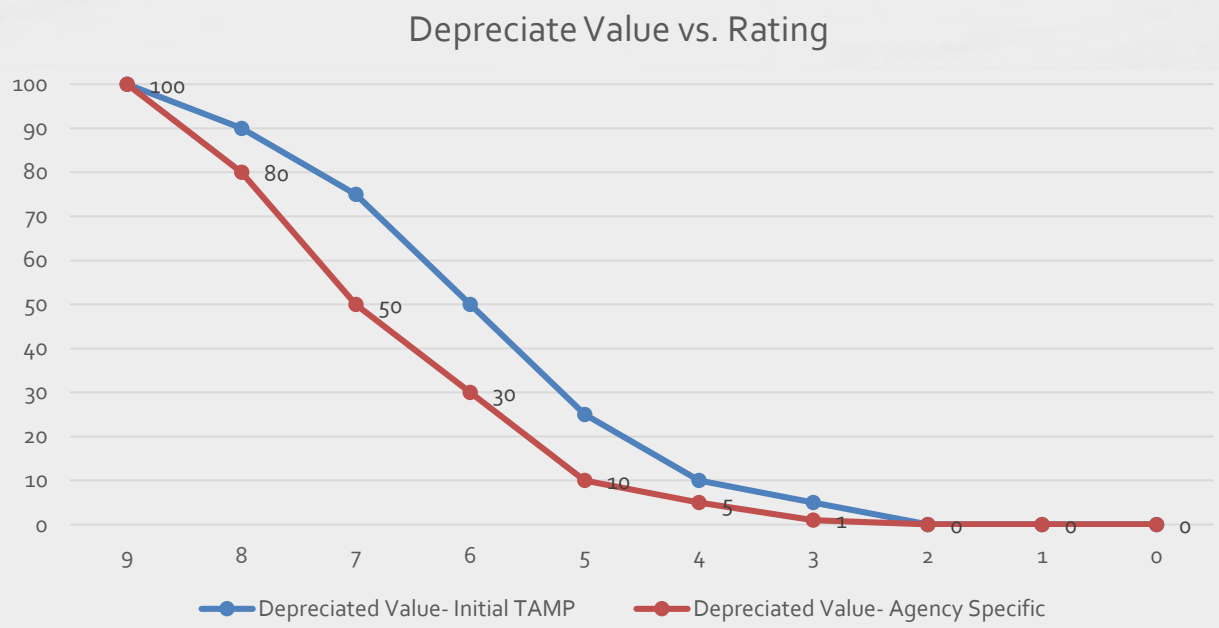
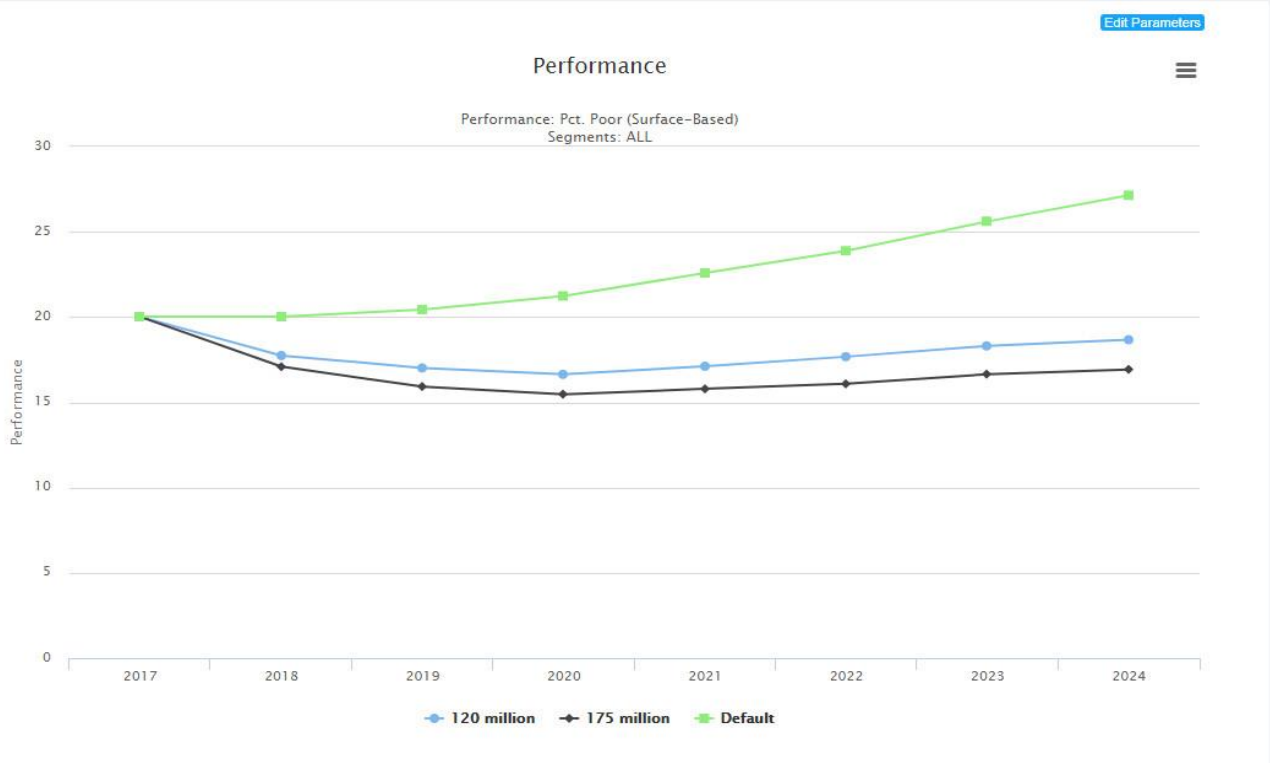


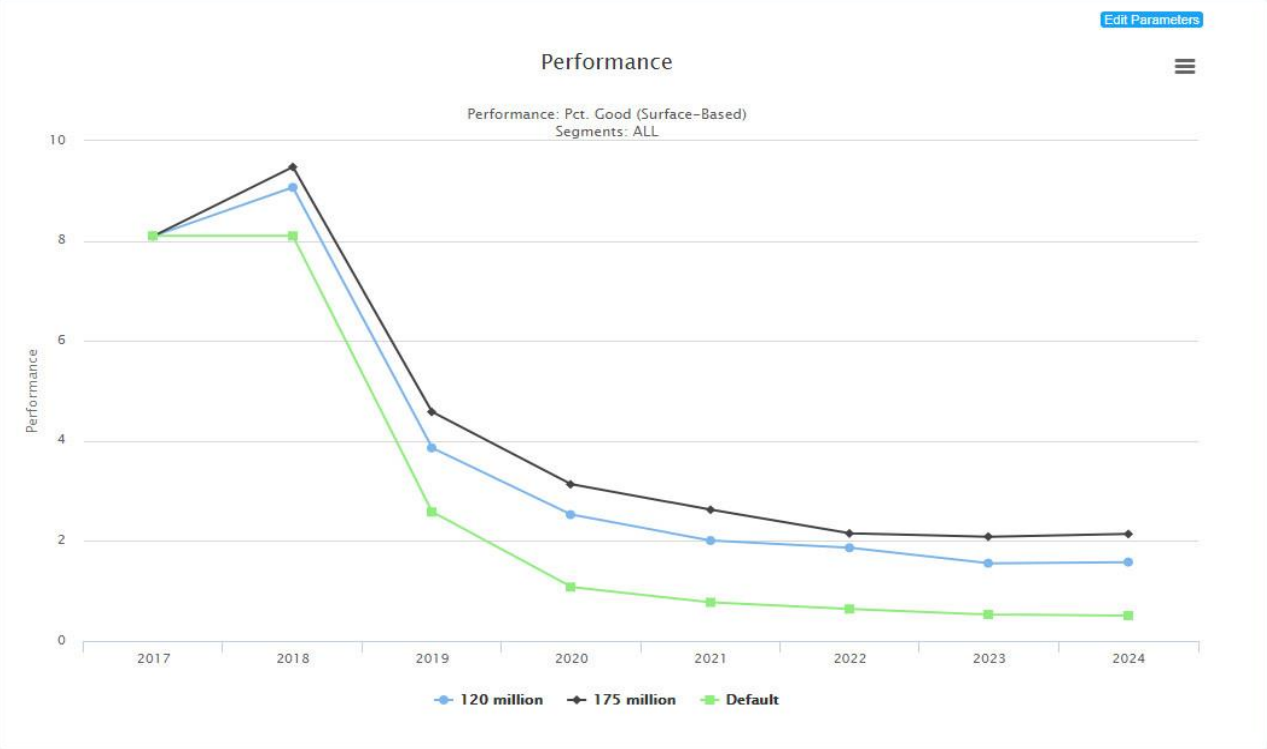
Figure 3-20. Assumed bridge asset value depreciation versus NBI rating of bridge components.



Kentucky's Future- Future TAMPs

- Continue to refine our Element Level Deterioration models
  - Currently have both Bentley and the University of Kentucky doing work on these models





Kentucky's Future- Future TAMPs

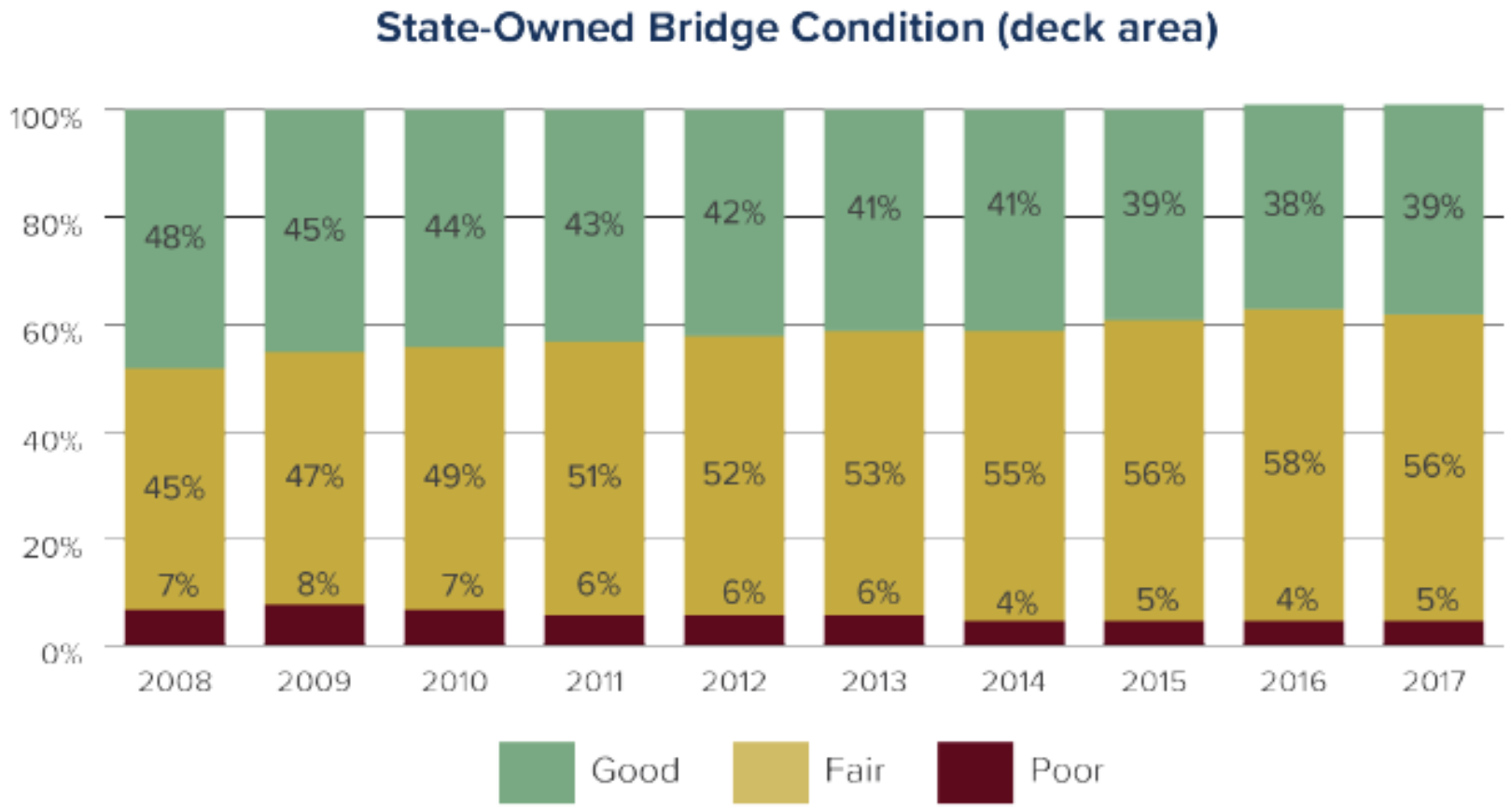


Figure 3-19. Historic Inventory and Condition Trend for State-Owned Bridges (Deck Area).

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?

BUREAU of BRIDGES and STRUCTURES

SPANNING CONNECTING SAFELY EFFICIENTLY

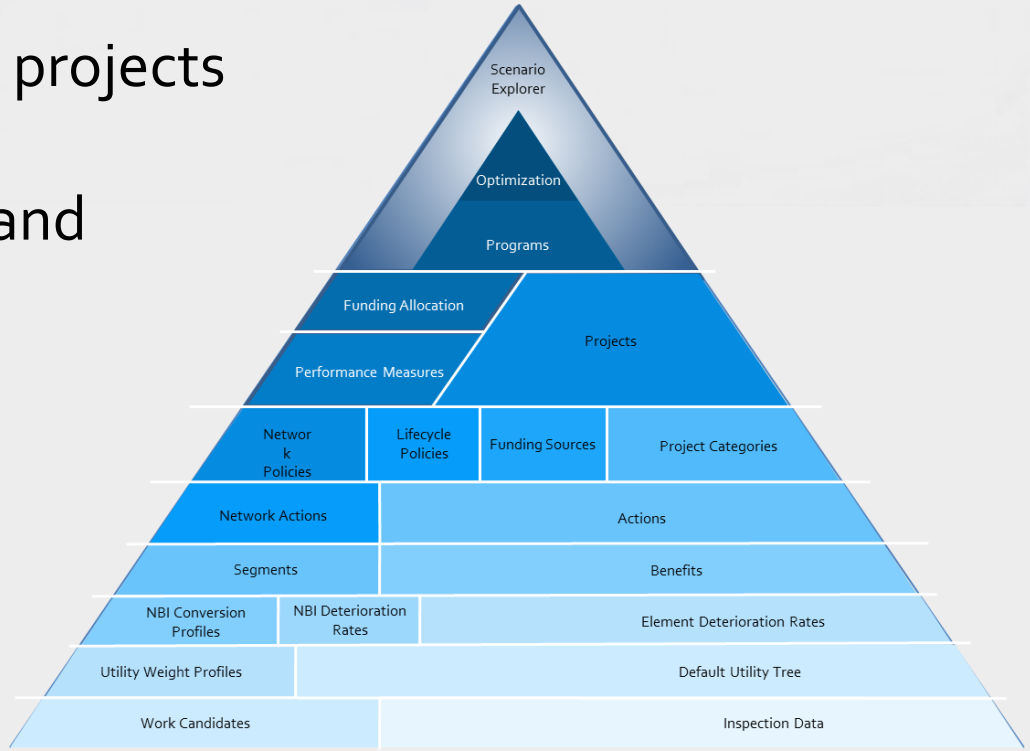
Transportation Performance Management (TPM) Michigan's Bridge Target Setting Method

Beckie Curtis & Dave Juntunen, MDOT
Bureau of Bridges and Structures

Michigan TPM Bridge Target Setting

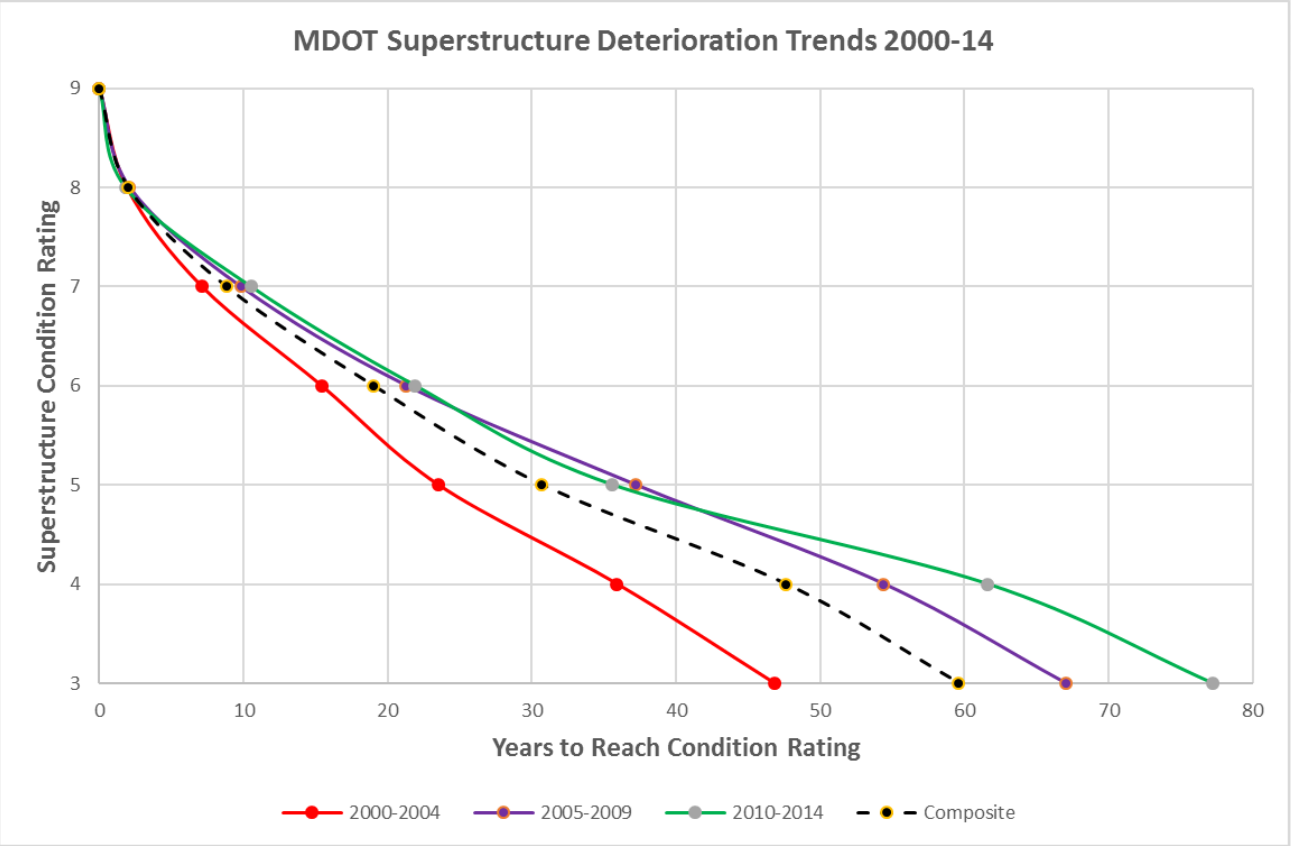
- Tasks to complete the TPM
  - Deteriorate bridges two and fours years out
  - Predict condition of bridges after improvement projects
  - Include MPO's
    - Automate Sharing and Reporting to MPO's and Executives

National performance measures are by deck area. Need to estimate percent good and percent poor



Deteriorate Bridges

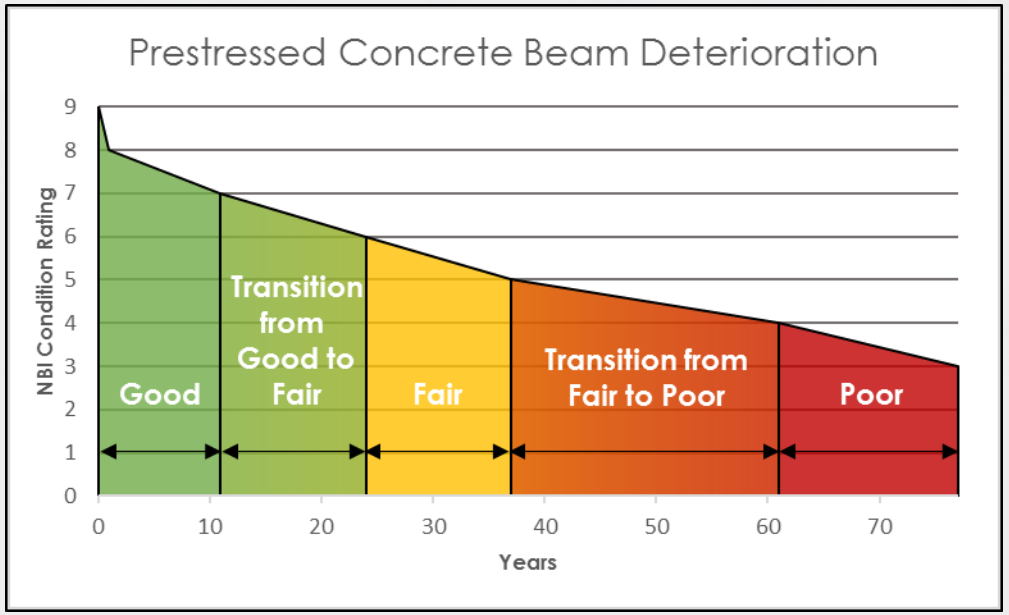
- MDOT has an established process through which trends in bridge deterioration rates can be evaluated at regular intervals



http://www.michigan.gov/documents/mdot/A_Process_for_Systematic_Review_of_Bridge_Deterioration_Rates_522422_7.pdf

Deteriorate Individual Bridge Components

- Determine the earliest year that the component was rated 5 or 7.
- Determine the median time for each component to go from 7 to 6 and from 5 to 4.
- Determine the predicted year to turn poor based on the first year at 7 or 5 plus the median time to poor.



- For those with multiple components rated 7 or 5, choose the minimum predicted year to turn poor from all such components.

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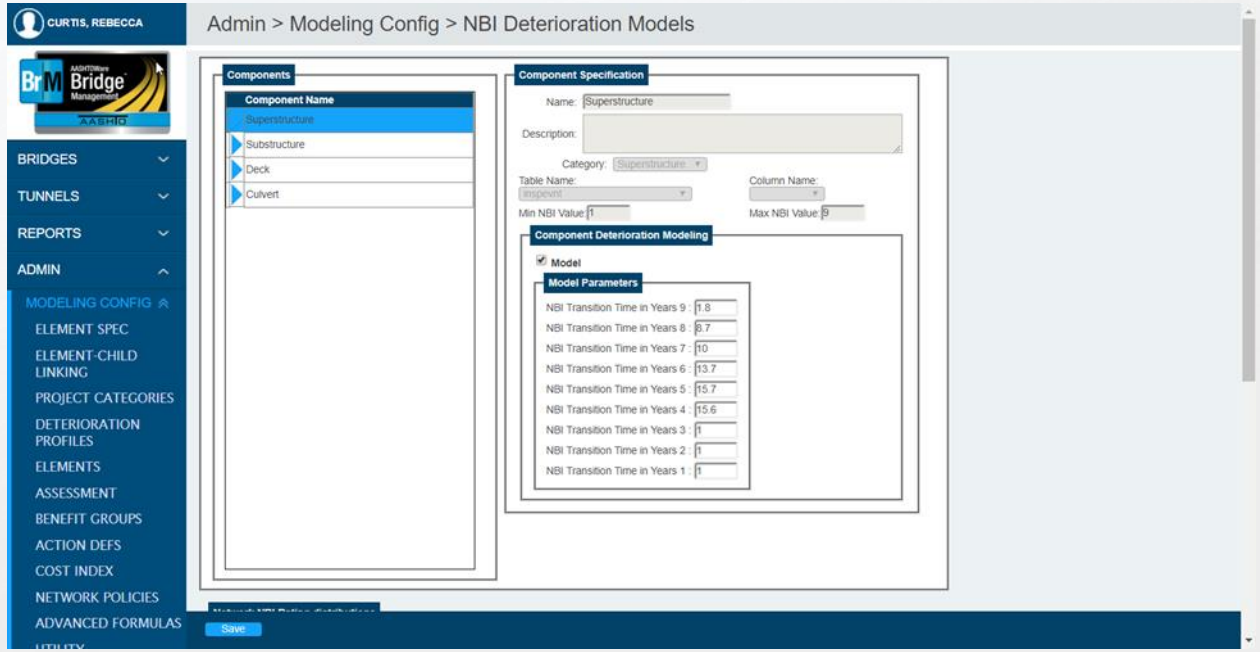
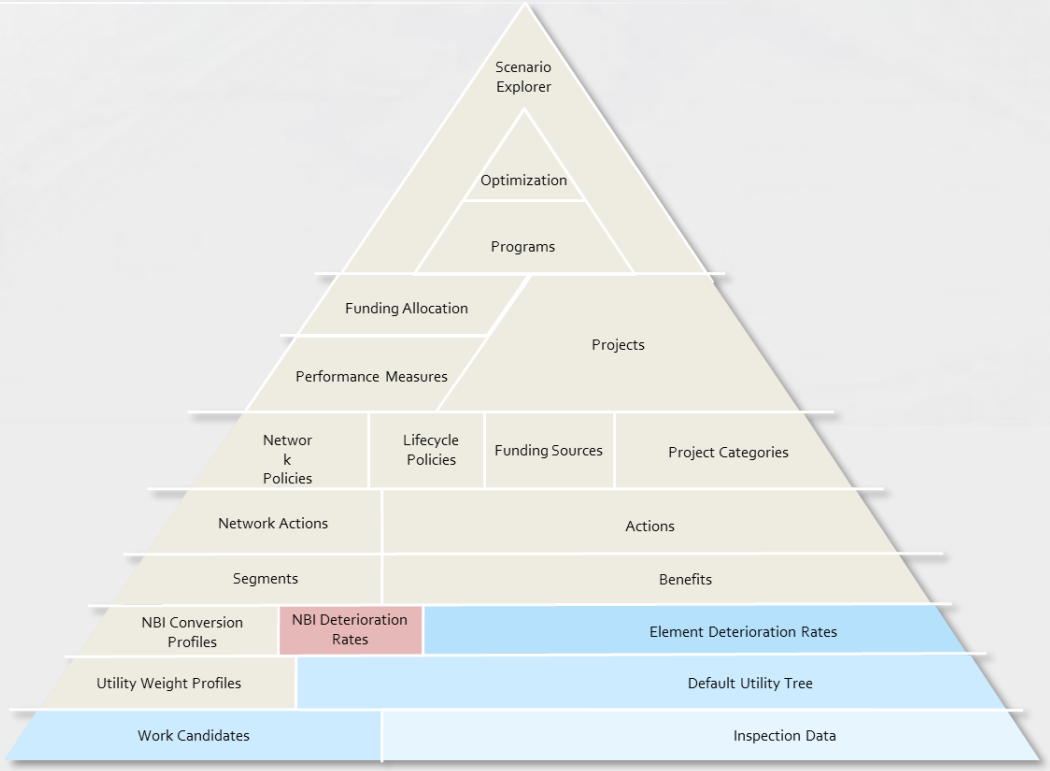
Deteriorate Bridges By Spreadsheet

	A	B	K	L	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1	Brkey	Str Num	Area	Item 41	Inspdate	Deck	Super	Subst	Culv	Poor Year	Historic Project?	2018	2020	2022		Period		
218	821821230	11563	10188	A	8/22/2017	7	8	7	N	2018	0	Good	Fair	Fair		1	Good To Fair	
219	821821230	11564	40582	A	8/22/2017	7	7	7	N	2019	0	Good	Fair	Fair		1	Good To Fair	
220	821821230	11567	23068	A	9/26/2017	7	7	7	N	2016	0	Good	Fair	Fair		1	Good To Fair	
221	821821230	11576	32654	A	9/14/2016	7	7	7	N	2020	15	Good	Good	Good		2	Good To Good	
222	821821230	11578	23379	A	8/29/2017	8	7	7	N	2024	15	Good	Good	Good		3		
223	821821230	11588	5639	A	10/17/2017	7	8	7	N	2008	0	Good	Fair	Fair		1	Good To Fair	
224	821821230	11590	32547	A	10/17/2017	7	7	7	N	2015	0	Good	Fair	Fair		1	Good To Fair	
225	821821230	11591	3638	A	10/16/2017	8	8	7	N	2022	0	Good	Good	Good		3		
226	821821230	11592	6599	A	10/17/2017	7	7	7	N	2015	0	Good	Fair	Fair		1	Good To Fair	
227	821821230	11593	6583	A	10/17/2017	8	7	7	N	2015	0	Good	Fair	Fair		1	Good To Fair	
228	821821230	11594	32633	A	10/17/2017	7	7	7	N	2015	0	Good	Fair	Fair		1	Good To Fair	
229	821821230	11595	3309	A	10/31/2017	8	7	7	N	2022	0	Good	Good	Good		3		
230	821821230	11596	4011	A	10/10/2017	8	7	7	N	2019	15	Good	Good	Good		1	Good To Good	
231	821821240	11606	26501	A	10/10/2017	7	8	7	N	2018	0	Good	Fair	Fair		1	Good To Fair	
232	821821240	11608	20190	A	10/9/2017	7	7	7	N	2017	0	Good	Fair	Fair		1	Good To Fair	
233	821821250	11613	25911	A	12/12/2016	7	7	7	N	2021	15	Good	Good	Good		2	Good To Good	
234	821821310	11615	20062	A	11/3/2017	8	8	7	N	2028	0	Good	Good	Good		3		
235	821821410	11619	5068	A	10/5/2016	7	7	8	N	2011	15	Good	Good	Good		1	Good To Good	
236	821821410	11620	5068	A	10/5/2016	7	7	7	N	2011	15	Good	Good	Good		1	Good To Good	
237	821821410	11621	4643	A	9/12/2016	7	8	8	N	2023	15	Good	Good	Good		3		
238	821821410	11622	16552	A	11/8/2017	7	7	7	N	2017	0	Good	Fair	Fair		1	Good To Fair	
239	821821410	11623	16552	A	11/8/2017	7	7	7	N	2017	0	Good	Fair	Fair		1	Good To Fair	
240	821821910	11629	1748	A	10/25/2016	N	N	N	7	2009	0	Good	Fair	Fair		1	Good To Fair	
241	824664382	11635	1256	A	12/6/2016	N	N	N	7	2024	0	Good	Good	Good		3		
242	821821910	11663	50368	A	10/24/2016	7	7	7	N	2021	0	Good	Good	Fair		2	Good To Fair	
243	821821910	11666	15001	A	6/9/2016	7	8	7	N	2015	0	Good	Fair	Fair		1	Good To Fair	
244	821821910	11667	15075	A	6/9/2016	7	7	7	N	2014	0	Good	Fair	Fair		1	Good To Fair	
245	821821910	11668	15315	A	10/14/2016	8	7	7	N	2016	0	Good	Fair	Fair		1	Good To Fair	
246	821821910	11669	15126	A	7/8/2016	7	8	7	N	2021	0	Good	Good	Fair		2	Good To Fair	
247	821821920	11679	8279	A	11/14/2017	7	7	7	N	2007	0	Good	Fair	Fair		1	Good To Fair	
[illegible]	[illegible]	[illegible]	8279	A	[illegible]	[illegible]	7	7	N	[illegible]	[illegible]	Good	Fair	Fair		[illegible]	Good To Fair	

Deteriorate Bridges Using AASTHOWare BrM

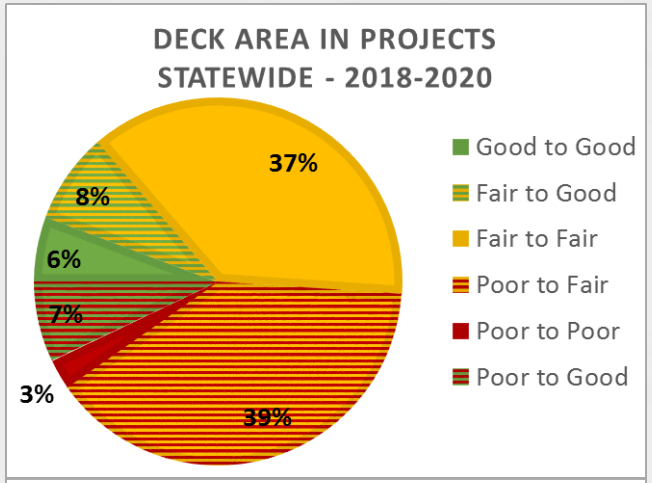


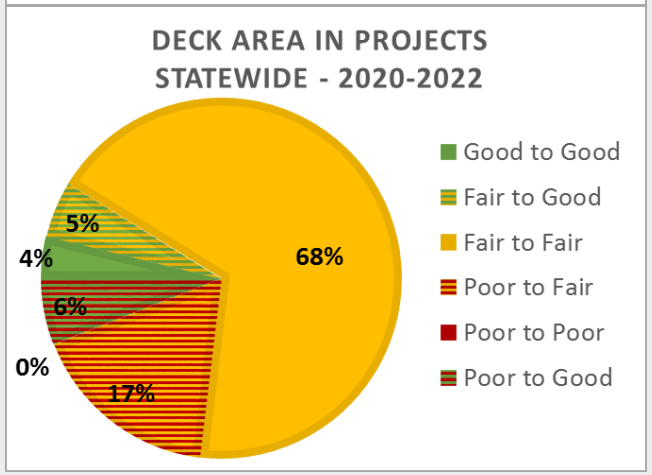


Input NBI Deterioration Rates for Major Components

Predict Improvement to Bridges from Projects

- The projects within the Five Year Plan on bridges that carry the NHS were identified. The projects were sorted by the scheduled letting date. It was assumed that projects would require one construction season to be completed and inspected.





BUREAU of BRIDGES and STRUCTURES

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Improve Bridges By Spreadsheet

Jurisdiction: MDOT Statewide

Note : Bridge jobs programmed prior to October 2002 will not appear on this report.

Report created on 01/29/2018

Structure Number	Bridge ID	Deck Area (sq ft)	Inspection Date	Structure Condition BEFORE		Structure Condition AFTER		Structure Condition Improvement	NBI Deck Rtg	NBI Surface Rtg	NBI Deck Bott Rtg	NBI Super-struct Rtg	NBI Sub-struct Rtg	NBI Culvert Rtg	Work Description (1)	Obligation Date	Schedule Letting Date	Category of Work	Job Template	Construction Cost	Funding Code	Surface Rating	2018	2020	2022
0																									
33	02102011000B020	2232	5/8/2017	Poor	4	6	Fair	Poor To Fair	4	5	4	7	6	N	, Deck Replacement; Bridge Approach; Painting Complete; Scour Protection; Substructure Patching	11/27/2020	1/8/2021	Bridge Replacement	Bridge Replacement	$361,162	NH	83.4	Poor	Poor	Fair
44	02102041000B010	2662	5/16/2017	Fair	5	5	Fair	Fair To Fair	5	5	5	5	6	N	, Overlay - Shallow; Bridge Approach; Bridge Barrier Railing Replace; Deck Patching - Full Depth; Substructure Repair; Superstructure Repair, Concrete	11/27/2018	1/11/2013	Bridge Rehabilitation	Bridge Preservation	$1,038,712	NH	65.6	Fair	Fair	Fair
33	03103032000C020	1456	3/7/2017	Good	7	8	Good	N/A To Good	N	N	N	N	N	7	, Guardrail, Culvert Replacement	10/15/2020	12/4/2020	Bridge Replacement	Bridge Replacement	$1,015,000	NH	38	Good	Good	Goo
124	03103035000R020	6136	5/22/2017	Fair	5	7	Good	Fair To Good	5	5	6	7	7	N	, Overlay - Deep; Bridge Approach; Bridge Barrier Railing Replace; Concrete Surface Coating; Deck Patching - Full Depth; Slope Protection Repair; Substructure Patching	1/15/2021	3/5/2021	Bridge Rehabilitation	Bridge Preservation	$1,067,086	IM	32.1	Fair	Fair	Good
127	03103035000S010	10950	5/24/2016	Fair	5	5	Fair	Fair To Fair	6	6	6	5	6	N	, Overlay - Deep; Bridge Approach; Bridge Barrier Railing Replace; Painting - Zone; Pin & Hanger Replacement; Substructure Patching	#######	12/4/2020	Bridge Rehabilitation	Bridge Preservation	$1,626,052	IM	80.5	Fair	Fair	Fair
407	06106111000B030	2190	6/21/2016	Fair	6	6	Fair	Fair To Fair	N			N	N	6	, Scour Protection; Substructure Patching	10/9/2020	12/4/2020	Bridge CPM	Bridge Preservation	$33,368	IM	36.7	Fair	Fair	Fair
408	06106111000B040	1583	6/21/2016	Fair	6	6	Fair	Fair To Fair	N			N	N	6	, Scour Protection	10/9/2020	12/4/2020	Bridge CPM	Bridge Preservation	$28,038	IM	34.7	Fair	Fair	Fair
421	06106111000S020	11930	6/14/2016	Fair	6	6	Fair	Fair To Fair	6	6	7	6	7	N	, Overlay - Epoxy; Bridge Approach; Bridge Barrier Railing Replace; Deck Patching; Deck Patching - Full Depth; Joint Repair	10/9/2020	12/4/2020	Bridge CPM	Bridge Preservation	$545,244	IM	30	Fair	Fair	Fair
422	06106111000S030	4812	5/9/2016	Fair	5	5	Fair	Fair To Fair	6	6	6	5	6	N	, Overlay - Epoxy; Deck Patching; Deck Patching - Full Depth; Joint Repair; Slope Protection Repair; Substructure Repair; Superstructure Repair, Concrete	10/9/2020	12/4/2020	Bridge CPM	Bridge Preservation	$83,751	IM	85.3	Fair	Fair	Fair
423	06106111000S040	4812	5/9/2016	Fair	6	6	Fair	Fair To Fair	7	7	8	6	6	N	, Overlay - Epoxy; Deck Patching; Joint Repair; Substructure Repair; Superstructure Repair, Concrete	10/9/2020	12/4/2020	Bridge CPM	Bridge Preservation	$110,517	IM	91.2	Fair	Fair	Fair
428	06106111000S130	9241	10/13/2016	Fair	6	6	Fair	Fair To Fair	7	7	7	6	8	N	, Overlay - Epoxy	10/9/2020	12/4/2020	Bridge CPM	Bridge Preservation	$47,122	IM	80	Fair	Fair	Fair
607	03103035000B010	7395	3/13/2017	Fair	5	5	Fair	Fair To Fair	6	6	6	5	6	N	, Overlay - Deep; Bridge Approach; Bridge Barrier Railing Replace; Concrete Surface Coating; Paint - Spot; Slope Protection Repair; Substructure Repair; Superstructure Repair, Concrete	10/25/2018	12/7/2018	Bridge Rehabilitation	Bridge Preservation	$327,174	IM	85.5	Fair	Fair	Fair
608	03103035000B020	5724	8/8/2017	Poor	4	5	Fair	Poor To Fair	4	6	4	8	5	N	, Deck Replacement; Bridge Approach; Concrete Surf	10/9/2020	12/4/2020	Bridge Replacement	Bridge Replacement	$2,030,391	IM	80.6			

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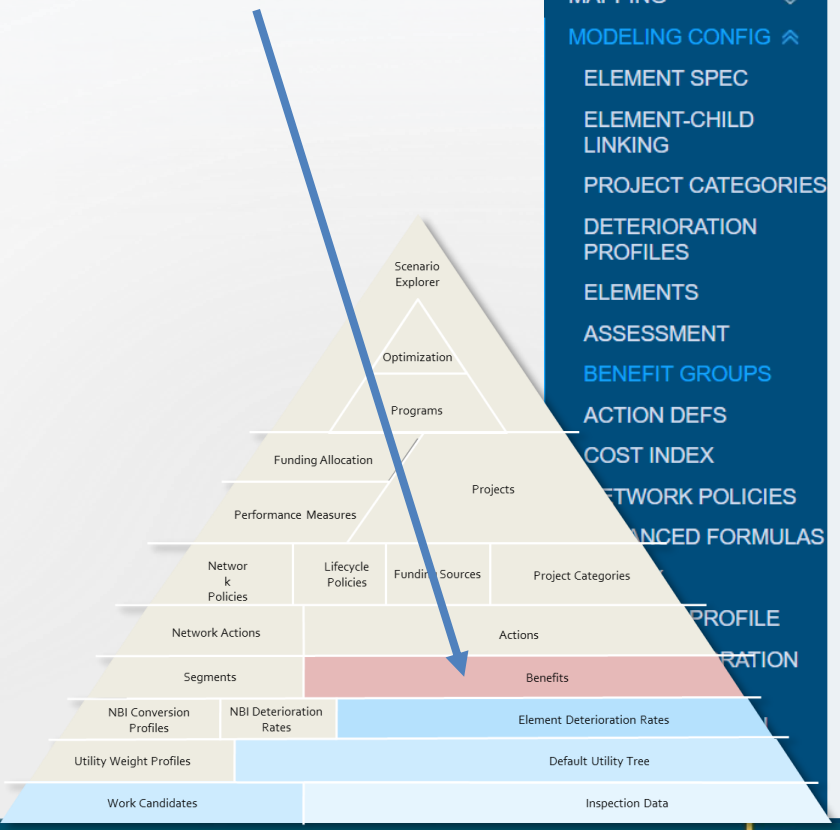
Improve Bridges Using AASHTOWare BrM

Benefits



USER, PONTIS

SECURITY
GENERAL CONFIG
MAPPING
MODELING CONFIG
ELEMENT SPEC
ELEMENT-CHILD LINKING
PROJECT CATEGORIES
DETERIORATION PROFILES
ELEMENTS
ASSESSMENT
BENEFIT GROUPS
ACTION DEFS
COST INDEX
TWORK POLICIES
NCED FORMULAS
PROFILE
RATION

Admin > Modeling Config > Benefit Groups

Superstructure-Replace	Superstructure-Replace	Replace Super- Network, Superstructure-Replace	Yes		
TPM - Culvert - Fair	Make NBI Culvert Fair	TPM - Culvert - 5	Yes	1	
TPM - Culvert - Good	Make NBI Culvert Good	TPM - Culvert - 7	Yes	1	
TPM - Deck - Fair	Make NBI Deck Fair	TPM - Deck - 5	Yes	1	
TPM - Deck - Good	Make NBI Deck Good	TPM - Deck - 7	Yes	1	
TPM - Sub - Fair	Make NBI Sub Fair	TPM - Sub - 5	Yes	1	
TPM - Sub - Good	Make NBI Sub Good	TPM - Sub - 7	Yes	1	
TPM - Super - Fair	Make NBI Super Fair	TPM - Super - 5	Yes	1	
TPM - Super - Good	Make NBI Super Good	TPM - Super - 7	Yes	1	

Expand Group Details Collapse Group Details

- Child Benefit Groups (0)
- Changed Elements (0)
- Removed Elements (0)
- Replaced Elements (0)
- Created Protective Systems (0)
- Fields (1)

Table Name	Column Name	New Value	Increment
inspevnt	suprating	8	

- Risks (0)

2 3 4

Total Records: 60

Items per page: 15

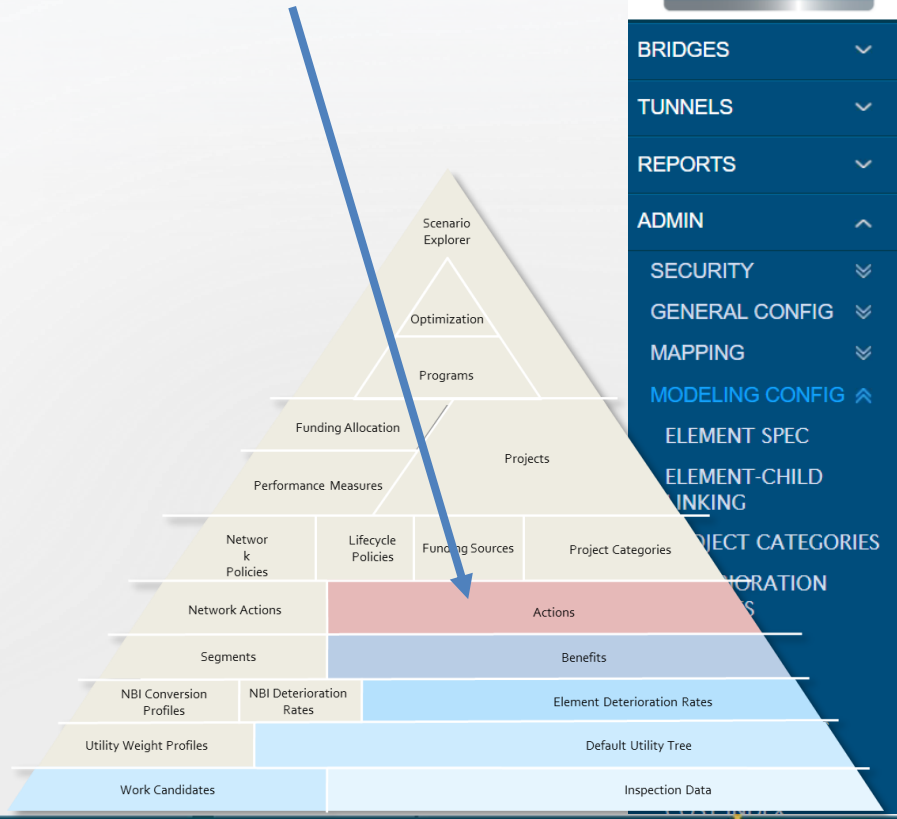
Records Matching

BUREAU of BRIDGES and STRUCTURES

SPANNING CONNECTING SAFELY EFFICIENTLY

Improve Bridges Using AASHTOware BrM

Actions



USER, PONTIS

AASHTOWare BrM Bridge Management AASHTO

BRIDGES
TUNNELS
REPORTS
ADMIN
SECURITY
GENERAL CONFIG
MAPPING
MODELING CONFIG
ELEMENT SPEC
ELEMENT-CHILD LINKING
ECT CATEGORIES
ORATION

Admin > Modeling Config > Action Defs

Action Defs

Search | Search

Name	Description	Notes	Order	Network Level	Bridge Replace	Required Minimum Cost	Action Type	Active	
						$			Add
TPM - Culvert - Fair	Make Culvert NBI Fair		1			$			
TPM - Culvert - Good	Make Culvert NBI Good		1						
TPM - Deck - Fair	Make Deck NBI Fair		1						
TPM - Deck - Good	Make Deck NBI Good		1						
TPM - Sub - Fair	Make Sub NBI Fair		1						
TPM - Sub - Good	Make Sub NBI Good		1						
TPM - Super - Fair	Make Super NBI Fair		1						
TPM - Super - Good	Make Super NBI Good		1						
Deep Overlay- Network	Deep Overlay		999						
Epoxy Overlay- Network	Epoxy Overlay		999						
Healer Sealer- Network	Healer Sealer		999						
HMA Cap- Network	HMA Cap		999						
Paint Sub - Network	First Painting	Example	999	✓			Network	✓	
Paint Super - Network	First Painting	Example	999	✓			Network	✓	
Place Wearing Surface - Network	First Wearing Surface	Example	999	✓			Network	✓	

First | Previous | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Next | Last

Associated Benefit Groups for Action TPM - Culvert - Fair

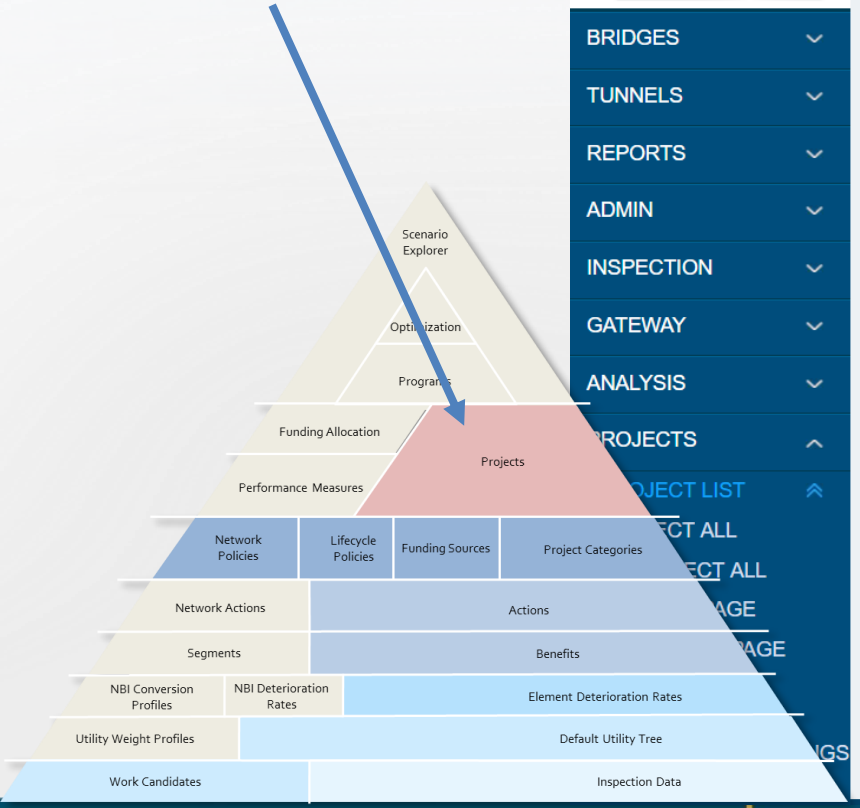
Save

BUREAU of BRIDGES and STRUCTURES

SPANNING CONNECTING SAFELY EFFICIENTLY

Improve Bridges Using AASHTOWare BrM

Projects



USER, PONTIS

AASHTOWare BrM Bridge Management AASHTO

- BRIDGES
- TUNNELS
- REPORTS
- ADMIN
- INSPECTION
- GATEWAY
- ANALYSIS
- PROJECTS
  - PROJECT LIST
  - PROJECT ALL
  - PROJECT ALL
  - PACKAGE
  - PACKAGE
  - BRIDGES

Projects > Project List > Select All

Filter: BrM - None Layout: Project Default Jump to Project: TPM 2018

Alt ID	Name	Start Date	Add Cost	Create Date	Status	First Name	Project Category
	tpm						
	TPM 2018		0	4/5/2018	0	Pontis	Bridge Rail
	TPM 2019		0	4/5/2018	0	Pontis	Bridge Rail
	TPM 2020		0	4/5/2018	0	Pontis	Bridge Rail
	TPM 2021		0	4/5/2018	0	Pontis	Bridge Rail

Total Projects: 5176 Matching Filter: 5154 Selected: 1

Bridge View | Bridge Map View | Work View

Bridge ID	District	County	Facility Carried	Feature Intersected	Deck	Superstructure	Substructure	Culvert	Health Index
000000000011714	07	163	M-102 EB	M-39	8 Very Good	7 Good	7 Good	N N/A (NBI)	99.64
000000000011715	07	163	M-102 WB	M-39	8 Very Good	7 Good	7 Good	N N/A (NBI)	99.6
000000000011716	07	163	I-75	ROUGE R,DEARBORN ST & RR	4 Poor	7 Good	6 Satisfactory	N N/A (NBI)	

Action	Work Item	Base Utility	New Utility	Utility Change	Estimated Cost	Benefit / Cost ($k)	Cost ($k) / Benefit	Target Year
TPM - Deck - Fair	(11716) TPM - Deck - Fair	44.33	58	13.67	$0		$0	2018

Bridge ID	District	County	Facility Carried	Feature Intersected	Deck	Superstructure	Substructure	Culvert	Health Index
000000000011717	07	163	I-75 NB OFF RAMP	RR AND MAINT RD	6 Satisfactory	8 Very Good	7 Good	N N/A (NBI)	96.39
000000000011718	07	163	I-75 SB ON RAMP	ROUGE RIVER & PLEASANT S	4 Poor	8 Very Good	7 Good	N N/A (NBI)	93.61
000000000011734	07	163	I-75	FORT ST	4 Poor	6 Satisfactory	4 Poor	N N/A (NBI)	82.48
000000000011756	07	163	RMP I-96E TO I-75N	I-96 WB	8 Very Good	8 Very Good	7 Good	N N/A (NBI)	99.98
000000000011760	07	163	14TH ST	I-75	5 Fair	5 Fair	4 Poor	N N/A (NBI)	99.06
000000000011786	07	163	M-85 SB	MARSH CREEK	5 Fair	5 Fair	6 Satisfactory	N N/A (NBI)	95.69
000000000011800	07	163	MADISON AVE RAMPS	I-375	5 Fair	7 Good	5 Fair	N N/A (NBI)	96.33

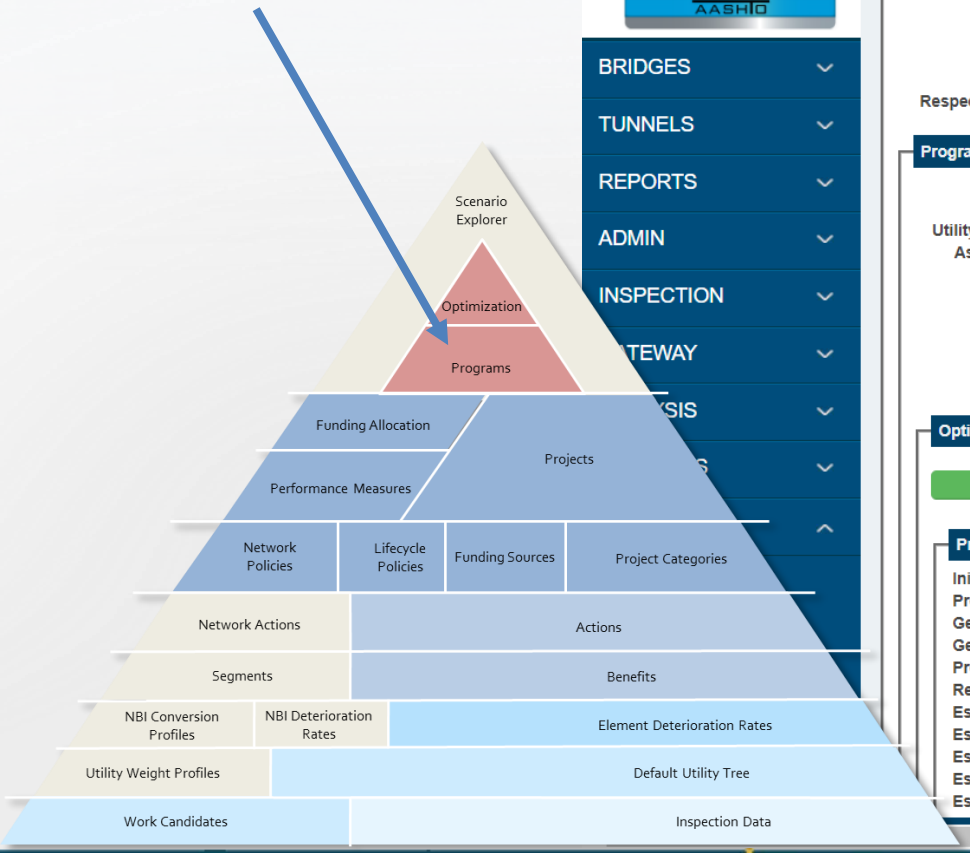
... 17 18 19 20 21 22 23 24 25 26 Page size: 10 252 items in 26 pages

BUREAU of BRIDGES and STRUCTURES

SPANNING CONNECTING SAFELY EFFICIENTLY

Improve Bridges Using AASHTOWare BrM

Programs



USER, PONTIS

AASHTOWare BrM Bridge Management AASHTO

BRIDGES
TUNNELS
REPORTS
ADMIN
INSPECTION
TEWAY
SIS

Programs > Program Planning

Optimize Program

Program: BRM Test
Scenario: Default
Optimization Method: Maximize Utility
Keep assigned projects: No
Run on all scenarios: No
Respect external frozen projects: Yes

Run Optimization

Program Information

Start Year: 2017
End Year: 2021
Utility Weight Profile: TPM
Assigned Network Policies: TPM Do Nothing

Subdivision Profile: Network-Wide
NBI Deterioration Method: ComponentLevelDeterioration

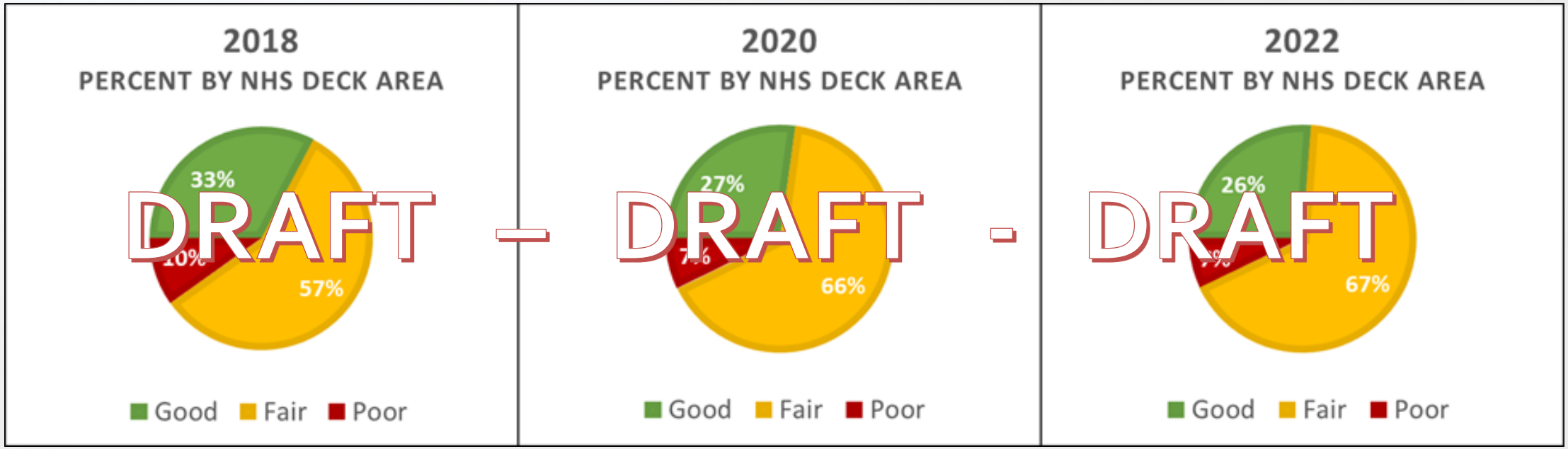
Optimization Progress

Complete!

Progress Messages

Initializing Program Optimization... 4/5/2
Processing Scenario 'Default'. 4/5/2
Getting Action Sequences 4/5/2
Getting Utility Tree 4/5/2
Processing Segments... 4/5/2
Retrieving Budgets 4/5/2
Estimating initial conditions of all segments 4/5/2
Estimated initial performance of 3.361% of bridges for ALL 4/5/2
Estimated initial performance of 6.723% of bridges for ALL 4/5/2
Estimated initial performance of 10.084% of bridges for ALL 4/5/2
Estimated initial performance of 13.445% of bridges for ALL 4/5/2

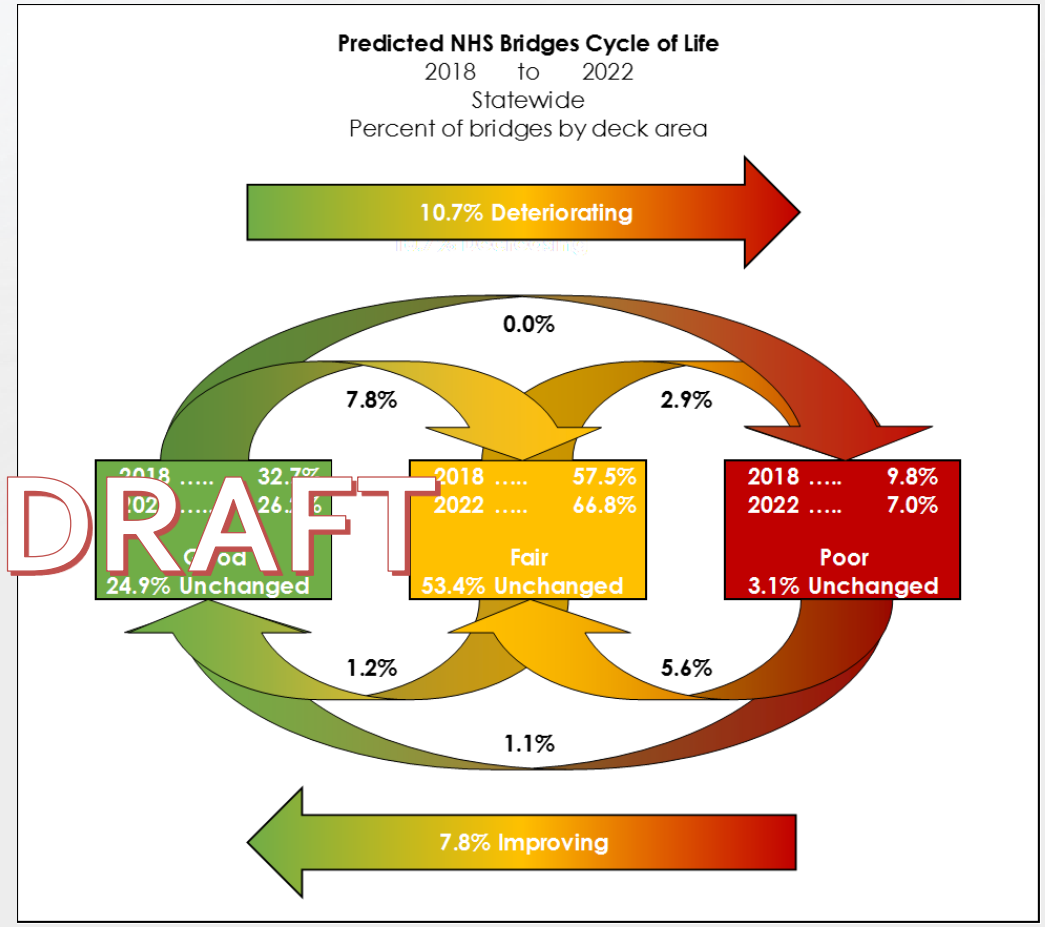
Forecasting for the Draft TPM Report



Spreadsheet and BrM Matched up very well ! ☺

Bridge and Project Level Management

This is our Future!

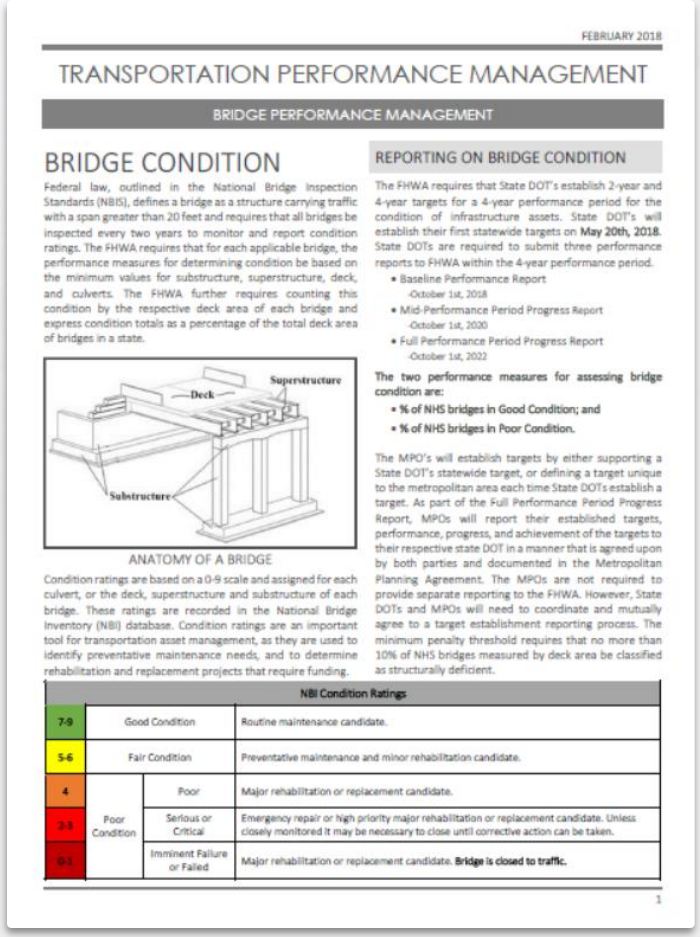


BUREAU of BRIDGES and STRUCTURES

SPANNING CONNECTING SAFELY EFFICIENTLY

Report and Share Information

- Using BrM to do the TPM Target Setting will allow automating reporting through Crystal Reports to provide highly informative, standardized reports for our MPO's



FEBRUARY 2018

TRANSPORTATION PERFORMANCE MANAGEMENT

BRIDGE PERFORMANCE MANAGEMENT

BRIDGE CONDITION

Federal law, outlined in the National Bridge Inspection Standards (NBIS), defines a bridge as a structure carrying traffic with a span greater than 20 feet and requires that all bridges be inspected every two years to monitor and report condition ratings. The FHWA requires that for each applicable bridge, the performance measures for determining condition be based on the minimum values for substructure, superstructure, deck, and culverts. The FHWA further requires counting this condition by the respective deck area of each bridge and express condition totals as a percentage of the total deck area of bridges in a state.

ANATOMY OF A BRIDGE

Condition ratings are based on a 0-9 scale and assigned for each culvert, or the deck, superstructure and substructure of each bridge. These ratings are recorded in the National Bridge Inventory (NBI) database. Condition ratings are an important tool for transportation asset management, as they are used to identify preventative maintenance needs, and to determine rehabilitation and replacement projects that require funding.

REPORTING ON BRIDGE CONDITION

The FHWA requires that State DOT's establish 2-year and 4-year targets for a 4-year performance period for the condition of infrastructure assets. State DOT's will establish their first statewide targets on **May 20th, 2018**. State DOTs are required to submit three performance reports to FHWA within the 4-year performance period.

- Baseline Performance Report
  - October 1st, 2018
- Mid-Performance Period Progress Report
  - October 1st, 2020
- Full Performance Period Progress Report
  - October 1st, 2022

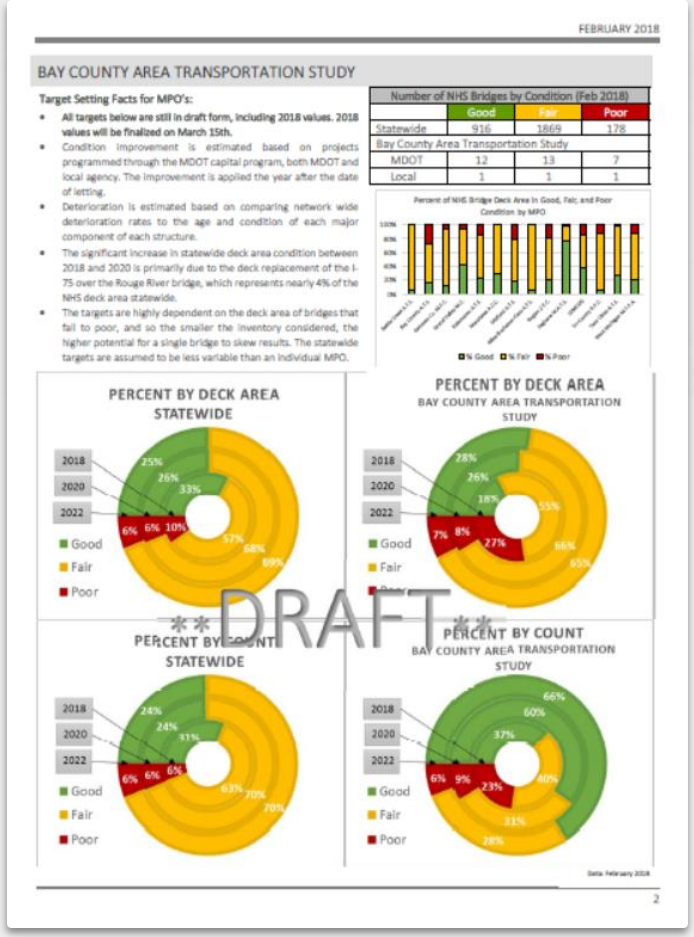
The two performance measures for assessing bridge condition are:

- **% of NHS bridges in Good Condition; and**
- **% of NHS bridges in Poor Condition.**

The MPO's will establish targets by either supporting a State DOT's statewide target, or defining a target unique to the metropolitan area each time State DOTs establish a target. As part of the Full Performance Period Progress Report, MPOs will report their established targets, performance, progress, and achievement of the targets to their respective state DOT in a manner that is agreed upon by both parties and documented in the Metropolitan Planning Agreement. The MPOs are not required to provide separate reporting to the FHWA. However, State DOTs and MPOs will need to coordinate and mutually agree to a target establishment reporting process. The minimum penalty threshold requires that no more than 10% of NHS bridges measured by deck area be classified as structurally deficient.

NBI Condition Ratings			
7-9	Good Condition		Routine maintenance candidate.
5-6	Fair Condition		Preventative maintenance and minor rehabilitation candidate.
4	Poor Condition	Poor	Major rehabilitation or replacement candidate.
2-3		Serious or Critical	Emergency repair or high priority major rehabilitation or replacement candidate. Unless closely monitored it may be necessary to close until corrective action can be taken.
0-1		Imminent Failure or Failed	Major rehabilitation or replacement candidate. **Bridge is closed to traffic.**

1



FEBRUARY 2018

BAY COUNTY AREA TRANSPORTATION STUDY

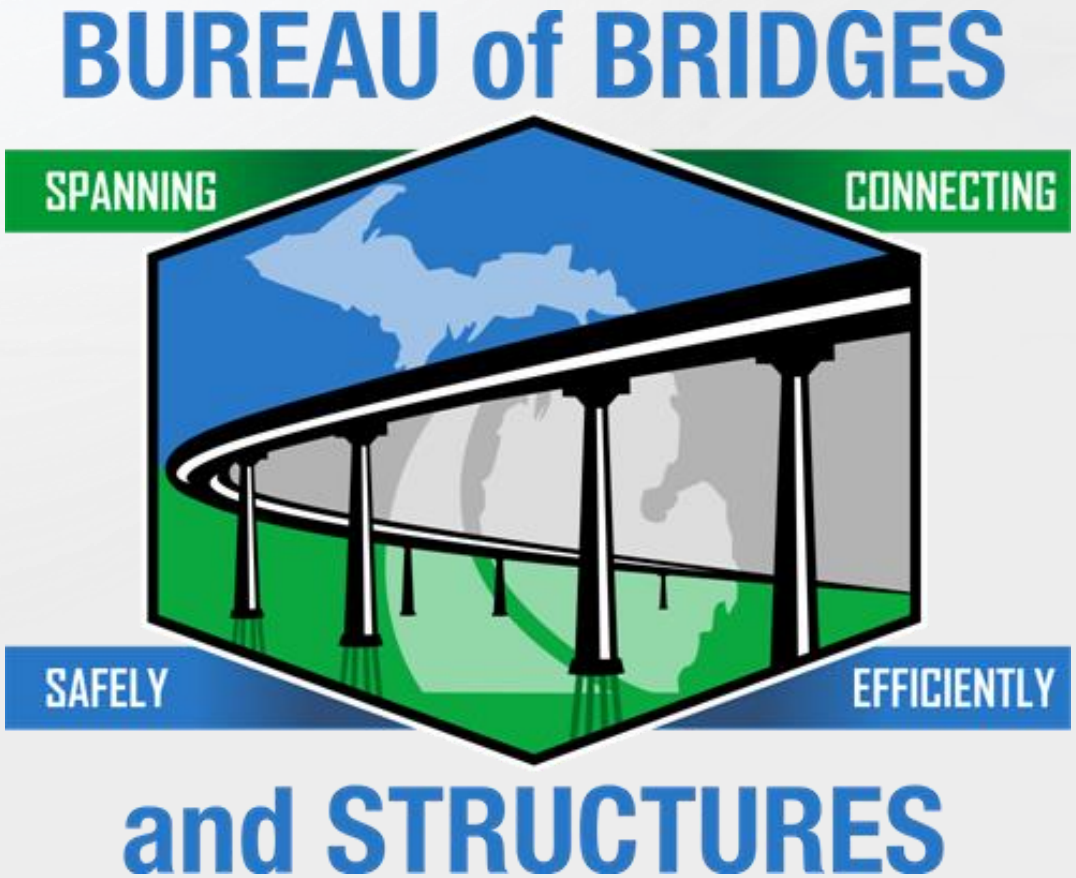
Target Setting Facts for MPO's:

- **All targets below are still in draft form, including 2018 values. 2018 values will be finalized on March 15th.**
- Condition Improvement is estimated based on projects programmed through the MDOT capital program, both MDOT and local agency. The improvement is applied the year after the date of letting.
- Deterioration is estimated based on comparing network wide deterioration rates to the age and condition of each major component of each structure.
- The significant increase in statewide deck area condition between 2018 and 2020 is primarily due to the deck replacement of the I-75 over the Rouge River bridge, which represents nearly 4% of the NHS deck area statewide.
- The targets are highly dependent on the deck area of bridges that fail to poor, and so the smaller the inventory considered, the higher potential for a single bridge to skew results. The statewide targets are assumed to be less variable than an individual MPO.

Number of NHS Bridges by Condition (Feb 2018)	Good	Fair	Poor
Statewide	916	1869	178
Bay County Area Transportation Study			
MDOT	12	13	7
Local	1	1	1

2

Questions?


BUREAU of BRIDGES
SPANNING
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