AASHTO Preservation Management - Local Agency Outreach Working Group

Bridge Maintenance Scoping – When it is Beyond Maintenance

7/16/2025

Outline

- Bridge Scoping
  - Definitions
  - Maintenance / Rehab / Replacement
  - Deck Driven Methodology

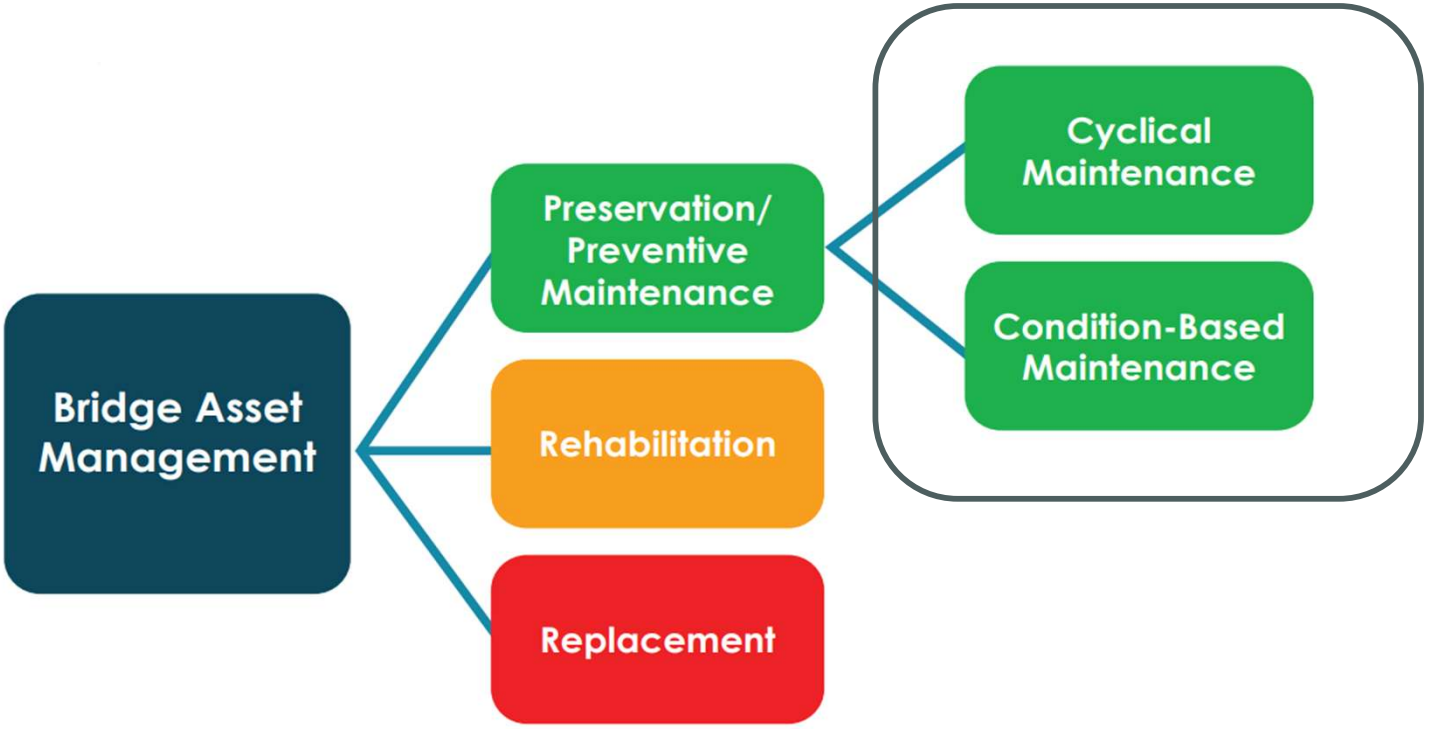



Project Planning Levels

- Schedule Maintenance (Keep current cond)
- Preventive Maintenance (address fairs)
- **Rehabilitation (poor to fair / good)**
- **Replacement (poor to good)**

Definition - Bridge Maintenance Scoping

- Maintenance Bridge Scoping – May 2024

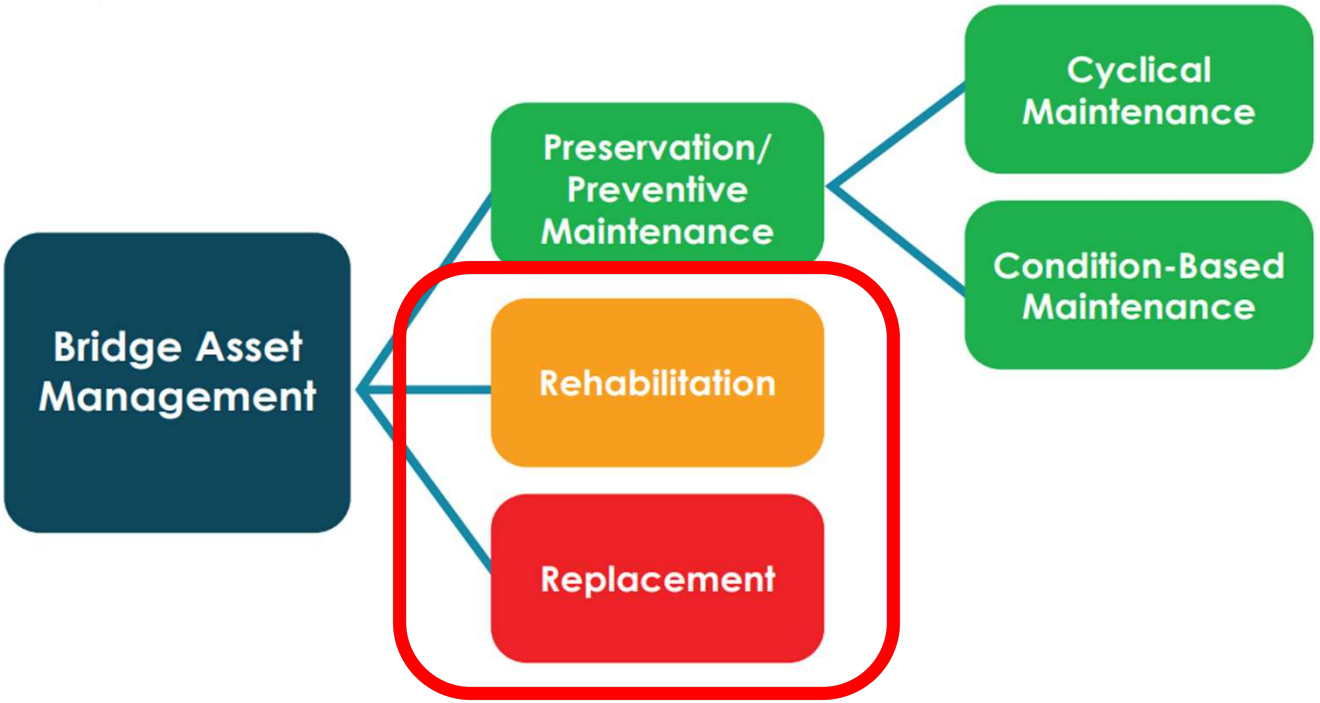


Definition - Bridge Maintenance Scoping

The process that bridge inspectors would identify, prioritize, and provide guidance on preservation activities **BEFORE** potential distress areas occur on the bridge by integrating repair strategies and develop preliminary cost estimates.

Definition - Bridge Rehabilitation Scoping

- Bridge Scoping – Beyond Maintenance July 2024

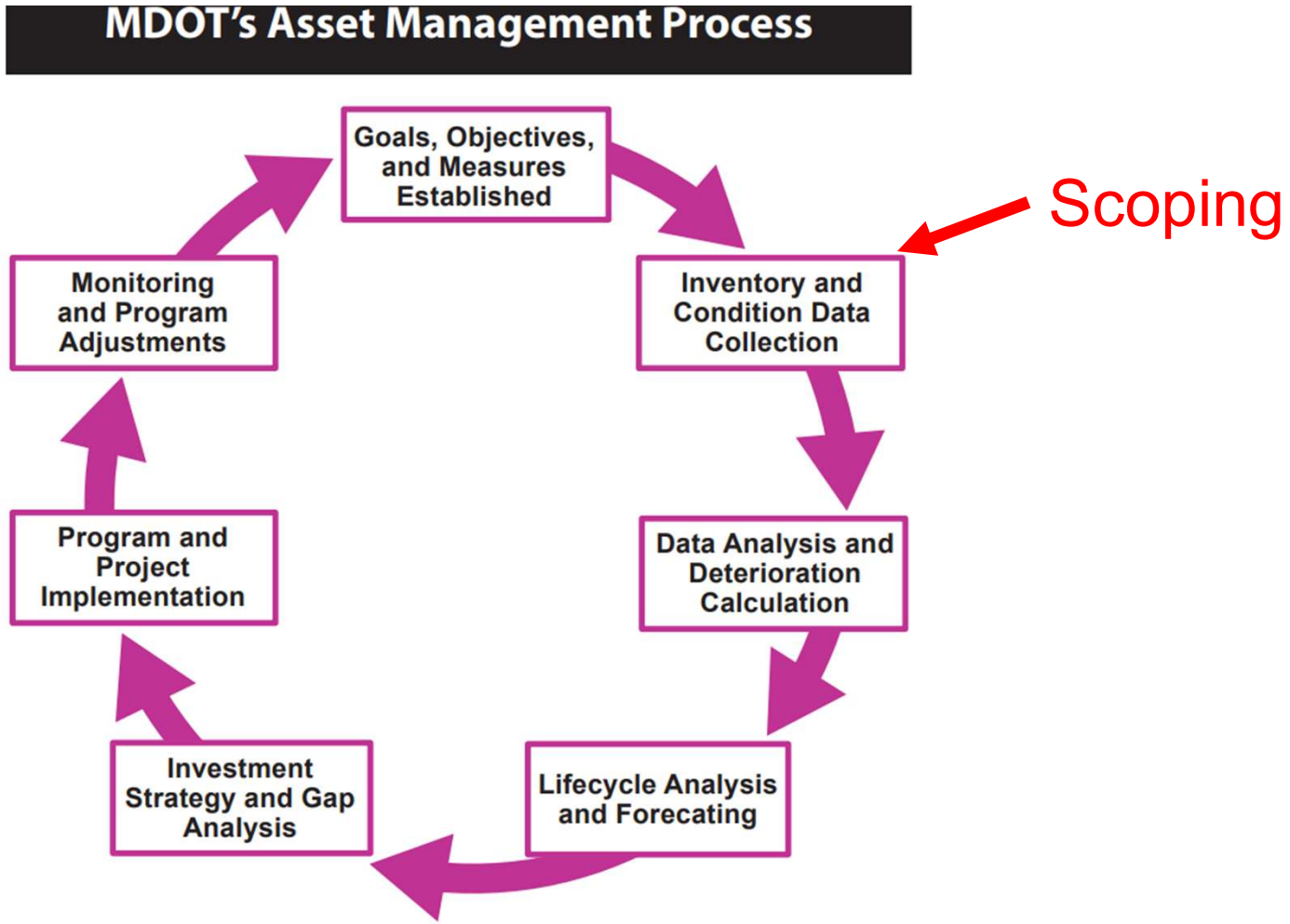


Why Scope?

- Incorporating an asset management plan in accordance with state requirements
- Example – Michigan Transportation Asset Management Council (TAMC)
- Asset Management Plans
  - Establish Goals
  - Life Cycle Forecasting
  - Investment Strategies
  - Monitoring

Why Scope?

- Scoping Develops the Input



Definition - Bridge Rehabilitation

- Rehabilitation – Major work required to restore structural integrity or safety defects

Definition - Bridge Rehabilitation

- Data indicates that more than maintenance is require – now what?

Internet Search Term – Michigan Bridge Deck Preservation Matrix Uncoated or Coated

BRIDGE DECK PRESERVATION MATRIX – DECKS WITH UNCOATED "BLACK" REBAR

DECK CONDITION STATE				REPAIR OPTIONS	POTENTIAL RESULT TO DECK BSIR		ANTICIPATED FIX LIFE
Top Surface		Bottom Surface			Top Surface BSIR #58a	Bottom Surface BSIR #58b	
BSIR #58a	Deficiencies % (a)	BSIR #58b	Deficiencies % (b)				
≥ 5	N/A	N/A	N/A	Hold (c) / Seal Cracks	No Change	No Change	N/A
				Silane			5 years
				Healer Sealer (d)			8 to 10 years
	≤ 10%	≥ 6	≤ 2%	Epoxy Overlay (f)	8, 9	No Change	15 to 20 years
	≤ 10%	≥ 4	≤ 25%	Deck Patch (e, j)	6, 7, 8	No Change	5 to 10 years
4 or 5	10% to 25%	≥ 5	≤ 10%	Deep Concrete Overlay (h, j)	8, 9	No Change	25 to 30 years
		4	10% to 25%	Shallow Concrete Overlay (h, i, j)	8, 9	No Change	20 to 25 years
				HMA Overlay with water-proofing membrane (f, i)	8, 9	No Change	8 to 10 years
		2 or 3	> 25%	HMA Cap (g, i)	8, 9	No Change	2 to 4 years
≤ 3	>25%	≥ 6	< 2%	Deep Concrete Overlay (h, j)	8, 9	No Change	20 to 25 years
		4 or 5	2% to 25%	Shallow Concrete Overlay (h, i, j)	8, 9	No Change	10 years
				HMA Overlay with water-proofing membrane (f, i)	8, 9	No Change	5 to 7 years
		2 or 3	>25%	HMA Cap (g, i)	8, 9	No Change	1 to 3 years
				Replacement with Epoxy Coated or Stainless Rebar Deck	9	9	60+ years

(a) Percent of deck surface area that is spalled, delaminated, or patched with temporary patch material. Top surface decision making based on concrete surface, not the condition of thin epoxy overlays or other wearing surfaces.
(b) Percent of deck underside area that is spalled, delaminated or map cracked.
(c) The "Hold" option implies that there is on-going maintenance to sustain current ratings.
(d) Seal cracks when cracks are easily visible and minimal map cracking. Apply healer sealer when crack density is too great to seal individually by hand. Sustains the current condition longer.
(e) Crack sealing must also be used to seal the perimeter of deck patches and joint replacements.
(f) Deck patching required prior to placement of epoxy overlay or waterproofing membrane.
(g) Hot Mix Asphalt cap without waterproofing membrane for ride quality improvement. Deck should be scheduled for replacement in the 5 year plan.
(h) If bridge crosses over traveled lanes and the deck contains slag aggregate, do deck replacement.
(i) When deck bottom surface is rated poor (or worse) and may have loose or delaminated concrete over traveled lanes, sidewalks or non-motorized paths, an in-depth inspection should be scheduled. Any loose or delaminated concrete should be scaled off and false decking should be placed over traveled lanes where there is potential for additional concrete to become loose.
(j) Some full depth repairs should be expected where top surface deficiencies align with bottom surface deficiencies.

Bridge Deck Preservation Matrix July, 2017 Rev.

Scoping Data – Deck Driven Decision Matrix

DECK CONDITION STATE				REPAIR OPTIONS	POTENTIAL RESULT TO DECK BSIR		ANTICIPATED FIX LIFE
Top Surface		Bottom Surface			Top Surface BSIR #58a	Bottom Surface BSIR #58b	
BSIR #58a	Deficiencies % (a)	BSIR #58b	Deficiencies % (b)				
≥ 5	N/A	N/A	N/A	Hold (c) / Seal Cracks	No Change	No Change	N/A
				Silane			5 years
				Healer Sealer (d)			8 to 10 years
	≤ 10%	≥ 6	≤ 2%	Epoxy Overlay (f)	8, 9	No Change	15 to 20 years
	≤ 10%	≥ 4	≤ 25%	Deck Patch (e, j)	6, 7, 8	No Change	5 to 10 years

- Maintenance and Contracted Maintenance

Bridge Rehab

DECK CONDITION STATE				REPAIR OPTIONS	POTENTIAL RESULT TO DECK BSIR		ANTICIPATED FIX LIFE
Top Surface		Bottom Surface			Top Surface BSIR #58a	Bottom Surface BSIR #58b	
BSIR #58a	Deficiencies % (a)	BSIR #58b	Deficiencies % (b)				
4 or 5	10% to 25%	≥ 5	≤ 10%	Deep Concrete Overlay (h, j, n)	8, 9	No Change	25 to 30 years
		4	10% to 25%	Shallow Concrete Overlay (h, i, j)	8, 9	No Change	20 to 25 years
				HMA Overlay with water-proofing membrane (f, i)	8, 9	No Change	8 to 10 years
		2 or 3	> 25%	HMA Cap (g, i)	8, 9	No Change	2 to 4 years
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		2 or 3	>25%	HMA Cap (g, i)	8, 9	No Change	1 to 3 years
				Replacement with Epoxy Coated or Stainless Rebar Deck	9	9	60+ years

- Bridge Rehabilitation

Other Rehab Items for Future Topic

- Substructure Repair
- Superstructure Repair
- Scour

Substructure Repair

- Columns and Caps

Substructure Repair

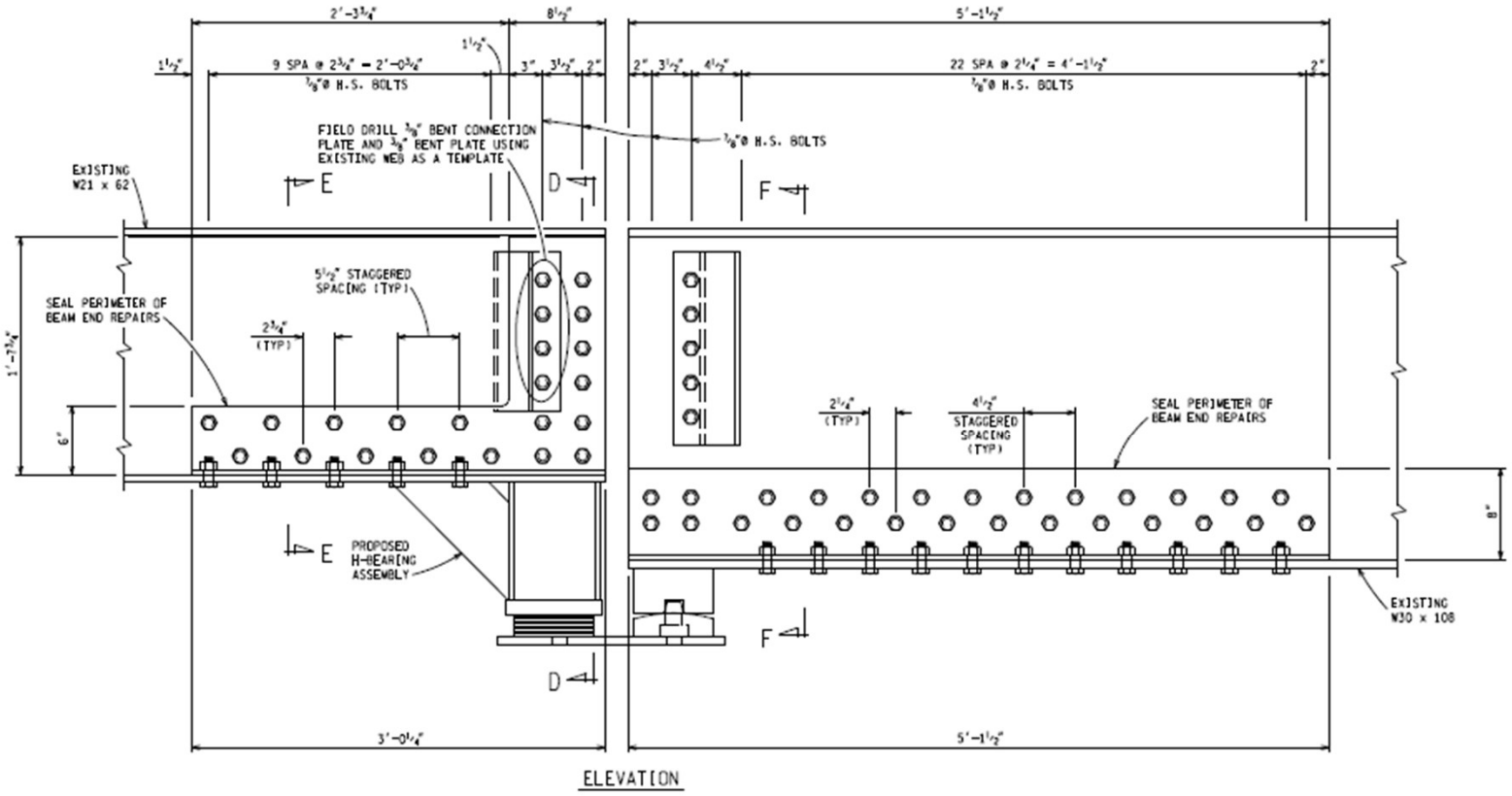
- Temporary Supports
  - Typically required when more than 25% of bearing is undermined – but always consult an engineer

Superstructure Repair

- Carbon Fiber

Superstructure Repair

- Steel Repairs



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Scour Repair

Questions?

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