

# BRIDGE MANAGEMENT PROJECTIONS



**Bridge Management Division**  
**October 2014**

# BRIDGE MANAGEMENT PROJECTIONS

## Overview



### Objective

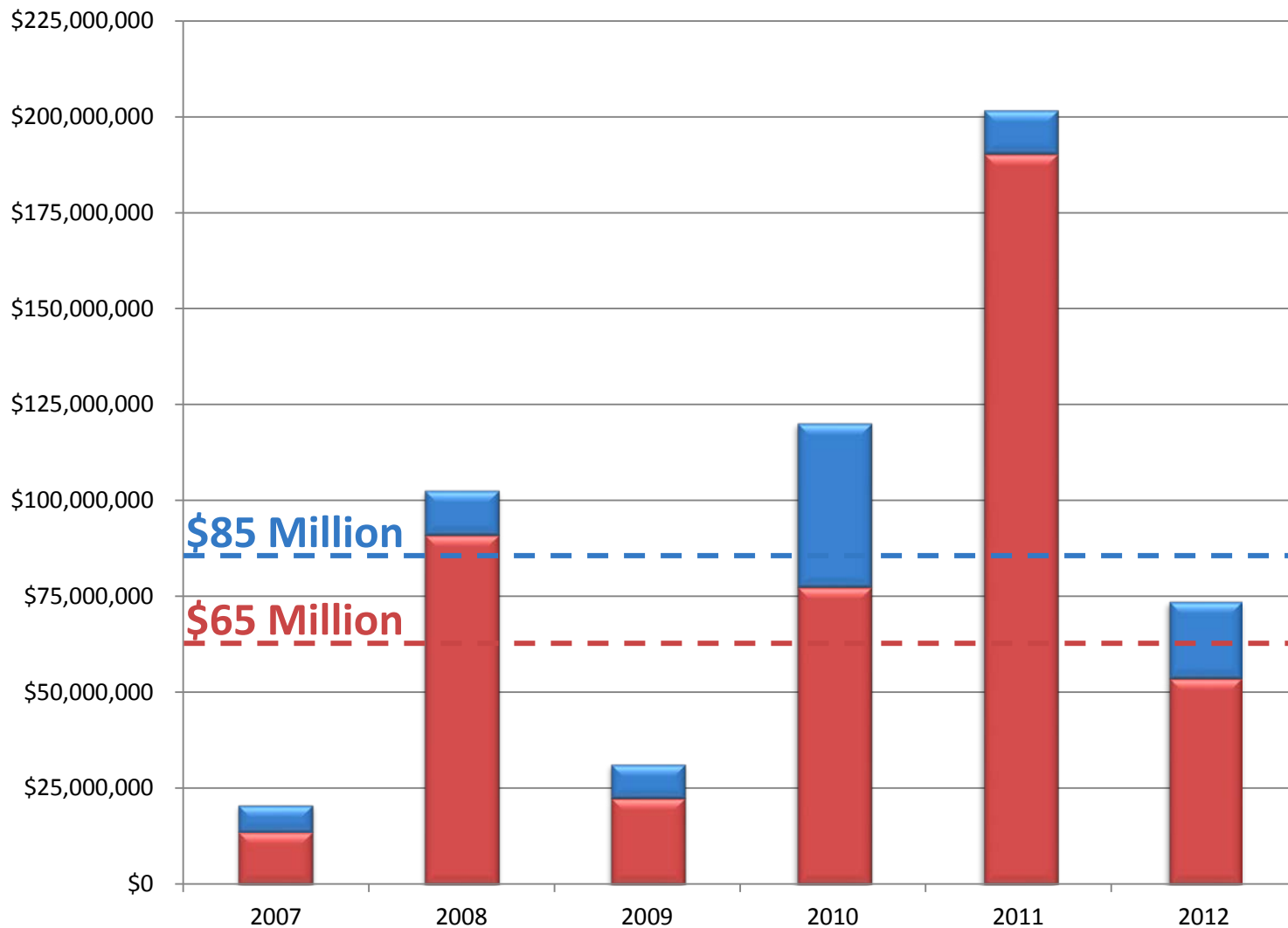
- Predict condition outcomes of different funding levels (informs the intelligent ask)
  - Assess 3 systems (NHS, State, Local FA)
  - Assess various funding scenarios

### Strategy

- Work on every bridge over a 20-year period
- Manage to a state of good repair (define thresholds)
- Prioritize funding to system

# BRIDGE MANAGEMENT PROJECTIONS

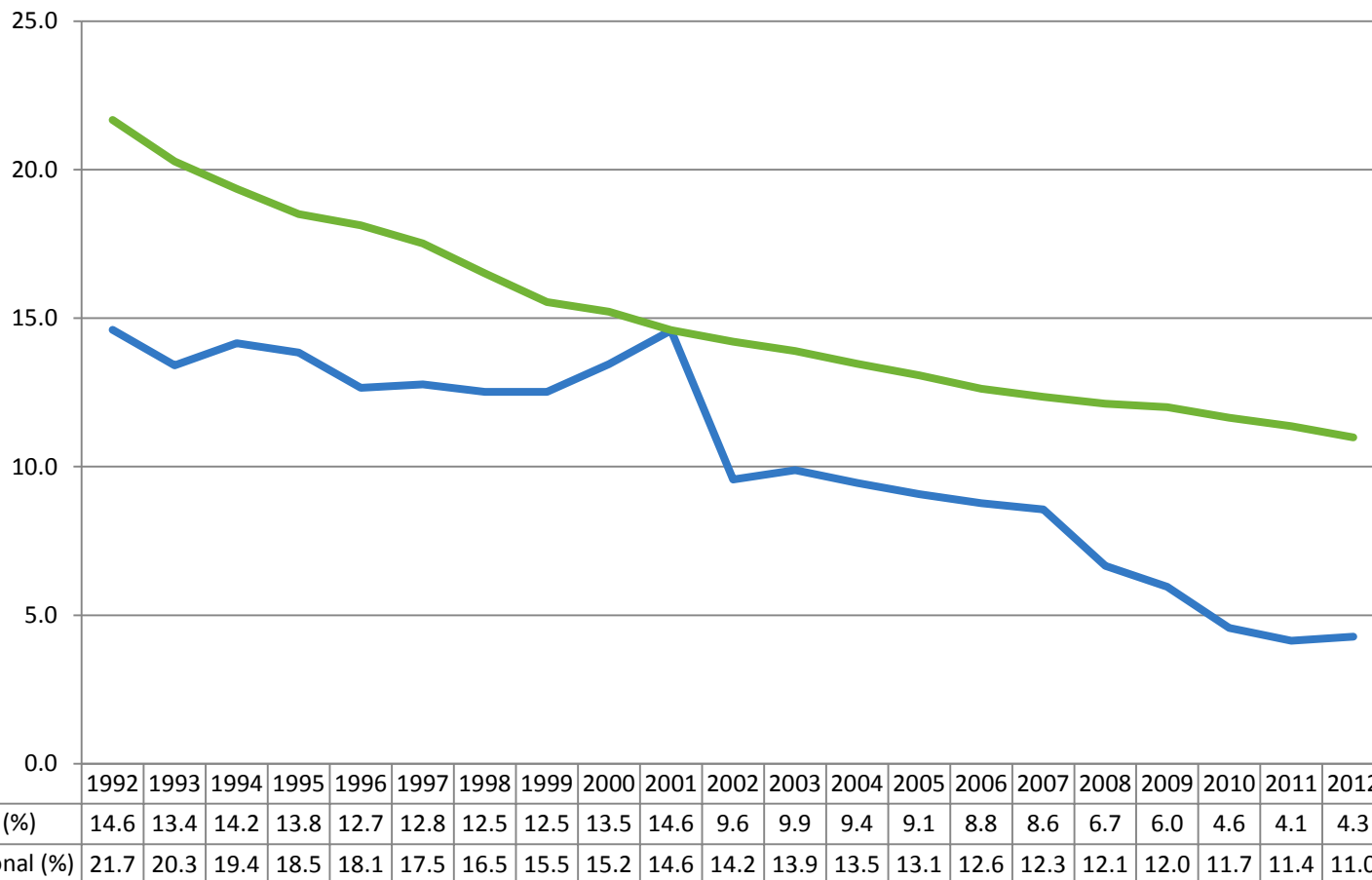
## Historical Spending (2007-2012)



# BRIDGE MANAGEMENT PROJECTIONS

## Past Performance Measures

- Only measured structural deficiency
- Ignores the remaining inventory

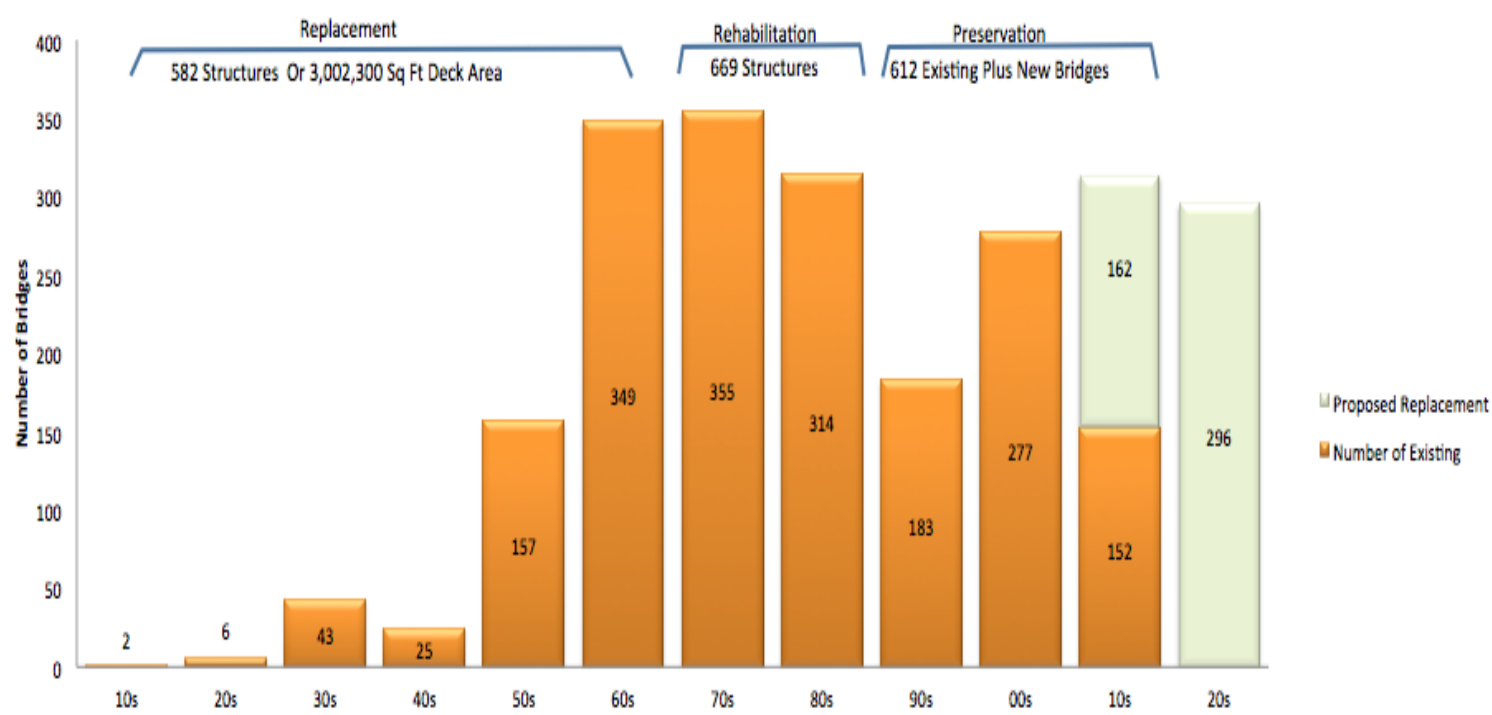


# BRIDGE MANAGEMENT PROJECTIONS

## Models: dTIMS (last year)



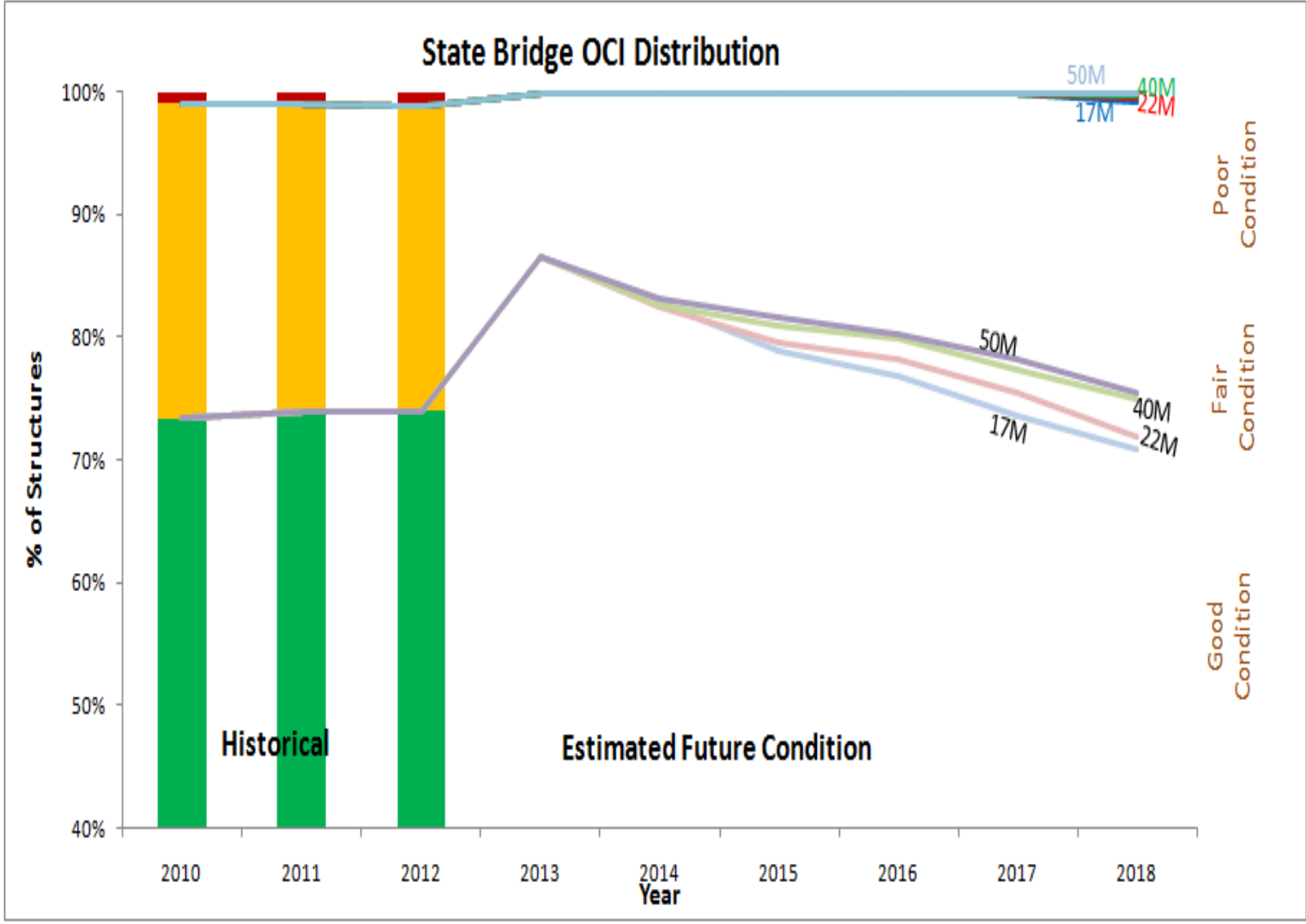
### Age Distribution of UDOT Bridges



20 Yr: Replacement program for older bridges: \$31 Millions Yearly  
 20 Yr: Rehabilitation /Preservation program for newer bridges: \$17 Millions Yearly

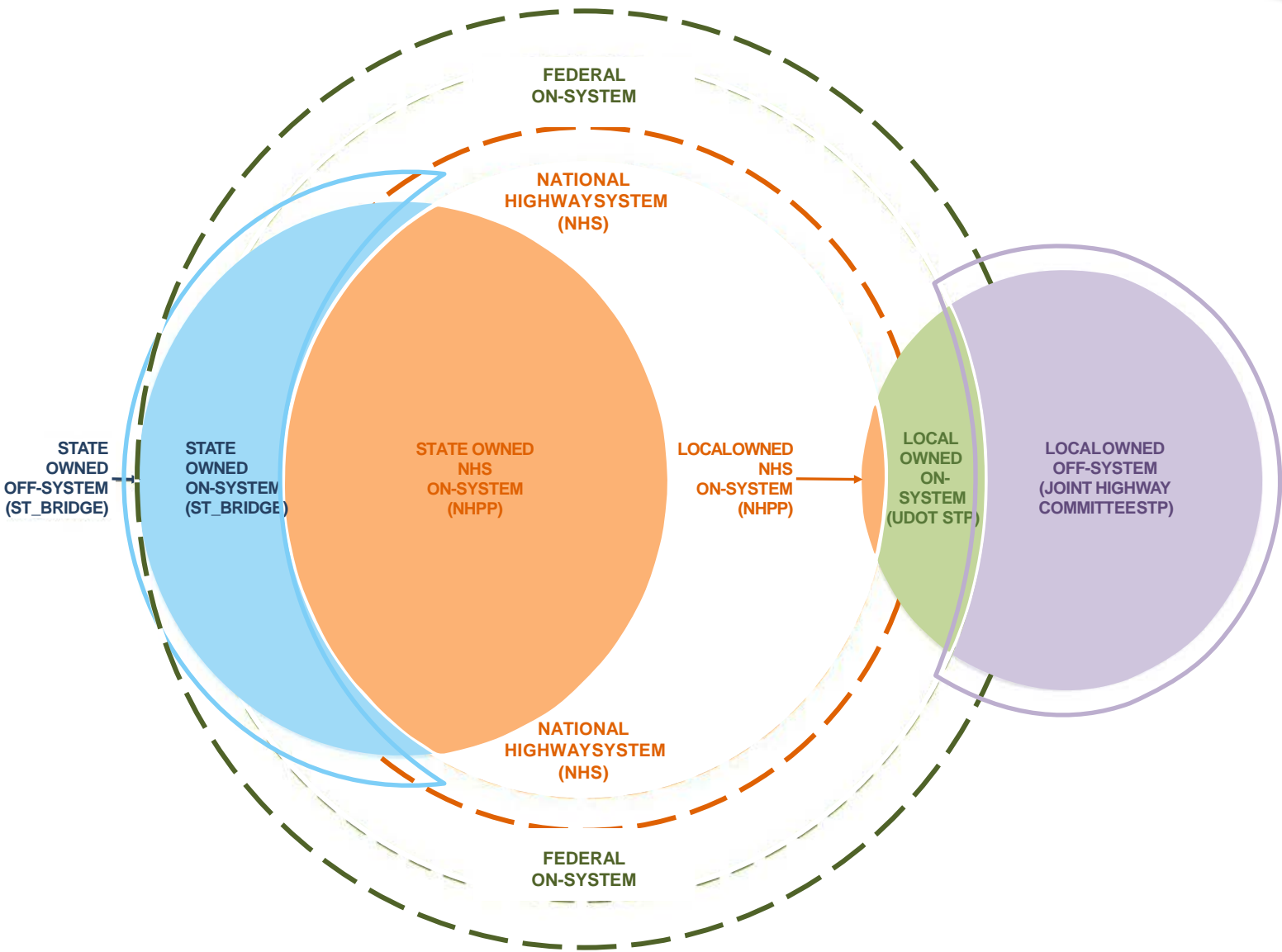
# BRIDGE MANAGEMENT PROJECTIONS

## Models: dTIMS (last year)



# BRIDGE MANAGEMENT PROJECTIONS

## Highway Systems

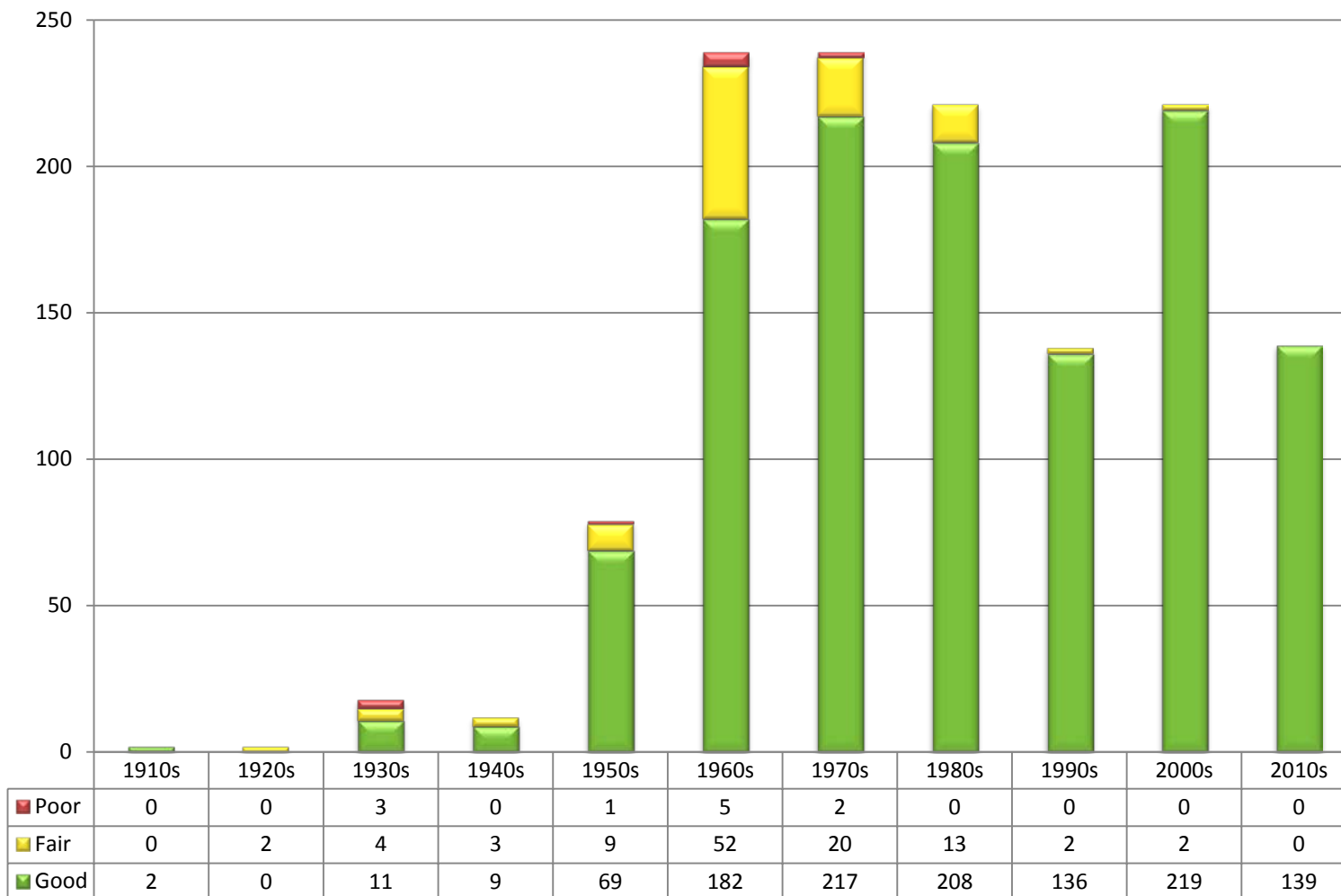


# BRIDGE MANAGEMENT PROJECTIONS

## Current Bridge Condition



**NHS System Health**



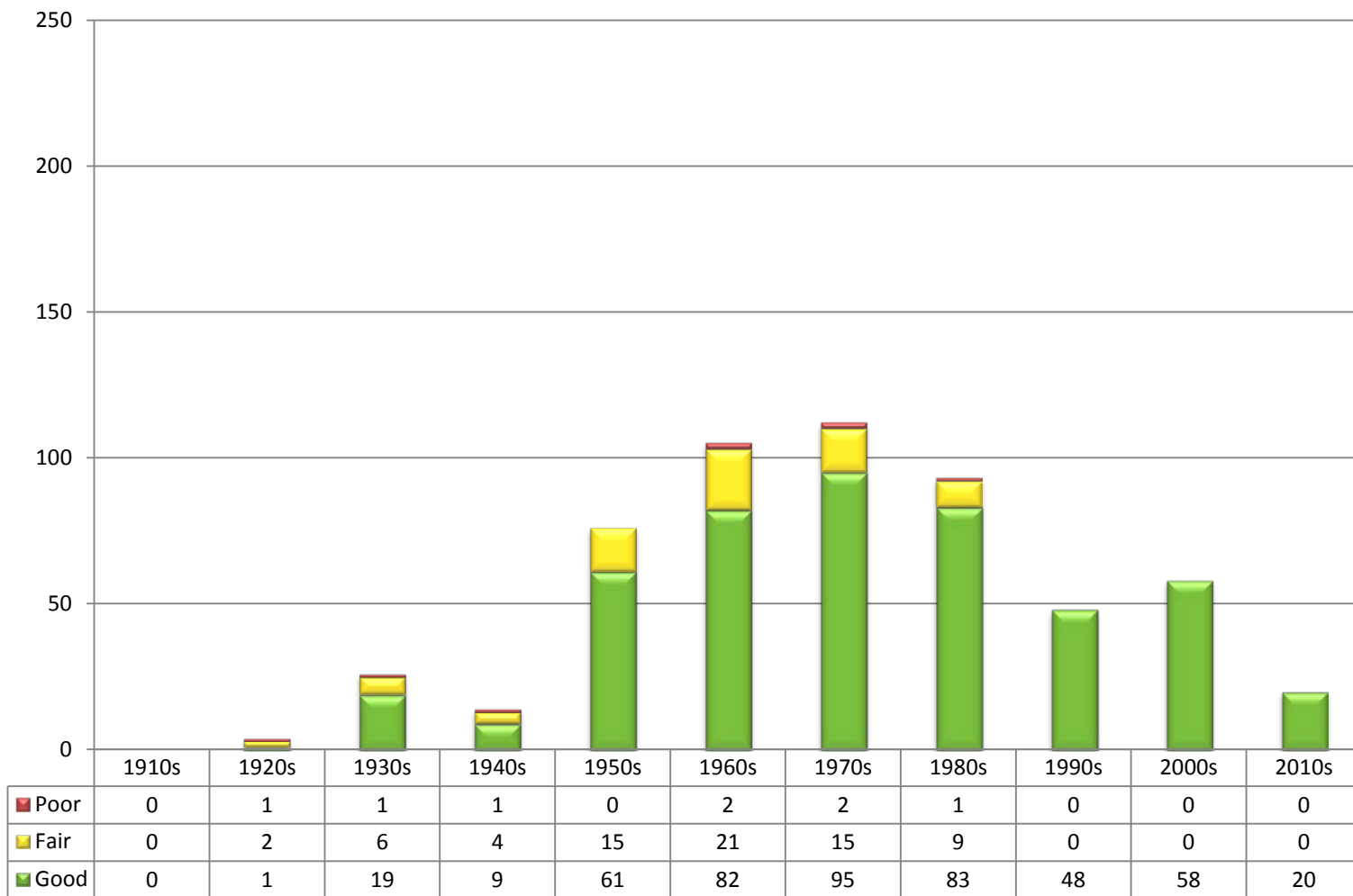


# BRIDGE MANAGEMENT PROJECTIONS

## Current Bridge Condition



State System Health

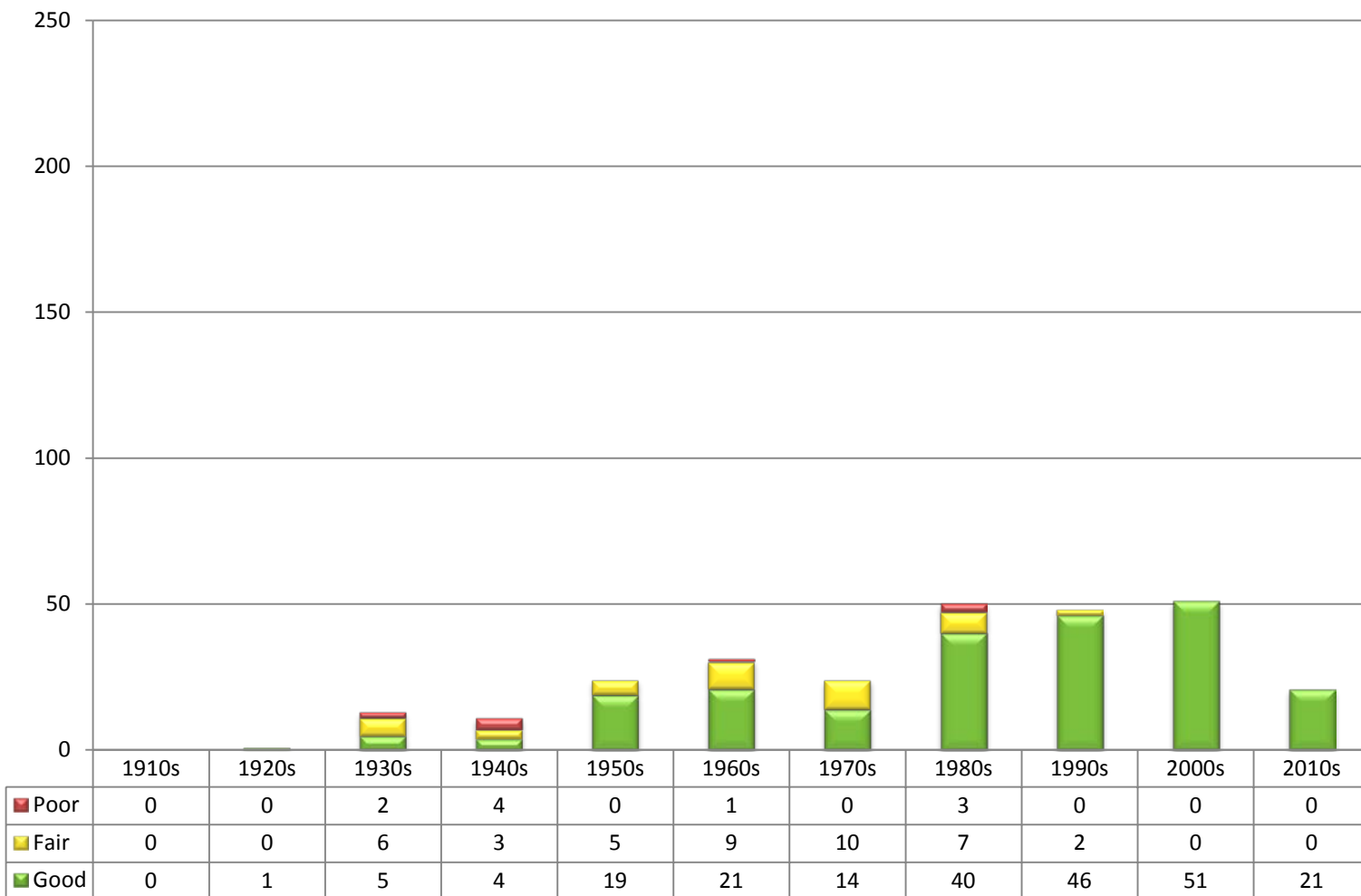


# BRIDGE MANAGEMENT PROJECTIONS

## Current Bridge Condition



Local FA System Health



# BRIDGE MANAGEMENT PROJECTIONS

## Current Bridge Condition

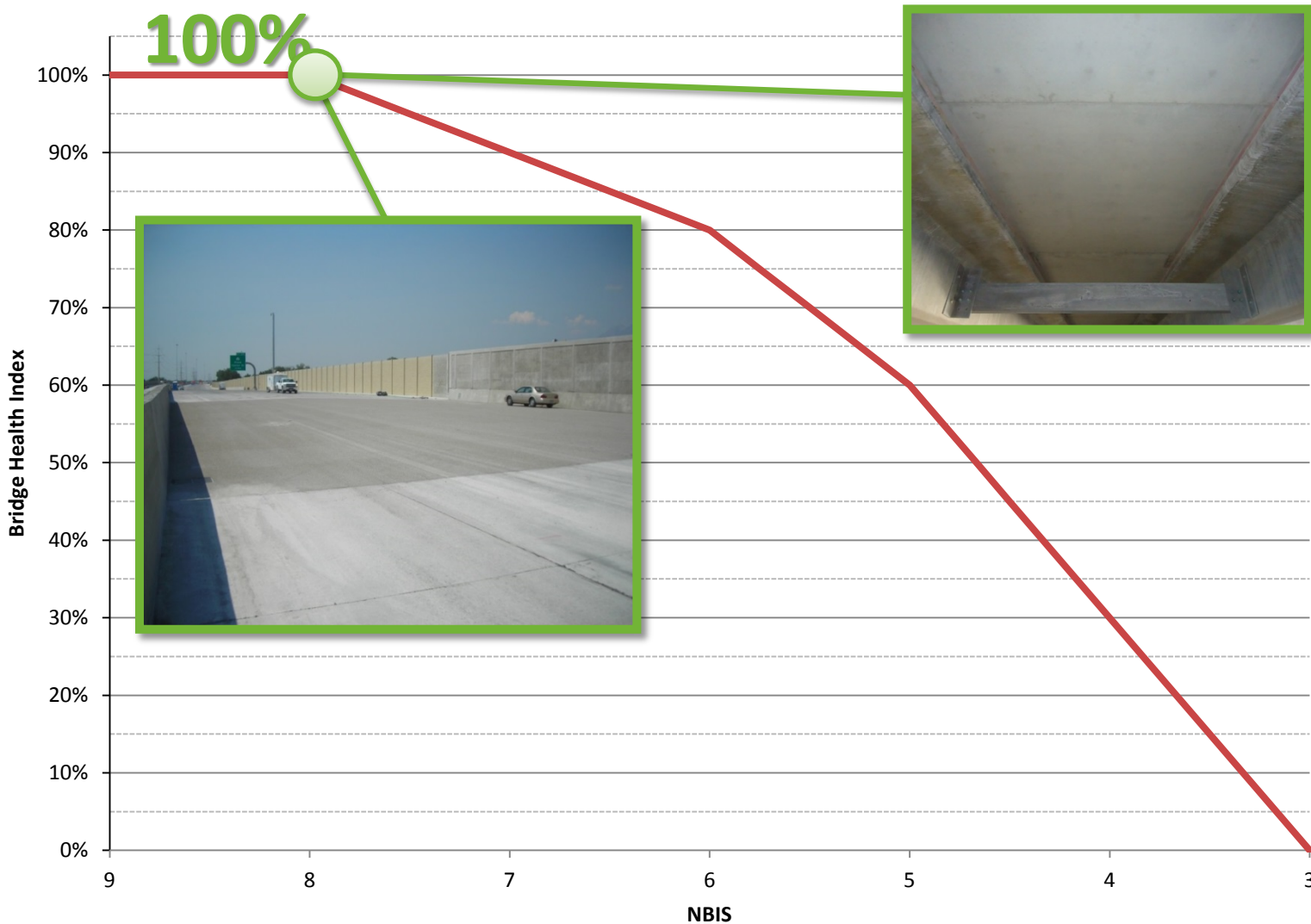
- Track condition of entire inventory
- Develop preservation projects to extend life

Health Index	Good (100 - 80)			Fair (80-60)		Poor (<60)	
	9	8	7	6	5	4	3
<b>Deck</b>	25	160	811	400	86	15	0
<b>Superstructure</b>	29	462	712	233	69	6	0
<b>Substructure</b>	26	316	805	295	61	8	0
<b>Culvert</b>	0	88	213	60	18	0	0



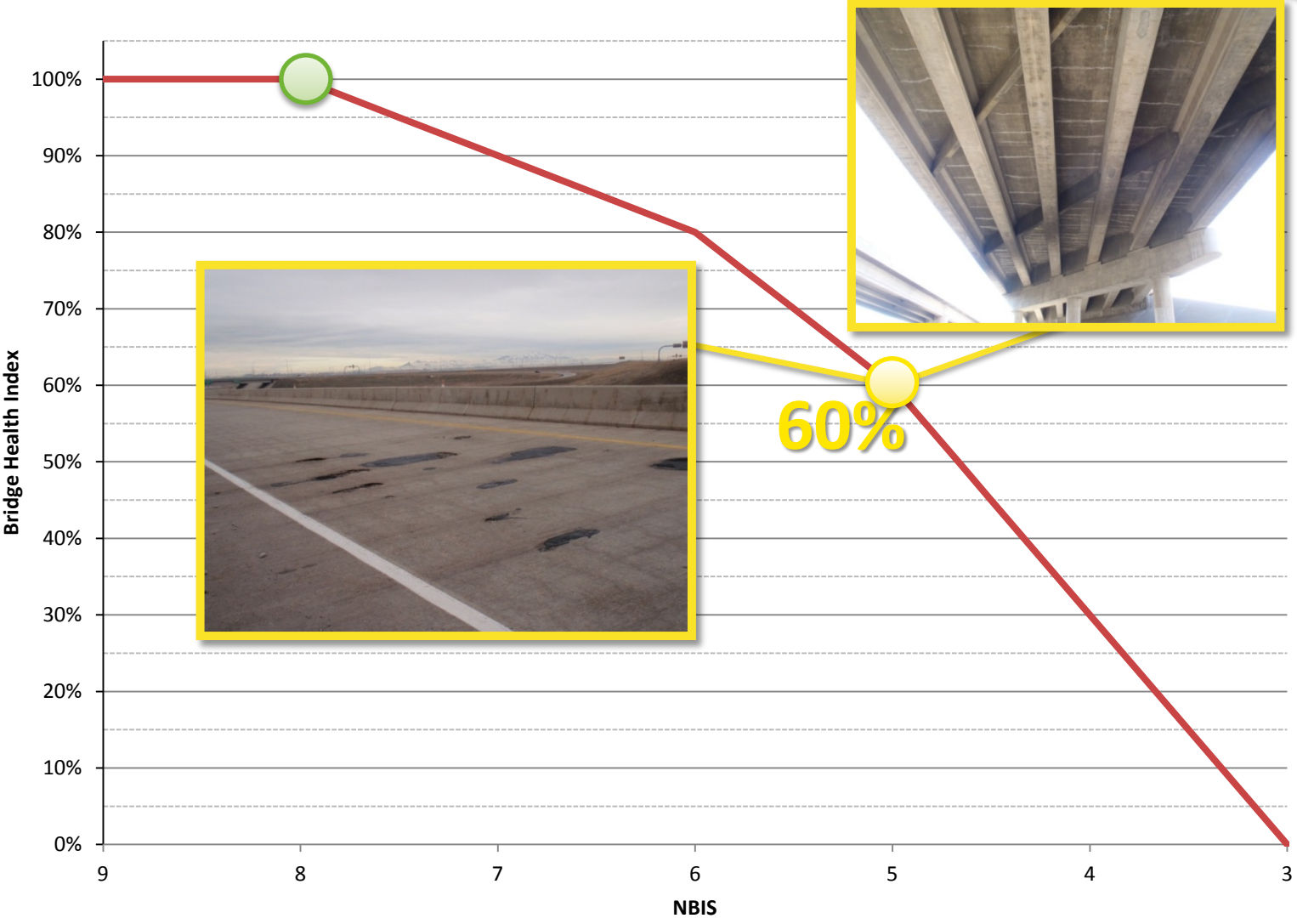
# BRIDGE MANAGEMENT PROJECTIONS

## Funding Projections



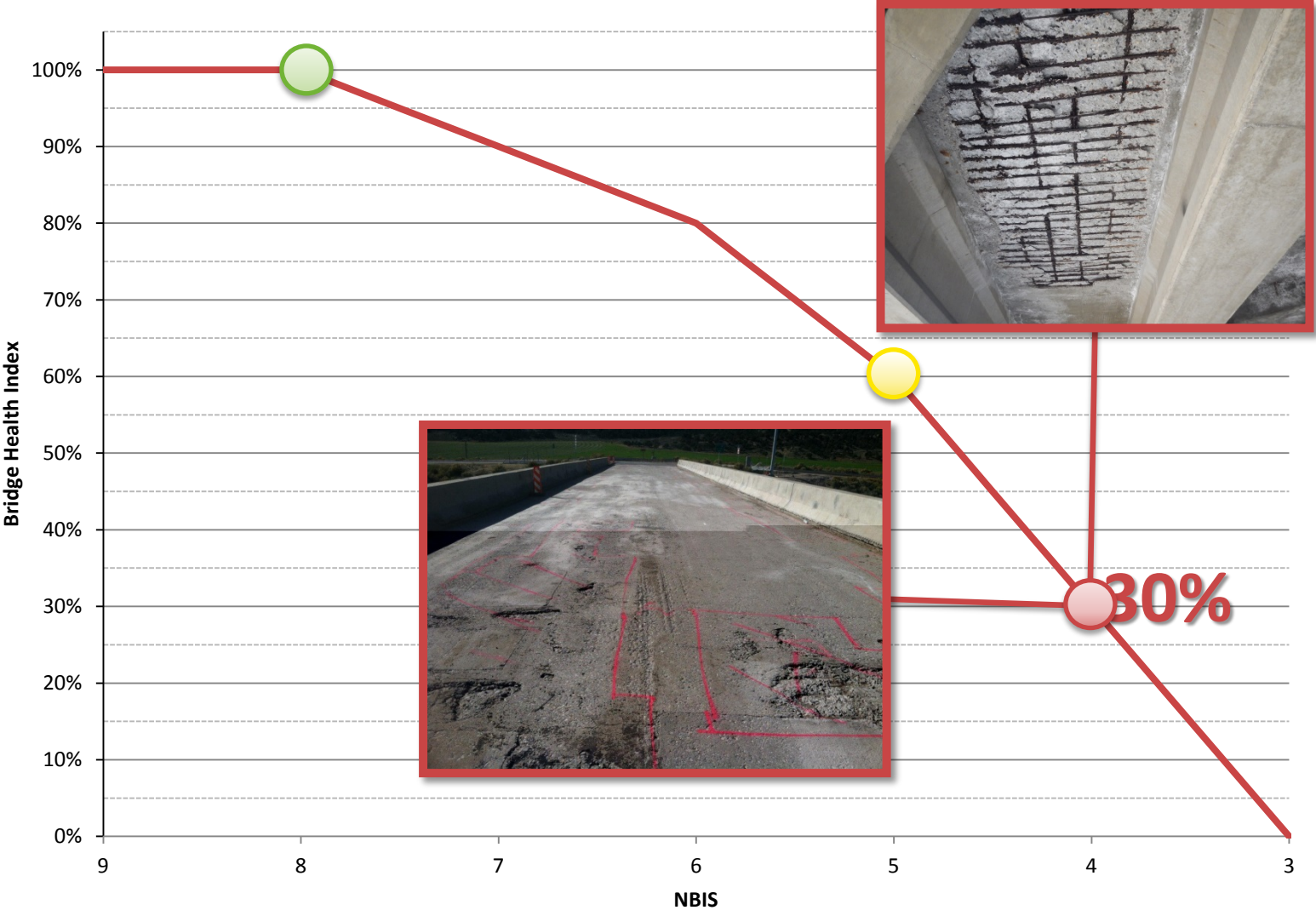
# BRIDGE MANAGEMENT PROJECTIONS

## Funding Projections



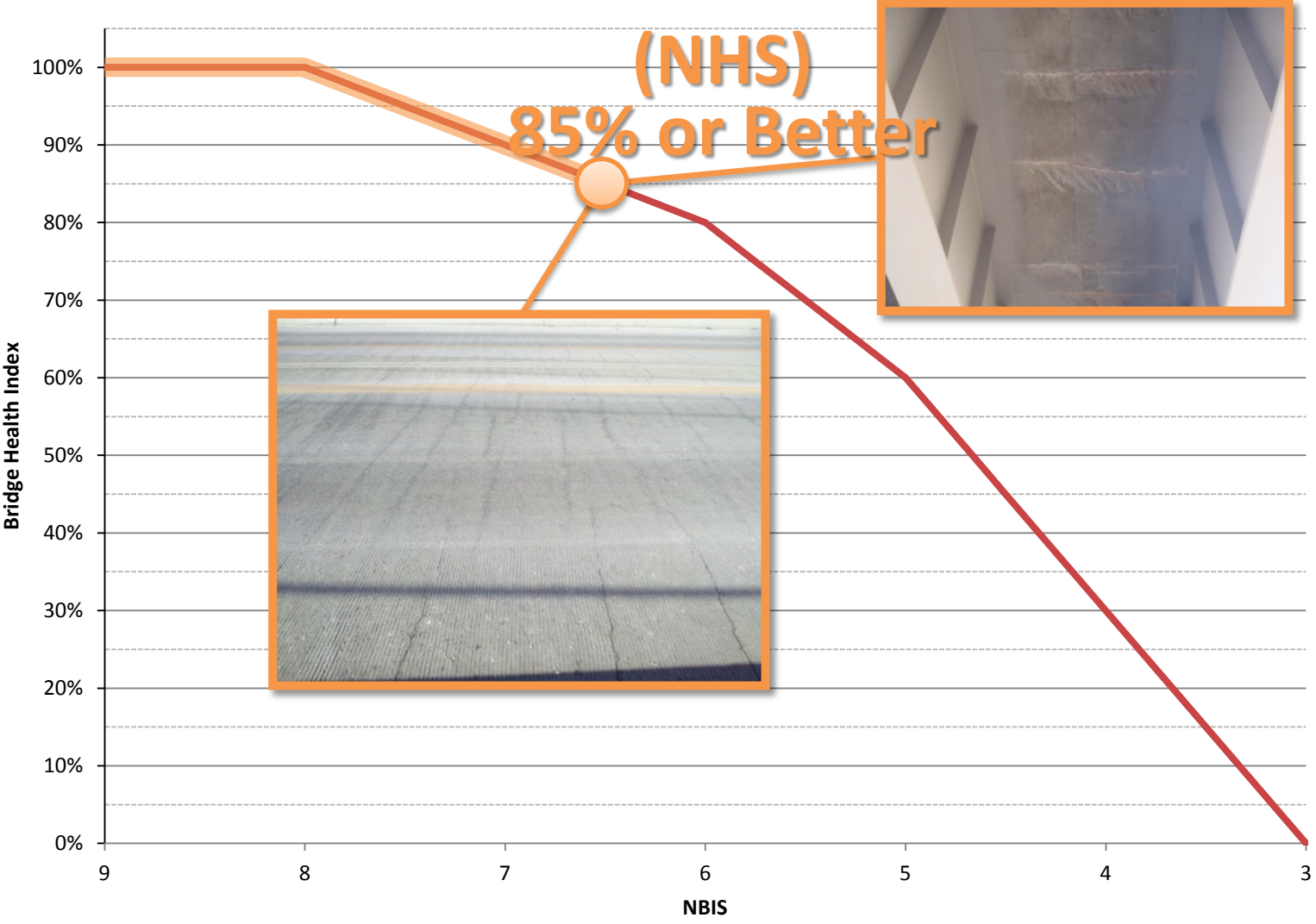
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## Funding Projections



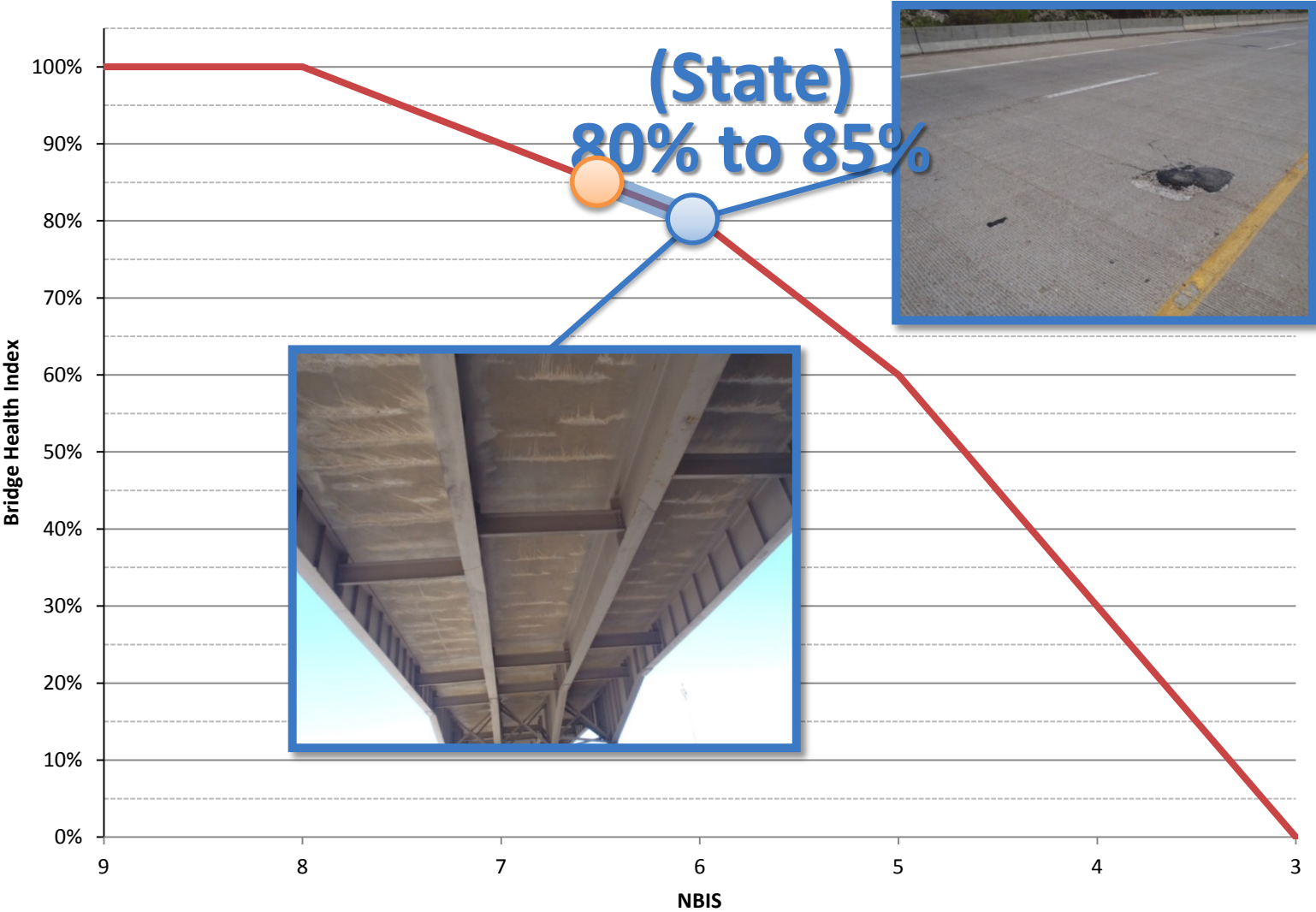
# BRIDGE MANAGEMENT PROJECTIONS

## Funding Projections



# BRIDGE MANAGEMENT PROJECTIONS

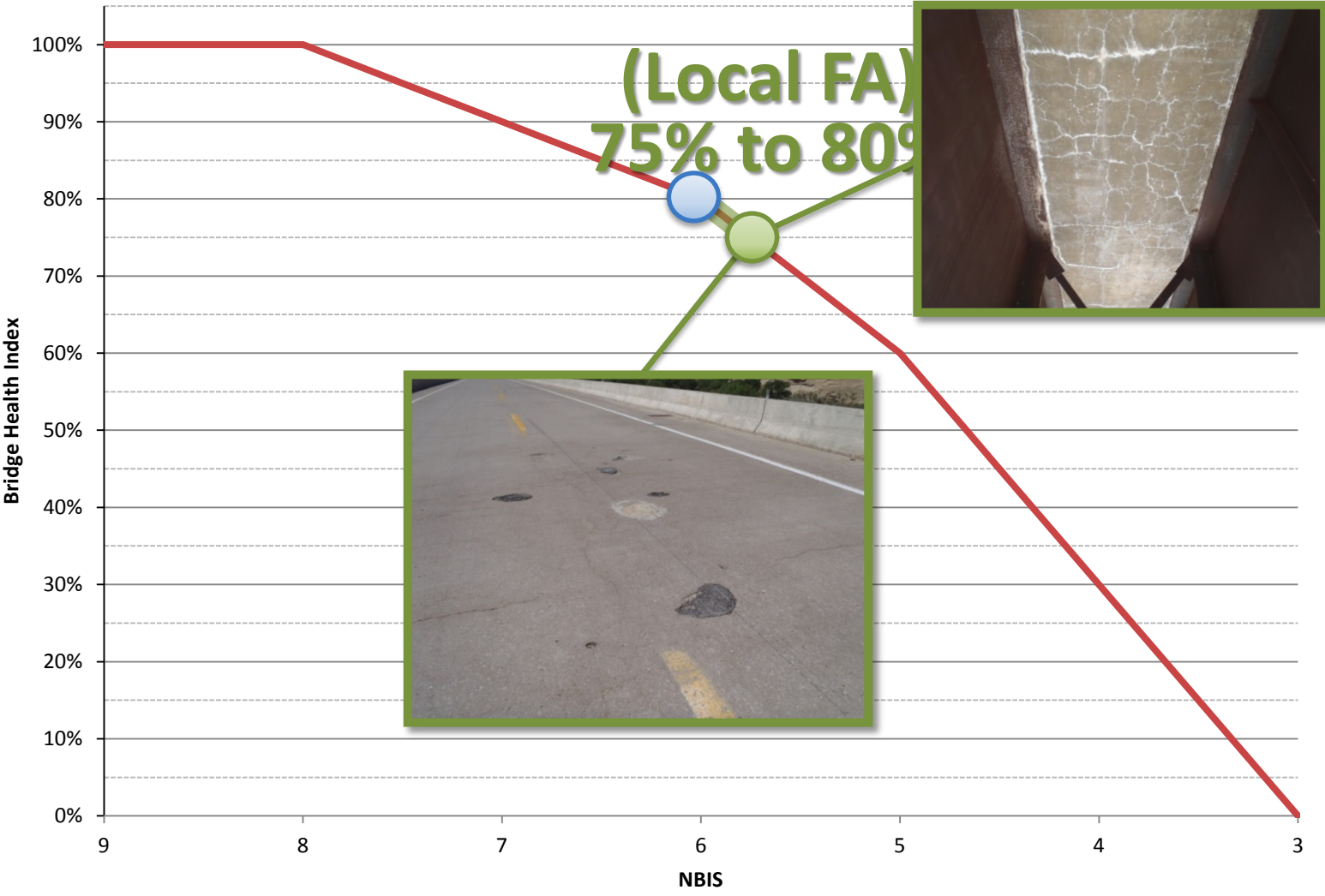
## Funding Projections





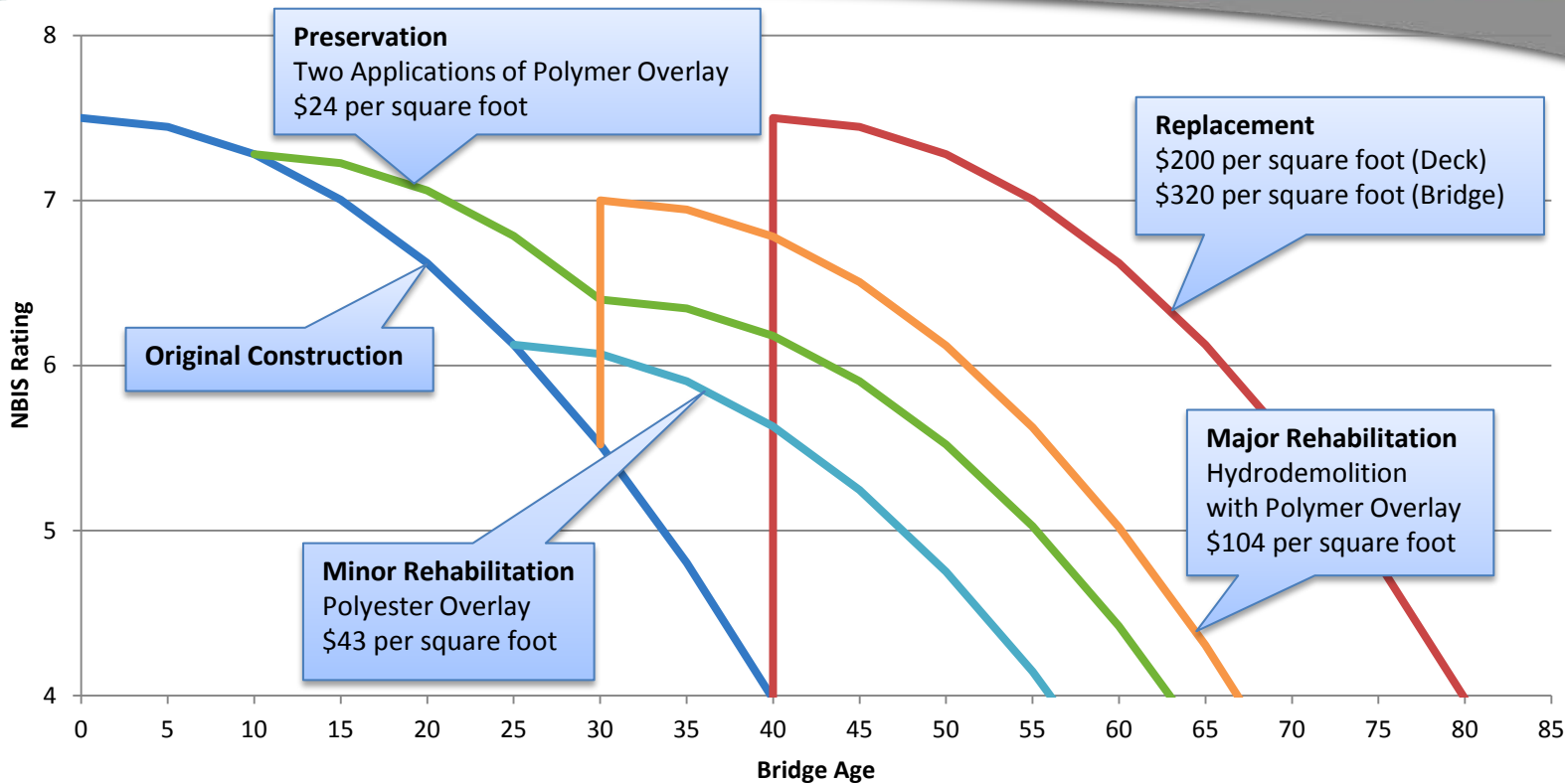
# BRIDGE MANAGEMENT PROJECTIONS

## Funding Projections



# BRIDGE MANAGEMENT PROJECTIONS

## Funding Projections



Years in NBIS Ratings

Approach	7+	6	5	4	Total
Original Construction/Replacement	20	10	6	4	40
Preservation	32	21	6	4	63
Minor Rehabilitation	28	18	6	4	56
Major Rehabilitation	20+17	10+10	6	4	67

# BRIDGE MANAGEMENT PROJECTIONS

## Funding Projections



Priority	Description	Cost
1	NHS Replacements	\$12.0M
2	State Replacements	\$7.8M
3	Local FA Replacements	\$2.6M
4	NHS Preservation/Rehabilitation	\$26.5M
5	State Preservation/Rehabilitation	\$15.2M
6	Local FA Preservation/Rehabilitation	\$1.7M
Total		\$65.8M

# BRIDGE MANAGEMENT PROJECTIONS

## Funding Projections



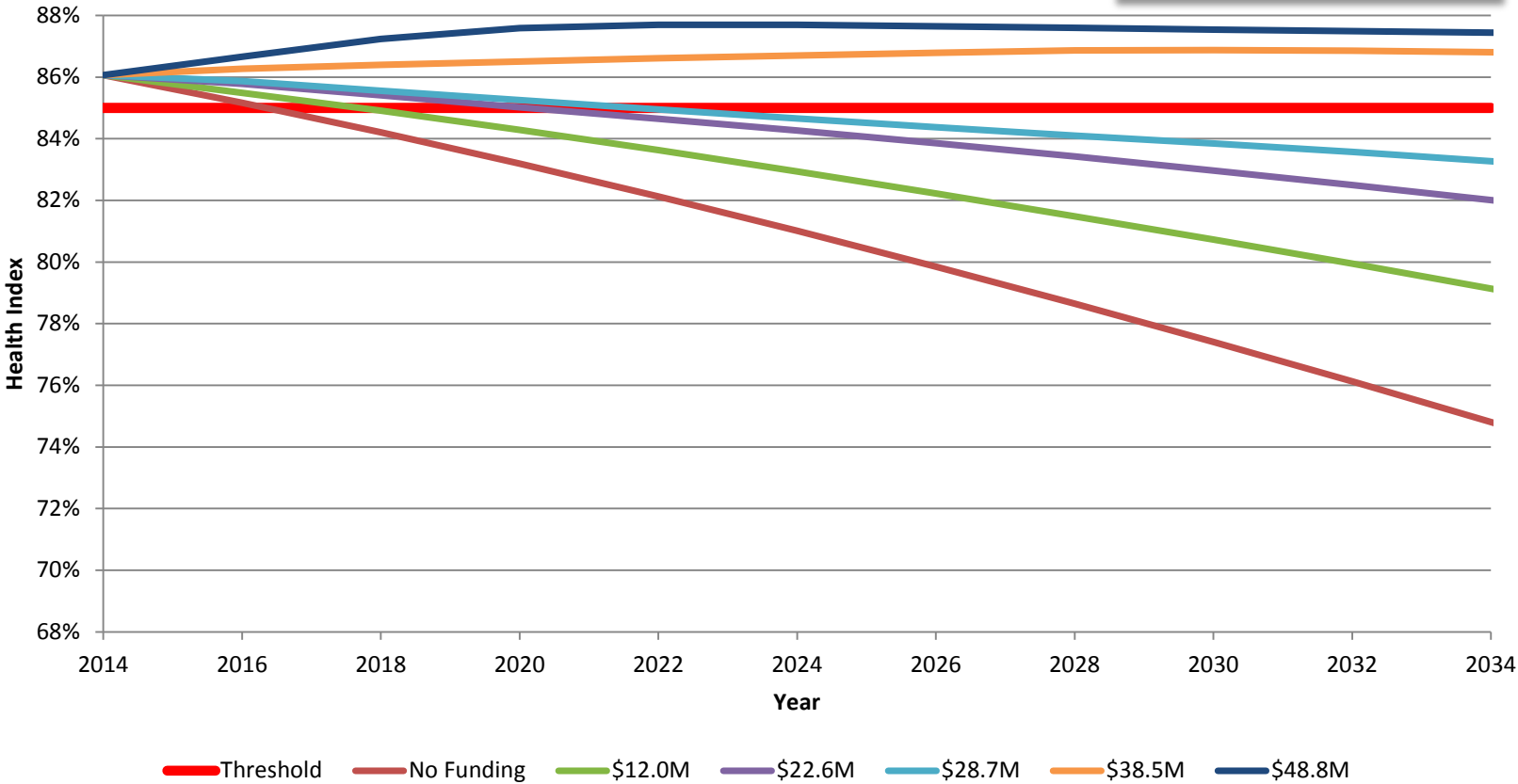
Priority	Scenario 1 Structures Only	Scenario 2 60% Optimal	Scenario 3 75% Optimal	Scenario 4 Optimal	Scenario 5 129% Optimal
1) NHS Repl.	\$12.0M	\$12.0M	\$12.0M	<b>\$12.0M</b>	\$22.3M
2) State Repl.	\$6.0M	\$7.8M	\$7.8M	<b>\$7.8M</b>	\$14.5M
3) Local FA Repl.	\$2.0M	\$2.6M	\$2.6M	<b>\$2.6M</b>	\$4.8M
4) NHS Pres./Rehab.	-	\$10.6M	\$16.7M	<b>\$26.5M</b>	\$26.5M
5) State Pres./Rehab.	-	\$6.0M	\$9.3M	<b>\$15.2M</b>	\$15.2M
6) Local FA Pres./Rehab.	-	\$0.5M	\$1.0M	<b>\$1.7M</b>	\$1.7M
Total	\$20.0M	\$39.5M	\$49.4M	<b>\$65.8M</b>	\$85.0M

# BRIDGE MANAGEMENT PROJECTIONS

## Funding Projections



Projected System Health over Time  
NHS Inventory

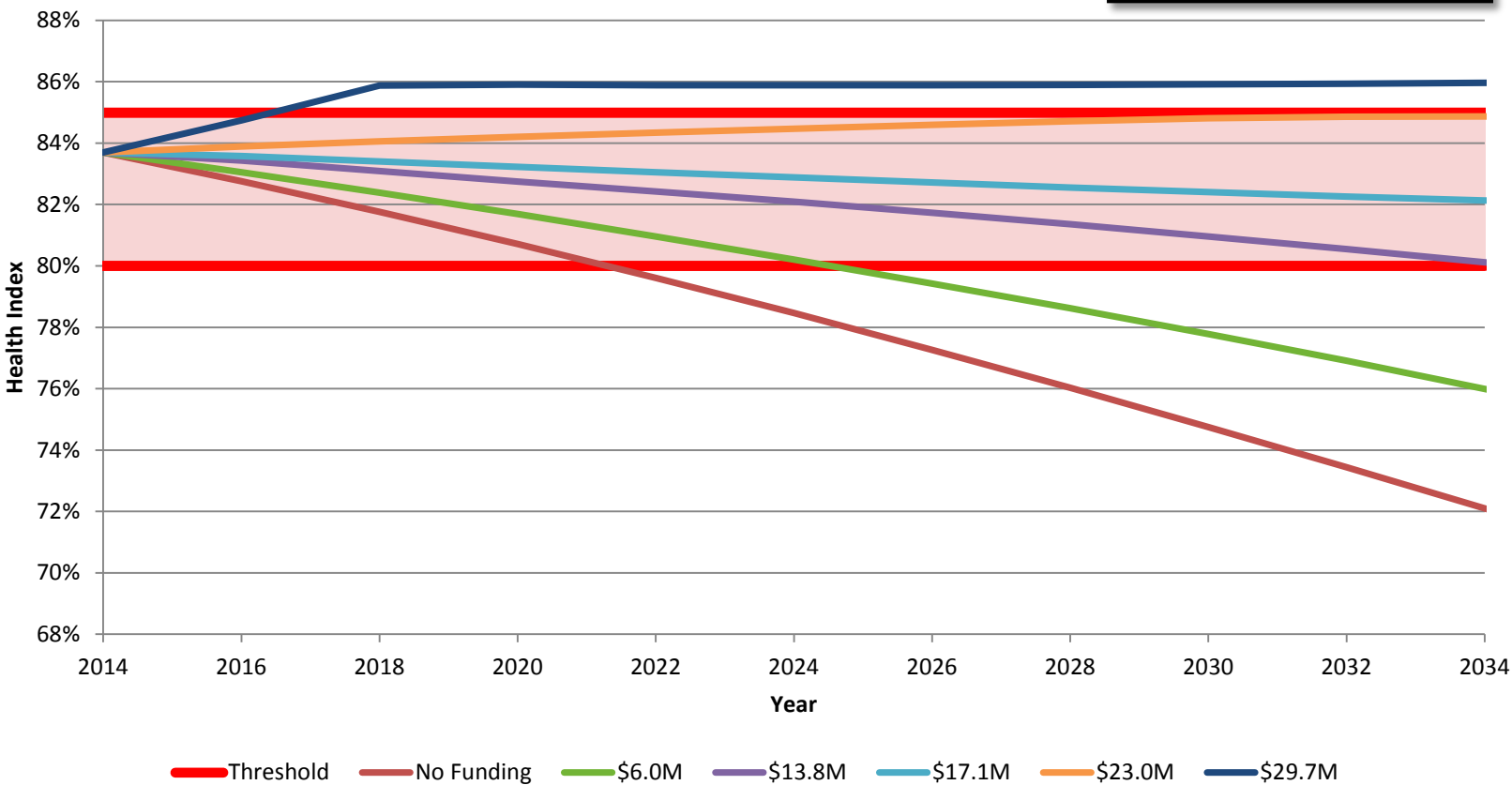


# BRIDGE MANAGEMENT PROJECTIONS

## Funding Projections

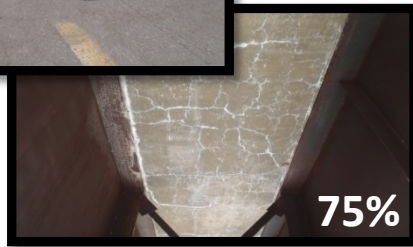


**Projected System Health over Time  
State Inventory**

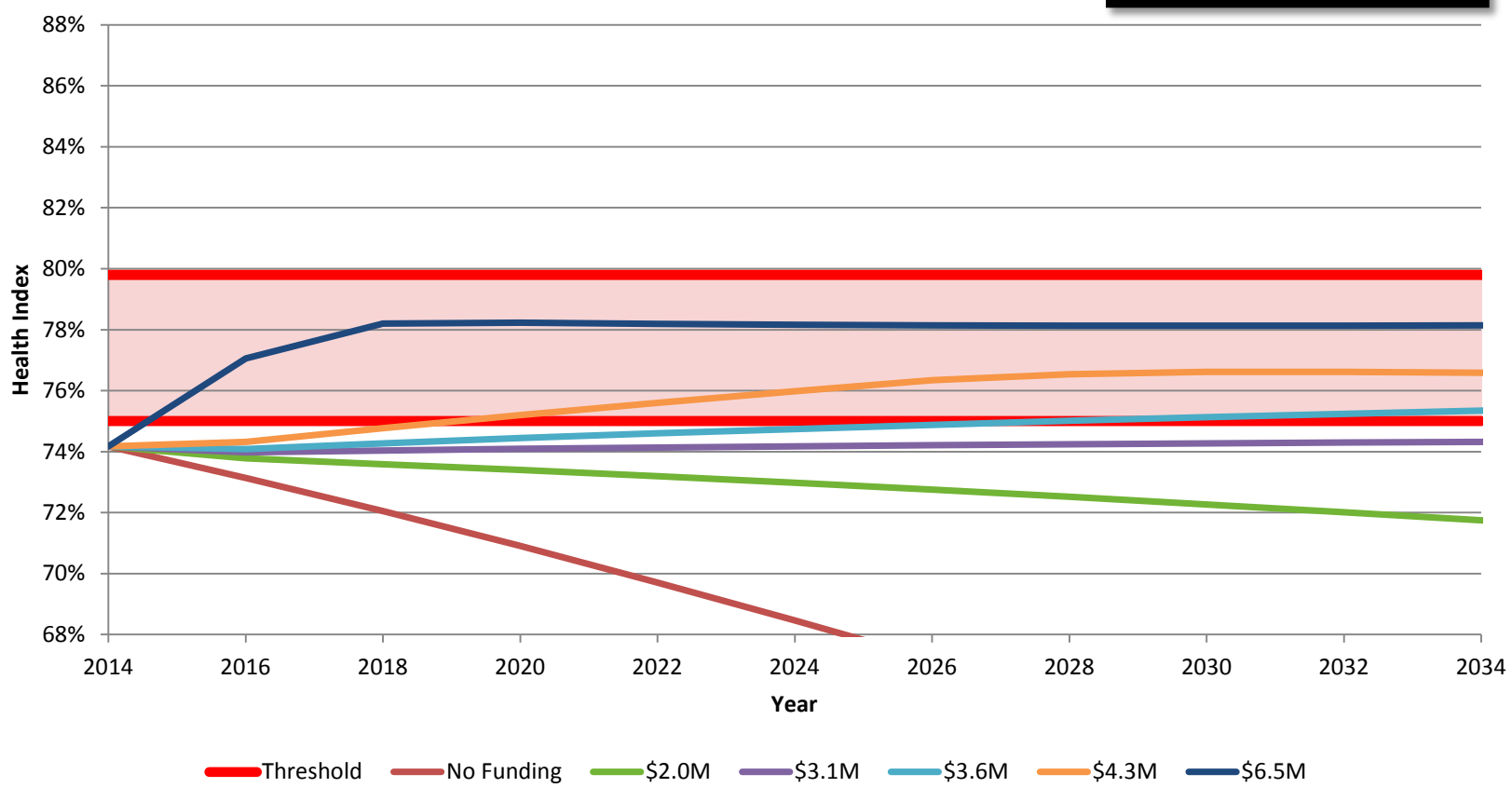


# BRIDGE MANAGEMENT PROJECTIONS

## Funding Projections



**Projected System Health over Time**  
**Local FA Inventory**



# BRIDGE MANAGEMENT PROJECTIONS

## Funding Projections

### NHS Inventory Condition Comparison in 2034

**Optimal  
Funding**  
BHI = 86.8%

Health Index	Good (100-80)		Fair (80-60)		Poor (<60)	
	8	7	6	5	4	3
<b>NBIS Component</b>						
<b>Deck</b>	189	739	523	42	4	0
<b>Superstructure</b>	546	649	305	34	2	0
<b>Substructure</b>	373	734	386	30	2	0
<b>Culvert</b>	104	194	78	9	0	0

**Replacements  
Only**  
BHI = 77.8%

Health Index	Good (100-80)		Fair (80-60)		Poor (<60)	
	8	7	6	5	4	3
<b>NBIS Component</b>						
<b>Deck</b>	189	506	437	240	125	0
<b>Superstructure</b>	546	444	255	193	50	0
<b>Substructure</b>	373	502	322	170	67	0
<b>Culvert</b>	104	133	66	50	0	0





# BRIDGE MANAGEMENT PROJECTIONS

## Future Needs

