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City of San Diego Committee on Infrastructure

Asset Management – Five Core Questions

February 25, 2013



Asset Management

Managing assets to minimize the life cycle cost of ownership while delivering the service level at an acceptable level of risk

Optimized Stewardship



Asset Management is About...

- Moving from reactive to proactive through managed solutions
- Working together towards a common goal of:
 - Maximizing return on investment
 - Maximizing the use of limited resources
 - Reducing risk
 - Minimize lifecycle cost
 - Understanding long-range capital investment needs
- Creating a collaborative and consistent decision-making platform backed by justification and documentation
- Making the **right decision**, at the **right time**, for the **right reason**, at the **right cost**



Five Core Questions of Asset Management

US EPA Asset Management Framework

1. What is the current state of my assets?
2. What is my required level of service?
3. Which assets are critical to sustained performance?
4. What are my best O&M and CIP investment strategies?
5. What is my best long-term funding strategy?



What is the current state of my assets?

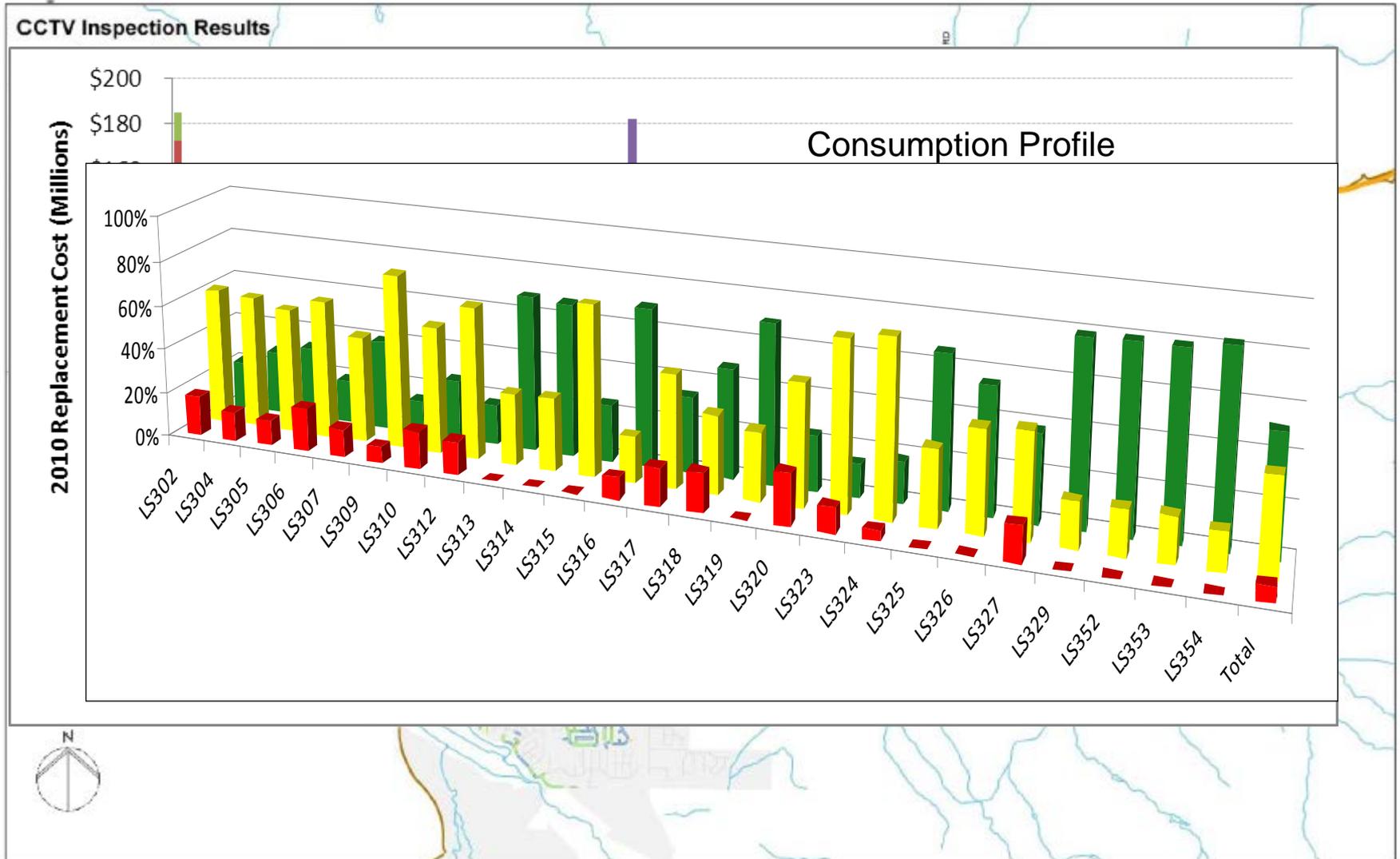


What Do I Own & Manage?

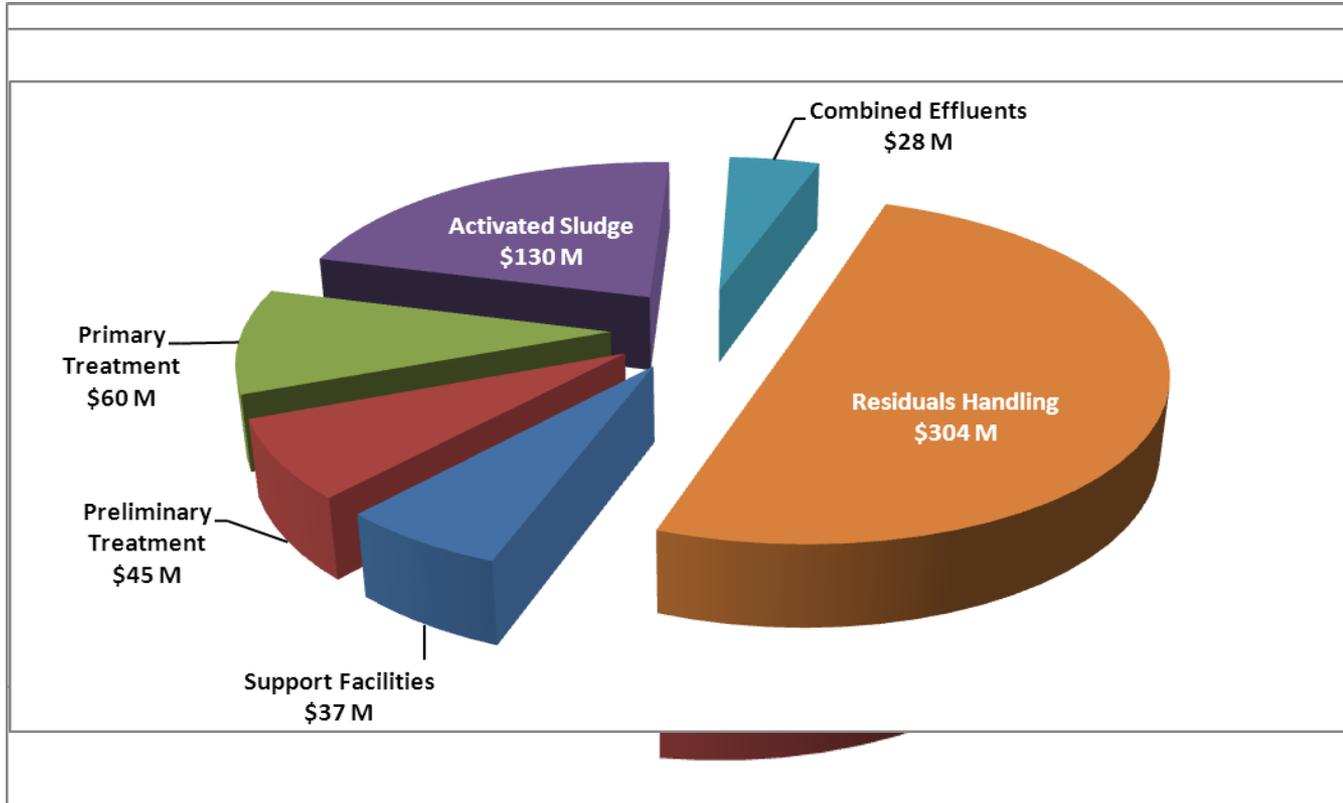
Diameter (inch)	AC	CI	CP	DIP	Fiber glass	POL	PVC	RCP	RCP T-LOCK	VCP	UNK	PE	STL	Total (ft)	Total (miles)
1							2,511							2,511	0.5
2							24,727							24,727	4.7
	Asset Class												Inventory		
													19.0	71.5	
6	16,270	1,811		4,969			292,573			318	2,717			324,659	61.5
7			1,153							389				1,541	0.3
8	94,276	33,279	1,944,376	62,238			580	4,124,278	4,096		3,383,273	45,810	2,258	9,695,268	1,836.2
10	11,120	2,716	31,459	1,622	4,545			214,023	505		70,884	2,700		3,176	64.4
12	158	7,323	141,455	4,682				206,662	8,349		172,601	1,618	841	543,877	103.0
14								207						1,294	0.2
15	5,204		14,942	2,241				97,988	38,813		70,099			229,287	43.4
16	10,842	1,689	1,316					207						15,513	2.9
18	902		11,681	6,333	2,977			89,724	73,463		53,436	460		238,977	45.3
20		580	719	143				172			463			3,697	0.7
21	8,455		9,212	65				36,356	39,159		24,268			117,516	22.3
24	7,351	2,371	3,208	8,494				51,821	99,564		7,332			186,865	35.4
27			406					11,952	19,893				1,245	33,496	6.3
30	6,912	1,712	771	9,330	375			6,552	24,278		549			50,478	9.6
33								3,455	5,865					9,520	1.8
34								55						55	0.0
36	3,014	1,660	1,024	170							1,747	3,756	1,900	96,343	18.2
40														178	0.0
42		1,400	789	334									138	54,913	10.4
48			1,669									200	15,547	139,655	26.4
52		80												80	0.0
54								1,328	49,444	4,818				55,589	10.5
60								1,666	20,704					22,370	4.2
66								526	1,851	1,293				3,670	0.7
72		91			3,039			98	38,270		31			41,529	7.9
78									8,258					8,258	1.6
Total (ft)	165,534	58,777	2,162,865	103,506	10,935	15,334	5,727,409	579,861	12,390	3,801,562	59,554	21,124	623	12,719,683	2,409.0
Total (miles)	31.4	11.1	409.6	19.6	2.1	2.9	1,084.7	109.8	2.3	720.0	11.3	4.0	0.1	2,409.0	



What is the Current State of My Assets?



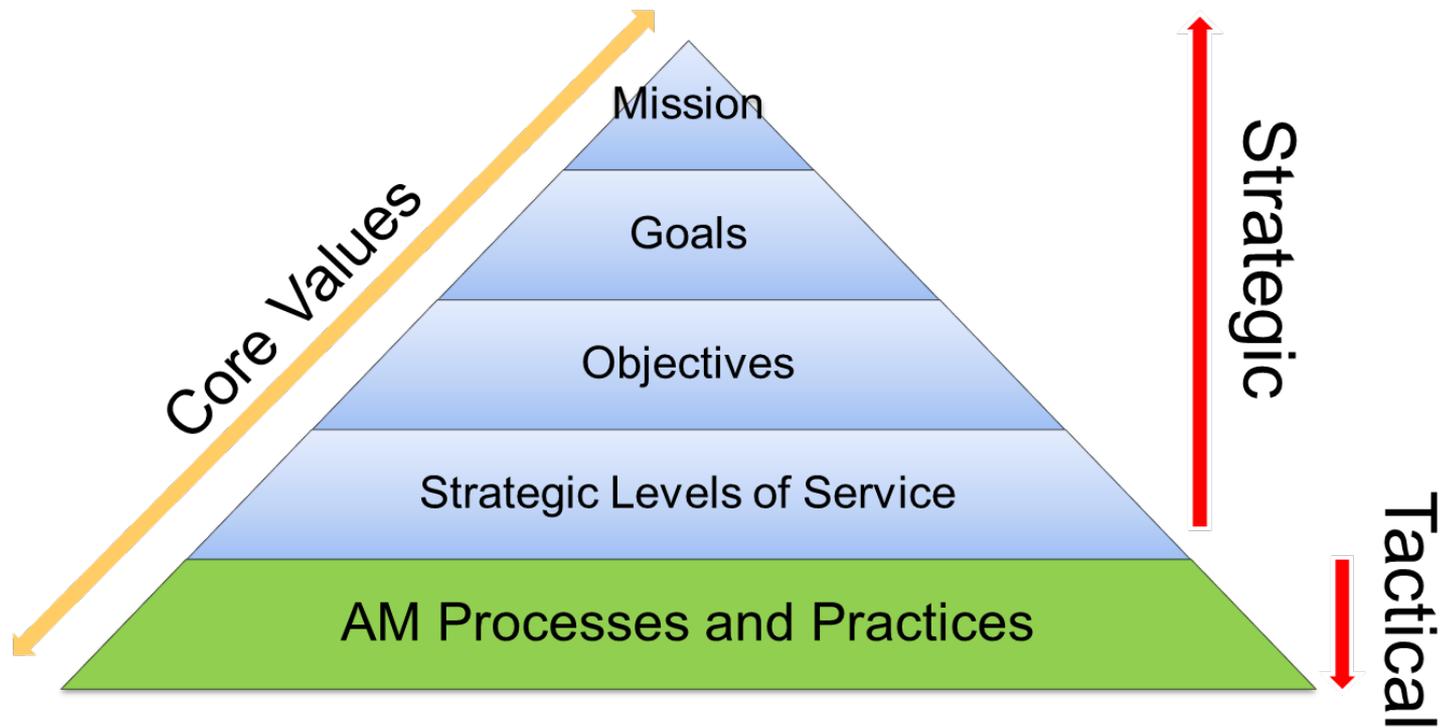
How Much are My Assets Worth?



What is my required level of service?



Asset Management Framework



Levels of Service (Example)

Mission: ***“To protect public health and environment through effective and sustainable utility systems”***

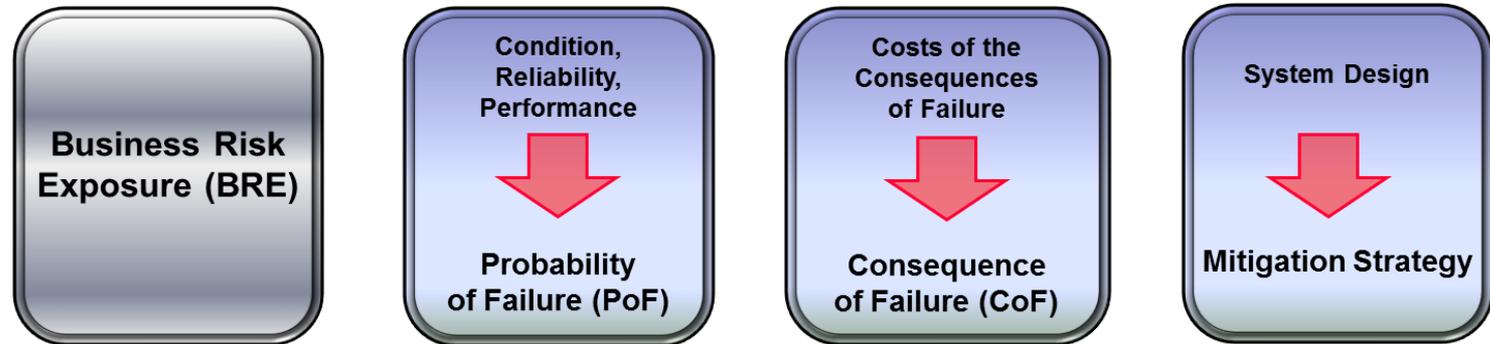
Goal	Objectives	Level of Service
Provide high customer satisfaction	Maintain water quality	Number of water quality complaints: 15 per 1000 customers
	Maintain water system reliability	Number of main breaks/leaks: 10 per 100 miles
	Minimize emergency response time	Emergency response time: < 30 mins

LOS should have measurable performance indicators

Which assets are critical to sustained performance?



Assess Risk

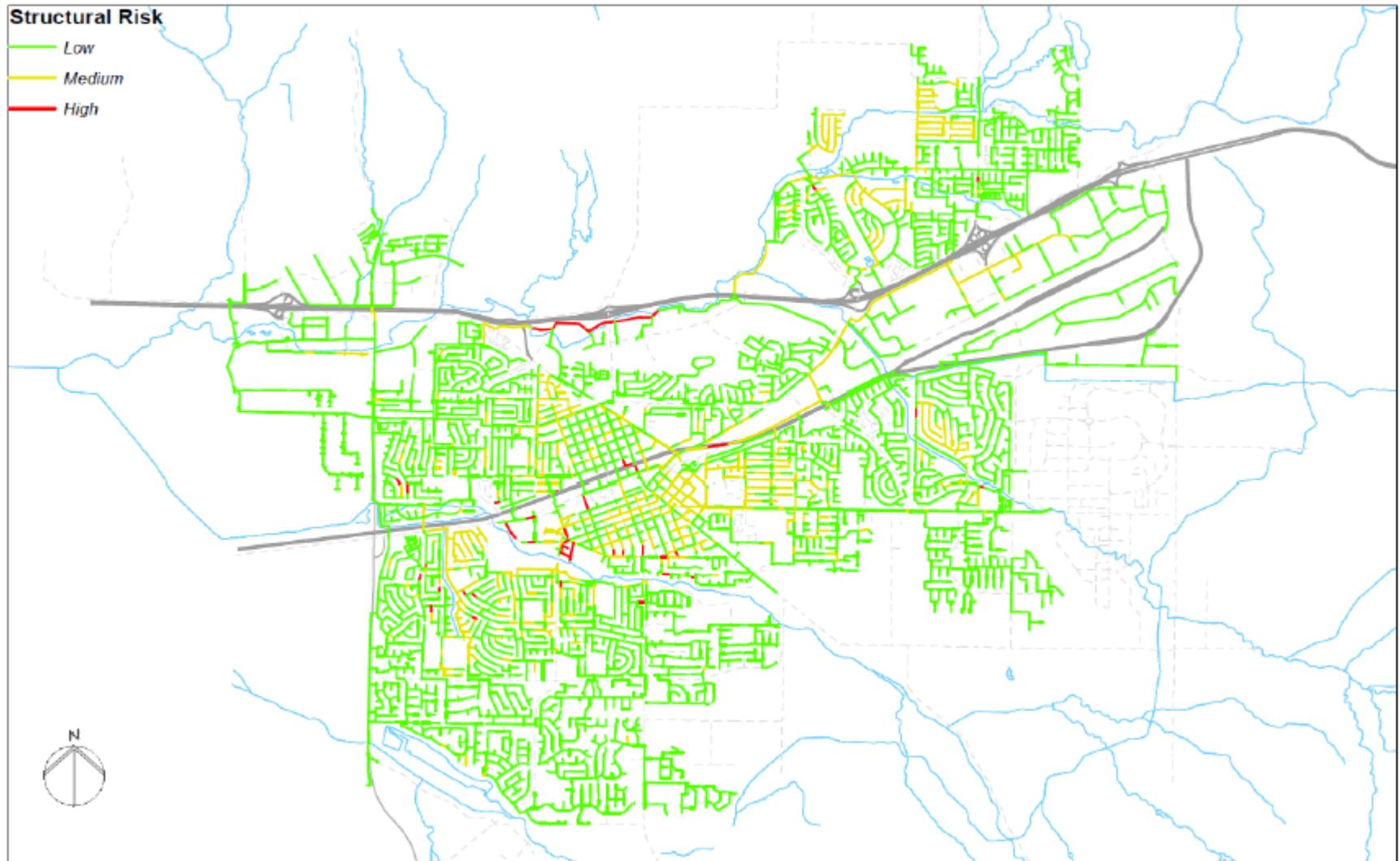


$$\text{BRE} = \underbrace{\text{PoF}}_{\substack{\text{Structural PoF} \\ \text{Operational PoF}}} \times \underbrace{\text{CoF}}_{\substack{\text{Triple Bottom Line} \\ \text{(Economic, Environment, Social)}}} \times \text{Mitigation Strategy}$$

Where PoF is driven by failure modes

- Physical Mortality (age)
- Capacity
- Levels of Service
- Financial Efficiency (lifecycle cost)

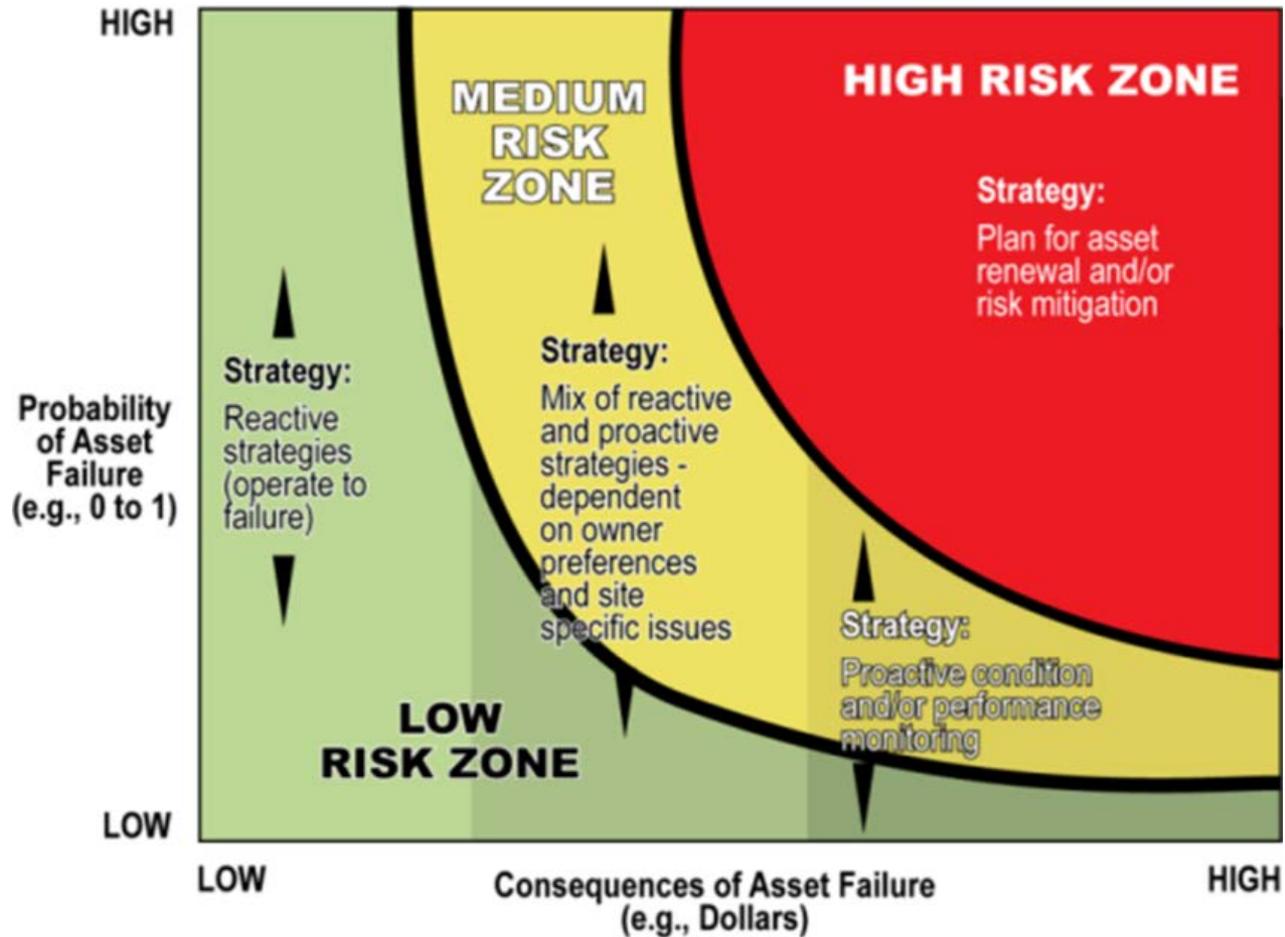
Risk Profile



What are my best O&M and CIP investment strategies?



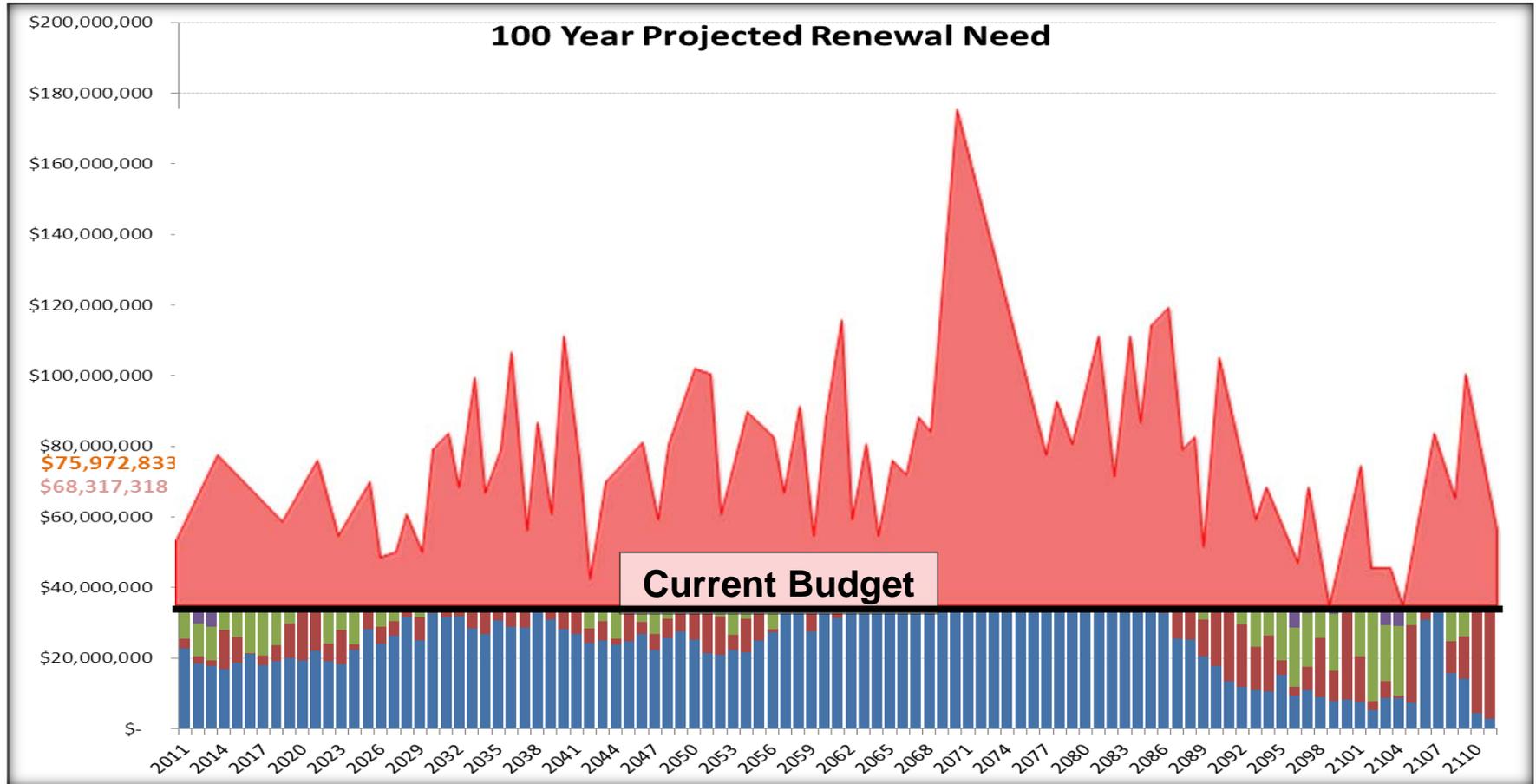
Risk-Based Strategy



What is my best long-term funding strategy?

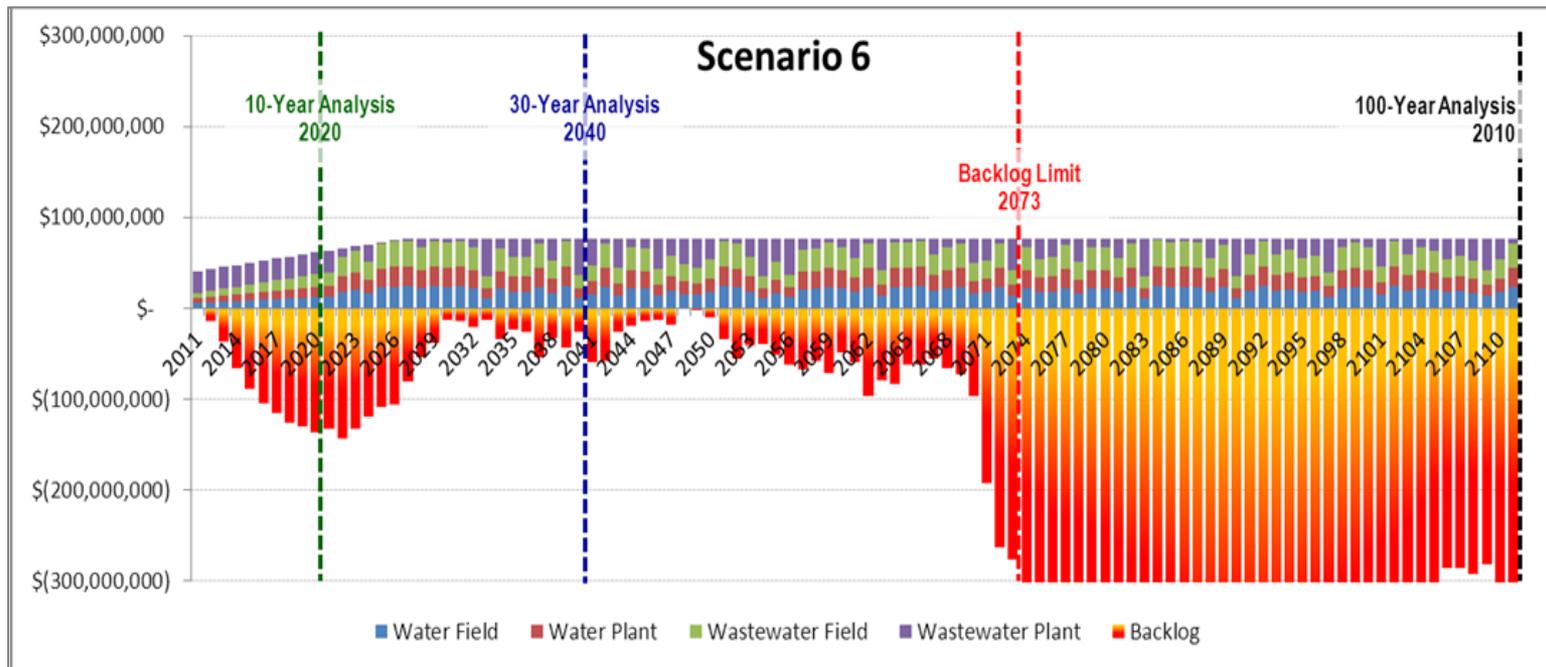


Projected Long-Term Renewal Needs

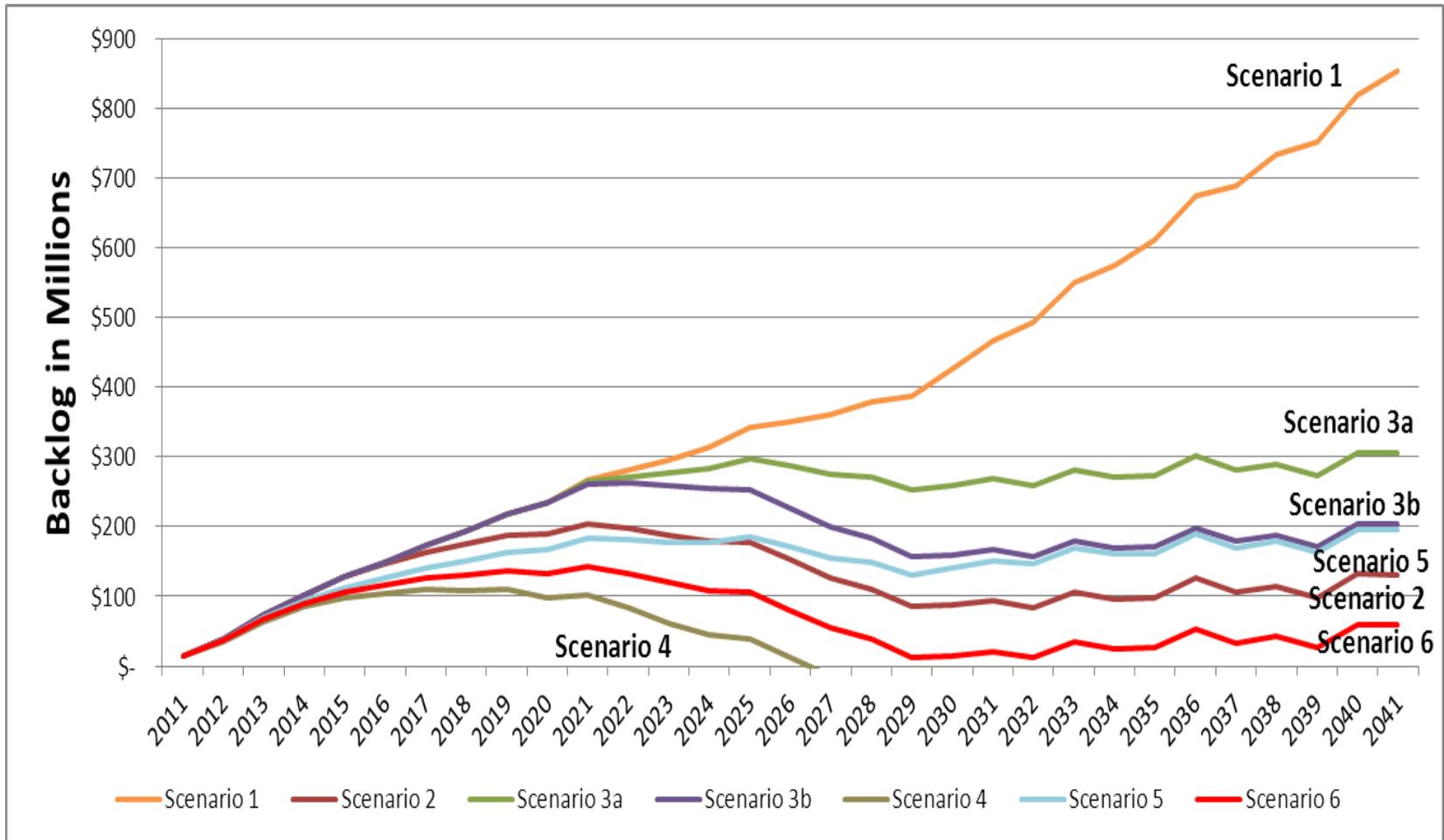


Work Backlog Analysis

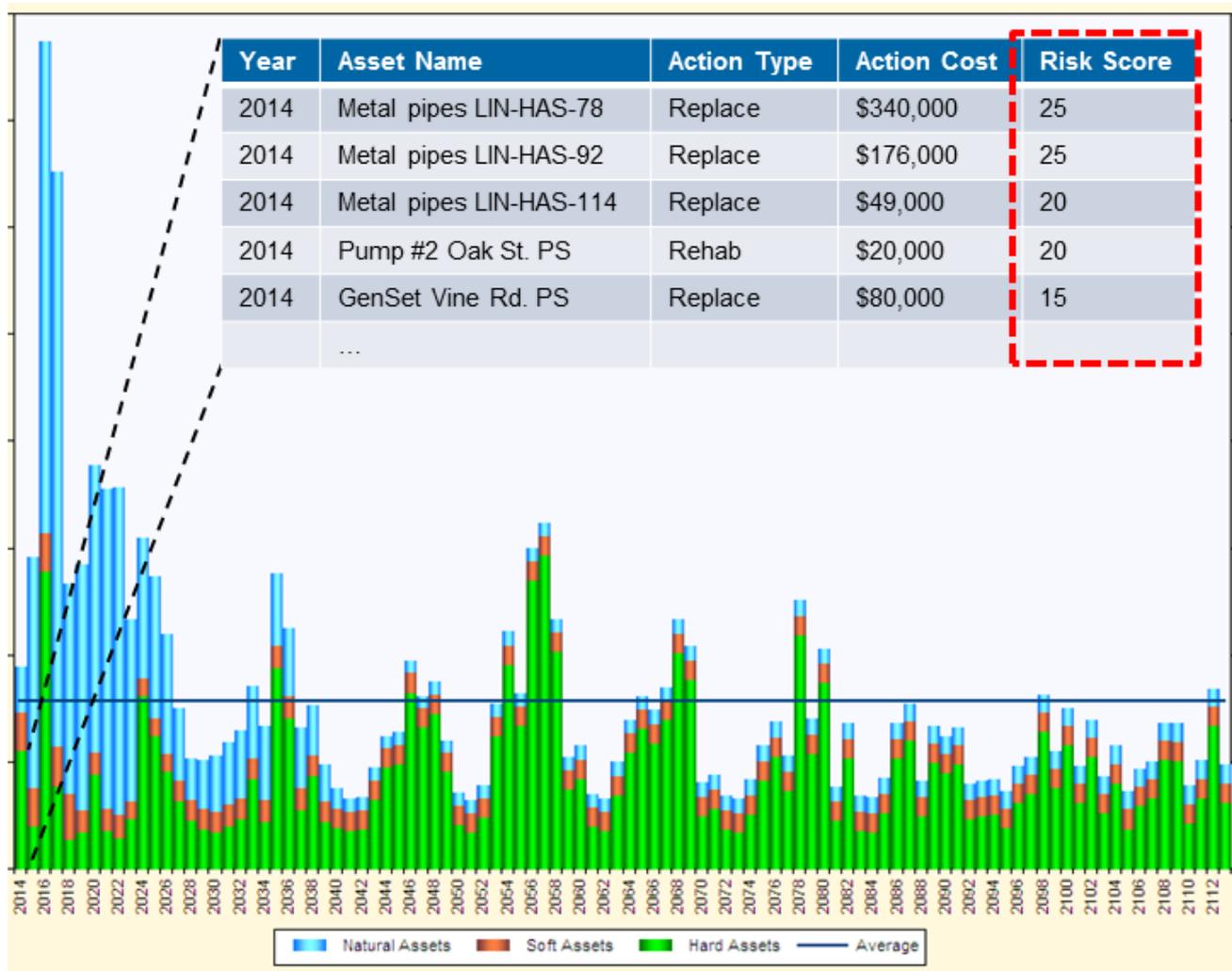
Scenario 6: Ramp up \$2.25M per yr for next 16 yrs



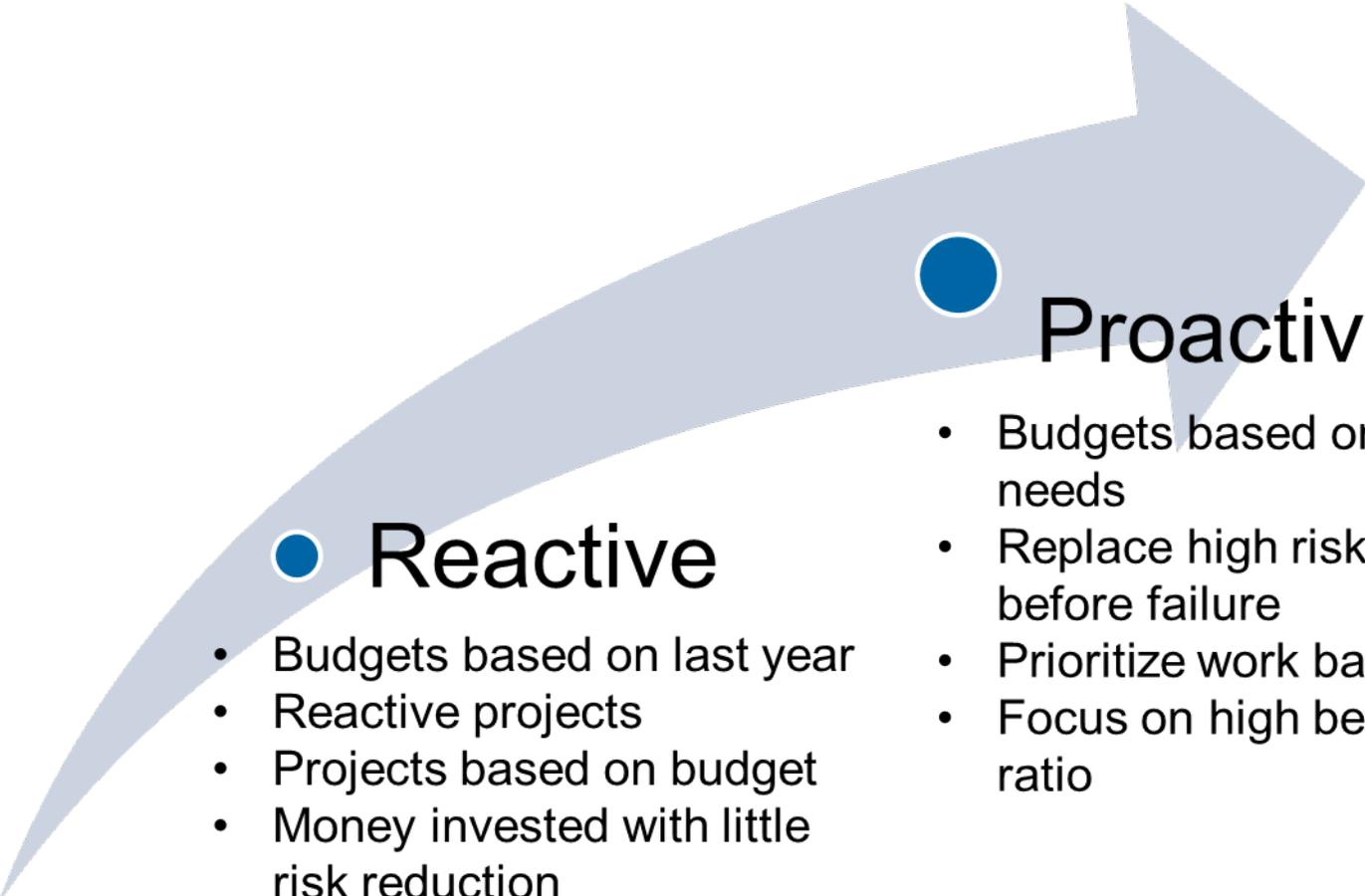
Scenario Comparison



R&R Needs Sorted by Risk



Goal of Asset Management



● Reactive

- Budgets based on last year
- Reactive projects
- Projects based on budget
- Money invested with little risk reduction

● Proactive

- Budgets based on future needs
- Replace high risk assets before failure
- Prioritize work based on risk
- Focus on high benefit to cost ratio



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