

# Analysis of Several Different CVWD Pipe Replacement Schedules

(Plateau Replacement Schedules  
for 80-year, 82-year, 85-year and  
78-year replacement cycles)

# Data from David Gould to Support this Analysis

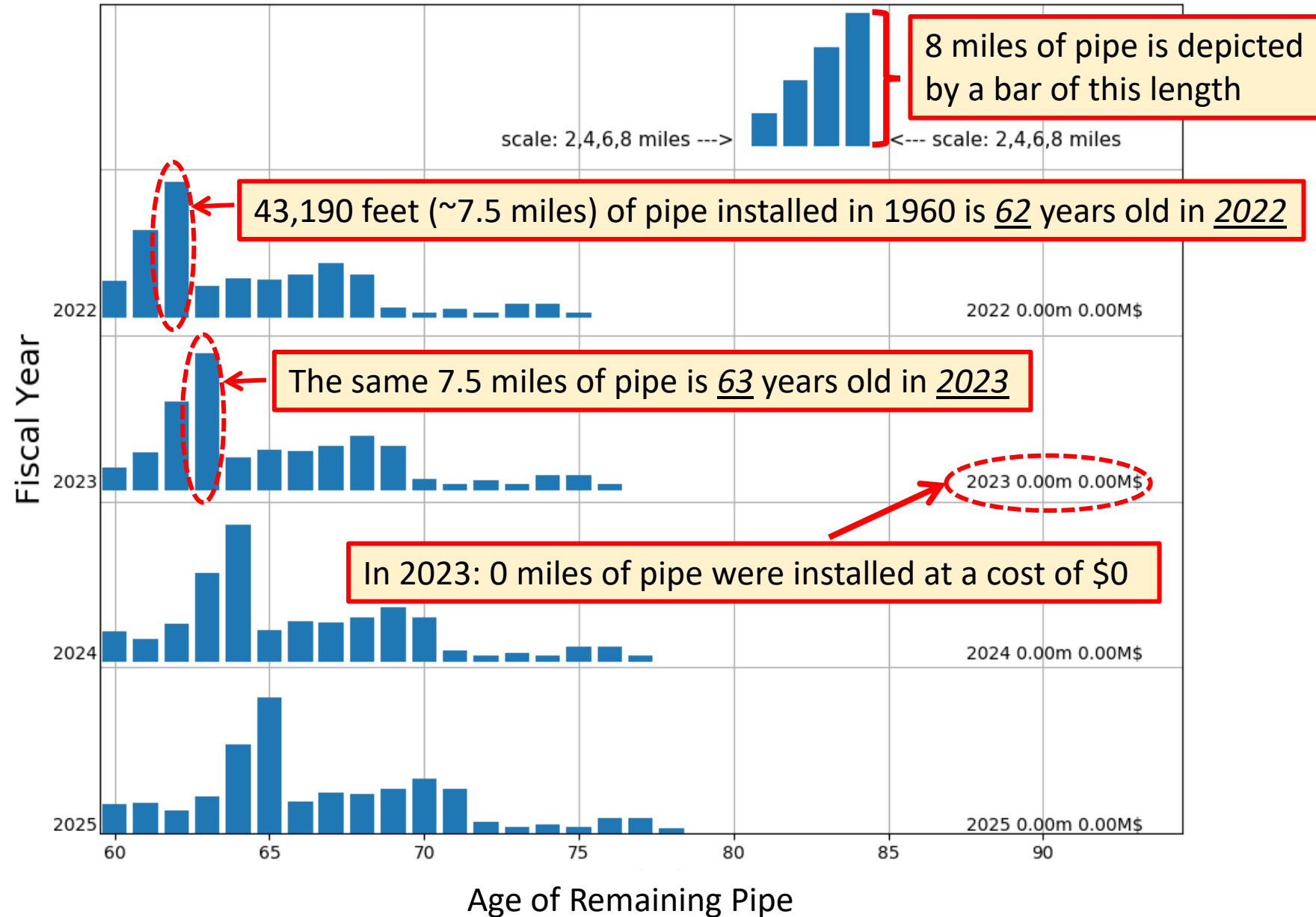
Scenario 1 - "Level" Pipeline Replacement Schedule				Scenario 2 - "Pyramid" Pipeline Replacement Schedule				Existing Pipeline Year - 1947 to 1967			Pipeline Breakdown by Age				
FY	Pipeline Replacement LF/Yr	Cost/LF	Estimated Construction Cost	FY	Pipeline Replacement LF/Yr	Cost/LF	Estimated Construction Cost	Year Pipeline Installed	Pipeline Length Installed per year (LF)	Year Pipeline Replaced based on 75-Year Cycle	2021	Years	Period	Length of Pipe (LF)	Percent of Pipe
2022	5,450	\$ 475	\$ 2,588,750	2022	5,450	\$ 475	\$ 2,588,750	1947	1,680	2022	1	>71 Yrs	1924 - 1950	14,950	3%
2023	11,150	\$ 496	\$ 5,530,000	2023	6,300	\$ 496	\$ 3,130,000	1948	4,560	2023	2	60 - 70 yrs	1951 - 1980	124,555	26%
2024	11,150	\$ 519	\$ 5,780,000	2024	7,200	\$ 519	\$ 3,730,000	1949	4,640	2024	3	50 - 60 yrs	1961 - 1970	114,810	23%
2025	11,150	\$ 542	\$ 6,040,000	2025	8,200	\$ 542	\$ 4,440,000	1950	1,810	2025	4	40 - 50 yrs	1971 - 1980	50,270	10%
2026	11,150	\$ 566	\$ 6,320,000	2026	9,400	\$ 566	\$ 5,320,000	1951	2,850	2026	5	30 - 40 yrs	1981 - 1990	40,850	8%
2027	11,150	\$ 592	\$ 6,600,000	2027	11,100	\$ 592	\$ 6,570,000	1952	1,820	2027	6	20 - 30 yrs	1991 - 2000	62,680	13%
2028	11,150	\$ 619	\$ 6,900,000	2028	12,300	\$ 619	\$ 7,610,000	1953	3,430	2028	7	10 - 20 yrs	2001 - 2010	62,470	12%
2029	11,150	\$ 646	\$ 7,210,000	2029	12,400	\$ 646	\$ 8,020,000	1954	13,910	2029	8	1 - 10 yrs	2011 - 2021	23,420	5%
2030	11,150	\$ 675	\$ 7,530,000	2030	13,300	\$ 675	\$ 8,980,000	1955	17,310	2030	Total			501,005	100%
2031	11,150	\$ 706	\$ 7,870,000	2031	14,500	\$ 706	\$ 10,240,000	1956	13,870	2031			\$237,977,375		
2032	11,150	\$ 738	\$ 8,220,000	2032	15,500	\$ 738	\$ 11,430,000	1957	12,340	2032			in 2021 dollars		
2033	11,150	\$ 771	\$ 8,800,000	2033	14,600	\$ 771	\$ 11,250,000	1958	12,735	2033					
2034	11,150	\$ 806	\$ 8,980,000	2034	14,000	\$ 806	\$ 11,280,000	1959	10,100	2034					
2035	11,150	\$ 842	\$ 9,390,000	2035	13,200	\$ 842	\$ 11,110,000	1960	43,190	2035					
2036	11,150	\$ 880	\$ 9,810,000	2036	12,400	\$ 880	\$ 10,910,000	1961	28,050	2036					
2037	11,150	\$ 919	\$ 10,250,000	2037	11,700	\$ 919	\$ 10,780,000	1962	11,750	2037					
2038	11,150	\$ 961	\$ 10,710,000	2038	11,000	\$ 961	\$ 10,570,000	1963	7,180	2038					
2039	11,150	\$ 1,004	\$ 11,190,000	2039	10,000	\$ 1,004	\$ 10,040,000	1964	9,640	2039					
2040	11,150	\$ 1,049	\$ 11,700,000	2040	9,500	\$ 1,049	\$ 9,970,000	1965	9,230	2040					
2041	11,150	\$ 1,096	\$ 12,220,000	2041	8,400	\$ 1,096	\$ 9,210,000	1966	11,510	2041					
2042	11,255	\$ 1,146	\$ 12,890,000	2042	8,105	\$ 1,146	\$ 9,280,000	1967	6,950	2042					
<b>Total</b>	<b>228,555</b>		<b>\$ 176,328,750</b>	<b>Total</b>	<b>228,555</b>		<b>\$ 176,438,750</b>	<b>Total</b>	<b>228,555</b>						

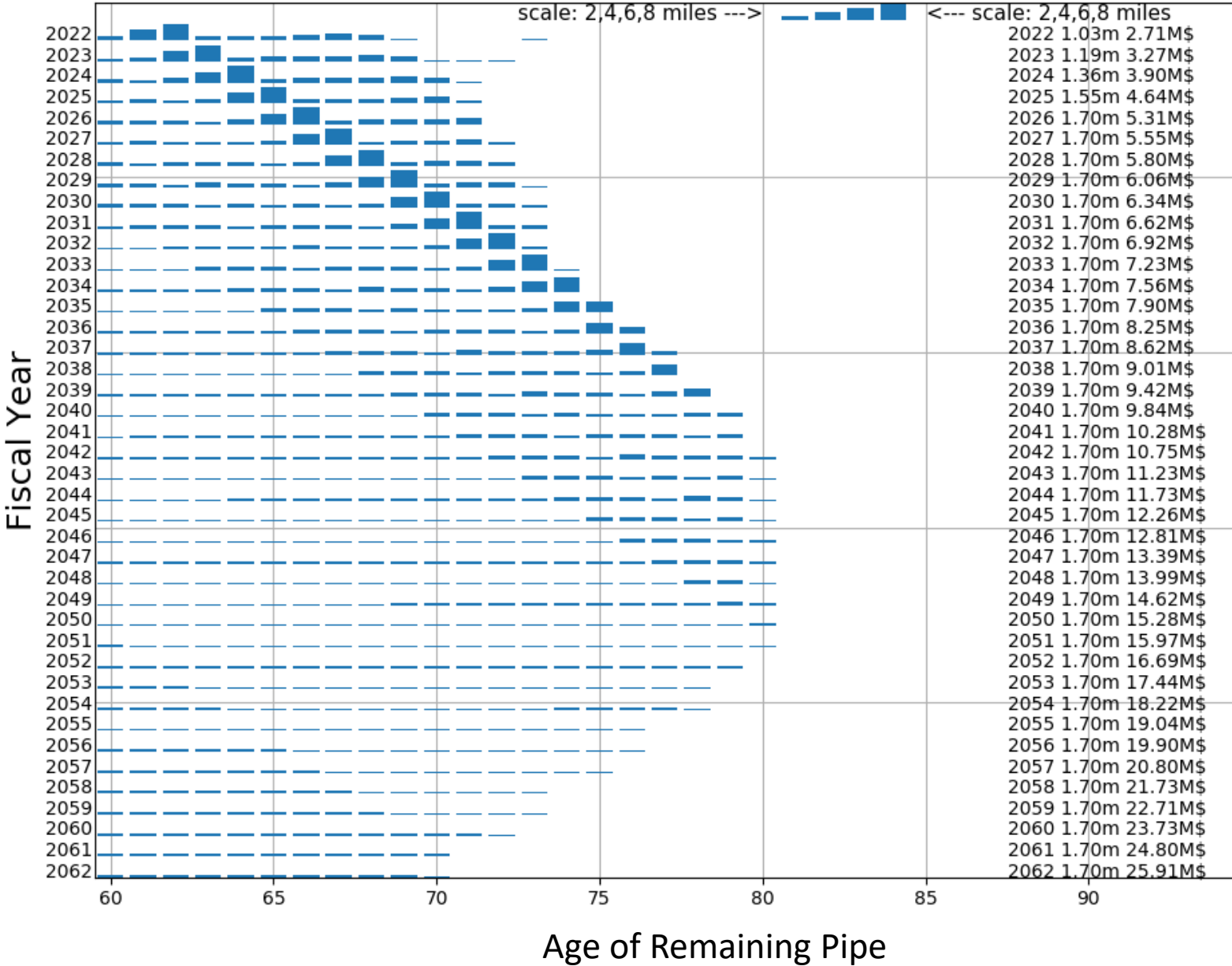
Notes:	Pipeline Schedule	Pipe per year (miles)	Year Completed (Start 2021)
1. Existing Pipeline Replacement - 20-year Period from 1947 to 1967 = 228,555 LF	75-Year	1.27	2096
2. Estimate Cost per Linear Foot based on 2021 Construction Costs of \$475/LF	85-Year	1.12	2106
3. Estimated Construction Cost to replace one (1) mile of Pipeline = \$2.5M (2021 dollars)	100-Year	0.95	2121
4. Assume Annual Construction Cost Inflation = 4.5%	200-Year	0.47	2221

# How to read the graphs

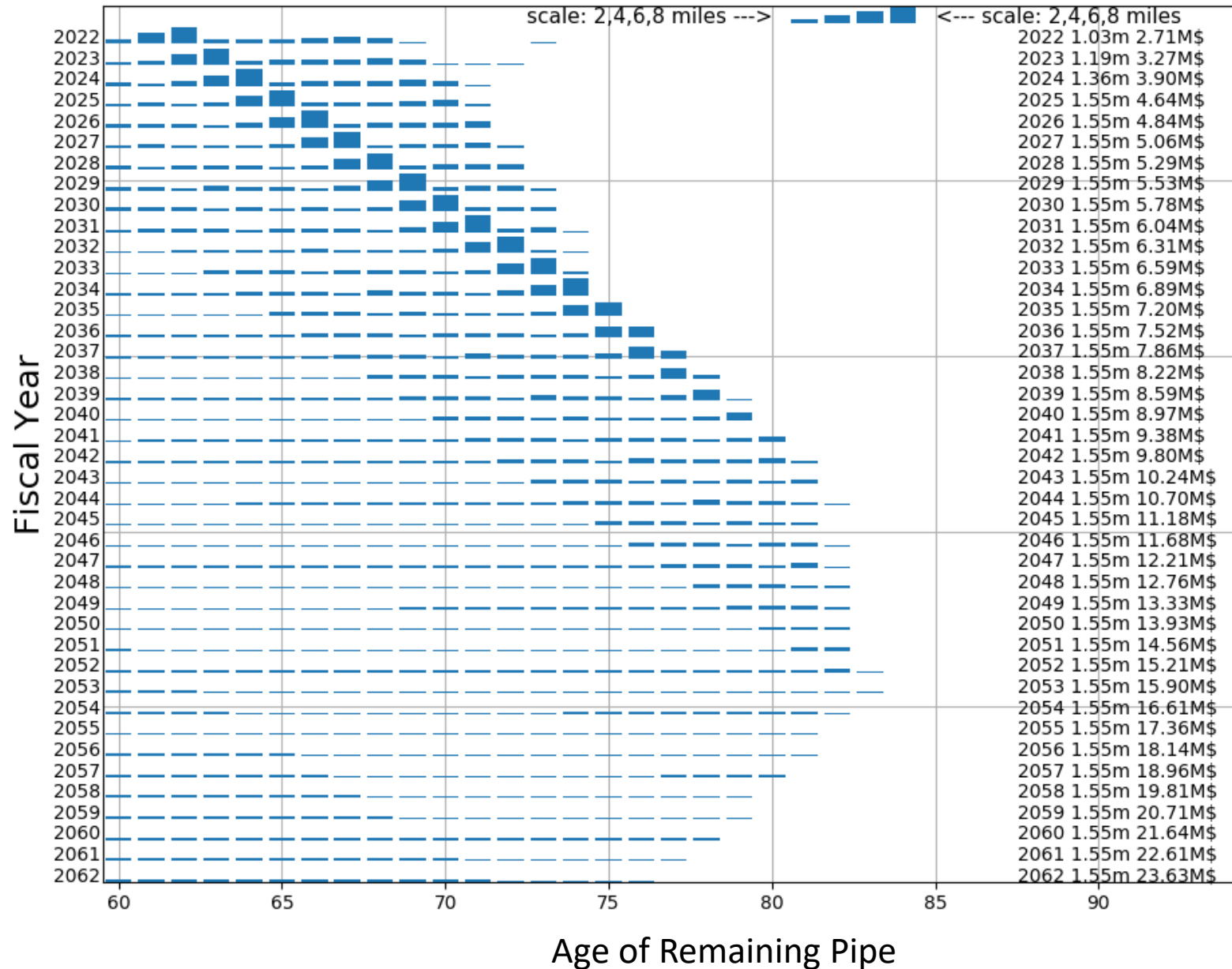
- This example shows CVWD pipe age distribution for 4 fiscal years [2022-2025]
- For this example, there is **no** pipe replacement each year
- Note that the bar chart simply shifts to the right each year



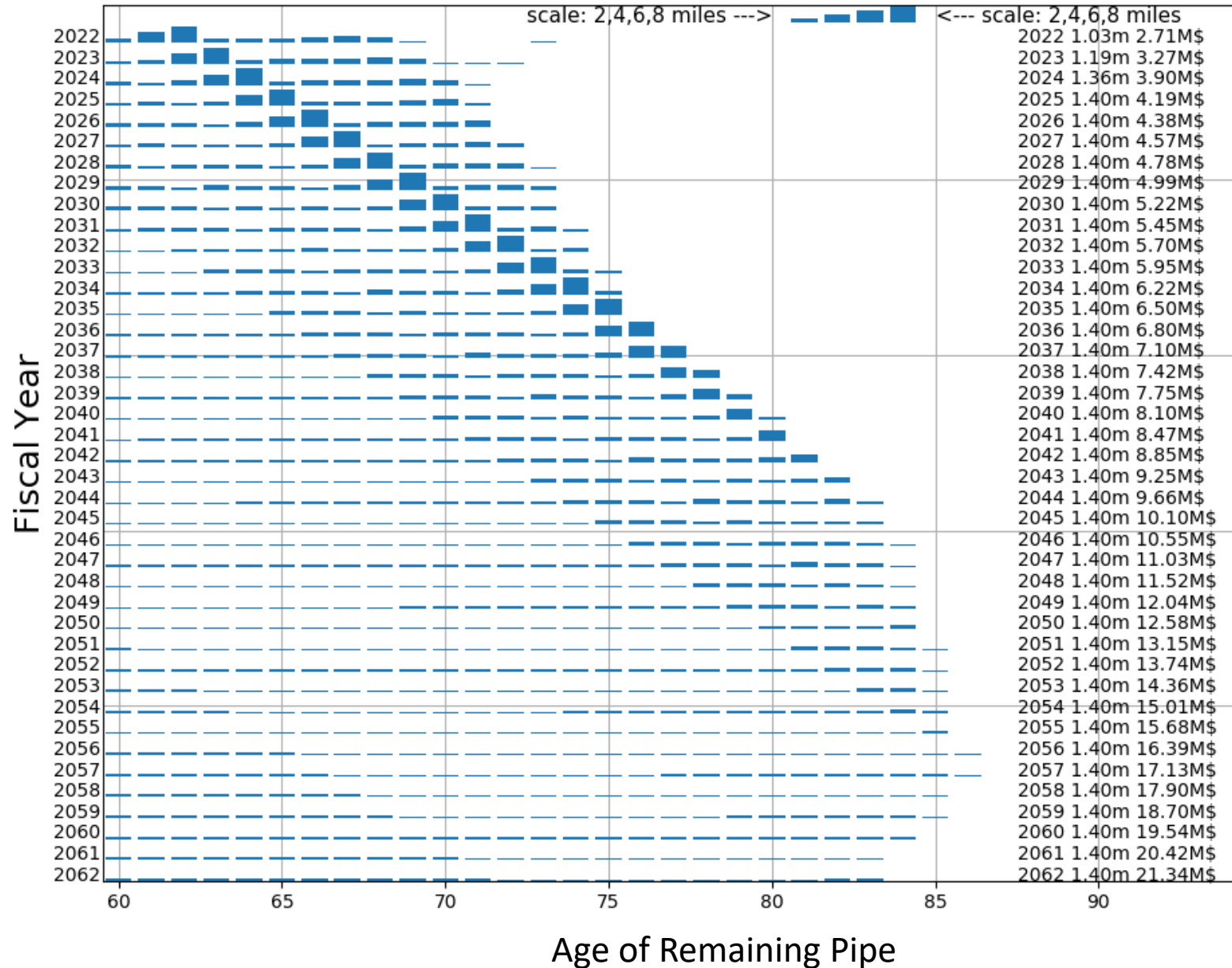
# 80-year Plateau Replacement Schedule (ramp up to 1.7 mi/yr)



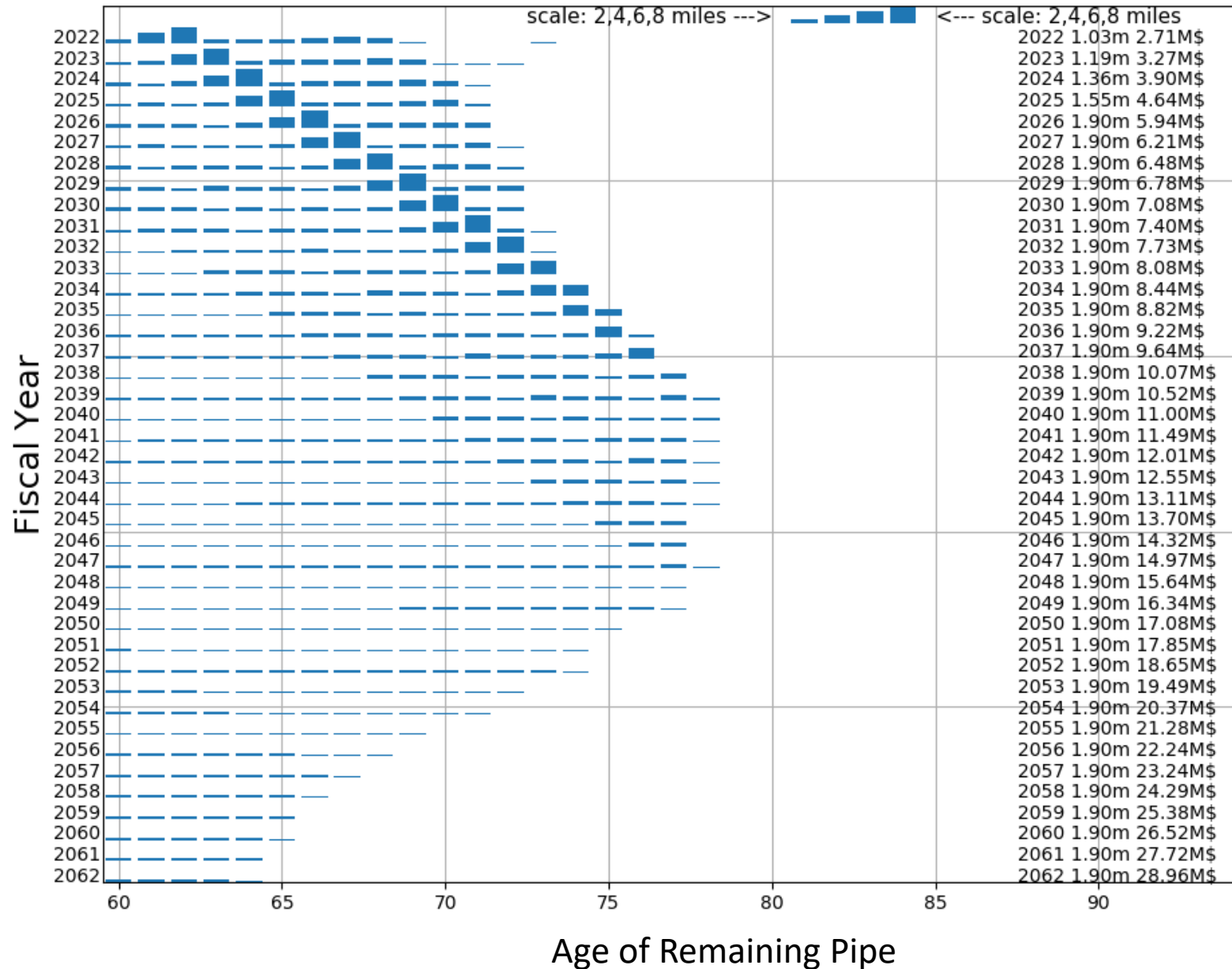
# 82-year Plateau Replacement Schedule (ramp up to 1.55 mi/yr)



# 85-year Plateau Replacement Schedule (ramp up to 1.4 mi/yr)



# 78-year Plateau Replacement Schedule (ramp up to 1.9 mi/yr)



- The analysis presented in this chart package has been automated with a Python program
  - Each chart takes seconds to create
- The Python program can be provided to CVWD if desired