

Table 1 provides information related to the standard method full lining recommendations coming out of our decision support software, InfoMaster. The standard method of lining refers to cured-in-place pipe (CIPP). For this analysis, ultra-violet cure pricing was used for pipes up to 24" in diameter and heat cure pricing was used for pipes up to 60". The standard method of lining is limited to pipes from 8" to 60" in diameter. Pricing used for the UV CIPP is based off of our 2016 bids for this type of work. Heat CIPP is based on the average of our three most recent projects using this technology. The costs provided are accurate with high confidence.

Full Lining Recommendations - Standard Methods					
	No. of Sewers	Footage	Mileage	Cost	Avg Cost/Foot
Extreme	360	54,659	10.4	\$ 6,262,426	\$ 115
High	1,244	197,085	37.3	\$ 20,088,619	\$ 102
Medium	1,331	212,130	40.2	\$ 17,333,951	\$ 82
Low	2,139	333,338	63.1	\$ 24,082,488	\$ 72
Negligible	1,245	197,865	37.5	\$ 11,931,945	\$ 60
Totals	6,319	995,076	188	79,699,429	\$ 80

Table 1 – Standard Method Full Lining Recommendations as of 6/21/2016

Table 2 provides information related to the specialized method full lining recommendations by InfoMaster. For the purpose of this analysis, the specialized method of lining is the application of a cementitious coating either by hand spraying or spin-casting in place. Pipe with diameters greater than 60" or with irregular shapes are included in this table. The costs provided are rough with low confidence.

Full Lining Recommendations - Specialized Methods					
	No. of Sewers	Footage	Mileage	Cost	Avg Cost/Foot
Extreme	11	2,661	0.5	\$ 5,991,226	\$ 2,252
High	37	7,952	1.5	\$ 13,759,478	\$ 1,730
Medium	28	3,870	0.7	\$ 6,638,311	\$ 1,715
Low	15	1,926	0.4	\$ 3,147,252	\$ 1,634
Negligible	3	286	0.1	\$ 397,734	\$ 1,393
Totals	94	16,694	3	\$ 29,934,001	\$ 1,793

Table 2 – Specialized Method Full Lining Recommendations as of 6/21/2016

Table 3 combines the information in Tables 1 & 2 to provide a global picture of the scope necessary to reduce the risk of full lining candidate sewers to acceptable levels.

Full Lining Recommendations - Combined Methods					
	No. of Sewers	Footage	Mileage	Cost	Avg Cost/Foot
Extreme	371	57,320	10.9	\$ 12,253,652	\$ 214
High	1,281	205,036	38.8	\$ 33,848,097	\$ 165
Medium	1,359	216,000	40.9	\$ 23,972,261	\$ 111
Low	2,154	335,264	63.5	\$ 27,229,740	\$ 81
Negligible	1,248	198,151	37.5	\$ 12,329,679	\$ 62
Totals	6,413	1,011,770	192	\$ 109,633,430	\$ 108

Table 3 – Combined Standard & Specialized Method Full Lining Recommendations as of 6/21/2016

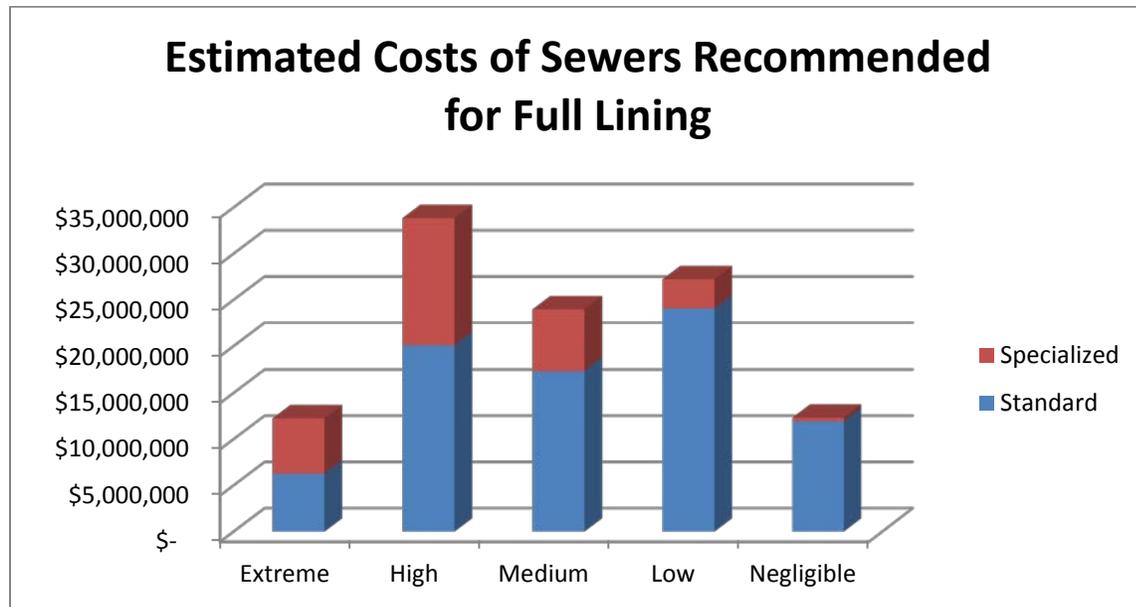


Figure 1 - Total Estimated Costs of Sewers Recommended for Full Lining by Risk as of 6/21/2016

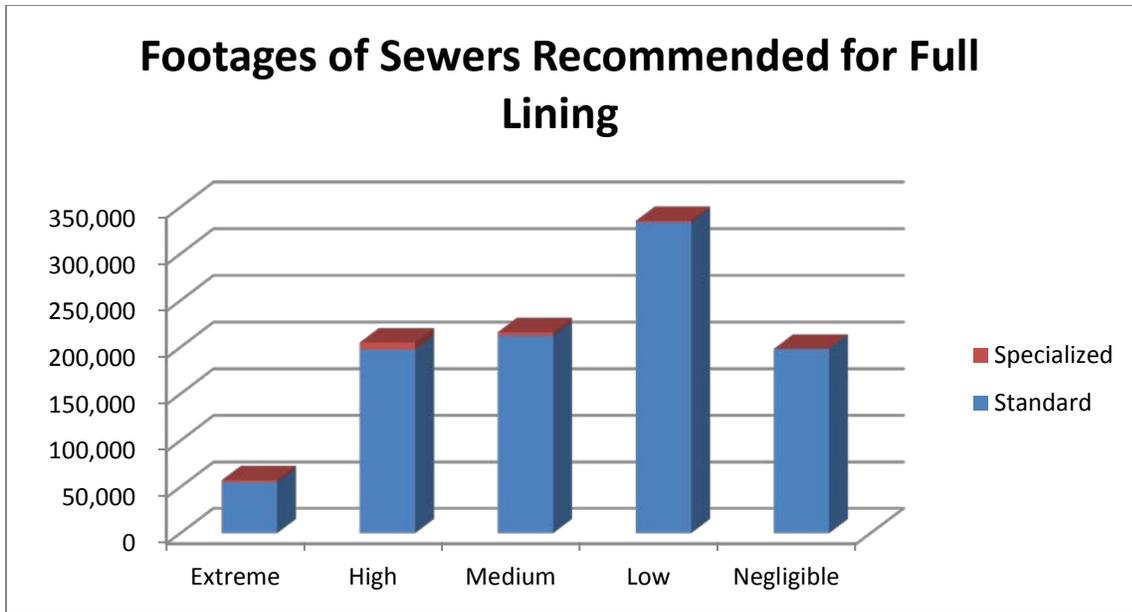


Figure 2 – Footages of Sewers Recommended for Full Lining by Risk as of 6/21/2016

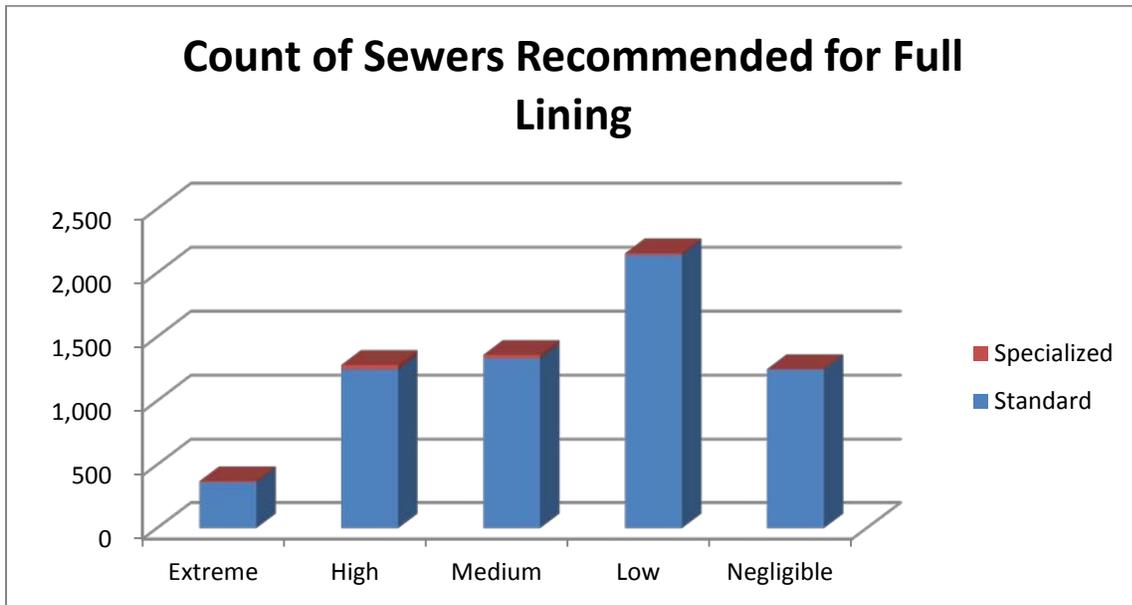


Figure 3 – Count of Sewer Segments Recommended for Full Lining by Risk Bin as of 6/21/2016

Table 4 shows the data for all recommended rehab methods of grout joint as of 6/21/2016.

	Cost	Count	Footage
Extreme	\$ 118,583	160	960
High	\$ 221,083	337	2,074
Medium	\$ 1,657,649	1,954	23,792
Low	\$ 1,092,382	1,486	10,452
Negligible	\$ 1,561,279	2,419	14,631
Total	\$ 4,650,976	\$ 6,356	\$ 51,908

Table 4 – Grout Joint Rehab Methods as of 6/21/2016

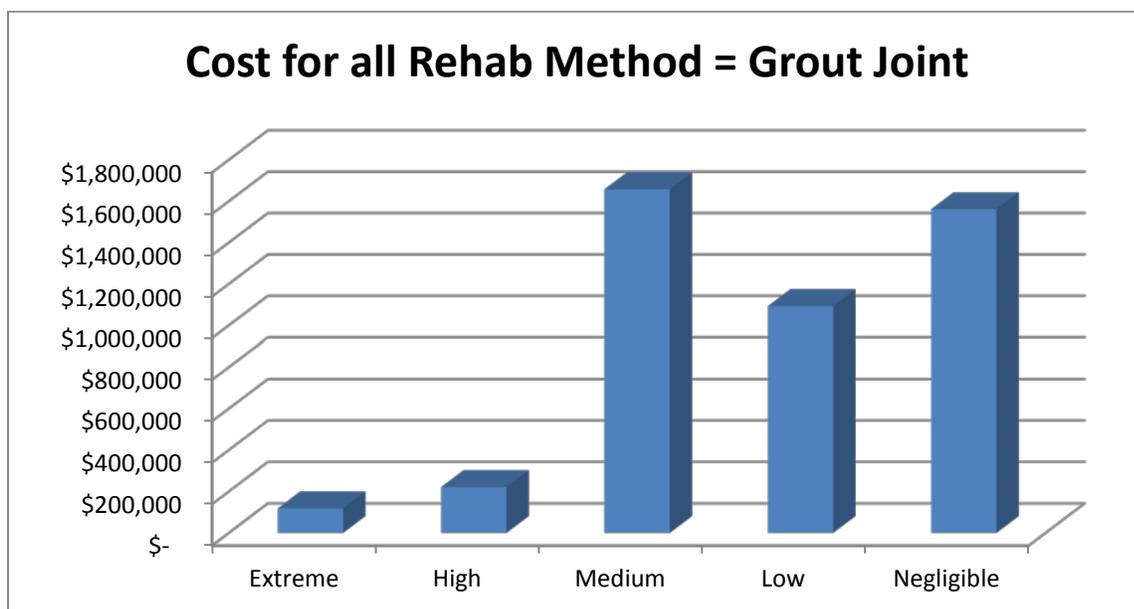


Figure 2 - Total Estimated Costs of Sewers Recommended for Grout Joint as of 6/21/2016

	Full Lining - Std	Full Lining - Special	Grout Joints
Extreme	\$ 6,262,426	\$ 5,991,226	\$ 118,583
High	\$ 20,088,619	\$ 13,759,478	\$ 221,083
Total	\$ 26,351,045	\$ 19,750,704	\$ 339,666

Grand Total
\$ 46,441,415

Table 5 – Summary of Costs for the Main Sewer Renewal Program as of 6/21/2016