

LIFE CYCLE COST ANALYSIS EXAMPLE PROBLEM

The following example develops the LCC for three alternative drainage structures to satisfy a 50-year design life.

Alternates

A: Galvanized CSP with an initial cost of \$195,000 and a projected service life of 40 years. At the end of 40 years, rehabilitation will be required to extend service life by at least 10 years.

B: Asphalt coated CSP with an initial cost of \$214,500 and an estimated service life in excess of the 50-year project design life.

C: Reinforced concrete pipe with an initial cost of \$230,000 and an estimated life in excess of the 50-year project design life.

Other Assumptions

Maintenance: The periodic cost for inspecting and maintaining each of the three alternates is considered to be about equal. Since the effect on all alternates is equal, these recurring costs need not be included in the calculation.

Rehabilitation: The material service life of alternate A is less than the required 50-year project design life. The invert life can be extended by at least 15 years with a lining that is estimated to cost \$48,750, or 25% of the initial cost, in current dollars.

Discount Rate & Inflation: All cost estimates are expressed in current dollars, inflation is ignored. The owner agrees that a real discount rate of 7% is appropriate.

Present Value Calculation

Of the three choices, only Alternate A needs to be analyzed to determine the present value of the invert rehabilitation projected in year 40. The present value of alternates B and C is equal to their initial cost since there are no significant future expenditures. In the case of A, at a discount rate of 7% the present value is as shown below:

Discount Rate = 7%

YEAR	CURRENT DOLLARS	FACTOR	PRESENT VALUE
0 - Initial Cost	\$195,000	1.0000	\$195,000
40 - Rehab.	\$48,750	.0668	\$3,255
Total	\$243,750		\$198,255

LCC Comparison

ALTERNATE	A	B	C
TOTAL CURRENT COST	\$243,750	\$215,500	\$230,000
TOTAL PRESENT VALUE @7%	\$198,255	\$214,500	\$230,000
RANKING	1	2	3

Alternate A, with a present value of \$198,255 is the lowest cost alternative.