

Hawthorne Road Life Cycle Analysis of Options

	Construction Cost	Life Expectancy of Option (in years)	Annual Maintenance Cost	Life Cycle Cost (25 years)
OPTION 1 - MAINTAIN EXISTING GRAVEL ROADWAY	\$0	0-1*	\$6,000	\$150,000
OPTION 2 – DRAINAGE IMPROVEMENTS WITH DITCHING AND DRAINTILE	\$1,442,160	4-7	\$3,000	\$1,517,160
OPTION 2A – DRAINAGE IMPROVEMENTS WITH DITCHING ONLY	\$678,960	3-6	\$3,000	\$753,960
OPTION 2B – DRAINAGE IMPROVEMENTS WITH NO DITCHING	\$839,472	2-4	\$3,000	\$914,472
OPTION 3 – CHEMICAL STABILIZER	\$471,960	3-10	\$3,000	\$2,434,800
OPTION 4 – BASE PATCH/GRAVEL SPOT REPLACEMENT	\$900,762	2-4	\$6,000	\$1,050,762
OPTION 4A – BASE PATCH/GRAVEL SPOT REPLACEMENT WITH DRAINAGE IMPROVEMENTS	\$2,419,242	8-10	\$4,000	\$2,519,242
OPTION 5 – ASPHALT OVERLAY OVER EXISTING GRAVEL	\$533,400	3-5	\$0	\$2,667,000
OPTION 5A – ASPHALT OVERLAY OVER EXISTING GRAVEL WITH BASE PATCH	\$1,414,482	4-6	\$0	\$5,657,928
OPTION 6 – GRAVEL RECONSTRUCTION	\$786,696	5-10	\$5,000	\$2,485,088
OPTION 6A – GRAVEL RECONSTRUCTION WITH DRAINAGE IMPROVEMENTS	\$2,229,000	10-15	\$5,000	\$4,583,000
OPTION 7 – ASPHALT PAVEMENT RECONSTRUCTION	\$1,225,116	10-15	\$10,000	\$2,700,232
OPTION 7A – ASPHALT PAVEMENT RECONSTRUCTION WITH DRAINAGE IMPROVEMENTS	\$2,556,000	20	\$10,000	\$2,806,000

Assumptions/Clarifications:

All annual maintenance costs for any gravel surface could vary substantially based upon weather and wear of the road on any given year. For example in 2019, this road had approximately \$68,000 spent on “maintenance”. Each gravel option could include a contingency maintenance cost of \$50,000 per year, but at this time it is not included.

Annual maintenance costs for asphalt roadways assume crack sealing 2 times during the 25 year life cycle, with a one-time seal coat and one time overlay.

Option 1=Life Expectancy is considered 0-1 year because the road has already had a critical failure, where no one could drive on a portion. The road could stay as is and have no issues for numerous years, with typical maintenance, but at any time it could fail again due to saturated base.

Option 2=The life expectancy is for keeping the road as is (option 1) and only doing the drainage improvements; no other work would be completed. The construction cost is not repeated every duration of life expectancy; the road will just continue to fail without fixing anything.

Option 3=The life expectancy will vary depending if any drainage improvements or subsurface work is completed and how much of a wear surface (gravel placed on top of the chemical stabilized road) is placed. 3 years assume no other improvements, 10 years is with drainage improvements and 4" wear surface (gravel) placed on top. Total cost assumes 5 year average life.

Option 4=This option fixes the areas believed to be the problem areas and no work is completed on other locations. This option would not be re-done every 2-4 years, but could fail at any time once the 2-4 years have went by and would be similar to option 1.

Option 5=The life expectancy of an asphalt overlay, with no subsurface or drainage improvements would drastically decrease the road life and failure could commence almost immediately. Therefore figure no annual maintenance and just re-pave every 5 years.

Option 6=The life expectancy of a gravel road, once reconstructed, could vary, and for this scenario we assumed a one-time re-construct during the life. The reconstruction assumes at least 25% of the sub-base is fixed.

Option 7=The life expectancy of an asphalt road, property reconstructed with at least 25% subbase removed, could vary between 10-20 years depending on the drainage. With no drainage improvements we believe the road would have to be reconstructed 2 times in the 25 year period; while it could last 25 years with just an overlay if drainage improvements were completed.