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April 4, 2025

Mayor Jacque and City Council Members
City of Dyersville
Memorial Building
340 1st Avenue East
Dyersville, IA 52040

RE: Discussion and Possible Action for 1st Avenue West Roadway Project

Dear Honorable Mayor Jacque and Council Members:

I am writing to provide a detailed analysis and recommendation for the roadway repair options for 1st Avenue W - West of RAB. After thoroughly evaluating the capital, operation, and maintenance costs over a 35-year period, and considering all benefits equal, I have conducted a Net Present Value (NPV) analysis using a discount rate of 3.1%. The results of this analysis are summarized below.

Summary of Options and NPV Analysis:

Option 1: 6-inch Whitetop

Initial Cost (2026): \$765,951

Annual Maintenance Costs:

- 2036: \$5,000
- 2041: \$5,000
- 2046: \$5,000
- 2051: \$5,000
- 2056: \$5,000
- 2057: \$3,000
- 2059: \$4,000
- 2060: \$4,000

NPV with Discount Rate (3.1%): \$1,392,124.19

NPV without Discount Rate: \$1,585,902.00

Option 2: 4-inch HMA Overlay

Initial Cost (2026): \$604,261

Annual Maintenance Costs:

- 2036: \$5,000
- 2041: \$5,000
- 2046: \$5,000
- 2051: \$5,000
- 2056: \$5,000
- 2057: \$3,000
- 2059: \$4,000
- 2060: \$4,000

NPV with Discount Rate (3.1%): \$1,516,387.09

NPV without Discount Rate: \$1,810,522.00

Option 3: 2-inch HMA Overlay

Initial Cost (2026):** \$287,500

Resurfacing Costs:

- 2041: \$373,750
- 2051: \$270,000
- 2056: \$162,000 (*Discounted to match 35 year period*)

Annual Maintenance Costs:

- 2037: \$2,000
- 2038: \$2,000
- 2039: \$2,000
- 2040: \$2,000
- 2043: \$2,000
- 2044: \$2,000
- 2045: \$2,000
- 2047: \$2,000
- 2049: \$2,000
- 2050: \$2,000
- 2052: \$2,000
- 2053: \$2,000
- 2055: \$2,000
- 2057: \$3,000
- 2059: \$4,000
- 2060: \$4,000

NPV with Discount Rate (3.1%): \$1,380,810.57

NPV without Discount Rate: \$1,682,500.00

Option 4: No Improvements

Annual Maintenance Costs:** \$3,000 - \$25,000 annually

Impact: The no-improvement option would affect the benefits and may result in road closures, leading to increased travel time, higher vehicle operating costs, more frequent pavement maintenance, reduced safety, and higher emissions. Since this option affects the benefits of the roadway, it is not a viable long-term option.

NPV Formula

The formula used for the NPV calculations is:

$$NPV = \sum_{t=1}^n \frac{C_t}{(1+r)^t} - C_0$$

Where:

- C_t = Cash flow at time t
- r = Discount rate (3.1%)
- t = Time period
- C_0 = Initial cost

Benefits Analysis

I have explored the benefit side and outlined all the benefits from the Benefit-Cost Analysis (BCA) report. The key benefits considered in the analysis include:

Travel Time Savings: Reduced vehicle hours traveled (VHT) and vehicle miles traveled (VMT).

Vehicle Operating Cost Savings: Reduced VMT for cars and trucks.

Pavement Maintenance Cost Savings: Reduced vehicle travel distance and modal diversion.

Crash Safety Benefits: Reduction in crashes per vehicle mile traveled.

Emissions Reduction Benefits: Calculated for NO_x, PM_{2.5}, SO₂, and CO₂.

I found that all options will have the same benefits for options 1 through 3 no matter what option the City Council chooses.

Recommendation

Based on the NPV calculations with a discount rate of 3.1%, Option 3: 2-inch HMA Overlay has the lowest NPV over the 35-year period. However, this option has more unknowns due to asphalt cost uncertainty and inflation constraints over the next 35 years. Therefore, I recommend proceeding with Option 1: 6-inch Whitetop. This option is a one-time expense with limited operation and maintenance costs.

Option 3: The 2-inch HMA Overlay will be more uncertain over the next 35 years. Political, economic, and environmental factors, along with different processes and formula changes, could increase costs in the future. This risk is too great, and I recommend the 6-inch Whitetop option to ensure a more stable and predictable financial outcome for the city.

Thank you for your attention to this matter. Please feel free to reach out if you have any questions or require further information.

Sincerely,

A handwritten signature in black ink, appearing to read "Mick J. Michel". The signature is fluid and cursive, with a large loop at the end.

Mick J. Michel,
City Administrator