

**Granite Falls Bridge #102 Replacement
TIGER Grant Application
Benefit Cost Analysis (1)**

| Costs | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2040 |
|----------------------------|-------------|-----------|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------|-------|-------|-------|-------|------------|-------|-------|-------|-------|
| Construction | 20,000,000 | | | | | | | | | | | | | | | | | | | | | | |
| Benefits | | | | | | | | | | | | | | | | | | | | | | | |
| Capital (avoided costs) | | | | | | | | | | | | | | | | | | | | | | | |
| Bridge Painting (2) | 1,129,238 | | | | | | | | | | | | | 3,116,000 | | | | | | | | | |
| Reconstruction (3) | 19,231,118 | | | | | | | | | | | | | | | | | | 53,066,000 | | | | |
| Major Repair (4) | 447,104 | | | | | | | | | | | | | | | | | | | | | | |
| GHG Emission Saved | | | | | | | | | | | | | | | | | | | | | | | |
| GHG Emissions (detour) (5) | 161,085 | | | 197,335 | | | | | | | | | | | | | | | | | | | |
| GHG Emissions (idling) (6) | 149,548 | | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 | 3,052 |
| Ladders of Opportunity | | | | | | | | | | | | | | | | | | | | | | | |
| DBE (7) | | 3,115,736 | | | | | | | | | | | | | | | | | | | | | |
| Training | | 36,000 | | | | | | | | | | | | | | | | | | | | | |
| Total | 21,118,093 | 3,151,736 | | | | | | | | | | | | | | | | | | | | | |
| BCR | 1.21 | | | | | | | | | | | | | | | | | | | | | | |

Footnotes (1) All costs are in 2017 Dollars
 (2) Cost to paint current structure on 20 year cycle; last painted in 2010. Costs inflated at 3%/year and discounted at 7% per OMB Circular A-4
 (3) Cost to replace current structure at 100 year anniversary; continuous impact loading (metal fatigue) will render substructure unsafe and cannot be renovated due to design
 (4) Four week shut down to replace failing gusset plates
 (5) Avoided GHG emissions due to four week detour using average mpg, emission rates and social cost of GHG per EPA
 (6) Avoided GHG cost of idling time attributable to single heavy truck limitation based on 750 trucks idling 5 minutes each per day and emissions data from US Energy Information Administration
 (7) Based on recent similar projects in same geographical vicinity