

TIGER Grant Application -2015

Criteria	Current Status (Baseline)
Safety	81 year old bridge utilizing a structural method no longer accepted by (?) Structurally deficient and functionally obsolete
State of Good Repair	Poor geometrics for current volumes and weight High likelihood of 4-week closure within 5 years High likelihood of one - year closure within 10 yrs
Economic Competitiveness	Vulnerable economically viable access to critical markets with national significance
Quality of Life	No non-motorized alternatives meeting current design standards
Environmental Sustainability	Only detour route to markets is 94 miles Current approach alignment does not protect adjacent wetlands or wildlife habitat Current structure does not manage water run-off
Innovation	Alignment, structural design and context integration was developed 81 years ago Existing project was constructed using the traditional design-bid-build concept
Partnership	Originally constructed by a single entity with no public input or partnership collaboration

Planned Improvement

Construct new bridge utilizing current approved construction methodology
Construct to current design standards

Incorporate approach geometry into new structure
Replace inherently weak construction methodology with more reliable system
Same

Design for redundancy
Connect with existing alignment in an integrated system

Construct wider shoulders and wider, more protected pedestrian and bicycle pathways

New structure designed to withstand all predictable eventualities
Map, evaluate and protect natural areas using context sensitive design
New structure will manage run-off

Incorporate interdisciplinary team analysis into project development process
Explore using alternative construction approaches such as design-build or GCCM

Develop project through robust planning process including multiple stakeholders

Benefit

75 year useful life
Ensured economic and employment access
Improved safety for all vehicle and modal types

Improve travel time by eliminating speed reductions
Minimize structural stress
Eliminate long closure

Maintain essential economic, recreational, safety connections

Reliable, continuous access to markets
Increase speeds, delivery time safely

Enhance non-motorized safety
Support and encourage non-motorized usage

Maintain air quality by avoiding heavy truck detours
Ensure continued convenient recreational access
Protected natural habitat

Protect water quality in the river

Assurance that project will be integrated into the entire community for its design life - 75 years
Lower overall construction costs and potential construction schedule improvements

Integration of new structure into local, regional and state plans and existing projects; local support for a regionally significant project

Granite Falls Bridge #102 Replacment
 BUILD Grant Application 2018
 Benefit Cost Analysis (1)

Costs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Construction	22,073,000																				
Benefits																					
Capital (avoided costs)																					
Bridge Painting (2)	2,500,000																				
Full Replacement (3)	12,461,000															34,423,000					
Major Repair (4a)	1,233,637					568,044					658,519										
Major Repair (4b)	1,772,914							3,166,925													
Annual Maintenance (avoided Costs)																					
Rail Repair		5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Pressure Washing		8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000
Grind/Repair Deck Surface		8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000
Apply/Sweep Sand		7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000
Total	560,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000
GHG Emission Saved																					
GHG Emissions (detour) (5)	161,085																				
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
DBE (7)	2,207,300																				
Payroll Loss Prevented (8)	16,400,000																				
Benefits -Total	37,445,484																				
BCR	1.70																				

Footnotes

- (1) All costs are in 2020 Dollars
- (2) Cost to paint current structure on 20 year cycle; last painted in 2010. Bridge would not be painted again in 2030 because it would be at the end of its useful life.
- (3) Cost to replace current structure at 100 year anniversary; continuous impact loading (metal fatigue) will render substructure unsafe under any circumstances. Cannot be renovated due to design cost shown is the PV of avoiding replacing the bridge following toal failure at 100 years compunded at 3% annually and discounted back at 7% annually
- (4a) Four week shut down to replace failing gusset plates; County Bridge Engineer estimates significant gusset plate failure every five years
cost shown is the PV of avoiding replacing gusset plates in 2020, 2025 & 2030, compunded at 3% annually and discounted back at 7% annually
- (4b) County Bridge Engineer recommends full deck replacement in 2018 at a 2020 cost of \$2.5M;
cost shown is the PV of avoiding replacing the bridge deck compunded at 3% annually and discounted back at 7% annually
- (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 emmissions data from U Administration Administration
- (7) Washington State Department of Transportation strives for a minimum of 10% DBE (Disadvantaged Business Enterprise) on all federally funded construction projects
- (8) Washington State Employment Security Department has documented that payroll in the two industries utilizing the structure is \$16,400,000 in 2017
There is no guideline for how this should be compounded or discounted. Wages, fuel costs, and equipment costs will generally keep pace with inflation so future vs. current present value will realistically be zero.