FY 22 HMA – Grant Application Review Summary

Subapplication Number	EMA-2022-BR-001-0034		
Project Title	Upper Yadkin River Floodplain Resiliency Initiative for Jonesville		
Applicant Name	North Carolina Department of Public Safety		
Subapplicant Name	Town of Jonesville		
Project Type	Flood Risk Reduction		
Recommendation	Yes with Conditions		
Federal Cost (FEMA GO)	$7,215,129	**Phased Project**	Yes
BCR (subapplication)	12.75	**Duplicate Project**	No
BCR (reanalysis)	1.08	**Benefits (reanalysis)**	$9,370,560

Summary

This is a technical feasibility and cost-effectiveness review in support of the National Technical Review process. Additional Environmental Planning and Historic Preservation (EHP), eligibility and completeness, and funding limitation considerations may affect the selection of this subapplication for further consideration and funding. No contact was made with the applicant or subapplicant; this review is solely based on information provided in the subapplication.

Scope of Work

The scope of work is well-defined and clearly explains the activities necessary to complete the work. The subapplicant has submitted a subapplication for two project components: (1) stream restoration of the south bank of the Yadkin River and four tributaries, and (2) relocating and paving of the Yadkin River Greenway and implementing flood proofing measures in adjacent areas.

The stream restoration component will consist of recontouring approximately 15,500 linear feet of streambanks and installing 53 rock vanes and 18 cross vanes to protect the streambanks and aid in diverting flood waters back into the main channel of the Yadkin River.

To further stabilize the banks, intensive revegetation with riparian grasses, container plants, live stakes, and bare root plants of diverse native species will be planted, monitored, and maintained. At the Greenway, a natural area between urban communities, the proposed improvements include relocation of the trails system out of the flood zone where possible, design and construction that withstands typical flood events, paving trails where feasible to protect against erosion, a parking area at the emergency boat access, and repaving of portions of local roads previously damaged by flood waters.

The scope of work appears to be missing a comprehensive hydrologic and hydraulic (H&H) study.

Technical Feasibility

Project Schedule

The schedule duration is 36 months. The schedule includes all items in the scope of work and is reasonable.

Cost Estimate

The cost estimate does not include sufficient line items consistent with the scope of work. The cost estimate appears to be missing a comprehensive H&H study. The mitigation purpose of some line items in the project budget is unclear, including mountain bike trails, picnic shelters, greenway access, parking, boat ramp, and bathroom/facility. The cost estimate included a contingency cost of 15 percent, which is

greater than the contingency cost range (1–5 percent; up to 7 percent for historical structures) recommended by the HMA Guidance. The cost estimate in FEMA GO is inconsistent with cost estimate included in documentation.

Technical Design Information

The following information and documentation were provided to support the project:

Item	Documentation	Evaluation
Proposed Level of Protection	Subapplication, Technical Memo, Scope of Work Memo	The project proposes to protect the Yadkin Riverbank and Greenway during the 25-year event.
Flood Risk Data	FIRM	The proposed project is in the Special Flood Hazard Area. The provided documentation does not show how the proposed project will reduce risk. The subapplication states that the project will reduce risk from flooding by implementing restoration activities that will reconnect the floodplain to the river allowing for reduced volumes, and velocities and accounting for the 25-year storm events. The subapplication states that natural stream channel design and engineering parameters will be implemented and a combination of bio-engineering practices (use of natural, woody, trees, shrubs and native seedings) coupled with the strength and stability of large, natural boulders and rocks strategically placed along the streambanks for restoration. However, the subapplication does not include technical data to support the claim.
Residual Risk	Subapplication, Scope of Work Memo	Subapplicant indicates that residual risk is present from floods above the 25-year event but residual risk is not quantified, and an H&H analysis has not been performed. The subapplication indicates, “investigation and calculations of hydrologic/hydraulic modeling will be drafted after project funding is awarded.” However, a comprehensive H&H study is not discussed in the scope of work nor is it included in the cost estimate.
Design and Performance Standards	Subapplication, Scope of Work Memo	Subapplicant states that the town will follow all necessary federal, state, and local permitting laws during the design process. Subapplication, identifies the 2018 NC State Code: Building, Energy Conservation, Fire, Fuel Gas, Mechanical, Plumbing, Residential.

Item	Documentation	Evaluation
		Scope of work also indicates that design plans will capture features such as load design, building code requirements, setbacks, vegetation establishment, etc.
Design Drawings, Maps, Photographs	Aerial Photos	Documentation was not provided to support the project. Subapplicant provided two aerial images that shows location of the Greenway and the general location of the proposed improvements. Drawings detailing the project components and the scope of the channel improvements are not provided.
Upstream and Downstream Impacts	Not provided	The documentation does not discuss whether the proposed project will have adverse upstream or downstream impacts. The subapplication states that "further investigation and calculations of hydrologic/hydraulic modeling will be drafted after project funding is awarded." However, it is unclear if an H&H study was considered as part of the proposed scope of work and budget.
CLOMR/LOMR	Subapplication, Scope of Work Memo, Cost Estimate	The documentation indicates a CLOMR/LOMR may be necessary. The scope of work sates that either a no rise certification or a CLOMR/LOMR may be required. A no rise certification task is identified in the detailed cost estimate.
Operation and Maintenance (O&M) Plans	Subapplication, Scope of Work Memo	Subapplicant indicates that a plan for the operation and monitoring of the stream restoration will be developed as part of the project design.

Based on the documentation provided, the project is technically feasible and effective at reducing risk to individuals and property from natural hazards. The following conditions were identified:

- Verify the eligibility of the costs associated with the mountain bike trails, picnic shelters, greenway access and parking and boat ramp, and bathroom/facility line items presented within the cost estimate.
- Verify that the cost estimate matches the supporting documentation. If they do not match, amend the cost estimate to match the supporting documentation.
- Provide documentation to support that the proposed project will not have adverse upstream or downstream impacts.
- Provide further explanation of H&H analyses to be performed as part of Phase 1.

Provide the following Phase 1 deliverables needed to determine technical feasibility:

- Hydrologic and hydraulic data/modeling, geotechnical investigation, and other relevant technical investigations and data needed to complete designs and permits.
- Engineering design (typically 30/60/90 percent completion) and cost estimate.
- Technical body of information needed to support the desired level of effectiveness/protection or amount of risk reduction.

Cost-Effectiveness

The Benefit-Cost Analysis (BCA) was completed based on historical damages.

The following was found during review of the submitted BCA:

Cost Estimation

Input	Value	Evaluation
Project Useful Life (PUL)	30 years	This value is consistent with the FEMA standard value.
BCA Toolkit Initial Project Cost	$4,811,999	This amount is not consistent with the subapplication project cost estimate. Project cost in subapplication is $8,556,558.50. Documentation indicates conflicting cost estimates. (BCA narrative document indicates a construction cost of $5,901,924.50 [no design or permitting], detailed cost estimate table indicates total project cost of $7,126,666.58).
Annual Maintenance Cost	$10,000	This amount is reasonable.
BCA Toolkit Total Project Cost	$4,936,089	This amount is calculated based on the initial project cost, the annual maintenance costs, and the PUL.

Historical Damages

Input	Evaluation
Facility Type	The facility type used in the BCA is listed as 'Other' (for the Greenway Trail system, river access, etc.). This input is consistent with the proposed project in the subapplication.
Before-Mitigation Damages	Damage estimates were provided for three flood events for the years 2017, 2018, and 2020. Recurrence intervals (RIs) for the events were inputted as 100-, 10-, and 100-year, respectively. The documentation narrative includes a description of how the damages for the 2020 flood event were estimated. However, numbers in the BCA do not match the narrative provided so it is not clear how the damages ($5,797,493) were calculated. Documentation for damages associated to the 2017 and 2018 events was not provided. Volunteer costs are included.

Input	Evaluation
After-Mitigation Damages	After-mitigation damages for a 10-year event were estimated in $10,000. No documentation is provided to support these costs. Costs for 20 volunteers working for 5 days were also included but not supported.

Additional Benefits

Input	Documentation	Evaluation
Environmental Benefits	BCA Analysis	The BCA estimated benefits for 166.5 acres consisting of 71% rural green open space (118.2 acres), 25% forest (41.6 acres) and 4% riparian (6.7 acres). Even though the scope of work indicates that "riparian buffer corridors will be reestablished" and extensive native habitat restoration through planting of woody, trees, and shrubs is recommended, no documentation is provided to support the area and habitat percentages values used in the BCA.
Volunteer Costs	Documentation not provided	BCA narrative indicates that the Jonesville Trails association have complete records for dates prior to 2019. However, the records do not provide a clear delineation of the number of volunteers and number of days spent for each clean-up effort. The narrative indicates that the association was able to "assign a dollar amount to each clean-up session." It is unclear how these costs were translated into number of volunteers and number of days of work.

BCA Assistance

This subapplication qualified for additional BCA assistance. A reanalysis BCA was performed, and the following edits were made:

Input	Value	Explanation
Initial Project Cost	$8,556,558.50	Adjusted to match subapplication project cost.
Before-Mitigation Damages		Damages associated to historical flood events were removed. Volunteer costs associated to the flood events were removed.
Environmental Benefits	20.3 acres Riparian (%) 100	Area value used was obtained from the costs estimate line item for the "planting, bioengineer, seeding" activity. The project SOW specifies planting of native riparian species.

Based on the reanalysis BCA, the total benefits associated with this project, $9,370,560, are greater than the total project cost of $8,680,649, producing a BCR of 1.08.

Based on the documentation provided, the project is cost-effective. The following conditions were identified:

- Provide documentation for environmental benefits that supports beneficial land use changes and/or improvements to those lands identified.
- Provide documentation, including a map, to confirm the total area of riparian habitat that will be enhanced or created within the project footprint.

Provide the following Phase 1 deliverables needed to determine cost-effectiveness:

- Refinement of the BCA.

Conclusion

Based on the information provided, the project is technically feasible and cost-effective; therefore, it is recommended for further consideration with the following conditions:

- Verify the eligibility of the costs associated with the mountain bike trails, picnic shelters, greenway access and parking and boat ramp, and bathroom/facility line items presented within the cost estimate.
- Verify that the cost estimate matches the supporting documentation. If they do not match, amend the cost estimate to match the supporting documentation.
- Provide documentation to support that the proposed project will not have adverse upstream or downstream impacts.
- Provide further explanation of H&H analyses to be performed as part of Phase 1.
- Provide documentation for environmental benefits that supports beneficial land use changes and/or improvements to those lands identified.
- Provide documentation, including a map, to confirm the total area of riparian habitat that will be enhanced or created within the project footprint.

Provide the following Phase 1 deliverables needed to determine technical feasibility and cost-effectiveness:

- Hydrologic and hydraulic data/modeling, geotechnical investigation, and other relevant technical investigations and data.
- Engineering design (typically 30/60/90 percent completion) and cost estimate
- Technical body of information needed to support the desired level of effectiveness/protection or amount of risk reduction.
- Refinement of the BCA.
- Additional documentation required to support compliance with eligibility, technical feasibility, cost-effectiveness, and EHP requirements.

This review is an evaluation of the project's technical feasibility and cost-effectiveness. Additional EHP, eligibility and completeness, and funding limitation considerations may affect the selection of this subapplication for further consideration and funding.