

Benefit-Cost Analysis (BCA) Data Documentation Template – Flood

FEMA reviews Benefit-Cost Analyses (BCAs) for all proposed mitigation projects submitted under the FEMA grant programs to determine whether the information provided in the application is:

1. Credible and well-documented
2. Prepared in accordance with accepted FEMA BCA practices
3. Able to demonstrate that the project is cost-effective

The following template can be used to assist in the collection and entering of information to meet these requirements within the BCA Tool. One way to use this tool is to highlight or circle the source and use the last column to record the software input and justification for values that vary from the FEMA Standard Values.

Obtained	Input	Documentation Summary	Potential Sources	Software Input/Justification
<input type="checkbox"/>	Name, address, county, and latitude/longitude for each project structure	Include contact information and whether building is historic.	Documents available from homeowner, local building inspector, local tax assessor's office, or title documents.	
<input type="checkbox"/>	Project Information	Project Information includes: <ul style="list-style-type: none"> • Project Number • Analyst Name and Contact Information • Grant Program • Project Point of Contact (POC) 	Information available from the project manager or POC.	
<input type="checkbox"/>	Flood Mitigation Project Type	Refer to your project SOW to determine the type of mitigation project. Project types include acquisition, elevation, flood proofing/temporary flood barrier, drainage improvement, or other.	The project manager or engineer can provide the SOW. Engineering designs may also provide this information.	

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<input type="checkbox"/>	<p>Scope of Work (SOW) (required)</p> <p>Upload the SOW to documents within the software.</p>	<p>Should include:</p> <ul style="list-style-type: none"> • Problem Description and Proposed Solution • Description of Existing Conditions • Work Schedule • Cost Estimate • Engineering schematics, detailed engineering drawings, or engineering designs 	<p>The SOW is available from the project manager.</p> <p>The BCA Cost Estimation module will walk the user through costs that are valid for each project type.</p>	
<input type="checkbox"/>	<p>Project Useful Life (PUL)</p>	<p>The estimated amount of time (in years) that the mitigation action will be effective. The PUL is based on the type of mitigation.</p>	<p>Sources include the PUL table provided in the dynamic help, the project manager, or the project engineer.</p>	
<input type="checkbox"/>	<p>Cost Estimate</p>	<p>All anticipated project costs, including maintenance costs, should be detailed over the useful life of the project. Avoid the use of lump-sum costs. The Cost Estimate should include:</p> <ul style="list-style-type: none"> • The source of the estimate and supporting documentation • The base year of all cost estimates and any deviations due to the anticipated date of construction • Anticipated environmental resource remediation or historic property treatment measures • Other related construction/demolition/relocation 	<p>Provide contractor or Standard Cost Estimating software estimates. Source should be government representative or professional with relevant expertise.</p>	

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		<p>costs, such as survey permitting, site preparation, and material disposal</p> <ul style="list-style-type: none"> Other acquisition costs, such as appraisals, legal recordation, displacement costs for renters, or maintenance 		
<input type="checkbox"/>	<p>Flood Insurance Study (FIS) or Hydrology and Hydraulics (H&H) Study Data</p>	<p>Indicate the source of flooding as either riverine or coastal.</p> <p>The 10-, 50-, 100- and 500-year flood events must be input for each source of flooding.</p> <p>Specific locations for hazard-specific FIS data by flooding source:</p> <ul style="list-style-type: none"> <u>Riverine</u>: Summary of Discharge Table and Flood Profiles (Streambed Elevation is found in profile) <u>Coastal A or V</u>: Summary of Stillwater Elevations Table, Transect Location Map, and Transect Data Tables <p>Include a copy of FIS or H&H study marked up with project location, FIRM title block, and map scale in each project application.</p>	<p>FIS reports can be obtained from the FEMA Flood Map Service Center at http://store.msc.fema.gov.</p> <p>If the source of hazard information is not an FIS, include the agency name, report title, date, and name of the watercourse (from the report cover) OR engineer/ hydrologist name, registration number, date, and methodology used.</p>	
<input type="checkbox"/>	<p>Special Flood Hazard Area (SFHA)</p>	<p>Show whether the project is located in the area that would be flooded by the “base flood” (1-percent-annual-chance</p>	<p>FIRMs can be obtained from the FEMA Flood Map Service Center at http://store.msc.fema.gov.</p>	

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		or 100-year flood) and is at a high risk for flood damage. SFHAs are indicated in the grey areas on the Flood Insurance Rate Map (FIRM).	Smaller versions of FIRMs, or FIRMettes, are also available at no extra cost.	
<input type="checkbox"/>	FIS, FIRM, and H&H – Effective Dates, Panel, and Community ID Numbers	The FIS effective date is on the front of an FIS report. The FIRM effective date, panel, and Community ID numbers are in the FIRM title block in the lower right portion of a FIRM. If an H&H is used, enter the study title and the effective date.	See above entry.	
<input type="checkbox"/>	Elevation of the top of the lowest floor <u>Riverine or Coastal A</u> : First Floor Elevation (FFE) <u>Coastal V</u> : Elevation of the lowest horizontal structural member	Depending on the source of flooding, the elevation of the top of the lowest finished floor in a building is described differently. However, the source of this information is the same: a FEMA Elevation Certificate signed by a licensed engineer or surveyor indicating the FFE or lowest horizontal structural member.	Obtain from licensed engineer or surveyor or municipal building department. Elevation certificate form is available at the FEMA Web site at http://www.fema.gov/pdf/nfip/elvcert.pdf .	
<input type="checkbox"/>	Size of Building	The total enclosed square footage of the building. Acceptable forms of documentation include appraisals, tax records, survey, homeowner estimates, or measured drawings accompanied by photographs.	Data is available from assessor, owner, local tax office or appraiser's office, surveyor, or title documents with building footprint.	
<input type="checkbox"/>	Building	Enter cost per square foot to build a	Sources can include a local building	

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	Replacement Value (BRV)	comparable structure. Acceptable forms of documentation include a letter from a construction company, contracting firm, or local building inspector; photocopies of pages from standard cost reference manuals; or tax records.	inspector, construction company, architect, building engineer, or standard cost estimating software. If tax records are used, the source must be an assessor.	
<input type="checkbox"/>	Demolition Damage Threshold	The demolition damage threshold is the percentage of building damage at which demolition and replacement (rather than repair) would be the economically efficient choice. The FEMA Standard Value for the Demolition Damage Threshold is 50 percent. Documentation is required for value other than 50%.	Sources may include a local ordinance that documents a building is considered substantially damaged below the 50 percent threshold defined by the NFIP.	
<input type="checkbox"/>	Residential Buildings Input Categories: <ul style="list-style-type: none"> • Building/foundation type • Number of stories • If there is a basement • Coastal V: with or without obstruction 	Building and foundation types are a major determinant of anticipated damage from floods. Building types include one-story, two or more stories, split level, mobile home, or other buildings. Foundation types include slab, pier, or pile. Acceptable forms of documentation include photocopies of tax records, hard copy or electronic photos, appraisals, and letters from homeowners.	Information is available from the homeowner, local building inspector, local tax assessor's office, or title documents.	

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		In Coastal V areas you must determine whether the waves are with or without obstruction.		
<input type="checkbox"/>	Non-Residential Buildings Input Categories: <ul style="list-style-type: none"> • Type of structure • Primary use of building 	Determine whether the structure is engineered or pre-engineered. Building uses may be retail, hotel, fast food, non-fast food, hospital, medical office, protective services, correctional facility, recreation, religious facilities, schools, service station, office, convenience store, grocery store, apartment, industrial, or warehouse. If not using the default value for the primary use of building, documentation must be provided.	Information is available from owner, local building inspector, local tax assessor's office, or title documents.	
<input type="checkbox"/>	Building Contents Value	FEMA Standard Value (default): <ul style="list-style-type: none"> • Residential Buildings: Varies between 50-100 percent depending on the Depth Damage Function • Non-Residential Buildings: Varies based on the primary use of the building Provide detailed descriptions of contents, their value, and the means by which the value was assessed for all non-residential buildings and if default value is not used for residential buildings.	Review insurance records, appraisals, purchase receipts, or estimates based on current market prices for similar contents. Contents do not include items that are permanent parts of the building, such as electrical and plumbing systems.	
<input type="checkbox"/>	Displacement Costs	Costs of occupants displaced to	Local community advertisements,	

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		<p>temporary quarters while damage is repaired. Includes rent and other monthly costs, such as furniture rental and utilities, and one-time costs, such as moving and utility hook-up fees.</p> <p>FEMA Standard Value for Residential (default): \$1.44 per square foot per month; one-time costs is \$500.</p> <p>Possible documentation if the default value is overwritten includes: copies of advertisements for local rentals in the community, records of phone contacts with rental agencies, and receipts from similar rentals.</p>	<p>rental agencies, and similar rental receipts.</p> <p>Extra commuting costs and day care may be estimated as long as the estimation methodology is explained.</p>	
<input type="checkbox"/>	Loss of Rent	Loss of Rent is for rental properties <i>only</i> and does not include one-time costs.	Provide receipts for rent payments or owner's records as documentation.	
<input type="checkbox"/>	Value of Contents of Crawlspace	<p>Enter the value of contents stored between the ground and the underside of the lowest flood structural component.</p> <p>The value of contents of crawlspace only applies to structures with pier foundation types. An itemized list of contents in the crawlspace must be provided.</p>	Data is available from owner.	
<input type="checkbox"/>	Non-Residential: Loss of Service	Critical facility types include fire station, hospital, police station, and other. The fire station facility type	Information regarding the number of people served by a critical facility (or by alternate hospitals)	

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		<p>includes fire fighting, search and rescue, public shelter, and Emergency Medical Services, if they are located in the same facility. The hospital facility type includes in-patient hospitals and emergency rooms. Other medical facilities, such as nursing homes, are included in the “other” facility type.</p> <p>Necessary documentation for Critical Facility Type is determined by the Facility Type selected, however it may include information to support the following data:</p> <ul style="list-style-type: none"> • Number of people served by the critical facility • Type of area served by a fire or police station • Distance (in miles) between the critical facility and alternate facility • Number of police officers working a particular facility <p>Number of police officers that would serve the area if a police station was shut down</p>	<p>can be obtained from the municipality, facility operations managers, or documents such as annual reports.</p> <p>Information regarding the distance (in miles) between the critical facility and alternate facility can be obtained from facility operations managers or municipal officials. Local maps or GPS software can be used as documentation of the distance.</p> <p>The number of police officers can be obtained from the municipality, facility operations managers, or documents such as annual reports.</p> <p>Information regarding the number of police officers that would serve the area if a police station were shut down can be obtained from municipal officials or facility operations managers who can provide the appropriate number on official letterhead.</p> <p>Many police stations have emergency plans that outline the number of critical staff needed to serve the area should a police station shut down.</p>	
<input type="checkbox"/>	Non-Residential:	A structure may provide multiple	Information regarding the annual	

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	Service Type Provided by Facility	<p>services. For example, a municipal building may house a government agency and a library. You may enter additional rows and select all that apply from the drop-down menu.</p> <ul style="list-style-type: none"> • Government – local, municipal, State, Federal, or Indian Tribal government agencies • Library – Public information depository • Education – Primary, secondary, college, university, or trade school, public or private • Medical – Out-patient medical facility, rehabilitation center, or nursing home • EMS – Emergency Medical Service not co-located with a fire station or hospital • Shelter – Facility designed to provide safe, temporary housing during a hazard • EOC – Emergency Operations Center <p>Once the Service Type is selected, you must enter the annual operating budget of the agency providing the Service</p>	<p>operating budget can be obtained from the agency providing the service or it can be obtained from an annual report.</p> <p>If an agency has multiple facilities, enter only the portion of the budget that pertains to the location of the proposed mitigation.</p>	
<input type="checkbox"/>	Building Depth-Damage Function	FEMA Standard Value (default): Determined based on answers to the	Historical loss records or	

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	(DDF)	<p>software questionnaire (foundation type, number of stories, basement, etc.).</p> <p>Users can choose between the default, a library of tables, or create a custom DDF table. If the default value is not used, provide complete documentation to support user-entered values.</p>	engineering judgment.	
<input type="checkbox"/>	Other Damages/Losses Avoided	Can include damages/losses such as debris removal, emergency management costs, or disruption of life. Documentation must be provided for all elements.	Supply owners' bills, affidavits from emergency management, or other credible documentation.	