



NEW YORK STATE  
DIVISION OF HOMELAND SECURITY AND EMERGENCY SERVICES  
STATE OFFICE OF EMERGENCY MANAGEMENT



Andrew M. Cuomo, Governor

Steven Kuhr, Director

## Hazard Mitigation Benefit Cost Analysis (BCA) For Project Grants

The Federal Emergency Management Agency (FEMA) requires that Mitigation projects be cost effective, or result in savings that exceed their cost. This can be found in 44 CFR Part 206.434(c)(5), and it is achieved by performing a Benefit-Cost Analysis (BCA) that results in a Benefit-Cost Ratio (BCR) of 1.0 or greater. BCAs are completed using FEMA software to inventory and document past damages and calculate the value of damages avoided or reduced if the project is implemented.

When compiling data for the BCA, it's helpful to think of mitigation benefits as future damages and losses that would be eliminated and/or reduced by implementing the proposed mitigation project. The following categories of avoidable or reducible damages---while not exhaustive---offer a good starting point and should be considered when gathering data for the BCA Information Worksheet:

- **Casualties:** deaths, injuries, and illnesses;
- **Physical Damages:** buildings, contents, infrastructure, landscaping, site contamination, vehicles, and equipment;
- **Loss of Function:** displacement costs, loss of rental income, loss of business income, lost wages, disruption time of residents, loss of public services, loss of utility services, and the impact of road and/or bridge closures;
- **Emergency Management:** costs for emergency operations centers, evacuations and rescues, security, temporary protective measures, and debris removal and cleanup.

The State Office of Emergency Management (SOEM) has prepared worksheets to assist with the BCA portion of the mitigation application. While these are intended to address most mitigation challenges, your situation may be unique and worth discussing with SOEM program and engineering staff to ensure all eligible damages are considered. We also may ask questions or request additional documentation to fully understand the existing problem and your proposed solution, capture all damages, and present your project to FEMA in the most positive light. In order for SOEM to prepare an accurate BCA, please remember that:

- Damages, losses and costs must be documented to be considered in the BCA;
- Information on damages or losses must be related directly to the particular problem the proposed project is intended to prevent or mitigate (e.g. in a culvert failure and flooding scenario, include your costs of emergency measures, clean-out, etc., as well as associated damages to surrounding private properties located off your right-of-way;
- FEMA recognizes only monetary losses, and events or activities that cannot be assigned a monetary value cannot be included in the BCA. However, dollar figures can be correlated with certain casualty situations, loss of service, and road closures, so you should contact us if you have any questions about the eligibility of your losses.

## Completing the Benefit Cost Analysis (BCA) Worksheet

Please remember that the BCA can include only **documented** losses and associated costs that will be avoided if your project is implemented. Therefore, your application should clearly link the damages and losses described to problems at the facility or infrastructure to be mitigated, and must include documentation of the costs associated with those damages or losses.

Submit one worksheet for each event, completing all applicable sections.

1. Project Information: Check the box that describes your proposed project and answer questions 1a through 1h.
2. Stabilization Projects: Provide the date(s) the erosion or slumping began. You must document those dates and the methodology used to determine the rate of erosion provided.
3. Flooding Event (if applicable): Complete a separate BCA worksheet for **each event** (pg 4 onetime, pgs 5-7 for each event), even where multiple events occurred within one year. To establish frequency, provide the date and year of the events (be sure to include **any size** event that produced damages or losses). Provide the magnitude of the event if known (e.g. “this was determined to be a 50-year event” or “3 inches of rain in two hours,” etc.).
4. Residential Property Damage: List damages and/or losses to all buildings, contents, infrastructure, landscaping, site contamination, vehicles, and equipment for each individual residential property. Documentation could include receipts of repairs completed or estimates for work to be done, insurance claims paid, and surveys completed by the homeowner. (Note: homeowner’s time for cleanup and/or repairs may be included.) If residents were displaced from the home, include all costs related to accommodating persons during and after the event (e.g., hotel costs).
5. Business Property: In addition to the items requested in #4 (Residential Property Damage), where applicable also specify the number of days any business was closed, the net income lost, and the wages of hourly employees lost. Salaried employees are not included unless they were laid off and not paid during the shutdown.
6. Crop Losses: Monetary losses resulting from crop damages *may* be eligible in the context of a larger project that protects improved property or infrastructure.
7. Public Buildings: Document damages and repair costs. If required to vacate, note the duration of the closure and the annual budget for department(s) housed in that facility.
8. School Closure: Document damages and repair costs. If required to vacate, note the duration of the closure and any resulting loss of State aid.
9. Roadways & Bridges: Document damages and repair costs to restore to pre-event condition. If roadways or bridges were closed or travel was restricted, include the duration, daily traffic count, and costs involved in closing and re-opening each road or bridge. Where detours are established, include the costs involved in establishing and demobilizing them. (If costs are not available, provide the number of man-hours involved.) Specify the *additional* mileage and travel time required by the closure. (Example: normal travel from A to B is 20 minutes and 10 miles: the detour requires 30 minutes and 14 miles; *additional* travel time is 10 minutes and 4 miles.) Finally, specify the cost for any additional inspections or increased maintenance required as a result of the event.

10. Municipal Services: Provide costs for all municipal services required to respond to the event. Examples include Fire and Police Department staff, and EMS and Public Works personnel activities such as pumping out cellars, directing traffic, setting up detours, cleaning culverts, overtime, etc. If costs are not available, provide the man-hours required.
11. Debris Cleanup & Removal: Include all costs and/or man-hours associated with debris cleanup for both public entities and private owners.
12. Electric Service: If electric service was interrupted, note the number of *people* (not customers) affected by the loss of service. Include the duration without service in days and/or hours.
13. Water and/or Wastewater Services: If either service was interrupted, note the number of *people* (not customers) affected by the loss of service. Include the duration without service in days and/or hours. For wastewater services, indicate whether the loss of treatment was full or partial and cite any remedial actions, regulatory requirements, or resulting fines.
14. Casualties, Illnesses, or Injuries: Include all that were caused by the event, specifying the type of illness and/or injury.

### **Additional Worksheets**

Please review the additional worksheet explanations below. Depending on your project type and scope of work, you may need to complete one or both of these additional worksheets. Please note these worksheets would need to be completed once for each affected structure, and not for each event.

The ***Property Information Worksheet*** (pgs 8-10) must be completed for acquisition, relocation, elevation, flood proofing, or flood barrier type projects. If required, **prepare one worksheet for each property**, even if it was impacted by more than one event;

The ***Historic Building – Structure Worksheet*** (also called a “Historic Resource Inventory Form”) (pgs11-12) must be completed if the subject property or surrounding properties are more than 50 years old. If required, **complete one worksheet for each property**.

If you have questions, contact the New York State Office of Emergency Management:

For general mitigation information: 518-292-2304

For engineering and BCA assistance: Joe Sikora  
Civil Engineer 1  
NYS State Office of Emergency Management  
1220 Washington Avenue, Bldg. 22  
Albany, New York 12226  
518-292-2373 phone  
518-322-4983 fax  
[JSikora@dhses.ny.gov](mailto:JSikora@dhses.ny.gov)

## Benefit Cost Analysis (BCA) Information Worksheet

To be completed for all hazard mitigation project (non-planning) grant requests. Please complete page 4 (once) for basic project information; complete pages 5-7 for **each event** affecting the structures or facilities with damages you wish to mitigate. Be sure to include only damages and losses that will be reduced or eliminated by your proposed project.

1. **Project Information:** Check the appropriate project type:

- Non-Structural (*securing appliances, hot water heaters, etc.*)
- Removal from Flood Plain (*acquisition, elevation, and/or relocation*)
- Barriers (*flood proofing and flood barrier*)
- Structural (*culverts, drainage, bridges*)
- Minor Flood Control (*stream bank stabilization, retention basins*)

- a) For project types other than Non-Structural, what is the age in years of the structure(s) to be mitigated? \_\_\_\_\_
- b) Specify your project's useful life in years: \_\_\_\_\_
- c) Specify your project's effectiveness as a function of year and level: \_\_\_\_\_  
(*e.g., "this culvert project will be designed to handle the 100-year flood."*)
- d) What is your anticipated start date (month and year)? \_\_\_\_\_ (*keep in mind the review and approval timelines for all funding and regulatory agencies*)
- e) What is your anticipated end date (month and year)? \_\_\_\_\_
- f) Total Project Cost \$\_\_\_\_\_ (*costs should be calculated to construction time frame provided in 1d and 1e*)
- g) What are your current documented annual maintenance costs? \$\_\_\_\_\_
- h) What are your estimated annual after-project maintenance costs? \$\_\_\_\_\_

2. **Stabilization Projects:**

- a) For stabilization projects, what year did the erosion or other changes begin to take place? \_\_\_\_\_ mm/dd/yr
- b) For stabilization projects involving eroding land, please **document** the annual rate of erosion: \_\_\_\_\_ ft/yr (*e.g., 0.5 ft/yr or 2 ft/yr*)

Note that pages 5 – 7 need to be completed for each event.

3. **Flooding Events**: Provide the following information:

- a) Date of Event \_\_\_\_\_ mm/dd/yr
- b) Magnitude of Event \_\_\_\_\_ Year (*if known, e.g., 25yr*)

4. **Residential Property Damages**: List each individual property and the damages/losses that occurred there. Refer to the instruction sheet for items to include. (If you need more space, please provide the information for all properties on a separate sheet and label it with this item number & title.)

---

---

---

---

5. **Business Properties**: List each individual property and the damages/losses that occurred there. Refer to the instruction sheet for items to include. (If you need more space, please provide the information for all properties on a separate sheet and label it with this item number & title.)

---

---

---

---

6. **Crop Losses**: List all crop losses resulting in monetary loss to any person(s) and the amount of that loss. (If you need more space, please provide the information for all properties on a separate sheet and label it with this item number & title.)

---

---

---

---

7. **Public Buildings**: Were public buildings closed as a result of the event? If yes, how long were they closed (in days), what were the lost wages of employees, and what is the annual budget for the affected departments? Document any damages and repair costs. (If you need more space, please provide the information for all properties on a separate sheet and label it with this item number & title.)

---

---

---

---

8. **School Closures:** Were schools closed as a result of the event? If yes, specify the school by name and address, and the State aid lost. (If you need more space, please provide the information for all properties on a separate sheet and label it with this item number & title.)

---

---

---

---

9. **Roadways and Bridges:** Were there any road and/or bridge closures as a result of the event? If yes *and a detour was established*, please provide the following information. (If you have more than one road or bridge affected or damaged, provide the information for all facilities on a separate sheet and label it with this item number & title.)

- a) What is the name of the road or bridge? \_\_\_\_\_
- b) What was the cost or person-hours for set-up and take-down? \$\_\_\_\_\_ (*cost*)  
or \_\_\_\_\_ (*person-hrs*)
- c) What was the duration of closure? \_\_\_\_\_ (*days / hrs*)
- d) What is the daily one-way traffic count? \_\_\_\_\_ (*vehicles/day*)
- e) What was the additional distance in miles? \_\_\_\_\_ (*refer to instruction*)
- f) What was the additional travel time in minutes? \_\_\_\_\_ (*refer to instructions*)
- g) If damages occurred, what were repair costs? \$\_\_\_\_\_ (*emergency repairs*)  
\$\_\_\_\_\_ (*restore to pre-disaster condition*)

10. **Municipal Services:** Provide the costs or person-hours for municipal services required as a direct result of the event. Do not include debris removal. (*refer to instructions*)

- a) Police:           Costs:           \$\_\_\_\_\_ (*regular*)   \$\_\_\_\_\_ (*overtime*)  
                          Person-hours:   \_\_\_\_\_ (*regular*)   \_\_\_\_\_ (*overtime*)
- b) Fire:            Costs:           \$\_\_\_\_\_ (*regular*)   \$\_\_\_\_\_ (*overtime*)  
                          Person-hours:   \_\_\_\_\_ (*regular*)   \_\_\_\_\_ (*overtime*)
- c) Public Works:  Costs:           \$\_\_\_\_\_ (*regular*)   \$\_\_\_\_\_ (*overtime*)  
                          Person-hours:   \_\_\_\_\_ (*regular*)   \_\_\_\_\_ (*overtime*)
- d) Volunteer Fire: \_\_\_\_\_ (*person-hours*)
- e) Other:           Costs:           \$\_\_\_\_\_ (*regular*)   \$\_\_\_\_\_ (*overtime*)  
                          Person-hours:   \_\_\_\_\_ (*regular*)   \_\_\_\_\_ (*overtime*)
- f) Other:           Costs:           \$\_\_\_\_\_ (*regular*)   \$\_\_\_\_\_ (*overtime*)  
                          Person-hours:   \_\_\_\_\_ (*regular*)   \_\_\_\_\_ (*overtime*)



## Property Information Worksheet

### **Acquisition, Relocation, Elevation, Flood Proofing, or Flood Barrier projects only**

*(Please complete one Property Information Worksheet for **each property** affected by your proposed project.)*

#### 1. Property Information

- a) Property Owner: \_\_\_\_\_  Public  Private
- b) Physical Street Address: \_\_\_\_\_
- c) City/Village/Town: \_\_\_\_\_
- d) County: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_
- e) Tax Map, Lot or Parcel Number: \_\_\_\_\_
- f) Is this a rental property? If yes, provide on a separate sheet the number of units and the name of each tenant and label it with this item number & title.
- g) If tenant-occupied, what is the estimated cost of relocation assistance: \$ \_\_\_\_\_
- h) Provide photographs showing the front, sides and rear of the property, as well as the surrounding properties.
- i) Provide a copy of the Property Field Card from your Assessor's Office
- j) Has the property been certified as "Substantially Damaged" by a local flood plain administrator or code enforcement official?  Yes  No.  
If yes, you must provide a copy of the determination with your application.

#### 2. Structure Information

- a) What is the year of construction? \_\_\_\_\_
- b) What is the square footage of the enclosed principal structure? \_\_\_\_\_ s.f.  
(living space, finished and unfinished basements, but not garages, porches, etc.)
- c) For Non-Residential structures, what is square footage of the **first floor** only?  
\_\_\_\_\_ s.f.
- d) What is the Building Replacement Value of structure (BRV)? \_\_\_\_\_ \$/s.f.  
*(from building inspector, code officer, contractor estimate, insurance)*

- e) Foundation Type:
- Slab on-grade       Pier       Pile       Post
- Crawl space    Basement    Walk-out basement
- f) Building Type:
- 1-story w/ basement       1-story w/o basement
- 2-story w/ basement       2-story w/o basement
- Split Level w/basement       Split level w/o basement
- Manufactured/Mobile Home    Other \_\_\_\_\_
- g) Elevations (*These must be certifiable/verifiable; e.g., surveyor*)
- i. Elevation of lowest finished floor of structure \_\_\_\_\_(ft)
- ii. Elevation of lowest opening that allows water to enter \_\_\_\_\_ (ft)
- iii. Depth of water in the structure \_\_\_\_ (in) Duration \_\_\_\_ (hrs)

3. **Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS):**

- a) FIRM Panel Number: \_\_\_\_\_ Effective date: \_\_\_\_\_
- b) Community ID Number: \_\_\_\_\_ FIS effective date: \_\_\_\_\_
- c) The following information may be obtained from the FIS & profiles, and other sources, such as the NYS Department of Environmental Conservation (DEC).

<b>Flood Frequency</b>	<b>Discharge (cfs)</b>	<b>Water Elevation NGVD (ft)</b>
10-year event		
50-year event		
100-year event		
500-year event		

- d) Is the structure located in the 100-year floodplain? \_\_\_ Yes \_\_\_ No
- e) What is Base Flood Elevation (BFE)? \_\_\_\_\_ (ft) (100-year BFE)
- f) What is the streambed elevation? \_\_\_\_\_ (ft)

NOTE: The information requested above may differ for properties not adjacent or contiguous. Therefore, other FIRMs and FISs may be required for the other individual structures/properties. Please include a copy of the FIRM with the property site and Community Panel Number identified along with a copy of the Applicant's local law for flood damage prevention. Also include the Profile(s) from the FIS that were used for ascertaining elevations.

4. **Project Cost Information per Structure:** Complete the appropriate section below based on your project type.

- a) Acquisition Total cost: \$ \_\_\_\_\_
- i. Fair Market Value (pre-disaster condition) \$ \_\_\_\_\_
  - ii. Estimated cost for appraisal \$ \_\_\_\_\_
  - iii. Estimated cost for closing (taxes not included) \$ \_\_\_\_\_
  - iv. Estimated cost for demolition \$ \_\_\_\_\_
  - v. Estimated cost for site restoration \$ \_\_\_\_\_
  - vi. Additional fees/surveys/relocation assistance \$ \_\_\_\_\_
  - vii. Other (describe) \_\_\_\_\_ \$ \_\_\_\_\_
- b) Relocation Total Cost: \$ \_\_\_\_\_
- i. Fair Market Value of existing land \$ \_\_\_\_\_
  - ii. Architectural, engineering, surveying, etc. \$ \_\_\_\_\_
  - iii. Estimated cost for appraisal \$ \_\_\_\_\_
  - iv. Relocation cost \$ \_\_\_\_\_
  - v. Estimated cost for site restoration \$ \_\_\_\_\_
  - vi. Other (describe) \_\_\_\_\_ \$ \_\_\_\_\_
- c) Elevation Total Cost: \$ \_\_\_\_\_
- i. Number of feet being raised above BFE \_\_\_\_\_ (ft)
  - ii. Architectural, engineering, surveying, etc. \$ \_\_\_\_\_
  - iii. Estimated displacement cost \$ \_\_\_\_\_
  - iv. Elevation of structure \$ \_\_\_\_\_
  - v. Utility relocation/reconnection \$ \_\_\_\_\_
  - vi. Estimated site work/restoration \$ \_\_\_\_\_
  - vii. Other (describe) \_\_\_\_\_ \$ \_\_\_\_\_
- d) Flood Proofing or Flood Barrier Total Cost: \$ \_\_\_\_\_
- i. Architectural, engineering, survey, etc. \$ \_\_\_\_\_
  - ii. Estimated construction cost \$ \_\_\_\_\_
  - iii. Estimated cost for site restoration \$ \_\_\_\_\_
  - iv. Other (describe) \_\_\_\_\_ \$ \_\_\_\_\_

# Historic Building – Structure Worksheet

(Please complete if building – structure is of historic nature)

## HISTORIC RESOURCE INVENTORY FORM



NYS OFFICE OF PARKS, RECREATION  
& HISTORIC PRESERVATION  
P.O. BOX 189, WATERFORD, NY 12188  
(518) 237-8643

OFFICE USE ONLY

USN:

### IDENTIFICATION

Property name(if any) \_\_\_\_\_  
Address or Street Location \_\_\_\_\_  
County \_\_\_\_\_ Town/City \_\_\_\_\_ Village/Hamlet: \_\_\_\_\_  
Owner \_\_\_\_\_ Address \_\_\_\_\_  
Original use \_\_\_\_\_ Current use \_\_\_\_\_  
Architect/Builder, if known \_\_\_\_\_ Date of construction, if known \_\_\_\_\_

### DESCRIPTION

Materials -- please check those materials that are visible

Exterior Walls:	<input type="checkbox"/> wood clapboard	<input type="checkbox"/> wood shingle	<input type="checkbox"/> vertical boards	<input type="checkbox"/> plywood	
	<input type="checkbox"/> stone	<input type="checkbox"/> brick	<input type="checkbox"/> poured concrete	<input type="checkbox"/> concrete block	
	<input type="checkbox"/> vinyl siding	<input type="checkbox"/> aluminum siding	<input type="checkbox"/> cement-asbestos	<input type="checkbox"/> other: _____	
Roof:	<input type="checkbox"/> asphalt, shingle	<input type="checkbox"/> asphalt, roll	<input type="checkbox"/> wood shingle	<input type="checkbox"/> metal	<input type="checkbox"/> slate
Foundation:	<input type="checkbox"/> stone	<input type="checkbox"/> brick	<input type="checkbox"/> poured concrete	<input type="checkbox"/> concrete block	

Other materials and their location: \_\_\_\_\_

Alterations, if known: \_\_\_\_\_ Date: \_\_\_\_\_

Condition:  excellent  good  fair  deteriorated

### Photos

Provide several clear, original photographs of the property proposed for nomination. Submitted views should represent the property as a whole. For buildings or structures, this includes exterior and interior views, general setting, outbuildings and landscape features. Color prints are acceptable for initial submissions.

Please staple one photograph providing a complete view of the structure or property to the front of this sheet. Additional views should be submitted in a separate envelope or stapled to a continuation sheet.

### Maps

Attach a printed or drawn locational map indicating the location of the property in relationship to streets, intersections or other widely recognized features so that the property can be accurately positioned. Show a north arrow. Include a scale or estimate distances where possible.

Prepared by: \_\_\_\_\_ address \_\_\_\_\_

Telephone: \_\_\_\_\_ email \_\_\_\_\_ Date \_\_\_\_\_

**PLEASE PROVIDE THE FOLLOWING INFORMATION**  
**IF YOU ARE PREPARING A NATIONAL REGISTER NOMINATION, PLEASE REFER TO THE ATTACHED INSTRUCTIONS**

**Narrative Description of Property:** Briefly describe the property and its setting. Include a verbal description of the location (e.g., north side of NY 17, west of Jones Road); a general description of the building, structure or feature including such items as architectural style (if known), number of stories, type and shape of roof (flat, gabled, mansard, shed or other), materials and landscape features. Identify and describe any associated buildings, structures or features on the property, such as garages, silos, privies, pools, gravesites. Identify any known exterior and interior alterations such as additions, replacement windows, aluminum or vinyl siding or changes in plan. Include dates of construction and alteration, if known. Attach additional sheets as needed.

**Narrative Description of Significance:** Briefly describe those characteristics by which this property may be considered historically significant. Significance may include, but is not limited to, a structure being an intact representative of an architectural or engineering type or style (e.g., Gothic Revival style cottage, Pratt through-truss bridge); association with historic events or broad patterns of local, state or national history (e.g., a cotton mill from a period of growth in local industry, a seaside cottage representing a locale's history as a resort community, a structure associated with activities of the "underground railroad."); or by association with persons or organizations significant at a local, state or national level. Simply put, why is this property important to you and the community. Attach additional sheets as needed.