Data Documentation Template and Checklist

Frequency Damage Method (Limited Data Module): Applicable to Most Hazards

This data documentation template is designed to assist Benefit-Cost (BC) analysts in recording the data and methodologies utilized in their Benefit-Cost Analysis (BCA). BC analysts should keep in mind that a well-documented BCA means that a knowledgeable BC analyst should be able to re-create the BCA from the supporting documentation provided (with a Mitigation application submitted for funding) without any additional explanation. BC analysts should provide an electronic or paper copy of the full BCA to compliment any template or summary submitted to FEMA for review. Check with your State Hazard Mitigation Officer or FEMA Regional office to find out if a completed Data Documentation Template (DDT) is required with your grant application.

The Frequency Damage Method can be used for any hazard for which frequency-damage relationships can be established from historical damage data and/or engineering judgment. Analysts should note that the Frequency Damage module, based on event frequency or a general approach, was designed for floods without quantitative flood hazard data and other hazards without standardized hazard data easily available (e.g., landslides, ice-storms, etc.) This module should generally not be used for earthquake, hurricane, tornado, or wildland/urban interface fire projects due to the fact that FEMA has BCA modules to support BCA for these hazards.

The BCA software is labeled Riverine Limited Data Module because this module was originally developed for analysis of flood projects. This module is commonly used for flood projects (for locations without quantitative flood hazard data) and for other hazards such as ice storms, windstorms, snow, landslides, etc.

Data Type	Value	Description	Documentation	Source
Discount Rate	**The OMB-mandated discount rate of 7% must be used for all BCAs.**	• The discount rate determines the time-value of money • In a FEMA benefit-cost analysis, a discount rate is used to calculate a value today (the Net Present Value) of future benefits so that they can be compared to the costs of a mitigation project.	• Electronic or paper copy of the BCA. • **The OMB-mandated discount rate of 7% must be used for all BCAs.**	• **The OMB-mandated discount rate of 7% must be used for all BCAs.**
Mitigation Project Useful Lifetime	Years	• Estimated amount of time that mitigation action will be effective. • Includes any maintenance activities that will be done to prolong effectiveness).	• Reference FEMA standard value if utilized. • If FEMA standard value is not utilized then include a justification of the value entered. • May also attach a letter, e-mail, etc. from credible agency documenting this estimate (if resource other than FEMA standard value).	• FEMA BCA Guidance, Page 27. • BCA Checklist, Page 14. • Government representative or private professional with expertise relevant to the proposed project.
Base Year of Costs	Year	• The year in which the mitigation project's cost was estimated. • If cost estimates are several years old, they may need to be adjusted by the user to account for inflation in costs between the base year and the present.	• None required if cost figures are current year or not manipulated. • If cost figures are adjusted provide a description of methodology utilized.	• Sub-applicant. • FEMA's inflation calculator located on the Mitigation BCA Toolkit.

Data Type	Value	Description	Documentation	Source
Mitigation Project Cost (includes data inputs for net mitigation project cost and additional annual maintenance cost ($/yr) for a project)	Total dollar value	• Estimated total cost of the proposed mitigation action **(not just the Federal share)** and any maintenance activities that will be done to prolong effectiveness.	• Narrative summary in the BCA module should state that this value comes from a potential or submitted project application. • Sub-applicant should provide a detailed cost breakdown, rather than a lump sum value, from an engineering cost estimate. • Must document source and reasoning in estimate of maintenance activity cost.	• Should support the value submitted with the project application. • Government representative or private professional with expertise relevant to the proposed project. • For maintenance values, see Government representative or private professional with expertise relevant to the proposed project.
Type of Facility [for Loss of Function calculation]	Selection of the facilities type to have a loss of function.	• Selection describes the facility type being considered in the loss of function analysis. • There are three choices: utilities, roads and bridges, and buildings. • Selecting facility type that brings you directly to your concern for using the software.	• None required for selection of *type* of facility via buttons.	• Sub-applicant.

Data Type	Value	Description	Documentation	Source
Loss of Function	Varies, depending on facility lost and data type	• In FEMA software, depending on the selection of facility type (via the button) users provide data about the volume and value of the service that is provided. • The volume and value entries are linked to the time of lost function to determine future damages. • In many situations, the economic impacts of loss of function (e.g., road closure or loss of a public service) are often much larger than physical damages alone, so the benefits of a project may be largely based on avoiding losses of function rather than physical damages. • Note: There is a difference between the calculation method of the LD module and in the newer "What is a Benefit?" guidance. Either calculation method is OK, but the "What is a Benefit?" values reflect FEMA's most recent values. For questions, please call the BC Helpline.	• Varies depending on data type. • For utility and road/bridge volume, provide written backup for data such as kilowatts, gallons or trips per day. Backup may include letters from utilities or traffic departments, internet site printouts, etc. • For utility and road bridge value, provide written backup for normal value of the service; e.g., cost per gallons of water or kilowatt of electricity under normal conditions; or value of traffic/traffic delay (see Source column at right) • For building annual budget value provide written backup from a knowledgeable source. If estimated provide written details on how estimated, including assumed or calculated staff salaries and overhead.	• Varies depending on the facility type (utilities, roads/bridges, buildings). • Source is generally a party responsible for operating and/or maintaining a facility. • Local electric, gas or water company. • Department of transportation or public works. • Building manager, official of organization housed in a building. • "What is a Benefit?" guidance • FEMA training materials. • Web sites. • Newspaper clippings when they cite other credible sources

Data Type	Value	Description	Documentation	Source
Frequency of Historical Events	Frequency (years) and Dollars for each entry	• Return frequency of past or projected damaging events (i.e. a 5-year event, 10-year event etc.) • Documentation and source credibility become more critical when analysis uses high-frequency events (i.e. 1- 5 year return interval). • Accurately determining frequencies is a key determinant in this kind of analysis. • Methods include analysis of historical damage data (frequency of events) or engineering calculations that determine other frequencies by interpolation or other methods.	• Varies depending on how the data were obtained. If obtained directly from a public source, provide copies of source documents, letters, or web pages. • If derived or calculated, provide written explanation of methodology used, plus written documentation of any source data (i.e. dates of past events that caused damage). • For flood hazards, if using FEMA frequency calculator software, provide printout of calculator results and source flood hazard data (usually Flood Insurance Study or technical report) utilized.	• Source varies depending on available resources in the event area. • US Geological Survey (stream gauge data), National Weather Service or National Ocean and Atmospheric Administration (sometimes these agencies calculate frequencies for large events), among many others. www.nws.noaa.gov/ • Insurance records (if used to assess how often events occurred), newspaper accounts when they cite other credible sources. • Engineering or technical reports. • FEMA frequency calculator. • Expert individuals, i.e. engineers or State Climatologist who have independently calculated frequencies. • See Flood Data Derivation and Case Studies on the Mitigation BCA Toolkit.

Data Type	Value	Description	Documentation	Source
Before Mitigation Damages and Losses (in FEMA software, the first large table)	Frequency (years) and Dollars for each entry	• Damages to buildings, contents, and infrastructure before a mitigation project are assumed to be in place. • May include loss of function impacts, <u>unless</u> calculated separately in loss of function section (FEMA software). • Casualty values as appropriate (<u>if proposed project reduces them</u>).	• Detailed breakdown of specific damages in separate categories (i.e. structural, contents, displacement, etc.). • If damages are derived or calculated rather than taken verbatim from a credible source, describe calculation method and provide copies of all source data.	• Historical data from past events, i.e. insurance or repair records, photographs of damaged facilities. • Expert in data derivation for given hazards. • Newspaper or other written accounts (if credible). • Damage values can be inflated to the present day value with the Inflation Calculator on the Toolkit CD or the U. S. Department of Labor has an inflation calculator for values up to $10,000. www.bls.gov/cpi
Time of Lost Function (before-mitigation)	Number of days or partial days (in before-mitigation damages and losses table).	• The number of days that a function was or is calculated to be lost in events of various frequencies (i.e. a bridge was unusable for five days after a flood) **before** the mitigation project is completed. • The loss of function calculation will not work if this figure is not provided.	• If based on historical occurrence (which is preferred), written documentation from a credible source. This may be a letter from an official, copy of a newspaper account, a copy of a written technical study. • If the figure is derived or estimated, written explanation of how this was accomplished, including all assumptions.	• Varies depending on type of function that is lost. • An official from a public utility, public works or transportation department. • Technical report or study. • Mitigation project specifications or technical documents related to project development. • Engineers.

Data Type	Value	Description	Documentation	Source
After Mitigation Damages and Losses	Frequency (years) and Dollars for each entry	• Same categories as above in Before Mitigation section, except assumes that the mitigation project is in place. • Damages and losses after mitigation are seldom eliminated completely, except in the case of acquisition/demolition or relocation projects. • All analyses must include post-project estimates of damages, even if they are zero (for an acquisition project, for example). BCAs MUST include estimate of (reduced) damages and losses after mitigation.	• Same guidance as above in Before Mitigation Section. • Documentation must include enough detail about the scope of the mitigation project to support estimates of the effectiveness of the mitigation project in reducing damages and losses after mitigation.	• Engineering or other technical reports. • Design or planning specifications from a technically qualified source, i.e. an engineer.

Data Type	Value	Description	Documentation	Source
Time of Lost Function (after-mitigation)	Number of days or partial days (in after-mitigation damages and losses table).	• The number of days that a function was or is calculated to be lost in events of various frequencies (i.e. a bridge was unusable for five days after a flood) **after** the mitigation project is completed. • Except where a function (utility, road/bridge, and building) is completely eliminated, there will be post-project lost function time, and it should be entered in this part of the analysis.	• Written documentation from a credible source, generally related to the design of the mitigation project. This may be a letter from an official, copy of a newspaper account, a copy of a written technical study. • If the figure is derived or estimated provide a written explanation of how this was accomplished, including all assumptions.	• Varies depending on type of function that is lost. • An official from a public utility, public works or transportation department. • Technical report or study. • Mitigation project specifications or technical documents related to project development. • Engineers.

Appendix II
FEMA BCA Checklist

Last Updated June 28, 2006

For the entire BCA Checklist, refer to the BCA_Checklist.doc located on the BCA Mitigation Toolkit (BCA Mitigation Toolkit\4 – BCA TOOLS\CHECKLIST AND DATA DOCUMENTATION TEMPLATES).

3.3   **Projects Based on the Limited Data Module**

    3.3.1   Verify that use of the Limited Data module is appropriate for the proposed mitigation project. The Limited Data module is required when one or more of the following conditions are met:

        (a) Flood mitigation projects where the FIS or comparable documented flood data from another agency, engineer, or hydrologist are not available.

        (b) Flood mitigation projects where the First Floor Elevation (FFE) of the structure is not documented.

        (c) Flood mitigation projects related to flash flooding, alluvial fan flooding, debris or mud flows, and landslides.

        (d) Flood, wind or earthquake hazard mitigation projects for non-building facilities such as culverts, roads, bridges, and utility systems.

    3.3.2   Provide an SOW for the project that is consistent with the information provided in the grant application and for the engineering review.

    3.3.3   Describe the existing flood conditions for the project.

    3.3.4   Briefly describe how the proposed mitigation project will provide protection for the facility.

    3.3.5   Provide detailed documentation of damages at the project site for two or more hazard events of known frequency. The following requirements must be met when compiling hazard event data:

(a) For two or more events with similar frequencies, use an average damage amount per event and an average frequency. Do not use an average of two or more events with widely varying frequencies.

(b) Estimates of damage between events of two known frequencies may be permitted if the estimates are reasonable and documented. However, estimates of damage based on extrapolation from events of two known frequencies are not recommended. Extrapolation of damages to more frequent events from one or more known less frequent events is not permitted.