



EMERGENCY MANAGEMENT DIVISION

"A disaster-ready and resilient Washington State"

Benefit-Cost Analysis 101

The conceptual basics of FEMA's BCA Tool

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What is BCA?

Let's start with a multiple-choice question...

What is the Benefit-Cost Analysis Tool?

- A. A torture device that undermines mental and emotional well-being
- B. A tool that helps demonstrate good stewardship of public dollars
- C. The bane of my professional existence
- D. A legally required component for most, *but not all*, FEMA mitigation grant applications
- E. All of the above



Math in Public: the BCA Basics

Benefits / Costs = Ratio

Cost-Effectiveness = \geq 1.0 Ratio

$$\$500,000 / \$400,000 = 1.25$$



COST
EFFECTIVE

$$\$1,000,000 / \$1,500,000 = 0.66$$



$$\$750,000 / \$125,000 = 6.0$$



COST
EFFECTIVE

A solid BCA with a low, conservative ratio is better than a shaky BCA with a high ratio.



Benefits: avoided losses

Benefits: the dollar-value of losses you're avoiding in future damage events as a direct result of your mitigation project.

- Avoided repairs and replacements
- Avoided evacuations and detours
- Avoided staff/volunteer time
- Avoided emergency response time/effort
- Avoided Injuries and deaths

Environmental Services benefits:

FEMA provides default dollar-values for establishing and protecting green infrastructure assets, like wetlands and salmon habitat.



Benefits are determined by reviewing **historical damages** or projecting/estimating future damages (without mitigation).



Costs

Costs: the amount of money it'll take to complete your entire mitigation project AND maintain the finished product for the duration of its useful life.



- total project budget
- maintenance costs (annual)
- estimated *post-mitigation* losses

In some cases, a project's environmental review/permitting costs may be omitted from this calculation.

Costs are determined by reviewing a complete project budget and estimating the annual costs to properly maintain the finished product.



Two very important BCA Inputs

Recurrence Interval: the frequency (in years) a hazard event occurs and causes damage and loss

- moderate, low-damage events occur more frequently
Floods, severe storms, light earthquake
- severe, high-damage events occurs less frequently
Earthquakes, tsunamis, zombies

Info about the problem

Useful Life: The duration (in years) a finished product will provide full benefits

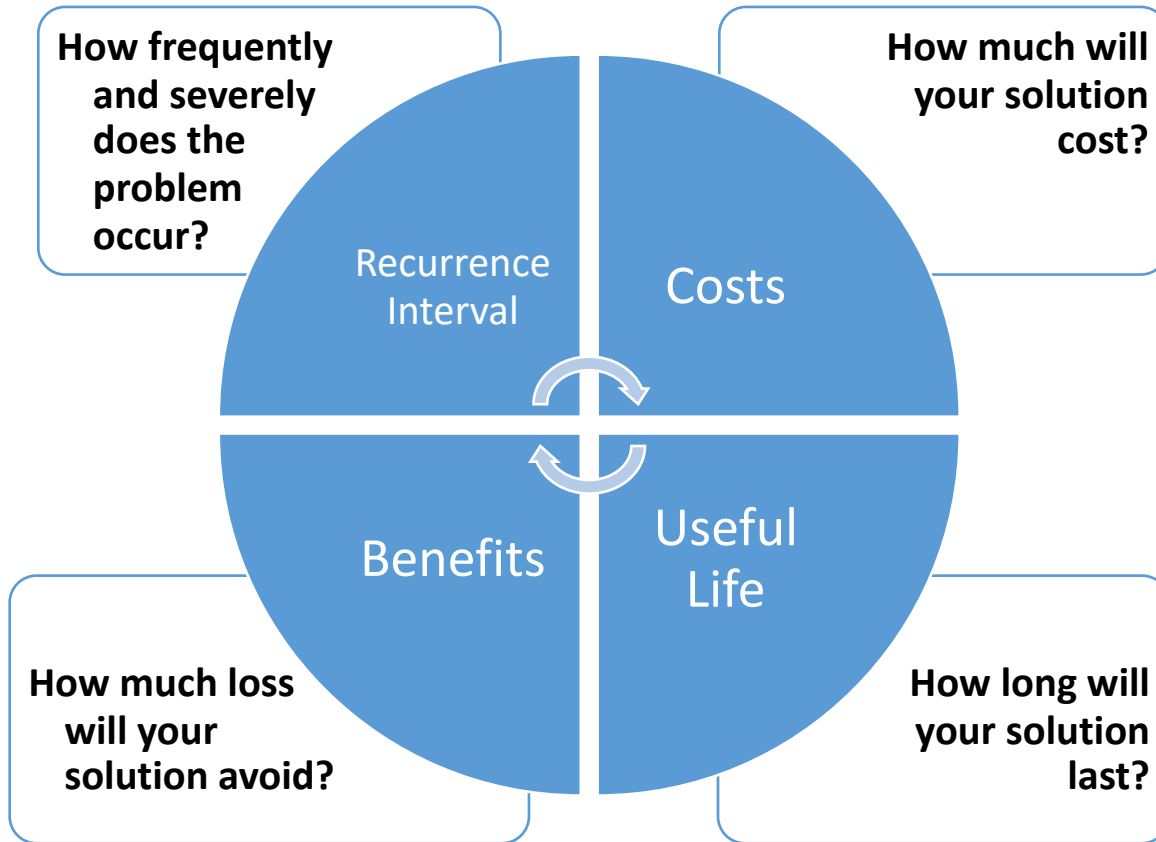
- Longer useful life = more benefits
Reservoirs, roads/bridges, elevations, levees, structural seismic retrofits
- Shorter useful life = less benefits
Generators, wildfire fuel reduction

Info about the solution

The BCA Tool uses these two inputs to calculate overall benefits.



The BCA Tool uses these four main inputs to generate the BC Ratio.



Top reason BCAs fail in FEMA reviews: no documentation or sources provided for the data.



When are BCAs not required?

- Planning grants
- Pre-calculated benefits for reseeding, home elevations and acquisitions costing less than a specified amount
- For “Immediate Threat” landslide mitigation projects, there’s a different BCA tool to use— and it’s very simple (one-time loss)
- 5% Initiative proposals, which include eligible outreach and training projects
- Advance Assistance proposals



FEMA has a new BCA Tool

- **BCA Toolkit 6.0 released in July 2019**
 - Excel-based
 - Compatible with both Windows and Mac
 - Improved user experience
 - Reduced number of data fields to enter
 - Improved help features
 - Improved report formatting

FEMA will continue to accept BCAs developed using the old version (5.3) until June 1, 2020. After that, all BCAs submitted as part of HMA grant applications must be developed with version 6.0 or later.



Let's conclude with another multiple-choice question...

Which of the following is true about BCAs in 2020?

- A. 9 out of 10 mental health professionals prefer the new BCA 6.0 Tool over all older versions.
- B. It's wise to seek professional BCA assistance when dealing with complex mitigation projects.
- C. Doing a basic BCA isn't wonderful, but it isn't hellish either. It's somewhere in between.
- D. FEMA provides lots of free online trainings and guides to help grant applicants do BCAs, including an actual BCA Helpline.
- E. All of the above



BCA Resources

- **FEMA's BCA Home page (www.fema.gov/benefit-cost-analysis)**
 - Guides and reference docs, Tool downloads, technical assistance links, etc.
- **FEMA's Emergency Mgmt. Institute website**
 - Free online Independent Study (IS) courses available:
 - IS-276.a [Benefit-Cost Analysis Fundamentals](#)
 - IS-277.a [Benefit-Cost Analysis \(BCA\): Entry- Level](#)
- **Professional Service Contractors (several)**
- **State Hazard Mitigation Officer and WA EMD's Mitigation staff**
- **My YouTube instructional video: ["Doing a Benefit-Cost Analysis for Wildfire Mitigation Proposals"](#)**