



DEPARTMENT OF
HOUSING



CDBG-MIT

BENEFIT COST ANALYSIS GUIDELINES

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1 Purpose

These Guidelines set forth the requirements for completing a Benefit-Cost Analysis (**BCA**) for applicable projects under the Community Development Block Grant–Mitigation (**CDBG-MIT**) Program, administered by the Puerto Rico Department of Housing (**PRDOH**). A BCA must be completed when a project meets the definition of a “Covered Project”, as defined by the U.S. Department of Housing and Urban Development (**HUD**) and contained herein. Covered Projects are intended to be large in scale, transformative in nature and strategically support Community Lifelines, those fundamental services in the community that, when stabilized, enable all other aspects of society to function.

BCA requirements set forth included in this document are based on federal standards, as referenced throughout the narrative, and adhere to the requirement of Office of Management and Budget (**OMB**) Circular A-94¹ as well as guidance published at Federal Register Vol. 84, No. 169 (August 30, 2019), 84 FR 45838, referred by HUD as the Main Mitigation Notice. Guidance from external federal entities is adopted into these Guidelines and is referenced throughout this document.

The requirements herein are adopted to promote consistency in the use of federally standardized methodologies and to create a clear guidance for Project Sponsors applying to PRDOH CDBG-MIT programs. Methodology requirements within these guidelines have been compiled from HUD, OMB, and the Federal Emergency Management Agency (**FEMA**).

2 HUD Requirements for Covered Projects

2.1 HUD requirements for Covered Projects Definition and Cost Thresholds

HUD has created a new standard for the evaluation of larger-scale infrastructure projects by introducing the concept of Covered Projects. As defined in 84 FR 45838, 45850, a Covered Project is an infrastructure project having a total project cost of \$100 million or more, with at least \$50 million of CDBG funds, regardless of source (CDBG–DR, CDBG–National Disaster Resilience (**NDR**), CDBG–MIT, or CDBG).²

These project cost thresholds are included in the Grant Agreement executed between PRDOH and HUD. Infrastructure projects that meet the definition of a Covered Project must be included in the action plan or a substantial amendment.³

¹ OMB Circular A-94, issued in October 1992, provides the highest-level framework for BCAs used by all federal programs, including FEMA and the U.S. Department of Transportation (**USDOT**), as well as the U.S. Army Corps of Engineers (**USACE**). Any alternative BCA approach used for Covered Projects will need to comply with Circular A-94.

² In official correspondence to PRDOH dated March 26, 2021, HUD waived some requirements stated at Federal Register Vol. 85, No. 17 (January 27, 2020), 85 FR 4676, which resulted in a lower threshold for Covered Projects in Puerto Rico.

³ 84 FR 45838, 45850. Additionally, the action plan must describe how the Covered Project meets additional criteria for national objectives for Covered Projects, including its consistency with other mitigation activities in the same most impacted and distressed (**MID**) area and demonstrated long-term efficacy and sustainability of the project including its operations and maintenance.

2.2 Definition of an Infrastructure Project

HUD defines an infrastructure project at 84 FR 45838, 45851, as an activity or group of related activities that develop the physical assets that are designed to provide or support services to the general public in the following sectors:

- Surface transportation, including roadways, bridges, railroads, and transit;
- Aviation;
- Ports, including navigational channels;
- Water resources projects;
- Energy production and generation, including from fossil, renewable, nuclear, and hydro sources;
- Electricity transmission;
- Broadband;
- Pipelines;
- Stormwater and sewer infrastructure;
- Drinking water infrastructure; and
- ~~And~~ Other sectors as may be determined by the Federal Permitting Improvement Steering Council.

As required by 24 C.F.R. §58.32(a), all individual activities which are related to one another, either on a geographical or functional basis, or are logical parts of a composite of contemplated infrastructure-related actions must be grouped together and evaluated as a single infrastructure project.⁴

2.3 Covered Project National Objective

To meet any national objective, as described at 84 FR 45838, 45857, all CDBG-MIT funded activities must:

- Demonstrate the ability to operate for the useful life of the project. Each grantee must plan for the long-term operation and maintenance of infrastructure and public facility projects funded with CDBG-MIT funds.⁵
- Be consistent with other mitigation activities. ~~The CDBG-MIT activity must be consistent with the other mitigation activities~~ that the grantee will carry out with CDBG-MIT funds in the most impacted and distressed (**MID**) area. To be consistent, ~~the CDBG-MIT the~~ activity must not increase the risk of loss of life or property in a way that undermines the benefits from other uses of CDBG-MIT funds in the MID area.

In addition to meeting the CDBG-MIT criteria, Covered Projects must also:

⁴ 84 FR 45838, 45851.

⁵ The grantee must have a plan to fund the long-term operation and maintenance for CDBG-MIT projects. Funding options might include State or local resources, borrowing authority, or retargeting of existing financial resources.

- Demonstrate long-term efficacy and fiscal sustainability.
 - Document measurable outcomes or reduction in risk associated with projected expenditures and outcomes.⁶
 - Document how the Covered Project will reflect changing environmental conditions (such as sea level rise or development patterns) with risk management tools and alter funding sources if necessary.
 - Establish a plan for the long-term operation and maintenance of the Covered Project and include a description of this plan in its action plan, as required by 84 FR 45838, 45848, section V.A.2.a.(10), and the additional criteria applicable to all CDBG-MIT activities.
- ~~Must~~ Demonstrably benefit the MID area.
 - The benefits of the Covered Project must outweigh their costs. Benefits outweigh costs if a BCA results in a benefit-to-cost ratio (**BCR**) equal to or greater than one (1.0) ~~greater than one (1.0)~~.
 - ~~Must provide a BCA using FEMA or non-FEMA methodologies (when applicable) an Additional Benefits Analysis~~ that accounts for economic development, community development, environmental, resilience and other social/community benefits or costs. Additional requirements for BCAs prepared using non-FEMA methodologies are discussed in the Applicable BCA Methods Section.
 - Alternatively, for a Covered Project that ~~serves low and moderate income (LMI) persons or other persons that are less able to mitigate risks or respond to and recover from disasters, after completing~~ has a BCA with a BCR which ~~may be less than~~ under one (1.0), the ~~grantee~~ Project Sponsor can demonstrate that ~~the~~ benefits outweigh the costs by supplementing its BCA with a narrative containing a qualitative description of benefits that cannot be quantified but sufficiently demonstrate unique and concrete benefits of the Covered Project for LMI persons or other persons that are less able to mitigate risks, or respond to and recover from disasters.
 - This qualitative description may include a description of how the Covered Project will provide benefits such as enhancing a community's economic development potential, improving public health and/or expanding recreational opportunities.

2.4 Implementation of Covered Projects

As required by 84 FR 45838, 45852, prior to the grantee's execution of a contract for the construction, rehabilitation, or reconstruction of an approved Covered Project, the grantee shall have:

⁶ See 84 FR 45838, 45852, section V.A.2.i Projection of expenditures and outcomes.

- Engaged an independent, third-party entity (e.g., a cost estimator) to verify the planned project costs and cost changes to the contract during implementation to determine the costs of the contract and any changes to the contract are reasonable;
- Confirmed applicant has secured the certification of a licensed design professional stating that the project design or redesign meets a nationally recognized design and performance standard applicable to the project, including, if applicable, criteria recognized by FEMA for a project of its type, pursuant to FEMA's Hazard Mitigation Assistance Guidance and Hazard Mitigation Assistance Guidance Addendum; and
- Confirmed applicant has established a plan for financing the operation and maintenance of the project during its useful life.

3 Definition of BCA

A BCA is a formulaic analysis used to demonstrate that the benefits of a project outweigh its costs. Benefits outweigh costs if the BCA results in a $BCR > 1.0$ or the BCR is greater than equal to or greater than one (1.0). The equation is, as follows: shown below.

$$BCR = \frac{Benefits}{Costs}$$

Benefits in this equation are the economic, social, and environmental advantages associated with a proposed hazard mitigation or resilience project and are calculated as follows:

$$Avoided\ Damages = \sum (Pre\ Project\ Event\ Damages) - \sum (Post\ Project\ Event\ Damages)$$

The Costs denominator is the sum of the upfront construction costs and the present value of the annual operations and maintenance costs over the useful life of the project. Consistent with other federally-funded hazard mitigation grant programs, PRDOH will shall require that a mitigation project's BCR must be one (1.0) or greater to be eligible for funding, unless conditions permitted by HUD can be met in the Alternative Demonstration of Benefits Narrative, as discussed in the Applicable BCA Methods Section below.

Most project benefits occur over a period of time into the future, while most of the project costs are incurred up front and in the present. In accordance with OMB Circular A-94, PRDOH shall require that BCAs be prepared on a net present value basis, meaning the present value of the benefits gained over the life of the project are compared to the total project costs to establish the BCR. Because most project benefits accumulate over time, project benefits can be calculated on an average annual basis ("annualized")

basis and then multiplied by a Present Value Coefficient (**PVC**) using the formula shown below to determine the present value of the annualized benefits.

$$PVC = \left[\frac{1 - (1 - r)^{-T}}{r} \right]$$

Where: r is the discount rate and T is the useful life of the project. For many infrastructure projects, the useful life of the project is twenty-five to fifty (25-50) years and, per OMB guidelines, the discount rate for federally funded mitigation projects is seven percent (7%). The seven percent (7%) discount rate applies to all BCA methods and is consistent with PRDOH guidelines.

4 Applicable BCA Methods

4.1 Permitted BCA Methodologies and Selection Criteria

BCA Methodology Selection Criteria: Project Sponsors shall follow the Determination of Method criteria and requirements of this Section when assessing which BCA methodology to use for valuing the benefits and costs of a project as set forth by HUD in 84 FR 45838.⁷

Determination of Method and Permitted BCA Methodologies: Per HUD guidance, discussed in HUD Requirements for Covered Projects section of these Guidelines, PRDOH adopts the preference for the FEMA BCA methodology and associated software for hazard mitigation and resilience projects.⁸

Therefore, Project Sponsors should first consider FEMA-approved methodologies and tools to demonstrate the cost-effectiveness of the proposed Covered Project.⁹ However, a non-FEMA methodology may be used when:

1. A BCA has already been completed or is in progress pursuant to BCA guidelines issued by other Federal agencies (i.e., USACE, USDOT).
2. It addresses a non-correctable flaw in the FEMA-approved BCA methodology; or
 - a. To use this approach, the Project Sponsor must identify the flaw and explain why it cannot be corrected.
3. It proposes a new approach that is unavailable using the FEMA BCA Toolkit.

Additional BCA Requirements for Non-FEMA Methodologies Benefits Analysis

⁷ The grantee must indicate whether another Federal agency has rejected a BCA for the Covered Project (including any BCA for an earlier version of the current proposed Covered Project).

⁸ PRDOH will provide separate training material with technical information that expands upon the different BCA methodologies.

⁹ The cost-effectiveness of a Covered Project is demonstrated by having a BCR of 1.0 or greater, regardless of the method used (FEMA or non-FEMA methodologies). Additional Benefit Analysis are required for projects whose BCAs result in BCRs under 1.0. The analysis is discussed in detail in the *Alternative Demonstration of Benefits Narrative Section* of these Guidelines.

~~Per HUD guidance, all BCAs developed using non-FEMA methodologies must include the account for economic development, community development and other social/community benefits or costs of the proposed Covered Project. Economic development, community development and other social/community benefits must be accounted for in all non-FEMA BCAs, even if they are outside of another Federal agency's BCA methodology and regardless of whether the BCA is completed or in progress.~~

If at the time of requesting CDBG-MIT funding there is a BCA completed or in progress pursuant to another Federal agency's requirements, the Project Sponsor must declare that the CDBG-MIT project is substantially the same as the project analyzed for that other agency's BCA.

If the non-FEMA BCA methodology is used because it addresses a non-correctable flaw in a FEMA-approved methodology, the Project Sponsor must include a narrative in the BCA identifying what the flaw is and why it cannot be corrected. If the Project Sponsor is proposing a new approach, the BCA must address this in a narrative.

~~If the BCA already considers these benefits or costs, it will not be necessary to do this analysis as a separate exercise.~~

Alternative Demonstration of Benefits Narrative for BCAs with BCR under 1.0

If a completed BCA, regardless of the methodology used, produces a BCR under one (1.0), an Alternate Demonstration of Benefits Narrative must be submitted to PRDOH. ~~Alternatively, when a Covered Project serves LMI persons or other persons that are less able to mitigate risks or respond to and recover from disasters, Project Sponsors shall demonstrate to PRDOH that the benefits outweigh costs by completing submitting a the BCA with a BCR under (which may be less than one (1.0)) and a qualitative description of the benefits that cannot be quantified but must sufficiently demonstrate unique and concrete benefits of the Covered Project for LMI persons or other persons that are less able to mitigate risks or respond to and recover from disasters.¹⁰~~

Less able to mitigate risk or respond to and recover from disasters may include protected classes, systemic and historically disenfranchised, highly isolated, facing compounding and cascading risks and impacts, and who could become LMI in the next disaster.

The qualitative description of benefits may include how the Covered Project will provide benefits such as:

- enhancing a community's economic development potential,
- improving public health, or

¹⁰ 84 FR 45838, 45851.

- expanding recreational opportunities.

BCA Methodology Selection Criteria:

~~Project Sponsors shall follow the Determination of Method criteria when assessing which BCA methodology to use for valuing the benefits and costs of a project in terms of measurable risk reduction and the potential for stabilizing a lifeline is appropriate and satisfies the conditions set forth by HUD in notice 84 FR 45838.¹¹~~

Determination of Method:

~~The selection of a method shall adhere to those permitted within these Guidelines and shall consider the type of project being funded:~~

- ~~Use the FEMA BCA Method for infrastructure projects with sufficiently quantified benefits that can produce a BCR of one (1.0) or greater.~~
- ~~Use other Federal Agency's BCA Methodology when:~~
 1. ~~A BCA has already been completed or is in progress pursuant to the BCA guidelines issued by that other Federal agency (i.e., USACE, USDOT), or~~
 2. ~~It addresses a non-correctable flaw in the FEMA approved BCA methodology.~~
 3. ~~Use a new approach when FEMA BCA methodology and/or any other Federal Agency methodology does not adequately account for project specific costs and/or benefits.~~

~~If a completed BCA produces a BCR that is less than one (1.0), an Alternative Demonstration of Benefits Narrative shall also be included to account for additional benefits where applicable.~~

~~The flow diagram in Figure 1 illustrates the basic process of selecting the proper BCA method(s).~~

4.2 Adoption of FEMA BCA Review for Global Match Projects

For Covered Projects determined eligible for match funding through the CDBG-MIT Hazard Mitigation Grant Program (HMGP) Global Match, PRDOH will adopt a FEMA review and approval of the BCA along with the determination of eligibility for the project. This determination must be substantiated by the completed BCA and supporting documentation, subject to PRDOH review.

~~Additional Benefits Analysis may be required if the FEMA BCA does not include a qualitative narrative to account for economic development, community development and other social/community benefits or costs.~~

¹¹The grantee must indicate whether another Federal agency has rejected a BCA for the Covered Project (including any BCA for an earlier version of the current proposed Covered Project).

The flow diagram in Figure 1 illustrates the process of selecting a BCA method for Covered Projects:

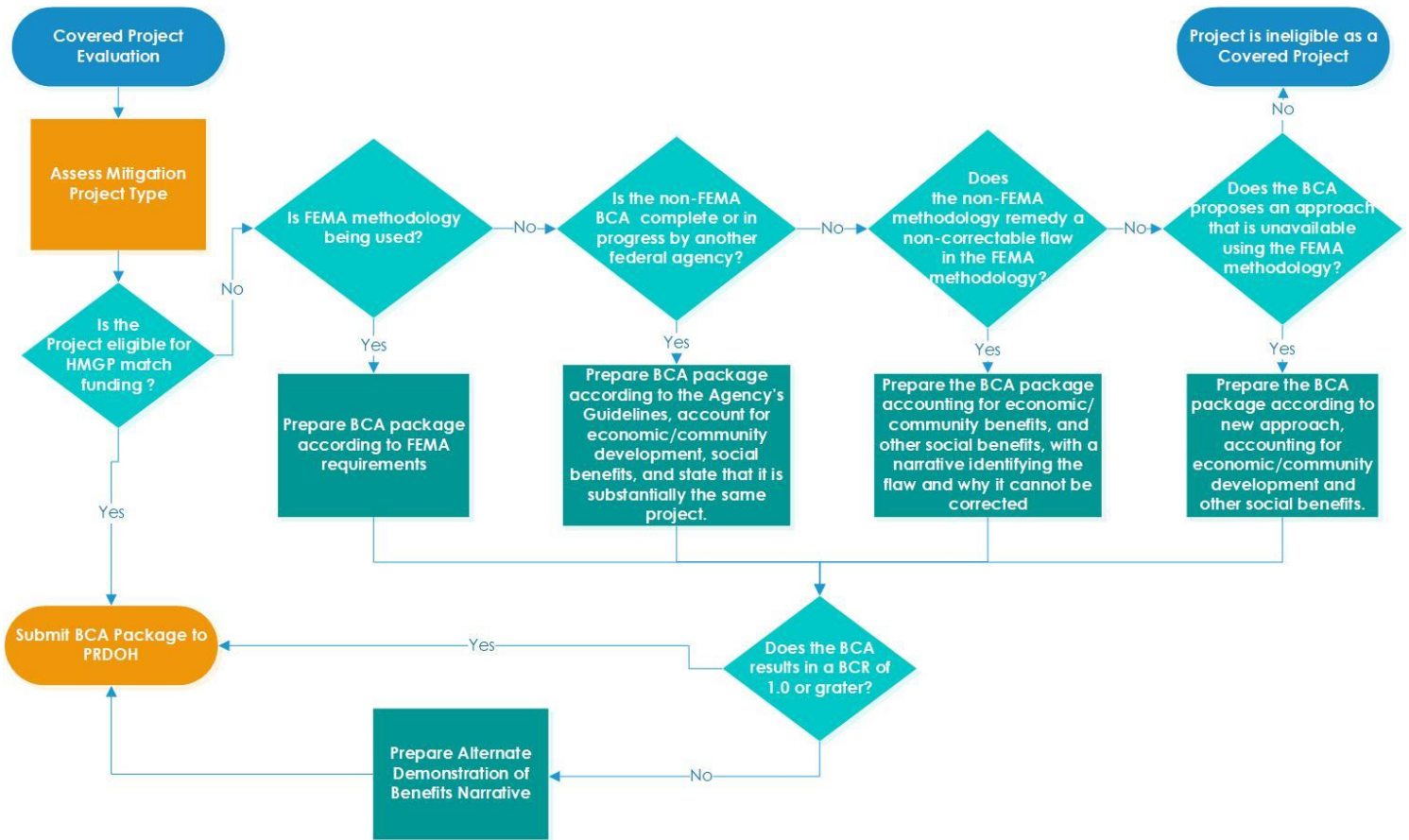


Figure 1. Flow Diagram of the BCA Methods

5 Verification of Costs

5.1 Third-Party Cost Verification

Prior to execution of award for construction funds, the BCA must be reviewed by a third-party entity (e.g., a cost estimator) to verify the **reasonableness** of planned project costs and cost changes to the contract during implementation ~~are reasonable~~.

Cost evaluation will require prepared costs and substantiating evidence of the method employed to arrive at the final estimate. The method employed must adhere to those permitted in the *PRDOH Procurement Manual for the CDBG-DR Program*.¹²

¹² Procurement Manual for the CDBG-DR Program, Regulation 9205, is currently under review. The document is available in English and Spanish at: <https://cdbg-dr.pr.gov/en/download/procurement-manual-cdbg-dr-program/> and <https://cdbg-dr.pr.gov/download/manual-de-adquisiciones-programa-cdbg-dr/>.

Changes to project cost that arise during implementation may trigger a reevaluation by the third-party cost estimator when costs exceed planned contingencies.

5.2 Adoption of FEMA Cost Verification

Where practicable, for projects determined eligible for match funding through the CDBG-MIT HMGP Global Match, PRDOH shall adopt the FEMA cost review of subrecipient grant administration and procurement project costs as a third-party cost verification. As FEMA is subject to 2 C.F.R. Part 200, Uniform administrative requirements, cost principles, and audit requirements for Federal awards, the eligibility review process under FEMA authority adheres to permissible cost standards set within the *PRDOH Procurement Manual for the CDBG-DR Program*.

6 Review and Approval

6.1 Pretest Evaluation

PRDOH will work with Project Sponsors to understand sites and facilities requirements as well as the project objectives to evaluate the BCA for compliance with requirements set forth in the Guidelines. Review of the BCA shall include an initial assessment or pretest evaluation of the draft, completed upon request by the Project Sponsor, prior to completion of full BCA draft. This pretest evaluation will assess the following:

- 1) Review BCA methodology to determine acceptability or recommend alternate approach.
- 2) Evaluate project cost data and BCA inputs to flag any foreseeable concerns.
- 3) Assess project benefit data and BCA inputs to recommend additional data, if needed, to yield the highest benefit.
- 4) Confirm data inputs are correct and justified by appropriate supporting documentation.
- 5) Prepare a preliminary BCA review report that summarizes the project BCA inputs and results and request any follow-up information or suggestions for technical assistance.
- 6) When required, prepare an updated BCA based on conservative data input values.

6.2 Final BCA Evaluation

PRDOH will conduct a final BCA draft review to determine if the BCA is complete and ready to proceed forward for HUD review by substantial amendment to the Action Plan. Assessment of the final draft shall result in a recommendation for revision or confirmation of completeness in adherence to the requirements in these Guidelines and corresponding federal requirements. This evaluation will assess the following:

- 1) Determine whether Project Sponsor selected the most appropriate BCA methodology and/or software.

- 2) Evaluate project information for adherence to useful life, construction cost, and estimated O&M cost standards.
- 3) Review and/or estimate project benefit data, to yield the highest benefit.
- 4) Confirm that data inputs and supporting documentation adhere to federal oversight entity standards.
- 5) Determine if it is necessary for the PRDOH CDBG-DR/MIT Deputy Secretary to authorize PRDOH and its subject matter expert consultants to prepare a BCA narrative with documentation on behalf of the Project Sponsor.
- 6) Complete a final assessment of BCA and supporting documentation completeness and adherence to compliance standards.

Upon the conclusion of the BCA final BCA draft review, PRDOH will proceed to validate the BCA. If the BCA is validated, the project will move on in forward with the application process as defined in the applicable Program Guidelines. If not validated, PRDOH will send the Project Sponsor a letter informing them of the outcome of the BCA review and notifying the possibility of requesting a technical meeting with PRDOH.

PRDOH reserves the right to reject any BCA that does not conform to the standards set forth in these Guidelines.

6.2.1 Technical Meeting

The Project Sponsor whose BCA has been rejected by PRDOH, may request a technical meeting with PRDOH, within **ten (10) calendar days** after the date of the letter on the outcome of the BCA review. During the meeting, technical teams of both parties may discuss the details of the completed BCA. The Project Sponsor may submit a revised BCA or an Alternative Demonstration of Benefits Narrative, as well as supporting documentation. PRDOH will review BCA results alongside other eligibility criteria established in the CDBG-MIT Action Plan, as amended, and the applicable Program Guidelines.

6.3 Approval of Covered Project BCA by HUD

HUD requires that all Covered Projects be approved by means of a substantial action plan amendment, as described at 84 FR 45838 (section V.A.2.h). These Covered Projects must be supported by a BCA determination, subject to HUD review following a **thirty (30) day** public comment period for the substantial amendment.

HUD has **sixty (60) days** to review Covered Project requirements and supporting BCA documentation. During this time, PRDOH shall coordinate technical assistance and other support to the Project Sponsors, as needed.

All Covered Project BCAs must be approved by HUD to move forward for final evaluation and award of funds. See workflow below for overview.

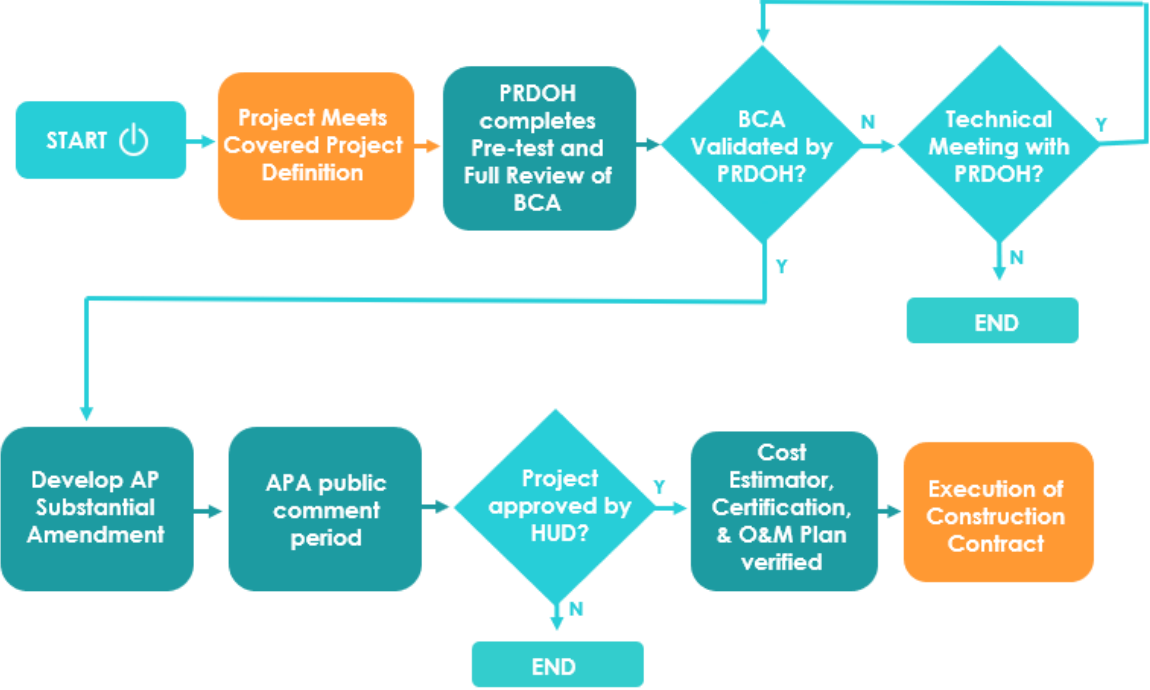


Figure 24: Diagram of the General HUD Approval Process.

6.4 Denial of Covered Project BCA by HUD

A rejection of the BCA by HUD shall constitute a determination of ineligibility for Program assistance. Such a determination shall be considered final and indisputable.

END OF GUIDE.