



DEPARTMENT OF
HOUSING



CDBG-MIT

OPERATIONS AND MAINTENANCE PLAN GUIDE

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1 Introduction and Overview

1.1 Background

The U.S. Department of Housing and Urban Development (**HUD**) requires from grantees and subrecipients to have a plan on how they will fund long-term operation and maintenance (**O&M**) of infrastructure and public facility projects funded by the Community Development Block Grant–Mitigation (**CDBG-MIT**) Program. This Operation and Maintenance Plan (**O&M Plan**) must demonstrate the project owners' ability to operate and maintain the project over its useful life (including funding sources and other necessary resources). Funding options might include State or local resources, borrowing authority, or retargeting existing financial resources.

Due to the emphasis placed by HUD on O&M Planning and implementation,¹ the Puerto Rico Department of Housing (**PRDOH**), as grantee, has established a process to help ensure projects funded through the CDBG-MIT Program comply with all O&M requirements established by HUD. The O&M document serves as guidance on the steps and requirements of the process established by PRDOH.

Because of the broad range of projects expected to be funded with CDBG-MIT funds, the information provided here is intended to be used in conjunction with industry standards and professional judgment specific to each project.

1.2 Purpose

The O&M document is a guide for CDBG-MIT funding recipients with infrastructure and public facilities projects. The operation and maintenance of these projects must be planned during the development phase, updated during the project's design phases, and implemented as a living document once the project completes construction and is placed in service. Subrecipients must specify in their O&M Plan if government resources, including local funds, will be required to support long-term operations and maintenance costs. This guide addresses the criteria and the expected level of completion for O&M planning throughout the project life cycle.

2 Definitions

- **Community Development Block Grant (CDBG):** A federal grant program administered by HUD that provides grant funds to local and state governments. The CDBG program works to ensure decent, affordable housing, provide services to the most vulnerable in communities, and create jobs through the expansion and retention of businesses.
- **Covered Project:** Notice 84 FR 45838 defines a Covered Project as an infrastructure project having a total project cost of \$100 million or more, with at least \$50 million of CDBG funds (CDBG-DR, CDBG-MIT or CDBG State). According to HUD, an "infrastructure project," as it relates to Covered Projects, is an activity or group of

¹ Federal Register Notice Vol. 84, No. 169 (August 30, 2019), 84 FR 45838.

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 other sectors as may be determined by the Federal Permitting Improvement Steering Council.²

- **Department of Housing and Urban Development (HUD):** Federal department through which CDBG, CDBG-DR, and CDBG-MIT program funds are distributed to recipients.
- **Mitigation:** Through notice 84 FR 45838, 45840, HUD defines mitigation “as those activities that increase resilience to disasters and reduce or eliminate the long-term risk of loss of life, injury, damage to and loss of property, and suffering and hardship, by lessening the impact of future disasters.”
- **Non-Covered Project:** A project that does not meet the definition of a Covered Project.
- **Subrecipient:** An entity, usually but not limited to non-Federal entities, receives a sub-award from a pass-through entity to carry out part of a federal program. A subrecipient may also be a recipient of other federal awards directly from a federal awarding agency. The term does not include an individual who is a federal program beneficiary.

2.1 Categories of Maintenance

Maintenance is comprised of several categories. The categories are organized based on frequency, level of effort, and cost. The categories of maintenance listed in this section are generally systematized based on expected level of effort from lowest to highest.

- **General Maintenance** – General upkeep of site conditions, including custodial services and cleaning, pest control, grounds care/landscaping, and trash-recycle removal.
- **Routine Maintenance** – Daily tasks, such as service calls that are not part of a preventive maintenance program. Examples include dripping faucets, HVAC filter replacements, light bulb replacement, touch-up painting, etc.
- **Preventative Maintenance** – Any scheduled service performed to ensure the equipment is operating properly and achieving its originally intended useful life -

² Consistent with HUD’s National Environmental Policy Act (**NEPA**) Implementing requirements at 24 C.F.R. §58.32(a), a grantee must group together and evaluate as a single infrastructure project 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.

following standard guidelines and/or technical manuals- to minimize unscheduled corrective maintenance.

- **Programmed Maintenance** – Any Preventative Maintenance activity whose cycle exceeds one (1) year. Examples of programmed maintenance are painting, roof coating, overlays and seal coating of roads and parking lots, pigging of constricted utility lines, emergency generator inspections/overhaul, and other similar functions.
- **Corrective Maintenance** – Any unscheduled or unplanned maintenance, including emergency and non-emergency corrective work activities. Activities may range from unplanned maintenance of a nuisance nature requiring low skill levels for correction to emergency tasks involving major expedited repair or correction following a disaster event requiring skilled labor.
- **Deferred Maintenance** – Maintenance was not performed when it was due or scheduled and, therefore, delayed until a future period. Deferred maintenance may result in additional corrective maintenance.

2.2 Additional Operations and Maintenance Terminology

- **Active Measures** – Measures that require human intervention to be effective at protecting an asset, such as storm shutters and floodgates, etc. Active measures typically have shorter project useful lifetimes and higher O&M costs than passive measures. Some active measures may require detailed operation and maintenance plans.
- **Depreciation** – The decrease in the monetary value of an asset or asset protection measures over its useful life for the project due to use, wear and tear, or obsolescence.
- **Operations and Maintenance Expenses** – Any cost related to operating or maintaining equipment, components, facility, or asset protection measures. It may include salaries, wages, maintenance and operations costs, materials, supplies, insurance, depreciation, and any other items under General Accepted Accounting Principles (GAAP).
- **Operations and Maintenance Plan** – A set of specific system operating parameters, maintenance inspections and periodic testing reports, maintenance procedures and schedules, and documentation methods to ensure that an asset or asset protection measure performs as intended over the project's useful life.
- **Operations and Maintenance Revenue** – Revenue generated from the sale of an asset, salvage value, or from the use of an asset or measure. For example, if a location generates power and sells excess power, this is revenue. Another example is sales of assets, such as cranes, trucks, or surplus material (ABC stone, lumber, metals).
- **Passive Measures** – Measures that do not require human intervention to be effective at protecting an asset, such as flood-prone property acquisitions and

seismic retrofits, etc. Passive measures typically have more extended project useful lifetimes and lower O&M costs than active measures.

- **Project Useful Life (PUL)** – The estimated amount of time that the mitigation activity or project will be effective. Regarding Operations and Maintenance, the definition of PUL is usually taken from depreciation tables.³ For this manual, a Federal Emergency Management Agency (**FEMA**) table of PULs for various assets and asset protection measures is provided in Appendix B.
- **Property, Plant, and Equipment (PP&E)** – Includes physical/tangible assets or measures with a useful project life greater than one (1) year. PP&E may include buildings, equipment, and vehicles, among others.

3 HUD Requirements

3.1 All Projects

Notice 84 FR 45838 emphasizes the importance of long-term maintenance of project activities, to HUD objectives, by tying O&M planning and implementation to project eligibility and national objective requirements for all CDBG-MIT-funded activities, as summarized below.

- 1) Section V.A.(2)(a)(10) of 84 FR 45838, 45848 requires grantees to:
 - a. Plan for long-term operation and maintenance of infrastructure and public facility projects funded with CDBG-MIT funds and include in its Action Plan a description of how it will fund long term operation and maintenance of CDBG-MIT projects.⁴ Funding options might include State or local resources, borrowing authority or retargeting of existing financial resources. If operations and maintenance plans are reliant on any proposed changes to existing taxation policies or tax collection practices, those changes and relevant milestones should be expressly included in the Action Plan. Additionally, the grantee must describe any State or local resources that have been identified for the operation and maintenance costs of projects assisted with CDBG-MIT funds.
- 2) Section V.A.13.a of 84 FR 45838, 45857 stipulates additional national objective criteria that all mitigation activities funded with CDBG-MIT funds must meet, as follows:
 - a. *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. The

³ BCA Reference Guide. June 2009. Appendix D: Project Useful Life Summary. Accessed at https://www.fema.gov/sites/default/files/2020-04/fema_bca_reference-guide.pdf.

⁴ The CDBG-MIT Action Plan is available in PRDOH website, in English and Spanish, at <https://cdbg-dr.pr.gov/en/cdbg-mit/> and <https://cdbg-dr.pr.gov/cdbg-mit/>.

grantee must also have a plan for financing the long-term O&M of CDBG-MIT projects.

- b. *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 by not increasing 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.

3.2 Covered Projects

Notice 84 FR 45838 stipulated several additional requirements for Covered Projects, as summarized, below:

- 1) Section V.A.2.h. of 84 FR 45838, 45851 requires grantees to:
 - a. Include all Covered Projects in an action plan or substantial amendment which describes:
 - i. Project scope and eligibility, how it meets the definition of mitigation activity, total project cost, and CDBG eligibility under the Housing and Community Development Act of 1974 (**HCDA**), or waiver and alternative requirement.
 - ii. How the Covered Project is consistent with the Mitigation Needs Assessment by addressing the current and future risks in the MID areas as identified in the grantee's Mitigation Needs Assessment.
 - iii. How the Covered Project will meet a national objective, including the additional criteria for mitigation activities and Covered Projects, describing:
 1. Long-term efficacy and fiscal sustainability of the Covered Project, including how the grantee plans to monitor and evaluate efficacy of the Covered Project.
 2. How the benefits of the Covered Project outweigh the costs of the Covered Project through a Benefit Cost Analysis (**BCA**).
 3. Consistency with other mitigation activities.
 - b. Prior to grantee's execution of a contract for the construction, rehabilitation, or reconstruction of an approved Project, grantee must:
 - i. Verify project costs are reasonable as determined by an independent third-party, entity (e.g., a cost estimator).
 - ii. Secure certification of a licensed design professional that the project design meets a nationally recognized design and performance standard applicable to the project.

- iii. Establish a plan for financing the operation and maintenance of the project during its useful life.
- 2) Section V.A.13.c. of 84 FR 45838, 45857 requires Covered Projects demonstrate the following to meet a national objective:
- a. Demonstrate the long-term efficacy and sustainability of the Covered Project by documenting measurable outcomes⁵ or reduction in risk as described herein:
 - i. The grantee must have a plan to fund the long-term operation and maintenance for CDBG-MIT covered projects and include a description in the Action Plan. Funding options might include State or local resources, borrowing authority, or retargeting of existing financial resources.⁶
 - ii. Must 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.
 - b. Must demonstrably benefit the MID area, which has been determined by HUD to be all municipalities of Puerto Rico. The benefits of the Covered Project must outweigh the costs of the projects. Benefits outweigh costs if a BCA results in a benefit-cost ratio greater than one (1.0). Alternatively, for a Covered Project that serves LMI persons or other persons that are less able to mitigate risks or respond to and recover from disasters, benefits outweigh costs if the grantee supplements its BCA with a qualitative description of benefits that cannot be quantified. However, this description 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. It may also 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.

4 Overview of O&M Planning Requirements

To successfully operate and maintain assets efficiently, the Subrecipient must develop written plans spanning the useful life for each year of operations and maintenance to be reviewed and updated annually. The plans should allow the Subrecipient to know, anticipate, and program when, where, and what the cost will be to complete O&M activities. Even if some unforeseen events occur, they should be minimal. O&M plans must

⁵ See Notice 84 FR 45838, 45852, section V.A.2.i Projection of expenditures and outcomes.

⁶ 84 FR 45838, 45848

include schedules for annual maintenance activities and programmed maintenance carried out over multiple years, to help the facility reach its useful life. In addition, the O&M Plan should be flexible to accommodate and implement unplanned, non-urgent and emergency maintenance that arises in a given fiscal year. As the Subrecipient collects O&M data, the data can be used to improve plans over time.

4.1 O&M Process Framework Overview

O&M plans ensure facility equipment, systems, and ancillaries are properly operated and maintained. Early detection of problems may decrease repair and replacement costs, prevent malfunctions, and extend the lifespan of facilities.

For CDBG-MIT funded projects subject to PRDOH funding approval, the O&M process has been divided into phases outlined in the next paragraph. Any application for a project that has not completed engineering or architectural design shall include a narrative that preliminarily addresses any anticipated local funding sources, local staffing, contractors, equipment, leasing costs, or cost of materials for long-term O&M needs.

Applications for projects that have completed all or portions of the design must include an O&M Plan corresponding to the completion percentage of the design before awarding funds. In addition, reporting requirements will be included in Subrecipient Agreements to provide quarterly operations and maintenance plan cost reports to PRDOH for the life of the CDBG-MIT Program.

1. Planning Phase – Application & Intake to Commissioning
 - a. O&M Plan Definition – Application & Intake.
 - b. O&M Plan Development- From 30% Design up to pre-construction.
 - i. 30% Design Draft O&M Plan Submittal
 - ii. 60% Design Draft O&M Plan Submittal
 - iii. 90% Design Draft O&M Plan Submittal
 - c. O&M Plan Refinement - From Construction Phase notice to proceed to project commissioning to accommodate changes during construction, as necessary.
2. Implementation Phase – From Commissioning to end of Useful Life
 - a. O&M Plan Implementation
 - b. O&M Plan revision – As Needed.

The O&M Planning process will require submittals to PRDOH during the various project phases, from application intake through construction completion and closeout. Table 1 summarizes the O&M Planning submittal process and requirements.

Table 1		
CDBG-MIT O&M Planning Process Summary		
Project Type	Intake Requirements	Design and Construction Phase Requirements
Non-Covered Project	1. Demonstrate ability to operate for useful life:	1. 30% Design Phase - Draft O&M Plan
	<ul style="list-style-type: none"> • Estimate of Useful Life • Responsible Entities for O&M • Proforma with costs and sources of revenue and/or other resources • Method of anticipated O&M funding and resource fulfillment 	2. 60% Design Phase – Revised Draft O&M Plan
		2. Acknowledgement of O&M as a National Objective and eligibility compliance
		4. Construction Closeout Phase – Final O&M Plan
Covered Project	1. Demonstrate ability to operate for useful life:	1. 30% Design Phase - Draft O&M Plan
	<ul style="list-style-type: none"> • Estimate of Useful Life • Responsible Entities for O&M • Detailed O&M Task list • BCA & O&M Cost Projections • Proforma with costs and sources of revenue / other resources • Method of anticipated O&M funding and resource fulfillment • Acknowledgement of O&M as a National Objective and eligibility compliance 	2. 60% Design Phase – Revised Draft O&M Plan
		2. Identification of Responsible Entities for O&M <ul style="list-style-type: none"> • Draft MOUs, Letters of Intent, and Service or other Agreements
		4. Construction Closeout Phase Final O&M Plan

4.2 O&M Plan Development

O&M plans will determine the required activities, preferred schedule, proper procedures, personnel, and equipment needed to complete the tasks and fund the associated costs. The plans should provide guidance in the O&M budget process.

The operations plan is a manual for running the facility which must include the SOP's⁷, the alternative operating procedures and emergency operating procedures for the facility. Emergency procedures should be in a separate section so they can be easily accessed during an emergency. The operation plan should describe the “who, what, when, and

⁷ Standard Operating Procedures (SOP's)

how" of the daily operations. It must define how resources (personnel, financial, and physical assets) will be allocated to achieve service level goals.

Maintenance plans must identify and include the schedule for routine, planned, predictive, preventive, and warranty maintenance for all facility assets. The maintenance plan must have information on how to complete corrective maintenance and identify the level of resources and staffing needed to complete each identified task.

4.3 Schedule and Cost Development

O&M Plan schedules and costs must be developed using project-specific industry standard practices for establishing the useful life of a project, O&M task identification, resource and cost estimation, and task durations. Therefore, the use of industry-specific estimating and costing methodologies and references is strongly recommended. PRDOH have complete discretion as to the validity of all aspects of the O&M Plan, including estimates of cost, effort, and duration of O&M tasks.

At a minimum, O&M Plan schedules and costs must be documented in sufficient detail to support the scope, level of effort, costs, and scheduling of O&M. The classification of O&M costs, to be considered, are as follows:

- 1) Labor
- 2) Material
- 3) Equipment
- 4) Services
- 5) Overhead (Administration, Insurance, Utilities and Miscellaneous expenses.)

A basic outline of the steps for developing O&M costs is provided detailed next:

- 1) **Resource and Facility identification** – Identify facilities and resources to be used for O&M (e.g., Personnel, Building space, materials & equipment, training, funding). Identify the available and/or future sources of funding for the activities necessary for implementation of the O&M plan for the useful life of the project.
- 2) **Operating Costs** - Essential operating activities and responsible personnel and required resources for each, condition monitoring, backup facilities necessary, etc. (lease agreements and costs, service agreements and costs.)
- 3) **Maintenance Costs** - E.g., scheduled, and unscheduled maintenance activities, including routine maintenance, preventative, and warranty-related maintenance and personnel and resources required for each of these to ensure the project reach its useful life.

Regarding sources of revenue:

- a. As applicable, identify all potential sources of revenue that can be directly applied to offset the costs of O&M activities and develop projections of revenue generation for the useful life of the project. Include identified information in the O&M Plan to notify the projections of additional funding required for the long-term O&M of the facility. Information of Revenue Sources returned to General Fund or similar accounts must not be included in the Plan projections since none are not considered directly applicable to offset O&M costs.

An O&M Plan Table of Contents template is provided in Appendix A. All O&M plans submitted to PRDOH must consider each aspect of O&M planning covered in the template.

4.4 Project Useful Life

The O&M Plan to be developed during the implementation of the project requires the inclusion of all O&M activities for the useful life of the project.

When a project is a Covered Project, the subrecipient must use values established by FEMA when determining the useful life of the project. Information can be found in the Help Menu of the FEMA BCA Version 6.0 toolkit (See Appendix B).

For Non-covered Projects, PRDOH will allow alternate methodology guidance for establishing the useful life, so long as the standard followed is adequately described and acceptable to PRDOH.

5 O&M Plan Review by Phase

5.1 O&M Planning at Project Intake

O&M planning activities must start early enough to support the project intake review process. The O&M planning process for Non-covered and Covered Projects follows the same steps but have been separated to accommodate the differences in size, scope, duration, and investment between the two (2) types of projects. While both Non-Covered and Covered Project applicants must demonstrate an existing capacity for operating and maintaining projects of similar scope and size, Covered Projects will be required to provide more detail and developed planning during the initial stages process to comply with the additional requirements. For example, Covered Projects will be required to include O&M costs and considerations as part of the BCA, which needs to be completed early in the planning phase. The O&M Planning submittal requirements for Non-covered and Covered Projects are described below.

A. O&M Planning Requirements at Intake for Non-Covered projects:

- 1) As part of the intake package submittal, all applicants must submit:
 - a. Narrative Description demonstrating the ability to operate for the useful life of the project including:

- i. A preliminary estimate of useful life of the project and O&M costs included at application.
 - ii. The proposed responsible entity(-ies) for O&M, and their current capacity for carrying out similar O&M activities (staffing, funds, management structure, etc.),
 - iii. A proforma with the estimated total and annual budget and projected sources of revenue or other funds and resources.
- b. Acknowledgment of O&M as a National Objective compliance aspect and an understanding of failure to comply could result in potential repayment of funds to PRDOH and certification statement on the intake application that the applicant has contemplated the O&M planning elements in the Template O&M Plan Table of Contents (see Appendix A).

B. O&M Planning Requirements at Intake for Covered Projects:

- 1) As part of intake package submittal, all applicants must submit:
- a. A narrative description demonstrating the ability to operate for the useful life of the project, including:
 - i. An estimate of useful life of the project
 - ii. The proposed responsible entity(-ies) for O&M, and their current capacity for carrying out similar O&M activities (staffing, funds, management structure, etc.).
 - iii. A detailed description of O&M tasks required over the useful life of the project. Description of the O&M tasks should contain as much detail as possible based on the level of project completion.
 - iv. If a BCA has been developed, the BCA must include O&M Costs. O&M cost projections and annual budget with detailed calculations of the costs of operating and maintaining the project for the useful life. The budget calculations must provide detail at the individual O&M task level and schedule over the useful service life of the project.
 - v. A proforma invoice with the estimated total and annual budget and projected sources of revenue or other funds and resources.
 - vi. How O&M for CDBG-MIT project is anticipated to be funded and resourced including borrowing authority, retargeting of existing financial resources, proposed changes to tax policy or practices that would be required, or any State or local resources identified to pay for or provide O&M costs.
 - vii. Acknowledgment of language in Subrecipient Agreements (**SRAs**) that specifically reference O&M as an aspect of national objective compliance and understanding that failure to comply could result in a potential repayment of funds to PRDOH. Also, a certification

statement on the intake application that the applicant has contemplated the O&M planning elements in the Template O&M Plan Table of Contents (see Appendix A).

- 2) Prior to SRA execution for construction funds, all Subrecipients with approved Cover Projects must:
 - a. Identify and document the responsible entity or entities anticipated to fund, resource, and carry out O&M activities for the project's useful life, including any draft Letters of Intent, Memorandum of Understanding (**MOUs**), or other agreements, as necessary, when multiple parties are involved.

5.2 O&M Planning During Project Planning and Design Phase

Drafting and developing O&M plans for all projects (Covered Projects and Non-Covered) will occur during the Planning and Design Phase of the projects, with submittals at 30%, 60%, and 90% design. It is during this period that the bulk of O&M Planning will occur. Projects will be required to submit complete draft O&M Plans and signed commitments from entities responsible for operating and maintaining the project before being allowed to proceed with construction. Note the O&M Plans will be finalized at the end of the construction phase. The following is a summary of the O&M Planning submittal requirements during the planning and design phase for both Covered and Non-covered projects:

- 1) O&M Planning requirements during Design Process
 - a. Submittal of draft O&M plan as part of the 30% and 60% design submittals and review processes. The 30% and 60% design submittals will include the information included in the intake O&M Plan plus additional information defined during the design development phase of the project.
 - b. Submittal of the completed O&M plan draft as part of the 90% Final Design submittal and review process. The 90% O&M draft Plan shall include all the project specific requirements for all the project components that shall require operation and maintenance throughout the life of the asset.
 - c. O&M Plan must include:
 - i. All elements outlined in the template Table of Contents developed by PRDOH.
 - ii. Schedules and projections of operation and maintenance tasks, staffing, and estimated costs for the useful life of the project.
 - iii. How funding and O&M resources are anticipated for the CDBG-MIT project, including borrowing authority, retargeting of existing financial resources, proposed changes to tax policy or practices that would be

required, or any State or local resources identified to pay for or provide O&M costs.

- iv. Signed Commitment of Responsible Entity/Entities towards funding and carrying out required O&M, including any MOUs or other agreements, as necessary, when multiple parties are involved.

5.3 O&M Planning during Construction Phase

During the project's construction phase, the O&M plan must be updated, as necessary, to reflect the changes and process. In addition, as specific components to be incorporated into the project are procured and implemented, the O&M Plan will be updated and expanded to include more detailed information of the changes incorporated.

Upon completion of construction, the project will enter the O&M Phase. This phase of the project continues until the end of the useful life of the project. The Final O&M Plan shall be produced and submitted to PRDOH as part of the construction closeout process.

O&M plans will be updated and amended, as the situation requires. Upon reaching a project's useful life, properly operated, and maintained projects will fulfill this portion of the National Objective requirements.

Because the eligibility of CDBG-MIT funded activities depends, in part, on the performance of long-term O&M of the project, special considerations and processes are required. The project owner and PRDOH must ensure the funded project is properly operated and maintained for the estimated useful life of the project. When the project owner is not the responsible entity for O&M and third party entity or multiple entities are going to be responsible for O&M the performance of activities there should be a binding service agreement in place. The agreements are to ensure the performance of O&M activities, owner must require performance reports and recordkeeping from these entities. PRDOH monitoring shall take place until the CDBG-MIT Grant end date.

5.4 O&M Planning Phase (Intake to Commissioning)

Since long-term O&M are critical to meeting a National Objective and thus project eligibility, the O&M Planning Phase starts before a project's intake and culminates upon completion of project commissioning. Non-Covered and Covered Projects will have separate processes for O&M Planning due to the difference in the size, scope, and HUD requirements.

Preliminary O&M Planning will be required in the early stages of project conception and will be part of the project intake submittals for both, Non-covered and Covered Projects.

O&M Plans will be developed during the project planning and design stages. Submittal of O&M Plans at Intake, 30% Design, 60% Design, and 90% Design are required. As the

project progresses through the design phase, the O&M plans will undergo development, and project specific details added for each development.

During the construction of the project, the plan will be adjusted, as necessary, to accommodate changes incorporated in the project during construction, and to include information specific to the equipment and systems installed (OME maintenance schedules, etc.). The final O&M Plan shall be submitted as part of the construction closeout process.

Appendix A: Sample O&M Table of Contents Template

TABLE OF CONTENTS

- I. INTRODUCTION**.....
Provide a description of the manual content and structure.
- II. PROJECT DESCRIPTION**.....
Include detailed information on the project including location map and a site plan showing project limits, location of mayor facilities and utilities.
 - A. LOCATION**.....
 - B. SITE PLAN**.....
Site plan should identify all mayor systems and
- III. DESIGN DRAWINGS AND SPECIFICATIONS**.....
Include a register of the drawings and Specifications. Drawings should be As-Built drawings.
- IV. OWNERSHIP AND MANAGEMENT**.....
- V. COMPONENTS AND FUNCTIONALITY**.....
Provide a summary of each system's components, location, and how they are designed to operate. Include a detailed list of equipment for each type of system that has been installed. Include all the manufacturer's information relating to the equipment, ancillaries, and systems.
- VI. PROJECT/FACILITY MAINTENANCE**.....
Provide instructions and schedules on how to maintain each piece of equipment, systems, and ancillaries of the installation. Cover: monthly, half-yearly, yearly program on items such as lubrication, adjustment, replacement, routine maintenance, cleaning, filter changing, access, safety, etc. Provide a list of spares that are recommended to be held by the operator/facilities department and also provide any purchasing information needed
 - A. SHORT TERM MAINTENANCE**.....
 - B. LONG TERM MAINTENANCE**.....
- VII. PROJECT/SITE OPERATION AND MANAGEMENT**.....
 - A. ROLES AND RESPONSIBILITIES**.....
 - B. HOURS OF OPERATION**.....
 - C. STAFFING**.....
 - D. SECURITY**.....
 - E. COMMUNICATIONS PLAN**.....
- VIII. SCHEDULE OF OPERATING EXPENSES**.....
Include all identified expenses related to short-term and long-term maintenance and operation.
- IX. OPERATIONS AND MAINTENANCE FUNDING AND REVENUE SOURCES**.....

X. PROJECTIONS OF O&M COSTS THROUGH THE USEFUL LIFE OF FACILITY.....

XI. INSURANCE COVERAGE

APPENDICES.....

Appendix B: FEMA Project Useful Life (PUL) Summary Tables

The FEMA Project Useful Life Summary Table below provides the Standard Values for hazard and project types. The tables also show the Acceptable Limits of the PUL value. If a value other than the Standard Value is used, documentation and justification are required. For example, a generator vendor could provide documentation to demonstrate that the PUL is longer than the standard value (19 years). Even with documentation, a PUL value cannot be higher than the highest Acceptable Limits value. The higher the PUL, the higher the BCR since project benefits will be considered farther into the future.

I. FLOOD			
Project Type	Useful Life		Comment
	Standard Value	Acceptable Limits (documentation required)	
Acquisition / Relocation			
Acquisition / Relocation	100	100	
Building Elevation			
Residential Building	30	30-50	
Non-Residential Building	25	25-50	
Public Building	50	50-100	
Historic Buildings	50	50-100	
Mitigation Reconstruction			
Mitigation Reconstruction	50	50	
Infrastructure Projects			
Major Infrastructure (dams, levees)	50	35-100	
Concrete infrastructure, flood walls, roads, bridges, major drainage system	50	35-50	
Culverts (concrete, PVS, CMP, HDPE, etc.)	30	25-50	Culvert with end treatment (i.e., wing walls, end sections, Culverts (concrete, PVC, CMP, HDPE, head walls, etc.)
	10	5-20	Culvert without end treatment (i.e., wing walls, end sections, head walls, etc.)
Pump stations, substations, wastewater systems, or	50	50	Major (power lines, cable, hardening gas, water, sewer lines, etc.)

Project Type	Useful Life		Comment
	Standard Value	Acceptable Limits (documentation required)	
equipment such as generators	5	5-30	Minor (backflow valves, downspout disconnect, etc.)
Other Flood Mitigation Project Types			
Floodplain and Stream Restoration	30		Higher PUL values acceptable with documentation
Flood Diversion and Storage	30		Higher PUL values acceptable with documentation

II. TORNADO AND HURRICANE SAFE ROOMS

Project Type	Useful Life		Comment
	Standard Value	Acceptable Limits (documentation required)	
Tornado Safe Room – Residential	30	30	
Tornado Safe Room – Community	30	30-50	Retrofit or Small Community safe room ≤ 16 people (30 yr), New (50 yr)
Hurricane Safe Room	30	30-50	

III. HURRICANE WIND

Project Type	Useful Life	Comment	
	Standard Value	Acceptable Limits (documentation required)	
Roof Diaphragm Retrofit	30	30	Roof hardening and roof clips
Hurricane Storm Shutters	15	15-30	Depends on type of storm shutter
Roof Diaphragm Retrofit	30	30	Roof hardening and roof clips

IV. WILDFIRE			
Project Type	Useful Life (years)		Comment
	Standard Value	Acceptable Limits (documentation required)	
Defensible Space/Hazardous Fuels Reduction (Vegetation Management)	4	2-4	Brush – Depends on drought conditions
	1	1	Grass – Depends on geographic location and precipitation
	20	3-20	Forest Canopy – Must be maintained every 3 years
Ignition Resistant Construction	10	10-30	Depends on type of construction and materials used.

V. SEISMIC			
Project Type	Useful Life (years)		Comment
	Standard Value	Acceptable Limits (documentation required)	
Non-Structural Building Elements	30	30	Ceilings, electrical cabinets, generators, parapet walls, or chimneys
Non-Structural Major Equipment	15	15-30	Elevators, HVAC, sprinklers
Non-Structural Minor Equipment	5	5-20	Generic contents, racks, shelves

VI. BUILDING RETROFIT PROJECTS			
Project Type	Useful Life (years)		Comment
	Standard Value	Acceptable Limits (documentation required)	
Residential Building Retrofit	30	30	
Non-Residential Building Retrofit	25	25-50	
Public Building Retrofit	50	50-100	
Historic Building Retrofit	50	50-100	

VII. UTILITY MITIGATION PROJECTS			
Project Type	Useful Life (years)		Comment
	Standard Value	Acceptable Limits (documentation required)	
Utility Mitigation Projects	50	50-100	Major (power lines, cable, hardening gas, water, sewer lines, etc.)
	5	5-30	Minor (backflow valves, downspout disconnect, etc.)

VIII. GENERATORS AND MISCELLANEOUS EQUIPMENT			
Project Type	Useful Life (years)		Comment
	Standard Value	Acceptable Limits (documentation required)	
Equipment Purchases	2	2-10	Small, portable equipment (e.g., computer)
	30	5-30	Heavy equipment
Generators	19		The PUL may be altered based on manufacturer warranty or other documentation that can demonstrate that the generator life may be able to provide service longer than 19 years.

IX. DROUGHT			
Project Type	Useful Life (years)		Comment
	Standard Value	Acceptable Limits (documentation required)	
Aquifer Storage and Recovery	30		Higher PUL values acceptable with documentation

Appendix C: BCA Guidance on O&M Costs

Operation and Maintenance (**O&M**) Costs are an important part of Benefit Cost Analysis (**BCA**) for FEMA and other alternate approaches used by the CDBG-MIT Program. BCA project submittals typically require O&M Plans with estimated costs for hazard mitigation and resiliency (i.e., asset protection) projects to ensure project effectiveness throughout the project useful lifetime. Guidelines and key considerations for O&M costs for BCAs are listed below:

Eligibility: O&M costs needed to maintain project effectiveness must be included in the BCA, even if the costs are not eligible for reimbursement by the grant.

Required Costs and Examples: O&M costs in the BCA should reflect the differential costs of the resilience project over and above the pre-project condition. If the project is expected to generate or reduce operations and maintenance costs that are from present operations, these can be considered project benefits in the FEMA's BCA methodology. However, if an alternative BCA methodology was used, the operations and maintenance costs needed to be included in the Project Investment Costs. Examples of different project scenarios using FEMA and non-FEMA BCAs are described below.

- FEMA BCA Project Scenario 1: Adding a new pump station to an existing drainage system will require additional O&M costs that should be included in an O&M Plan and added to the BCA project cost.
- Non-FEMA Project Scenario 1: North Gate Relocation & Access Optimization – This project increases O&M costs by constructing new roadways and gate facilities. Following the success of the South Gate Container Complex and by being in a region experiencing rapid population growth, there is an urgent need to reroute the general cargo entrance at the North Gate and provide for the modernization of access control using Optical Character Recognition. The new route will include a new access road and bridge and incur additional O&M costs outside of the initial construction cost. The authority has shown that it can handle the additional operational and maintenance costs associated with this project through financial statements, showing stable and reliable capital and operational funds sufficient to cover estimated costs and showing contingency reserves. At the time of submittal, the O&M cost was not known, and a statement was provided the authority would be financially capable of handling the increased cost.
- FEMA BCA Project Scenario 2: Increasing the diameter of culverts from sixty (60) inches to 72 inches in an existing drainage system that is already well maintained by a generous annual maintenance budget could be considered to have zero

(\$0) annual O&M costs in the BCA. This is because the small increase in culvert size would have a negligible increase on the existing annual maintenance budget.

- Non-FEMA BCA Project Scenario 2: Intermodal Facility – This project has no impact on operation or maintenance costs. Operational costs for pavement repairs compared to stacking and lifting containers onto rail cars will not differ materially from stacking containers onto trucks. The facility does not add any clerical or administrative costs to the facility since the facility is operated remotely through innovation improvements made from a previous project. No additional staffing is needed, as the current staff of the facility will operate equipment. Therefore, O&M costs are not included in the BCA for this project.
- FEMA BCA Project Scenario 3: Replacing existing equipment such as pumps or generators with more efficient equipment that reduce annual O&M costs may be considered a project benefit. In the FEMA BCA Toolkit, this benefit can be quantified by inputting the project savings in annual O&M costs as damages before mitigation at a 1-year recurrence interval.
- Non-FEMA BCA Project Scenario 3: South Gate Container Complex Expansion – This project reduces O&M costs by decreasing the number of employees required to operate the facility. This project also increased the throughput capacity by installing new technology, including Optical Character Recognition and Weigh-in-Motion Sensors, which allow truck drivers to enter and exit the port without stopping for processing. Previously, a dedicated staff of gate operators was required to manually enter container numbers, truck driver information, container location, and other operational input on paper forms. By automating this process, operating costs were significantly reduced, as personnel was reassigned to other duties by modernizing this process.

O&M costs in the FEMA BCA should only reflect the costs needed to maintain project effectiveness. For example, if an existing flood-prone structure is demolished and the site is converted to open green space, there will be annual maintenance costs associated with mowing grass and other landscaping of the site. However, those annual maintenance costs do not impact the effectiveness of the project at eliminating future flood damages to the structure; then the annual O&M cost may be considered zero (\$0) in the BCA.

O&M for Active vs Passive Measures: Active and passive measures with example were briefly addressed in Section 2.2. O&M plans tend to be more complex and O&M costs tend to be higher for active measures than passive measures. In general, passive measures are preferable to active measures for long-term protection of assets.

Long-duration projects, such as structural retrofits and road or rail transportation projects, with project useful lifetimes for more than twenty (20) years, often only require minimal

maintenance. If the project does not generate increased or reduce incremental O&M costs they do not need to be included in the BCA.

FEMA BCA guidance indicates that annual O&M costs for drainage improvement projects generally range from 0.5% to 1.0% of the total construction costs and can include labor and equipment costs.

END OF GUIDE