

PLANES DE MITIGACIÓN CONTRA PELIGROS NATURALES  
Resiliencia Planificada



J U N T A   D E   P L A N I F I C A C I Ó N

2020

# Municipality of Guayanilla

Natural Hazard Mitigation Plan

Executive Summary

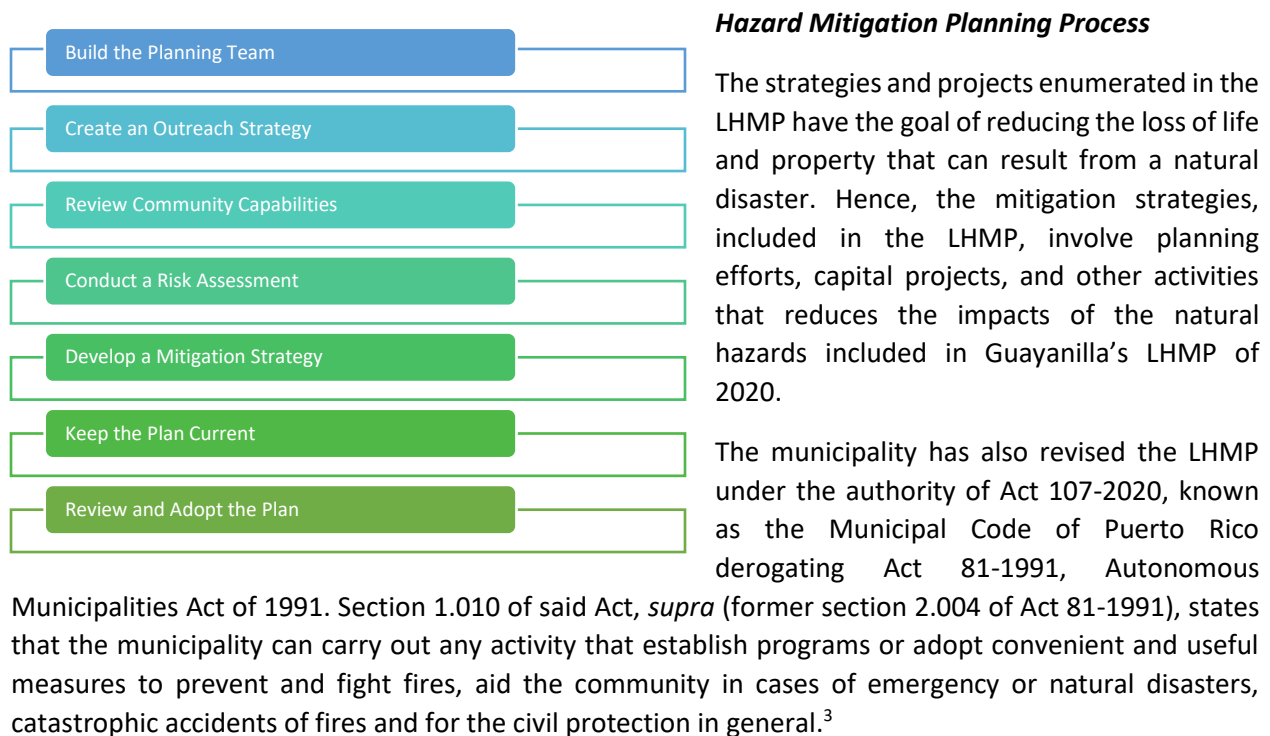


# 1 Introduction

The Municipality of Guayanilla has revised its Local Hazard Mitigation Plan (LHMP)<sup>1</sup> in accordance with the federal Disaster Mitigation Act of 2000 (DMA2K), which was signed into law to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988. One of the requirements that this legislation establishes is that in order for the municipality to receive federal mitigation funds, it must elaborate and adopt a Federal Emergency Management Administration (FEMA) approved LHMP.<sup>2</sup> Also, the DMA2K promotes that the local government, together with the State, work on pre disaster planning and encourages the development of sustainable hazard mitigation activities.

These LHMPs must be revised and updated every five (5) years to remain in compliance with regulations and Federal mitigation grant conditions. This updating requirement offers the municipality an opportunity to reevaluate recommendations, monitor the implementation of mitigation strategies included in the previous Plan, monitor the impact of mitigation actions that have been implemented, and determine if any changes to the Plan need to be incorporated. This Plan complies with said regulations.

Figure 1 Hazard Mitigation Planning Process



<sup>1</sup> Please note that the 2020 Revised HMP was written in Spanish as per agreement between the Municipality, the Planning Board, the Governor's Authorized Representative (GAR) and FEMA.

<sup>2</sup> 42 U.S.C 5165; 44 C.F.R. § 201.6.

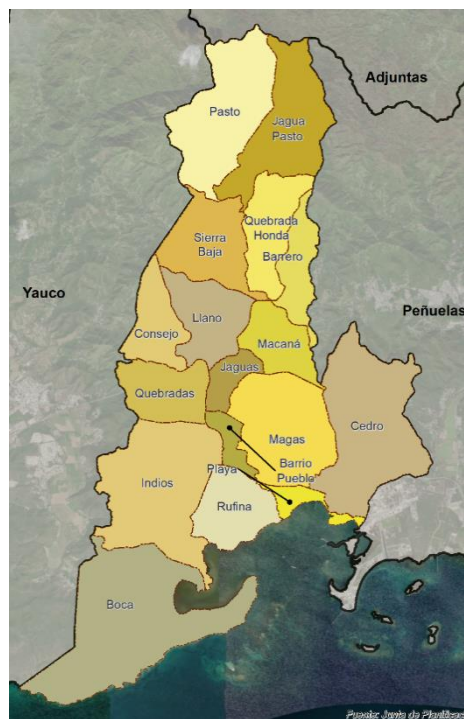
<sup>3</sup> 21 L.P.R.A § 7015

This Executive Summary will provide an overview on:

- Guayanilla's population characteristics;
- The public participation and outreach efforts with the community during the LHMP planning process;
- Guayanilla's risk assessment;
- A review of the mitigation strategies, goals and LHMPs action plan; and
- Plan maintenance, and how to keep the Plan current.

## 2 Guayanilla' Profile: Main Population Characteristics

Figure 2: Guayanilla and its wards



The Municipality of Guayanilla is a coastal community located in the south of Puerto Rico. The Caribbean Sea is at the south of the Municipality. To the north it borders with the municipality of Adjuntas, to the east with the municipality of Peñuelas, to the west with the Municipality of Yauco. The Municipality covers approximately 42.2 square miles (109.7 square kilometers). The municipality has 17 *barrios* (wards) including the Barrio Pueblo (old Spanish downtown center). Guayanilla's *barrios* or wards are Barrero, Boca, Cedro, Consejo, Indios, Jagua Pasto, Jaguas, Llano, Macaná, Magas, Rufina, Pasto, Playa, Pueblo, Quebrada Honda, Quebradas, y Sierra Baja.

The Puerto Rico Planning Board, according to the most recent area delimitation, divides the island into eleven areas, grouping the different municipalities by their demographic trends and human settlements, infrastructure endowment, socioeconomic variables, sociodemographic characteristics, internal cohesion, and the resources and development potential of each. The Functional Area of Ponce, to which the Municipality of Guayanilla belongs, is composed of the municipalities of Adjuntas, Coamo, Guánica, Guayanilla, Jayuya, Juana Díaz, Peñuelas, Ponce, Santa

Isabel, Villalba and Yauco.

Table 1: Population by age group: 2010 and 2018

Population	2010 Census	2018 ACS Estimate	% Rate of Change
Younger than 5 years of age	1,412	929	-34.21%
5 to 19 years of age	4,689	3,707	-20.94%
20 to 64 years of age	12,440	10,733	-13.72%
65 years of age and older	3,040	3,639	19.70%
<b>Total</b>	<b>21,581</b>	<b>19,008</b>	<b>-11.92%</b>

Source: US Census Bureau, Census 2010; American Community Survey 2013-2018 Estimates

According to the 2010 Census, Guayanilla had a population of 21,581. The American Community Survey (ACS) of 2018 estimated that the population of Guayanilla had decreased by 2,273 inhabitants. This represents a reduction of 11.92%. All barrios except for Sierra Baja had a decrease in their populations. The barrios that had a loss

of population greater than 30% are Quebrada Honda (-49.23%), Quebradas (-39.96%), Consejo (-39.28%), Jaguas (34.32%) and Boca (32.05%). Note that further population change might have happened due to the strong earthquake that shook Guayanilla in early 2020. Statistics for 2019 at the ward level have of

yet not been released. Further details, regarding the profile of the municipality, can be found in Chapter 3, Section 3.2 of the updated 2020 LHMP.

### 3 Outreach and Public Participation

In order to guide the development of this Plan, Hon. Nelson Torres Yordán, Mayor of Guayanilla, appointed the following officials to constitute the Mitigation Planning Committee (henceforth, the Planning Committee). The Planning Committee is comprised by representatives from several departments with key roles and experience in community planning, public works, and emergency management to serve as key components in the planning process. Please refer to Section 2.5 on the LHMP.

*Table 2 Hazard Mitigation Planning Committee*

Name	Position	Agency	email
Fernando Borrero Caraballo	Director	Municipal Public Works	fjavier.borrero@gmail.com
Janice Rullán Borrero	Director	Federal Programs	janice.rullan@gmail.com
Carlos Jirau Vélez	Consultant	n/a	cjirau@yahoo.com

The Planning Committee activities included: (1) updating the list of the municipality assets and local critical facilities; (2) updating the status of the previous LHMP mitigation strategies; (3) determine possible new mitigation strategies for the 2020 LHMP; (4) development and implementation of public participation and outreach activities and stakeholders at large such as neighboring municipalities, governmental agencies; (5) announce the municipality's LHMP efforts to agencies, stakeholders and public feedback for Guayanilla LHMP 2020 draft version and incorporate such comments on the Plan.

An initial notice was published on a local newspaper. Said notice informed the public about the first public participation meeting to be held on June 23, 2020. This meeting was held via YouTube Live due to the restriction imposed by the Governor's Executive Order regarding the restrictions on public gathering to stem the spread of COVID-19. A second notice was published regarding the publication of the 2020 LHMP draft version for review providing 20 days period for review, submit comments, and the opportunity to participate in a second community meeting held on August 8, 2020. This second meeting as well was held via YouTube Live. A draft version of the 2020 LHMP was made available on the Puerto Rico Planning Board's (PRPB) website (jp.pr.gov).

### 4 Guayanilla's Risk Assessment

After reviewing the natural hazards identified as priorities on the previous Guayanilla's 2017 LHMP, the Municipal Emergency Response Plan, the municipality's disaster history, and other literature related to potential future hazards, the Planning Committee identified the following hazards in the 2020 LHMP; (1) Sea Level Rise, (2) Drought, (3) Earthquakes, (4) Flooding, (5) Landslides, (6) Strong Winds (Tropical

Cyclones), (7) Tsunami (8) Coastal Erosion, (9) Storm Surge, (10) Wild Fire. Discussion of these natural hazards are included in the 2020 LHMP's Chapter 4. In addition, the 2020 LHMP includes a quantitative vulnerability analysis based on the best available data for Guayanilla and Puerto Rico accounting for future development to assess mitigation strategies to prevent repetitive and severe property loss.

This assessment served as a key tool for the Planning Committee and the public to identify and prioritize potential mitigation strategies by focusing attention on areas that present the greatest risk of damages to people, critical facilities, and normal municipality operations. The analysis for earthquake, flood, landslides, and high winds was performed by assessing the potential impacts from each hazard using geographic information system data (GIS).

By ranking each section, the municipality was in position to determine an overall risk classification. It is important to mention that this classification exercise resulted from the municipality's 2020 LHMP technical risk assessment along with a capability gap analysis and the local community input, which is based on previous natural events experienced by the Planning Committee and the residents and business owners of Guayanilla.

The following table provides a summary of the risk classification for each identified hazard. Part of the process of completing the next appraisal required input from the community as well as from the Committee. Beyond the risk analysis, this table presents the municipality's prioritization analysis.

*Table 3 Natural Hazard Ranking*

Natural Hazard	Risk to people	Risk to facilities	Risk to operations	Classification
Sea Level Rise	2	1	1	Moderate
Drought	3	1	1	Moderate
Earthquake/Liquefaction	3	3	3	High
Flooding	3	3	3	High
Landslide	3	1	1	Moderate
Strong Winds/Tropical Cyclones	3	3	3	High
Tsunami	3	1	2	Moderate
Storm Surge	3	1	1	Moderate
Coastal Erosion	1	1	1	Low
Wildfire	2	1	1	Moderate

Source: Planning Committee 2019-2020

High=3, Moderate=2, Low=1

Currently, the potential risks with the highest classification or greater impact identified for the municipality are: (1) earthquake/liquefaction, (2) flooding, and (3) strong winds.

A ranking methodology was adopted to develop the mitigation strategies based on these risks as discussed on Chapter 6 and are divided into the following categories: (1) Prevention, (2) Property Protection, (3) Natural Resources Protection, (4) Structural Projects, (5) Emergency Services, and (6) Education and Public Awareness. The strategy category with most mitigation actions is “Prevention” with a total of 15 mitigation projects. Landslide and flooding are the natural hazards that are most addressed within the mitigation actions.

## 5 Mitigation Strategies, Goals, and Action Plan

The municipal capabilities, along with the risk assessment, serve as a foundation for the design, development and implementation of mitigation strategies. Mitigation strategies, found in Chapter 6, consist of a broad amount of local goals and strategies. The local mitigation actions were gathered from the 2017 LHMP and were incorporated into the current LHMP. This chapter provides information about the assigned implementation mechanisms and target completion dates. The sections in this chapter are designed to make the Plan strategic by identifying long-term goals, and functional, by identifying short term and immediate actions that will guide the daily local decision-making process and project implementation.

Mitigation goals consist of general guidelines that explain what the Municipality of Guayanilla wants to achieve in terms of hazards and mitigation. Thus, the goals included in the 2020 LHMP, offer the Planning Committee and the communities a framework for identifying, prioritizing and implementing actions to reduce the risks associated to natural hazards at Guayanilla.

Mitigation strategies are activities, projects, measures, or processes that Guayanilla will adopt in order to reduce or eliminate risk to people and property from hazards. Consequently, Guayanilla reviewed and revised the criteria adopted in the 2017 LHMP to analyze and prioritize potential mitigation strategies for the municipality. In order to develop the actions, the Planning Committee used the following criteria: (1) the potential of the strategy to reduce expected future damages and/or losses; (2) the capacity of the municipality to implement the action within the 5-year cycle of the Plan; (3) support from the public, agencies, municipal departments, amongst others; and (4) the potential of the action to increase resiliency of Guayanilla and its residents. Accordingly, the Planning Committee adopted these criteria, the results from the risk assessment, and the feedback from local and neighboring communities to prioritize each mitigation strategy that was contained in this LHMP.

Most of the strategies and projects in the action plan target the continuity of municipality services after a hazard event. The following summarizes some of the strategies intended to mitigate these hazards:

- Acquisition and/or relocation of structures that have had repetitive loss in various sectors of the Municipality (Sector La Playita, Sector El Faro, San Pedro de Macorís, etc.).
- Stabilization of slopes and landslide prevention in various rural communities (Hacienda Casanova St, El Parque St., El Monte Subdivision, Road PR-3378 Km. 0.5, Sector Los Paganés, etc.).
- Development of a Wetland Protection Plan.
- Sediment removal from the bed of the Guayanilla River.
- Acquisition of 250 acres along the floodway of the Guayanilla River for flood mitigation purpose.
- Sheet Pile installation along segments of the Guayanilla River
- Construction of a new Emergency Operation Center.



## 6 Maintenance to Keep the Plan Current

Chapter 7 details the revision and monitoring process in great extent. The formal maintenance process, identified by the Planning Committee, aims to keep the document viable and current, as it is a living document that shall reflect the hazards and realities affecting its community, and how to plan and prepare ahead in the event of a natural disaster. The plan maintenance process provides the procedures for evaluation and review every third quarter of each fiscal year during its 5-year life cycle. Evaluation will include a review of the mitigation action plan implementation, continued public involvement through the Plan's life cycle, as required by federal legislation. As part of the review process, the members of the Planning Committee. In the event of a major natural disaster affecting the island and/or municipality, an emergency meeting must be scheduled, and the Plan should be updated or amended, as necessary, bypassing the 5-year term. The Municipal Administrator will coordinate with other municipal dependencies, as needed, to achieve the goals and objectives stated in this LHMP.

Finally, the municipality will promote continued public participation during the plan maintenance by, including, but not limited to (Refer to Section 7.3 of the LHMP):

- Inviting the public to the yearly review meeting of the Plan
- Notifying the public of any proposed revision or progress report that may arise during the life cycle of the Plan

## 7 Plan Approval and Adoption

The Federal Emergency Management Agency (FEMA) completed review of the Municipality of Guayanilla's Hazard Mitigation Plan, based on the standards pursuant to title 44 C.F.R. Section 201 as authorized by the Disaster Mitigation Act of 2000 (DMA2k). The Plan received a satisfactory rating for all required criteria and was approved as approvable pending adoption (APA) on December 8, 2020. Accordingly, the Municipality of Guayanilla, adopted said Plan on December 15, 2020 via Executive Order #60 signed by Mayor Nelson Torres Yordán.

Upon receiving the record of adoption from the municipality, FEMA approved Plan on January 12 and issued an official approval letter to municipality stating the jurisdiction has adopted said Plan thus approved and eligible for FEMA Hazard Mitigation Assistance programs. The approval letter establishes the expiration date 5 years from the date of approval, or until January 7, 2026.