

ENVIRONMENTAL ASSESSMENT

CONSTRUCTION OF PR-10 ADJUNTAS TO UTUADO, PUERTO RICO

OCTOBER 2024

**FEDERAL HIGHWAY ADMINISTRATION
PUERTO RICO DEPARTMENT OF HOUSING**

ENVIRONMENTAL ASSESSMENT

CONSTRUCTION OF PR-10

**Section II (AC-100069), Section III (AC-100071), Section IV (AC-100055
and Section V (AC-100076)**

ADJUNTAS TO UTUADO, PUERTO RICO

The FHWA has determined that the construction of the preferred alternative identified as sections of PR-10 (AC-100069, AC-100071, AC-100055, and AC-100076) will have no significant impact on the human environment. This FONSI is based on the attached EA which has been independently evaluated by the FHWA and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that the preparation of supplement to the FEIS is not required. The PRDOH and FHWA take full responsibility for the accuracy, scope, and content of the attached EA.

10/10/2024

Date of Approval

10/9/24

Date of Approval

For Federal Highway Administration

For Puerto Rico Department of Housing

The following resources may be contacted for any matter regarding this document:

Juan Pérez, PE, MEng.
Director for Disaster Recovery
CDBG-DR/MIT Program
Puerto Rico Department of Housing
PO Box 21365
San Juan, PR 00928-1365
Mail to: environmentCDBG@vivienda.pr.gov

Jamie Christian
Division Administrator
Federal Highway Administration
400 W. Washington Street Rm. 4200
Orlando, FL 32801
Mail to: jamie.christian@dot.gov

Table of Contents

| | |
|--|-----------|
| EXECUTIVE SUMMARY | 11 |
| Chapter 1: Introduction, Regulatory Background, And Summary of Conclusions | 19 |
| 1.1 Introduction | 19 |
| 1.2 Regulatory Background | 20 |
| 1.3 Summary of Conclusions | 20 |
| Chapter 2: Proposed Action | 24 |
| 2.1 Background Information | 24 |
| 2.2 Proposed Action | 29 |
| 2.3 Planning Consistency | 32 |
| Chapter 3: Purpose and Need for the Project | 32 |
| 3.1 Project Purpose | 32 |
| 3.2 Project Need..... | 33 |
| Chapter 4: Alternatives | 35 |
| 4.1 No Build Alternative | 35 |
| 4.2 Build Alternatives | 36 |
| 4.2.1 Alternative 1: Improvements to existing PR-123 between Adjuntas and Utuado | 36 |
| 4.2.2 Alternative 2: Construction of a new highway in a new corridor | 38 |
| 4.2.2.1 Alternative 2A: Construction of a new highway connecting existing sections of PR-10 that was selected as the preferred alternative of the FEIS and its subsequent reevaluations..... | 38 |
| 4.2.2.2 Alternative 2B: Construction of a new highway to the east side of the Rio Grande de Arecibo within PR-123 corridor | 40 |
| 4.2.3 Alternative 3: Alternative Considered but not Selected for Detailed Study | 411 |
| Chapter 5: Compliance with FHWA and HUD Environmental Laws and Regulations..... | 55 |
| 5.1 Compliance with 24 CFR §58.5, and §58.6 Laws and 23 CFR 771.119 and other Environmental Laws | 55 |
| 5.1.1 Airport Hazards 24 CFR § 51, Subpart C and 24 CFR 58.6 (d) | 55 |
| 5.1.2 Coastal Barrier Resources 24 CFR § 58.6 (c) and CFR 771.119 | 56 |
| 5.1.3 Flood Insurance 24 CFR § 58.6..... | 56 |
| 5.1.4 Clean Air 24 CFR § 58.5 (g), 23 CFR 771.119 and 40 CFR Parts 51 and 93 | 57 |
| 5.1.5 Coastal Zone Management 24 CFR § 58.5 (c) and 23CFR 771.119..... | 62 |
| 5.1.6 Contamination and Toxic Substances 24 CFR § 58.5 (i) (2) and 24 CFR 51..... | 63 |

| | |
|---|------------|
| 5.1.7 Endangered Species 24 CFR §58.5 (e), U.S.C. 1536, Section 7 and 23 CFR 771.119 | 66 |
| 5.1.8 Explosive and Flammable Hazards, 24 CFR Part 51C and 23 CFR 771.119 | 70 |
| 5.1.9 Farmlands Protection 24 CFR Sec. 58.5(h) and 23 CFR Sec. 777..... | 72 |
| 5.1.10 Floodplain Management 24 CFR 58.5(b) and 23 CFR 650A..... | 72 |
| 5.1.11 Historic Preservation 24 CFR § 58.5 (a), 23 CFR Sec. 771 and T 6640.8A | 75 |
| 5.1.12 Compliance with Section 4(f) - 49 U.S.C. 303 and 23 U.S.C. 138 | 77 |
| 5.1.13 Noise Abatement and Control 24 CFR § 51 B and 23 CFR Sec. 774..... | 77 |
| 5.1.14 Sole Source Aquifers 24 CFR §58.5(d) and 23 CFR Sec. 777 | 80 |
| 5.1.15 Wetlands Protection 24 CFR §58.5(b) and 23 CFR 777 | 80 |
| 5.1.16 Wild and Scenic Rivers 24 CFR §58.5(f) 23 CFR Sec. 774 and Sec. 777 | 83 |
| 5.1.17 Environmental Justice 24 CFR §58.5 (j) and 23 CFR Sec. 771.119 and FHWA Order 6640.23A | 83 |
| 5.2 Environmental Assessment Factors | 91 |
| 5.2.1 Land Development | 92 |
| 5.2.2 Socioeconomic Conditions | 103 |
| 5.2.3 Community Facilities and Services | 105 |
| 5.2.4 Natural Features | 108 |
| 5.2.5 Greenhouse Gases..... | 122 |
| 5.3 Control Monitoring, Mitigation and Environmental Commitments | 124 |
| 5.4 Cumulative Impacts | 136 |
| 5.4.1 Affected Environment Condition..... | 136 |
| 5.4.2 Past, Present, and Reasonably Foreseeable Future Actions in the Study Area..... | 137 |
| 5.4.3 Land Use | 137 |
| 5.4.4 Traffic and Transportation | 138 |
| 5.4.5 Hydrology and Flood Plains | 139 |
| 5.4.6 Water Quality/Sedimentation | 140 |
| 5.4.7 Landslide/Geology/Soils..... | 140 |
| 5.4.8 Climate Change | 141 |
| 5.4.9 Air Quality/GHG | 141 |
| 5.4.10 Noise | 142 |
| 5.4.11 Natural Systems | 143 |
| 5.4.12 Existing Stressors/Pollution Burden | 145 |
| Chapter 6: Public Participation | 145 |

| | |
|---|--------------|
| Chapter 7: Coordination and List of Preparers..... | 15959 |
| 7.1 Coordination Agencies | 15959 |
| 7.2 Preparers..... | 15959 |
| ATTACHMENTS | 16060 |

LIST OF TABLES

| | |
|---|-----|
| Table 1: Summary of Repair Projects of PR-123 | 37 |
| Table 2: Comparison of Alternatives Impacts | 43 |
| Table 3: Typical Noise Levels Associated with Highway Construction Activities as a Function of Distance | 79 |
| Table 4: Summary of Mitigation Measures..... | 124 |
| Table 5: Summary of PR-10 Hurricane Maria and Fiona Repair Projects | 139 |

List of Attachments

- Attachment 1: Tabulated Summary of the Reevaluations conducted for PR-10 after approval of the FEIS by FHWA
- Attachment 2: Figures and Photographs
- Attachment 3: Copy of the Proposed Action Drawings Illustrating ROW and Location of Bridges
- Attachment 4: Copy of a selected section of the most recent Statewide Transportation Improvement Program (STIP)- Amendment #1 for FY 2023-2026 approved by FHWA/FTA including PR-10 Project
- Attachment 5: Copy of Recertification Approval of the EQB for the Adjusted Alignment of PR-10
- Attachment 6: Copy of HUD Environmental Evaluation Assessment Form
- Attachment 7: Copy of the Results Obtained from the NEPAAssit Database
- Attachment 8: Environmental Site Assessments Phase I and II
- Attachment 9: Proposed Specifications for the Surplus Material Management
- Attachment 10: Copy of IPAC Report
- Attachment 11: Copy of the Programmatic Biological Opinion (PBO) approved by the USFWS
- Attachment 12: Copy of comments and endorsement letters received from consulted federal and local agencies
- Attachment 13: Copy of the Flora/Fauna Study conducted by OIKOS 2002
- Attachment 14: Copy of the Endangered Bird of Prey Species Reports for Sections II, III and IV (June 2013 and May 2014)
- Attachment 15: Copy of the Field Protocols requested by the DNER for the Protection of Endangered Species
- Attachment 16: Copy of the 8-Step Decision Making Document
- Attachment 17: Copy of the USACE Nationwide Permit for Section II of the Proposed Action
- Attachment 18: Copy of the Archaeological Phase IA and IB Studies for Sections III through V of PR-10

Attachment 19: Copy of the Archaeological Study Requesting Reconsideration to the Need to Perform an Archaeological Phase II at Section II (AC-100069)
Attachment 20: Copy of the Noise Traffic Impact Study performed for Section V (AC-100076)
Attachment 21: Copy of DNL Calculator Result
Attachment 22: Copy of the Forecasting and Traffic Analysis Report for PR-10
Attachment 23: Copy of the EJ Screen: Environmental Justice Screening and Mapping Tool/US Census Database Review Reports
Attachment 24: Geotechnical Studies for Sections II, III, IV and V performed at the request of the DNER
Attachment 25: Copy of the Hydraulic/Hydrologic Studies Performed for Sections II, III, IV and V
Attachment 26: Copy of Letter from DNER with respect to Mitigation Agreements for PR-10 (Hacienda Verde)
Attachment 27: Cumulative Impacts Analysis Report for PR-10
Attachment 28: Copy of Comments Received During the PRDOH Environmental Reevaluation Process
Attachment 29: Copy of the Public Notice for the EA
Attachment 30: Summary of Comments and Responses for EA

Acronyms

| | |
|-------------|--|
| ACM | Asbestos Containing Material |
| ACT | Autoridad de Carreteras y Transportación |
| ADT | Average Daily Traffic |
| ASTM | American Society for Testing and Materials |
| AASHTO | American Association of State Highway and Transportation Officials |
| BHA | Barret Hale & Alamo |
| BMP | Best Management Practices |
| BR | Bridge |
| BWH | Broad-Winged Hawk |
| CAA | Clean Air Act |
| CBIA | Coastal Barrier Improvement Act |
| CBRA | Coastal Barrier Resources Act |
| CBRS | Coastal Barrier Resources System |
| CDBG-DR/MIT | Community Development Block Grant-Disaster Recovery / Mitigation |
| CE | Categorical Exclusion |
| CEQ | Council of Environmental Quality |
| CFR | Code of Federal Regulations |
| CGP | Construction General Permit |
| CMP | Congestion Management Process |
| CN | Curve Number |
| CO | Carbon Monoxide |
| CWA | Clean Water Act |
| dba | Decibels A |
| DEIS | Draft Environmental Impact Statement |
| DNER | Department of Natural and Environmental Resources |
| DNL | Day/Night Noise Level |
| EIS | Environmental Impact Statement |

| | |
|----------|--|
| ESA | Environmental Site Assessment |
| EJScreen | Environmental Justice Screening and Mapping Tool |
| EQB | Environmental Quality Board |
| ESpA | Endangered Species Act |
| FAHP | Federal-Aid Highway Program |
| FEIS | Final Environmental Impact Statement |
| FEMA | Federal Emergency Management Agency |
| FHWA | Federal Highway Administration |
| FIRM | Flood Insurance Rate Map |
| FONSI | Finding of No Significant Impact |
| FTA | Federal Transit Administration |
| GHG | Green House Gases |
| HEC-HMS | Hydrologic Modeling System |
| HUD | Department Of Housing and Urban Development |
| JPA | Joint Permit Application |
| LBP | Lead Based Paint |
| Leq | Equivalent Continuous Sound Pressure Level |
| LOS | Level of Service |
| MLAA | May Affect, Likely to Adversely Affect |
| MOT | Maintenance of Traffic |
| MPO | Metropolitan Planning Organization |
| MSATs | Mobile Source Air Toxics |
| MSEM | Master of Science in Engineering Management |
| MSHA | Mine Safety and Health Administration |
| NAAQS | National Ambient Air Quality Standards |
| NAC | Noise Abatement Criteria |
| NEPA | National Environmental Policy Act |
| NFIP | National Flood Insurance Program |

| | |
|--------|---|
| NHPA | National Historic Preservation Act |
| NLAA | May Affect, Not Likely to Adversely Affect |
| NOI | Notice of Intent |
| NPDES | National Pollutant Discharge Elimination System |
| NPS | National Parks Service |
| NRCS | Natural Resources Conservation Office |
| NRI | Nationwide Rivers Inventory |
| NWSRS | National Wild and Scenic River Systems |
| OSHA | Occupational Safety and Health Administration |
| PBO | Programmatic Biological Opinion |
| PMO | Permits Management Office |
| PN | Public Notice |
| PR | Puerto Rico |
| PRASA | Puerto Rico Aqueduct and Sewer Authority |
| PRDOH | Puerto Rico Department of Housing |
| PRDTPW | Puerto Rico Department of Transportation and Public Works |
| PREPA | Puerto Rico Electric Power Authority |
| PRHTA | Puerto Rico Highway and Transportation Authority |
| PRIC | Puerto Rico Institute of Culture |
| RCRA | Resource Conservation and Recovery Act |
| RE | Responsible Entity |
| ROW | Right of Way |
| RROF | Request for Release of Funds |
| SIP | Single Incidental Permit |
| SCS | Soil Conservation Service |
| SFHA | Special Flood Hazard Area |
| SHPO | State Historic Preservation Office |
| SIP | State Implementation Plan |

| | |
|-------|---|
| SQG | Small Quantity Generator |
| SSH | Puerto Rican Sharp-Shinned Hawk |
| STIP | State Transportation Improvement Plan |
| SWPPP | Storm Water Pollution Prevention Plan |
| T | Technical Advisory 6640 |
| TMDL | Total Mass Daily Loading |
| TNM | Traffic Noise Model |
| TPH | Total Petroleum Hydrocarbons |
| TUB | Traditional Urban Centers |
| NTSB | National Transportation Safety Board |
| UIC | Underground Injection Control |
| URA | Uniform Relocation Act |
| US | United States |
| USACE | US Army Corps of Engineers |
| USC | United States Code |
| USEPA | United States Environmental Protection Agency |
| USFS | United States Forest Service |
| USFWS | United States Fish and Wildlife Services |
| VHT | Vehicle Hours Traveled |
| VMT | Vehicle Miles Traveled |
| WTP | Water Treatment Plant |

EXECUTIVE SUMMARY

The Puerto Rico Highway and Transportation Authority (PRHTA) is proposing the construction of the remaining sections of PR-10 between the municipalities of Utuado and Adjuntas whose terrestrial connection is being made through state road PR-123. In the context of the Island, the Proposed Action is in the central mountainous region known as Cordillera Central. The Proposed Action would serve to interconnect the northern and southern segments of PR-10 already constructed and in operation. Once completed, PR-10 will span approximately 58.0 kilometers between the Municipalities of Arecibo and Ponce. While most of the roadway has been already built, approximately 7.6 kilometers, divided into four sections for construction purposes, remain to be constructed.

Resulting from its design and construction starting in the late 1880's and completed early in the 1900's, PR-123's exhibits dangerous and substandard operational conditions, a conclusion that was confirmed by various traffic studies as well as a relatively high accident rate. In response to these findings, the PRHTA engaged in the performance of transportation engineering analyses that confirmed the need to improve PR-123 and ultimately identified that its relocation was the recommended alternative resulting from the limitations and constraints of PR-123 corridor. The relocated highway was identified as PR-10, whose construction has progressed as a function of the availability of funds but has not been completed as previously noted. The Proposed Action area remains sparsely developed, with a declining population and low per capita income as per information obtained from the U.S. Census Bureau data for Puerto Rico. Recent Traffic studies (2021) project a low daily traffic volume on PR-123 and estimate that roughly a 60% of the current vehicular traffic using PR-123 would be diverted to the Proposed Action. The new highway aims to enhance safety and should result in a highway that meets modern transportation standards. The Proposed Action typical section consists of an undivided highway with one (1) traffic lane of 3.65 meters in each direction, with an additional climbing lane in the southbound direction toward the Municipality of Adjuntas. An exterior shoulder of 3.0 meters is provided in the northbound lane, while a 1.80 meters shoulder is provided in the southbound lane. As a result of the rugged characteristics of the topography of the area, twenty bridge structures will be constructed as well as drainage improvements in the form of berms, pipe crossings, pipes, catch basins, headwalls, and manholes.

The purpose and need of this project include finishing the construction of a terrestrial link from north to south, aimed at enhancing accessibility and mobility for existing PR-10 users. Its completion will serve to establish a secure and resilient highway infrastructure that mitigates the impact of future natural disasters, in accordance with the latest construction standards outlined in the AASHTO Design and Construction of Highway and Bridges and will provide a safer and modern route for its current and future users. A resilient terrestrial corridor is required as a measure aimed to prioritize mitigation of risk, a key lifeline asset that in the aftermath of a disaster event, and to contribute to the Island's resilience.

The Puerto Rico Department of Housing (PRDOH) plans to contribute \$540,069,976.00 from the Community Development Block Grant – Mitigation (CDBG-MIT) under Grant #B-18-DP-72-0002 for the construction of the Proposed Action. These funds stem from the presidentially declared disaster following Hurricane Maria and are designated for transformative infrastructure projects that enhance long-term community resilience to future hazards. Additionally, the State Transportation Improvement Program

(STIP) allocates \$2,000,000.00 in federal aid from the Federal Highway Administration (FHWA) funds for the remaining right-of-way (ROW) acquisition related to the Proposed Action.

PRHTA has envisioned the planning and construction of PR-10 as a north-to-south roadway since the late 1960s. The National Environmental Policy Act (NEPA) required the preparation of an Environmental Impact Statement (EIS) at the project's inception, which was finalized on May 27, 1979. Compliance with NEPA <https://act.dtop.pr.gov/enlaces-pr-10-utuado-adjuntas/> was documented, and as funds became available, PRHTA initiated the construction of the new roadway in 1995. Since its inception, the FHWA has been the lead federal agency for PR-10, overseeing the EIS and the various Reevaluations that have been conducted until August 2022. Currently, the Proposed Action has received funds under the Federal-Aid Highway Program (FAHP), included in the State Transportation Improvement Program (STIP). However, the primary funding for the proposed action will come from the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant – Mitigation (CDBG-MIT) funds. The PRDOH, as the grantee of CDBG-MIT funds, acts as the Responsible Entity (RE) under 24 CFR § 58.4, assuming responsibility for environmental review, decision-making, and actions as specified in “24 CFR Part 58”, following HUD's authority under NEPA and other relevant laws.

Given that CDBG-MIT funds will combine with the allocated Federal-aid funds for the final sections of the PR-10 Project, FHWA and PRDOH are jointly leading the preparation of Environmental Assessment (EA) to assess the impacts on the human and natural environment. This assessment ensures compliance with FHWA and HUD's requirements under 23 CFR § 771 and 24 CFR § 58, respectively. Coordination with PRHTA, the CDBG-MIT subrecipient, and FAHP recipient will also occur. As joint lead agencies, FHWA and PRDOH made the EA available for review to local, state and federal agencies as well as the general public and concerned parties. Per CEQ guidance, a supplemental EIS is not needed, and a Finding of No Significant Impact Determination (FONSI) is the appropriate action based on environmental studies and analysis.

Prior to the above-described determination, in June 2023, the PRDOH publicly announced its intention to adopt the FHWA's 1979 Final Environmental Impact Statement (FEIS) and related re-evaluations. However, it was decided to re-evaluate the FEIS further, opening it for public comment. Subsequently, and per CEQ guidance, an EA would be more appropriate to update the analysis of the Proposed Action conducted to determine if a Supplemental EIS was necessary.

This EA has been prepared in compliance to the NEPA regulations (CFR 1500-1511), FHWA regulations (23 CFR § 771.119), FHWA's Technical Advisory T 6640.8, and HUD regulations (24 CFR Part 58). The FHWA and PRDOH collaborated on this EA to assess the significance of the impacts associated with the final four sections of PR-10. The EA incorporates current laws, regulations, and relevant information to conduct a comprehensive and up-to-date analysis of the potential impacts.

This EA serves as an assessment of the FEIS and the proposed action to determine if a Supplemental EIS is needed. The purpose of the process is to evaluate whether new information or circumstances, including changes in regulations and other federal and local laws relevant to the remaining Proposed Action, would result in significant environmental impacts not previously considered in the FEIS.

Three alternatives were assessed for the proposed action. The No Action Alternative and the alternative to enhance the current highway PR-123 were found unsuitable for meeting the transportation infrastructure needs and goals of the region. The third alternative evaluates the construction of a new

highway connecting the north and south sections of PR-10 currently in operation. Although the adoption of a mass transit system was initially considered during project planning, it was later dismissed after a thorough study and evaluation. After reviewing the scope of the Proposed Action, the following determinations have been made:

A. Alignment Adjustments

The Proposed Action remains within the same corridor of alternatives analyzed in the FEIS due to its selection as the preferred alternative. However, after its selection as the recommended alternative in early 2000s, and during the performance of design and construction stages, the desirability of making some adjustments in the project alignment were identified in the Adjuntas – Utuado area. The purpose of these adjustments was to minimize environmental impacts and address right-of-way acquisition needs. The adjustments maintained the original highway concept and capacity.

B. Air Quality and Noise

Air quality within the Proposed Action is good, meeting National Ambient Air Quality Standards (NAAQS). Minor air quality impacts are anticipated to occur during the construction stage, necessitating mitigation controls. These have been included in Section 5.3 of the EA, as mitigation measures of the Proposed Action. With respect to noise, a small to moderate increase in noise levels is expected during highway operation, but no significant impacts requiring the adoption of noise abatement measures were identified.

C. Coastal Zone and Coastal Barriers Resources

The Proposed Action is located outside the coastal zone and/or locations with Coastal Barrier resources. Therefore, these types of resources will not be affected by the proposed Action.

D. Hazardous Wastes and Contamination

After conducting a site reconnaissance, it was determined that a Phase I Environmental Site Assessment was required to be performed only a one parcel resulting from the finding of an old heavy trucks repair shop. This environmentally recognized condition resulted in the need to conduct a Phase II Assessment due to the potential presence of contaminants. The results of the Phase II assessment indicate that no significant environmental concerns were detected but did identify the need to perform closure activities of a septic tank found at the property. Closure of the tank and disposal of its contents shall be conducted in compliance with the Department of Natural Resources (DNER) regulations as further described in Section 5.3 of the EA.

E. Explosive and Flammable Hazards

The proposed action does not include development, construction, rehabilitation, or any type of action that will induce an increase in residential densities, or conversion. No installation of aboveground storage tanks (AST) that may jeopardize the security of the scarce number of residences that are located near the Proposed Action construction sites will occur. Regarding flammable hazards, small quantities of flammable substances (diesel, paints, etc.) may be utilized only during the project construction phase but would be managed as per applicable federal and state regulations. The construction phase will require the use of explosives in some areas within the ROW. The implementation of regulatory health and safety protocols required for the use of explosives will serve

to protect from harm nearby properties, humans as well as threatened and/or endangered species (especially during their breeding season) that may be located nearby the Proposed Action corridor. Therefore, due to the location of the proposed action and its surroundings, no impact on human health or the environment is expected.

F. Floodplain Management and Impacts

An 8 Step Process was accomplished, and it concluded that the Proposed Action is the only practical alternative to traverse through floodplain areas within its alignment. The Proposed Action considers only one bridge crossing over the Rio Grande de Arecibo that is located within a FEMA designated A/AE flood zone. The construction of a proposed bridge at that flood prone area within the designated corridor will not significantly impact the floodplain and adjacent wetland. Both resources will be restored, returning them to essentially their previous existing conditions. A Nationwide 14 permit has been granted for the construction of this structure by U.S. Army Corps of Engineers (USACE). The 8-step study provides detailed information on the Nationwide Permit requirements to mitigate impacts during construction on existing resources. These mitigation measures are included in Section 5.3 of the EA.

G. Natural Features

The proposed action will have no significant impact on Unique Natural Features and Water Resources based on consultations with agencies with jurisdiction of this subject as well as consultations with publicly available databases from the DNER and the U.S. Fish and Wildlife Service (USFWS). Mitigation measures during the construction phase of the project to protect the Rio Grande de Arecibo, as described in Section 5.3 of the EA, will be implemented. These measures will be included in the Storm Water Pollution Prevention Plan (SWPPP) that will be prepared for the project to secure coverage of the Construction General Permit (CGP) issued by the U.S. Environmental Protection Agency (EPA).

H. Flora and Fauna

The area is located in the Subtropical Wet Forest life zone (Ewel & Whitmore, 1973) and it is composed by a combination of Sub-montane and lower montane wet evergreen forest/shrub and active/abandoned shade coffee, Sub-montane wet evergreen forest and pastures. Most of the fauna observed in the Proposed Action corridor are common species found in similar locations within the Island. The diversity of the species is higher through the central portion of the alignment. Biological studies through the years, in conjunction with consultations with state and federal agencies have not disclosed the presence of endangered or protected species within the corridor. An agreement was reached with the DNER to develop and implement protective protocols for rare and/or endangered species that may be present nearby the Proposed Action corridor. Said protocols require that qualified biologists shall be present at the Proposed Action site to assess the construction areas before and during the construction phase of the project. Detailed mitigation measures can be found in Section 5.3 of the EA. The DNER granted PRHTA the exemption from conducting a tree inventory for the proposed action after a review of a proposal that considered the size of the impacted areas and the assessing of their wildlife habitats. Both agencies agreed to transfer 253.32 cuerdas of Hacienda Verde as compensation and mitigation, aligning with compliance requirements outlined in Regulation 25, Law 241 of 1999, and its Regulation Number 6765, addressing wildlife and vegetation

management and conservation. The property transfer was officially completed through a deed signed in 2021 and ultimately comprise a total of 369.64 cuerdas considering the size of the property.

I. Endangered Species

Geospatial data identified four federally listed species that might be present along the path of the proposed action which are: the Puerto Rican boa (*Epicrates inornatus*) now known as *Chilabothrus inornatus*, Puerto Rican board-winged hawk (*Buteo platypterus brunnescens*), Puerto Rican parrot (*Amazona vittata*) and Puerto Rican sharp-shinned hawk (*Accipiter striatus venator*). The USFWS reviewed the information submitted by the PRHTA regarding these species and concurred with determination that the proposed action may affect but is not likely to adversely affect the above-mentioned species, except for the Puerto Rican boa. For this reptile specie, the USFWS concluded with a determination of A May Affect Not Likely to Adversely Affect, if a boa is captured and relocated. Therefore, the PRHTA and FHWA accepted the recommendation of the USFWS to comply with sections 6.4 and 6.5 of the Programmatic Biological Opinion (PBO) during the construction activities of the Proposed Action. As one of the environmental commitments developed for the construction of the Proposed Action, the adoption of the required conservation measures and to the adopt the restriction to conduct some construction activities that may affect protected species during the breeding season extending from January to July has been included in Section 5.3 of the EA. These requirements will be included in the contract documents. At a local level, an agreement to implement protection measures in the form of field protocols requiring the presence of an on-site qualified biologist was also included in section 5.3 to comply with the DNER requirements. It is important to indicate that the required protocols for the protection of endangered species were developed and already approved by the DNER. Copy of coordination and protocols approved by the DNER are included in the EA.

J. Wetlands

Existing topographic conditions along the path of the project action corridor promote a rapid drainage of the soils, which in turn limit the formation of wetlands. No extensive wetlands systems are found within the project ROW and its vicinity. If available, only limited riverine wetlands may be present in the vicinity of the surface bodies of water as may be observed from the National Wetland Inventory Maps developed by the US Fish and Wildlife Service (USFWS). Therefore, the potential for directly or indirectly impacting riverine systems by the proposed action are limited to (approximately 4.0 acres based on available drawings) since avoidance and minimization measures have been incorporated in proposed action design. Because of this reason permanent impacts on wetlands along the Proposed Action corridor are estimated to be less than 4.0 acres, since for section II, the Nationwide Permit issued by the USACE indicates that no wetlands will be impacted for the crossing of the Rio Grande de Arecibo. This crossing is the most significant one over a water body capable of sustaining a riverine wetland system. This determination incorporates the result of a Jurisdictional Determination (JD) of the proposed action area conducted by a qualified biologist. A more accurate area will be obtained once the corresponding Joint Permit Applications (JPA) are developed for the remaining sections of the project, however, none of them crosses over Rio Grande de Arecibo. Because of this reason, 4.0 acres of wetlands is estimated to be magnitude of the temporary impacts to wetlands that would be resulting from the proposed action construction activities. Also, it is important to indicate that protective measures will be implemented during its construction to further minimize the estimated

temporary impacts. The same determination applies to the aquatic resources of the Rio Grande de Arecibo. The USACE permit issued for Section II of the proposed action that has been granted for the construction of the bridge structure that would directly impact the Rio Grande de Arecibo, indicates that 0.35 acres of waters of the United States would be impacted. The remaining sections (III, IV and V) of the proposed action will have to comply, to the extent applicable (when final drawings are developed for them), with the requirements of Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act of 1899 for impacts on wetlands and/or construction on navigable waters of the United States. Mitigation measures anticipated to be applied to are described in the 8 Step Process and in Section 5.3 of the EA.

K. Farmlands

A review of the database published by the National Resources Conservation Service (NRCS) disclosed the fact that there are no prime or unique farmlands located along the corridor of the Proposed Action. This finding is consistent with the topography of the area and the existing soils within the corridor of the Proposed Action.

L. Aquatic Impacts

The Proposed Action design incorporates measures to minimize adverse impacts to the water quality of the Rio Grande de Arecibo and its aquatic resources, in particular Best Management Practices (BMPs) and the requirements of frequent inspections as required by the 2022 EPA Construction General Permit (CGP). This permit requires the development of a Stormwater Pollution Prevention Plan (SWPPP) that considers the quality of the receiving bodies of water. Specific details pertaining to these measures have been included in section 5.2.1 of the EA as well as in the 2022 CGP issued by the EPA.

M. Sole Source Aquifers

The Proposed Action complies with the Sole Source Aquifer requirements enforced by the EPA under provisions of the Safe Water Drinking Act (SWDA). There are no Sole Source Aquifers in Puerto Rico as defined by EPA in the SWDA of 1974.

N. Wild and Scenic Rivers

A review of the database published by the U.S. Forest Service (USFS) regarding the Proposed Action, disclosed the fact that it will not affect rivers designated as Wild and Scenic Rivers by National Parks Service (NPS).

O. Earthquakes

The area of the proposed action did not experience extensive damage in the aftermath of January 7, 2020 earthquake except for some limited structural damage and the terrestrial highway network for the area did not experience significant damage. The proposed structures will be designed in accordance with stringent design codes that require the construction of earthquake resistant structures and the recommendations of geotechnical studies. Mitigation measures can be found in Section 5.3 of the EA.

P. Historic Properties

No historic properties or structures were identified along the corridor of the Proposed Action. Compliance with Section 106 of the National Historic Preservation Act was secured. As required by Section 106 of the National Historic Preservation Act (NHPA), the State Historic Preservation Office (SHPO) issued a “no historic property affected” determination for the proposed action. At a local level, the Puerto Rico Institute of Culture (PRIC) endorsed the project and required an archaeological monitoring during the construction of Sections III (AC-100071) and IV (AC-100055) due to the proximity of the remains of coffee estates to the proposed action’s corridor. This requirement has been included in Section 5.3 of the EA as an Environmental Commitment.

Q. Socioeconomic Impacts and Environmental Justice

The Proposed Action complies with the Requirements of the Environmental Justice Act. There are no environmental conditions identified that would result in a disproportionately high impact adverse effect on low-income and/or minority populations. The Proposed Action will have benefits to the community because of the improved terrestrial connections, and accesses. It will also enhance community well-being by diverting through traffic away from the current PR-123 to PR-10, which includes heavy trucks. A safer and more efficient connection will be established serving as the primary access point for emergency providers and utility agencies in times of crisis.

R. Land Use and Development

The Proposed Action construction is an integral part of all regional land use plans, serving as a vital component of transportation infrastructure for the area. Its implementation will not adversely affect land use developments in the area, since the Planning Board of Puerto Rico (PRPB) and the planning and zoning regulations of Adjuntas and Utuado municipalities have acknowledged and integrated the Proposed Action corridor into their respective planning strategies. Furthermore, the lands adjacent to the Proposed Action corridor have been designated as non-developable. This project entails full access control, prohibiting any direct vehicular access to existing lands. Also, it shall be noted that upon completion of ROW acquisition, the proposed action will be nested at the center of the properties owned by the government of Puerto Rico (as discussed in section 5.2.1 Land Management of the EA). This implies that there is no possibility of establishing other uses along the corridor of the proposed action, and thus no pressure for urban development would be induced.

S. Construction Impacts

Construction noise impacts, although temporary in nature, would occur longer in time in the mountainous sections of the Proposed Action corridor than in flatter portions of the project. Mitigation measures to be implemented by the selected contractor and which are described in Section 5.3 of the EA will serve to control and minimize negative impacts derived by these activities.

T. Cumulative Impacts

Cumulative impacts of the proposed action are discussed in Section 5.4.2 of the EA. In general terms, the analysis demonstrates that the Proposed Action will not induce cumulative impacts to the area.

U. Mitigation Measures

Mitigation measures and environmental commitments have been adopted by FHWA, PRDOH and PRHTA to reduce, avoid, or eliminate adverse environmental impacts and to avoid non-compliance

or non-conformance with applicable regulations. The applicable mitigation measures are described and discussed in Section 5.3 of the EA. These measures must be incorporated into project contracts, development agreements, and other relevant documents. The staff responsible for implementing and monitoring mitigation measures will be clearly identified in the mitigation plan and will be conducted by a contracted third party under the supervision of the PRHTA/FHWA/PRDOH.

V. Landslide and Erosion

Due to the topographic characteristics of the Proposed Action area, it has been acknowledged that the corridor is located within the boundaries of a high landslide prone area. The DNER highlights that, given the project's route through regions prone to landslides, the final roadway design must incorporate the recommendations derived from comprehensive geotechnical and geological investigations. Attachment 24 includes the preliminary geotechnical and geological studies which will be expanded by the selected contractor during the Design-Build phase. This is essential to minimize risks associated with these natural conditions. Specific measures in hazard areas identified on soil studies will be implemented during the project's design phase. These requirements have been included in Section 5.3 of the EA, as mitigation measures of the Proposed Action.

W. Climate Change and Greenhouse Gases

The Proposed Action will not significantly contribute to greenhouse gases emissions and climate change. Vehicular traffic volume is low and a decrease in Vehicle Miles Traveled (VMT) for both passenger and commercial freight vehicles due to its construction are predicted. This reduction is primarily the result of a shorter distance along the new PR-10 corridor when compared to the existing comparable portion of PR-123. A total annual reduction of 3,503,467 VMT is expected, thus contributing to lower emissions, and helping reduce the factors contributing to climate change.

X. Public Participation

Various public participation processes have been carried out as part of the Proposed Action. In doing so, FHWA, PRDOH, and the PRHTA intended to receive early comments in their evaluation process to comply with NEPA. These processes include the 8 Step Process for Flood Plain and Wetlands and a Draft Environmental Reevaluation made available in June 2023. Responses to the comments received have been included in Attachment 28 of the EA. This EA process includes the provision of an additional thirty (30) day commenting period to comply with FHWA regulations. Comments received during this EA as well as a summary of the most significant comments have been discussed in Chapter 6 of this EA and copy of the comments have been included in Attachment 30.

Chapter 1: Introduction, Regulatory Background, And Summary of Conclusions

1.1 Introduction

The Puerto Rico Highway and Transportation Authority (PRHTA) is proposing to finalize the construction of Sections II, III, IV and V of PR-10. This will connect the northern sections of the completed PR-10 to the southern sections of the completed PR-10 and will be referred to as the Proposed Action. For its construction, the Puerto Rico Department of Housing (PRDOH), proposes to provide \$540,069,976.00 from the Community Development Block Grant – Mitigation (CDBG-MIT) from Grant #B-18-DP-72-0002. The funds are available resulting from the presidentially declared disaster in the aftermath of Hurricane Maria. These funds are intended to be used for projects that provide transformative infrastructure projects that will provide long-term benefits and strengthen the community's resilience to future hazards. In addition to the CDBG-MIT funds, the STIP has \$2,000,000.00 of federal aid (FHWA) funds for the remaining ROW acquisition of the Proposed Action.

The planning and construction of PR-10 as a north to south roadway was envisioned by the Puerto Rico Highway and Transportation Authority (PRHTA) since the late 1960's. At inception, compliance with the National Environmental Policy Act (NEPA) required the preparation of an Environmental Impact Statement (EIS) that was finalized on May 27, 1979, as per letter of June 8, 1979, issued by the Federal Highway Administration (FHWA). Having documented compliance with NEPA (<https://act.dtop.pr.gov/enlaces-pr-10-utuado-adjuntas/>) and as the necessary funds became available for the proposed action construction, the PRHTA undertook the endeavor of constructing the new roadway since 1995 and which when completed, will stretch 58.0 kilometers between the Municipalities of Arecibo and Ponce. Most of the roadway has already been built but approximately 7.6 kilometers consisting of four sections remain to be constructed for the project completion.

Since its inception, the FHWA has been the lead federal agency for the PR-10 responsible for the preparation and completion of the EIS and various Reevaluations through the years until August 2022 (see **Attachment 1**). Currently, the proposed action has been allocated funds under the Federal-Aid Highway Program (FAHP) which are included in the State Transportation Improvement Program (STIP). However, the primary funding for the proposed action will be from the U.S. Department of Housing and Urban Development (HUD) CDBG-MIT funds. The Puerto Rico Department of Housing (PRDOH) as the grantee of CDBG-MIT funds, is the Responsible Entity (RE) under the authority of 24 CFR 58.4 and assumes the responsibility for environmental review, decision making and action that would otherwise apply to HUD under NEPA and other provisions of the law, as specified in 24 CFR 58.5. Since CDBG-MIT funds will be combined with the currently allocated Federal-aid funds to finance the final sections of the PR-10 Project, FHWA and PRDOH will jointly lead the preparation of the Environmental Assessment (EA) to assess the impacts of these final sections on the human and natural environment. This assessment will ensure compliance with FHWA and HUD's requirements under 23 CFR 771 and 24 CFR 58, respectively. The EA will also be coordinated with the PRHTA, which is the CDBG-MIT subrecipient and the recipient of the FAHP. As the joint lead agencies, FHWA and PRDOH are responsible for approving the EA once it is finalized.

and issuing a joint public notice of Finding of No Significant Impact (FONSI), if applicable. The issuance of the Finding will adhere to the respective agencies' public notice requirements. Should the agencies, following the completion of the EA, conclude that a Supplemental Environmental Impact Statement (Supplemental EIS) or an Environmental Impact Statement (EIS) is necessary, they will undertake the necessary actions to ensure compliance with NEPA and the relevant federal laws and regulations governing such environmental documents.

1.2 Regulatory Background

Due to recent actions to provide funding to complete design and right-of-way acquisition and advance the proposed action for construction, this EA has been prepared in accordance with NEPA regulations at CFR 1500-1511, FHWA regulations at 23 CFR 771.119, FHWA's Technical Advisory T 6640.8, and HUD's regulations at 24 CFR part 58. The FHWA and PRDOH prepared this EA to determine the significance of the impacts of proposed action of the final four sections of PR-10. The EA incorporates current applicable laws and regulations and other relevant information and/or changes to the environment to inform a complete and current analysis of impacts. The PRDOH had publicly notified in June 2023 that they would adopt the FHWA's 1979 FEIS and related re-evaluations by further re-evaluating the FEIS. The FEIS was made for public comment. Subsequently, FHWA and PRDOH, agreed that it was appropriate to perform an EA to update the analysis of the proposed action and to determine if a supplemental EIS was necessary as provided in 23 CFR § 771.130 rather than to proceed the FHWA's FEIS as the Final Draft.

The EA is a continuation of the FHWA's FEIS that was completed for the entire PR-10 highway project in late-1970s; it updates the analysis to assess if new information or circumstances, including regulations and other federal and local law relevant concerns for the remaining proposed action would result in significant environmental impacts not evaluated in the FEIS, and thus determine if a supplemental EIS is required.

1.3 Summary of Conclusions

After reviewing the Proposed Action scope, it has been determined that:

- The Proposed Action remains located within the same corridor as the alternatives analyzed for the FEIS since it remains the alternative that was selected as the preferred one. However, as the design and construction of the highway advanced with the assignment of federal funds, project design activities identified the desirability of adjusting some parts of the proposed action alignment within the area of Adjuntas – Utuado to reduce the environmental impacts pertaining to the construction activities on adjacent natural systems and/or ROW acquisition needs. Regarding the highway characteristics, no change in the concept or capacity was considered.
- Land uses along the path of the Proposed Action corridor remain relatively similar to the ones discussed in the original FEIS since the Proposed Action crosses a scattered populated area, with no significant commercial or industrial developments. The Proposed Action does not impact communities along its path, and it should be noted that the ROW acquisition has been already

completed except for some portions of Section IV. The remaining acquisitions will not require the displacement of families, nor businesses nor organizations.

- In general, it can be stated that changes in the vegetation cover of the proposed action corridor have resulted from a change in the Island economy from an agriculturally based one to an industrial/services-oriented economy. Also, it shall be noted that the existing vegetation cover, forested areas along the path of the corridor were damaged in the aftermath of hurricanes Irma and Maria in 2017, and Fiona in 2022. This fact was taken into consideration in the reevaluation of impacts and by concerned agencies before their determination to endorse the proposed action, if measures described in this document are taken during construction of the proposed action.
- Proposed action corridor development is limited to scattered residential uses resulting from the rugged terrain conditions of the area.
- Air quality for the area is good since it is classified as an Attainment area where the National Ambient Air Quality Standards (NAAQS) are met. Only minor impacts on air quality are expected for the area, mostly during the proposed action construction. Mitigation controls are to be developed to further reduce any impacts during the construction phase of the proposed action.
- A small to moderate increase in noise levels are expected during the operation of the new highways but since only a few receptors consisting of various residences, and no other type of noise sensitive locations such as schools, hospitals, daycare centers nor worship centers are located close to the Proposed Action (within 60 meters or more), no impacts requiring the development of noise abatement measures were identified. Predicted noise levels are below the 10 decibels (dBA) increase threshold that defines a substantial increase as per the FHWA Noise Policy and/or the recommended noise exposure level of 65 dBA defined in HUD regulations. The FHWA currently establishes a Noise Abatement Criteria (NAC) of 67 dBA for residential land uses.
- Wetlands impacts along the proposed action corridor are minimal and protective measures for their protection are to be implemented during the construction activities.
- A study for the assessment of forest types cleared for land development in Puerto Rico was conducted by the Colorado State University and the International Institute of Tropical Forestry of the U.S. Department of Agriculture (USDA) Forest Service (GIScience & Remote Sensing, 2007, 44, No. 4, p. 356-382). Said study concluded with some observations among which changes in landscape that have occurred in Puerto Rico between 1950's and 2000 were documented. The study, which was conducted using a time series of digitized land cover maps, concludes with the finding that the economic shift of the Island's economy from an agricultural one to an industrial one the previously intensively cultivated lands have transitioned to hay or intermittently grass cultivation. In some areas that have been left unmanaged, new forested areas have been regenerated. In other areas, such as the one subject of the proposed action, areas cleared for agricultural purposes have reverted to forest. The Proposed Action area is known to have been used in the past for the cultivation of coffee. This information is consistent with the assessment included in the EIS. After hurricane Maria, a study conducted by the Journal of Geophysical Research of January 2020 (Hosannah, N. Ramamurthy, P. Marti, J. Munoz, J., & Gonzalez, J.E. (2021), Impacts of Hurricane Maria on Land and Convection Modification over Puerto Rico)

documented the damage caused by the effects of the winds in the forested areas of Puerto Rico, including the proposed action area.

- During the construction phase of the proposed action, a qualified biologist will be present to monitor the area in accordance with field protocols that were developed and approved by the Puerto Rico Department of Natural and Environmental Resources (DNER). This includes a restriction to perform certain construction activities within the corridor during the peak breeding season (January to July) of the following bird species:
 - Puerto Rican Broad-winged Hawk (*Buteo platypterus brunnescens*)
 - Puerto Rican Sharp-shinned Hawk (*Accipiter striatus venator*)
 - Puerto Rican Parrot (*Amazona vittata*)
- It shall be noted that the biological monitoring conducted for the project for the Puerto Rican Broad-winged Hawk and the Puerto Rican Sharp-shinned Hawk, during the planning phase between 2013 and 2014 (as requested by the USFWS) did not disclose their presence within the proposed action corridor. The performance of these studies required the development of the current environmental conditions to identify spatial factors of the landscape that influence the organism occurrence, habitat use and movement in the landscape. This analysis was performed by using the topographic survey maps developed for the Proposed Action for the development of a Digital Elevation Model for the study area, among other techniques that are described in the report. The findings of this study have been updated with a recent review of the USFWS Information for Planning and Coordination (IPAC) database and formal consultation with the agency that will be discussed in section 5.1.7 of the EA.
- The USFWS recommended the adoption of Section 6.4 of the Programmatic Biological Opinion (PBO) and must be acknowledged by PRHTA and FHWA to be exempted from the “take” as defined by the Endangered Species Act (ESA), and May Affect But Not Likely to Adversely Affect (MANLAA). This PBO became effective in 2022 and applies to the Puerto Rican boa addressing the “take” in the form of capture and relocation while conducting activities with Federal or under the jurisdiction of a Federal agency in Puerto Rico.
- The proposed action considers only one bridge crossing over the Rio Grande de Arecibo that is located within a FEMA designated A/AE flood zone. Please refer to **Attachment 2, Figure 16: Flood Zone Map of the Crossing Over Rio Grande de Arecibo**. To minimize the impacts on this area, a Hydrologic/Hydraulic (H/H) Study was prepared, and its recommendations incorporated in the design of the bridge. An Eight Step Decision Making Process was prepared on March 20, 2023, and was performed in accordance with 24 CFR 55.20. As a result, mitigation measures will be implemented to avoid and/or minimize impacts on floodplains and riverine wetlands located within the crossing over Rio Grande de Arecibo. Proposed action design incorporates measures to minimize adverse impacts to the water quality of the Rio Grande de Arecibo. More details pertaining to these measures have been included in section 5.2.1 of the EA.
- No historic properties or structures were detected along the path of the proposed action. As required by Section 106 of the National Historic Preservation Act (NHPA), the State Historic Preservation Office (SHPO) issued a “no historic property affected” determination for the proposed action. At a local level, the Puerto Rico Institute of Culture (PRIC) required the PRHTA

to conduct archaeological monitoring during the construction of Sections III (AC-100071) and IV (AC-100055) due to the proximity of the remains of coffee estates to the proposed action corridor.

- A review of available DNER/EPA databases for sites and/or facilities that may have managed hazardous wastes or substances which may present a risk for contamination was conducted. This analysis resulted in the identification of one parcel where the remains of a small repair shop were located within the limits of Section II (AC-100069). Due to the potential to find contaminants in this site, a Phase I Environmental Site Assessment (ESA) in accordance with the American Society for Testing and Materials (ASTM) protocols was performed for this property. This study resulted in a Recognized Environmental Condition (REC) that triggered the need to perform a Phase II investigation with intrusive soil testing. The laboratory test results of samples collected in the remains of a septic tank provided support to the statement that the potential presence of soils impacted with Volatile Organic Compounds (VOCs), Sem-volatile Organic Compounds (SVOCs), Total Petroleum Hydrocarbons (TPH) and Priority Pollutant Metals constituents either did not exceed the comparison criteria or appeared to be associated with natural metal concentrations. Therefore, the chemical constituents of concern should not present an environmental concern for the site. However, the remains of the septic system shall be closed in compliance with the closure requirements of the DNER.

- Proposed action design will incorporate hazard mitigation measures to help to mitigate potential impact to the highway from extreme rain events resulting from hurricanes and the perceived increase in the intensity and duration of rain events caused by the climate change on the Island. Examples of these types of incidents were the landslides caused by hurricanes María and Fiona. Mitigation measures to address potential landslides compromising the structural integrity of side slopes and structures will be incorporated as part of the design requirements of this highway. Therefore, it is the intention of the PRHTA to incorporate what is known as Critical Infrastructure Hazard Mitigation (Critical Infrastructure Resilience - HUD Exchange) for the design of this proposed action. Critical infrastructure refers to the assets, systems, and networks, whether physical or cyber, so vital to the Nation, that their incapacitation or destruction would have a debilitating effect on national security, the economy, public health or safety, and the way of life. Adoption of this strategy will directly reduce the risk of physical damage and service losses to the infrastructure component as well as nearby structures and utilities from one or more hazards addressed by the proposed action. Additionally, these hazard mitigation projects can indirectly reduce risk to other assets and infrastructure from multiple hazards through the interdependent nature of those assets. This interdependence, in turn, mitigates risk from human or natural hazards for people and critical or secondary infrastructure in the area of impact.

Chapter 2: Proposed Action

2.1 Background Information

PR-10 is part of the Puerto Rico highway system and constitutes the only north-south traffic link that serves the west-central part of the Island, but which currently lacks a section of approximately 7.6 kilometers between the municipalities of Adjuntas and Utuado. Please refer to **Attachment 2 (Figures 1, 2 and 3)** for location of PR-10 project from Arecibo to Ponce and Proposed Action from Utuado to Adjuntas. This highway, for practical purposes, constitutes the relocation of PR-123 which is a secondary highway that connects the Municipality of Arecibo to the Municipality of Ponce. The PR-123 roadway dates from the late 19th century and it started as a road to link the coffee-farming mountain of Adjuntas to the southern port of Ponce for the export of coffee. Eventually the road was completed to the smaller northern port city of Arecibo as well, connecting the mountain town of Utuado in its way. The stretch from Ponce to Adjuntas was built under the Spanish government while the remainder of the route to Arecibo was built by the United States and opened on July 1, 1904.

During the 1970's the PRHTA assessed the condition of this state road and concluded that it was inadequate to continue to serve its vital function because of its dated design and construction. This highway was constructed during the early years of the twentieth century as a primary road linking the municipalities of Arecibo, Utuado, Adjuntas and Ponce. As a result of this condition, it was designed to accommodate the needs of the mentioned municipalities for the displacement of people and freight in horse-drawn vehicles. With the advent of combustion engine vehicles, and over the span of many years of use, by the 1950's it was clear that the roadway was no longer adequate to fulfill its intended function. The road was designed for its use in the pre-auto age and cannot accommodate the geometric requirements of higher speed vehicles. PR-123 was described as a narrow, winding two (2) lane road with inadequate provision of shoulders (**see Attachment 2, Figures 4A-4G**). The total pavement width ranged from 5.5 to 7.9 meters. Lane widths are substandard and pose a limiting factor on capacity. The Right of ROW is of inadequate width enabling the sitting of structures directly on the edge of the pavement. Side slopes are dangerously steep and hazardous fixed objects (i.e., trees, poles, etc.) are located near the edge of the pavement with no guard rail protection. Once PR-10 is completed, the old PR-123 will remain in use, basically for the residents of the areas it currently serves.

The alignment of the current section of PR-123 between Adjuntas and Utuado, constitutes the most significant limiting factor for the operation of vehicles due to the reduced speed capability of the highway. Designed to minimize earthwork cuts and fills, the existing route conforms very evenly with the existing topography. Although topographic conformance is an important design goal, the maximum operating capacity of motor vehicles is within a range of 15 to 20 miles per hour (mph).

Traffic movement in characteristics of the existing PR-123, limit the capacity and safety of the roadway. Stopping and passing sight distances are inadequate for a primary transportation link. Excessively long and steep upgrades tend to reduce the operating speed of heavy trucks disproportionately to those of cars. An associated lack of adequate sight distance contributes to a situation where unsafe passing conditions occur, or the faster cars are confined to follow slower trucks. At-grade intersections also have

substandard sight distances. Many of the intersections mentioned also have sharp angles and no provisions for traffic distribution. Recent traffic analysis of the 59 curves located within PR-123 between Utuado and Adjuntas for a speed of 25 mph indicated that only one curve complied with the minimum sight distance required by current standards. Traffic speed in this roadway segment is currently 15 mph on most of the route.

Average capacity analysis of PR-123 was also conducted and provided support that from a standpoint of transportation, the highway was operating at below capacity resulting from its substandard design condition with a determined Level of Service (LOS) assessment of F, with an average operating speed of 30 mph or less as defined by the Highway Capacity Manual (HCM). The LOS of a roadway is a quality measure describing operational conditions within a traffic stream, generally in terms of service measures such as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. The LOS of a facility is described with a letter, varying from A to F. A is assigned to imply the best operating condition of a highway and F the worst. Transportation engineers use the latest version of the HCM or the Transportation Research Board's Circular 212 for the analysis of Congestion Management Process (CMP) roadways. A LOS of C is acceptable for highways like PR-123. A LOS F is considered the worst level that may be assessed for the operation of a highway. This condition was further supported by the fact that a high rate of accidents has been reported on this roadway.

After confirming the hazardous and substandard operating conditions of PR-123, and during late 1960's and early 1970's, the PRHTA retained the services of transportation engineering firms to assess and investigate possible alignments to construct a new and modern highway in the vicinity of the existing PR-123. Primary consideration for the identification of alternate alignment routes took into consideration the displacement of homes, businesses, and farms; required earthwork activities, drainage, and economic impacts. This effort resulted in the identification of three (3) advanced alignments that were included in a **Route Location Study and Reconnaissance Report (April 29, 1969)**.

Once the possible alignments were identified, the PRHTA started the planning and performance of the environmental studies for the construction of the PR-10. Since the funding for the construction of the new roadway was being provided by the FHWA, compliance with the requirements of the NEPA was mandatory. The FEIS for PR-10 was approved by the FHWA on March 30, 1979. The proposed action and selected alternative for PR-10 consisted of the construction of a 58.0 kilometers highway with partial access control starting from PR-22 (De Diego Expressway) at km. 60.2, located toward the south-east part of the town of Arecibo to the existing PR-10 located to the north part of the town of Ponce (in 1974).

As funding for the construction of the highway became available, PRHTA started the construction of PR-10, on a section-by-section basis. Its construction began at the northern and southern sections of the Proposed Action alignment. Due to the protracted construction schedule of this Proposed Action, prior to the initiation of each section or grouped sections of the new highway, a reevaluation to verify the findings of the original FEIS (**see Figures 5 and 6 in Attachment 2 for an illustration of the alignments within the proposed action area**), and to update the findings and environmental commitments was prepared. Maps for the FHWA and the PRHTA illustrating the location of the Proposed Action area in the context of the Island and sections of PR-10 already constructed have been included in **Attachment 2 (Figure 7)**. The

remaining sections of PR-10 whose construction is being addressed by this report are section II (AC-00069), Section III (AC-100071), Section IV (AC-100055) and Section V (AC-100076). These sections were previously reevaluated on August 8, 2022, by the FHWA (see **Attachment 3**).

Also, it shall be noted that the limitations for the use of the current PR-123 in the aftermath of recent natural disasters, such as hurricane Maria, have exposed the limitations of the current PR-123 operational condition as a safe and reliable evacuation route to provide assistance, and some cases an evacuation route, for the nearby communities.

Existing Conditions and Trends of PR-123 and Vicinity

The proposed action area is located in the western-central mountainous part of Puerto Rico and currently lacks visible and extensive urban developments. Information obtained from the U.S. Geological Survey (USGS), Atlas of Ground-Water Resources in Puerto Rico and the U.S. Virgin Islands (94-4198) published in 1996 indicates that the main Island of Puerto Rico (excluding the municipalities of Culebra and Vieques) has three principal physiographic areas:

- The alluvial coastal plains: located mostly toward the north and some partes of the south coastal plains
- Karst: located toward the north coastal plains
- Central Mountainous Interior: located in the central part of the Island where the proposed action is located. Ground elevations in Puerto Ric elevations range from mean sea level at the coast to 4,389 feet above the sea level in Cerro Punta, at Jayuya (located toward the south-east side of the proposed action area).

Attachment 2 (Figure 8) illustrates this condition.

The Island of Puerto Rico is of volcanic origin, and its interior is composed mainly of a mixture of volcanic and sedimentary rocks. The volcanic rocks include lava, tuff, breccia, and tuffaceous breccia. The sedimentary rocks include siltstone, sandstone, conglomerate, and limestone. In terms of geology, Puerto Rico central mountainous interior is flanked by limestone deposits of Tertiary age and by clastic sediments of Quaternary age. The most extensive limestone deposits in Puerto Rico are observed along the north coast in a band that extends from the northwestern corner of the island to the Rio Grande de Loíza, in the northeastern corner (**see Attachment 2, Figure 9**). This band has a maximum width of 14 miles (Monroe, 1980a, p.20). In the area along the north coast, mature karsts have developed by dissolution of the limestone. The limestone deposits in the southern part of the Island are less extensive and karts features are not well developed. Clastic sediments that underlie Puerto Rico consist predominantly of poorly sorted mixture of gravel, sand, and finer materials (Quiñones - Marquez and others, 1984b, p. 367). These sediments lie along the north and south coastal plains and in river valleys along the east and west coasts. With respect to the karst formations that are associated with limestone deposits, it shall be noted that they are characterized by the presence of sinkholes. Geologically, a sinkhole is a depression in the ground that has no natural external surface drainage. Basically, this means that when it rains, all the water stays inside the sinkhole and typically drains into the subsurface.

Review of historic climate data for Puerto Rico indicates that the annual average rainfall is 70 inches ("). Rainfall varies geographically and is much more abundant in the northern part of the island than in the southern part, because the latter lies in a rain shadow caused by the central mountain range, which forces the northeasterly trade winds to rise and precipitation to fall on the windward slopes. Annual rainfall ranges from 30 inches in the western end of the south coast area valleys to about 160 inches near the top of El Yunque (Colón-Dieppa and Torres Sierra, 1991, p. 475). Rainfall also varies seasonally. The driest month is February, and the wettest months are September and October. Adjuntas and Utuado exhibit an average annual rainfall of 73.7 and 70.9 inches respectively (an illustration of this condition has been included in Attachment 2, Figure 10). The previously described conditions exert an impact with respect to the type of vegetation that is observed in the area. The proposed action is located within the boundaries of a Subtropical Wet Forest (The Ecological Life Zones of Puerto Rico and the U.S. Virgin Islands by J.J. Ewel and J.L. Whitman of December 1973). According to this reference, this ecological zone can be described as follows:

“Subtropical Wet Forest occupies much of the higher parts of Puerto Rico’s mountains and, like the wet- and rain-forest life zones, is not found on any other island in the study region. This is a high rainfall life zone, encompassing areas with mean annual precipitation within the approximate range of 2000 to 4000 mm per year. Mean annual rainfall ranges from 2150 mm to 2900 mm. Soil moisture drops below field capacity at these three stations only for three months, at most, and the water deficit is very small. Significant amounts of runoff occur at each of these sites during at least seven months and, in some cases, all year. The annual runoff is greater than the rainfall input in most areas of the Subtropical Dry Forest zone. The abundant moisture of this life zone is evident in the character of the vegetation. Epiphytic ferns, bromeliads, and orchids are common, the forests are relatively rich in species, and the growth rates of successional trees are rapid.”

A map showing the project location with respect to the life zones described in the mentioned reference has been included in **Attachment 2, Figure 11**.

The proposed action area exhibits high ground elevations and exuberant vegetation resulting from its high rainfall characteristics. Residential uses are scattered within the area which exhibit some forested zones resulting from the shift of an agriculturally based economy at the beginning of the last century to an industrial and services based one starting approximately in 1948 when Operation Bootstrap (“Operación Manos a la Obra”) promoted by the local government, provided tax incentives to mainland-based industries (like pharmaceutical and petrochemical ones) that established their operations in Puerto Rico in an effort to pull the Island into the Global North. Another incentive was the possibility of benefiting from a cheap labor force. This initiative resulted in the internal population movement from rural to urban areas, which consequently resulted in the significant reduction of the previous century agriculturally based economy that included coffee plantations were common with the area as well as subsistence agricultural practices. As these practices were abandoned or significantly reduced, secondary forested areas began to dominate the landscape. Toward the north a south part of the proposed action area, sugar cane plantations flourished during the past century until the 1990’s, when lower cost of sugar obtained from external sources, gradually affected the economics of the operation, and eventually caused their disappearance. Under these conditions, lower scale agricultural uses in the proposed action area

remained accompanied by a low development of commercial and industrial uses. Residential uses in rural areas retained their characteristics while most of the previous coffee plantations were abandoned, resulting in the population of these areas with common flora species observed within the region. This condition was documented in the FEIS approved in 1979. Because of the previously described conditions, the proposed action area remains not significantly changed with respect to its land uses characteristics after the shift of the Island's economy and lack of urban development requiring expanding the area infrastructure (i.e., potable water, electricity, municipal roadways, etc.) to accommodate new developments. Recent U.S. Census data indicates that a trend toward a reduction in the populations of the municipalities of Adjuntas and Utuado is still being experienced in the proposed action area, when considering 2000 to 2020 information. Current characteristics of the observed flora exhibit the results of the changes in agricultural practices through the years as well as the damages caused by the storm winds caused by hurricanes María and Fiona in 2017 and 2022 respectively. These impacts have been documented by both local and federal agencies.

In terms of its setting, the Proposed Action area is located within the mountainous center part of the Island, where past agricultural uses were significantly reduced during the middle of the past century. This condition and the rugged topographic characteristics of the terrain have constrained the urbanization trends that occurred in other parts of Puerto Rico, which was previously described and can be evidenced by observing the aerial photographs that illustrate the location of the Proposed Action included in **Attachment 2, Figure 12**. Residential uses along the alignment remain scarce as well as commercial and industrial ones. This trend is not anticipated to change any time soon as local planning regulations require that some conditions must be met as required by local land use regulations and most of the terrains of the Municipalities of Adjuntas and Utuado have restrictions for their development.

A review of recent available socio-economic characteristics of the population data for the area obtained from the U.S. Census (see section 5.1.17) depict a population with low per capita income and exhibiting a general trend toward its reduction, a condition that may have been exacerbated by the occurrence of recent hurricanes through the Island. Information obtained from this source also indicates that the existing population along the path of the Proposed Action corridor is basically homogeneous in terms of ethnicity and has a low per capita income (which is common for the center region of the Island). It is important to note that the Proposed Action area shares the trend toward the reduction in population that is also being observed for the rest of the Island. This observation is particularly noticeable in the Municipality of Utuado, where the reduction in population has been estimated at approximately 14.7% between 2010 and 2020. It is important to indicate that the ROW acquisition for the construction of the proposed action has been completed except for Section IV. No relocations of families and/or businesses are required for the remaining acquisitions.

Traffic studies performed in 2021 determined that the daily existing traffic through PR-123 was low and would remain low through 2045, at approximately 4,183 vehicles per day for 2019 and 4,430 in 2025 respectively, when the new highway section was projected to be in operation. For the year 2045 the forecast estimated that 5,254 daily vehicles would travel through existing PR-123. Given the decline in population and employment, total travel demand in the subarea is expected to diminish in future years, representing a small increase between 1.0 and 1.5%.

In a two-lane highway configuration, as exhibited by PR-123, with one lane for use by traffic in each direction, passing of slower vehicles requires the use of the opposing lane. As volumes of traffic or geometric constraints increase, the ability to pass slow vehicles decreases and platoons of vehicles are formed. As the delays experienced by motorists increase, the LOS worsens to D or F. After the approval of the FEIS, the geometric conditions of existing PR-123 have not changed significantly since the roadway alignment is located within a mountainous region and its initial design did not consider the traffic of modern vehicles. Based on the geometric conditions of the existing roadway, and collected traffic data, the LOS of current PR-123 has not been improved and remains constrained.

2.2 Proposed Action

The Proposed Action is the construction of the remaining four (4) sections of the PR-10 between the municipalities of Adjuntas and Utuado. A brief description of each section follows:

Section II (AC-100069)

This section of the highway consists of the construction of PR-10 between civil stations 39+78.73 and 55+50.36 with a total length of 1.571 km. It runs southeast alongside the Rio Grande Arecibo in the Guaonico neighborhood in the Municipality of Utuado. The highway's typical section consists of an undivided highway with one (1) traffic lane of 3.65 meters in each direction, with an additional climbing lane in the southbound direction toward Adjuntas. An exterior shoulder of 3.0 meters is provided in the northbound lane, while a 1.80 meters shoulder is provided in the southbound lane.

As part of this section, three (3) concrete bridges (BR-1, BR-1A and BR-1B) will be constructed and whose construction will help minimize the use of fill material, therefore will help to minimize environmental impacts associated with earthwork activities on the adjacent natural systems (such as the Rio Grande de Arecibo). As a result of the rugged characteristics of the topography of the area, drainage improvements in the form of berms, pipe crossings, pipes, catch basins, headwalls, and manholes will need to be incorporated into the highway design. The bridge structures are proposed at the following locations:

- Bridge BR-1 near station 41+01.05 with a span of 149 meters (location coordinates: 18.234, - 66.719)
- Bridge BR-1A near station 44+71.00 with a span of 99 meters (location coordinates: 18.231, - 66.719)
- Bridge BR-1B near station 50+96.50 with a span of 80 meters (location coordinates: 18.223, - 66.718)

Bridge BR-1 crosses over the Rio Grande de Arecibo.

Section III (AC-100071)

This section of PR-10 joins the previous section and runs southeast alongside Rio Grande de Arecibo for 1.839 kilometers. The typical section of the highway consists of an undivided highway with one (1) traffic

lane of 3.65 meters wide per direction and an additional climbing lane in the southbound direction to Adjuntas. An exterior shoulder of 3.0 meters will be provided in the northbound section, while a 1.80 meters shoulder is being provided in the southbound lane.

As part of this section, five (5) concrete bridges will be built since the existing site topography requires them. The bridges structures are proposed at the following locations:

- Bridge BR-2 near station 56+25.00 with a span of 140 meters (location coordinates: 18.223, - 66.722)
- Bridge BR-3 near station 61+25.00 with a span of 180 meters (location coordinates: 18.223, - 66.727)
- Bridge BR-3A near station 66+20.00 with a span of 110 meters (location coordinates: 18.220, - 66.729)
- Bridge BR-3B near station 70+10.00 with a span of 190 meters (location coordinates: 18.216, - 66.728)
- Bridge BR-3C near station 72+00.00 with a span of 130 meters (location coordinates: 18.215, - 66.728)

Section IV (AC-100055)

This section of PR-10 continues its extension toward the Capaez Ward of the Municipality of Adjuntas. It runs for approximately 2.295 kilometers alongside the Rio Grande Arecibo. As with previous sections, the typical section of the highway consists of an undivided highway with one (1) traffic lane of 3.65 meters per direction, with an additional climbing lane southbound toward Adjuntas Lane. An exterior paved shoulder of 3.0 meters is provided in the northbound lane, and a 1.80 meters shoulder is also provided in the southbound lane.

The construction of seven (7) concrete bridges is also required for this section of the highway. The bridges structures are proposed at the following locations:

- Bridge BR-4 near station 77+95.00 with a span of 129 meters (location coordinates: 18.212, - 66.732)
- Bridge BR-4A near station 79+85.00 with a span of 115 meters (location coordinates: 18.210, - 66.733)
- Bridge BR-4B near station 81+45.00 with a span of 50 meters (location coordinates: 18.209, - 66.733)
- Bridge BR-5 near station 84+20.00 with a span of 105 meters (location coordinates: 18.207, - 66.735)
- Bridge BR-6 near station 86+30.00 with a span of 134 meters (location coordinates: 18.205, - 66.734)
- Bridge BR-7 near station 90+20.00 with a span of 160 meters (location coordinates: 18.202, - 66.734)
- Bridge BR-8 near station 92+40.00 with a span of 80 meters (location coordinates: 18.200, - 66.734)

Section V (AC-100076)

It will have an approximate length of 1.832 kilometers and will interconnect Section IV with the already constructed PR-10 in the Capaez Ward of the Municipality of Adjuntas. As with previous sections, the typical section of the highway consists of an undivided highway with one (1) traffic lane of 3.65 meters per direction, with an additional climbing lane southbound toward Adjuntas Lane. An exterior paved shoulder of 3.0 meters is provided in the northbound lane, and a 1.80 meters shoulder is also provided in the southbound lane.

This last section of the highway requires the construction of four (4) concrete bridges. Those bridges structures are proposed at the following locations:

- Bridge BR-9 near station 97+10.76 with a span of 284 meters (location coordinates: 18.196, - 66.735)
- Bridge BR-10 near station 103+72.58 with a span of 84 meters (location coordinates: 18.191, - 66.738)
- Bridge BR-11 near station 105+85.42 with a span of 154 meters (location coordinates: 18.189, - 66.738)
- Bridge BR-12 near station 109+63.89 with a span of 315 meters (location coordinates: 18.185, - 66.738)

It is important to indicate that all the sections of PR-10 herein remain located within the preferred alignment of the FEIS that was modified through various re-evaluations. Current bridge's location data is possible since the design has advanced with respect to its previous status. Therefore, the current Proposed Action description incorporates details of the latest designs. Construction drawings of the proposed action, and typical cross sections of the proposed highway have been **included in Attachment 3**).

It is important to indicate, that land uses related with commercial/industrial/residential areas, except those related with agricultural uses across which this highway corridor traverses, have not changed in a significant way after all these years since the rugged topography of the area has severely constrained its potential for development, and the ROW of sections II, III, and V have been already acquired through the years. As a result of this fact, no recent significant types of developments have been constructed along the path of the alignment since the original environmental clearance document was approved. The area can be described as rural with scattered residential structures located close to the existing tertiary roads that have been built in the area, for locals' access. A review of available data indicates that no institutional uses, such as schools and medical facilities, will be affected by the Proposed Action. Additional information pertaining to conditions of the natural systems located along the path of the Proposed Action and results of more recent studies performed at the request of the DNER/USFWS is included in Chapter 3 of this report.

2.3 Planning Consistency

The proposed action has been included in the FY 2023-2026 Statewide Transportation Improvement Program (STIP) – Amendment #1 approved by the FHWA and the Federal Transit Administration (FTA) on May 12, 2023. The Proposed Action has programmed funds for completion of ROW acquisition of its section IV, which appears on page FHWA-4 of the Amendment #1 Table (see **Attachment 4**).

Also, it shall be indicated that PR-10 is a part of the freight network of Puerto Rico as per the 2050 Long Range Multimodal Transportation Plan (LRMTP) which defines the state strategies for the enhancement and protection of these highways. Because of this reason, completion of the construction of PR-10 is necessary to comply with this local transportation planning strategy. Since this network provides a key connection between the freight facilities and the distribution centers, one of the adopted strategies is to enhance such accesses. The completion of this Proposed Action serves to fulfill this state transportation goal.

Chapter 3: Purpose and Need for the Project

3.1 Project Purpose

PR-10 corridor connects Arecibo and Ponce providing the 2nd most important North-South route of the Island after PR-52. The existing connection between Utuado and Adjuntas is the PR-123, a 12.0 Km low-capacity winding road corridor. Travel time today from Arecibo to Ponce is approximately 1 hour and 5 minutes but with the construction of the missing section between Utuado and Adjuntas it may be reduced to 45 minutes. This Proposed Action will significantly decrease the overall cost of moving people and goods and travel time, especially during a natural disaster like Hurricanes Maria and Irma. The Proposed Action would also help increase the resilience to disasters and reduce the long-term risk of loss of life, injury, damage and loss of property, and suffering and hardship, by lessening the impact of future disasters.

Numerous transportation studies conducted by the PRHTA through the years dating back to the late 1960's have disclosed the need to improve the north and south terrestrial connection originally served by PR-123, an old highway designed in compliance with requirements predating the advent of combustion propelled vehicles. Therefore, the PR-123 operates under substandard and unsafe conditions that after an extensive engineering analysis and environmental clearance process conducted in the late 1970's, resulted in the proposal to build a safer and efficient roadway that was identified as PR-10. This new highway for practical purposes constitutes the relocation of PR-123. Over the years, sections of PR-10 have been constructed as a function of the availability of funds, with a section of 7.6 kilometers remaining to be constructed and which constitutes the Proposed Action for the purpose of this EA. The remaining part of the Proposed Action between the Municipalities Adjuntas and Utuado, which for the purposes of construction has been subdivided into four (4) sections, would serve to complete the entire relocation of PR-123 as originally envisioned. Therefore, the Proposed Action purpose is to complete the terrestrial interconnection of the north section of PR-10 in operation between Arecibo and Utuado and the south section of PR-10 in operation between Ponce and Adjuntas. In summary, the construction of the proposed

action is aligned with the principal strategies of the CDBG-MIT program and will serve the following purposes:

- **Community and Regional Investment:** Reduce the conditions of risk through community and regional level projects that identify transformative mitigation opportunities that serve the needs of vulnerable communities and reduce the displacement of individuals.
- **Lifeline Stability and Strengthening:** prioritizing infrastructure improvements that avoid or reduce the disruption of essential services while promoting sustainability.
- **Alignment of Capital Investments:** Alignment of CDBG–MIT programs and projects with other planned federal, state, regional, or local capital improvements.
- Provide a modern, fast and safe highway to efficiently link the northern and southern part of the Island.
Promote the economic development of the region and all of Puerto Rico.
- Connect the industrial and agricultural areas of the central north with the Port of Ponce, PR’s second most important domestic port which would be critical in case of disruptions in the operation of the main port of San Juan due to natural disaster.

3.2 Project Need

Once completed, PR-10 would serve to satisfy the following needs:

- Finalizing the establishment of a terrestrial link from north to south, aimed at enhancing accessibility and mobility for existing PR-10 users. This connection will also function as the secondary primary corridor for the north and western regions of the island after considering that PR-52 constitutes the main north to south terrestrial corridor.
- To establish a secure and resilient infrastructure that mitigates the impact of future natural disasters, in accordance with the latest construction standards outlined in the AASHTO Design and Construction of Highway and Bridges.
- Providing a safer and modern route for its current and future users. Statistics obtained from the National Transportation Safety Board (NTSB), indicate that between 2014–2018, a total of 832 accidents occurred in the section of PR-123 subject of this project.
- Construction of a resilient terrestrial corridor required as a measure aimed to prioritize mitigation of risk, a key lifeline asset that in the aftermath of a disaster event, contributes to the Island’s resilience. Transportation assets, including points of entry at airports and seaports and connecting road networks, are essential for the movement of people and goods throughout Puerto Rico, before, during, and after a disaster event. The freeways and primary roadways are responsible for the movement of most of the population in Puerto Rico as well as freight daily. The secondary, tertiary, and municipal roadways provide access to neighborhoods, residences, and community assets.
- Pertaining to the above-described Proposed Action need, it is important to note that in the aftermath of Hurricane María in 2017, entrance of food, medical supplies, equipment, that were shipped to the Island through the Port of San Juan (which is the primary port of Puerto Rico) was

negatively impacted. Due to this condition, the unloading of critical supplies was negatively impacted and resulted in a delay in their deployment. The Port of Ponce, which is being developed by the Municipality of Ponce, is directing their efforts to complete the development of what has been designated as Port of Las Americas. This Proposed Action, when completed, will serve to provide a second point of entrance for supplies and assistance needed to respond to future natural disasters as well as to supplement to operation of the Port of San Juan. Therefore, completion of PR-10 will serve to provide a much needed alternative corridor for the distribution of supplies toward the north and northwest part of the Island.

- A completed PR-10 will constitute part of the Island's components of the transportation network that is considered as a critical corridor that serves to connect communities in Puerto Rico to critical ingress/egress routes and necessary supply chain circulation. These corridors are Puerto Ricans' main connections to their work, food, healthcare, community, and the ports. They are the routes by which supplies are moved around the Island, including food, fuel, and medicine. Though many main highways in the primary road system were intact following the recent hurricanes, many internal roads of the secondary and tertiary systems located within the central part of the Island were closed, limiting citizens' access to everything from fresh drinking water to medical assistance.

The absence of the PR-10 highway section between Utuado and Adjuntas became a significant impediment to the swift recovery of the region following the devastating Hurricanes Irma and Maria in September 2017. The lack of an efficient ground communication system delayed emergency and healthcare responses, resulting in loss of life during and in the aftermath of these hurricanes. Numerous landslides along PR-123, coupled with power outages, water scarcity, and a deficient communication network, collectively led to economic losses for the region.

The extensive landslides that obstructed PR-123 during Hurricanes Irma and Maria in September 2017 disrupted the provision of essential services and supplies to the communities in the Municipalities of Utuado and Adjuntas. Residents had to search for alternative routes to access food and medical care in a desperate fight for survival. Vital services such as electricity, clean water, and sustenance were scarce, while rescue teams struggled to reach the disaster-stricken areas. The construction of the PR-10 sections will ensure the continuity of essential services during future natural disasters, enabling first responders, utility companies and supporting organizations to access affected areas swiftly and safely.

When the PR-123 becomes unavailable, a detour must be taken. It will consist of taking the PR-10 to PR-135 to PR-129 and back to PR-10. This detour will increase travel time from 23 minutes to 1 hour and 20 minutes. The construction of the PR-10 highway (Utuado – Adjuntas), as a replacement for the PR-123 section will provide assurance that the challenges experienced during and after Hurricanes Irma and Maria, including the scarcity of essential services, will not reach the same magnitude in future natural disasters.

Upon completing the specified enhancements, PRHTA conducted an analysis of the current state of PR-123. The findings indicate that achieving significant improvements to the existing PR-123 without causing substantial impacts on local communities and the environment is not feasible. The exploration of design

and construction considerations aimed at enhancing the roadway's geometry to meet contemporary safety standards yielded the following conclusions:

- Achieving the desired improvement in the highway geometry of PR-123 to meet the latest safety standards would require extensive cut and fill operations. However, these activities would have a considerable impact on nearby residents and commercial establishments.
- The implementation of the required enhancements to PR-123 would entail significant displacement of families.
- Construction activities associated with this alternative would adversely affect the mobility of current PR-123 users for a very long period of time.
- The use of existing roadways as temporary detours during construction, as a mitigation measure, is not feasible due to their non-existence or would result in excessively long travel times for current users of this corridor.

Chapter 4: Alternatives

4.1 No Build Alternative

The no action alternative considers that the existing PR-10 would not be completed, and PR-123 would remain as the only terrestrial connection for vehicular traffic in operation between the municipalities of Adjuntas and Utuado. A reduced emergency response efficiency will continue, and the existing roadway will be very difficult to traverse through during an emergency, hampering the movement of emergency vehicles and personnel. Evacuation challenges and efforts of surrounding communities will continue. Communities will also experience increased recovery time due to inadequate or limited access to repair crews and equipment to provide restoration of services and utilities and may suffer long-term social impacts due to prolonged recovery times, including displacement, stress, and potential loss of community cohesion. Also, the no build alternative would maintain the substandard and unsafe operating conditions of PR-123 and would continue to jeopardize the possibility of improving current accessibility and mobility limitations for the users of the existing terrestrial highway corridor. This in turn would result in the following additional negative impacts:

- Lack of a safe and reliable North – South corridor for the western part of the Island.
- Poor system linkage and connectivity between North and South of the Island
- Incomplete terrestrial freight transportation network for the western part of the Island
- Higher environmental impacts due to risks associated by the operation of the existing road
- A decrease in the competitiveness of the region
- Shrinking market areas for employment due to travel inefficiencies

Without the new construction, the existing infrastructure and natural resources will remain unchanged, and vehicular traffic will continue to use PR-123.

4.2 Build Alternatives

A description of the alternatives that were analyzed to address the Proposed Action need follows.

4.2.1 Alternative 1: Improvements to existing PR-123 between Adjuntas and Utuado

As described in the background section of this document, the alignment of PR-123 constitutes the most significant limiting factor for the operation of vehicles imposed by the reduced speed capability of the highway. Originally designed to minimize earthwork cuts and fills, the existing route conforms very evenly with the existing topography. Although topographic conformance is an important design goal, the maximum operating capacity of motor vehicles that use this roadway is limited to a range of 15 to 20 miles per hour (mph). Additional operational constraints that were identified for the operation of PR-123 are:

- Horizontal and vertical alignments are substandard with respect to bridges, delineators, steep-grades, drainage, shoulders, intersections, site distance, side slopes and super-elevation.
- Horizontal radii are extremely short.
- Vertical grades are often too long, and too steep.
- Combined horizontal and vertical alignments are improperly coordinated.

The current state of traffic flow on PR-123 is adversely affecting the road's capacity and safety. Insufficient stopping and passing sight distances are creating unsafe conditions for overtaking, leading to instances where vehicles are forced to tail slower trucks. This is a concerning issue for primary transportation routes.

Moreover, the presence of excessively long and steep inclines disproportionately reduces the operating speed of heavy trucks compared to that of cars. In addition, the inadequate sight distance exacerbates the problem, giving rise to unsafe passing situations or compelling faster vehicles to trail slower trucks. The at-grade intersections compound the issue by having below-standard sight distances. Furthermore, many of these intersections feature sharp angles and lack provisions for efficient traffic distribution.

To improve to the maximum extent possible, the existing operational conditions of PR-123 between km. 37.0 (in Adjuntas) and km. 53.0 (in Utuado), the PRHTA developed various improvement projects. These projects were constrained by the limitations imposed by the current ROW and the rugged topography of the area and were required to maintain the integrity of the terrestrial interconnection between Adjuntas and Utuado. A brief description of the activities performed by the PRHTA for this roadway follows:

Improvements

In year 2000, the PRHTA planned a geometric improvement project for PR-123 between Adjuntas and Utuado with an estimated length of 16.0 kms. The following improvements were proposed:

- Where possible, increase the width of the two (2) lanes from 3.35 m. to 3.65 m. This was necessary to provide more space for vehicular traffic flow since the existing widths are lower than the minimum recommended.

- Where possible, provide an emergency paved shoulder.
- Where possible, improve the curve ratio on areas exhibiting extremely close radius.

The Proposed Action goal was to improve the safety of the roadway to its users to the extent possible, considering the physical constraints imposed by the existing geology, soils, and abrupt topography of the roadway corridor.

A review by the PRHTA Construction Department disclosed the fact that projects AC-012315, AC-012316 and AC-012316 were completed between 2002 and 2004 by the PRHTA to improve, within the constraints imposed by current ROW limitations, the traffic conditions of PR-123.

Repairs

In the aftermath of Hurricanes Irma and María (2017), PR-123 (between kms. 37.0 and 53.2) experienced embankment washouts, landslides, damage to traffic signs that required the PRHTA to develop repair projects at the following locations:

Table 1: Summary of Repair Projects of PR-123

| Damage ID | Location | Description |
|------------------|----------------------|---|
| PR-123-S-01 | Km. 37.4 to 37.8 | Landslide due to heavy rain |
| PR-123-S-02 | Km 38.7 to 47.3 | Landslide due to heavy rain |
| PR-123-N-06 | km 50.8 | Partial road washout |
| PR-123-N-05 | km 50.6 | Road washout |
| PR-123-N-04 | km 48.8 | Embankment washout |
| PR-123-N-03 | km 48.5 | Embankment washout |
| PR-123-N-02 | km 48.4 | Partial road washout |
| PR-123-N-01 | km 48.24 | Partial road washout |
| TS-33 | km 38.0-48.0 | Damage to traffic signs and guardrails. |
| PR-123-S-03 | Km. 42.0, 44.1, 44.3 | Partial road collapse |

After completion of the described repairs, analysis of the current condition of PR-123 by PRHTA have concluded that significant improvements to current PR-123 are not possible without resulting in significant impacts on the communities and environment. Efforts to define appropriate design and construction considerations that may serve to improve the geometry of this roadway to meet current design standards concluded that:

- Significant cut and fill operations would be required to significantly improve the geometry of the highway up to the latest standards of safety recommended by design codes. These activities would have a significant impact on nearby residents and commercial uses.
- Significant displacement of businesses/families would be required to accommodate the required and improved PR-123.

- Construction activities for this alternative would impose significant temporary negative impacts on the mobility of current users of PR-123.
- Existing roadways that may be used as temporary detours during the construction activity as a mitigation measure are non-existent or would result in excessive travel times for current users of this corridor.

With respect to resilience, this alternative does not serve the need of maintaining a critical access route required in the aftermath of natural disasters such as earthquakes, hurricanes, and landslides for communities served by current PR-123, since it will be blocked for vehicular traffic. The required access of crews to provide immediate assistance for disrupted infrastructure repairs (i.e., electric lines, potable water, etc.), medical supplies and evacuation routes will not be warranted with this alternative due to the physical, geological and soil conditions of its corridor.

4.2.2 Alternative 2: Construction of a new highway in a new corridor

4.2.2.1 Alternative 2A: Construction of a new highway connecting existing sections of PR-10 that was selected as the preferred alternative of the FEIS and its subsequent reevaluations

This alternative considers the construction of a new highway connecting the north and south sections of PR-10 currently in operation. The alternative alignment considered in the EA considers the preferred alignment that was discussed and analyzed in the 1979 FEIS and the subsequent reevaluations. Therefore, it is important to indicate that this alternative remains located within the same corridor of those alternatives analyzed for the FEIS. The alignment of the current Proposed Action has evolved due to project design activities, which highlighted the need for adjustments in certain areas.

The selected alignment has been adjusted as required to reduce the environmental impacts resulting from the construction activities, protection of adjacent natural systems and/or ROW acquisition needs. However, with respect to the highway characteristics, no change in the concept or capacity was considered.

The latest noticeable adjustment of the Proposed Action alignment occurred in 2002 and its scope was presented to the public and government agencies (including the EQB and FHWA) on March 19, 2002, during a public meeting. The adjustment started with a portion of the highway alignment near the Municipality of Utuado, which resulted in a reduction of the volume of earthwork activities required for the construction activities. This adjustment required realigning a portion of the highway toward the east when compared to the revised 2B alignment considered in the FEIS and basically occupies the alignment identified as 2A of the FEIS. Therefore, it is appropriate to indicate that this alignment remains within the corridor of alternatives analyzed in the original EIS document. As an additional measure to further reduce environmental impacts of the preferred alternative alignment, in 2007 the PRHTA issued a Request for

Proposals (RFP). This process resulted in the submittal of two (2) alternatives by the engineering firms Behar Ybarra and Associates (BYA) and Barret Hale and Alamo (BHA). Both options share the adoption of structures as a measure to minimize the need of earthwork operations. The alternative presented by BHA, current project designer, was selected as the best one. Major environmental benefits of this alignment adjustment are the reduction of the impacts of the earthwork activities by shifting the alignment toward the Rio Grande Arecibo and the incorporation of 19 bridges in the proposed action which ultimately result in the reduction of the temporary increase of the sedimentation and turbidity of the Rio Grande de Arecibo water quality during the performance of the earthwork activities. This alternative also helps to reduce the negative effects of landslides in the integrity of the proposed action once completed by minimizing the need of cut and fill activities. After receiving the comments from agencies and the public, an update of the conditions of the corridor of the Proposed Action was conducted. These included the performance of updated consultations with the DNER, PRIC, SHPO and the USFWS. The updated Proposed Action realignment required to prepare a Reevaluation for the concurrence of the FHWA and a recertification of the FEIS from the EQB (see **Attachment 5**), both of which were approved. A figure illustrating the mentioned realignment and DEIS alignments with respect to the ones described in the FEIS of the Proposed Action alignment is included in **Attachment 2 (Figures 5 and 6** respectively). This alignment has been basically maintained up to the present for the continuation of the Proposed Action construction as may be observed from the figure that illustrates the various alignments considered in the analysis as well as the consultations with the required agencies. For the latest presentations, computer generated drawings over imposed on aerial photographs have been used, therefore providing more accurate representation of the alternatives used for the analyses.

This herein described alternative (see **Attachment 3** considers the construction of a new highway which is designed incorporating the required horizontal and vertical alignments recommended by the American Association of State Highway and Transportation Officials (AASHTO) standards with a design speed of 50 mph. The 7.6-kilometer section is designed to comply with the requirements of the latest construction codes of AASHTO Design and Construction of Highway and Bridges to provide a resilient facility for future natural events (storms, hurricanes, and earthquakes). The alternative consists of the construction of a new roadway facility including 20 bridges spanning over 20-30 creeks and water bodies along one of the steepest terrains in Puerto Rico. Those bridges will provide free flow to the storm runoff water which is the major cause of erosion and landslides of the highway embankments. It is important to indicate that from a transportation perspective, the logical termini of the alternative are imposed by the ending points from Arecibo to Utuado (north section) and from Ponce to Adjuntas (south section) of PR-10 already constructed and in operation. The alignment of this alternative was assessed in the original FEIS prepared for the Proposed Action and has been adjusted through the years to minimize environmental impacts associated with its construction, particularly those related to earthwork activities and impacts on flora/fauna species of the area. During this process, federal and local environmental agencies have been providing their expertise and knowledge to maintain the validity of the findings. Therefore, it can be stated that the proposed action corridor has been extensively studied. The alignment crosses mostly vacant rural areas.

The typical section of the highway consists of two 3.65-meter lanes and 1.80-meter shoulder in the uphill sections and one 3.65 meter lane and 3 meter wide shoulder in the downhill sections. The steep cuts will

be reinforced with a soil nails system which will protect the roadway against landslides and reduce the volume of cuts resulting in reduced environmental impacts.

This alternative starts at its intersection with PR-10 in the vicinity of the town of Utuado and runs toward the south until reaching Rio Grande de Arecibo, where it turns toward its west side and then running all the way up to the south section of PR-10 that is located toward the northeast side of the town of Adjuntas.

The construction of the proposed action in this mountainous region, characterized by persistent rainfall, heavy truck traffic, and high landslide risk, presents numerous benefits. It enhances safety, improves emergency response times, and increases the region's resiliency to natural disasters. The economic advantages, improved connectivity, and potential environmental and health benefits further underscore the importance of this development. By addressing the limitations of the existing roadway and incorporating modern design standards and advanced landslide mitigation measures, the new highway will significantly contribute to the overall resilience and prosperity of the region.

Annual maintenance costs for a 20-year period are presently estimated at \$375,000 annually, totaling approximately \$7,500,000. Costs include:

- Regular Road Maintenance: \$70,700
- Bridge Maintenance: \$126,500
- Landslide and Erosion Control: \$114,000
- Drainage System Maintenance: \$38,000
- Other Maintenance Activities: \$25,200

During the project's design phase, a detailed Operations and Maintenance (O&M) Plan will be developed, including schedules, staffing projections, funding sources, and infrastructure management details. Long-term funding for O&M will be integrated into PRHTA and DTPW budgets. The plan will also address risks from climate change and other environmental factors through ongoing risk assessments and updates.

4.2.2.2 Alternative 2B: Construction of a new highway to the east side of the Rio Grande de Arecibo within PR-123 corridor

This alternative may be considered as a realignment of PR-123 that conforms to current highway design standards and therefore is located toward the east side of Rio Grande de Arecibo, which as indicated in the PR-123 description exhibits a rugged topography. To reduce its impact on the mountains, its alignment was brought to the riverbanks, however, this requirement results in impacts to existing commercial and residential uses that have been long established along the path of PR-123. This alternative has an approximate length of **7.06** kms. with the following general characteristics:

- Requires the construction of five (5) viaducts
- Requires the construction of three (3) conventional bridges
- Requires the construction of two (2) tunnels with a length of 685 meters and 375 meters

- Requires the displacement of approximately 36 structures out of a total of 94 identified along the path of the alternative corridor
- Estimated Cost of \$ 978,203,433.00

It is important to indicate that this alternative's starting and ending points are shared with the previous one since they consider the completion of PR-10. An illustration of this alternative alignment has been included in **Attachment 2 (Figure 13)**.

A review of the existing environmental condition of this alternative results in the following findings:

- Requires extensive earthwork activities resulting from the significant difference in elevations observed through its corridor.
- Requires five (5) crossings of the Río Grande de Arecibo. This implies more impacts to the surface waters bodies and associated wetlands
- Requires the construction of two (2) tunnels, which are expensive to construct
- A review of the Planning for Consultation and Review (IPaC) database tool developed by the USFWS disclosed the presence of the same listed rare and/or endangered species listed for the previous alternative which were: Puerto Rican Broad-winged Hawk (*Buteo platypterus brunnescens*), Puerto Rican Parrot (*Amazona vittata*), Puerto Rican Sharp-shinned Hawk (*Accipiter striatus venator*), and the Puerto Rican Boa (*Chilabothrus inornatus*). However, the Puerto Rican Harlequin Butterfly (*Atlantea tulita*) was also identified as potentially affected species but not critical habitat for them identified in the corridor.
- Requires the displacement of 36 families and/or businesses
- Its construction would impact PR-123, which is considered as a historic resource by SHPO and the Puerto Rico Institute of Culture (PRIC).
- During its construction, the accessibility and mobility of current users will be severely impacted since there are no alternate routes or detours near the area. Current users would be forced to take detours that will significantly delay their trips, a condition that would also negatively affect the traffic of heavy trucks that rely on PR-123 for the delivery of raw materials and finished products.
- If a natural disaster occurs during its construction, the integrity of this north to south link integrity will be lost. This in turn may jeopardize the recovery and assistance efforts required to be deployed in the aftermath of such type of incidents.

4.2.3 Alternative 3: Alternative Considered but not Selected for Detailed Study

An additional alternative that was considered as part of the planning of the Proposed Action but was eliminated upon detailed study and evaluation, is the adoption of a mass transit system. A brief description of this alternative follows.

A mass transit alternative is considered a mode of transportation that can move many people at once. It is often used as an alternative to personal vehicles, which can cause traffic congestion and air pollution. Some examples of mass transportation alternatives include:

- **Buses:** Buses are a common form of mass transportation in many cities. They are relatively inexpensive to operate and can carry many passengers at once. Some cities have dedicated bus lanes to help buses move more quickly through traffic.
- **Trains:** Trains are another popular form of mass transportation. They can carry many passengers over long distances and are often faster than buses. Some cities have commuter trains that run between the suburbs and the city center.
- **Subways:** Subways are underground trains that run on tracks. They are often used in large cities where space is limited. Subways can carry many passengers quickly and efficiently.
- **Light rail transit (LRT):** LRT systems are like subways, but they run above ground on tracks. They are often used in smaller cities or suburbs where a full subway system would not be practical.
- **Bus rapid transit (BRT):** BRT systems are designed to be faster and more efficient than traditional bus systems. They often have dedicated bus lanes and stations that allow passengers to board quickly.

Each mode of the described mass transit modes has its own advantages and disadvantages, and the best option will depend on the specific needs of the city or region.

Locally, there are various modes of motorized public transportation which are currently in use in Puerto Rico. Among them are the heavy rail (Tren Urbano), local buses, trolleys, *públicos*, and taxis. Buses and trolleys are typically owned by specific municipalities and thus operate exclusively within their jurisdictions while *públicos* are privately owned and have an expanded coverage area. In addition to the Tren Urbano rail line, the PR Department of Transportation and Public Works (DTPW) operates the Metropolitan Bus Authority (MBA) fixed bus route system within the San Juan Metropolitan area, and therefore, there are no MBA bus routes serving the Adjuntas and Utuado area. Upon analysis of the rural characteristics of the Proposed Action area and existing infrastructure, it was determined that consideration of a mass transit system is not compatible with the PRHTA purpose and need for the Proposed Action.

After analysis of alternatives considered, it was determined that:

- Alternative 1 is not deemed appropriate for the benefit of residents living along the path of the Proposed Action corridor as well as current and future users of PR-10. Operating conditions of PR-123 will continue to deteriorate. This alternative does not provide for improvements in its operation resulting from landslides, therefore the threats to its operation will remain.
- Alternative 2B is not deemed appropriate since it has more environmental impacts when compared to Alternative 2A, including its cost. In addition, during its construction, current PR-123 users would lack a terrestrial connection since adequate detours and/or alternate temporary routes are not available. This scenario could further detract the resiliency of the roadway system needed to receive assistance in the aftermath of a natural disaster.

- Alternative 3 was analyzed but not considered as feasible for the Proposed Action area since it would not serve as an additional needed access to the Port of Ponce and would not provide access to emergency response vehicles, personnel, etc. to communities during a disaster since they would not be operational. This alternative does not provide adequate protection from the effects of landslides.
- Alternative 2A is considered as the preferred alternative and thus identified as the proposed action to be analyzed in this document for compliance with NEPA. It is important to indicate that the design of this alternative design will incorporate measures to prevent and/or minimize the disruption of the roadway operation resulting from landslides.

The following table summarizes the characteristics of each of the analyzed alternatives.

Table 2: Comparison of Alternatives Impacts

| | Brief Alternatives Description | | |
|--|---|--|---|
| | No Build Alternative | Upgrading Existing PR-123 Alternative (2B) | Recommended Alternative (2A) |
| | <p>Substandard and old roadway not complying with modern geometric and safety requirements. Typical lane width of lanes varies between 2.9 and 3.75 meters with adequate or inexistent paved shoulders. Operational vehicles velocity of 15 to 20 Miles per hour with many fixed objects observed at both sides (i.e.: trees, poles, etc.). Level of Service F (worst condition). The estimated length of PR-123 is of approximately 14 kms. The acquired corridor would remain undeveloped and vehicular traffic continues to use PR-123. Infrastructure</p> | <p>New roadway located to the east side of the Rio Grande de Arcibo River near current PR-123 with an estimated length of 7.06 kms. with two (2) lanes and an auxiliary lane for uphill passing of trucks. Typical lane width of 3.65 meters with lateral paved shoulders with a variable width of 3.0 to 1.8 meters at both sides. Design speed of 40 Miles per hour. Requires the construction of two (2) tunnels with an estimated length of 685 and 375 meters respectively, 5 viaducts and 3 conventional bridges. Requires five river crossings.</p> | <p>New roadway with an estimated length of 7.6 kms. with two (2) lanes and an auxiliary lane for uphill passing of trucks. Typical lane width of 3.65 meters with lateral paved shoulders with a variable width of 3.0 to 1.8 meters at both sides. ROW has already been acquired except for section IV. No families nor business displacements in the remaining acquisition. Design speed of 40 Miles per hour. This alternative is the result of an extensive engineering/environmental review of the FEIS recommended alternative that has been reevaluated. Requires one river crossing</p> |

| | | | |
|--|---|--|--|
| | and/or Natural Resources remain unchanged. | | |
| Affected Infrastructure and/or Natural Resource | | | |
| 1. Transportation | Direct impacts resulting from a deficient and unsafe PR-123 operation will remain, negatively impacting it users. Also, the transportation of finished goods and raw materials will continue to the negatively impacted. Loss of opportunity to improve the resiliency of the highway system, especially in the aftermath of natural disasters. Indirect impacts resulting in the lack of opportunities for the improvement of new businesses and associated improvement of employment opportunities. | Temporary negative direct impacts during construction resulting from the disruption of PR-123 normal operations that may require the use of detours that will significantly increase travelling times estimated in 1 hour and 23 minutes. Positive direct impacts resulting from an improved terrestrial connection between Adjuntas and Utuado. | Temporary impact during construction. The proposed action will reduce the travelling time of vehicles, including heavy trucks. Travelling distance will be reduced by 6.4 kilometers, therefore resulting in a direct positive impact to current users of PR-123. Positive direct impacts resulting from an improved terrestrial connection between Adjuntas and Utuado. |
| 2. Land Use | No impact since no construction activities would be performed. Properties would remain on their current condition. | Direct impacts are expected since ROW acquisition along PR-123 is required. Indirect impacts may result to current land uses along the path of PR-123, in particular commercial uses. | No direct or indirect impacts, state planning already included the proposed action as well as local governments. Also 90 % of the ROW has been already acquired. |
| 3. Air Quality | No impact since no construction activities would be performed. Existing good air quality would remain unaltered. | Temporary direct impacts during the construction activities resulting from the exhaust system of vehicles and heavy equipment. This | Temporary direct impacts during the construction activities resulting from the exhaust system of vehicles and heavy equipment. This impact will be mitigated by requesting the contractor |

| | | | |
|--|--|---|--|
| | | <p>impact will be mitigated by requesting the contractor maintain in good working condition the emission control devices installed by the manufacturer, as required by the EPA. After completion of construction activities, current vehicular traffic air pollutant emissions will return to their previous condition. These emissions are considered non-significant resulting from the low vehicular traffic volume and the good air quality of the area, which complies with the National Ambient Air Quality Standards (NAAQS), and therefore it has been classified as an attainment area. In terms of the air basin quality, the current vehicular traffic has already contributed to its condition.</p> | <p>maintain in good working condition the emission control devices installed by the manufacturer, as required by the EPA. After completion of construction activities, current vehicular traffic air pollutant emissions will return to their previous condition.</p> <p>These emissions are considered as non-significant resulting from the low vehicular traffic volume and the good air quality of the area, which complies with the National Ambient Air Quality Standards (NAAQS), and therefore it has been classified as an attainment area.</p> <p>In terms of the air basin characteristics, the air quality impacts along PR-123 would be reduced since vehicular traffic will be reduced. It is estimated that approximately 80% of the current vehicular traffic of PR-123 would be diverted to the proposed action while the remaining 20% would remain using PR-123. On the proposed action alignment there are less residential structures and are located at minimum distances of approximately 60 meters or more. Considering the fact that the travelling distance will be reduced, the overall combustion emissions resulting from the vehicular traffic within the air basin will be reduced, a positive direct impact.</p> |
|--|--|---|--|

| | | | |
|------------------|--|---|--|
| 4. Noise Quality | <p>No impacts since no construction activities would be performed. Noise environment would remain unaltered. Existing noise levels equivalent measured for Section IV (considered typical of a rural area) ranged between 48.0 and 50.2 dBA.</p> | <p>Temporary direct noise impacts during construction activities resulting from the use of heavy equipment and trucks. After construction, existing traffic noise levels will continue to be perceived by residences located adjacent to PR-123.</p> | <p>Temporary direct impacts during construction. After construction an increase of noise levels is expected but will remain below FHWA /HUD requiring abatement of 67 dBA Leq and 65 Ldn respectively. However, the estimated levels are not considered substantial and do not require to consider noise abatement measures.</p> |
| 5. Water Quality | <p>No impacts since no construction activities would be performed. Impacts to water quality would remain to be by current uses within the drainage area such as agricultural uses. It shall be noted that the Río Grande de Arecibo has been included in the most recent 305 (b) – 303 (d) Integrated Report published by the DNER on September 2023. In this report, the Río Grande de Arecibo has been included in the list of streams listed as impaired based on the water quality data collected at stations PRNR7A2 and PRNR7A3. Parameters of impairment are: Chromium VI, Enterococcus Total, Nitrogen Total, Phosphorus and Turbidity. Potential sources of pollution have been identified as: agriculture,</p> | <p>Temporary direct impact during construction and will be mitigated using Best Management Practices (BMPs) required by the EPA to comply with the 2022 Construction General Permit (CGP). A SWPPP will be prepared to minimize the effects of erosion and sedimentation of the Río Grande de Arecibo and its tributaries. The Río Grande de Arecibo is included in the impaired waters list published by the EPA on its most recent report for turbidity. After construction, revegetated areas as well as green practices to be included in the storm sewer system will reduce sources of pollutants.</p> <p>This alternative has five river crossings.</p> <p>The operation of PR-123 will continue to</p> | <p>Temporary direct impact during construction that will be mitigated using Best Management Practices (BMPs) required by the EPA to comply with the 2022 Construction General Permit (CGP). A SWPPP will be prepared to minimize the effects of erosion and sedimentation of the Río Grande de Arecibo and its tributaries. The Río Grande de Arecibo is included in the impaired waters list published by the EPA on its most recent report for turbidity. After construction, revegetated areas as well as green practices to be included in the storm sewer system will reduce sources of pollutants.</p> <p>This alternative has one river crossing.</p> <p>The operation of the proposed action will generate pollutants associated with the vehicular traffic flow. However, their contribution will be minimized by the adoption of low impact development techniques to the extent possible. It shall be</p> |

| | | | |
|-------------|--|--|---|
| | <p>collection system failure, confined animal feeding operations, landfill, major municipal point sources, minor industrial point sources, onsite wastewater systems, and urban runoff storm sewers.</p> | <p>generate pollutants associated with the vehicular traffic flow. However, their contribution will be minimized by the adoption of low impact development techniques to the extent possible. It shall be noted that its contribution with respect to the size of the water basin of the Río Grande de Arcibo is minimal when considering other sources of pollutants identified in EPA's report as potential sources of pollutants within the drainage basin. The estimated sediment load during the construction of the proposed action has been estimated in less than 890.35 cubic meters per year using data collected by the USGS. Since the construction of tunnels will help to reduce the earthwork activities resulting in the exposure of soils to the effects of stormwater.</p> | <p>noted that its contribution with respect to the size of the water basin of the Río Grande de Arcibo is minimal when considering other sources of pollutants identified in EPA's report as potential sources of pollutants within the drainage basin. The estimated sediment load during the construction of the proposed action has been estimated in 890.35 cubic meters per year using data collected by the USGS.</p> |
| 6. Wetlands | <p>No impact since no construction activities would be performed. The presence of some riverine type of wetlands are located within the proximity of Rio Grande de Arcibo River, which</p> | <p>Limited impacts on wetlands crossings associated with construction activities related with existing bridges and roadway. Presence of wetlands along the proposed action corridor are</p> | <p>Limited temporary impacts on wetlands crossings associated with construction activities related with proposed bridges and roadway, direct impacts have been avoided by means of structure crossings. Presence of wetlands along the proposed action corridor</p> |

| | | | |
|--------------------------------------|---|---|---|
| | <p>constitutes the most significant water resource of the area. However, small creeks and natural drainage swales are observed and due to the rugged topography of the area, favorable conditions for the development of an extensive wetland are not observed as noted.</p> | <p>mostly associated with the presence of riverine systems. This alternative has five river crossings which imply temporary wetland impacts of more than 4.0 acres.</p> | <p>are limited and associated with the presence of riverine systems. A maximum of approximately 4.0 acres temporary impacts to wetland systems can be reasonably expected since structures are being used to minimize those impacts. It shall be noted, that the proposed action only considers one (1) crossing of the Río Grande de Arecibo and that more accurate impacts in wetlands would be estimated once the design/build stages of sections IV and V reach advanced stages. It is important to indicate that sections III, IV and V would be required to comply with Sections 404 of the CWA and Section 10 of the Rivers and Harbor Act of 1899, if applicable considering that avoidance of impacts is not possible.</p> |
| <p>7.Unique Fauna/Flora Habitats</p> | <p>No direct or indirect impacts since no construction activities would be performed. Flora/fauna species would remain on their current condition. Current sources of impacts such as natural disasters, agricultural uses, etc. will continue. No unique flora/fauna habitats have been identified within the corridor of the proposed action.</p> | <p>Direct impacts of less than 209 acres during the construction and indirect impacts resulting from the proximity of undeveloped areas. However, no impacts to unique flora/fauna habitats have been identified along the path of the existing PR-123.</p> | <p>Direct impact to approximately 209 acres resulting from the construction activities. No unique flora/fauna habitats have been identified along the path of the proposed action as determined by consultations with federal and local agencies (DNER/USFWS). Also, mitigation measures consisting of the acquisition and transfer of 369.56 cuerdas (359.4 acres) property for preservation to the DNER have been already completed. This mitigation measure included the project</p> |

| | | | |
|--|--|--|---|
| | | | to exiting flora/fauna habitats as well as the need to cut trees for the proposed action construction |
| 8. Rare and/or Endangered Species Habitats | No impact since no construction activities would be performed and no rare/endangered species habitats were identified along the corridor of the proposed action. | Construction activities would require securing USFWS endorsement under provisions of Section 7 of the Endangered Species Act (ESA). Therefore, it can be reasonably expected to be required to adopt same Programmatic Biological Opinion (PBO) that was required for the protection of the Puerto Rican boa. For other species, since the construction of this alternative requires the acquisition of ROW, a formal consultation to the USFWS shall be conducted. Since this alternative alignment is located close to the preferred alternative, it is reasonable to conclude that the same recommendations of Protective Measure Protocols would be required for the same species. | <p>Previous field surveys and consultations with government agencies (DNER/USFWS) with expertise about this subject have not disclosed the presence of rare/endangered species habitats along the path of the proposed action corridor. Nevertheless, since some of those species may be present in nearby areas, measures consisting of the development of Protective Measures Protocols will be implemented. This measure is considered an adaptive management practice.</p> <p>The specific species addressed by the previously described protocols are: <i>Chilabotrus inornatus</i> (Puerto Rican Boa), <i>Amazona vittata</i> (Puerto Rican Parrot), <i>Accipiter striatus venator</i> (Puerto Rican Sharp-shinned Hawk), <i>Buteo platypterus brunnescens</i> (Puerto Rican Broad-winged Hawk), <i>Atlantea tulita</i> (Puerto Rican Harlequin Butterfly), <i>Oplonia spinosa</i>, <i>Cornuvia obovata</i>, <i>Pleodendron macranthum</i>, <i>Solanum ensifolium</i>, <i>Myrcia paganii</i>, and <i>Varronia bellonis</i>.</p> <p>However, with respect to the Puerto Rican Boa, it shall be indicated that consultation under provisions of Section 7 of the Endangered Species</p> |

| | | | |
|---|---|--|---|
| | | | Act (ESA) resulted in the recommendation of the USFWS for the adoption of sections 6.4 and 6.5 of the Programmatic Biological Opinion (PBO) approved by this agency. Both the PRHTA and the FHWA accepted this recommendation which will be incorporated in the proposed action contract documents. |
| 9. EJ Communities | Direct negative impacts to EJ Communities will prevail due to the deficient access, which will result in a constraint response from crews that will be required to reach the communities in the aftermath of a major disaster. First responders, food and utility repair crews' access to the areas may be blocked by landslides, power line poles, falling trees, etc. No indirect impacts are expected from the no build alternative. | EJ communities will be directly and positively impacted with a safer and secure access road. The proposed action will help to improve the resiliency of the infrastructure. No indirect impacts are expected from this alternative construction. | EJ communities will be directly and positively impacted with a safer and secure access road. The proposed action will help to improve the resiliency of the infrastructure. No indirect impacts are expected from this alternative construction. |
| 10. Community Facilities and Services | No direct or indirect impacts since no construction activities would be performed. Also, it is important to indicate that no communities' facilities or services are located within the proposed action corridor. | Temporary direct impacts during the construction activities. No indirect impact can be reasonably expected since community facilities and services are not present along the path of PR-123. | No direct or indirect impacts since there are no community facilities or facilities located along the path of the proposed action corridor. |
| 11. Relocation of Businesses and Families | No direct or indirect impacts since no construction activities would be performed. | Direct impacts resulting from the need to acquire 36 businesses and/or | No direct or indirect impacts. ROW acquisition has been completed for all sections except for section IV, which |

| | | | |
|----------------------------|---|---|---|
| | | residential structures. No indirect impacts are reasonably expected for this alternative. | does not result in the need to relocate businesses and/or families. An approximate 90% of the required acquisition has been completed. A total of 792 acres have been acquired for the construction of the proposed action. This total includes the remnant of the acquired properties due their size. Local laws preclude the formation of properties without access to a public roadway. |
| 12. Coastal Zone | No direct or indirect impact, the project is located far from coastal zones. | No direct or indirect impact, the project is located far from coastal zones. | No direct or indirect impacts, the project is located far from coastal zones. |
| 13. Coastal Barriers | No direct or indirect impact, the project is located far from coastal zones. | No direct or indirect impact, the project is located far from coastal zones. | No direct or indirect impacts, the project is located far from coastal zones. |
| 14. Wild and Scenic Rivers | No direct or indirect impact since database review did not disclose the presence of wild and scenic rivers resources within the area. | No direct or indirect impact since database review did not disclose the presence of wild and scenic rivers resources within the area. | No direct or indirect impacts since database review did not disclose the presence of wild and scenic rivers resources within the area. |
| 15. Historic Properties | No direct or indirect impact since no construction activities would be performed. | Direct and indirect Impacts during the construction resulting from the fact that existing bridges and/or drainage structures of PR-123 are considered historic resources since their construction began in the late 1890's during the Spaniards presence in Puerto Rico. Archaeological monitoring may be | No direct or indirect impacts. Consultation with the Puerto Rico Institute of Culture (PRIC) and the State Historic Preservation Office (SHPO) has not disclosed the presence of archaeological/historic properties. However, the PRIC required to conduct a monitoring during the construction of Sections III and IV. |

| | | | |
|------------------------------|---|---|--|
| | | required both by SHPO and the PRIC. | |
| 16. Archeological Resources | No direct or indirect impact since no construction activities would be performed. | The project ROW was already impacted during the construction of PR-123. However, even though there is need to acquire properties the likelihood of finding an archaeological resource is low based on the results of previous studies conducted for the area. Therefore, no direct or indirect impact is expected from this alternative construction. | No direct or indirect impacts. Consultation with the Puerto Rico Institute of Culture (PRIC) and the State Historic Preservation Office (SHPO) has not disclosed the presence of archaeological/historic properties. However, the PRIC required to conduct a monitoring during the construction of Sections III and IV. |
| 17. Landslides and Geology | No direct or indirect impact since no construction activities would be performed. | Its operation has been already impacted by landslides that occurred in the aftermath of hurricane María and Fiona. Steep grades along the path of the roadway, geology and type of soils promote the occurrence of landslides. It shall be noted that this roadway was designed in a pre-automotive era with limited consideration to these subjects. | The proposed action design incorporates the best available engineering knowledge and the results of geotechnical soil and geologic studies. Also, the experience learned from the construction of previous sections of PR-10 would be incorporated in the design of the proposed action. Because of the stated conditions, no direct or indirect impact can reasonably be expected for this alternative. |
| 18. Socioeconomic Effects/EJ | No direct or indirect impact since no construction activities would be performed. | Direct positive impacts since the improved access will help the EJ communities receive faster assistance in the aftermath of a major natural disaster. Some indirect positive | Direct and indirect positive impacts resulting from an improved access to the area for EJ communities in the aftermath of major natural disaster. Some indirect positive impacts may result from the possibility of finding |

| | | | |
|--------------------------------|--|---|---|
| | | impacts may result from the possibility of finding jobs nearby resulting from the establishment of new businesses. | jobs nearby resulting from the establishment of new businesses. |
| 19. Climate Change | No direct and indirect impact since no construction activities would be performed. | Positive direct and indirect impacts resulting from the improved access for the communities of the area in the aftermath of impacts caused by climate change. Negative impacts are not considered to occur in the context of the relatively small footprint of the proposed action. | Positive direct and indirect impacts resulting from the improved access for the communities of the area in the aftermath of impacts caused by climate change. Negative impacts are not considered to occur in the context of the relatively small footprint of the proposed action. |
| 20. Green House Gases (GHG) | No direct or indirect impact since no construction activities would be performed. | No direct or indirect impact resulting from the low vehicular traffic volume using PR-123 in the context of scale of the area (approximately 5,000 vehicles per day). | No direct or indirect impact resulting from the low vehicular traffic volume that will be using the proposed action in the context of scale of the area (approximately 5,000 vehicles per day). However, a reduction of the GHG generation is expected due to a projected reduction in VMT resulting from a shorter length of the proposed action with respect to the length of PR-123. |
| 21. Hazardous/Toxic Substances | No direct or indirect impact since no construction activities would be performed. | Temporary direct impact during construction activities. Solid and/or hazardous wastes to be generated during the construction activities will be handled as per regulatory DNER/EPA requirements. This includes the preparation and submittal of the | Temporary direct impact during construction activities. Solid and/or hazardous wastes to be generated during the construction activities will be handled as per regulatory DNER/EPA requirements. An abandoned septic tank closure found during the planning stage shall be closed in accordance with DNER/EPA regulations. This includes the preparation |

| | | | |
|----------------------------------|---|---|--|
| | | required permit. No indirect impacts are expected. | and submittal of the required permit. No indirect impacts are expected. |
| 22. Floodplains | No direct or indirect impact since no construction activities would be performed. | The proposed action would cross the Río Grande de Arecibo River flood plains five times. Design of the required bridges/viaducts would incorporate measures to avoid and minimize impacts to the waters of the United States and associated riverine wetland systems. Therefore, this activity may result in direct and indirect impacts to the body of water and wetlands. The temporary direct riverbed impacts within the OHWM are estimated in approximately 2.5 acres resulting from the need to place a berm for the construction of the bridge/viaducts piers. Construction of the structures would require t secure a USACE Permit. | The proposed action would cross only once through the flood plain associated with the Río Grande de Arecibo River, for which a USACE Nationwide permit has been already secured. Permanent impact to waters of the United States have been estimated in 0.35 acres resulting from the bridge construction and no wetlands would be impacted since they were not observed within the proposed action area. Temporary direct impacts within the OHWM would result from the placement of a temporary berm for the construction of the north revetment mat (0.2487 acre) and the south bridge pier and revetment mat (0.2449 acres). After the completion of the construction of the structures, the material will be removed and the area returned to its natural condition, and no indirect impacts are reasonably expected. |
| 23. Infrastructure and Utilities | No direct or indirect impact since no construction activities would be performed. | Direct impacts during construction activities to potable water lines and/or electric poles. These activities will be coordinated with the appropriate infrastructure entity (PRASA, LUMA). No indirect impacts are reasonably expected | Limited temporary direct to impact electric poles and/or potable water lines during construction activities. These activities will be coordinated with the appropriate infrastructure entity (PRASA, LUMA). No indirect impacts are reasonably expected from the construction of this alternative. |

| | | | |
|--------------------------|---|--|--|
| | | from the construction of this alternative. | |
| 24. Construction Impacts | No direct and indirect impacts since no construction activities would be performed. | Temporary direct impact during construction activities. No indirect impacts are reasonably expected. | Temporary direct impact during construction activities. No indirect impacts are reasonably expected. |
| 25. Cost | This alternative has no associated cost. | Estimated cost of \$ 978,203433.00 million. | Estimated cost of \$540,069,976.00 million. |

Chapter 5: Compliance with FHWA and HUD Environmental Laws and Regulations

The first section of this chapter documents compliance with federal laws and authorities listed in HUD Environmental Review Procedures at 24 CFR Part 58 and applicable FHWA environmental regulations in 23 CFR 7712 for the construction of Sections II, III, IV and V of PR-10 between the municipalities of Adjuntas and Utuado, Puerto Rico. The second portion of this chapter addresses the adequacy of other environmental issues areas considered under NEPA. The No-Build Alternative would not result in construction and would not result in impacts to in the environmental factors herein described.

5.1 Compliance with 24 CFR §58.5, and §58.6 Laws and 23 CFR 771.119 and other Environmental Laws

All compliance specifics for HUD requirements are shown in **Attachment 6** – HUD Environmental Evaluation Assessment Form.

5.1.1 Airport Hazards 24 CFR § 51, Subpart C and 24 CFR 58.6 (d)

Regulatory Requirements

It is HUD’s policy to apply standards to prevent incompatible development around civil airports and military airfields. See 24 CFR 51, Subpart D.

Impacts Associated with the No Build Alternative

No direct or indirect impacts are expected from the No Build Alternative since there would be no construction activities.

Impacts Associated with the Proposed Action

There are no impacts. The closest Civil Airport (Mercedita, in Ponce) is approximately 25.2 km southeast of the Proposed Action site (outside of the 2,500 feet regulated distance for the Runway Protection Zone). The closest Military Airport is the Joint Civil-Military airport (Luis Muñoz Marin, in Carolina), which is approximately 73.3 km northeast of the Proposed Action site (outside of the 15,000 feet regulated distance for the Accident Potential Zone). A location map illustrating the location of the closest airport with respect to the Proposed Action site has been included in **Attachment 2** (Figure 14).

Affected Environment and Regulations Update

This Proposed Action complies with Airport Hazards requirements since neither civil nor military airports are located within the range of the runway protection zone. No mitigation is required.

5.1.2 Coastal Barrier Resources 24 CFR § 58.6 (c) and CFR 771.119

Regulatory Requirements

The Coastal Barrier Resources Act (CBRA) of 1982 designated relatively undeveloped coastal barriers along the Atlantic and Gulf coasts as part of the John H. Chafee Coastal Barrier Resources System (CBRS) and made these areas ineligible for most new Federal expenditures and financial assistance. The Coastal Barrier Improvement Act (CBIA) of 1990 reauthorized the CBRA and expanded the CBRS to include undeveloped coastal barriers along the Florida Keys, Great Lakes, Puerto Rico, and U.S. Virgin Islands.

Impacts Associated with the No Build Alternative

No direct or indirect impacts are expected from the No Build Alternative since the areas are not located close or nearby a coastal zone with a designated barrier resource.

Impacts Associated with the Proposed Action

The closest Coastal Barrier Resource System Unit is PR-58P, an Otherwise Protected Area, is approximately 21.8 km south of the southern terminus of the Proposed Action site. A map showing the distance between the Proposed Action site and the nearest coastal barrier resource system has been included in **Attachment 2 (Figure 15)**.

Affected Environment and Regulations Update

The proposed action complies with the Coastal Barrier Resource System requirements.

5.1.3 Flood Insurance 24 CFR § 58.6

Regulatory Requirements

The Flood Disaster Protection Act of 1973 and the National Flood Insurance Reform Act of 1994 (42 USC 4012a) require flood insurance for projects receiving federal assistance and located in an area identified as a Special Flood Hazard Area (SFHA) on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRMs). The SFHA is the area where the National Flood Insurance Program's floodplain regulations must be enforced and the area where the mandatory purchase of flood insurance applies.

Impacts Associated with the No Build Alternative

No direct or indirect impacts associated with the No Build Alternative are expected since PR-123 is not located within a FEMA designated 100-year floodplain zone A/AE after reviewing the Flood Insurance Rate Map (FIRM) panel 72000C1080H dated 4/19/2005.

Impacts Associated with the Proposed Action

The Proposed Action area crosses the 100-year floodplain zone A/AE zone at only one location, the site of the bridge crossing the Rio Grande de Arecibo near the northern terminus of Section II) at approximately Latitude 18.234500 N and Longitude 66.719402 W. The Flood Insurance Rate Map (FIRM) panel applicable to this crossing is 72000C1080H dated 4/19/2005. It shall be noted that roads are not insurable structures under current NFIP coverage provisions. **Figures 16 and 17**, included in **Attachment 2** illustrate the Proposed Action location map and the FIRM.

Affected Environment and Regulations Update

Flood insurance is not required, since NFIP does not provide flood insurance for roads and/or bridges. Therefore, the Proposed Action complies with flood insurance requirements.

5.1.4 Clean Air 24 CFR § 58.5 (g), 23 CFR 771.119 and 40 CFR Parts 51 and 93

Regulatory Requirements

Clean Air Act, Sections 176 (c) and (d), and 40 CFR Parts 6, 51, 9 apply to all federal actions. As such, federal actions, including those affiliated with HUD funding must conform to the State Implementation Plan.

Impacts Associated with the No Build Alternative

Consultation with EPA/DNER databases disclosed the fact that the air quality of the area is good since concentration of regulated air pollutants such as Carbon Monoxide (CO) and Particulate Matter (PM) are below the applicable National Ambient Air Quality Standards (NAAQS). Therefore, with the No Build Alternative this condition would remain the same since no construction activities capable of producing fugitive dust emissions and/or additional air pollutants resulting from the operation of automobiles, trucks and/or construction equipment would occur. For those receivers located in the proximity of the ROW of PR-123 the air quality will remain within the acceptable parameters although some adjacent residences will continue to experience some effects on their air quality resulting from their proximity to PR-123. This condition is the result of the traffic of trucks through a roadway that exhibits substandard geometric conditions and relatively high percentage of trucks that use this roadway. The existing emission of air pollutants generated by the vehicular traffic through PR-123 will continue to be emitted to the air basin of the area. The operation of PR-123 will not provide a meaningful source of Mobile Sources Air Toxics (MSATs) for the air basin and therefore, no changes to this condition are anticipated to occur.

Based on the previous discussion no direct or indirect impacts are expected from the No Build Alternative.

Impacts Associated with the Proposed Action

Operation Impacts

Existing air quality predicted air quality impacts and conformity with the State Implementation Plan (SIP) are discussed in this section. A summary of each one of the mentioned subjects follows:

➤ **Existing Air Quality**

Under provisions of the Clean Air Act (CAA), the EPA developed and enforces the National Ambient Air Quality Standards (NAAQS). Those standards have been established for pollutants that are common in outdoor air, considered harmful to public health and the environment, and that are generated from numerous and diverse sources. The statute established two types

of national ambient air quality standards: primary standards and secondary standards for six criteria pollutants which are:

- Carbon Monoxide (CO)
- Lead (Pb)
- Particulate Matter (PM)
- Nitrogen Dioxide (NO₂)
- Ozone (O₃)
- Sulfur Dioxide (SO₂)

Pollutants of concern for transportation related projects which are considered herein for the assessment of air quality impacts are Carbon Monoxide (CO) and Particulate Matter (PM). However, under the provisions of the Clean Act (CAA) the EPA was required to identify all hazardous air pollutants (HAPs) that were not identified as a criteria pollutant but can result in an illness. In response to this directive, EPA issued its final Mobile Source Air Toxics Rule (MSATs) in February 2007. MSATs are hazardous air pollutants emitted by mobile sources that are known, or suspected, to cause cancer or serious health effects such as damage to immune, neurologic, reproductive, and respiratory systems at a national and regional scale. These types of pollutants may also result in environmental effects. While the universe of HAPs includes a total of 188 air toxics, the FHWA identified in its latest Updated Interim Guidance on MSAT Analysis for the National Environmental Policy Act (NEPA) Documents nine (9) air toxic pollutants of concern published in January 18, 2023 ([Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents \(dot.gov\)](#)). They are acetaldehyde, acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. Said document also establishes a systematic approach for the analysis of the environmental impacts caused by these pollutants based on the specific characteristics of the proposed action with respect to the NEPA documents.

To obtain information about the current air quality of the Proposed Action area, a review of the current EPA Green Book ([Air Quality \(2010\) Designated Area/State Information | Green Book | US EPA](#)) was conducted and disclosed the fact that the air quality of the area meets the NAAQS.

Based on the most recent information obtained from the EPA, the municipalities of Adjuntas and Utuado are located within an attainment area (see **Attachment 2, Figure 18**), where the concentration of NAAQS air pollutants, including CO, are met. Therefore, the air quality for the proposed action area is good. Current guidelines for assessing air quality impacts by highway projects only require performing air quality modeling only if the Proposed Actions are within a non-attainment area, or there are hot-spots intersections pertaining to highways located within the proposed action area, which does not occur in this air basin. Traffic Studies performed in 2021 for the Proposed Action area indicate that vehicular traffic volumes levels will remain low due to the forecasted decline on population and employment of the region. Because of this decline, emissions from vehicles are also expected to further decline with the projected increase in the use of hybrid and electric cars that is currently being adopted by the population. A meaningful increase of electric vehicles is expected to occur starting in 2035.

At a local level, a review of the current air quality monitoring data collected by the DNER disclosed the fact that there are no stations located close to the Proposed Action area for CO.

The nearest CO monitoring station operated by this agency to collect air quality data (EQB Station #56; Lat: 18.009558, long. -66.627249) is in the San Antonio housing development, at the Municipality of Ponce. It is located at an approximate distance of 22.90 kms. (see **Attachment 2, Figure 19**) toward the southeast side of the Proposed Action area. The database reported for 2022 by the DNER/EPA ([Air Quality Statistics Report | US EPA](#)) disclosed the fact that measured CO concentrations for the area were 12.2 and 2.2 ppm for the one-hour and eight-hour monitoring periods respectively. The reported concentrations are well below the current applicable NAAQS of 35.0 and 9.0 ppm respectively, and considering the rural characteristics of the area, existing CO concentrations can reasonably be expected to be lower for the air basin of the proposed action area. This statement is supported by the fact that no CO monitoring stations are located within the Proposed Action areas, since their location is a function of the air quality of an air basin. It is important to indicate that even in the San Juan Metropolitan Area of Puerto Rico, where vehicular traffic is considerably higher than the existing and predicted for this area, no air quality issues with high ambient concentrations for CO have been identified.

➤ **Predicted Air Quality Impacts**

Current compliance with the NAAQS criteria pollutants of the air basin and the reduced volume of vehicles (approximately 5,000 vehicles per day for 2025 with an annual forecasted increase of 1.0 to 1.5%) allows to reasonably assert that during the operation of the Proposed Action, ambient concentrations of air pollutants would remain close to current levels. Therefore, no exceedances of the NAAQS are predicted for the Proposed Action area. The area is subjected to a regime of relatively constant easterly trade winds and high temperatures (annual average of 69.3° F and 75.4° F for Adjuntas and Utuado respectively) that promote the rapid dispersion of air pollutants.

Review of proposed action drawings allow us to observe that:

- There are no sensitive receptors such as schools, childcare centers, elderly housing complexes, or healthcare facilities within the proposed action corridor or adjacent to it. Scattered residential uses are observed toward the west at the end of Section V but are located at distances of 65 meters or more from the proposed action. Dispersion of air pollutants in the area is promoted by the presence of an easterly winds regime resulting from the high ground elevations of the area.
- The surrounding areas of the corridor are characterized by dense vegetation, which aids in sequestering emitted pollutants. On average, these areas can sequester approximately 2.5 metric tons of CO₂ per acre annually. Additionally, they can reduce concentrations of Particulate Matter (PM) by 7-24%, remove approximately 5-15% of NO₂ and SO₂, and eliminate 1-15% of ozone from the atmosphere. They also play a crucial role in sequestering volatile organic compounds (VOCs).
- The acquisition of the ROW precludes the possibility of future development that may be adversely impacted within the proposed action corridor.

The proposed action begins, at its northern boundary, in the Guaonico Ward of the Municipality of Utuado, at its intersection with existing PR-10. It then proceeds through the Guaonico Ward in a southwestern direction, following parallel to the path of the Rio Grande

de Arecibo. Continuing southward, it traverses through the Capaéz Ward in the Municipality of Adjuntas, west of the Rio Grande de Arecibo, until reaching its intersection with existing PR-10 north of the urban center of the Municipality of Adjuntas. Both wards primarily consist of sparsely populated rural areas. The corridor navigates mountainous terrain, acting as a natural barrier between the roadway and adjacent communities to the west. To the east, the highway's elevation is higher, and it maintains a considerable distance from residents along PR-123.

Currently, residents in the Guaonico Ward are not exposed to air quality impacts from roadways, while those along PR-123 and its surroundings experience minimal exposure. Following the project's completion, a significant reduction in traffic on PR-123 (approximately 60%) is expected, thereby mitigating potential air quality impacts. Given the proposed highway's elevation profile, favorable meteorological conditions, especially prevailing winds aiding gas emission dispersion, and the presence of mountainous terrain separating communities, an increase in air quality impacts is not anticipated.

A similar situation is observed in the Capaéz Ward in the Municipality of Adjuntas, where communities closer to the corridor are shielded from the highway by mountains and vegetation. Communities adjacent to PR-123 are further away from the proposed project and will benefit from existing vegetation and topography providing additional shielding.

Also, it is important to indicate that project level analysis of air quality impacts is only required for federal projects located in non-attainment and maintenance areas. The entire Island is currently designated as an attainment area for CO and most of the planned transportation improvement project's objective is to reduce delays and adequately manage congested conditions. Modeling projects performed on projects island wide, including the San Juan Metropolitan Area, has consistently shown no exceedance of NAAQS CO standard.

Carbon Monoxide (CO)

The air basin of the area currently experiences the emission of CO levels that are emitted by the vehicular traffic flow of PR-123. However, under the proposed action build scenario, CO levels are expected to decrease resulting from the fact that idle conditions due to traffic congestion will be reduced and the vehicular traffic speed will increase from the existing 15 mph to 40 mph. Communities close to PR-123 will experience an improvement of air quality since vehicular traffic is expected to decrease since they will be diverted to the proposed action area. For the proposed action corridor, the few scattered residential uses are farther apart from the new roadway, resulting from the ROW acquisition process.

Particulate Matter (PM)

The proposed action is located in an attainment designated area for PM (2.5 and 10 μ size particles), and therefore no project level analysis is required.

Mobile Source Air Toxics (MSAT)

As indicated in the January 11, 2023, FHWA Updated FHWA Guidelines, a national trend data projecting substantial overall reduction in emissions the emissions of MSAT have been identified from modeling that considers strictest engine and fuels regulations issued by EPA. These FHWA guidelines also establish that:

“Projects with Low Potential MSAT Effects are those that serve to improve operations of highway, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions. This category covers a broad range of projects. We anticipate that most highway projects that need an MSAT assessment will fall into this category. Examples of these types of projects are minor widening projects; new interchanges; replacing a signalized intersection on a surface street; and projects where design year traffic is projected to be less than 140,000 to 150,000 annual average daily traffic (AADT). For these projects, a qualitative assessment of emissions projections should be conducted.”

Considering that the proposed action projected vehicular traffic on its opening will be approximately 5,000 annual average traffic per day (AADT), which is considerably lower than 140,000 established in the FHWA guidelines, no detailed study is required to be performed for MSATs. The proposed action is not expected to result in adverse impacts on air quality because the areas is currently designated as an attainment one for all NAAQS, the VTM would be reduced and traffic delays resulting in hot spots conditions will be minimized. The proposed action will also improve the traffic flow conditions of PR-123 since a diversion to the new roadway would reduce current vehicular traffic volume through this highway.

➤ **Conformity with the SIP**

The CAA of 1970 established the NAAQS and the requirement that each state must prepare a plan for the implementation, maintenance, and enforcement of such standards. In 1972, the Puerto Rico Environmental Quality Board (EQB) prepared and submitted for the review and approval of the EPA, a State Implementation Plan (SIP). Said plan serves as a standard against which governmental performance may be assessed and to satisfy the requirements of the CAA. Through the years, the SIP is a document that is revised to incorporate changes in the regulation and to address specific areas in which the air quality is not in compliance with the NAAQS.

Based on the available information, the Proposed Action is in state conformity with the current SIP, which was approved by the EPA in December 2022, although it shall be noted that the none of the SIP approved for Puerto Rico are located within the proposed action area.

Construction Impacts

Temporary impacts on air quality, specifically with respect to Particulate Matter (PM), can be expected to occur at a project level during the construction stage of the Proposed Action, during the performance of earthworks activities. Those impacts are associated with the generation of temporary airborne dust emissions resulting from the operation of heavy equipment, as well as the clearing and grubbing of the Proposed Action area for construction.

The specific pollutants of concern as well as control measures to minimize such emissions are:

- **Fugitive dust emissions resulting from earthwork activities**

These emissions would result from the cut and fill, grading, and fill material transportation between different locations within the Proposed Action. Control measures to minimize these emissions would be the use of a tank truck with non-potable water and equipped with a water spraying device and cover of dump trucks loading areas with tarps of similar type of material.

- **PM and combustion gasses emissions generated by heavy equipment and trucks**

Trucks and heavy equipment to be used during the construction phase of the Proposed Action will be required to maintain their engines in good working conditions to minimize the generation of higher rates of air pollutants. Other sources of air pollutants such as brake dust, tire wear particles, and roadway dirt carry over will be minimized by adherence of the state regulations and the PRHTA Standards Specifications for Road and Bridge Construction. Additional emissions control measures include the adoption of a policy to limit unnecessary idling and the use of the cleanest engines available to the extent possible.

It is important to indicate that these impacts are temporary in nature, until the construction activities are completed. These impacts are not considered significant. The selected contractor will be required to secure a “Single Incidental Permit” for the Permits Management Office (PMO) that requires the adoption of the previously mentioned air pollutants control measures which are based on the requirements set forth in DNER’s Rule 102, 210, and 425 of the Regulation for the Control of Atmospheric Air Pollution.

Affected Environment and Regulations Update

This proposed action complies with Clean Air Act requirements. However, prior to starting the construction activities, the contractor would be required to secure a Single Construction Permit from the local Puerto Rico Permits Management Office. This permit requires, among other things, mitigation measures such as the implementation of dust control measures consisting of basically of the use of a tank truck that would transit at regular intervals within the internal Proposed Action roads spraying water. This measure is commonly used to minimize fugitive emissions on construction projects requiring earthwork activities and is based on the DNER requirements.

5.1.5 Coastal Zone Management 24 CFR § 58.5 (c) and 23CFR 771.119

Regulatory Requirements

The Coastal Zone Management Act, Sections 307(c), (d) applies to any proposed activity affecting areas covered by an approved coastal zone management plan. The Act requires that projects are consistent with coastal zone programs within each jurisdiction.

Puerto Rico's Coastal Zone Management Program (PRCZMP) was adopted in 1978 under the authority of the U.S. Coastal Zone Management Act of 1972, as amended. The PRCZMP established the basis for the

required balance between conservation and the sustainable use of coastal resources. The PRCZMP was also adopted by the Puerto Rico Planning Board (PRPB) as the coastal component of the Island-wide Land Use Plan for Puerto Rico. The Program document was approved by the Governor of Puerto Rico and certified by the National Oceanographic and Atmospheric Administration (NOAA) in September 1978. The Department of Natural and Environmental Resources (DNER) is the lead agency responsible for the overall coordination and implementation of the PRCZMP. The PRCZMP exerts Commonwealth control over the designated coastal zone which covers a geographic area, of a 1,000-meter-wide belt of coastal lands or additional distances needed to protect key coastal natural systems, the Territorial waters, and submerged lands beneath them extending 9 nautical miles offshore, as well as the Vieques, Culebra, Mona islands, and all keys and islets within the Puerto Rico jurisdiction. Federal actions must be consistent with the coastal zone programs.

Impacts Associated with the No Build Alternative

No direct or indirect impacts associated with the No Build Alternative would occur since there are no coastal zones near the area. The project is located in the center part of the Island.

Impacts Associated with the Proposed Action

The Proposed Action area is located well outside of the Coastal Zone boundary for Puerto Rico as per the review of the database published by the U.S. Wildlife Service (USFWS). (See **Attachment 2, Figure 20**).

Affected Environment and Regulations Update

This Proposed Action complies with Coastal Zone Act requirements.

5.1.6 Contamination and Toxic Substances 24 CFR § 58.5 (i) (2) and 24 CFR 51

Regulatory Requirements

24 CFR §58.5(i)(2) requires that properties being proposed for use in HUD projects be free of hazardous materials, contamination, toxic gases, and radioactive substances, where a hazard could affect the health and safety of occupants or conflict with the intended utilization of the property.

Impacts Associated with the No Build Alternative

A review of currently available federal and local agencies databases was conducted and disclosed the fact that no sites or sources of contamination within the limits of PR-123 under study were observed. Therefore, no direct or indirect impacts are anticipated since no construction activities will be performed.

Impacts Associated with the Proposed Action

To assess the condition of the Proposed Action corridor with respect to the presence/absence of contamination and toxic substances, a review of federal and local agencies databases was conducted on May 10, 2023. Facilities that manage hazardous waste are regulated under the provisions of 40 CFR Parts 260 through 265 of the Resource Conservation Recovery Act (RCRA). These regulations, among other things, require the owner/operator of such a facility to assess the management of the chemicals substances whose use may result in the generation of wastes that may be characterized as Hazardous

Wastes (HW) as per the results of their chemical testing in a certified laboratory. If testing or knowledge of the waste results in the characterization of the wastes as HW, those wastes shall be handled, managed, and disposed of only at approved EPA/DNER facilities. Also, if certain minimum threshold monthly HW generation rates are met, the facility must file for and obtain an EPA RCRA Waste Generator number, which is used as an identifier of the facility for regulatory purposes. The facility ID is then entered into one of various databases maintained by EPA and is required to be used in the manifest document that is prepared by the generator and accompanies the waste until reaching its final disposal site. One of such databases has been designated as NEPAAssist. A review of the mentioned database online tool disclosed the fact that there are some EPA regulated sites that manage hazardous waste within a radius of 3,000 feet from the Proposed Action corridor (see **Attachment 7**). However, none of them were located toward the Proposed Action corridor. A total of seven (7) sites were identified on the eastern side of the river within 3,000 feet of the Proposed Action alignment. These include:

- **Three (3) NPDES discharge points**
 - Hot Asphalt Paving Company – No violations reported.
 - Wildco Construction – No violations reported.
 - PRASA Adjuntas Wastewater Treatment Plant (WWTP) – Numerous violations, all resolved administratively and pertain to discharges of the wastewater treatment plant discharges to the Rio Grande de Arecibo.
- **Four (4) hazardous waste management sites**
 - Shell Company SS 0108 – Small Quantity Generator (SQG).
 - PRHTA Unit – No violations reported.
 - PR Public Housing – Villa Valle Verde – No violations reported.
 - PRASA Adjuntas-Garzas Filter Plant – No violations reported.

Based on the results of the investigation, no impacts on the Proposed Action area are reasonably expected since regulated facilities are not located within or adjacent to the ROW. Also, a review of the EPA data indicates that those facilities are located either close to the towns of Adjuntas and Utuado, and/or along the path of PR-123 which is physically separated from the ROW by the Rio Grande de Arecibo. Therefore, migration of pollutants from those sources toward the Proposed Action site is physically impossible since the Rio Grande de Arecibo constitutes a natural barrier to the Proposed Action site and the topographic elevations corridor are significantly higher than the ones of the riverine areas. This topographic condition precludes the mobility of pollutants from lower to higher ground levels. Also, there is a significant physical separation from potential sources of contamination to the Proposed Action boundaries. Migration of contaminants into the site is an unlikely possibility (see **Attachment 2, Figure 21**).

In addition to the previous observation, during the planning stages of the Proposed Action, the PRHTA consultants performed a walkthrough inspection of the Proposed Action corridor. The inspection disclosed the fact that there was a parcel to be acquired by the agency at which a heavy vehicles mechanical workshop operated for many years. To adequately address this finding, a Phase I and II Environmental Site Assessment (ESA) was prepared for said property, which is located within Section II (see **Attachment 8**). The results of the intrusive soil sampling activities performed at the site did not result in the finding of detectable concentrations of hazardous materials except for the ones found in the

sediment sample from the septic tank that was used in the property. Because of this finding, prior to the initiation of Section II construction, the selected contractor shall secure a closure permit from the DNER, and the septic tank removed along with any contaminated sediment. Since the Proposed Action area remains the same in terms of the lack of potential sources of pollutants given the rural character of the area, the results of the Phase I and II investigations performed in August 2020 area are valid.

Finally, it shall be indicated that solid waste will be generated during the initial clearing and grubbing operations required to be conducted at the start of the earthwork activities as well as during the construction stage of the Proposed Action. Both types of activities generate waste that will be required to be disposed of in accordance with the federal and state regulations. Clearing and grubbing wastes consist of the superficial layer of soil and its vegetation cover which has been estimated in approximately 760,000 cubic meters along the path of the Proposed Action corridor considering the removal of the first 0.5 meters layer along the path of 7,600 meters and an average width of 200 meters, but is not generated at once, but rather as a function of the section of the Proposed Action being constructed. Some of this material is kept in stockpiles at designated locations within the Proposed Action is used as topsoil for areas at which will be revegetated like in the lateral shoulders of the highway. These areas are required to be protected from the effects of erosion as per the BMP to be included in the SWPPP required to be developed for the Proposed Action. With respect to the waste to be generated during the performance of the construction activities, they will typically consist of construction debris, discarded materials which may include residues of paint, wood, adhesives, etc. shall be stored in bins and/or covered areas until their final disposal. Management and disposal of waste resulting from the performance of demolition activities, will be required to be tested for the presence of asbestos containing materials (ACM) and lead based paints (LBP). If testing of samples collected by an accredited DNER/EPA inspector proves positive, wastes are to be disposed only at landfills with approval to receive special types of wastes as required by the DNER Regulation for the Management of Non-Hazardous Solid Wastes. Also, if a waste test is positive for a hazardous characteristic under applicable sections of the Resource Conservation Recovery Act (RCRA), 40 CFR Parts 260-265, and the DNER Regulation for the Control of Hazardous Wastes, the wastes are to be managed and disposed of only at EPA approved facilities. Currently, there are no EPA approved facilities for the final disposal of hazardous waste which must be shipped to an EPA approved facility in the USA. Non-hazardous solid wastes may be transported and disposed of at DNER/EPA sanitary landfills in Puerto Rico after securing the required PMO permits that require the development of an Operation Plan.

Also, it is important to indicate the goal of the design pertaining to the earthwork activities is to balance the cut and fill operations of a project to minimize to the extent possible the need to transport fill material into the project or the need to transport surplus material to offsite locations, since they increase project costs. Based on currently available information, based on the completed design of sections II and II, it has been estimated that a surplus of approximately 850,000 cubic meters of fill material will have to be adequately managed or disposed of at approved final disposal facility, mostly related to the activities of section IV and V. However, it shall be clarified that this estimated volume may be reduced during the advanced design stages of mentioned sections. Regardless of the final volume, this material may be suitable for its use as a fill material for other construction projects and thus, will not constitute a waste. Regardless of its destination, the transportation and management of the material shall comply with

applicable environmental regulations of the DNER and/or PMO. To provide additional guidance on the BMPs applicable for the management of this material, the PRHTA has developed specifications that will be included in the contract documents (see copy in **Attachment 9**) that address the correct management procedures applicable to this material.

Affected Environment and Regulations Update

The approval of closure plan for the septic tank must be secured from the Underground Injection Control (UIC) Program of the DNER prior to the commencement of the construction activities from the identified property. Once approved, the septic tank would be removed along with any contaminated sediment. Also, if during the construction, special or hazardous waste is generated, they shall be managed and disposed of in compliance with the terms and conditions of a permit issued by the DNER.

5.1.7 Endangered Species 24 CFR §58.5 (e), U.S.C. 1536, Section 7 and 23 CFR 771.119

Regulatory Requirements

Section 7 of the Endangered Species Act (ESpA) applies to any federal action which may affect federally listed endangered or threatened species or result in destruction or modification of critical habitat.

No Build Alternative

No direct or indirect impacts on endangered species are anticipated since no construction activities will be performed, and no such species' habitats were identified along the PR-123 corridor. There would be no adverse effect to threatened or endangered species.

Impacts Associated with the Proposed Action

Figure 22, included in **Attachment 2** shows Critical Habitats Location Map for Puerto Rico. The ESA Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that are proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. As part of the Proposed Action planning activities the Information Planning and Consultation (IPAC) database resource developed by the US Fish and Wildlife Services (USFWS) was consulted. The report identified that the following species could be potentially affected, by the proposed Action:

- Puerto Rican Broad-winged Hawk – *Buteo platypterus brunnescens*
- Puerto Rican Parrot – *Amazona vittata*
- Puerto Rican Sharp-shinned Hawk – *Accipiter striatus venator*
- Puerto Rican Boa – *Chilabothrus inornatus (Epicrates inornatus)*

Copy of the IPAC report ([IPaC: Home \(fws.gov\)](#)) has been included in **Attachment 10**.

Since compliance with Section 7 of the ESA is mandatory to secure federal funding and permits, coordination with the US Fish and Wildlife Service (USFWS) has been maintained through the years to address the presence of rare and/o endangered species along the path of the Proposed Action. A chronological summary of the USFWS endorsement letters follows:

- **February 19, 2024**

This written communication from the USFWS was received on February 19, 2024 in response to a FHWA request for an updated endorsement for the Proposed Action issued on January 18, 2024. The comments are provided under the Endangered Species Act (Act) (87 Stat. 884, as amended; 16 United States Code 1531 et seq.), and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). The Service indicated that using the IPaC system, FHWA identified four federally listed species within the project area: Puerto Rican Boa (*Epicrates inornatus*, now known as *Chilabothrus inornatus*), Puerto Rican Broad-winged Hawk (*Buteo platypterus brunnescens*), Puerto Rican Parrot (*Amazona vittata*), and Puerto Rican Sharp-shinned Hawk (*Accipiter striatus venator*).

In its response, the Service refers to the previous consultation conducted between FHWA and the Service on May 5, 2023, for this project, the Service concurred with a may affect not likely to adversely affect (NLAA) determination for the Puerto Rican Broad-winged Hawk, Puerto Rican Parrot, Puerto Rican Sharp-shinned Hawk and Puerto Rican boa.

However, it further indicates the FHWA has changed its previous effects determination for the Puerto Rican boa and has determined that the proposed actions may affect and are likely to adversely affect (MLAA) the Puerto Rican boa. Thus, as part of the project conditions, FHWA will be implementing the terms and conditions established in the U.S. Fish and Wildlife Service's (Service) Amended Programmatic Biological Opinion (PBO) of July 2023, addressing the take of the Puerto Rican boa and the Virgin Islands tree boa in the form of capture and relocation while conducting activities with Federal nexus. We have reviewed the information provided FHWA and concur with their MLAA determination for the Puerto Rican Boa. Based on FHWA's commitment to implement all Terms and Conditions, and Monitoring Requirements described in Sections 6.4 and 6.5 of the PBO, the Service express their belief that the proposed actions will not jeopardize the continued existence of Puerto Rican boa.

As for the Puerto Rican Broad-winged Hawk, Puerto Rican Parrot and Puerto Rican Sharp-shinned Hawk, FHWA has still determined that the proposed actions may affect but are not likely to Adversely affect these species with the implementation of the previously provided conservation measures. Thus, the Service's concurrence with this determination on May 5, 2023, stills valid.

- **May 5, 2023**

This letter was issued in response to a Public Notice from the Puerto Rico Department of Housing (PRDOH), since the Proposed Action was included as a Strategic Project under the Community Development Block Grant - Mitigation (CDBG-MIT Grant number B-18-DP-72-0002), Infrastructure Mitigation Program to finalize the last 7.6 kilometers of this highway project, the USFWS, by letter dated May 1, 2023, informed that: (1) through the years the Service has been consulted and collaborated with project development as it has been constructed, (2) in 2022, the Service developed a Programmatic Biological Opinion (PBO) for the Puerto Rican boa and the Virgin Islands tree boa addressing the "take" of both species in the form of capture and relocation. The Puerto Rican boa is present throughout the Proposed Action area, and capture and relocation may be needed to remove boas from harm's way during the project activities. Capturing and relocating out of harm's way during construction activity constitutes "take" as defined by ESA and

requires a May Affect Likely to Adversely Affect Determination (MLAA) from PRHTA and FHWA, which trigger a formal consultation. Since there is a PBO in place, the Service would concur with the MLAA determination, and PRHTA and FHWA will be exempted from the “take” determination that would result from the Proposed Action provided that both agencies agree to comply with the Terms and Conditions stated in Section 6.4 of the PBO, (3) The PBO has reporting requirements (section 6.5) regarding the capture and relocation of the boas. These requirements are mandatory and must be complied with.

Copy of the **PBO** has been included in **Attachment 11**, while copy of the Service letter has been included in **Attachment 12**.

To comply with the USFWS recommendation, both the FHWA and the PRDOH will adopt the PBO. the PRHTA sent an email indicating the acceptance of the MLAA and the applicable PBO terms and conditions, whose copy has been also included in **Attachment 12**.

▪ **September 1, 2021**

In response to the PRHTA consultation of August 11, 2021, the USFWS issued a response on September 1, 2021. Their response indicated that: (1) geospatial data identified four federally listed species that might be present along the path of the remaining sections of PR-10 which are the Puerto Rican Boa (*Epicrates inornatus*, now known as *Chilabothrus inornatus*), Puerto Rican Board-winged Hawk (*Buteo platypterus brunnescens*), Puerto Rican Parrot (*Amazona vittata*) and Puerto Rican Sharp-shinned Hawk (*Accipiter striatus venator*), (2) we have reviewed the information provided in your letters and concurred with your determination that the Proposed Action may affect but is not likely to adversely affect the above-mentioned species. No adverse impacts to designated critical habitat are anticipated. However, the service recommends the PRHTA pay special attention to the species during the months of January to July (instead of April to June) in case any breeding activity is observed within or near the proposed construction area. In view of this, we believe that the requirements of Section 7 of the ESA have been satisfied.

A copy of this letter has been included in **Attachment 12**.

The PRHTA will include as an environmental commitment, the adoption of the required conservation measures and to the adopt the restriction of the Proposed Action activities that may affect protected species during the breeding season extending from January to July. These requirements will be included in the contract documents.

Copy of previous letters of endorsements issued by the USFWS for the proposed action have also been included in **Attachment 12** for reference and evidence of the continuous communications pertaining to the development of this Proposed Action.

Besides the studies carried out for the F-EIS in 1979, additional biological studies have been conducted for this Proposed Action as part of the re-evaluation process. These include:

- Flora/Fauna conducted by OIKOS (2002)

- Presence and Absence of Broad-Winged Hawk (*Buteo platypterus brunnescens*) and Sharp-Shinned Hawk (*Accipiter striatus venator*) and their habitat, along PR-10 proposed alignments for Sections II, III and IV, Utuado-Adjuntas, Puerto Rico, Laredo González, MP, PPL (June 2013)
- Endangered Species Assessment: Endangered Bird of Prey Species Status AT Highway PR-10 Proposed Alignment for Sections III (AC100071) and IV (AC100055), Utuado - Adjuntas, Puerto Rico. Breeding Season 2014 Final Report, Laredo González, MP, PPL (May 2014)

Copy of the above-mentioned studies is included in **Attachments 13** and **14** respectively.

At a local level, close coordination with the Puerto Rico Department of Natural and Environmental Resources (DNER) has been done. This includes:

- Development of protocols to minimize impacts and adequately manage the potential of finding threatened and/or endangered species that even though were not detected along the path of the Proposed Action alignment may be present in the vicinity of the ROW.
 - The specific species are: *Chilobotrus inornatus* (Puerto Rican Boa), *Amazona vittata* (Puerto Rican Parrot), *Accipiter striatus venator* (Puerto Rican Sharp-shinned Hawk), *Buteo platypterus brunnescens* (Puerto Rican Board-winged Hawk), *Atlantea tulita* (Puerto Rican Harlequin Butterfly), *Oplonia spinosa*, *Cornuvia obovata*, *Pleodendron macranthum*, *Solanum ensifolium*, *Myrcia paganii*, and *Varronia bellonis*.
- The protocols include a restriction indicating that the removal of vegetation or earthwork activities phase of the Proposed Action shall not coincide with the peak breeding season (January to July) of the previously mentioned bird species.
- A qualified biologist capable of conducting monitoring activities and implementing conservation measures for the protection of protected species shall be contracted and be present at the project site, before, during and after the construction of the Proposed Action. The biologist shall be capable of identifying both acoustically and visually individuals, nests, and newborns, leaves, flowers, or fruits of the species identified with the potential to be found within the Proposed Action. If listed threatened and/or endangered species are detected, as soon as practicable, the biologist shall contact, either by telephone or email the following endangered species coordinators from the DNER and the USFWS.
- Coordinate with the DNER and USFWS to agree on the identification of a site for the relocation of an individual that may be identified inside the Proposed Action area.
- All incidents which may result in the death or injury of any of the listed flora and fauna species shall be documented through the preparation of monthly and a final report. The report shall include information about the observed species, place and time of the sighting, number of individuals, type of incident, and type response action. Technical personnel from the DNER/USFWS may assist in the identification of the species through

photographs and/or videos. Copies of the reports shall be delivered to the Protected Endangered Species Coordinators of the DNER and the USFWS.

- The previously described constitutes an **adaptive management** decision making process that serves to address uncertainties about the level of impact pertaining to rare/endangered species that although no detected within the proposed action corridor, may be close to it. Therefore, it helps to adequately manage any unforeseen condition pertaining to protected species.

The required protocols for the protection of endangered species were developed for and approved by the DNER. Copy of coordination and protocols worked with the DNER and are included in **Attachment 15**.

Affected Environment and Regulations Update

A May Affect Not Likely to Adversely Affect determination has been made for all the protected species except for the boa. However, as previously discussed, the USFWS agreed to a May Affect Not Likely to Adversely Affect determination for the boa provided that the terms and conditions of sections 6.4 and 6.5 of the PBO are complied with. To that end, the FHWA and the PRHTA have already accepted the implementation of this condition during the construction of the proposed action. These measures, in addition to the DNER approved field protocols for the monitoring and protection of rare/endangered species allow to indicate that there would be no adverse effect to threatened or endangered species.

5.1.8 Explosive and Flammable Hazards, 24 CFR Part 51C and 23 CFR 771.119

Regulatory Requirements

Under 24 CFR Part 51C, HUD will not approve an application for assistance for a proposed action located less than the acceptable separation distance from a hazard unless appropriate mitigation measures are implemented or are already in place. The requirements of this section establish a threshold for impact resulting from the storage of explosive and flammable hazards if the project considers an increase in the residential density that may be exposed to those hazards. HUD will fund projects located at less than the Acceptable Separation Distance (ASD) from a hazard, if there is no risk to residential properties.

Impacts Associated with the No Build Alternative

No direct or indirect impacts associated with the No Build Alternative would occur since no explosive and flammable would be used under this alternative.

Impacts Associated with the Proposed Action

This citation is primarily intended to apply for protection of residents in buildings that may be constructed in an area that may have explosive and/or flammable hazards. Based on the Proposed Action characteristics, which is the construction of a new roadway, it has been determined that the Proposed Action does not include development, construction, rehabilitation that will increase residential densities, or conversion. Also, the Proposed Action would not result in the permanent installation of aboveground storage tanks (AST) that may jeopardize the security of the scarce number of residences that are located near the Proposed Action construction sites. Regarding flammable hazards, small quantities of flammable substances (diesel, paints, etc.) may be utilized only during the project construction phase but would be

managed as per federal and state regulations. This would require storing them in secure and supervised locations by qualified personnel. Once construction is completed, no AST nor flammable hazards will remain in the Proposed Action area.

Based on the results of the geotechnical studies performed so far, the use of explosives will be necessary in some portions of Sections IV and V since outcrops of rocks were found. Construction equipment is not capable of removing them as part of the earthworks stage of the Proposed Action. Due to the location of the Proposed Action and its surroundings, no impact on human health or the environment is expected. The use and management of explosives is a highly regulated practice that would only be performed by qualified persons with the necessary safety training as required by the DNER permit conditions which include notification to nearby residents and the use of seismographic equipment to document that vibrations resulting from the use of explosives does not affect nearby structures. The protocols included for the Proposed Action will ensure that threatened and/or endangered species will not be impacted, especially during their breeding season.

Affected Environment and Regulations Update

Use of explosives for the construction of the roadway corridor will be controlled so that no adverse impact is caused to human health or the environment. The use of explosives will be necessary to build the new roadway through rock outcrops that were found in some parts of Section IV and V of the Proposed Action. Considering the current Proposed Action corridor conditions, the probability of finding nearby structures is low. On those instances, and since the Proposed Action earthwork related activities exceed the threshold value of 5,000 cubic meters, a Single Incidental Operation Permit must be secured from the DNER. The permit application would be required to indicate if the use of explosives is needed as part of the Proposed Action construction activities and must include a copy of the geotechnical soil survey report. The contractor will be required among other conditions to monitor the use of explosives using seismographs. The results of the monitoring will be reported to the agency and will serve to document that no damage was caused to nearby structures and the environment. The use and handling of explosives requires a permit from the Police Department. Personnel in charge of the use of explosives for the Proposed Action will comply with the following state/federal regulations:

- Regulation for the Administration, Application and Supervision of the Puerto Rico Explosive Law (September 11, 1970)
- Applicable requirements of the Occupational Safety and Health Administration (OSHA) and the Mine Safety and Health Administration (MSHA)

The PRHTA Standard Specifications for Road and Bridge Construction (2005) regulates the use of explosives by contractors in a highway construction project. Article 107.12 of the General Provisions section addresses the use of explosives. Other controls are established in Specifications 203-3.01(d)(2) and 203-3.02(f) regarding blasting operations and the use of explosives in the excavation phase of the project.

5.1.9 Farmlands Protection 24 CFR Sec. 58.5(h) and 23 CFR Sec. 777

Regulatory Requirements 24 CFR § 58.5 (h)

NEPA and the Farmland Protection Policy Act (FPPA) and its regulations require federal agencies to coordinate with the Natural Resources Conservation Service (NRCS) if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance.

The Farmland Protection Policy Act of 1981 applies to any federally assisted action which encourages the conversion of prime, unique, state/locally important farmlands. Compliance requires that the extent to which federal programs contribute to the unnecessary conversion of farmland to non-agricultural uses be minimized.

Impacts Associated with the No Build Alternative

No direct or indirect impacts associated with the No Build Alternative are expected since no construction activities capable of affecting designated farmland resources would occur.

Impacts Associated with the Proposed Action

The current Department of Agriculture database (see **Attachment 2, Figure 23**) supports the statement that there are no prime farmlands of importance located along the corridor of the proposed roadway. This includes the current National Resources Conservation Service (NRCS) which has published maps for farmlands. This finding is consistent with the topography of the area and the existing soils within the corridor of the Proposed Action.

Affected Environment and Regulations Update

The Proposed Action complies with FPPA.

5.1.10 Floodplain Management 24 CFR 58.5(b) and 23 CFR 650A

Executive Order 11988 and 24 CFR Part 55 require that federal projects should avoid direct or indirect support of floodplain development whenever there is a practicable alternative. Executive Order 13960 established a Federal Flood Risk Management Standard to address among other things the consideration of climate change issues and to ensure that infrastructure is resilient to flood risk. An 8-step Decision-Making Process document in compliance with 24 CFR 55.20 was developed and is included in **Attachment 16**.

Impacts Associated with the No Build Alternative

No direct or indirect impacts associated resulting from the No build alternative would occur since no construction activities capable of having a direct or indirect support of floodplain development may result from this alternative.

Impacts Associated with the Proposed Action

The decision-making process involved eight steps to assess whether viable alternatives exist to avoid crossing the floodplain and wetlands in Rio Grande de Arecibo. The proposed action includes the crossing of a floodplain and a wetland area with a Special Flood Hazard Area (Zone AE) at approximately Latitude 18.234500 N and Longitude 66.719402 W. This crossing will be made by a bridge constructed over the Rio Grande de Arecibo as shown in Attachment 15. The Early Public Notice (PN) advising the federal, state, and local agencies and the public about an activity in the 100 year-floodplain and Wetlands and the availability of the document for comments was published in El Vocero, a major circulation newspaper on February 10, 2023. A Final Notice of An Activity in a Floodplain and Wetlands was published in El Vocero on March 14, 2023. No comments were received in the first notice and only one comment from a federal agency was received from the second notice. See pages 119-120 and 156-157 of **Attachment 16**. The analysis conducted for the proposed action concluded with a determination of no adverse impacts to the floodplain due to their temporary nature and the fact that the impacted area will be restored after the completion of the construction phase of the proposed bridge.

A Nationwide 14 permit (applicable to transportation related projects) for Section II of the Proposed Action (AC-100069) has been granted by the USACE. Said permit, which authorizes activities impacting USACE jurisdictional areas, expires on March 14, 2026. Additional proposed actions sections III, IV and V do not affect floodplain areas.

Step 6, detailed in **Attachment 16** on page 12 of the 8-step report, delves into potential alternatives for bypassing the afore-mentioned floodplain and wetland area. The report concludes that, after thorough examination, there are no practical alternatives to siting the Proposed Action in the floodplain and wetlands. This specific location is deemed necessary for constructing the bridge that will link existing PR-10 located north and south of the Proposed Action.

The potential impacts of the Proposed Action are discussed in Step 4 on page 6 of the 8-step report. Despite the BR-1 Section Activity being situated in a floodplain and wetland, the proposed action is designed to comply with conditions and requirements outlined by the USACE in the Nationwide permit granted for the construction of the bridge. This approach aims to minimize the impact on floodplain and wetland values.

The 8-step study provides detailed information on the Nationwide Permit requirements to mitigate impacts during construction on existing environmental resources, including the Floodplain and Wetlands mandated by the Corps of Engineers. These requirements, summarized on page 9 of the study, include:

- Restoration of the area after completing construction.
- Compliance with Section 401, General Water Quality Certification.
- Adequate reporting and Commencement Notification.
- Ensure authorized work does not alter existing water bodies within the project area.
- Implement Endangered Species Conservation Measures.
- Incorporate measures related to Cultural Resources Properties/Historic Properties.
- Restrictive use of only adequate fill material in the project.

In light of the above discussion, the report concludes that the proposed action is the only practical choice, and the construction of the proposed bridge within the designated corridor will not significantly impact the floodplain and wetland. Both resources will be restored, returning them to essentially their previous existing conditions.

The computer program Hydrologic Modeling System (HEC-HMS) developed by the USACE [2016] was used for hydrologic analysis. Using this program, the Unit Hydrograph method, and the Runoff Curve Number (CN) method, both developed by the Soil Conservation Service (SCS), currently the National Resources Conservation Service (NRCS), were applied to determine the design hydrograph. This was computed by a process of translating the excess rainfall into a runoff hydrograph known as convolution. Peak discharges corresponding to storms ranging in frequencies from 2, 10, 25, 50 and 100 years were estimated for the existing and proposed conditions. A hydraulic analysis was made to find the hydraulic parameters of the storm watercourses and verify that the increase in water surface elevation due to the construction of the bridges as well as major hydraulic structures will not be more than 0.15 meters. The US Army Corps of Engineer's HEC-RAS computer model was used. The Curve Number (CN) was computed using the NRCS methodology. Soil types and land uses were gotten from NRCS soil maps. With regards to the precipitation used in this H-H study according to the National Hurricane Center Tropical Cyclone Report, the total precipitation between September 19th and 21st, 2017 (Hurricane María) at the rain gauge located in Utuado was 18.18 inches. And during Hurricane Georges between September 21st and 22nd, 1998 the total precipitation over two days was 28.36 inches in Jayuya and 24.62 inches at Lake El Guineo in Villaba. In both cases, the 24-hour precipitation will be less than 20 inches. Compared to the precipitation value adopted in the study (equivalent to 22.4 inches in 24 hours), neither Maria nor Georges produced higher precipitation.

The minimum low chord elevation of the bridges must be 0.60 meters above the 100-year water surface elevation to allow floating solids to pass through avoiding accumulation or clogging. The H-H study concluded that given the configuration of the bridge, their beam and deck are significantly located at a very high altitude in reference to the maximum flood elevation determined by the study and therefore it is not necessary to take additional measures regarding the height of the structure to comply with the free board requirements. The clearance height for bridge provides adequate clearance to allow floating materials to pass through the structure in an extraordinary event.

With regards to the change of flood elevations after the construction of the proposed structure and its impact to adjacent sensitive structures, the H-H study concludes that the proposed structure complies with the existing requirement of an increase of elevation of less than 0.15 meters and residences or resources exist near the Proposed Action area that could be affected by the proposed action. Even if an event having a frequency of a 500-year flood would not have any impact on this site because no structures are located near within the floodplain limits created by an event of this magnitude.

Concerning the alteration in flood elevations following the construction of the proposed bridge and its potential repercussions on nearby vulnerable structures, the H-H study asserts that the planned roadway structure adheres to the current regulatory requirements, having an elevation increase of less than 0.15

meters. Furthermore, there are no residences or other sensitive resources in the Proposed Action vicinity that could be adversely affected by the proposed action. Even in the unlikely occurrence of a 500-year flood event, there would be no impact on the site, as no structures are situated within the floodplain limits created by an event of such magnitude and the flood elevations are lower than the elevation of the proposed bridge.

Affected Environment and Regulations Update

All requirements of the 8-step Decision-Making process and the Nationwide 14 permit must be followed during the construction of the roadway. Copy of the USACE Nationwide 14 permit issued for Section II of the proposed action has been included in **Attachment 17**.

5.1.11 Historic Preservation 24 CFR § 58.5 (a), 23 CFR Sec. 771 and T 6640.8A

Regulatory Requirements

Federal actions are subject to Section 106 of the National Historic Preservation Act, 16 USC §470(f), Section 106; 36 CFR Part 800. Under provisions of this law, all federal agencies consider the effects of their undertakings on historic properties that are included in, or eligible for inclusion in, the National Register of Historic Places prior to the approval of the expenditure of any federal funds or to the issuance of any federal license or federal permit. This process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects, and seek ways to avoid, minimize or mitigate any adverse effects on historic properties.

Impacts Associated with the No Build Alternative

No direct or indirect impacts associated with the No Build Alternative are expected since this alternative does not entail construction activities capable of adversely affecting historic resources.

Impacts Associated with the Proposed Action

The Advisory Councils Historic Preservation's four (4) step process to obtain the State Historic Preservation Officer (SHPO) endorsement was followed and a No Effect Determination was granted to this Proposed Action since its initial planning stage. Studies conducted by professionals meeting the Secretary of Interior (SOI) qualifications and consultation with the SHPO resulted in a concurrence of No Effect determination. This determination was reaffirmed by SHPO by means of a letter regarding the proposed action dated January 17, 2024, in which they stated that they continue to support their agency's finding of no historic properties affected (See Attachment 11). Based on this determination, no further action is needed unless there is a change in the findings, new historic or cultural resources are found, and the proposed action could have an adverse effect on them if mitigation measures are not taken. As part of the documentation provided for their evaluation of the Proposed Action, archaeological studies performed by qualified SOI professional archaeologists were submitted for the review and approval of the agency. These professionals perform the study in accordance with the SHPO guidelines applicable to this type of Proposed Action, which shall include consideration of above and below ground cultural resources, as well as Traditional Urban Centers (TUC).

Review of available information allows us to indicate that there are no TUCs in the immediate vicinity of the Proposed Action corridor (see **Attachment 2, Figure 24**).

Affected Environment and Regulations Update

All archaeological or historical studies conducted for the Proposed Action determined that there are no archeological or historical properties within the corridor of the Proposed Action. Gus Pantel, a qualified SOI professional, conducted a Phase I and Phase I-B study for Section III-V (April 2016) (see **Attachment 18**). This comprehensive study involved a review of historical and archaeological data in the region where the proposed action is located, along with field studies. The findings indicated no archaeological sites or historic structures within the corridor of Sections III-V.

Similarly, Jacqueline Lopez Melendez, another qualified SOI professional, conducted a Phase I-A study for Section II in September 2012. The study aimed to evaluate the potential existence of archaeological sites and historic structures within the corridor of the proposed action. The conclusion was that no archaeological sites were detected within Section II, but two structures with potential historical importance were identified. The Puerto Rico Institute of Culture (PRIC) endorsed the SOI's recommendations, approving the construction of the proposed action contingent upon a Phase II study on the identified structures.

Subsequently, Virginia Rivera Calderon, a qualified SOI, conducted the Phase II study in September 2022, determining that the identified structures held no historical value (see **Attachment 19**). PRIC concurred with these findings and granted authorization for the construction of Section II, with the condition that Archaeological Monitoring be implemented during the construction phase.

At the local level, the PRIC mandated Archaeological Monitoring during the construction of Sections III (AC-100071) and IV (AC-100055) due to the proximity of coffee estate remains in those sections. Although PRIC initially required a Phase II investigation in Section II, a qualified SOI professional demonstrated that the structures were part of an abandoned residential complex. PRIC accepted this evidence, and the study was deemed unnecessary. However, before commencing construction activities, an archaeological monitoring plan must be submitted for advanced review and approval by PRIC for Sections II and IV. No Memorandum of Understanding was required, and these conditions are detailed in Section 5.3, Mitigation Measures.

5.1.12 Compliance with Section 4(f) - 49 U.S.C. 303 and 23 U.S.C. 138

There are no public Parks, recreational areas, waterfowl, and wildlife refuges or listed historic, archeological resources within the corridor of the proposed action. The proposed Action would not impact any public parks, recreational areas or wildlife and waterfowl refuges or other listed historic/archaeological resources. Therefore, there is no need to generate an evaluation document (Programmatic or Individual) for Section 4 (f) resources in accordance with existing regulations and guidelines. This determination also applies to the No Build Alternative.

5.1.13 Noise Abatement and Control 24 CFR § 51 B and 23 CFR Sec. 774

Regulatory Requirements

HUD regulations at 24 CFR Part 51 B establish standards for exterior noise levels along with policies for approving HUD-supported or -assisted housing projects in high-noise areas This typically applies to new construction of and rehabilitation residential projects, and do not apply to road construction projects. However, a determination of the impact of the noise from PR-10 on existing structures will be determined. For the assessment of the noise impacts, the procedures established in FHWA's 23 CFR 772, Analysis of Traffic Noise Impacts has been used. Additionally, the HUD noise calculator has been used to determine the noise impacts on existing structures and residences.

Impacts Associated with the No Build Alternative

No direct or indirect impacts associated with the No Build Alternative are expected since this alternative does not entail construction activities.

Impacts Associated with the Proposed Action

Operation Impacts

Since the Proposed Action passes through rural land, the dominant noise source for the area would be the noise generated by the vehicular traffic once the highway is in operation. It was also noted that no major industrial uses, airports, or other major noise generating sources were identified along the path of the Proposed Action.

Resulting from the fact that the recommended alternative alignment passes through less developed lands, a relatively small number of sensitive receptors were identified. Special consideration was provided for the identification of noise sensitive sites such as schools, hospitals, residences, etc. for the noise impact analysis. Results of the noise surveys conducted along the path of the proposed PR-10 indicated that, consistent with the underdeveloped nature of the Proposed Action area, existing noise levels were quite low. Spot checks of existing noise levels conducted in several remote areas disclosed the fact that existing noise levels were below 45 decibels (dBA).

A traffic noise study, using the Traffic Noise Model (TNM) (version 2.5) developed by the FHWA, was performed in September 2012 (see **Attachment 20**) along the path of the Proposed Action corridor, since the closest noise receiver was in this area. This condition remains unchanged. Said study was conducted

considering the fact that the closest noise sensitive residential receptor that was identified along the path of the Proposed Action was located at an approximate distance of 60 meters measured from the edge of the proposed PR-10. The highest noise level measured as part of the study was 50.2 dB (Leq) which corresponds to the location of the closest receiver to the proposed roadway. Two additional noise measurements conducted along the path of the Proposed Action corridor near residential areas resulted in recorded noise levels of 45.8 and 48.9 dBA (Leq). All the recorded noise levels are considered typical for a residential neighborhood located within a rural area. Once the existing conditions of the area were defined, modeling the most critical receptor in terms of proximity to the proposed PR-10 using TNM, was performed for design year 2032 since the FHWA requires conducting the analysis in a 20 year future horizon for comparison purposes. The results of modeling predicted a noise level of 58.6 dBA (Leq) for this receiver, which is well below the 67 dBA established by the FHWA Noise Policy in the Development and Operation of Transportation Projects for residential land uses. Due to the results of this analysis, consideration of noise mitigation measures was not required as per the requirements of the Noise Abatement Criteria (NAC) established in the Noise Policy. This consideration of noise abatement is required whenever one of two (2) conditions are identified during the noise impact analysis, which are: prediction of noise levels approaching or exceeding the 67 dBA for a residential area, or the predicted noise levels exceed a threshold of 10 dBA when compared to existing levels. Since none of the mentioned criteria were met, no noise abatement mitigation is required under the FHWA guidelines. With respect to additional residential areas located within the Proposed Action corridor, a review of the Proposed Action drawings revealed the fact that they are located farther from the roadway than the analyzed receptor. Therefore, and since the noise intensity is inversely correlated with the distance, it is reasonable to conclude that no traffic noise impacts requiring noise abatement measures, would be required for additional receptors located along the path of the Proposed Action, since they would not be negatively impacted in a way that would require to consider noise mitigation measures. Predicted increases in the existing noise environment would be 8.4 dBA or lower based on the results of the most recent study.

With respect to HUD requirements for noise exposure, and although not applicable for a roadway construction project, the HUD Exchange noise calculator ([DNL Calculator - HUD Exchange](#)) was used to estimate the Day/Night Noise Level (DNL) for the nearest residential receptor with respect to the proposed highway for comparison purposes only. The results of the calculations resulted in an estimated DNL of 64 dBA, which is below the 65 dBA threshold established by HUD Regulations (see **Attachment 21**). It is important to indicate that once the Proposed Action construction is completed, there are no additional noise generation activities in the area such as airports. Therefore, the Proposed Action complies with HUD Policies pertaining to noise exposure.

The previously described noise analysis results are consistent with the findings of a report entitled PR-10 Forecasting Demand and Traffic Analysis (included in **Attachment 22**) that concluded that given the decline in population and employment forecasted for the area, total travel demand in the subarea is predicted to decline in future years. Existing Average Daily Traffic (ADT) on PR-123 in 2019 was approximately 4,183 vehicles per day. Projected ADT for the new highway section for the year 2025 is between 2,800 and 3,808 vehicles and for the year 2045 between 3,556 and 4,633 vehicles, representing an annual increase ranging between 1.0 and 1.5%.

Construction Impacts

Temporarily high noise levels will be produced by the heavy equipment that would be used during the construction stage of the Proposed Action. However, the intensity of noise perceived by the receivers will vary as a function of the distance between the source and the receiver. A reduction of approximately six (6) dBA can be expected with the doubling of the separation between the source and the receiver (Report to the President and Congress on Noise, March 1972, US Government Printing Office, Washington, D.C., page 2-104). Typical noise levels as a function of the type of equipment being used for the Proposed Action construction are summarized in the following table:

Table 3: Typical Noise Levels Associated with Highway Construction Activities as a Function of Distance

| Construction Operation | Observation Distance (in meters) | | | | |
|------------------------|----------------------------------|----|-----|-----|-----|
| | 30 | 60 | 120 | 240 | 480 |
| Ground clearing | 78 | 72 | 66 | 60 | 54 |
| Excavation | 82 | 76 | 70 | 64 | 58 |
| Foundations | 82 | 70 | 66 | 60 | 54 |
| Erection of structure | 73 | 67 | 61 | 55 | 49 |
| Finishing | 78 | 72 | 66 | 60 | 54 |

Noise impacts would result in the potential use of pile driving equipment during the construction of new bridges. However, the nature of the terrain requiring the bridges tends to minimize the number of potential receivers nearby.

Construction noise impacts, although temporary in nature, would take longer to complete in the mountainous sections of the Proposed Action corridor than in flatter portions of the Proposed Action. These impacts include the use of explosives during the construction of section IV and V of the Proposed Action. During the construction phases that would require the use of explosives, neighbors of the detonation areas will be notified in advance to make them aware of the high noise levels that would be expected to occur when explosives would be used. However, it shall be noted the potential negative impact on receivers is very low due to the distance of these residential uses in these areas which are also scattered.

Affected Environment and Regulations Update

This Proposed Action complies with the Noise Abatement and Control requirements as demonstrated by the analyses performed using the FHWA and HUD noise Impacts assessment criteria. Both analyses allow to estimate maximum noise levels of L_{eq} of 58.6 dBA (per FHWA methodology) and DNL of 64 dBA (per HUD criteria). These findings indicate that noise abatement measures are not required to be considered as part of the Proposed Action design.

5.1.14 Sole Source Aquifers 24 CFR §58.5(d) and 23 CFR Sec. 777

Regulatory Requirements

The Safe Drinking Water Act of 1974 applies to federally assisted projects which may contaminate an aquifer designated by U.S. Environmental Protection Agency (EPA) as the sole source of drinking water for a community. Further, it prohibits financial assistance of projects which the EPA determines may contaminate a designated sole source aquifer.

Impacts Associated with the No Build Alternative

No indirect or indirect impacts associated with the No Build Alternative are expected since no sole source aquifers are located within the area and **this alternative does not entail construction activities.**

Impacts Associated with the Proposed Action

A review of the database published by the EPA, regarding the Proposed Action disclosed the fact that the Proposed Action is not located within a Sole Source Aquifer designated area (<https://www.epa.gov/dwssa/map-sole-source-aquifer-locations>). **Figure 25 of Attachment 2** illustrates the results of the database review.

Affected Environment and Regulations Update

The Proposed Action complies with the Sole Source Aquifer requirements. There are no Sole Source Aquifers in Puerto Rico as per defined by EPA in the Safe Drinking Water Act of 1974.

5.1.15 Wetlands Protection 24 CFR §58.5(b) and 23 CFR 777

Regulatory Requirements

Executive Order 11990, governing the Protection of Wetlands, is applicable to any federal action involving construction in a wetland. HUD projects are urged to steer clear of any direct or indirect support for new construction in wetlands, opting for practicable alternatives when available. A comprehensive 8-step Decision-Making Process, in line with 24 CFR 55.20, is detailed in **Attachment 16**.

Impacts Associated with the No Build Alternative

No direct or indirect impacts associated with the No Build Alternative are expected since this alternative does not entail construction activities capable of adversely affecting wetlands.

Impacts Associated with the Proposed Action

A review of the National Wetland Inventory Maps by the USFWS (see **Figure 26 in Attachment 2** for details) reveals six potential riverine wetland crossings along the Proposed Action corridor. Information obtained from this source also indicates that those systems are classified as R5UBH. The Riverine System (R) includes all wetlands and deepwater habitats contained in natural or artificial channels periodically or continuously containing flowing water or which forms a connecting link between the two bodies of standing water. Upland islands or Palustrine wetlands may occur in the channel, but they are not part of the Riverine System. This Subsystem designation (Unknown Perennial) was created specifically for use when the distinction between lower perennial, upper perennial, and tidal cannot be made from aerial photography and no data is available. Class UB Includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover and a vegetative cover of less than 30%. The water regime H means that water covers the land surface throughout the year in all years.

Generally, it is important to note that conditions that foster the presence of wetland systems are: hydric soils, hydrology and vegetation adapted to wetland conditions. Information obtained from the Web Soil Map of the NRCS indicates that the soils observed along the path of the proposed action are well drained soils (CbF2 – Caguago gravelly clay loam; CdF – Caguabo rock outcrop complex; CuF2 – Consumo clay; LcF2 – Lirios clay loam and PeF – Pellejas clay loam). Also, it shall be noted that because of the rugged topography conditions that prevail along the path of the proposed action corridor, wetland systems are limited to the ones observed near the Rio Grande de Arecibo and small creeks. However, in the center of the Island, the Ordinary High-Water level (OHWL) mark level that defines transition from the waters of the United States to uplands is noticeable. It is precisely in this transitional area that wetland systems may thrive. Due to the previous corridor characteristics, the required conditions for the development of wetland system are limited. In terms of the types of wetlands and its functions, Forested type of wetlands receive the highest assigned value. However, those types of wetlands are not observed along the path of the proposed action corridor. Wetland functions are defined as a process or series of processes that take place within a wetland. These include the storage of water, transformation of nutrients, growth of living matter, and diversity of wetland plants, and they have value for the wetland itself, for surrounding ecosystems, and for people. Functions can be grouped broadly as habitat, hydrologic, or water quality. Not all wetlands perform all functions, nor do they perform all functions equally well. The location and size of a wetland may determine what functions it will perform. For example, the geographic location may determine its habitat functions, and the location of a wetland within a watershed may determine its hydrologic or water-quality **functions** ([Wetland Functions, Values, and Assessment \(usgs.gov\)](https://www.usgs.gov/land-use-land-cover/wetlands/wetland-functions-values-and-assessment)).

While all crossings, except the first one over the Rio Grande de Arecibo, traverse small tributaries, design requirements set by PRHTA dictate the use of structures to minimize direct impacts on creeks and streams without disturbing the underlying wetlands. The first crossing, however, will not involve a wetland disturbance as evidenced by the USACE Permit issued for section II which indicates that permanent impacts of this section of the proposed action are associated with the loss of 0.35 acres of waters of the United States but no wetland impacts were noted. Specific areas with wetlands on small tributaries and creeks crossings impact details will be determined during their corresponding USACE permitting process; however, no direct permanent impacts are anticipated to these systems considering the avoidance and minimizations measures adopted for the project design by the PRHTA.

This wetland-impacting crossing will be facilitated by a bridge over the Rio Grande de Arecibo, as illustrated in **Attachment 2, Figure 17**. Early Public Notice (PN) was published in El Vocero on February 10, 2023, notifying federal, state, and local agencies, as well as the public, about the activity in the 100-year Floodplain and Wetlands, with the document available for comments. A Final Notice was issued on March 14, 2023, with only one comment received from a federal agency. Pages 113-114 and 149-154 of **Attachment 16** provide further details.

The analysis concludes that the wetlands' temporary disturbance during construction will not result in adverse impacts, as the affected area will be restored upon completion of the bridge construction. Considering previous information, and the characteristics of the proposed action corridor, it is understood that time required for the restoration of the temporary loss of wetlands functionality, if present at the proposed action area would be short.

A Nationwide 14 permit, applicable to transportation-related projects (AC-100069), has been granted by the USACE, valid until March 14, 2026. This type of permit applies to linear transportation projects whose projected impact to non-forested wetlands is equal or less than 0.5 acres.

Alternatives Assessment

Step 6 of the 8-step report, detailed in **Attachment 16** on page 12, explores potential alternatives for avoiding the wetlands. The report determines that, upon thorough examination, no practical alternatives exist, necessitating the project's location in the wetlands to construct the bridge connecting existing sections of PR-10 north and south of the proposed action.

Mitigation and Compliance

Step 4 on page 6 of the 8-step report addresses potential impacts, and despite the BR-1 Section Activity being in a wetland, the proposed action aligns with USACE conditions outlined in the Nationwide permit. This strategy aims to minimize impacts on wetland values.

The 8-step study, details Nationwide Permit requirements for mitigating construction impacts on environmental resources, including wetlands. The analysis concludes that, aside from the temporary disturbance in the mentioned area, there will be no adverse impacts on wetlands along the remaining Proposed Action corridor.

Affected Environment and Regulations Update

All requirements of the 8-step Decision-Making Process must be adhered to during roadway corridor construction. If after completion of the design phase it is determined that Sections III, IV, and V of the Proposed Action impact USACE jurisdictional areas, JPAs must be submitted and permits secured accordingly, in adherence to both federal and state requirements. Detailed plans and specifications will be provided to contractors to clearly mark any nearby wetlands near construction areas to minimize potential incidental impacts from construction and staging areas.

5.1.16 Wild and Scenic Rivers 24 CFR §58.5(f) 23 CFR Sec. 774 and Sec. 777

Regulatory Requirements

The Wild and Scenic Rivers Act (WSRA) established a policy of preserving designated free-flowing rivers for the benefit and enjoyment of present and future generations. Section 7 is one of the most important and powerful parts of the Wild and Scenic Rivers Act. This key provision directs federal agencies to protect the free-flowing condition and other values of designated rivers and congressionally authorized study rivers. Federal actions must ensure that they would not affect river designation and are not inconsistent with the management and land use plan for the designated river area of rivers protected under the Wild and Scenic Rivers Act. NWSRS includes rivers designated as Wild and Scenic Rivers, Study Rivers and those listed on the Nationwide Rivers Inventory (NRI).

Impacts Associated with the No Build Alternative

No direct or indirect impacts associated with the No Build Alternative are expected since there are no wild and/or scenic rivers in the area and this alternative does not entail construction activities.

Impacts Associated with the Proposed Action

A review of the database published by the U.S. Forest Service with respect to the Proposed Action, disclosed the fact that the proposed action will not affect rivers designated as Wild and Scenic Rivers by National Parks Service (NPS). There are only three (3) rivers designated in this list which are Mameyes River, La Mina River and Icacos River. These rivers are located within or close to the Caribbean National Forest, locally known as El Yunque National Forest. This area is located at an approximate distance of 97 kilometers from the Proposed Action corridor. A figure illustrating the results of this database review has been included in **Attachment 2, Figure 27**.

Affected Environment and Regulations Update

The Proposed Action complies with the WSRA.

5.1.17 Environmental Justice 24 CFR §58.5 (j) and 23 CFR Sec. 771.119 and FHWA Order 6640.23A

Regulatory Requirements

Executive Order 12898 states that federal agencies shall identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

The EJ analysis in this EA has been prepared in accordance with the definitions, methodologies, and guidance provided in Executive Order (EO) 12898; the Council on Environmental Quality (CEQ) Environmental Justice Guidance Under the National Environmental Policy Act; US Department of Transportation (USDOT) Order 5610.2(a); FHWA EJ Order 6640.23A; FHWA memorandum Guidance on Environmental Justice and NEPA; the FHWA Environmental Justice Reference Guide; the FHWA Technical Advisory T6640.8A.

A review of the proposed action drawings allowed to identify that communities located near the proposed action corridor include the Arenas Ward and Guaonico Ward of the Municipality of Utuado, and the Capaez, Pellejas and Juan Gonzalez Wards of the Municipality of Adjuntas. All these wards were found to have household incomes below the poverty level and a high percentage of the population without a high school diploma based on data obtained from the latest U.S. Census Bureau (2020). However, the Guaonico Ward in Utuado and Capaez Ward in Adjuntas are the communities directly impacted by the proposed action. For the purposes of this study, each ward is considered as a single community, although being in a rural area, residential structures are scattered, and few clusters of residences can be identified in some sectors.

Vulnerable populations within the communities were studied, including population above the age of 64 and below the age of five, and were 25% of the population have less than high school education. Individuals over the age of 64 do not necessarily belong to a population protected under EJ statutes; however, this population represents a key demographic group that is associated with increased susceptibility to environmental issues. Elderly populations have shown elevated sensitivity to particulate matter exposure (EPA, 2009). The inclusion of this population in these analyses supports the EJ's goal of emphasizing potential effects on public health to "ensure the fair treatment and meaningful involvement of all people.

Methods Utilized in Identifying Environmental Justice Populations

Data on low-income populations was collected from 2020 Census Tracts and EPA's online EJSCREEN tool (EPA, 2021b). Demographic information for five wards located in the municipalities of Utuado and Adjuntas adjacent to PR-123 and the proposed action's corridor. For the purposes of this study each ward represents a community. The demographic composition of census blocks adjacent to the project area was compared to state averages to identify communities with significant EJ populations. Demographic attributes associated with EJ populations, such as those discussed above, were evaluated in relation to proximity to the project area, potential to be impacted by the proposed build alternative and existing conditions within their communities to evaluate existing vulnerabilities within local communities and the potential for adverse impacts to EJ populations from the project alternatives. Two communities were used as reference community, Salto Arriba ward located south of the town of Utuado and Vegas Arriba Ward located southeast of the town in Adjuntas. Both communities are served by existing PR-10 and have similar traits that the communities near the proposed action.

Three (3) wards are traversed by existing PR-123. Arenas Ward in the municipality of Utuado and Pellejas and Juan Gonzalez Ward in the Municipality of Adjuntas. Two wards are adjacent to the proposed action, Guaonico Ward in the municipality of Utuado and Capaez Ward in the Municipality of Adjuntas.

At its northern end, the proposed action traverses through the Guaonico ward in the Municipality of Utuado and continues in a generally southwest direction through the Capaez ward in the Municipality of Adjuntas.

Guaonico is located in the central part of the island, within the municipality of Utuado, which is in the mountainous region known as the Cordillera Central. The terrain in Guaonico is characterized by steep hills of the Cordillera Central. The elevation varies significantly, with elevations ranging from about 200 meters (656 feet) to over 600 meters (1,969 feet) above sea level. Guaonico experiences a tropical rainforest climate with high humidity and significant rainfall throughout the year. Average annual rainfall in the region exceeds 2,000 millimeters (79 inches). Temperatures are generally warm year-round, with an average range from 70°F (21°C) to 85°F (29°C). The area is part of the watershed of several rivers and streams, including the Río Grande de Arecibo, which is a significant waterway in the region. Numerous smaller streams and tributaries flow through Guaonico, contributing to the region's lush vegetation and fertile soils. Land use in Guaonico is a mix of agricultural, residential, and undeveloped natural areas. Traditional farming practices are common, and coffee cultivation is a significant agricultural activity. Guaonico is part of the subtropical wet forest ecological zone. The population of Guaonico is relatively small and dispersed, with residents living in rural communities. The local economy is largely based on agriculture, with many families involved in farming and related activities. The infrastructure in Guaonico includes rural roads that connect the ward to the main town of Utuado and other surrounding areas. Access to public services such as healthcare and education requires travelling to nearby towns.

Capaéz is located in the central part of Puerto Rico within the municipality of Adjuntas, which is part of the Cordillera Central Mountain range. The terrain in Capaéz is mountainous with steep slopes. Elevation ranges from around 400 meters (1,312 feet) to over 1,000 meters (3,281 feet) above sea level. Capaéz experiences a tropical rainforest climate, characterized by high humidity and substantial rainfall throughout the year. Average annual rainfall typically exceeds 2,500 millimeters (98 inches). Temperatures are generally mild to warm, ranging from about 65°F (18°C) to 80°F (27°C). The area is part of the watershed for several rivers and streams, including tributaries of the Río Grande de Arecibo. Numerous smaller streams and rivulets crisscross the ward, feeding into larger waterways and supporting a lush, verdant landscape. These soils are generally well-drained but can be prone to erosion on steeper slopes. Land use in Capaéz includes a mix of agriculture and a few residential areas. Traditional farming practices dominate, with coffee farming being particularly significant. It is within the subtropical wet forest ecological zone. The population of Capaéz is relatively small and dispersed, with residents living in rural communities. The local economy is heavily reliant on agriculture, particularly coffee farming, and related activities. Infrastructure in Capaéz includes rural roads that connect the ward to the main town of Adjuntas and other surrounding areas. Access to public services, such as healthcare and education, requires travelling to nearby towns.

Both communities have low population densities, with approximately 314 people in Guaonico living in 88 scattered single-family homes and 544 people in 237 scattered single-family units in Capaéz. The per capita income is below poverty levels in communities, \$10,536 and \$7,574 respectively. The level of education among residents without a high school diploma is high, 30% and 35% respectively. This information was obtained from the [EJ Screen: Environmental Justice Screening and Mapping Tool | US EPA \(see Attachment 23\)](#).

Access to these communities is via municipal roads, which will not be affected by the proposed action. The proposed corridor provides an entry and exit route for residents of the Guaonico ward to their

community and to the existing PR-123. For residents of the Capaéz ward, their access to PR-10 is through the existing connection of PR-123 with PR-10. The proposed action corridor is distant from both communities, and due to the steep topography, the mountains isolate these communities from it. There are only three pockets of residences near the corridor: the first in the Guaonico neighborhood of Utuado, where the closest distance to the project is approximately 65 linear meters to the west, and two small pockets to the west of the corridor in the southern part of the project in the Capaéz neighborhood of Adjuntas, with approximate distances of 90 and 75 linear meters, located in sections IV and V of the corridor. Due to the topography, these residences would be protected from the corridor by the surrounding mountains.

West of the proposed action corridor and the Rio Grande de Arecibo, along PR-123, there are three communities also considered environmental justice communities. These are the Arenas ward of the Municipality of Utuado and the Pellejas and Juan González wards in the Municipality of Adjuntas. The population of the Arenas neighborhood is 1,096 people with 542 residences and a per capita income of \$11,466. Twenty-nine percent of the population has not completed high school education. The Pellejas ward of the Municipality of Adjuntas has a population of 542 people and 175 residences with a per capita income of \$8,886. Thirty-four percent of people do not have a high school diploma, 4% are over 60 years old, and there are no children under 5 years old. The Juan González community has a population of 953 people, with 223 single-family homes, and a per capita income of \$7,554. Forty percent of the residents do not have a high school diploma, 17% are over 60 years old, and 6% of the population is under 5 years old. Like the other communities in the area, agriculture is the main economic activity. There are 27 single-family homes, 11 businesses, and two churches adjacent to the road along this stretch of PR-123, which is approximately 14.0 kilometers long.

Environmental indicators show that both communities adjacent to the proposed action are not currently affected by environmental problems. The only high indicator regarding proximity to a Superfund site revealed that due to the topography of the land, this factor is not significant. Environmental analyses and studies conducted indicate that there are no contaminating sites near these communities, the air quality is good, noise levels are low, and there are no contaminated sites near these neighborhoods.

Salto Arriba Ward, located in the central mountainous region of Puerto Rico, is characterized by its complex geology. The area is part of the Cordillera Central, which is the central mountain range of the island. The geology primarily consists of volcanic and sedimentary rocks from the Cretaceous period, along with intrusive igneous rocks. Salto Arriba is situated in a region characterized by rugged terrain, with elevations ranging from approximately 1,000 to 2,000 feet above sea level.

Salto Arriba experiences a tropical rainforest climate, with high humidity and significant rainfall throughout the year. The average annual rainfall is about 100 inches, contributing to the lush vegetation and dense forests in the area. The temperatures are relatively moderate due to the elevation, typically ranging from 60°F to 80°F. Salto Arriba Ward, according to the 2020 Census, has a population of approximately 2,456 people. This is a slight decrease from previous years, reflecting broader demographic trends in Puerto Rico, including migration to the mainland United States. There are around 1,000 households in Salto Arriba. The average household size is approximately 2.5 persons per household, which

is consistent with national trends in household sizes. The median household income in Salto Arriba is relatively low compared to the national average. This reflects the broader economic challenges faced by many communities in Puerto Rico, which include higher rates of poverty and unemployment. The economy of Salto Arriba, like much of Utuado and rural Puerto Rico, is primarily based on agriculture, though there has been a decline in this sector. Coffee production has historically been a significant part of the local economy, but it has faced challenges due to economic changes and natural disasters. Additionally, there are small businesses and some residents commute to other parts of the island for work. Salto Arriba and Utuado, in general, have faced significant challenges, particularly following Hurricane Maria in 2017, which caused widespread damage and disruption. Recovery efforts have been ongoing, but economic and infrastructural challenges remain. The community, however, is known for its resilience and strong cultural ties.

Impacts Associated with the No Build Alternative

The No-Build Alternative would not produce beneficial or adverse impacts to the communities within the proposed action's area. However, residents along the path of PR-123 are currently experiencing noise and combustion engines emissions resulting from their proximity to the roadway. They are also exposed to potential fuel spill hazards in the event of an accident involving trucks that pass through the sector daily transporting fuels and other hazardous substances. Populations in the vicinity of the proposed area would continue to experience delays in their accessibility and mobility to health services outside of the region and to other services outside of these municipalities. They would also lack adequate access to evacuate the area during an emergency or to receive prompt aid after the occurrence of a meteorological event that results in adverse impacts to their communities.

Impacts Associated with the Proposed Action

Since the proposed action would be constructed on new alignment separated from PR-123; it is not anticipated to cause major traffic disruptions, community disruptions, and/or disruptions to emergency services within the area. Due to the largely unoccupied nature of the project area, impacts to Environmental Justice populations are anticipated to be minimal and indirect in nature and would not be disproportionately higher than the effects that will be experienced by other adjacent communities.

No business or residential acquisitions would be required for the construction of the proposed action, only properties. The proposed action is anticipated to provide improved mobility to commute to jobs centers by providing a safer and efficient roadway and reducing traffic congestion. During the construction phase, there will be temporary impacts derived from this type of activity, such as increased noise levels, higher runoff levels, and emissions to the atmosphere from construction equipment. These impacts will be controlled and mitigated and will not affect the communities due to the distance and topography that separate the proposed action from the communities. Construction activities would not significantly impact the air quality around the area. Greenhouse gases would experience a net decrease in the design year of this project while ambient concentration in the air basin of Carbon Monoxide would remain in compliance with the NAAQS and therefore, would maintain its current attainment level status. The proposed action will provide the residents of the area an improved ease-of-access to private and public facilities located outside their wards. Improved emergency response times and a decrease in traffic noise and air pollutant emissions levels are anticipated to benefit all the populations including persons over 64 years of age. Improved access to service facilities and schools located outside of their wards will

also take place. In summary, the proposed action is expected to be a net-benefit for the surrounding communities which are mainly composed of Environmental Justice populations within those communities.

It is important to highlight that the primary concern expressed during this process is the frustration over the prolonged time it has taken to advance the construction of the proposed action. Efforts to address these concerns and expedite the development by PRHTA aim to prevent the denial, reduction, or significant delay in the receipt of benefits by environmental justice communities. This commitment aligns with one of the three fundamental principles of environmental justice as outlined by FHWA. The communities adjacent to PR-123 will not be impacted by the proposed action and will benefit from its construction.

After evaluating numerous communities, the Salto Arriba Ward of the Municipality of Utuado and the Vegas Arriba Ward of the Municipality of Adjuntas were selected as the EJ reference communities. Both municipalities are served by PR-10, and the current vehicular traffic including trucks is like what would occur if the proposed action is built. In demographic terms, the characteristics of these communities are similar to the ones exhibited by the communities adjacent to the proposed action. The environmental indicators of these communities reflect that they are not exposed to significant environmental, or health indicators and that PR-10 has not had adverse effects on these communities. These findings help confirm the determination that the proposed action will not expose the adjacent communities of the proposed action to greater environmental or health effects than those experienced by other communities served by the existing PR-10.

Community Outreach and Engagement

The public participation process for this EA relied mainly on the public notice requirements as the means of obtaining comments and feedback from interested parties and EJ communities. Input from residents, environmental organizations and other stakeholders interested in the Proposed Action was gathered through the public review processes established for this project. These inputs were carefully evaluated, resulting in modifications to the Environmental Assessment (EA) to enhance clarity for residents and other interested parties. A detailed discussion of the responses to comments received following the release of the draft Reevaluation in June 2023 is provided in Attachment 28. Comments received during the public review process in March 2024 are included in Attachment 30. Written input from residents of environmental justice communities, along with feedback from other concerned groups and individuals within these municipalities, will continue to be actively encouraged.

The environmental studies did not identify any environmental or human health impacts that may have a disproportionately high impact on the above-mentioned communities considered as environmental justice communities based on their low income. This includes whether the health and environmental effects impact minority populations or low-income populations in a disproportionately high and adverse way. The determination that the proposed action would not have a disproportionate effect on these communities is based on the following:

1. The residents in these areas are presently not subject to environmental stressors as enumerated by EPA in the EJ Screen Environmental data and will not be subject to any disproportionate impacts by the proposed action.
2. The proposed action will not lead to a significant increase in traffic through their communities. About 80% of the current traffic will be redirected to the new highway, substantially decreasing the presence of heavy freight trucks and through traffic on PR-123. This new traffic flow pattern

will occur within an isolated corridor, separated from the communities to the west by existing mountainous terrain and vegetation.

3. The proposed action will not hinder the access of these communities to essential services or cultural destinations such as churches, parks, community centers, medical offices, and public services.
4. The proposed action will not alter or reduce the accessibility of these communities to transportation infrastructure for these communities.
5. The benefits outlined in the purpose and need of the Environmental Assessment are fair to all resident segments within the region or in the two municipalities.

Additional public participation and notification for the Proposed Action were performed in the following activities:

- Publication of Information about the Proposed Action in the agency's social/network media and web site (December 2021). Please refer to the following link for referenced information: [<https://act.dtop.pr.gov/wp-content/uploads/2023/06/Presentacion-junio-2023.pdf>]
- Development of a pre-recorded virtual presentation of the Proposed Action that was uploaded to the Puerto Rico Department of Transportation and Public Works/Puerto Rico Highway and Transportation Authority (PRDTPW/PRHTA) web site and YouTube (November 2021). Please refer to the following link for referenced information: [<https://act.dtop.pr.gov/act-proyecto-extension-puerto-rico/>]
- State Transportation Improvement Program (STIP) is a staged four-year capital improvement program that lists all projects expected to be funded with federal (FHWA and FTA) participation. The STIP is developed in coordination with the Metropolitan Planning Organization (MPO). It includes a public participation period of 45 calendar days for public review and comments, before it gets approved by FHWA and FTA. The following bullets list public participation periods which included the Construction of the PR-10 Proposed Action from Adjuntas to Utuado:
 - STIP 2019-2022, Approved by MPO, FHWA and FTA – August 2022
Projects: AC-100071,100069, 100076, 100055 for CDBG-MIT only
 - STIP 2019-2022, Approved by MPO, FHWA and FTA – August 2022
Projects: AC-100071,100069, 100076, 100055 for CDBG-MIT only
 - STIP 2023-2026, Approved by MPO, FHWA and FTA – November 2022
Projects: AC-100071,100069, 100076, 100055 for CDBG-MIT only

To enhance the involvement of EJ communities, the following measures will be taken:

- Technical assistance to help communities understand technical documents and processes will be provided.
- Open lines of communication with EJ communities will be maintained to address any unforeseen impacts and ensure they benefit from the project as planned
- Continue outreach to EJ communities to make them aware of the main aspects of the roadway construction of the project, including timeline, major design features, futures access to and from the future roadway and other important aspects of the construction phase of the project.
- Consistent updates on the progress of the Design-Build process will be provided.
- Notices and key documents will be provided in languages spoken in the EJ communities as requested or needed. In the case of technical documentation, a document explaining the main aspects of the document will be provided.
- Varied methods of communication, including social media, local newspapers, flyers in gathering), and door-to-door outreach will be used.
- Periodic meetings in locations easily accessible to EJ communities, such as city hall and community centers, will be held at times convenient for people with work or family obligations (e.g., evenings or weekends).
- Virtual or hybrid options for participation, especially for individuals who may have limited mobility or transportation options will be provided if appropriate.
- Concerns during the Design-Build process will be promptly considered.

Based on the above it has been determined that the proposed action complies with the requirements of Executive Order 14096 and Executive Order 12898.

The No-Build Alternative would not result in construction and the existing impacts on communities along PR-123 will continue.

Affected Environment and Regulations Update

A review of available information provides support to the statement that there are no environmental conditions identified that would have a disproportionately high impact adverse effect on low-income and/or minority populations. The Proposed Action complies with the Environmental Justice requirements based on a review of the available socioeconomic data obtained from the latest U.S. Census Office (2020) as previously discussed in this report and will have benefits to the community because of the improved connections, access, etc. The proposed action will also enhance community well-being by diverting through traffic away from the current PR-123, which includes heavy trucks. This will establish a safer and more efficient connection, serving as the primary access point for emergency providers and utility agencies in times of crisis. Additionally, the project's construction phase will generate new job opportunities for residents in nearby communities. It will also stimulate the growth of tourism and agricultural businesses, contributing to additional employment opportunities and economic development, without an increase in traffic volumes.

5.2 Environmental Assessment Factors

The completed HUD Environmental Review Form for this Proposed Action is included in **Attachment 6** for reference. It includes impact ratings, as well as A/B compliance or mitigation requirements for the 58.5 and 58.6 resource areas. The No-Build Alternative would not result in construction and would not result in impacts to the matters herein discussed. The assessment factors used in this EA were developed by HUD and are explained as follows ([Environmental Assessment - HUD Exchange](#)).

“Based on the relevant information and analysis that is entered for each factor, environmental assessment preparers can make a determination using one of four codes: 1) Minor beneficial impact; 2) No impact anticipated; 3) Minor adverse impact; or 4) Significant or potentially significant impact.

The codes are provided to cover the four types of impact that could be determined for any given factor. Environmental assessment preparers must explain the basis for each code entered and provide a list of sources, agencies, and persons consulted ([40 CFR 1501.5\(c\)](#)) as well as documentation of additional studies performed for making a final determination.

- **Minor beneficial impact**
 - An outcome of the project is positive in some way, but the community improvement is limited
- **No impact anticipated**
 - The proposed project will likely have no beneficial or adverse effect on the community.
- **Minor adverse impact**
 - Analysis of the proposal shows that some aspect(s) of the project will negatively affect the community, but the impact can be easily mitigated
 - While not required, mitigation may be appropriate to improve project and environmental quality
- **Significant or potentially significant impact**
 - The environmental assessment description of existing conditions and trends establishes the baseline environmental conditions at the site. When project impacts would significantly change conditions from this baseline ([40 CFR 1501.3\(b\)](#)), especially in a manner that is adverse and affects one of the environmental assessment factor categories listed here, this is considered a “significant impact.” The threshold for a degree of change that is considered significant depends on the baseline conditions at each project site and is determined as part of the environmental assessment process.
- **When there is potential significant impact, NEPA requires either:**
 - Identification of mitigation measures that reduce the impact below the level of significance (which, for HUD projects, often involves mitigating changes that are adverse)
 - Preparing an Environmental Impact Statement

The terms “A” and “B” typically refer to different levels or types of environmental reviews within HUD’s guidelines. [For example, certain projects might require a more detailed review \(A\) due to their potential environmental impacts, while others might need a less intensive review \(B\) based on their scope and nature.](#)

5.2.1 Land Development

Conformance with Plans / Compatible Land Use and Zoning / Scale and Urban Design

The Puerto Rico Planning Board approved the Municipal Zoning Plan (*Plan de Ordenamiento Territorial*) for the whole island in 2015. The Municipality of Adjuntas approved its Municipal Zoning Plan (*Plan de Ordenamiento Territorial*) for the Municipality in 2011 and the Municipality of Utuado approved its plan on May 8, 2023. The construction of the Proposed Action is included in all these plans as an essential transportation infrastructure element for the region.

The Proposed Action will have no impact on land developments for the area since the PR Planning Board and the Municipalities of Adjuntas and Utuado planning and zoning regulations have recognized and incorporated the corridor of the proposed action within their respective planning strategies and has classified the lands adjacent to it as non-developable. The Proposed Action is a full access control project and no direct vehicular access to the existing lands will be allowed.

The Land Use Plans of the Municipalities of Utuado and Adjuntas have classified the properties adjacent to the Proposed Action corridor as specially protected lands and do not allow any type of new development on them. Both Municipalities local planning regulations allow future developments in three nearby wards adjacent to the urban center, which are located west, north, and southeast. Page 115 of the Plan shows the land uses of the Municipality of Utuado. It is worth noting that the Plan is marked as a Draft, but it was approved by the Municipality on May 9, 2023, and it was approved and signed by the governor of Puerto Rico in December 2023. Therefore, the Plan has transitioned into a legally binding planning instrument.

In the Municipality of Adjuntas, the lands are classified as non-developable land, but the classification is less strict for development than the one adopted by the Municipality of Utuado. Its land use plan allows for development west and south of its urban center and in some lands located north and northwest of the town. The Proposed Action is a full access control project and no direct access to the existing lands will be allowed. However, it is important to indicate the Proposed Action is included in the state transportation plan and there will be no encroachment on the protected lands. The Proposed Action will not increase the residential density of the area. The construction will take place within a corridor that has no impact on existing land uses, traversing through areas classified as non-developable land. Links for each municipality’s land use information are:

https://jp.pr.gov/wp-content/uploads/2023/01/POT_Utuado-Fase-2-01.11.2023.pdf

<https://jp.pr.gov/wp-content/uploads/2021/11/Adjuntas-PT-Programa-2011.pdf>

Based on the review of the available information, the Proposed Action conforms with local land use and zoning plans developed for the area. Compliance with scale and urban design is not applicable to this Proposed Action since this is a highway construction project.

Assessment of this subject under the provisions of HUD regulations allows us to assign an impact code of 2 (no impact anticipated) for the proposed action. There is little or no growth or land use change in the Proposed Action area. As mitigation measures, permits are required to be obtained or renewed prior to initiation of construction.

Soil Suitability/Erosion/Drainage/Storm Water Runoff

The Proposed Action's design requires the execution of soil geotechnical studies. These studies aim to assess the soil's properties to determine its capacity to withstand the loads imposed by the construction of structures and vehicles during the operation of the roadway. The findings from these studies will be relayed to the structural engineers, who will integrate these recommendations into the final design. This step ensures that the soil's suitability for the Proposed Action is adequately addressed.

The requirement to conduct these studies was explicitly specified by the DNER in their feedback on the project. This requirement stems from a review of geological data provided by the US Geological Survey for the area (USGS Open File Report 2020-1022, authored by K. S. Hughes and W. H. Schultz). The DNER highlights that, given the project's route through regions prone to landslides, the final roadway design must incorporate the recommendations derived from comprehensive geotechnical and geological investigations. This is essential to minimize risks associated with these natural conditions.

Concerning the geological conditions of the area, the DNER (please refer to the attached copy of the letter dated September 30, 2021 and October 25, 2021, and other relevant documents, along with the geotechnical studies for all Proposed Action sections in **Attachment 24**) has identified specific hazards and established mandatory requirements to address these issues during the Proposed Action design phase. It is imperative to adhere to these detailed recommendations. The recommendations are as follows:

- Adopt the recommendations of the geotechnical/geological studies aimed to be incorporated in the design of the roadway and structures.
- Notify the agency and others with jurisdiction, if superficial/underground bodies are found during the investigation or construction activities.

Recommendations for the design of the bridges that resulted from the evaluation of the already submitted H/H studies for the DNER review and approval are also mandatory.

Given the challenging terrain in the central to southern sections of the Proposed Action alignment, it's crucial to address how the Proposed Action will manage sedimentation and turbidity during the construction phase.

Regarding to the sedimentation of the Rio Grande de Arecibo and its effect on water quality, as well as its impact on the available storage capacity of the Dos Bocas reservoir (built in 1942), after which the intake of the “Superaqueduct” was built, a review of studies conducted by the U.S. Geological Survey and Universities was conducted. This review was focused on the following subjects:

➤ **Information about levels of sedimentation**

- The Dos Bocas reservoir construction was completed by 1942 by the Puerto Rico Electric Power Authority (PREPA) legacy agency as a hydroelectric power facility with a total storage capacity of 30,420 acre-feet and a drainage basin area of 170 square miles (including approximately 6.2 of the Garzas Lake). According to a draft study prepared by the DNER on March 2004, the estimated annual sedimentation rate of the reservoir was estimated in 3,566 acre-feet/square mile/year, with an estimated date for full loss of storage capacity estimated to occur in 2052. Land uses particularly those related with agricultural practices are identified as one of the main sources of sediment generation in the watershed.
- A report entitled Evaluation of Storm Sediments in Rio Grande de Arecibo watershed prepared by Jairo Díaz Ramírez (University of California), Luis Rómulo Pérez García (University of Puerto Rico, Mayaguez Campus) and John J. Ramírez Avila (Mississippi State University) published on September 2008 ([\(PDF\) Evaluation of Storm Sediments in Rio Grande de Arecibo Watershed, Puerto Rico. \(researchgate.net\)](#)) concluded that:
 - Factors promoting sedimentation in the Rio Arecibo de Arecibo River watershed are land use, steep drainage basin slopes, frequent and high magnitude of rainfall, characteristic of major tropical disturbances
 - Preliminary analyses indicated a correlation between the sedimentation rate and a runoff quickly rising in the area.
- A report entitled Sedimentation History of Lago Dos Bocas, Puerto Rico 1942-2005, Luis R. Soler López for the USGS, report 2007-5053 ([SIR2007_5053.pdf \(usgs.gov\)](#)) establishes that storm events (such as Hurricane Georges in 1998) causes massive sediment transport to the river as evidenced by the before and after estimated sediment trap efficiency of the Dos Bocas reservoir. The storage loss for the reservoir was estimated in 54% of the total capacity for 2005.

➤ **Predicted Sedimentation rates resulting from the project construction**

The annual sedimentation rate for the Dos Bocas Reservoir has been estimated in 5.05 cubic meters/acre/year using the total sedimentation rate of the Rio Grande de Arecibo drainage basin obtained for the USGS report entitled Sedimentation Survey of Lago Dos Bocas, Utuado, Puerto Rico, by Luis R. Soler López, January 2010). Therefore, considering that the no build alternative area is 209 acres, the estimated annual sediment contribution of this alternative would be 1,055.45 cubic meters

(209 acres x 5.05 cubic meters/acre/year). For the proposed action alternative, the paved roadway area would reduce the total impact area by 32.69 acres which is calculated by multiplying the project length by its width (7,539.22 meters x 17.55 meters). This impervious area is estimated in 132,313.31 square meters (32.29 acres). Therefore, the net exposed area is estimated in 176.31 acres (209 acres – 32.69 acres) which results in an estimated annual sedimentation rate of 890.36 cubic meters (see details of calculation in Attachment 2, Figure 29). The estimated sediment load contribution resulting from the proposed action construction represents a small reduction when compared to the no build alternative and is the result of the new impervious area. The total proposed action area sediment generation rate is estimated in approximately 0.000017% of the total sediment generation of the Rio Grande de Arecibo watershed, assuming that no adequate BMP are implemented and maintained as required by the EPA CGP.

Adequate control measures to minimize the sediment transport to nearby bodies of water necessitates a multistage approach, which can be summarized as follows:

Planning Stage

In the planning stage, an initial assessment is conducted by reviewing publicly available information, such as:

- The Web Soil Map published by the Natural Resources Conservation Service (NRCS) (see **Attachment 2, Figure 30**)
- Topographic Quadrangle Maps published by the U.S. Geological Survey.

These sources provide fundamental data for understanding soil erodibility characteristics, site topography, and general site drainage patterns. This information helps identify areas of concern specific to the Proposed Action.

Design Phase

During the Proposed Action design phase, site-specific data is generated, including:

- **Geotechnical Soil Reports:** These reports offer detailed information about the soil properties at the project location, obtained from soil borings. They are used by structural and civil engineers to inform the project's design.
- **Hydraulic/Hydraulics (H/H) Studies:** These reports analyze stormwater flow through the project site based on engineering standards and specialized software. Government agencies typically require approval of these reports. In Puerto Rico, the Department of Natural and Environmental Resources (DNER) must approve H/H reports. These reports provide recommendations for designing a storm sewer system capable of handling the anticipated stormwater volume from the project.

Information gathered from these reports guides the civil engineer in designing the roadway and its storm sewer system. It is important to note that the storm sewer system's design must adhere to the Puerto Rico Planning Board Regulation for the Design, Criteria for the Operation, and Maintenance of Storm Sewer Systems (Regulation #40 as of April 19, 2023). This regulation represents an update from the previous version dating back to 1975, incorporating lessons learned from recent natural disasters and the impacts of climate change in Puerto Rico. Additionally, the Proposed Action's design must align with the PRHTA and FHWA Design Standards.

Given the challenging terrain in the central to southern sections of the Proposed Action alignment, it's crucial to address how the Proposed Action will manage sedimentation and turbidity during the construction phase. Proper control of sediment transport to nearby bodies of water necessitates a multistage approach, which can be summarized as follows:

Construction Phase

Before commencing construction, the Proposed Action owner or contractor is mandated to create a Storm Water Pollution Prevention Plan (SWPPP). This requirement arises because the earthwork activities for the project exceed the one-acre threshold specified in 40 CFR Part 122 for construction projects. Developing the SWPPP involves a qualified individual performing the following tasks:

Site Assessment and Planning

During the site assessment phase of SWPPP preparation, the following considerations are essential.

- Understanding how stormwater currently flows from the site and identifying points of discharge or areas.
- Identifying slopes and their lengths, as these topographic features significantly impact erosion.
- Recognizing soil types, especially highly erodible soils, and their infiltration capacity.
- Identifying natural features such as trees, streams, wetlands, slopes, and other elements requiring protection.

As part of this task, a brief description of construction activities is provided, including project type, location, estimated start and end dates, activity sequence and timing, project size, estimated total excavation and grading areas, percentages of impervious areas before and after construction, and runoff coefficients.

Selection of Erosion and Sediment Control Best Management Practices (BMPs)

The EPA defines erosion and sediment controls as essential measures used during construction to prevent sediment from leaving the site (erosion control) and to capture any sediment moved by stormwater before it exits the site (sediment control). Erosion controls play a vital role in a sound SWPPP and serve as the primary defense against stormwater pollution. Sediment controls provide a secondary line of defense when erosion controls are correctly designed and installed. The specific Best Management Practices (BMPs) described in the SWPPP should reflect the unique site conditions.

Erosion control measures include:

- Reducing the disturbance of areas and protecting natural features and soil on the site.
- Phasing construction activities to control stormwater movement throughout the project.
- Managing stormwater that flows onto and through the project site.
- Stabilizing soils promptly.
- Safeguarding slopes.

Sediment control measures encompass:

- Protecting storm drain inlets.
- Establishing perimeter controls.
- Retaining sediments on-site and controlling dewatering practices. This involves using temporary sediment traps or sediment basins based on the project site's size to contain sediments, preventing them from reaching nearby surface water bodies. This measure effectively removes suspended solids from stormwater, reducing water turbidity.
- Establishing stabilized construction exits for the project.
- Inspecting and maintaining controls regularly.

Selection of Good Housekeeping BMPs

Construction projects, like the one discussed in this report, generate significant waste that, if not managed correctly, can contaminate stormwater runoff. Therefore, the SWPPP should incorporate good housekeeping practices to prevent stormwater contamination from material and waste management on the project site. The EPA identifies six key areas that should be considered in the SWPPP.

- Implementing effective waste management practices.
- Establishing appropriate building material staging areas.
- Designating paint and concrete washout areas.
- Establishing proper equipment and vehicle fueling and maintenance practices.
- Controlling equipment and vehicle washing and allowable non-stormwater discharges.
- Developing a spill prevention and response plan.

Developing Inspection, Maintenance, and Housekeeping BMPs

The effectiveness of erosion and sediment control BMPs, as well as good housekeeping and pollution prevention measures, hinges on the consistent and ongoing implementation of an inspection and maintenance schedule. Key considerations for SWPPP preparation include:

- Determining inspection frequency, as required by regulations and before/after expected rainfall events.
- Generating complete inspection reports and filing system.

Operational Phase

Before beginning construction activities, the contractor must meet two specific conditions:

- Obtain coverage under the 2022 Construction General Permit (CGP) issued by the EPA. This involves submitting a Notice of Intent (NOI) to the EPA at least fourteen (14) days before starting construction activities. The NOI submission requires a prepared SWPPP duly signed by responsible parties.
- Secure a Single Incidental Permit (SIP) from the Puerto Rico Permits Management Office (PMO). The SIP includes a Plan for the Control of Erosion and Sedimentation for the Proposed Action, similar but not identical to the SWPPP.

Before commencing actual construction activities at the site, both plans require the installation of necessary BMPs. This involves appointing a qualified person or engineer responsible for implementing the plans, conducting periodic inspections, and preparing required reports.

Typical BMPs used for highway construction projects involving earthwork activities include, but are not limited to:

- Constructing stabilized entrance and exit points for trucks.
- Installing silt fences at the lower portions of the project perimeter to retain sediments within the project premises.
- Promptly stabilizing exposed slopes, using methods such as hydroseeding and geotextile membranes.
- Creating ditches at the top of slopes to divert stormwater away from exposed soil areas.
- Constructing the storm sewer system promptly to manage stormwater runoff effectively.
- Implementing erosion protection measures at the discharge points of the storm sewer system, such as riprap.
- Installing silt fences around soil stockpiles.
- Constructing stormwater sediment traps and sedimentation basins as required for the project.
- Replanting vegetation on already completed exposed areas.
- Conducting regular BMP inspections and preparing reports, typically every seven days or after rain events exceeding 0.25 inches, as permitted by the 2022 EPA Construction General Permit (section 4.2 of the permit).

Regarding drainage, the Proposed Action design aims to maintain existing drainage patterns in the area. The design of the storm sewer system for the new roadway must adhere to the latest requirements of the PRPB, DNER, EPA and FHWA. The existing watersheds traversed by the Proposed Action are outlined in the Hydrologic-Hydraulic studies in **Attachment 25**. The Proposed Action area's drainage patterns remain largely consistent with those discussed in the FEIS, and adjustments made during the design stage to reduce earth movement have resulted in more bridge structures, further minimizing the impact on existing drainage patterns of the Proposed Action.

The proposed action will preserve natural drainage patterns and existing watercourses to the greatest extent possible while minimizing their disturbance during highway construction. Culverts are designed to allow water to flow beneath the road when it crosses natural watercourses. The size and design of culverts are chosen to maintain natural flow patterns and aquatic habitat, while preventing erosion and flooding. Roadside ditches are designed to collect and channel stormwater runoff, ensuring their size and slope are adequate to prevent erosion.

The proposed action is anticipated to lead to a rise in stormwater runoff volume reaching nearby surface water bodies. This increase is attributed primarily to the expansion of impervious areas, particularly the paved section of the proposed new roadway. However, the storm sewer system design for the Proposed Action involves analyzing before-and-after conditions through a Hydrologic-Hydraulic (H/H) study, discussed in section 5.1.10 of this report. The results of this study, combined with the applicability of the Regulation for the Design, Operation, and Maintenance of Storm Sewer Systems (Regulation #40 of April 19, 2023) from the Puerto Rico Planning Board, will be considered during the design phase of the proposed action.

The updated regulations now incorporate requirements to address recent storm impacts and climate change conditions, allowing for the inclusion of appropriate mitigation measures to minimize adverse impacts as part of the Proposed Action construction.

Assessment of Landslide Hazard Risks

The municipalities of Utuado and Adjuntas are in the central mountainous region of Puerto Rico, an area that is characterized by steep terrain, heavy rainfall, and the presence of weathered volcanic and sedimentary rocks, which can contribute to landslide occurrences.

The geology and topography of Puerto Rico has always made Puerto Rico susceptible to landslides. A recent [hazard risk assessment report for Puerto Rico](#) indicated the following:

- Landslides induced by heavy rain were one of the top three hazards impacting the island, second only to flooding and hurricane-force winds.
- For the two municipalities in which the PR-10 extension is located, Utuado and Adjuntas, landslide is the second highest hazard risk behind hurricane wind.
- The municipalities of Utuado and Adjuntas have very high to extreme susceptibility to landslides.
- PR-123 has an extreme susceptibility to landslides along most of the PR-10 extension.

A review of the PRHTA Geotechnical Engineering Office (GEO) database geotechnical reports revealed the following:

- Based on a review of more than 100 site locations along PR-10 and PR-123, there were at least 20 definite reports and 5 probable reports of documented landslide incidents, with 19 incidents along PR-10 and 6 incidents along PR-123. Most of these landslide reports are supported field observations and detailed subsurface exploration data including site photographs and measurements of slide areas, soil boring samples, rock cores, and inclinometer readings.

- Of these 25 geotechnical reports, there were four definite reports and two probable reports of documented landslide incidents within the 7.6-Km Utuado-Adjuntas extension of PR-10.

This data is considered in the design and construction phase of the Proposed Action. It is essential to reduce water runoff speed in steep terrain and adequately manage increased water flow to reduce or avoid landslide in this type of terrain.

The proposed completion of PR-10 between Utuado and Adjuntas provides a more stable north-south route that can reduce traffic delays from landslide damage along PR-123. Additionally, the Proposed Action would provide improved access to utility rights-of-way that can help facilitate post-disaster repairs to damaged electrical transmission lines.

The required steep cuts will be reinforced with a soil nails system which will protect the roadway against landslides and reduce the volume of cuts resulting in reduced environmental impacts. Twenty (20) bridges will be built to maintain free flow conditions to the rainfall water and avoid the washing-out of the embankments of the new road during heavy rainfall events.

Measures for the Proposed Action protection against landslides are as follows:

1. **Site Evaluation and Planning:** A thorough site evaluation through the planning process is being done and will continue during the design process, to assess the geological conditions, including slope stability, soil types, and drainage patterns. Areas prone to landslides will be identified to avoid construction of the road in high-risk zones, if possible.
2. **Slope Stabilization Techniques:** Slope stabilization measures will be taken as part of the design phase and construction phase. They will include techniques such as terracing, retaining walls, rock bolts, soil nails, and slope reinforcement with geosynthetic materials. The specific methods used will depend on the site conditions and engineering recommendations.
3. **Drainage Systems:** An effective drainage system will be designed and constructed to manage surface water runoff and prevent the accumulation of water on or near slopes. Adequate culverts, ditches, and channels will be installed to divert water away from the slopes and road surface. Proper drainage will aid in maintaining the stability of the slopes by reducing soil saturation and erosion.
4. **Vegetation and Erosion Control:** During the construction phase PRHTA has stated that it will implement measures to preserve or restore vegetation along slopes and in areas adjacent to the roadway. Planting trees, shrubs, and grass helps stabilize the soil, control erosion, and absorb excess water. PRHTA has also stated that it will incorporate erosion control techniques such as erosion control blankets, matting, or geotextiles to prevent soil erosion and promote vegetation establishment.
5. **Retaining Structures:** PRHTA has stated that it will design and construct retaining walls or embankments where necessary to support or stabilize slopes. Retaining structures will provide additional stability to steep or problematic areas along the roadway, reducing the risk of slope failure.

6. Regular Maintenance and Monitoring: PRHTA has stated that as part of the roadway operation it will establish a regular maintenance program to inspect and address potential issues promptly. Regular monitoring by a third party of slope stability, drainage systems, and vegetation health is essential to identify any signs of instability or erosion. Implement early warning systems, such as slope sensors or rainfall monitoring, to detect changes that may indicate an increased landslide risk.
7. Qualified geotechnical, highway, and civil engineers, as well as other relevant professionals such as environmental professionals, will team up to ensure the design, construction, and maintenance of the roadway follow best practices and meet safety standards. Their expertise will help in conducting detailed geological surveys, analyzing slope stability, and recommending appropriate mitigation measures that will be considered in the design and construction phase of the Proposed Action.

Upon reviewing available information, it has been determined that an impact code 3 (slight adverse impact) is adequate for the Proposed Action. This determination is supported by the compromise to provide adequate mitigation measures described in this section as well as in section 5.3.

Hazards and Nuisances including Site Safety and Noise

The Proposed Action will have a minor adverse impact on Hazards and Nuisances for Noise. A Noise Study was performed, and results indicated that the existing noise levels do not exceed an Leq of 50.2 dB, which is considered “Quiet.” This would be less than the HUD action level DNL of 65 dB. Projection of future noise levels for the closest residential areas using applicable FHWA and HUD noise impact criteria resulted in predicted noise levels below the threshold levels that are required to consider noise abatement mitigation measures (Leq = 67 dBA and DNL of 65 dBA respectively).

There will be noise associated with construction, including the blasting of some rocky areas. However, that noise is associated with road construction and will cease upon completion of the Proposed Action. Additionally, safety measures must be taken during times of blasting activities to prevent injury to workers and other non-workers that may be in the area.

The use of explosives in the construction of a rural highway project is a highly regulated and controlled process that requires careful planning, preparation, and execution to ensure the safety of everyone involved. Environmental restrictions that will be implemented during the construction phase of the proposed action to control the use of explosives include the following:

- To control the noise level, maximum noise levels will be established as well as limiting and restricting the times when explosives can be used.
- To control the air quality impact of explosives, dust and smoke control measures will be implemented, such as using water to suppress dust.
- Sediment control measures to prevent soil erosion and runoff and to contain any spills that may occur during the handling or storage of explosives will be implemented.

- To manage waste, waste management practices will be implemented, such as recycling or reusing materials where possible, and disposing of waste in accordance with local regulations.
- To protect wildlife, buffer zones will be established around sensitive areas, and construction activities will be scheduled to avoid critical periods of wildlife activity, such as nesting and breeding seasons.

The occurrence of landslides along the path of the Proposed Action corridor has been considered to pose a potential safety hazard during the construction and operation of the new roadway. As a result of the extreme rain events experienced in Puerto Rico in the aftermath of Hurricanes Irma and María, many landslides were documented on highways located mostly within the mountainous central portion of the Island. The Adjuntas and Utuado regions were not exempted from these incidents which were studied by the U.S. Geological Survey (USGS). This agency issued a map (see **Attachment 2, Figure 31**) depicting the potential for landslides for Puerto Rico on an area basis (landslide per square kilometer) in 2017. A review of report indicates that the Proposed Action area landslide density is estimated less than 25 landslides per square kilometer ([landslide map Puerto Rico | U.S. Geological Survey \(usgs.gov\)](https://www.usgs.gov/landslide-map-puerto-rico)).

To adequately address this potential risk, the Proposed Action design incorporates the results of geotechnical studies as well as H/H studies. Geotechnical studies are required to analyze the geological conditions of the existing formations and type of soils found along the path of the Proposed Action corridor while the H/H studies analyze the current natural drainage patterns of the area to define adequate design measures aimed to minimize the potential damages resulting from the occurrence of landslides. The design is required by regulations and updated design practices, to consider the potential impacts of extreme weather events and experiences learned from the construction of section of PR-10 currently in operation. A detailed discussion of this subject has been incorporated in the previous section of the report titled **Assessment of Landslide Hazard Risks**. This measure warrants that an adequate phasing of the construction activities will be developed as part of the recommendations of project designer and would also incorporate BMPs designed to minimize the effects of erosion on the newly formed slopes which may lead to unwanted landslides.

With respect to the potential risk of structural failures resulting from an earthquake, like the recent one that occurred on January 18, 2021, it is important to indicate that Puerto Rico is known to be in an active seismic zone. As a result of this condition, current Design and Building codes require designing seismic resistant structures to prevent catastrophic events to the extent possible. Therefore, the design of the Proposed Action incorporates seismic resistant measures which are based on the results and recommendations of the geotechnical and soil studies conducted for the Proposed Action. It should be noted that based on available information, no structures failure attributable to the referenced seismic event were reported for the Adjuntas and Utuado area. As a matter of fact, no damage to sections PR-10 structures already in operation was reported.

Upon reviewing available information, it has been determined that an impact code 3 (slight adverse impact) is adequate for the Proposed Action. This determination is supported by the compromise to provide adequate mitigation measures described in this section as well as in section 5.3.

Energy Consumption

The Proposed Action will have no impact on Energy Consumption. The new roadway will require no energy consumption for its operation. However, portable sources of electricity consisting of emergency generators would be used during the construction phase of the Proposed Action. Current Proposed Action drawings do not include the installation of light poles since this is a Rural Roadway. Also, due to the presence of endangered/rare species near the Proposed Action corridor, the installation of lighting poles is not recommended. Installation of lighting fixtures in a rural area like the one being considered for this project may constitute a source of what is known as lighting pollution, which may cause disruption of the behavior of reptiles, mammals, and insects among others. Therefore, from a perspective of wildlife protection, the installation of lighting pole is not recommended for this proposed action. Upon reviewing available information, it has been determined that an impact code 2 (no impact) is adequate for the Proposed Action. This determination is supported by the characteristics of the Proposed Action.

5.2.2 Socioeconomic Conditions

Employment and Income Patterns

The Proposed Action is expected to have a positive impact on employment and income patterns in the area. During the construction phase, the Proposed Action will generate new job opportunities for residents and those in nearby municipalities. We estimated the number of new jobs that would be created during construction using an employment multiplier developed by the Puerto Rico Planning Board for construction projects. This estimation indicates that over 4,528 direct and indirect employment opportunities would result from the construction phase of the Proposed Action.

Once the Proposed Action is operational, it is not anticipated to bring significant changes to local employment opportunities or income patterns.

Although the Proposed Action does not directly provide access to businesses, the Land Use Plans of the Municipalities of Utuado and Adjuntas¹ suggest that it will contribute to attracting tourists to the existing cultural, culinary, and scenic attractions within both municipalities. Additionally, it will facilitate the transportation of agricultural products from the region to external markets, enhancing cargo movement and service provision. These economic activities are expected to create new job opportunities.

¹ [Adjuntas Land Use Plan\(2011\)](#) at pages 67, 161 and 178 and [Utuado Land Use Plan\(2023\)](#) at page 146 and 147.

However, according to current US Census data, the region is projected to experience a population decline, with both municipalities losing nearly 15% of their respective populations by 2045. Employment growth rates are also expected to decrease by almost 10% by 2045. Several factors contribute to this decrease:

- A significant decline in birth rates.
- A decrease in manufacturing employment due to changes in federal taxation policies, international competition, and increased automation leading to reduced employment.
- An increase in the rate of out-migration to other parts of the United States.
- The disruption of economic activity caused by Hurricane María and other events such as earthquakes and COVID epidemic.
- A long-standing fiscal imbalance, culminating in the appointment of a federal oversight board in 2017.

These factors collectively contribute to the projected population decline and slower employment growth in the region.

Aside from the construction, the Proposed Action would not employ additional personnel or affect income patterns. Therefore, there is no impact associated with this Proposed Action and an impact code of 2 (no impact anticipated) has been assessed for the Proposed Action.

Demographic Character Changes and Displacement

The Proposed Action is not expected to have significant impacts on demographic character changes and displacement. The acquisition of the Right of Way (ROW) necessary for the construction of the proposed action has already been completed, except for Section IV. The Right of Way acquisition plans developed by the Puerto Rico Highway and Transportation Authority (PRHTA) indicate that the remaining acquisition procedures will only involve vacant structures and properties, with no further relocation required.

It is important to note that the remaining acquisition process will adhere to the guidelines of the Uniform Relocation Act (URA) as mandated. As a result, the demographic character of the area has not been significantly altered, and most of the individuals who were relocated have been resettled in nearby areas within Adjuntas and Utuado.

All acquisitions have been completed except for the ones pertaining to section IV in accordance with the URA. Based on available PRHTA records, acquisition affects only lots and structures. No family/business relocations are required. Therefore, applicable URA for relocations does not apply to the remaining section. In general, the demographic character change in the area has not been altered as a majority of the individuals relocated to nearby areas in Utuado and Adjuntas. Therefore, there is little impact associated with this Proposed Action and an impact code of 2 (no impact anticipated) has been determined appropriate for this subject.

5.2.3 Community Facilities and Services

Educational and Cultural Facilities

In the vicinity of the Proposed Action, there are no educational or cultural facilities. The closest such facilities are located in the towns of Utuado and Adjuntas, situated to the north and south of the Proposed Action boundaries. Based on the land use plans developed by these municipalities, there will be no direct or indirect impact on educational or cultural facilities due to the Proposed Action.

Due to the above-mentioned facts, an environmental impact code of 2 (no impact anticipated) has been assigned for the Proposed Action. While the Proposed Action is not expected to negatively impact these facilities, it will enhance residents' accessibility to the existing educational and cultural facilities in the area. An increase in tourism activities is also expected with improved access to the region.

Commercial Facilities

The Proposed Action is expected to have a positive impact on commercial facilities. This is due to the improved terrestrial connection between the northern and southern parts of the island, which will facilitate the transportation of raw materials and finished goods in a safer and more efficient manner. The completion of the Proposed Action corridor may stimulate the growth of private commercial ventures and provide quicker travel routes that benefit commercial facilities.

After considering the available information, it has been determined that an environmental impact code of 1 (slight beneficial impact) is adequate for the Proposed Action.

Health Care and Social Services

The Proposed Action is anticipated to have a positive impact on health care and social services. The improved roadway will enhance access to hospitals, emergency facilities, clinics, and physician services. This improved accessibility will result from a safer and more modern route, increasing the availability of these services in the municipalities of Arecibo, Ponce, Utuado, and Adjuntas.

An environmental impact code of 2 (no impact anticipated) is adequate for this category of assessment.

Solid Waste Disposal / Recycling

The finished roadway will not impact solid waste disposal and recycling. During the construction phase, a significant amount of construction debris is expected to be generated. To address this, a comprehensive operation plan must be developed by the selected contractor, covering the generation, handling, and disposal of construction waste. This plan must be approved by the Department of Natural and Environmental Resources (DNER) and should identify the permitted sanitary landfills that will receive the waste. Transportation of waste to these destinations must be carried out by DNER-approved transporters and accompanied by the required manifest for waste management, as per the Regulation for the Control of Non-Hazardous Solid Wastes.

A split 2 (no impact anticipated)/ 3 (minor impact anticipated) has been determined appropriate for this category of assessment. This rating is based upon the disparity between the finished roadway and the roadway construction. The finished roadway will not be associated with solid waste generation and will have no impact on these services. However, during construction, a significant amount of construction debris is anticipated to be generated. Because of this reason, mitigation will be required to address this condition and will consist of the preparation of an Operation Plan which must be prepared for the revision and approval of the DNER. These mitigation measures have been included in section 5.3.

Wastewater/ Sanitary Sewers

As the proposed action pertains to the construction of a new roadway and does not include offices or dwelling units, it is not expected to have significant impact on wastewater/sanitary sewers. However, during construction activities, minor impacts are expected, resulting from the generation of small amounts of wastewater by construction employees. To address this, portable toilets will be installed on-site and emptied by a licensed contractor who will transport the waste to an EPA/DNER permitted wastewater treatment plant facility. The contractor is required to develop a plan for handling and disposing of wastewater during the construction stage, subject to DNER approval.

As with the previous subject, a split rating of 2 (no impact anticipated)/ 3 (minor impact anticipated) has been determined to be appropriate for this category of assessment. The finished roadway will not be associated with wastewater generation and will have no impact on these services. However, during the construction, some wastewater will be generated. Therefore, mitigation will be required. Mitigation will consist in the preparation of a plan to be developed by the contractor and submitted for the review and approval of the DNER.

Water Supply

The Proposed Action will have no impact on water supply systems in terms of consumption. It will require only limited amounts of water for dust control, which may be sourced from non-potable sources. Water supply for construction purposes will be delivered using tank trucks, and no connections to existing Puerto Rico Aqueduct and Sewer Authority owned potable water utilities will be made when the Proposed Action is open for highway users. Thus, the water supply capacity for existing communities near the Proposed Action will remain unaffected. The Adjuntas Lake, located in proximity to the Proposed Action, is no longer used as a source of potable water due to sedimentation effects. The protection of the water quality of this reservoir will be ensured by rigorous implementation of Best Management Practices (BMPs) during construction to minimize negative impacts from erosion and sedimentation resulting from earthwork activities. Implementation of the required erosion and sedimentation controls should minimize the adverse effects on this water source and other sections of the Rio Grande de Arecibo.

There are no water supply issues associated with the construction or operation of the roadway. Therefore, there is no impact associated with this subject for the Proposed Action and an environmental assessment factor of 2 (no impact anticipated) has being assessed.

Police, Fire, and Emergency Medical Services

The Proposed Action corridor is situated between the towns of Adjuntas (to the south) and Utuado (to the north). While the Proposed Action does not create a new terrestrial interconnection route between these towns, it will have a positive impact on Police, Fire, and Emergency Medical Services. The Proposed Action will provide a safer and faster route for responding to emergencies in the southern parts of Utuado and northern parts of Adjuntas. After the Proposed Action completion, PR-10 will also facilitate the coordination of resources for responding to natural disasters and emergencies requiring joint efforts between the municipalities. The Proposed Action will enhance accessibility for these services, especially for the local population of nearby rural municipalities like Lares.

The completion of PR-10 will provide an easier means of access for these services, and therefore, there is a potential for a minor benefit associated with this Proposed Action. Because of this reason an environmental assessment code of 1 (minor beneficial impact) has been assessed for this Proposed Action.

Parks, Open Spaces, and Recreation

There are no Parks, Open Spaces and recreation facilities within the corridor of the proposed action. The proposed action is not expected to have a direct negative impact on parks, open spaces, and recreation areas. A review of the National Park Service database and Google Maps aerial photographs identified specific resources such as Cancha Pellejas and the Guarionex Recreational Complex, none of which will be impacted by the proposed action because they are located far away from the footprint of the corridor. (see **Attachment 2, Figure 32**). The completion of PR-10 will provide safer and faster terrestrial access to these locations, resulting in a positive impact.

Since no parks, open spaces and/or recreation areas will be significantly impacted by the Proposed Action an environmental assessment code of 2 (no impact anticipated code) has been assessed for the Proposed Action.

Transportation and Accessibility

The Proposed Action's construction will significantly reduce travel times for both passenger and freight vehicles that currently rely on PR-123 between Adjuntas and Utuado. Based on traffic analysis and demand modeling of approximately 5000 vehicles per day on a 7.6-kilometer roadway, it is estimated that the Proposed Action will save on average 11.96 minutes per vehicle for "on-peak" drivers and 10.76 minutes for "off-peak" drivers. These time savings translate into a reduction in Vehicle Hours Traveled (VHT) of 1,305,946 hours in the first year, with a total savings of 19,127,181 hours over the analysis period.

Additionally, the Proposed Action will lead to a substantial decrease in Vehicle Miles Traveled (VMT) for passenger and commercial freight vehicles, reducing total VMT by 3,503,467 annually through the analysis period. This reduction will result in cost savings, emissions reductions, and improved safety.

The completion of the Proposed Action will enhance accessibility between the north and south regions of the island, improving transportation routes for essential supplies and services. It will benefit residents by

providing a safer and more efficient highway, leading to an improved quality of travel, and facilitating the response to natural disasters. The Proposed Action will offer significant advantages for users, especially those commuting between Adjuntas and Utuado. In summary, the Proposed Action will have wide-reaching positive effects on both the south and north regions of the Island.

As previously mentioned, a traffic study conducted in 2021 for the Proposed Action forecasts that once the Proposed Action is operational, approximately 60% of the vehicular traffic will shift to the new roadway, while the remaining 40% will continue to use the existing PR-123. The primary goal of the Proposed Action is to enhance connectivity across the entire island by finalizing one of the limited transportation projects that spans from the northern to the southern regions. Completing this highway is one of the three critical road projects recognized by the PRHTA to ensure a robust transportation system for future emergencies.

The findings of the previously mentioned traffic study are applicable to all users of the proposed highway, with a particular focus on the current commuters between the municipalities of Adjuntas and Utuado. In essence, this Proposed Action will enhance access to medical services, facilitate goods and services movement, provide better access to parks, and enable a quicker response for residents in the event of natural disasters. The most significant benefit for future users of this Proposed Action will be a safer and more efficient highway, ultimately resulting in an improved overall travel experience.

Considering the enhancement of the accessibility and mobility of current users of PR-123 that will provide the Proposed Action, it has been determined that an environmental assessment code of 1 (minor beneficial impact) is appropriate for this Proposed Action.

5.2.4 Natural Features

Unique Natural Features, Water Resources

There are no unique natural features within the corridor that could be affected by the proposed action.

The Rio Grande de Arecibo River and its watershed constitute the surface body of water located adjacent to the proposed action ROW and therefore the one whose quality may be impacted by the construction of the proposed action. It shall be indicated that water quality of the Rio Grande de Arecibo constitutes an important subject for consideration of the EA since downgradient toward the north of the Dos Bocas reservoir, a major potable water intake of what is locally known as the “Superaqueduct,” built by the Puerto Rico Aqueduct and Sewer Authority (PRASA) started its operation in 1996. Said facility has daily maximum design capacity for 100 million gallons per Day (MGD) out of which approximately 65 MGD are conveyed to the San Juan Metropolitan Area and the remaining 35 MGD are distributed among eight municipalities along its path. Once the raw water is treated at the Antonio Santiago Vázquez filtration plant (located at an approximate distance of 17.4 kilometers toward the northeast boundary of the town of Utuado, in the municipality of Arecibo), the water is distributed through a 72” diameter pipe that runs mostly along the ROW of PR-22. For practical purposes, the Dos Bocas reservoir constitutes a sediment trap that serves to protect the intake of the potable water system from high loads of sediments originated

in the upper parts of its drainage basin as indicated in studies conducted by the U.S. Geological Service (USGS) that are discussed later in this section. Finally, it shall be noted that Lago Adjuntas, which is located near section IV and V of the proposed action, was used as a source of potable in the past, is no longer operating as a source of potable water due to the cumulative effects of sedimentation in the lake. This effect is related to sources of sediments located toward the southern sections of the drainage basin.

In Puerto Rico, the Department of Natural and Environmental Resources (DNER) has received delegation from the EPA to develop and enforce the Water Quality Standards Regulation (WQSR) that requires the agency to conduct regular monitoring of the quality for the protection of the resources for recreation, prevention of the resource's degradation and protection as sources of potable water for the population. The Rio Grande de Arecibo is a surface body of water that has been designated as a class SD under provisions of Rule 1302.2 of the WQSR based on the designated use to be protected. This designation applies to all surface bodies of water except for those classified as SE which applies to Laguna Cartagena, Laguna Tortuguero and any other surface body of water with exceptional quality or high ecological or recreational value which may be designated by the pertinent agency through a Resolution requiring this classification for protection of the waters. Section 303 (d) of the Clean Water Act authorizes the EPA to assist the state and its territories in listing impaired water surface bodies of water and developing as needed Total Mass Daily Loads (TMDLs) to protect these waterbodies. A TMDL establishes the maximum amount of a pollutant allowed in the waterbody and serves as the starting point or planning tool for restoring water quality. Therefore, on a biannual basis, the DNER publishes a 303 (d) and 305 (b) Integrated Report (drna.pr.gov/wp-content/uploads/2024/04/Water-Quality-Area-PR-2022-305b-303d-IR.pdf). This report identifies the surface bodies of water or segments of them, that based on the results of water quality laboratory test results, have been identified as surface bodies whose qualities have been degraded as result of the discharges it receives. Said report also provides information about the potential sources of pollutants and describes the specific water quality parameter being impaired. In the 2022 report, which was published on September 2023 information pertaining to segment AU PRNT7A2 and monitoring station 50025000 of the Rio Grande de Arecibo ([How's My Waterway - Waterbody Report \(epa.gov\)](https://epa.gov)) located in the Rio Grande de Arecibo located downgradient from the area of the proposed action resulted in the listing as an impaired waterbody for the following parameters:

- Chromium VI
- Enterococcus
- Pesticides
- Temperature
- Total Phosphorus
- Turbidity
- Total Nitrogen

This means that the Río Grande de Arecibo River is currently receiving discharges that are causing high concentrations for the listed parameters.

The report also indicates that the following potential sources of pollutants have been identified:

- Agriculture
- Collection System Failure
- Confined Animal Feeding Operations
- Landfill
- Major Municipal Point Sources
- Minor Industrial Point Sources
- Onsite Wastewater Systems
- Urban Runoff/Storm Sewers

It is important to indicate that to this date the DNER has not established a TMDL applicable to this segment of the river that requires a need to implement control measures beyond those required by the 2022 Construction General Permit construction general permit (CGP) for on road construction projects. Therefore, compliance with the project's CGP needs meets the need to address the discharges of proposed action waters resulting from dewatering operations to impaired waters during the performance of earthwork related activities. With respect to the environmental review process. The DNER has established a strategy to deal with these conditions through the application of its WQSR by establishing the requirement of permits to regulated activities and the development of a Management Plan for the river's basin. Also, it is important to note that parameters causing impairment appear to be mostly related with current agricultural uses, confined animal feeding operations, properties not in use with exposed soils, and the extensive use of individual septic systems resulting from the lack of sanitary sewer systems operated by the Puerto Rico Aqueduct and Sewer Authority (PRASA) observed in the drainage basin. Single family septic tank systems are currently not regulated by the DNER but are common in the central part of the Island which in conjunction with the discharge of grey waters (usually generated by activities such as dishwashing wastewaters) are commonly observed in the rural areas and may contribute with pollutants such as phosphate, bleach, formaldehyde, ammonium sulfate, among others. The construction and operation of these single dwelling housing systems are not currently regulated by the DNER and therefore are known to contribute to the degradation of the quality of surface bodies of water. Finally, it is important to indicate that the DNER regularly continues the monitoring quality of the surface bodies of water. The results of the sampling serve to monitor the success or failure of the antidegradation policies being enforced by the agencies and continues the establishment of TMDL as required to meet the WQSR objectives.

The proposed action will have no significant impact on Unique Natural Features and with respect to water resources quality, the proposed project area construction area has been estimated in 209 acres, which when compared to the size of the entire drainage basin of the Rio Grande de Arcibo estimated in 103,761 acres by the USGS represents only 0.2 % of it. This implies that no significant water quality impacts can be reasonably expected because of the project construction and operation since BMP will be implemented during the construction stage of the proposed action.

The latest letter from DNER dated September 30, 2021, indicates (see Attachment 12) no impact from the proposed action to the water resources or other natural resources within surrounding areas. Attachment

25 includes the Hydraulic/Hydrologic (H/H) studies performed for the construction of the bridges of the four (4) sections as well as the DNER endorsements for each one of the sections. In general, the agency provided the following recommendations throughout their responses for comments:

- For the construction of bridge BR-1 of Section II (AC-100069), the DNER establishes the need to secure a Nationwide Permit #14 from the USACE (already obtained).
- If a superficial or underground body of water is found, either perennial or intermittent, it shall be immediately notified to the DNER and/or other agencies with jurisdiction.

The construction and use of a highway, introduces three general potential water quality hazards:

- An increase in the volume of runoff due to additional paved areas.
- Temporary ground water contamination resulting from waste disposal or the use of contaminated fill material.
- A change in the quality of runoff water due to increased erosion during and after construction as well as additional pollution inherent to highway traffic.

It is rather difficult to predict the increase of water quality pollutants quantitatively resulting from the construction and operation of a new highway facility. However, it shall be indicated that currently, the operation of PR-123 already contributes to the generation of pollutants associated with the traffic flow in the area. After construction of the Proposed Action, it is reasonable to expect that the generation of pollutants resulting from the operation of the existing roadway would be transferred to the new highway while a reduction of the potential for the generation in the current PR-123 would occur. The following is a list of pollution sources affecting the quality of highway runoff:

| <u>Source</u> | <u>Pollutant</u> |
|----------------------------|---|
| Vehicles | Lubricants, hydraulic flues, coolants, tire dust, dirt carried on undercarriages, fuel residue, particulate exhaust emissions, brake and clutch lining materials. |
| Street Surface Material | Asphalt and its decomposition products, aggregates and crack fillers. |
| Runoff from Adjacent Areas | Silt, leaves, grass clippings, soil stabilizers and growth control compounds. |
| Litter | Diverse items |
| Spills | Oil, gasoline, bulk goods, and other items |
| Sediments | Unprotected soil exposed during highway and bridge construction |

It is anticipated that the contribution of the first five items towards the degradation of water quality of the Río Grande de Arecibo will be so minor that extensive evaluation of the probable impact is not warranted. Normal operations of the facility will not generate large quantities of the above items to adversely impact water quality. However, the potential impacts of soil erosion require the adoption of temporary and permanent exposed soil protection measures discussed in other sections of this report. These measures would also help to address the generation, reduction and control of sedimentation and turbidity that, if not adequately controlled may affect the quality of the receiving bodies of water. The design of the proposed highway will include measures to avoid and/or minimize erosion, sedimentation, turbidity, and water pollution. These include the replacement of vegetation on exposed areas as soon as practicable, especially on slopes, construction of diversion swales at the top of newly formed slopes to minimize the entrance of run-on water to the Proposed Action site. Also, to reduce the contamination of stormwater runoff during the operation of the highway the following BMP have been incorporated in the design:

- A strip of vegetation has been provided between the roadway and the lateral swales that convey the stormwater runoff toward the discharge points;
- The discharge of the stormwater runoff associated with the operation of the bridges has been designed to occur either before or after the bridge and has been provided with oil/water separators to retain to the extent possible small leaks that may occur. This measure may also help to collect coarse sediments that may have reached this device.

A potential hazard exists along one kilometer of roadway which approaches the Lago Adjuntas. The lake is no longer operating as a source of potable water due to the cumulative effects of sedimentation in the lake. However, if a spill of toxic chemicals occurs on the road, the runoff would flow directly into the lake thereby contaminating the body of water. Therefore, erosion control measures must be complete and effective to avoid further impacts. The potential hazard of dangerous spills will be minimal because a new road designed at high safety standards will greatly reduce the possibility of accidents. It shall be also noted that existing PR-123 operating conditions present higher risks for the occurrence of spills that may affect the water quality of the Adjuntas Lake due to its geometrical limitations. The Proposed Action would improve this condition.

Consultation with the DNER indicates that no impact on the surrounding areas is expected based on the hydrologic surveys performed for the four sections. Therefore, an environmental assessment code of 3 (minor adverse impact) was assessed for this category. This will require adopting mitigations measures during the construction phase of the Proposed Action to protect the Rio Grande de Arecibo. These measures will be included in the SWPPP that will be prepared for the Proposed Action to secure coverage of the Construction General Permit (CGP) issued by the EPA.

Vegetation, Wildlife

A description of the existing vegetation (trees, shrubs, and herbs) along the path of the proposed action was included in the FEIS. An updated Flora and Fauna Study including a description of the vegetation for the present Proposed Action was prepared in 2002 and covered an area of approximately 50 – 60% of the

total corridor of the Proposed Action. On more recent dates, extensive defoliation of the Proposed Action area vegetation and habitat destruction occurred in the aftermath of hurricanes Irma and Maria in 2017. Nevertheless, subsequent site visits over these years and discussions with organizations knowledgeable in this field have revealed a gradual recovery in the local flora. A brief summary of the wildlife and vegetation description observed within the corridor of the Proposed Action, obtained from both the 2002 study and the survey for the detection of the presence/absence of the Puerto Rican Broad-winged Hawk (*Buteo platypterus brunnesceens*) reports of 2013-14 included in **Attachments 13** and **14** indicate that:

- “The area is located in the Subtropical Wet Forest life zone (Ewel & Whitmore, 1973) and it is composed by a combination of Sub-montane and lower montane wet evergreen forest/shrub and active/abandoned shade coffee, Sub-montane wet evergreen forest and pastures (Gould & et. al., 2008; Miller & Lugo, 2009).”
- “The diversity of the species is higher through the central portion of the alignment.”
- “Understory is irregularly developed, frequently absent or undeveloped, possible due to clearing for coffee cultivation and Musa plantations and washing of deposited seed by runoff water on very thin litter mattress and very steep slopes. When present, it was composed by saplings of canopy species, remains of Coffea (Arabica and robusta) plantations, Cyathea arborea and Casearia guianensis.”

Additional information about the existing vegetation along the path of the Proposed Action corridor can be obtained from page 9 of the field protocols to be implemented at the request of DNER and approved in September 30, 2021 for sections II, III and IV and in October 25, 2021 for section V. Copy of the protocols have been included in **Attachment 15**) which indicates that:

- *“The area shows a matrix of young to moderate mature secondary forest with a mosaic of manmade features (roads, houses, power lines, etc.), Mussa and Coffea, both active and abandoned, plantations, bamboo groves, openings (pastures, shrub land, bare soil areas, etc.) and areas occupied by more mature, denser, and taller tracks of secondary forest. Residential dwellings are sparsely distributed, more common in Sections II, III and V. No active human dwellings were found in Section IV. However, several abandoned human dwellings, electric poles, shacks, and ornamental plants, indicates that this section supported a greater degree of human activities in the past. Aerial images taken in 1930’s shows drastic deforestation and clearing implemented during those years in significant portions the proposed alignment. Some forest fragments which were spared may now have evolved to more mature secondary forest tracks.*
- *“Some forested areas are dominated by Cecropia peltata, Guarea guidonias, Zanthoxylum martinicense, Cordia sulcata, Inga laurina and Inga vera. This cover type contains tall (DBH >20”, height>50’) emergent trees of Ochroma pyramidale, Castilla elastica, Trichillia pallida, Guarea guidonias, Roystonea borinquena and Zanthoxylum martinicense. Around houses and roads was common the presence of fruit tree species like Mangifera indica, Mammea americana, Psidium guajava and Persea americana.”*
- *“Understory is irregularly developed, frequently absent or undeveloped, possible due to clearing for coffee cultivation and Musa plantations and washing of deposited seed by runoff water on very thin litter mattress and very steep slopes. When present, it was composed by saplings of canopy*

species, remains of Coffea (arabica and robusta) plantations, Cyathea arborea and Casearia guianensis.”

Further review of recent publicly available databases and reports providing information about the existing vegetation along the Proposed Action corridor was conducted and the results are summarized below. With respect to the studies, it is important to indicate that most of them have been conducted using remote sensing technology that allows the observation of the before and after condition of the vegetation. The information has been used by local and federal agencies to develop geospatial maps that may be accessed by the agencies and the public as a planning tool.

- A report titled “**A Comprehensive Inventory of Protected Areas and Other Land Conservation Mechanism in Puerto Rico**”² was published by the International Institute of Tropical Dasonomy of the USDA Forest Service in August 2019². The report was prepared with the cooperation of the USFWS, DNER, PRPB, Caribbean Landscape Conservation Cooperative, Para la Naturaleza, Alma de Bahia, and Bahia Beach Resort & Golf Club. Geospatial inventories of protected areas and information pertaining to additional conservation mechanisms that were established to protect natural resources are useful in evaluating conservation effectiveness and supporting conservation planning at broader scale that can serve for long term objectives. It also indicates that the lack of a single inventory and common terminology among stakeholders in Puerto Rico was identified as a major limitation in planning and monitoring conservations effectiveness across the Island. To overcome the described conservation limitations, the report delineates a multiagency/organization effort aimed to facilitate communication between managers and stakeholders of protected areas toward an integrated system for the conservation of natural and cultural resources in Puerto Rico. As part of this endeavor, an inventory of protected public and private lands was developed and a map illustrating their location included in the report. Said figure incorporates the proposed action area (see **Attachment 2, Figure 33**). A review of the illustration discloses the fact that no critical or conservation designated area has been identified within the proposed action corridor which validates the results of previous studies. It’s important to note that this document constitutes one of the most recent efforts designed by the entities to publicly disclose the location of areas which merit conservation measures based on the known data.
- Recent information about the condition of the vegetation along the path of the Proposed Action in the aftermath of Hurricane María was obtained to supplement available information about thus subject. To that end, specific information was obtained from the report titled [Impacts of Hurricane María on Land and Convection Modification over Puerto Rico - Hosannah - 2021 - Journal of Geophysical Research: Atmospheres - Wiley Online Library](#) which provides the result of the analysis which was conducted using LANDSAT-8 image mosaics to quantify the hurricane land modifications (2020). It is important to indicate the study was performed to assess the condition of the entire Island, which includes the Proposed Action area. The result of the analysis indicates that:

² Castro-Prieto, Jessica; Gould, William A.; Ortiz-Maldonado, Coralys; Soto-Bayó, Sandra; Llerandi-Román, Ivan, Gaztambide-Arandes, Soledad; Quiñones, Maya; Cañón, Marcela; Jacobs, Kasey R. 2019. A Comprehensive Inventory of Protected Areas and other Land Conservation Mechanisms in Puerto Rico. Gen. Tech. Report IITF-GTR-50. San Juan, PR: U.S. Department of Agriculture Forest Service, International Institute of Tropical Forestry.161 p.

- The before and after analysis of the Normalized Difference Vegetation Index (NDVI) indicated a decrease value across the Island after Hurricane María, particularly over El Yunque, along the north coast, and at the center of the Island.
- Based on the imagery analysis, it was estimated that before Hurricane María, approximately 53% of land cover was forest, with forests located along the south-central coast, largely virgin evergreen forests within El Yunque at the eastern side of the Island, dry/moist serpentine forest in the northwest and mostly moist forests in the central to eastern areas.
- Most of the forest cover island-wide apart from the south was severely impacted, with satellite imagery indicating a decrease from 53% to 11%. The northwest exhibits the most forest damage followed by the central region and El Yunque. The grass cover increased from 15.45 % to 26.30%.

The study concluded that Puerto Rico suffered significant damage to its land cover (excluding the south coast) and that approximately 80 % of the forest cover was affected.

- The PRPB has an online search engine known as Puerto Rico Interactive Map (<http://gis.jp.pr.gov/mipr>). Through this portal, a series of georeferenced maps is available for the public including ecological and flora/fauna resources. After consulting this reference, it was found that no protected forest nor endangered/rare habitats of plants were identified along the path of the proposed action corridor. **Figures 34, 35 and 36** illustrating the results are included in **Attachment 2** for reference and validate findings other sources of information results.

Finally, it is important to indicate that continuous coordination with the DNER and USFWS has been maintained through the course of the years as evidenced by the record, to update the survey for the presence of protected flora species that may have been added to the list of rare/endangered species that would have triggered the need to comply with applicable requirements of Section 7 of the ESpA.

Wildlife

Regarding wildlife, studies conducted in 2002 for the flora/fauna, and 2013-14 for the Broad-winged Hawk (*Buteo platypterus brunnesceens*) disclosed the following findings:

- “Most of the animals observed in the study area are common species found in similar locations within the Island.”
- “The diversity of the species is higher through the central portion of the alignment.”
- “Since most of the study area has been used for coffee crops in the past, the abundance of animal species is low when compared to nearby forests such as Guilarte and Toro Negro Forests. The greater diversity and abundance of species was found at the central part because slopes in the mountains are higher thus limiting their use for agricultural purposes. Also, it was noted that greater biodiversity was observed at locations close to the river, especially near Adjuntas Lake.”

- “Although not observed during the six (6) months of observations for the study, it is understood that some areas along the corridor near the Rio Grande Arecibo are suitable to constitute a habitat of the *Chilabothrus inornatus* (Puerto Rican Boa).
- “The Broad-winged Hawk (*Buteo platypterus brunnesceens*) was not observed within the corridor of the Proposed Action.”

To update previous findings about the wildlife resources identified through previous studies along the path of the proposed action corridor, a review of georeferenced sources of information for wildlife in Puerto Rico was conducted. The investigation resulted in the identification of the report titled **Puerto Rico State Wildlife Action Plan: Ten Year Review**, ([PRCWCS: ELEMENT 2 & 4](#)). The report was developed by the DNER and the USFWS with the objective of assessing the progress of a comprehensive strategy for the conservation of Puerto Rico’s wildlife resources and documented the progress made to accomplish among others, the following activities:

- Identify and address the conservation needs of Puerto Rico’s fish and wildlife.
- Prioritize efforts for species with great conservation needs.
- Allow the DNER to work with partnerships to conserve, enhance and protect Puerto Rico’s diverse, but not necessarily rare or at risk, fish, and wildlife species.

The previously referenced report acknowledged that new species were identified and included in the plan and new and completed databases resulting from the terrestrial and aquatic gap analysis projects added. The plan also recognized that climate change is considered as a new stressor and threat for wildlife species and habitats and updated previous wildlife data such as:

- Updated Land Cover Map of Puerto Rico (see **Figure 37** in **Attachment 2**)
- Puerto Rico Land Stewardship Map (see **Figure 38** in **Attachment 2**). The land stewardship is an interagency collaborative effort to update and existing, but not complete land stewardship layer of Puerto Rico. The figure identifies a total of 21 public land managers.
- Distribution of Critical Elements in the Natural Heritage Program (see **Figure 39** in **Attachment 2**)

After reviewing the information obtained from this report, the presence of critical wildlife resources was not identified along the path of the proposed action corridor. Also, it shall be noted that the recommendations for the protection of the Puerto Rican Boa (*Chilabothrus inornatus*) were addressed in section 5.1.7 Endangered Species through the acceptance of the PBO recommended by the USFWS.

The new roadway construction entails the removal of vegetation and trees within the right of way, resulting in an impact on forested areas. After the construction is finished, there is a plan to revegetate exposed areas using methods such as hydroseeding, avoiding the use of impervious materials. While this commitment of resources is unavoidable, it is deemed necessary for the successful completion of the PR-10 construction. Following this, an agreement was established to acquire Hacienda Verde farm, encompassing 253.23 cuerdas (245.88 acres). As part of the agreement, 117 cuerdas (113.61 acres) of Hacienda Verde were designated for transfer to DNRE as compensation for the impacted trees and habitat loss, while the remaining area would serve as a mitigation bank for future projects.

In the context of the proposed action, PRHTA sought an exemption from conducting a tree inventory and suggested using the remnant lands of Hacienda Verde as compensation and mitigation for tree and habitat loss. On August 1, 2011, DNRE granted PRHTA the exemption from conducting a tree inventory for the proposed action. Both agencies agreed to transfer 253.32 cuerdas of Hacienda Verde as compensation and mitigation, aligning with compliance requirements outlined in Regulation 25, Law 241 of 1999, and its Regulation Number 6765, addressing wildlife and vegetation management and conservation. The property transfer was officially completed through a deed signed in 2021. (**See Attachment 26**)

The agreement stipulates that PRHTA must contract a biologist for assessing the areas before commencing construction activities to identify the presence of state and federally protected, threatened, and/or endangered species. If such species are identified, individuals will be relocated to designated areas following approved protocols. Given these conditions, an environmental assessment code of 3 (indicating minor adverse impact) has been assigned to this category.

Concerning wildlife, the construction of the proposed action may cause disruption along its path. However, the affected wildlife is expected to relocate to nearby areas. Consideration of the guidelines for assessing avoidance measures of highway projects that are aimed at the reduction of habitat fragmentation when avoidance of the resource is not completely possible were reviewed during the design, however it is important to indicate that the vicinity of the Rio Grande de Arecibo to the proposed action corridor constitutes, in practical terms, a natural barrier for the wildlife habitats fragmentation. An additional consideration that was adopted for the design of the proposed action was to incorporate measures during the selection of the alignment that help to minimize barrier effects of the proposed action. Such recommendations have successfully been applied to the proposed action. Early in the year 2000's the proposed action along with two previous sections of PR-10 north of the northern limit of the proposed action, were shifted further east to reduce earth movement, projects cost, relocation impacts as well as habitat fragmentation. Mitigation of the barrier effect of the proposed action has been accomplished by providing 20 bridge structures that represent approximately 32% of its project length as well as the drainage structures of the other sections of the highway, that will allow the passage of the local fauna through it. Additional enhancements of these measures are expected during the remaining design process of the proposed action.

Consequently, there is no anticipated adverse impact, as wildlife is expected to adapt to the new conditions, similar to what has been observed in sections of the already constructed PR-10. To obtain an updated endorsement of the DNER for the Proposed Action, the PRHTA sent a written request on January 9, 2024. In response to this request, the DNER issued a response on February 9, 2024 validating its previous endorsements for the project. Copy of this letter has been included in **Attachment 12**.

Other Factors

Climate Change and Hurricanes

"Climate change" refers to the gradual, long-term alterations in climate measures, encompassing factors like rainfall, temperature, and wind patterns.

To gain a comprehensive understanding of the broader implications of constructing rural highways on climate change, it is essential to adopt a holistic viewpoint. This entails evaluating various factors, such as the density of existing road networks in the region, traffic volume, travel speed, traffic patterns, induced travel effects, and the implementation of environmental mitigation measures.

Studies suggest that this region may experience a decline in economic activity, a reduction in population, and a decrease in job creation. Traffic studies also anticipate a modest annual traffic increase of approximately 1 to 1.2% over the next two decades, while land use and transportation plans for this region do not include any future major highway projects.

The proposed highway construction will fulfill the originally planned route, potentially boosting economic development by enhancing access to markets, services, and employment opportunities that are presently more accessible. This, in turn, could reduce the dependence on high-carbon emission economic activities within the agriculture sector or manufacturing in favor of lower-emission service and knowledge-based industries.

It is important to note that there are no activities associated with the construction and operation of PR-10 that would have a significant impact on climate change.

The proposed action offers several positive outcomes in this context. It enhances transportation efficiency by improving connectivity and reducing travel time. This improvement is expected to lead to optimized fuel consumption and a reduction in vehicle emissions per unit of distance traveled, potentially resulting in lower greenhouse gas (GHG) emissions. In the first year of benefits, it's estimated that the Proposed Action will reduce the total Vehicle Hours Traveled (VHT) by 1,305,946 hours, with total time savings of 19,127,181 hours over the analysis period.

Furthermore, the Proposed Action will lead to a decrease in Vehicle Miles Traveled (VMT) for both passenger and commercial freight vehicles. This reduction is primarily due to the shorter distance along the new PR-10 connector compared to the existing comparable portion of PR-123. This difference will result in an annual reduction of 3,503,467 total VMT throughout the analysis period. This reduction in VMT will contribute to lower emissions, thus helping mitigate the negative impacts of climate change.

To address environmental concerns, the Proposed Action includes various mitigation measures. These measures focus on protecting and restoring natural habitats, implementing green infrastructure practices, and promoting sustainable construction techniques. By mitigating the environmental impact of construction and either preserving or enhancing ecosystem services, these measures can actively support climate change adaptation and mitigation efforts. The overarching goal is to safeguard the road infrastructure from climate change impacts and prevent any increase in vulnerability in the surrounding area due to these impacts.

To safeguard the Proposed Action from potential adverse impacts of climate change, measures are being integrated into both its design and construction phases to the extent feasible. The PRHTA aims to address

climate change effects in multiple ways to reinforce the primary goal of enhancing user accessibility and mobility. These efforts will focus on:

- Protecting the road infrastructure from the effects of climate change.
- Ensuring that the road infrastructure does not exacerbate the vulnerability of the surrounding area to climate change impacts.

Climate change can significantly affect rural highway construction in mountainous regions, presenting unique challenges that must be considered during planning, design, and maintenance. Specific impacts include:

- Increased landslides and rockfalls due to more intense rainfall events and changing precipitation patterns.
- Higher temperatures and extreme heat affect worker safety and pavement materials.
- Changes in hydrology and drainage, leading to increased runoff and flash floods.
- Spread of invasive species and pests affecting slope stability and vegetation health.

To adapt to these climate change impacts and ensure highway construction resilience in mountainous areas, the following strategies will be employed:

- Thorough site assessments and consideration of future climate projections during the design phase.
- Use of climate-resilient and durable construction materials.
- Implementation of slope stabilization and hazard mitigation measures.
- Construction of culverts and bridges to handle increased water flow during intense rainfall.
- Integration of eco-friendly construction practices to minimize environmental impacts.
- Measures to prevent riverbank erosion, such as riprap or vegetation stabilization.
- Consideration of flood risk assessments and adequate drainage systems.
- Design and placement of bridges to accommodate potential changes in river flow and water levels.
- Implementation of erosion and sediment control measures during construction to maintain water quality.
- Efforts to minimize disturbances to aquatic habitats during construction.
- Consideration of potential bridge scouring due to altered river flow patterns.
- Regular maintenance of bridges to prevent structural damage and ensure stability.

These measures and strategies will enhance the Proposed Action resilience to climate change impacts while promoting the safety and sustainability of the highway infrastructure.

Considering the scope of the proposed action, it is understood that there are no activities associated with construction and operation of PR-10 that would significantly contribute to climate change. Therefore, an environmental assessment code of 2 (no impact anticipated) has been assigned to this category.

Hurricanes in Puerto Rico

Puerto Rico is located in a region prone to tropical storms and hurricanes within the Caribbean. As a result, the local population and agencies are well-prepared to create plans aimed at aiding the deployment of emergency response teams and equipment during the hurricane season. The hurricane season, as established by the National Weather Service (NWS), runs from June 1st to November 30th for Puerto Rico and the U.S. Virgin Islands. The most recent hurricanes to affect the island were Hurricanes Irma (on September 6, 2017), María (on September 20, 2017) and Fiona (on September 18, 2022).

In light of these frequent hurricane events and recent studies conducted by government entities like the NWS, researchers have been investigating the potential connection between climate change and the frequency and intensity of hurricanes. Scientists are particularly concerned about how the higher temperatures of sea waters might be influencing hurricane intensity. Recognizing the existence of climate change in the scientific community, the National Oceanic and Atmospheric Administration (NOAA) has initiated studies to establish a link between hurricane frequency and intensity in the Caribbean. One such study, ([Global Warming and Hurricanes – Geophysical Fluid Dynamics Laboratory \(noaa.gov\)](#)), concludes:

“In summary, our model projections and analyses do not support the idea that greenhouse gas-induced warming will significantly increase the number of tropical storms or hurricanes in the Atlantic. There is [evidence](#) of increased hurricane rapid intensification, but this may be due to internal climate variability rather than anthropogenic forcing. While some studies suggest anthropogenic influences on hurricane precipitation in Texas and Puerto Rico, more research is needed for definitive conclusions. The cause of a slowing of tropical cyclone propagation speeds over the continental U.S. since 1900 remains uncertain.

Regarding future changes, [several climate modeling studies project](#) that climate warming will lead to higher rainfall rates and increased hurricane intensity in the Atlantic in the coming century. Coastal inundation levels related to tropical cyclones are also expected to rise with [projected](#) sea level increases. Additionally, there is uncertainty about the [frequency](#) of Atlantic tropical storms and very intense hurricanes in a warming climate.”

Based on the available information, including recent anecdotal data, it is clear that hurricanes are becoming more intense in terms of wind speed and precipitation rates. This has a noticeable impact on the stability of structures and the management of stormwater in the infrastructure and water bodies. To adapt to these new conditions, the Proposed Action design incorporates measures to construct resilient structures, handle increased stormwater, and safeguard bridge structures and exposed slopes to prevent landslides. These measures are discussed in more detail in other sections of this document, see in Section 5.2.1, Soil Suitability/Erosion.

Finally, information obtained from NOAA, provide support to the statement that the municipalities of Adjuntas and Utuado have experienced significant accumulated rainfall, approximately 18 inches after Hurricane María and between 14 to 18 inches after Hurricane Fiona. Both hurricanes exhibited extreme intensity, leading to the defoliation of the area’s vegetation, particularly in forested areas, and causing landslides that disrupted traffic on PR-123 and many secondary municipal roads. The damage from both hurricanes resulted in disruptions in road operation, along with power outages and water supply

disruptions. The Proposed Action aims to provide a safer route for faster government agency responses, reducing the hardships faced by the local population. The Proposed Action design will incorporate the most up-to-date construction codes.

Earthquakes

In general, and as per information published by the USGS, it is a fact that Puerto Rico lies in a tectonically active region where earthquakes have occurred for centuries. However, the Island has not experienced an earthquake of the level of the one that occurred on January 7, 2020, since 1918, the recent quakes, their aftershocks, and resulting damage took the population by surprise. It caused widespread damage and power outages, more extensively in the southern part of the Island. The earthquake was caused by the oblique faulting of the Caribbean and the North American plates. The municipalities of Guánica, Guayanilla, Peñuelas and Ponce experienced extensive damage to their structures.

The Proposed Action area did not experience extensive damage except for some limited structural damage and the terrestrial highway network for the area did not experience significant damage. No environmental impacts within the corridor of the proposed action were identified during these events.

Since the proposed structures are being designed in accordance with stringent design codes that require the construction of earthquake resistant structure and the recommendations of the geotechnical studies, it is understood that the Proposed Action shall be capable to withstand future earthquakes to the extent that current knowledge allows.

5.2.5 Greenhouse Gases

The emission of Greenhouse Gases (GHGs), which are known contributors to climate change, is a worldwide concern. While natural climate variations have occurred throughout Earth's history, the current consensus is that the planet's climate is changing at an accelerated rate. This trend is not anticipated to reverse in the foreseeable future, and scientific evidence suggests that human activities are playing a significant role in this acceleration. The most prominent anthropogenic GHG is Carbon Dioxide (CO₂), responsible for most of the human-induced warming. While CO₂ naturally occurs in the carbon cycle, human activities, such as burning fossil fuels, have significantly increased atmospheric CO₂ levels. Other noteworthy GHGs related to transportation include methane (CH₄) and nitrous oxide (N₂O).

Under NEPA regulations, an in-depth environmental analysis should focus on issues that hold significance and relevance for decision-making. A review of the Proposed Action scope and local conditions reveals that:

- The Proposed Action has a limited geographic footprint.
- Land uses in the Proposed Action corridor are governed by established Land Use Plans.
- The area is predominantly rural with scattered residential developments.
- No substantial industrial activities are planned or exist in the region

Current vehicular traffic between Adjuntas and Utuado predominantly uses PR-123, which runs close to the Proposed Action alignment. Recent traffic studies indicate that after the Proposed Action's completion, the expected increase of traffic volumes on PR-123 and the new PR-10 section will be minimal. Consequently, the construction of the Proposed Action is not anticipated to result in significant changes in GHG emissions within the local air basin. GHG sources, rural transportation projects are likely to have relatively small potential GHG impacts.

Nevertheless, it is essential to recognize that the proposed action brings several favorable outcomes in this context. The majority of GHG emissions from transportation come from carbon dioxide (CO₂) released during the combustion of petroleum-based products in internal combustion engines. The most significant sources of transportation-related GHG emissions include passenger cars, medium and heavy-duty trucks, and light-duty trucks, including SUVs, pickup trucks, and minivans. These sources account for over half of the emissions from the transportation sector. In 2020, the average fuel economy for cars and light trucks was 22.9 miles per gallon, with each gallon of gasoline burned emitting 8.89×10^{-3} metric tons of CO₂.³ The average passenger vehicle emits about 400 grams of CO₂ per mile.⁴

The proposed action enhances transportation efficiency by improving connectivity and reducing travel time. This improvement is expected to lead to optimized fuel consumption and a reduction in vehicle emissions per unit of distance traveled, potentially resulting in lower GHG emissions. In the first year of benefits, it's estimated that the Proposed Action will reduce the total Vehicle Hours Traveled (VHT) by

³ <https://fueleconomy.gov>

⁴ <https://epa.gov/energy/greenhouse-gas-equivalencies-calculator>

1,305,946 hours, with total time savings of 19,127,181 hours over the analysis period. Additionally, it will lead to a decrease in Vehicle Miles Traveled (VMT) for both passenger and commercial freight vehicles. This reduction is primarily due to the shorter distance along the new PR-10 connector compared to the existing comparable portion of PR-123. This difference will result in an annual reduction of 3,503,467 total VMT throughout the analysis period, contributing to lower emissions and helping mitigate the negative impacts of climate change.

No-Build Alternative

The annual contribution of the No-Build alternative of Carbon Dioxide (CO₂) is 14,815 metric tons per year of which 9,065 metric tons per year are emitted by cars and 5,750.3 metric tons are emitted by trucks.

The present value of the Social Cost of Greenhouse Gases for the No-Build Alternative, with a road length of 14 kilometers, a posted speed of 15 miles per hour, 5,000 vehicles per day, an annual increase of 1%, of which 20% is truck traffic, a discount rate of 3%, and an analysis period of 20 years, is approximately \$11,242,163.

Build Alternative

The annual contribution of the proposed action of Carbon Dioxide (CO₂) is 7,326 metric tons per year of which 4,483 metric tons per are emitted by cars and 2,843 metric tons are emitted by trucks.

The present value of the Social Cost of Greenhouse Gases for the proposed action, with a road length of 7.6 kilometers, a posted speed of 35 miles per hour, approximately 5,000 vehicles per day, an annual increase of 1% of which 20% is truck traffic, a discount rate of 3%, and an analysis period of 20 years, is approximately \$5,557,854.

5.3 Control Monitoring, Mitigation and Environmental Commitments

Mitigation measures and environmental commitments have been adopted by PRDOH, FHWA and PRHTA to reduce, avoid, or eliminate adverse environmental impacts and to avoid non-compliance or non-conformance with applicable regulations. These measures including permit requirements will be incorporated into project contracts, development agreements, and other relevant documents. Any additional mitigation measures required as part of the design and build will be coordinated, implemented and enforced by all agencies. The parties responsible for implementing and monitoring mitigation measures will be clearly identified in the mitigation plan. The following table provides a summary of the mitigation measures required for this project.

Table 4: Summary of Mitigation Measures

| Law, Authority, or Factor | Mitigation Measure |
|---|--|
| <p>Contamination and Toxic Substances - 24 CFR Part 58.2 (i)(2), 23 CFR Sec. 771.119 and 42 U.S.C. Chapter 82</p> | <p>Contractor will obtain permit from DNER/PMO for the closure of the septic tank found, including the disposal of contaminated debris at approved DNER/EPA facilities.</p> <p>If demolition debris is generated during the construction activities, testing for the presence of ACM and LBP will be conducted on the wastes prior to disposal in compliance with the DNER/EPA regulations. Testing ACM/LBP will be performed only by accredited inspectors and management and disposal of the waste at approved facilities after securing the necessary DNER permits. Waste containing paints, and/or other types of organic solvents will be tested as per RCRA regulations and disposed of only at approved DNER/EPA facilities.</p> <p>Responsible Party: Contractor</p> |
| <p>Endangered Species Act of 1973, Section 7: 50 CFR Part 402, 16 U.S.C. 1536, Section 7 and 23 CFR Sec. 771.119</p> | <p>Implementation of Sections 6.4 and 6.5 of the PBO (Attachment 11) required to be adopted by USFWS. These sections pertain to the management of Puerto Rican boas that may be found during the clearing and grubbing and construction activities stages of the project.</p> <p>Implementation of the Flora/Fauna Management Protocols approved by the DNER that were described in section 5.1.7 that require:</p> <ul style="list-style-type: none"> - A qualified biologist capable of conducting monitoring activities and implementing conservation measures for the protection of protected species shall be contracted by the selected contractor and be present at the project site, before, during and after the |

| | |
|---|---|
| | <p>construction of the Proposed Action. There must be at least one qualified biologist for each matter, one specialized in flora and one specialized in fauna.</p> <ul style="list-style-type: none"> - Vegetation clearing and earthwork activities by contractor shall be performed outside the breeding season of the four endangered species described in Section 5.1.7 (January to July) during the project construction phase. - Other ones included in the approved DNER protocols. <p>The previously mentioned protocols shall be implemented as an adaptive management measure intended to deal with the rare/endangered species that may be present in the vicinity of the proposed action since no habitats for the species were identified along the path of it. To the extent applicable, adaptive management is useful in terms of focusing on using evidence obtained from monitoring, evaluation, and research to inform decisions and action, and a reminder that, to some extent, all management practices need to be adaptive – not simply implementing plans but modifying them in response to changes in circumstances. These requirements will be included in the contract documents to serve as guide in any decision-making process that may arise during the project construction.</p> <p>Responsible Party: Contractor, PRHTA, FHWA</p> |
| <p>Explosive and Flammable Hazards – 24 CFR Part 51, Subpart C and 23 CFR Sec. 771.119</p> | <p>Use of explosives for the construction of the Proposed Action will be controlled so that no adverse impact is identified to human health or the environment. The contractor shall secure DNER a permit for the use of explosives and manage them accordingly to permit requirements and PRHTA construction specifications. Blasting of rocks outcrops shall not be performed during the breeding season of the four endangered species described in Section 5.1.7 during the breeding season (January through July) as required by USFWS/DNER. Also, the PMO/DNER Single Incidental permit that must be secured prior to start project construction, requires to notify the residents in advance of the use of explosives and to document that vibrations resulting from the blasting operations does not result in damages to nearby structures, if present. This may require the use of seismographic equipment.</p> <p>Responsible Party: Contractor</p> |

| | |
|--|---|
| <p>Floodplain Management Executive Order 11988, Section 2(a): 24 CFR Part 55 and 23 CFR Sec. 650A</p> | <p>All requirements of the 8-Step Decision-Making Process and the conditions of the Nationwide 14 USACE permit as described in Sections 5.1.10 and 5.1.15 and Attachments 15, and 16 must be followed during the construction of the Proposed Action.</p> <p>Responsible Party: PRHTA, PRDOH</p> |
| <p>Wetlands Protection Executive Order 11990, Sections 2, and 6 and 23 CFR Sec. 777</p> | <p>All requirements of the 8-Step Decision-Making Process as well as in the Nationwide Permit SAJ-2021-01875 (NW-AMG) issued by the USCE for section II must be complied with by contractor during the construction of the Proposed Action.</p> <p>For sections II, IV and V, wetland areas (if present) shall be managed and protected by contractor in accordance with the USACE and EPA requirements. If present in a specific section of the project, their locations shall be marked and protected with BMPs as required by the EPA Construction General Permit (CGP).</p> <p>Final Contract drawings and specifications to be prepared during the Design-Build phase will include the requirement to clearly mark wetland areas near the construction areas to minimize the potential for incidental impacts from construction and staging areas which may result in enforcement actions under Section 404 of the Clean Water Act.</p> <p>The Construction Management Team will monitor and ensure compliance of the measures.</p> <p>Responsible Party: Contractor, PRHTA, PRDOH</p> |
| <p>Soil Suitability / Slope / Erosion / Drainage / Storm Water Runoff</p> | <p>PRHTA will meet requirements from DNER regarding geological hazards as per the recommendations of geotechnical studies. Also, as a mitigation measure, the selected contractor will be required to prepare and submit for approval the following permits:</p> <ol style="list-style-type: none"> 1. Construction General Permit (CGP) from the EPA, which will be prepared by the selected contractor, requires a SWPPP and obtaining coverage of the permit by filing a Notice of Intent (NOI). <p>For this project, since the Rio Grande de Arecibo has been classified as an impaired surface body of water upon its assessment by the EPA stringent BMPs and inspection requirements will be imposed</p> |

to minimize to extent possible the carryover of sediments. Inspection reports are also required to be prepared and kept on files for review by EPA officials, if required. Copy of the inspection reports will be required to be submitted to the Project Manager (PM) that will request its review by a qualified person to ensure that permit conditions are being complied with, when the need of corrective actions is identified.

2. Single Incidental Permit from the PMO that requires to develop a Plan for the Control of Erosion and Sedimentation (CES Plan). Said plan is like the one required by the EPA but not as comprehensive.

The development of the SWPPP by contractor requires the design of site specific BMPs such as:

- Stabilized project entrance/exits.
- Trucks tire washing area at entrance/exits.
- Installation of perimeter erosion control along the project construction areas (silt fences, haystacks, etc.)
- Phased construction activities.
- Control for stormwater flowing onto and through the project.
- Project potentially erodible material exposed by excavation and borrow/fill operations will be minimized.
- Cut and fill side slopes will be treated as excavation takes place by loaming, seeding, and mulching side slopes, thereby dissipating water energy and protecting otherwise unprotected soil.
- Sedimentation basins will be constructed to remove sediment from runoff during the construction before the water reaches surface bodies of water.
- Special treatment such as stone blankets, terraces, pipes berms, dams, and slope basins are recommended for problem areas where significant erosion potential may exist (i.e., near Lago Adjuntas)
- Crushed stone at culvert inlets and outlets, ditches and other sloped channels is recommended to minimize erosion by acting as a water flow energy dissipator.
- Portable toilets must be provided during construction and disposed of at a DRNE/EPA approved facility.
- The effects of increased runoff should be minimized through design to maintain the hydrologic balance of the water-shed area.

3. At a local level, contractors shall prepare and submit a Plan for the Control of Erosion and Sedimentation to the DNER/PMO which is part of the SIP required for the construction of projects. Said plans shall provide comprehensive BMPs to protect the Rio Grande de Arecibo and in particular the Adjuntas Lake from the negative impacts resulting from the effects of erosion and sedimentation.

The DNER required the adoption of the following measures:

- Performance of geotechnical/geological studies aimed to obtain specific recommendations for the design of the roadway and structures in the design phase.
- Notify the agency and others with jurisdiction, if superficial/underground bodies are found during the investigation or construction activities
Recommendations for the design of the bridges that resulted from the evaluation of the H/H studies submitted for their review and approval. Adoptions of the design recommendations are mandatory in the preparation of the final plans by the selected design firm.

The selected contractor would be required to hire a third party which will be responsible for performing the required permit inspections and monitor water quality to ensure that BMPs are functioning adequately. Copy of the reports, whose frequency is dictated by the permit conditions shall describe the status of compliance with the permit requirements and describe corrective measures, if required. Adoption of corrective or remedial activities shall be conducted as soon as practicable and in no instance exceed those specified by the permits (CGP, CES Plan). Copy of all reports shall be immediately forwarded to the construction, who will forward periodic reports of compliance with these measures PRHTA, FHWA and PRDOH.

For the protection of the project from the landslide effects, the following mitigation measures are required to be implemented:

1. Site Evaluation and Planning: A thorough site evaluation through the planning process is being done and will continue during the design process, to assess the geological conditions, including slope stability, soil types, and drainage patterns.

| | |
|--|--|
| | <p>Areas prone to landslides will be identified to avoid construction of the road in high-risk zones, if possible.</p> <ol style="list-style-type: none">2. Slope Stabilization Techniques: Slope stabilization measures will be taken as part of the design phase and construction phase, to enhance the stability of slopes along the roadway. They will include techniques such as terracing, retaining walls, rock bolts, soil nails, and slope reinforcement with geosynthetic materials. The specific methods used will depend on the site conditions and engineering recommendations.3. Drainage Systems: An effective drainage system will be designed and constructed to manage surface water runoff and prevent the accumulation of water on or near slopes. Adequate culverts, ditches, and channels will be installed to divert water away from the slopes and road surface. Proper drainage will aid in maintaining the stability of the slopes by reducing soil saturation and erosion.4. Vegetation and Erosion Control: During the construction phase the contractor will implement measures to preserve or restore vegetation along slopes and in areas adjacent to the roadway. Planting trees, shrubs, and grass helps stabilize the soil, control erosion, and absorb excess water. The contractor incorporates erosion control techniques such as erosion control blankets, matting, or geotextiles to prevent soil erosion and promote vegetation establishment in newly formed slopes as well as other non-paved areas as soon as practicable5. Retaining Structures: The contractor will design and construct retaining walls or embankments where necessary to support or stabilize slopes. Retaining structures will provide additional stability to steep or problematic areas along the roadway, reducing the risk of slope failure.6. Regular Maintenance and Monitoring: PRHTA has stated that as part of the roadway operation that it will establish a regular maintenance program to inspect and address potential issues promptly. Regular monitoring of slope stability, drainage systems, and vegetation health is essential to identify any signs of instability or erosion. Implement early warning systems, such as slope sensors or rainfall monitoring, to detect changes that may indicate an increased landslide risk.7. The selected contractor, who will be in charge of the final design, will ensure the design and construction of the roadway follow best practices and meet safety standards. Detailed geotechnical and geological surveys, slope stability analysis and design, and appropriate mitigation measures will be included in the design and implemented during the construction phase of the project. |
|--|--|

| | |
|--|--|
| | <p>Mitigation measures aimed to minimize the carryover of pollutants to nearby surface bodies of water during the operation of the Proposed Action have been identified for its adoption as part of the roadway design. They are:</p> <ol style="list-style-type: none"> 1. A strip of vegetation has been provided between the roadway and the lateral swales that convey the stormwater runoff toward the discharge points; 2. The discharge of the stormwater runoff associated with the operation of the bridges have been designed to occur either before or after the structure and has been provided with oil/water separators to retain to the extent possible small leaks that may occur. This measure may also help to collect coarse sediments that may have reached this device. <p>Fuels and oils stored on the Proposed Action site shall comply with 40 CFR Part 112, if applicable. This regulation requires the development of a Spill Prevention Control and Countermeasures (SPCC) Plan. The applicability of this regulation is triggered whenever the total aggregate storage of oil, within the context of the regulation, exceeds 1,320 gallons. Aboveground storage of oils, including drums of 55 gallons, shall incorporate secondary containment measures and the performance of regular inspections, among other requirements.</p> <p>The Construction Management Team will monitor compliance by contractor of the above-mentioned measures.</p> <p>Responsible Party: Contractor, PRHTA, PRDOH</p> |
| <p>Hazards and Nuisances, including Site Safety and Noise</p> | <p>The following noise pollution control measures will be incorporated by the selected contractor during construction activities:</p> <ol style="list-style-type: none"> 1. Equipment must be fitted with noise suppressing devices and adequately maintained and repaired to minimize noise impact. 2. Construction activities should be limited to the daylight hours. 3. Access to construction sites shall be located on more isolated routes to minimize the noise impact on residential areas, schools, etc. 4. Pile driving activities should be conducted during hours in which the serenity of the surrounding neighborhoods is less disturbed. |

| | |
|--|---|
| | <p>5. Additionally, a plan for blasting activities to prevent injuries and information to residents must be developed as part of the construction phase of the Proposed Action.</p> <p>For controlling air pollution during construction, the following measures must be complied with:</p> <ol style="list-style-type: none"> 1. Emissions from the construction equipment to be used during construction shall be minimized and controlled by close supervision of the maintenance and repair schedule of the contractor. 2. To the extent possible, modern equipment will be required to be fitted with EPA mandated emission control equipment, as applicable. 3. Burning of trees and shrubbery for clearing purposes and/or the burning of trash within the construction site is not permitted. 4. Dust emissions from earthwork related operations shall be controlled by adequate means such as sprinkling of water using tank trucks. 5. Loading truck areas shall be covered with tarpaulins to prevent dust emission while transporting their loads. <p>The Construction Management Team will monitor compliance of these measures.</p> <p>Responsible Entity: Contractor</p> |
| <p>Solid Waste Disposal / Recycling</p> | <p>Initial earthwork activities will require to conduct a clearing and grubbing operations that will result in the generation of a combination of superficial soil and vegetation, shrubs, trees, etc. The upper cover of soil will be stored in stockpiles for its use as topsoil once the grading/construction activities are completed. Areas designated for the storage of this material, shall be provided with BMPs such as the use of silt fence around the perimeter of the area to minimize the effect of erosion and other as required by the CES Plan and SWPPP that shall be prepared for the project. Construction solid wastes to be generated by the construction activities will be stored in covered waste bins and/or sheds as determined in the SWPPP.</p> |

| | |
|--|--|
| | <p>With respect to material that will be transported to either a final waste disposal facility or to a construction project requiring such material, the following measures will apply:</p> <ol style="list-style-type: none"> 1. Transport will be conducted using only permitted DNER transporters and the cargo area shall be provided with tarpaulins to minimize the emission of dust while in transit. 2. Surplus material could be transported only to projects with valid construction permits issued by PMO, with approved CES Plans and SWPPP, as applicable. 3. Management of the material shall be planned and coordinated as a function of the project development and coordinated between sections construction schedules. <p>At a local level, an Operation Plan will be developed by the selected contractor to address the generation of solid waste handling and disposal for the construction of the Proposed Action. This plan must be approved by the DNER/PMO and shall comply with applicable regulations for the management and disposal of such waste using qualified personnel. Consideration of the adoption of waste recycling practices such as the shredding of vegetative material that may be used to produce mulching for erosion control at the proposed action site shall be included in the plan as well as other ones deemed appropriate.</p> <p>Compliance with 40 CFR Part 122 of EPA regulations also requires the owner/contractor to develop a SWPPP which also incorporates specific BMPs for the adequate management of solid wastes to be generated by the construction activity.</p> <p>The Construction Management Team will monitor compliance of these measures and will coordinate with the PRHTA for the preparation of the documentation of the SWPPP by owner.</p> <p>Responsible Party: Contractor/PRHTA/ PRDOH</p> |
| <p>Wastewater/Sanitary Sewers</p> | <p>Portable toilets will be provided for employee use during construction activities. The contractor shall be responsible for providing regular disposal of the wastewater at approved sewage treatment facilities and transportation performed only by DNER approved transporters. A written plan must be developed by contractor to address the generation of wastewater handling and</p> |

| | |
|------------------------------------|---|
| | <p>disposal during the construction of the Proposed Action. The plan must be approved by the DNER/PMO.</p> <p>Responsible Party: Contractor</p> |
| <p>Vegetation, Wildlife</p> | <p>Perform monitoring of the areas prior to construction to detect and manage any species in accordance with DNER approved protocols. This activity shall be performed by a qualified resident biologist. The selected contractor will be required to contract qualified biologists as required by state and federal agencies that regulate each environmental matter.</p> <p>Responsible Party: Contractor, PRHTA, PRDOH</p> |
| <p>Historic</p> | <p>An archaeological monitoring by a qualified archaeologist shall be provided by the contractor and performed during the construction phase of Sections III and IV of the projects as required by the PRIC. As per the agency request, an archaeological monitoring plan must be submitted for advance review and approval. The construction Management Team will monitor compliance of these activities.</p> <p>Responsible Party: PRHTA, PRDOH</p> |
| <p>Other</p> | <p>Measures for Adapting Project Design and Operation to Climate Change and Hurricane Impacts:</p> <ol style="list-style-type: none"> 1. Through site assessments and considerations of future climate change projections during the design phase. 2. Use of climate-resilient and durable construction materials. 3. Implementation of slope stabilization and hazard mitigation measures. 4. Construction of culverts and bridges to handle increased water flow during intense rainfall. 5. Integration of eco-friendly construction practices to minimize construction impacts. 6. Adopt measures to prevent riverbank erosion, such as riprap or vegetation stabilization. 7. Consideration of flood risk assessments and provide adequate drainage systems. 8. Design and placement of bridges to accommodate potential changes in river flow and water levels. |

9. Implementation of erosion and sediment control measures during construction to maintain water quality.
10. Incorporate efforts to minimize disturbances to aquatic habitats during construction.
11. Consideration of potential bridge scour due to altered river flow patterns.
12. Regular maintenance of bridges to prevent structural damage and ensure their stability.
13. Proposed Action Design must incorporate the Critical Infrastructure Hazard Mitigation recommendations developed by HUD.

During construction

All permits required for construction activity shall be reviewed and updated, if needed.

- Single Incidental Permit from the PMO
- Construction General Permit from the EPA
- Permit to use explosives from the DNER
- COE permit for sections II, IV and V, if required
- Control/mitigation measures to reduce air emissions resulting from the earthwork activities include the use of tank trucks spraying water to particulate matter; maintenance of air emission control equipment of engines in good condition, limit unnecessary idling, and the use of the cleanest and more efficient engines available to the extent possible.

Hydrology Commitments:

The following commitments apply to the hydrologic component of the project to be taken in consideration in the Design-Build process:

- Two percent minimum cross slopes are to be provided in the roadways so that effective drainage will be accomplished across the surface of the pavement and down the side slopes of the embankment.
- Where existing terrain slopes toward the embankment or where protection of adjacent properties is required, interceptor ditches will be provided to interrupt and channel the overload flows to proper discharge locations.

- At high fill and deep cut areas, special erosion controlling methods will be introduced to secure stable side slope conditions and to prevent sliding.
- Where a depressed median is designed, drainage will be performed by median inlets spaced approximately 100 meters on centers and connected to reinforced concrete pipes that will discharge into lateral interceptor ditches.
- In flood plains, large equalizing drainpipes will be placed across the highway to control the extent of these floods and to minimize any higher flood levels that would otherwise result from damming this area by the proposed highway.
- Drainage will not be combined with sewage and will not be carried across natural drainage divide unless such modification is already in existence.
- Bridge openings will be designed to accommodate coincident with a flood of 100-year frequency.

Relocations and/or Displacements:

- Remaining acquisitions of the remaining properties located in section IV of the proposed action ROW will not require the displacement of families or business as indicated in section 1.3 of the EA. As applicable, those acquisitions will be conducted by the PRHTA in compliance with the requirements of the URA.

Responsible Party: Contractor, PRHTA, PRDOH

5.4 Cumulative Impacts

The assessment of cumulative impacts is required by the Council of Environmental Quality (CEQ) NEPA regulations. Cumulative impacts are those that result from incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, combined with the potential impacts of the proposed action construction. A cumulative effect assessment considers a review of the collective impacts posed by other entities (federal, state, or private) reasonably foreseeable projects. Cumulative impacts can result from individually minor, but collectively substantial, impacts taking place over a period of time.

Cumulative impacts to resources in the proposed action area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. The described land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, and changes in water quality. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

Construction and operation of the proposed action build alternative would result in direct and indirect impacts that could contribute to cumulative effects to the built and natural environment when combined with other related past, present, and reasonably foreseeable future actions. To identify and assess the potential for cumulative impacts of a proposed action, there is a requirement focusing on the nature of the Proposed Action, the organization and composition (i.e., ecological structure, connectivity, and land use) of the affected environment, and those actions that have already contributed to the existing environment, and those that could in the foreseeable future. To provide relevance to the assessment, it is important to identify the specific resources that may be significantly affected over time.

The cumulative effect analysis focuses on those issues and resources that would be affected by aggregation of stress factors on the environment and does not address in detail those topics that would not have additional environmental effects from the cumulative condition. The analysis provided in this section considered the effects of the other projects and the build alternative in assessing whether a particular environmental parameter would experience cumulative adverse impacts. A detailed technical report providing details about the cumulative impact analysis has been included in **Attachment 27**.

5.4.1 Affected Environment Condition

A description of the **affected** environmental condition **has been included** in section 1.1.2 of the report included in **Attachment 27**.

5.4.2 Past, Present, and Reasonably Foreseeable Future Actions in the Study Area

Specific geographic boundaries for cumulative effects analysis are determined for each analyzed resource and vary accordingly. For the purposes of this analysis, the term Resource Study Area (RSA) is used as applicable for each resource.

The proposed action has been included in the Multimodal Long-Range Transportation Plan (MLRTP) 2050 and a review of its recommendations discloses the fact that no additional new highway construction projects have been identified or planned to be developed in this area by the PRHTA/FHWA. Repair projects aimed to correct damages caused by Hurricane María and Fiona have been identified,

A review of the PMO database disclosed the fact that aside from the PRHTA, no other government agency has submitted for its review, projects within the study area. With respect to private entities, small projects consisting of lot segregations, permit applications for small businesses, individual residences repairs in the aftermath of hurricane María and PRHTA sponsored projects for the repairs of PR-123 and PR-10 constitute the most significant ones identified from the data review.

The projected horizon considered for the reasonably foreseeable projects analysis is 20 years in the future (2045).

5.4.3 Land Use

The RSA for land use and planning covers the proposed action ROW acquisition area and its immediate vicinity and the communities observed along the path of PR-123. It shall be noted that the proposed action area is comprised of vacant lots with no urban developments, except for mostly scattered residential uses. Some agricultural uses are also observed, mostly close to the town of Adjuntas as observed from recent aerial photographs. Most commercial uses within the area are observed in the towns of Adjuntas and Utuado, outside the physical boundaries of the proposed action ROW or adjacent. They are observed toward the north and south boundaries of the proposed action corridor. Some cafeteria/bars small businesses are located along the path of PR-123. Development of the area has been curtailed by the rugged conditions of the area with low population density and local zoning restrictions promote the conservation of these lands. Also, it is important to note that approximately 790 acres have been already acquired for the construction of the proposed action since 2016. This means that no development has occurred in those government owned properties and would not occur. This observation also applies to the remaining properties of Section IV to be acquired by the PRHTA. A review of the ROW acquisition for the project reveals that basically all the properties located between the proposed action and the Rio Grande de Arecibo will be owned by the Government of Puerto Rico. It shall be noted that the corridor for this highway has been incorporated in the state and local planning that restricts their development due to the zoning district for conservation designation of the area but at the same time recognizing the protection of the corridor the planned PR-10 construction. The proposed communities in which the proposed project is located are almost entirely built out, containing few undeveloped or vacant parcels.

Since no extensive urban developments would be allowed within the limits of the RSA, no direct, indirect, or cumulative impacts are anticipated, and no further analysis is required for any of the alternatives considered.

5.4.4 Traffic and Transportation

A review of available government database and PRHTA/FHWA programming for the RSA, defined by the area, disclosed the fact that there are no foreseeable future transportation projects proposed for the area except for the proposed action, as discussed in section 5.4 of the EA and the 20250 Multimodal Long-Range Transportation Plan for Other Urbanized Areas approved on December 27, 2023. The traffic network (i.e., RSA) used in the traffic forecasting process consists of the existing transportation system (PR-123), as well as projects with committed for future funding that were included in 2050 Multimodal Plan. As a result, the forecasting network includes not only facilities and services in place today, but also those transportation improvements planned for future funded and committed for implementation through the horizon year. As previously discussed, the traffic analysis considers cumulative traffic impacts from all state and local projects within the study area.

Reasonably foreseeable traffic volumes for the proposed action have been considered as discussed in sections 2.1 Background Information, Existing Conditions, and Trends of PR-123 and Vicinity; section 5.2.3 Community Facilities and Services, Transportation and Accessibility of the EA. The no build and the PR-123 improvement alternative would not change the current transportation condition of the RSA and therefore no direct, indirect, or cumulative adverse effect of the RSA are anticipated. The proposed action would have a positive direct impact on the traffic conditions of the RSA with an enhanced resiliency but no cumulative impact requiring further analysis is necessary.

Finally, it shall be indicated that an exception to the previously is constituted by a series of projects being promoted by the PRHTA aimed at repairing the damage caused by Hurricane María and Fiona in PR-10. As part of their environmental compliance, an assessment of these projects' potential impact on the Proposed Action will be conducted to evaluate their effects on the accessibility and mobility of PR-10 users. The table shown in the following page provides a summary of these projects along with their respective locations.

Table 5: Summary of PR-10 Hurricane Maria and Fiona Repair Projects

| AC Code | AC Number Construction | Roadway | Municipality |
|---------|------------------------|---------------------------------|--------------|
| 808544 | 826579 | PR-10, km. 41.6 | Utuaado |
| 808544 | 826579 | PR-10, km. 41.9 | Utuaado |
| 808544 | 827579 | PR-10, km. 46.7 | Utuaado |
| 808544 | 827579 | PR-10, km. 47.5 | Utuaado |
| 808544 | 865579 | PR-10, km. 52.3 | Utuaado |
| 818544 | 865579 | PR-10, km. 30.3 – 30.4 | Adjuntas |
| 808544 | 828579 | PR-10, km. 44.7, 44.9, 45, 45.1 | Utuaado |

The existing PR-10 south to north section between Ponce and Adjuntas ends at kilometer 30.6 while the north to south section between Arecibo and Utuaado ends at kilometer 38.2. This implies that, except for the project located at kms. 30.3 through 30.4, none of them are located within the corridor of Proposed Action since this is a new section of PR-10. A review of the Categorical Exclusions (CE) prepared for the listed projects indicates that throughout construction, the PR-10 sections would remain open, but a temporary half section closure may be necessary. Advance notice of the closure for its users and the development of a Maintenance of Traffic (MOT) would be implemented. Those projects include the installation of temporary traffic control devices, installation of temporary traffic signs, temporary concrete barriers, etc. Travel through this project during its reconstruction phase will continue and the operation of the roadway will be temporarily limited, but not permanently disrupted affected. A review of the CE prepared for the repairs of km. 30.3 – 30.4 of PR-10 in the Municipality of Adjuntas (ER-HWY-12, ER-9999 (327), AC-818544) indicates that similar traffic management measures would be implemented during the construction activities of this project. In summary, based on the review of the available information, the planned repairs for the existing PR-10 would incorporate measures to minimize the disruption of current users of PR-10.

5.4.5 Hydrology and Flood Plains

Avoidance, Minimization, and/or Mitigation Measures, for the proposed action would not result in any adverse impacts to the natural and beneficial floodplain values, would not result in a significant change in flood risks or damage, does not have significant potential for interruption or termination of emergency

services or emergency routes, and is not considered an adverse encroachment. The proposed action would not contribute to a cumulative impact to hydrology or floodplains.

Any future projects not anticipated at this time would also be required to analyze their individual and cumulative impacts to hydrology and floodplains. These proposed projects are required to be designed such that conveyance facilities have adequate capacity to meet projected flows. Similarly, FEMA and local requirements ensure that development within the floodplain or floodway consider potential effects to buildings and their occupants or visitors. Based upon the information and analysis above, direct, or indirect cumulative impacts related to hydrology and floodplains are not anticipated to result, and no further analysis is necessary and no additional measures are required.

5.4.6 Water Quality/Sedimentation

The no build alternative would maintain the current degraded water quality condition of the RSA and therefore no direct, indirect, or cumulative impact from its adoption are expected. The alternative of improving current PR-123 would have a temporary direct impact on the water quality resulting from an increase of turbidity during the performance of construction activities. However, no indirect nor cumulative impacts are expected.

Construction of the proposed action could result in the temporary erosion of soil, thereby cumulatively degrading water quality during the proposed action construction. In addition, a minimal increase in impervious surface area of the roadway will increase the amount of stormwater runoff, transportation-related pollutants entering the storm drain system. However, the construction of the proposed action as well as other ones being proposed by others would have to comply with existing regulations regarding construction practices that minimize risks of erosion and runoff.

Additional requirements: Among the various regulations are the 2022 Construction General Permit (CGP) issued by the EPA which establishes in section 3.0 water quality based effluent limitations that consider the characteristics of the receiving body of water. Section 3.1 of the CGP indicates that “EPA may insist that you install additional controls on a site-specific basis or require you to obtain coverage under an individual permit, if information in your NOI or from other sources indicates that your discharges are not controlled as necessary to meet applicable to all water quality standards.” Additional requirements applicable to the construction activities aimed at reducing impacts in the quality of the receiving bodies of water within the drainage basin of the Rio Grande de Arecibo near the proposed action site are detailed in the Cumulative Impact Analysis report included Section 5.3.

Based upon the provided information and analysis, direct or indirect cumulative impacts related to sediment generation are not anticipated to occur. Therefore, no further analysis is necessary and no additional measures are required.

5.4.7 Landslide/Geology/Soils

The RSA for this subject is comprised by the ROW for the proposed action and its immediate vicinity. As a result of the limited urban development of the area, through the span of 50 years, most of the impacts associated with the effects of landslides pertain to those affecting the integrity of state roads PR-123 and PR-10. Landslides induced by heavy rain were one of the top three hazards impacting the island, second only to flooding and hurricane-force winds, also along the stretch of the proposed action area, landslide is the second highest hazard risk behind hurricane wind. This condition has remained the same through

the years. The municipalities of Utuado and Adjuntas have very high to extreme susceptibility to landslides. Also, their occurrence has been triggered by the effects of heavy rain events associated with storms and hurricanes a condition that has been documented by the USGS. Various geotechnical studies have been and will continue to be conducted for the design of the proposed action. These studies have identified conditions of the existing soils/geology along the path of the proposed project corridor and have resulted in recommendations for the design of the proposed roadway which have been discussed in section 5.2.1 of the EA. The specific topics covered in this section are Soil Suitability, Assessment of Landslides Hazard Risks. Experience obtained from incidents affecting the stability of previous sections of PR-10 currently in operations have been also considered in the design of the proposed project. After considering available information, it is understood that the No build and the alternative of Improving PR-123 would have a direct or indirect commutative impact. For the proposed action alternative, and based upon the above provided information and analysis, direct or indirect cumulative impacts related to geology, soils, or landslide are not anticipated to result, and no further analysis is necessary and no additional measures are required.

5.4.8 Climate Change

The RSA for this subject discussion of the proposed action ROW and its immediate vicinity. "Climate change" refers to the gradual, long-term alterations in climate measures, encompassing factors like rainfall, temperature, and wind patterns. Consideration of this subject as part of the EA development is a recent requirement, due to its predicted negative impact on EJ communities in the aftermath of more frequent natural disasters. Therefore, existing scattered residential uses along the path of the proposed action corridor constitutes the baseline for the analysis of this subject. A discussion about climate change has been included at the end of section 5.2.4 Natural Features of the EA. The proposed action construction will fulfill the originally planned route, by providing a more resilient terrestrial infrastructure for the region.

For the No build and the alternative to improve PR-123, no direct or indirect cumulative impact are anticipated to occur and therefore no additional analyses are necessary. For the proposed action alternative, the relatively limited scale of this project with respect to the region as well as the fact that currently, vehicular traffic travels through the RSA resulting in a source of tail pipe gases that contribute to the air basin allow to reasonably conclude that no meaningful contribution to the climate change resulting from the construction of the proposed action can be expected. However, the design of the proposed action has incorporated provisions for the protection of the roadway and would serve to minimize the vulnerability of the communities of the area by improving their terrestrial access. Additional information about this subject has been included in section 5.2.4 Natural Features, Other Factors of the EA. Based upon the information and analysis above, direct, or indirect cumulative impacts are not anticipated to result, and no further analysis is necessary and no additional measures are required.

5.4.9 Air Quality/GHG

With respect to emissions that may contribute to exceeding NAAQS federal standards, the low vehicular traffic volume expected from the proposed action construction (which basically will absorb the current vehicular traffic using PR-123 allow to qualitatively indicate that no air quality impacts are foreseen, and that current good air quality would be maintained; therefore, it does not present an adverse cumulative impact. Implementation of the proposed action would improve traffic flow and congestion currently being experienced by users of PR-123 as well as air quality of existing residences along this roadway resulting

from the diversion of traffic toward the new roadway. The no build alternative as well as improvement alternative of PR-123 would result in no direct, indirect, or cumulative impacts. Based upon the previously provided information and analysis, direct or indirect cumulative impacts related to air quality are not anticipated to result, and no further analysis is necessary and no additional measures are required.

Regarding the Green House Gases (GHG) the no build alternative and the improvement of PR-123 would have no direct, indirect, or cumulative impact on the RSA. No national standards have been established for GHGs. Similarly, the United States Environmental Protection Agency (USEPA) has not established criteria or thresholds for ambient GHG emissions pursuant to its authority to establish motor vehicle emission standards for CO₂ under the Clean Air Act. GHGs are different from other air pollutants evaluated in federal environmental reviews because impacts are not localized or regional due to their rapid dispersion into the global atmosphere. Therefore, it is difficult to isolate and understand the GHG emissions impacts for a particular transportation project given there is no scientific methodology for attributing specific climatological changes to that transportation project's emissions. Based on the nature of GHG emissions and the exceedingly small potential for GHG impacts from the proposed project, the GHG emissions from the proposed action will not play a meaningful role in a determination of an environmentally preferable alternative or the selection of the preferred alternative. No alternatives-level GHG analysis has been performed for this project since GHG emissions is very small in the context of the affected environment.

The construction of the proposed action will serve to reduce the Vehicle Miles Traveled (VMT) because of the shorter length of the proposed action as discussed in Section 5.2.4 Natural Features, Other Factors of the EA. This reduced distance would translate into a reduction of the emission of CO₂ emitted by the vehicular traffic which in turn would result in a reduction of the effects of the potential GHG impact on a local level, since at a regional level this impact would not be significant. In recognition of this fact, the FHWA currently requires GHG analysis for the development of long-range transportation plans that are directed for the planning of transportation modes at a regional level. Based upon the previously provided information and analysis, direct or indirect cumulative impacts related to air quality are not anticipated to result, and no further analysis is necessary and no additional measures are required.

5.4.10 Noise

The RSA for noise includes sensitive noise receptors (e.g., residences, institutional uses, churches, etc.) within the ROW and adjacent properties. Over the past 50 years, ambient noise conditions have remained typical of those observed in rural areas of Puerto Rico due to the lack of urban developments of the area. The proposed action is expected to contribute to temporary and permanent cumulative noise impacts. Permanent impacts are not expected due to the low vehicular traffic volume forecasted for the area and the results of the traffic noise levels analyses conducted using FHWA Traffic Noise Model as described in section 5.1.14 Noise Abatement and Control of the EA. During construction, noise impacts are expected to occur due to the use of construction equipment and movement of heavy trucks during the performance of earthwork activities, but on limited areas resulting from the low residential density and lack of urban development nearby the construction zones. Typical noise reduction strategies such as the requirement of mufflers in good working conditions, for heavy equipment and trucks would be required to contractors to minimize noise impacts during construction. Because no additional construction projects have been identified to occur within the RSA, no cumulative impacts are expected.

Based on the previous analysis, direct or indirect cumulative impacts related to noise are not anticipated to result, and therefore, no further analysis is necessary and no additional measures are required.

5.4.11 Natural Systems

Natural Communities

The natural communities within the RSA have largely remained in the areas due to the lack of urbanization over the last 50 years, except for the damages caused to vegetation caused in the aftermath of hurricanes through the years (Georges in 1998; Maria in 2017, and Fiona in 2022). A review implementation of any of the build alternatives would not result in impacts to USFWS critical habitat or wildlife corridors because neither exists within the RSA. Furthermore, implementation of the build alternatives would not result in permanent impacts to natural communities of special concern. Vegetation communities/land cover types that would be permanently impacted within the RSA include undeveloped and agricultural lands. Implementation of the build alternative would permanently impact approximately 209 acres of rural undeveloped land. Given that the proposed project's impacts were already addressed by acquiring and transferring to the DNER, a property comprising 369.64 cuerdas (358.92 acres) as mitigation for the ecological and trees impacts to be caused by the proposed action. Based upon the information and analysis above, direct, or indirect cumulative impacts related to natural communities are not anticipated to result, and no further analysis is necessary and no additional measures are required. The no build alternative and the improvement to PR-123 would have no impact on the existing natural systems since they would remain in their current condition, therefore no direct or indirect cumulative impacts are anticipated to occur and no further analysis is required.

Wetland and other Waters

The rugged topography of the area promotes a fast drainage of the soils, a condition that does not support the presence of extensive wetlands as evidenced in the figures and discussion of Section 5.1.15 Wetland Protection of the EA. Wetland areas within the proposed action corridor were identified using the National Wetland Inventory Maps developed by the U.S. Fish and Wildlife Service (USFWS), except for Section II of the proposed action for which a detailed jurisdictional delineation was conducted as part of its USACE permit process. Using available project drawings for Sections III, IV and V as well as because structures would be used as a measure to avoid or minimize impacts on wetlands and jurisdictional waters, it has been estimated that approximately 4.0 acres of wetlands and/or jurisdictional waters of the U.S. would be impacted. However, most of those impacts would be temporary and once the proposed action construction is completed, they would revert to their natural condition except for 0.35 acres of the Rio Grande de Arecibo River that would be permanently impacted by the bridge structure of section II It is important to indicate that this river crossing, which may be considered as the most significant in terms of its size does not affect wetlands, because they are not observed in the proposed action limits. Project-specific analysis would be required for Sections III, IV and V as well as any other no foreseen developments to ensure that impacts to wetlands or other waters are assessed and adequately mitigated. Implementation of the no build alternative and/or improvements to PR-123 would not result in impacts to wetlands or jurisdictional waters of the U.S. Also considering that the proposed project's impacts would be addressed through Avoidance and Minimization measures required by the USACE the proposed action contribution to wetlands and other waters impacts would not be cumulatively considerable. Based upon

the information and analysis above, direct, or indirect cumulative impacts related to wetlands and other waters are not anticipated to result, and no further analysis is necessary and no additional measures are required.

Plant Species

The RSA pertaining to plant species is ROW of the proposed action and its vicinity. Plant species within the RSA have been studied since the preparation of the original FEIS preparation in 1979 and updated with additional studies as well as with consultation with agencies pertinent to this subject such as the DNER and the USFWS. This subject has been discussed in Sections 5.1.7 Endangered Species and 5.2.4 Natural Features, Vegetation, Wildlife of the EA. These efforts have not disclosed the presence of rare/endangered plant species or of unique value. Therefore, the proposed action would not result in cumulative impacts to special-status plant species. Also, there are no foreseeable planned projects for the RSA that may result in cumulative impacts for the current plant species. Based upon the previous provided information and analysis, direct or indirect cumulative impacts related to plant species are not anticipated to result, and no further analysis is necessary and no additional measures are required. The no action and alternative for improvements to PR-123 would not result in direct and/or indirect cumulative impacts and no further analyses is required.

Rare/Endangered Species

The RSA pertaining to rare/endangered or threatened species is constituted by the ROW and immediate vicinity of the proposed action. The RSA has remained in its rural condition for more than 50 years without the pressure exerted by the urban sprawl resulting from its rugged topography and limited commercial/industrial developments. A review of the presence of these species and/or their habitats along the path of proposed action corridor has been continuously revised in coordination with the DNER and the USFWS, which the local and state federal agencies with jurisdiction. Field surveys conducted along the project through the years and more recently, by reviewing the USFWS database known as IPAC ([IPaC: Home \(fws.gov\)](http://ipac.fws.gov)) have not disclosed the presence of designated flora/fauna habitats although some of the listed species may be observed within areas beyond the RSA. For this reason, conservation measures for the protection of species such as the Puerto Rican boa (*Chilabothrus inornatus* (*Epicrates inornatus*)) through the adoption of a Programmatic Biological Opinion (PBO) issued by the USFWS would be adopted during the construction of the project. For the protection of other species such as: Puerto Rican Broad-winged Hawk (*Buteo platypterus brunnescens*), Puerto Rican Parrot (*Amazona vittata*), Puerto Rican Sharp shinned Hawk (*Accipiter striatus venator*) which have not been found, but may be present in nearby areas, measures for their protection during their breeding season will be incorporated in the proposed action contract documents. Also, a Flora/Fauna Management Plan has been developed and approved by the DNER. This plan requires the presence of an on-site biologist that will be inspecting the area before the commencement of clearing and grubbing activities. Additional Information about this subject has been provided in Section 5.1.7 Endangered Species of the EA.

As discussed previously since no protected species have been found within the RSA, protective measures required to be adopted by regulatory agencies the proposed project action would not result in direct, or indirect, cumulative impacts to those threatened/protected species are anticipated; therefore, no further analysis is necessary and no additional measures are required.

5.4.12 Existing Stressors/Pollution Burden

The RSA for this subject discussion of the proposed action ROW and its immediate vicinity. Consideration of this subject as part of the EA development is a recent requirement, due to its predicted negative impact on EJ communities in the aftermath of more frequent natural disasters. Therefore, existing scattered residential uses along the path of the proposed action corridor constitutes the baseline for the analysis of this subject. As previously indicated, a discussion about this subject has been included at the end of section 5.1.17 of the EA. The proposed action construction will fulfill the originally planned route, by providing a more resilient terrestrial infrastructure for the region.

For the No build and the alternative to improve PR-123, no direct or indirect cumulative impact are anticipated to occur and therefore no additional analyses are necessary. For the proposed action alternative, the improved access to the communities allow to reasonably conclude that positive benefits can be expected from the construction of the proposed action. However, the design of the proposed action has incorporated provisions for the protection of the roadway and would serve to minimize the vulnerability of the communities of the area by improving their terrestrial access. Additional information about this subject has been included in section 5.2.4 Natural Features, Other Factors of the EA. Based upon the information and analysis above, direct, or indirect cumulative impacts are not anticipated to result, and no further analysis is necessary and no additional measures are required.

Chapter 6: Public Participation

A Public Participation Process during February to March 2023 was carried out regarding the 8-Step Process for Floodplains and Wetlands to involve the affected and interested public and agencies in the 8-step decision making process. A second participation process ended on June 24 on an Environmental Re-evaluation of the FEIS and subsequent Re-evaluations approved by FHWA for the construction of PR-10 between Arecibo and Ponce with the intention to adopt this document. In doing so, PRDOH intended to receive early comments in their evaluation process for the adoption of said document.

There were approximately 166 comments. A response to the comments is included as **Attachment 28**. As explained in Section 1.1, in accordance with the guidance provided by CEQ, the appropriate course of action in complying with NEPA, FHWA, and HUD environmental regulations was to prepare an EA to assess whether changes and new environmental impacts not previously analyzed require a Supplemental EIS. Within this EA process there will be an additional thirty (30) days commenting period to respond, which includes the fifteen (15) day commenting period required by HUD regulations and the thirty (30) day commenting period required by FHWA regulations.

The Notice of Availability of the EA was published on March 17, 2024 (See copy in **Attachment 29**) with a 30 day comment period. A total of 46 comments were received during this period. A summary of them and the agency responses were tabulated and included as **Attachment 30** of this EA. Comments were submitted either by letters and/or emails. Comments include a letter from the EPA, three municipalities (Adjuntas, Ponce and Utuado) and one representative of the local Chamber of Representatives. Additional

information incorporated in the text of the EA in response to the received comments have been incorporated and can be identified by the use of bold characters.

A summary of the most significant comments received during the commenting period follows:

- **Environmental Protection Agency (EPA)**

This agency issued a letter dated April 17, 2024 providing comments on the EA, whose most significant ones are:

- **Alternative Analysis**

The Alternative Analysis discussion of the EA was revised to include an additional meaningful alternative, out of the corridor that was analyzed in the original FEIS. However, it is important to indicate that the ending and starting point of the proposed action are defined by the sections of PR-10 already constructed and in operation. In addition, and as requested, a table with estimated impacts (to the greatest extent possible) of the analyzed alternatives was developed and incorporated in the text of the EA.

- **Air Quality Impacts**

The air quality impacts section was updated to incorporate additional pollutants of concern including fine particle matter, nitrogen oxides, volatile organic compounds, air toxics, and greenhouse gases. It was further clarified that the proposed action area is in the central part of the Island which exhibits a good dispersion of gases resulting from the relatively high terrain elevation, temperatures, and constant wind regime. Also, it has been clarified the fact that the air quality basin of the area is currently receiving the emission of combustion gases generated by the vehicular traffic of users of PR-123. The proposed action will serve to divert approximately 80% of the current traffic volume of the to the west side of the Rio Grande de Arecibo and will reduce the travelling distance in approximately 6.4 kilometers, which in turn will result in a reduction of the air emissions when compared to current levels in the air basin.

- **Water Resources/Wetland Impacts**

The water resources section of the EA was revised to incorporate water quality data obtained from the latest DNER/EPA **303 (d) and 305 (b) Integrated Report** was incorporated to provide a context against which the construction impacts on water quality may be assessed. This report identifies various sources of sediments impacting the turbidity of the waters of which the agricultural practices within the basin constitute one of the major sources of pollutants. An estimate of the sediment loading that may reach the Rio Grande de Arecibo waterway was also included and provides support to the statement that the size of the project construction area with respect to the size of the drainage basin of the Rio Grande de Arecibo is not significant (estimated in 0.2% of the entire size of the drainage basin). In terms of water quality, the impact resulting or associated with the vehicular traffic flow of PR-123 is already

impacting the drainage basin of the Rio Grande de Arecibo. The proposed action will serve to improve this condition since a new roadway incorporating green practices, to the extent practicable, will be constructed with an associated shorter travelling distance.

The potential negative impacts to the water quality of the Rio Grande de Arecibo resulting from the construction activities will be mitigated resulting from the need to develop a Storm Water Pollution Prevention Plan (SWPPP) required under provisions of 40 CFR Part 122 which considers the condition of the quality of the receiving water bodies. Said plan is required to incorporate Best Management Practices (BMPs) aimed to reduce the impacts of sedimentation and turbidity as a function of the quality of the receiving waters. It is also required to conduct regular site inspections and to perform corrective actions if malfunction or deficiencies in the operation of the specified control measures are identified.

- Environmental Justice (EJ)

The Environmental Justice discussion of the EA was revised to define a reference community which would be used as a comparison with the affected community used in the environmental justice analysis. Additionally, a discussion of the benefits that may experience the EJ communities of concern is included in Section 5.1.17.

- Cumulative Impacts

The cumulative section of the EA was revised to incorporate a detailed discussion of the cumulative impacts using the CEQ's cumulative impacts effects guidance as well as FHWA guidance documents.

- **Anael Asociados, Inc.**

This entity issued a communication providing comments on the EA which may be summarized as follows:

- The EA fails to disclose the true environmental effects of the construction of PR-10. This comment is subdivided in basically three topics that will be discussed but a general observation of the comments is that it indicates that addressing local environmental laws is absent. With respect to this comment, it is important to indicate that in Section 4.2.2.1 of the EA a discussion of the proposed action background information including previous reevaluations conducted for previous sections already constructed and in operation of PR-10 consultations with the DNER (formerly EQB) maintained the validity of the local FEIS of the action. The EA also discloses the instances in which consultations with the DNER were conducted to identify habitat and tree mitigation requirements of the project as well as the development of Flora and Fauna Management Protocols that will be required to be implemented before commencement of earthwork activities (see section 5.2.4 Natural Features of the EA).

The first subtopic of this comment states that the EA falls short of regarding the potential impacts of the sediments to be generated by the PR-10 construction. It indicates that the EA would disclose the quantity of sediments and residuals to be generated by the project and exactly how they will be handled to avoid polluting the waters and causing excessive handling costs during extreme events that generate landslides and more sediments. This comment was addressed in section 5.2.4 Natural Features of the EA in which an estimate of the sediment loading estimated to be generated during the construction of the project is provided. Using the results of the USGS investigations and projecting it to the proposed action the generation of sediments by the proposed action, the estimated sediment load reaching the drainage basin of the Rio Grande de Arecibo represents approximately a **0.000017%** of the total loads of sediments currently estimated to reach the Rio Grande de Arecibo watershed (see section 5.2.1 Land Development of the EA). With respect to the management of the excess or surplus of material, it is discussed at the end of section 5.1.6 Contamination and Toxic Material of the EA. Finally, mitigations measures for the protection of surface bodies of waters are also discussed in section 5.3 Control Monitoring, Mitigation and Environmental Commitments of the EA.

Second subtopic of this comment deals with the statement that “the way of addressing the environmental issue fails to disclose anything and simply passes the baton to the contractors, who have the burden of acquiring permits and following laws and regulations. Any failure by the contractor exposes the public and the environment to the serious consequences of excessive sedimentation and erosion by landslides. One does not expect the government agencies to abandon the public interest to such a degree. Moreover, this strategy of delegating to private contractors the responsibility of maintaining environmental quality, bypasses the environmental issue and fails to add substance or justification to the discussion lading to a FONSI.” With respect to this comment, it is important to indicate that:

- Construction of the proposed action is to be performed by a contractor selected based on its qualifications that include previous experience with similar types of projects, availability of adequate equipment and qualified professionals.
- The obtention of the required local and federal permits require that qualified professionals, as defined by regulations, develop adequate BMPs, mitigation measures and controls which in the case of the EPA CGP requires a certification of the inspections which shall be performed by qualified persons as per the EPA permit.
- The development of the SWPPP required by the EPA as a prerequisite to obtain coverage under the CGP requires to identify the condition of the receiving water body and consequently, develop erosion and sedimentation measures aimed to minimize or exacerbate the water body cause of

impairment. This information is provided to the EPA at the time of the submittal of the Notice of Intent (NOI) to request coverage under the CGP.

- For this action, since funding from FHWA and HUD will be used for project construction, the proposed action is subject to the monitoring of construction activities described in section 5.3 of the EA.
- The PRHTA/FHWA/PRDOH requires the designation of a Project Manager capable of assessing the progress of the project construction and its compliance with contract terms and conditions which include compliance with applicable local and federal environmental regulations.
- The project construction is subjected to the inspection of local and federal environmental agencies.
- Development of mitigation measures during the construction also considers the recommendations of geotechnical engineers that took soil samples along the path of the proposed action corridor and considered geological conditions of the area.

The third subtopic of this comment is related to the observation of the effects of landslides during the construction and operation of the project with respect to the sedimentation on river, river water quality, estuary, and coastal systems, particularly during extreme events when sediments are expected to be on the move downhill at high concentrations. The EA has no consideration or analyses of the sediment issue with this construction. It is a fatal flaw of the EA. Sedimentation of the basin is a cumulative effect not addressed in the EA. The response to this comment may be addressed as follows:

- The entire central region of Puerto Rico is susceptible to landslides as per the results of investigations performed by the USGS, whose general observations (**see Figure 31 in Attachment 2**) are discussed in section 5.2.1 of the EA. This susceptibility is inherently applicable to the entire area, and the proposed action needs to consider it in its design to minimize its impacts. However, the entire area not affected by the proposed action will continue to generate sediments loading impacting the watershed regardless of the construction or not of the project. The geotechnical projects that have been conducted provide the necessary information to incorporate measures to minimize occurrence during the construction and operation of the roadway. However, the sediment loading resulting from agricultural practices (**see DNER/EPA 303 (d) and 305 (b) Integrated Report**) as well as soils conditions within the watershed which result in significant sediments loading will continue to remain uncontrolled.

- With respect to the effects of sedimentation of rivers, river water quality, estuary, and coastal systems it is important to indicate that as discussed in section 5.2.4 Natural Resources, Unique Natural Features, Water Resources of the EA, information about the water quality of the Rio Grande de Arecibo River and potential sources of pollutants are discussed. The results of analysis of the water quality of this surface body of water resulting in its designation as an impaired water quality designation are also discussed. Information about the sediment generation of the watershed was also studied by the USGS, which published reports titled Sedimentation History of Lago Dos Bocas, Puerto Rico 1942-2005, Luis R. Soler López for the USGS, report 2007-5053 ([SIR2007_5053.pdf](#) ([usgs.gov](#)) and Sedimentation Survey of Lago Dos Bocas, Utuado, Puerto Rico, by Luis R. Soler López, January 2010) establishes that storm events (such as Hurricane Georges in 1998) causes massive sediment transport to the river as evidenced by the before and after estimated sediment trap efficiency of the Dos Bocas reservoir which is located toward the north of the proposed action site. The reports discuss the loss of storage capacity of the reservoir, which is used as a source of potable water for the “North Super aqueduct” and indicating a remaining available reservoir capacity of 54% of the total capacity for 2005. The USGS also indicated that the Dos Bocas and Caonillas constitute efficient sediment trap for the sediments that are generated in the upper parts of the watershed. The report states that “under normal dam operating conditions, about 73 percent of the sediment entering the reservoir is accumulated, the remaining 27 percent is either spilled over the dam or discharged downstream during releases for hydroelectric power generation.” Based on this conclusion, it may be stated that the Dos Bocas and Caonillas reservoir serve to protect estuary and coastal systems from the effects of the sedimentation produced by natural and manmade sources that reach the Rio Grande de Arecibo watershed referenced in this comment.
- The EA fails to disclose the projected interruptions of service and maintenance costs of the PR-10 project. Information on the annual maintenance cost of the proposed action has been incorporated in section 4.2.2.1 of the EA. The estimated annual maintenance costs for a 20-year period are presently estimated at \$375,000 annually, totaling approximately \$7,500,000. Costs include:

| | |
|----------------------------------|-----------|
| • Regular Road Maintenance: | \$70,700 |
| • Bridge Maintenance: | \$126,500 |
| • Landslide and Erosion Control: | \$114,000 |
| • Drainage System Maintenance: | \$38,000 |
| • Other Maintenance Activities: | \$25,200 |

During the project's design phase, a detailed Operations and Maintenance (O&M) Plan will be developed, including schedules, staffing projections, funding sources, and infrastructure management details. Long-term funding for O&M will be integrated into PRHTA and DTPW budgets. The plan will also address risks from climate change and other environmental factors through ongoing risk assessments and updates.

With respect to projected interruptions of the PR-10, the construction activities will be conducted inside a construction corridor without impacting the operation of PR-123. Therefore, no interruptions of service are anticipated.

- The EA introduces a scale of environmental impacts to assess various aspects of the project. The environmental scale of impacts is not formally defined in the EA, even though it is used several times. The reader is not informed of the range of effects considered by the scale nor the procedure that is used to arrive at a particular level of the scale. Is the scale lineal, logarithmic, or exponential?

A description of the assessment factors used for HUD documents was included in section 5.2 of the EA.

- The EA is inadequate to sustain or justify a FONSI. It lacks the information required to assess the critical environmental problems that affect the project and those caused by the project. Heavy rainfalls and landslides will continuously affect PR-10. Instead of addressing the arguments that would justify a FONSI, the EA delegates to private contractors the government's responsibility to plan and address the problems with landslides and sedimentation that are sure to occur. Because the EA is deficient in identifying environmental issues, it cannot be used to assure that no harm to environment will ensue. An EIS is needed to conduct an updated, thorough, and objective evaluation of environmental impacts and alternative courses of action for this section of PR-10. Among those impacts the EIS should include the sedimentation of the Rio Grande de Loiza basin, the expected frequency of landslides and their effects on the environment and the cost estimates for overcoming landslide effects and maintaining PR-10 open. Such analysis should lead to an objective cost/benefit analysis of the project and its alternative.

This closing part of the comment has been addressed in the previous comment's responses presented in this summary and in the table summarizing the comments included in Attachment 30. Moreover, additional information supporting the responses has been included in the text of the EA. It should be noted that all the constructed sections of the PR-10 are currently in operation, even though some of them cross through equally landslide susceptible areas such as the ones along the Proposed Action.

After reviewing the available information, the agencies respectfully support the statement that the EA adequately addresses important environmental issues and that the preparation of supplement to the EIS is not required.

- **Hon. Mariana Nogales Molinelli, House of Representatives**

By letter of April 18, 2024, Representative Mariana Nogales Molinelli provided comments to the EA. A summary of the agency responses to the most significant ones follows:

- Lack of Public Participation

Through the years, and as the proposed action has advanced in its construction, various public meetings and publication of documents aimed to disclose project scope as well as coordination with the public and local (EQB, DNER, OGP) and federal agencies (SHPO, USFWS) have been conducted. As part of the EIS Re-evaluation process summarized in Attachment 1, public information meetings were held on March 19, 2002, and March 18, 2011 in the municipality of Utuado. The purpose of the meetings was to provide information to the community and government officials about the proposed action scope.

The publication of the public notice notifying of the availability of the EA for comments continues to provide information to the public about the scope of the remaining parts of the proposed action.

- Proposed Action is not effective to meet the desired objectives

Chapter 3 of the EA (Purpose and Need) provides information about the need to complete the construction of PR-10, while Chapter 4 Alternatives described the analyzed alternatives including one that is located close to the existing PR-123 ROW. The analyses of improvements to current PR-123 have resulted in the determination that it entails the need to perform extensive earthwork activities and the displacement of approximately 36 residences/businesses while the recommended alternative acquisition process has been completed and the remaining properties would not require the displacement of residences nor businesses.

Once completed, the proposed action will provide an alternate and more secure access to residents of assistance in the aftermath of a natural disaster that affects the capacity of PR-123 to remain open. Therefore, it will serve to improve the resiliency of the terrestrial connection of the areas as well as of the region. It shall be noted that as described in the Purpose and Need chapter of the EA, this action is included in the Long-Range Transportation Plan (LRTP) of Puerto Rico given the importance of PR-123 to provide a corridor for the transportation of raw materials and finished goods between the north and south parts of the Island for this region. Current PR-123, although being for this purpose, constitutes an unsafe and inefficient roadway to serve this function that is being used by truck drivers. With respect to the effectiveness to meet the desired objectives, it is a fact that if a major structural damage affects the integrity of PR-123, all users (including those with residences along the path of this roadway) will be left without a secure access.

- Significant and irreparable environmental impact

The EA has been revised to incorporate additional information pertaining to the water quality, effects of sedimentation and impacts on wetlands. These environmental aspects are recognized and discussed in the EA, and because of this reason mitigation measures considered to minimize and/or address this subject since the design stage (through the performance of specific geotechnical/geologic studies) of the proposed action detailed in the 5.2.1 document. With respect to the wetland crossing, information about their location and characteristics was obtained from the National Wetland Inventory Maps developed by the USFWS. Estimates about the estimated permanent and temporary impacts have been also included in the EA (see Table 2). Mitigation measures to be adopted during the construction stage of the proposed action include the development of continuous monitoring process to be implemented from the early stages of the proposed action construction activities. These measures are discussed in section 5.3 of the EA. In addition, with respect to the Hydrological and Hydraulic (H/H) studies performed so far for the proposed action planning, they will be revised to comply with the most recent regulatory requirements as the project designs advances and have and will consider the effects of the rains caused by events such as hurricane María.

Also, it is important to indicate that with respect to the Determination of the former Environmental Quality Board (EQB) during the reevaluation processes conducted to maintain the validity of the FEIS, additional studies such as the one of Flora and Fauna conducted for the project (2002) and for rare/endangered birds of prey during 2013-2014 with negative results. In addition, continuous coordination with state and federal agencies has been maintained during the time that the construction and planning of the completion of PR-10 has been continued. All their requirements have been met as evidenced by their endorsement letters DNER. USFWS).

With respect to the material resulting from the clearing and grubbing operations, the EA indicates that it is generated at once but gradually as the proposed action advances. However, due to the high vegetative contents of its it is indicated that it may be stored within the proposed action area for its as topsoil after construction is completed, this a common practice of projects (see section 5.1.6 of the EA). In addition, for the surplus material, specific procedures for their management have developed and discussed in section 5.1.6 and in Attachment 9 of the EA.

After assessing available information, the sponsor agencies have determined that no significant impact will result from the construction of the proposed action.

- **Para la Naturaleza**

Para la Naturaleza submitted for the consideration of the PRDOH and the PRHTA various comments which are summarized as follows accompanied by a brief response:

- Sediment Control in Construction: Concerns were raised that the EA didn't adequately analyze sediment issues. The response clarified that the EA discusses erosion, drainage, and sediment control measures in detail, including the installation of berms and nails for stabilization and runoff management. Preliminary estimates suggest a minimal annual sediment contribution from the project.
- Cumulative Sedimentation Issues: It was noted that the EA did not address cumulative sedimentation impacts in the basin. The response indicated that the project's contribution to sedimentation is small compared to the total basin sediment generation and highlighted ongoing efforts for reforestation and erosion control.
- Sediment and Waste Generation: Concerns were expressed about sediment and waste from construction. The response emphasized that erosion control measures will be dynamic and monitored continuously, with plans in place for water quality checks to minimize impacts on local water bodies.
- Permit Compliance Responsibilities: There was skepticism about the contractor's permit obligations. The response reiterated that compliance with local and federal regulations is essential and that both contractors and project owners must adhere strictly to these standards.
- Involvement of Experts: The EA mentioned the need for a qualified technical team for project assessment. The response affirmed that such professionals have already been involved in the EA process and will continue to ensure adherence to environmental standards.
- Increased Landslide Risks: Concerns about the road's contribution to landslides were raised. The response cited studies indicating that unpaved roads and agricultural practices are more significant contributors to landslides, while the proposed project includes features to manage runoff and stabilize slopes.
- Cost-Benefit Analysis: The necessity for a comprehensive cost/benefit analysis concerning sedimentation and landslide risks was highlighted. The response noted that such analyses were conducted in compliance with federal requirements during project planning.
- Environmental Impact Rating: Concerns about the impact scale used in the EA were expressed. The response detailed the rating system utilized by the HUD, emphasizing its clarity and alignment with federal standards, while noting areas for potential improvement in public engagement and specificity.

- **Héctor M. Quintero Vilella, MS, PhD**

By letter of April 8, 2024, Hector Quintero Vilella, MS, PhD submitted for the consideration of the PRDOH and the PRHTA various comments which are summarized as follows accompanied by a brief response:

- Flora and Fauna Study of 2002

The commenter indicates that the study conducted in 2002 covers only 47 % of the total project corridor. It also notes that in order to know the impact of the proposed action construction, a comprehensive field study must be conducted and therefore, this EA should not be accepted and an EIS that includes the results of the recommended study prepared. It is recommended that such study considers the establishment of at least 30 transects along the path of the proposed action corridor using between three to four (4) biologists with experience. With respect to this comment, it is necessary to indicate that various sources of information, both at a federal and local level, were consulted and their references included in the preparation of the EA. These include databases used for the regulated community to develop environmental clearance documents such as the IPAC (USFWS), National Wetland Inventory Maps (USFWS), etc. Recent studies conducted in the aftermath of Hurricane María were also analyzed to obtain information about the impacts suffered by the vegetation in the area. In addition, continuous communication has been maintained with the DNER and the USFWS which have issued their endorsement to the proposed action through the years and indicating that no rare/endangered species were identified along the path of the proposed action corridor. It is understood that the purpose of these studies is to identify the likeliness of affecting either protected species and/or their designated habitats. Also, it is important to note, that the Flora/Fauna Management Protocols developed and approved by the DNER for this action, require to conduct an inspection of the area by a qualified biologist (part of a group) before clearing and grubbing activities are conducted. The protocols establish procedures for the relocation of a rare/endangered species detected within the project area, if applicable. This measure is aligned with EPA's recommendation to incorporate adaptive management practices for this project.

- Reports used in the EA pertaining to vegetation

The commenter indicates that there is no methodic analysis of the flora along the path of the proposed action corridor since a methodic field study has not been conducted. This comment negates the utility of using remote sensing technologies to observe changes in vegetation of areas. The use of remote sensing in the preparation of NEPA documents is supported by several regulations and guidelines issued by the Council on Environmental Quality (CEQ). Some of them are:

1. 40 CFR § 1502.24 - This regulation emphasizes the need for agencies to ensure professional integrity, including scientific integrity, of the discussions and analyses in

environmental impact statements. [It supports the use of high-quality data, which can include remote sensing data.](#)

2. 40 CFR § 1506.5 - This section requires that agencies independently evaluate the information submitted by applicants and ensure its accuracy. [Remote sensing data can be a reliable source of information for these evaluations.](#)
3. CEQ's NEPA Implementing Regulations - The regulations encourage the use of modern technology to improve the efficiency and effectiveness of the NEPA process. [Remote sensing is specifically mentioned as a tool that can enhance data collection and analysis.](#)

Use of remote sensing technology allows for comprehensive data on land use, vegetation cover, essential for baseline environmental assessments; assess changes over time, conduct spatial analysis, and help in the visualization of those changes. Also, it helps to reduce the need to conduct extensive field surveys, whenever possible.

- Reports used in the EA pertaining to wildlife

The reports included in the EA pertaining to wildlife were prepared as per the requirements of the regulatory agencies (DRNA and USFWS). Once prepared they were submitted for the review and approval of the corresponding agency. They concluded with the finding that no rare/endangered species were observed in the proposed action corridor, and consequently their endorsement was obtained.

- Flora and Fauna Management Protocols

For the implementation of the Flora and Fauna Management protocols the commenter indicates that only one biologist shall be present during the construction conducting the identification of the sensitive species for their relocation. However, it should be clarified that this activity would be conducted by a biologist who will be part of a group of professionals that would include additional biologists/ecologists. The magnitude of the project does not allow us to assign such responsibility to a single person.

- Public Participation

The commenter indicates that as part of the EA process no adequate procedures for public participation have been provided. No Public Hearings in the affected area (Adjuntas and Utuado) have been conducted, nor public orientation about the potential project impacts and analyzed alternatives provided. The process has been fast and hasty.

It further indicates that he submitted comments to Reevaluation of the Final Environmental Impact Statement (FEIS), 24 CFR Part 58) Draft Construction of PR-10 Adjuntas to Utuado, Puerto Rico to the PRDOH on July 16, 2023. After their submittal he did not receive a notification from the PRDOH indicating that an EA was prepared for the project.

With respect to this comment, it shall be indicated that this EA process is being conducted in accordance with applicable NEPA requirements to provide the government agencies as well as the public with the opportunity to comment about the published document. As part of this process, comments from the Majors of Adjuntas and Utuado were requested and obtained. Additional public involvement activities pertaining to this project are detailed in Environmental Justice (24 CFR §58.5 (j) and 23 CFR Sec. 771.119 and FHWA Order 6640.23A) of the EA.

- Other species

The commenter indicates that the EA analyzes the potential impacts on rare/endangered species but does not analyze in details other species. As an example, no amphibians are mentioned. It is indicated that in the project area there are four (4) species of coquí (a native frog), that although not designated as rare/endangered, have been recently experiencing a significant reduction on its population. The names of these species are: Coquí Caoba (*Eleutherodactylus richmondi*), Coquí Grillo (*Eleutherodactylus gryllus*), Coquí de la montaña (*Eleutherodactylus portoricensis*), and Coquí de Melodioso (*Eleutherodactylus wightmanae*).

The listed species are included in the red list of the International Union for the Conservation of Nature (IUCN) with the following status:

- Coquí Caoba (*Eleutherodactylus richmondi*) – endangered
- Coquí Grillo (*Eleutherodactylus gryllus*) – critically endangered
- Coquí de la montaña (*Eleutherodactylus portoricensis*), – endangered
- Coquí de Melodioso (*Eleutherodactylus wightmanae*) – endangered

It is further indicated that this observation may be applicable to other species.

In response to this comment, it shall be noted that the analysis of the species scope of the species analyzed in the EA corresponds to ones required to be analyzed as required by federal and local regulations that govern the preparation of the document for NEPA purposes.

- Request for the preparation of an Environmental Impact Statement (EIS)

At the end of its letter, the commenter expresses his understanding about the need to prepare an EIS for the proposed action and to conduct public hearings.

After assessing this comment and based on the results of the analysis conducted by the sponsor agencies, the EA adequately addresses the environmental impacts of the proposed action and describes the mitigation measures required to mitigate the identified impacts.

**FINDING OF NO SIGNIFICANT IMPACT
FOR
CONSTRUCTION OF PR-10, ADJUNTAS TO UTUADO, PUERTO RICO**

FEDERAL HIGHWAY ADMINISTRATION

The FHWA has determined that alternative (identify the alternative selected) will have no significant impact on the human environment. This FONSI is based on the attached EA (reference other environmental and non-environmental documents as appropriate) which has been independently evaluated by the FHWA and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an EIS is not required. The FHWA takes full responsibility for the accuracy, scope, and content of the attached EA (and other documents as appropriate).

_____ Date **LUIS D LOPEZ-
RIVERA** Digitally signed by LUIS D
LOPEZ-RIVERA
Date: 2024.10.10 17:39:21 -0400 for FHWA

PUERTO RICO DEPARTMENT OF HOUSING

Environmental Determination:

Finding of No Significant Impact [24 CFR 58.40(g)(1); 40 CFR 1508.27]

The project will not result in a significant impact on the quality of the human environment. Based on the findings of the environmental studies and analyses performed, it has been determined that a Supplemental EIS is not needed, as defined in 40 CFR 1502.9(d).

Finding of Significant Impact [24 CFR 58.40(g)(2); 40 CFR 1508.27]

The project may significantly affect the quality of the human environment.

Preparer Signature: *Jorge Rivera Jiménez* Date: 10/9/24

Name/Title/Organization: Senior Environmental Consultant | DC Engineering Group, PSC

Certifying Officer Signature: *Juan Pérez* Date: 10/9/24

Name/Title: Juan Pérez, PE, MEng. / Director for Disaster Recovery

This original, signed document and related supporting material must be retained on file by the Responsible Entity in an Environmental Review Record (ERR) for the activity/project (ref: 24 CFR Part 58.38) and in accordance with recordkeeping requirements for the HUD program(s).

Chapter 7: Coordination and List of Preparers

7.1 Coordination Agencies

Puerto Rico Highway and Transportation Authority

Eng. Luis E. Rodríguez Rosa - Programming and Special Studies Area

Puerto Rico Department of Housing

Juan Pérez, PE - Disaster Recovery Director CDBG-DR/MIT

Federal Highway Administration

Luis López, PE – Senior Environmental Specialist

7.2 Preparers

PRHTA Environmental Consultant

David Moreno Vázquez, P.E. – Senior Environmental Consultant

Barret Hale and Alamo (BHA)

César Collazo, P.E. – Lead Engineer

DC Engineering Group, PSC

Jorge Rivera Jiménez, JD, P.E. – Senior Environmental Consultant

Daianyk Córdova Marrero, MSCE, P.E. – Environmental Coordinator

ATTACHMENTS