



February 2020

PUERTO RICO DISASTER RECOVERY

FEMA Actions Needed to Strengthen Project Cost Estimation and Awareness of Program Guidance

GAO Highlights

Highlights of [GAO-20-221](#), a report to congressional requesters

Why GAO Did This Study

In September 2017, two major hurricanes—Irma and Maria—struck Puerto Rico, destroying roads and buildings among other things. Puerto Rico estimates that \$132 billion will be needed to repair and reconstruct infrastructure and services through 2028. FEMA is the lead federal agency responsible for assisting Puerto Rico to recover from these disasters. FEMA administers the Public Assistance program in partnership with Puerto Rico to provide funds to rebuild damaged infrastructure and restore services. GAO was asked to review federal recovery efforts in Puerto Rico.

In this report, GAO examines, among other things, (1) the status of FEMA Public Assistance program funding and any challenges in implementing the program, (2) the extent to which Public Assistance cost estimating guidance addresses conditions in Puerto Rico and aligns with best practices, and (3) the extent to which FEMA has developed policies and guidance for the program and any challenges with these policies and guidance. GAO reviewed FEMA's cost estimation guidance as well as documentation and data on the Public Assistance program through September 2019. GAO conducted site visits to Puerto Rico and interviewed FEMA and Puerto Rico government officials regarding the status of recovery efforts.

What GAO Recommends

GAO recommends that FEMA (1) revise its cost estimating guidance for Public Assistance to more fully adhere to best practices and, (2) develop a repository of current applicable Public Assistance guidance available to all relevant recovery partners in Puerto Rico. The Department of Homeland Security concurred with these recommendations.

View [GAO-20-221](#). For more information, contact Chris Currie at (404) 679-1875 or currie@gao.gov

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What GAO Found

As of September 30, 2019, the Federal Emergency Management Agency (FEMA) had obligated nearly \$6 billion in Public Assistance grants to Puerto Rico for 1,558 projects since the September 2017 hurricanes. Of this \$6 billion, \$5.1 billion was obligated for emergency work projects such as debris removal and temporary power restoration. However, FEMA and Puerto Rico faced challenges in developing long-term, permanent work projects under the Public Assistance program. The large number of damaged sites and delays in establishing cost estimation guidance specific to Puerto Rico have also presented challenges to developing projects, according to FEMA and Puerto Rico officials. Both parties must agree to fixed cost estimates for these projects before work can begin. FEMA and Puerto Rico had approved fixed cost estimates for 19 projects as of September 2019, out of 9,344 damaged sites in Puerto Rico, such as schools, hospitals, and roads. FEMA and Puerto Rico have recently taken actions, including extending the deadline for fixed cost estimates, to address these challenges. However, it is too soon to assess the impact of these actions.

FEMA has adapted its Public Assistance cost estimating guidance to accurately reflect costs in Puerto Rico but could improve the guidance to further enhance its reliability. GAO found that FEMA's guidance substantially or fully met best practices for nine of 12 steps included in the *GAO Cost Estimating and Assessment Guide*, such as documenting and defining the purpose of the estimate. However, FEMA could improve the guidance in three areas, including analyzing risks and future uncertainties that could affect these estimates.

Hurricane Damage to a School in Puerto Rico, March 2019



Classroom with mold on floors and water damage on the walls at a school in San Juan, Puerto Rico.



Interior damages to a school in Puerto Rico from water infiltration with standing water and mold on walls.

Source: GAO. | [GAO-20-221](#)

FEMA has developed Public Assistance policies and guidance to respond to complex recovery conditions in Puerto Rico. However, Puerto Rico government officials GAO spoke with stated that they were not always certain about how to proceed in accordance with FEMA policy because they did not consistently understand what guidance was in effect. Further, FEMA does not maintain a repository of Public Assistance guidance available to all recovery partners that includes current applicable guidance. Without real time access to current applicable guidance, recovery partners risk using guidance that has been revised or replaced.

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Abbreviations

Central Recovery Office	Central Office for Recovery, Reconstruction, and Resilience
DHS	Department of Homeland Security
DRF	Disaster Relief Fund
FEMA	Federal Emergency Management Agency
GAO Cost Guide	GAO's Cost Estimating and Assessment Guide
Management Guide	Disaster Recovery Federal Funds Management Guide
NOAA	National Oceanic and Atmospheric Administration
RAND	RAND Corporation
SOP	FEMA's Standard Operating Procedures for Alternative Procedures
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
Supplemental Relief Act	Additional Supplemental Appropriations for Disaster Relief Act of 2019

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February 5, 2020

Congressional Requesters

In a span of 14 days in September 2017, two major hurricanes—Irma and Maria—struck Puerto Rico causing billions of dollars in damage to its infrastructure, housing, and economy.¹ In its recovery plan, Puerto Rico estimates that \$132 billion in funding from 2018 through 2028 will be needed to repair and reconstruct the infrastructure damaged by the hurricanes, exacerbating an already difficult financial situation in Puerto Rico, which had been operating under severe fiscal constraints prior to the storms.² Estimating the costs to repair or replace damaged infrastructure is an important task to determine federal funding needed to support Puerto Rico’s recovery.

The Federal Emergency Management Agency (FEMA)—a component of the Department of Homeland Security (DHS)—is the lead federal agency responsible for assisting Puerto Rico as it recovers from these natural disasters.³ Among other responsibilities, FEMA administers the Public Assistance program in partnership with the government of Puerto Rico, including officials from various levels of government who work together as partners in the recovery, providing grant funding for a wide range of eligible response and recovery activities. The Public Assistance program provides funding for debris removal efforts; life-saving emergency protective measures; and the repair or replacement of disaster-damaged publicly-owned facilities, roads and bridges, electrical utilities, among other activities.

¹The National Oceanic and Atmospheric Administration (NOAA) measures hurricanes on a scale from 1 to 5 with a Category 1 being the least intense and a Category 5 being the most intense. NOAA defines a Category 4 hurricane as one with winds above 130 miles per hour but less than 157 miles per hour. Hurricane Maria made landfall on Puerto Rico as a Category 4 hurricane.

²In fiscal year 2016, the last year for which audited financial statements are available at the time of our 2019 review of Puerto Rico’s public debt, total public debt outstanding stands at \$65.2 billion. Puerto Rico’s total public debt outstanding increased continuously between fiscal years 2005 and 2014, prior to a default in 2015. Puerto Rico is in the process of restructuring its outstanding debt. See GAO, *U.S. Territories: Public Debt Outlook – 2019 Update*, [GAO-19-525](#) (Washington, D.C.: June 28, 2019).

³See 6 U.S.C. § 313.

On November 2, 2017, Amendment 5 to the president’s disaster declaration for Hurricane Maria imposed a number of grant conditions, including that FEMA must obligate all large project funding for Public Assistance permanent work through alternative procedures as authorized by the Sandy Recovery Improvement Act of 2013.⁴ The stated goals of the alternative procedures are to reduce costs to the federal government, increase flexibility in the administration of the Public Assistance program, expedite the provision of assistance under the program, and provide financial incentives to recipients of the program for the timely and cost-effective completion of projects. The alternative procedures also require that FEMA and Puerto Rico develop cost estimates before work can begin on large Public Assistance permanent work projects.

We have previously reported on federal disaster response and recovery efforts in Puerto Rico. For example, in September 2018, we reported on our observations of FEMA’s response to hurricanes Irma and Maria in Puerto Rico, among other impacted areas. In March 2019, we reported on the status of FEMA’s Public Assistance program in Puerto Rico, including FEMA’s obligations and expenditures in Puerto Rico, and initial challenges with the recovery process.⁵

You asked us to review the federal government’s response and recovery efforts related to the 2017 hurricanes. In this report, we examine: (1) the

⁴See 82 Fed. Reg. 53,514-01 (Nov. 16, 2017). The Sandy Recovery Improvement Act of 2013 amended the Stafford Act by adding Section 428, which authorized FEMA to approve Public Assistance program projects under the alternative procedures provided by that section for any presidentially-declared major disaster or emergency. Pub. L. No. 113-2, div. B, § 1102(2), 127 Stat. 39, amending Pub. L. No. 93-288, tit. IV, § 428 (codified at 42 U.S.C. § 5189f).

⁵GAO, *2017 Hurricanes and Wildfires: Initial Observations on the Federal Response and Key Recovery Challenges*, [GAO-18-472](#) (Washington, D.C.: September 4, 2017). GAO, *Puerto Rico Hurricanes: Status of FEMA Funding, Oversight, and Recovery Challenges*, [GAO-19-256](#) (Washington, D.C.: March 14, 2019). Further, we testified on four occasions between June 2019 and October 2019, regarding our observations on Puerto Rico’s plans for using the alternative procedures program and challenges with program implementation. GAO, *Emergency Management: FEMA Has Made Progress, but Challenges and Future Risks Highlight Imperative for Further Improvements*, [GAO-19-594T](#) (Washington, D.C.: June 12, 2019). GAO, *Emergency Management: FEMA Has Made Progress, but Challenges and Future Risks Highlight Imperative for Further Improvements*, [GAO-19-617T](#) (Washington, D.C.: June 25, 2019). GAO, *Emergency Management: FEMA’s Disaster Recovery Efforts in Puerto Rico and the U.S. Virgin Islands*, [GAO-19-662T](#) (Washington, D.C.: July 11, 2019). GAO, *Disaster Recovery: Recent Disasters Highlight Progress and Challenges*, [GAO-20-183T](#) (Washington, D.C.: October 22, 2019). For other relevant reports, see the *Related GAO Products* page.

status of FEMA's Public Assistance funding in Puerto Rico and any challenges FEMA and Puerto Rico face in developing Public Assistance projects; (2) the extent to which Public Assistance cost estimating guidance addresses specific conditions in Puerto Rico and aligns with best practices for cost estimating; (3) the extent to which FEMA has developed policies and guidance for the Public Assistance program in Puerto Rico and any challenges recovery partners faced with these policies and guidance; and (4) the structures Puerto Rico and FEMA have put in place to manage and oversee Public Assistance program funding.

To address these objectives, we reviewed relevant laws and FEMA Public Assistance grant program guidance, including the April 2018 *Public Assistance Program and Policy Guide*, and the April 2018 and September 2019 revised *Public Assistance Alternative Procedures Permanent Work Guide for Puerto Rico*. We also observed the data systems FEMA uses to develop, manage, and oversee individual projects. These include the Emergency Management Mission Integrated Environment and the Integrated Financial Management Information System. We interviewed officials from FEMA headquarters, as well as officials from FEMA Region II, the FEMA regional office with oversight for Puerto Rico.⁶ Further, in May, August, and September of 2018, and March of 2019, we conducted site visits to Puerto Rico to observe hurricane-damaged areas and interview relevant FEMA and Puerto Rico government officials. These site visits were not generalizable to all damaged areas across Puerto Rico, but provided important context about the status of recovery efforts.

To assess the status of Public Assistance program funding in Puerto Rico, we obtained and analyzed data on FEMA's obligations and Puerto Rico's expenditures from September 2017 through September 30, 2019,

⁶ FEMA Region II is responsible for the states of New Jersey and New York, the Commonwealth of Puerto Rico, the territory of the U.S. Virgin Islands, and eight Tribal Nations.

the most recent data available at the time of our review.⁷ We reviewed information about these systems, interviewed data users and managers responsible for these data, and cross-checked data across sources to ensure consistency. Based on these steps, we determined these data to be sufficiently reliable for the purposes of describing the status of Public Assistance funding in Puerto Rico. To identify any challenges FEMA and Puerto Rico faced implementing the Public Assistance program in Puerto Rico, we reviewed documentation on the use of alternative procedures for Public Assistance and interviewed FEMA officials in Puerto Rico, FEMA Region II, and FEMA headquarters. These interviews focused on the agency's responsibilities and processes for ensuring Puerto Rico implemented the Public Assistance program in accordance with relevant laws, regulations, policies, and FEMA guidance. Further, we reviewed documents and interviewed officials from Puerto Rico's Central Office of Recovery, Reconstruction, and Resilience (central recovery office).

To examine the extent to which Public Assistance cost estimating guidance addresses specific conditions in Puerto Rico, we interviewed FEMA officials in Puerto Rico and at FEMA headquarters. We also reviewed FEMA documentation on exceptions FEMA developed to adapt their Cost Estimating Format to specific costs in Puerto Rico. To determine how well FEMA cost estimating guidance for Public Assistance alternative procedures aligns with best practices for cost estimating, we evaluated FEMA's *Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-PR* issued in April 2018 and updated in September 2019, and FEMA's *Cost Estimation Format for Large Projects Instructional Guide*. We compared FEMA's guidance for developing cost estimates outlined in these documents against the best practices in the 12 steps for cost estimating described in the GAO Cost Estimating and Assessment Guide which we developed to establish a consistent methodology that can be used across the federal government

⁷These data do not include obligations and expenditures for, among other federal disaster assistance programs, direct federal mission assignments, in which a federal agency is tasked with providing eligible emergency work or debris removal services to a territory or state, or for other categories of mission assignments. An obligation is a definite commitment that creates a legal liability of the government for the payment of goods and services ordered or received. For the purposes of this report, obligations represent the amount of grant funding FEMA provided through the Public Assistance program for specific projects in Puerto Rico. An expenditure is an amount paid by federal agencies, by cash or cash equivalent, during the fiscal year to liquidate government obligations. For the purposes of this report, an expenditure represents the actual spending by the Puerto Rico government of money obligated by the federal government.

to develop, manage, and evaluate cost estimates.⁸ We used a five point scale for our assessment:

- **Fully met.** FEMA provided complete evidence that satisfies all the elements of the step.
- **Substantially met.** FEMA provided evidence that satisfies a large portion of the elements of the step.
- **Partially met.** FEMA provided evidence that satisfies about half of the elements of the step.
- **Minimally met.** FEMA provided evidence that satisfies a small portion of the elements of the step.
- **Not met.** FEMA provided no evidence that satisfies any of the elements of the step.

We have summarized our findings for each of the Cost Guide's 12 steps in appendix IV of this report.

To assess the extent to which FEMA has developed policies and guidance for the Public Assistance program in Puerto Rico and any challenges recovery partners have had with those policies and guidance, we reviewed FEMA policy and guidance on national and Puerto Rico-specific Public Assistance and alternative procedures guidance and compared them to FEMA's *National Disaster Recovery Framework*.⁹ We interviewed officials from FEMA, the central recovery office and six Puerto Rico government agencies and public corporations headquartered in San Juan, Puerto Rico. We selected the six entities with the greatest shares of Public Assistance obligations in Puerto Rico as of December 6, 2018. We also interviewed Puerto Rico government officials from 10 selected

⁸GAO, *GAO Cost Estimating and Assessment Guide Best Practices for Developing and Managing Capital Program Costs*, [GAO-09-3SP](#) (Washington, D.C.: March, 2009). The 12-step process addresses best practices, including defining the program's purpose, developing the estimating plan, defining the program's characteristics, determining the estimating approach, identifying ground rules and assumptions, obtaining data, developing the point estimate, conducting sensitivity analysis, performing a risk or uncertainty analysis, documenting the estimate, presenting it to management for approval, and updating it to reflect actual costs and changes. Following these steps ensures that realistic cost estimates are developed and presented to management, enabling them to make informed decisions.

⁹FEMA; *National Disaster Recovery Framework*, Second Edition (Washington, D.C.: June, 2019).

municipal governments throughout Puerto Rico.¹⁰ We selected these municipalities based on population and Public Assistance per capita spending. In interviews with agencies and municipalities, we asked officials about their experience working with FEMA to implement the Public Assistance program and any challenges they faced. The results from our interviews cannot be generalized to all of Puerto Rico's government agencies, public corporations, and municipalities; however, they provide important context about the Public Assistance program in Puerto Rico.

To describe the structures FEMA and Puerto Rico have created to manage and oversee Public Assistance program funding, we reviewed FEMA documentation. This included the *Public Assistance Program Management and Grant Closeout Standard Operating Procedure* and Puerto Rico's administrative plans and recovery management guide outlining the territory's programmatic management and project oversight activities for these programs, among other relevant documents. Further, we interviewed FEMA officials and Puerto Rico officials from Puerto Rico's central recovery office and reviewed Puerto Rico government documents related to recovery planning and internal controls.

We conducted this performance audit from March 2018 through January 2020 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

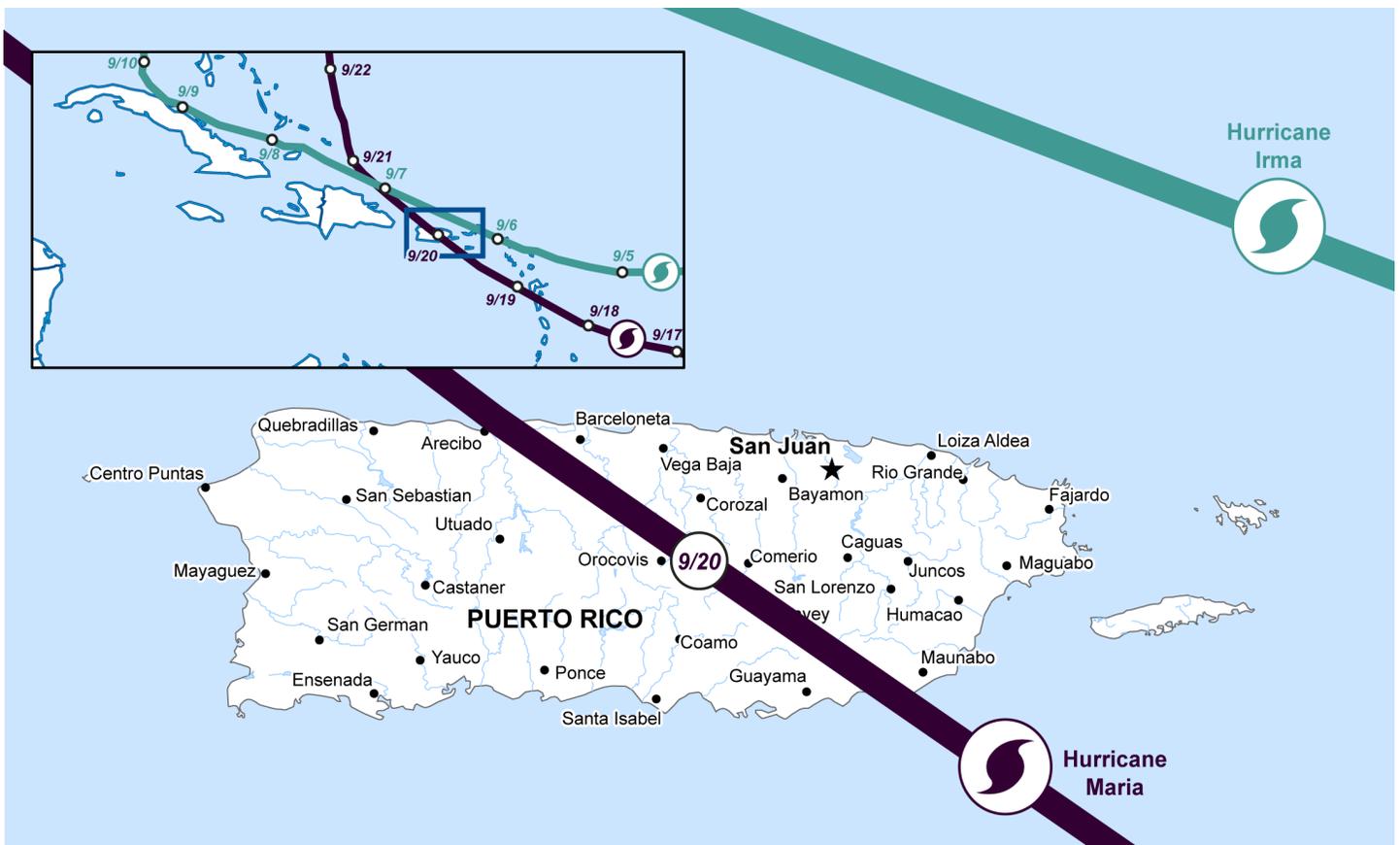
Background

On September 6, 2017, the eye of Hurricane Irma traveled about 50 nautical miles to the north of the northern shore of Puerto Rico as a

¹⁰In September 2018, we conducted semi-structured interviews with Puerto Rico's six most populous municipalities and the four municipalities with the highest level of Public Assistance spending per capita in each of FEMA's four administrative branches in Puerto Rico. According to 2017 Census estimates, the six most populous municipalities are, in order of population: San Juan, Bayamón, Carolina, Ponce, Caguas, and Guaynabo. According to FEMA, the four municipalities with the highest level of Public Assistance spending per capita per FEMA branch as of August 6, 2018 are: Maricao (Branch I), Naranjito (Branch II), Maunabo (Branch III), and Guayanilla (Branch IV). Prior to our September 2018 site visit, we met with officials from the municipalities of Canóvanas, Cayey, Orocovis, and Toa Baja in August 2018, to gather preliminary information and to develop the semi-structured interviews.

category 5 hurricane. Less than two weeks later, Hurricane Maria made landfall as a category 4 hurricane on the main island of Puerto Rico on the morning of September 20, 2017, with wind speeds up to 155 miles per hour. The center of the hurricane moved through southeastern Puerto Rico to the northwest part of the island, as shown in figure 1 below.

Figure 1: The Paths of Hurricanes Irma and Maria



Source: GAO analysis of National Oceanic and Atmospheric Administration data; Map Resources (map). | GAO-20-221

In response to the request of the governor of Puerto Rico, the president declared a major disaster the day after each hurricane impacted Puerto

Rico.¹¹ Major disaster declarations can trigger a variety of federal response and recovery programs, including assistance through FEMA’s Public Assistance program.¹² Under the *National Response Framework*, DHS is the federal department with primary responsibility for coordinating disaster response, and within DHS, FEMA has lead responsibility.¹³

FEMA’s Public Assistance Program

FEMA’s Public Assistance program provides grant funding to state, territorial, local, and tribal governments, as well as certain types of private nonprofit organizations, to assist them in responding to and recovering from major disasters or emergencies.¹⁴ As shown in figure 2, Public Assistance program funds are categorized broadly as either “emergency work” or “permanent work.” Within those two broad categories are separate sub-categories. In addition to the emergency work and permanent work categories, FEMA’s Public Assistance program includes Category Z, which represents any indirect costs, any direct administrative costs, and any other administrative expense associated with a specific project.¹⁵

¹¹In accordance with the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended, the President of the United States may declare that a major disaster or emergency exists in response to a Governor’s or tribal chief executive’s request if the disaster is of such severity and magnitude that effective response is beyond the capabilities of a state, tribe, or local government and federal assistance is necessary. See 42 U.S.C. § 5170.

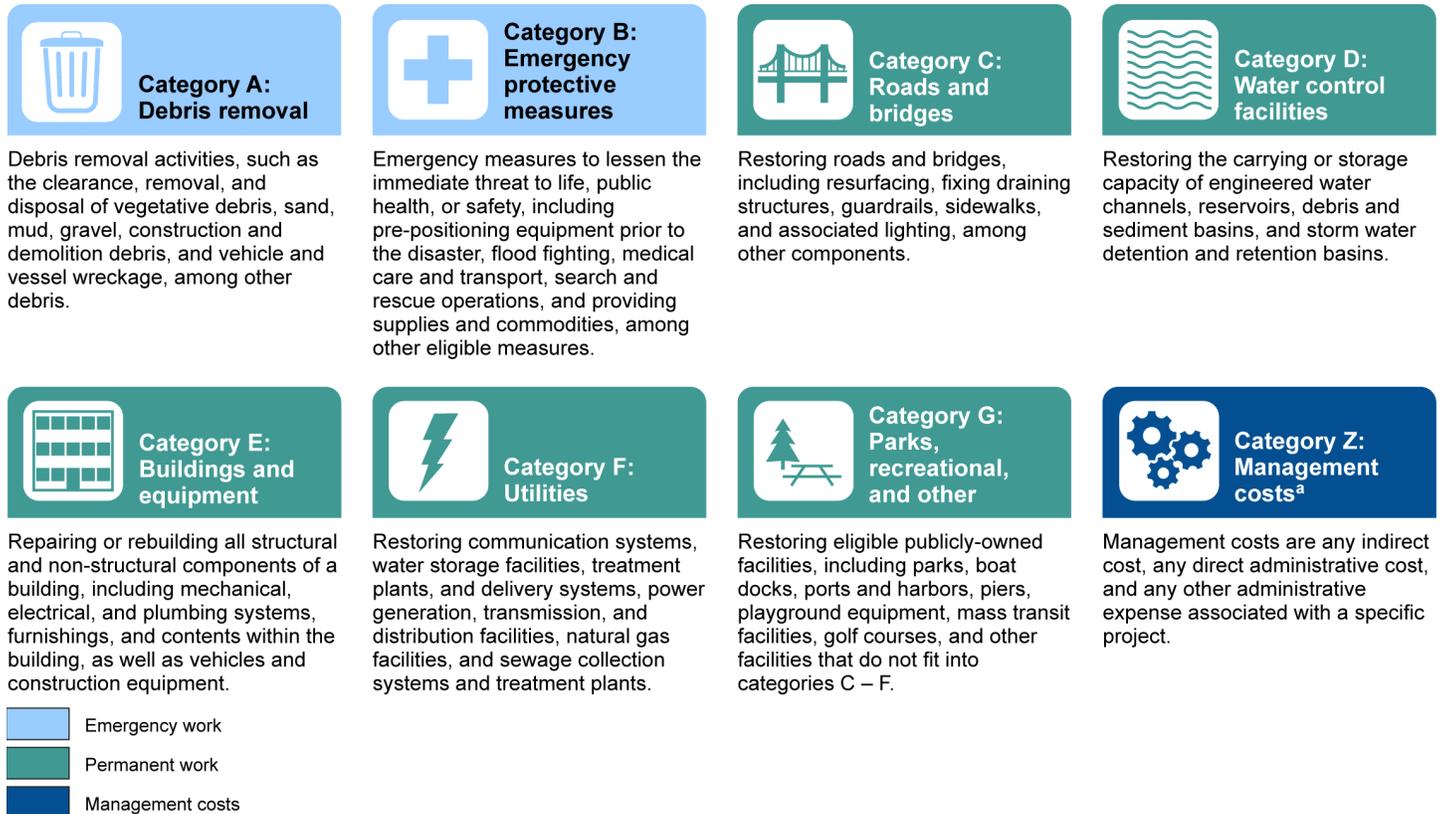
¹²Presidential Policy Directive-8: National Preparedness establishes a national preparedness system made of an integrated set of guidance, programs, and processes designed to strengthen the security and resilience of the United States through systematic preparation for the natural and human-caused threats that pose the greatest risk. This system breaks preparedness activities into five different lines of effort—prevention, protection, mitigation, response, and recovery—each of which requires a separate planning framework.

¹³FEMA; *National Response Framework*, Fourth Edition (October 29, 2019).

¹⁴The Public Assistance program represents the largest share of the Disaster Relief Fund (DRF), which is the primary source of federal disaster assistance for state and local governments when a disaster is declared. The DRF is appropriated no-year funding, which allows FEMA to fund, direct, coordinate, and manage response and recovery efforts—including certain efforts by other federal agencies and state and local governments, among others—associated with domestic disasters and emergencies.

¹⁵The Disaster Recovery Reform Act of 2018 amended the definition of management cost, referred to as category Z. See Pub. L. No. 115-254, § 1215, 132 Stat. 3186, 3449 (codified at 42 U.S.C. § 5165b(a)).

Figure 2: Federal Emergency Management Agency (FEMA’s) Public Assistance Program Categories of Work



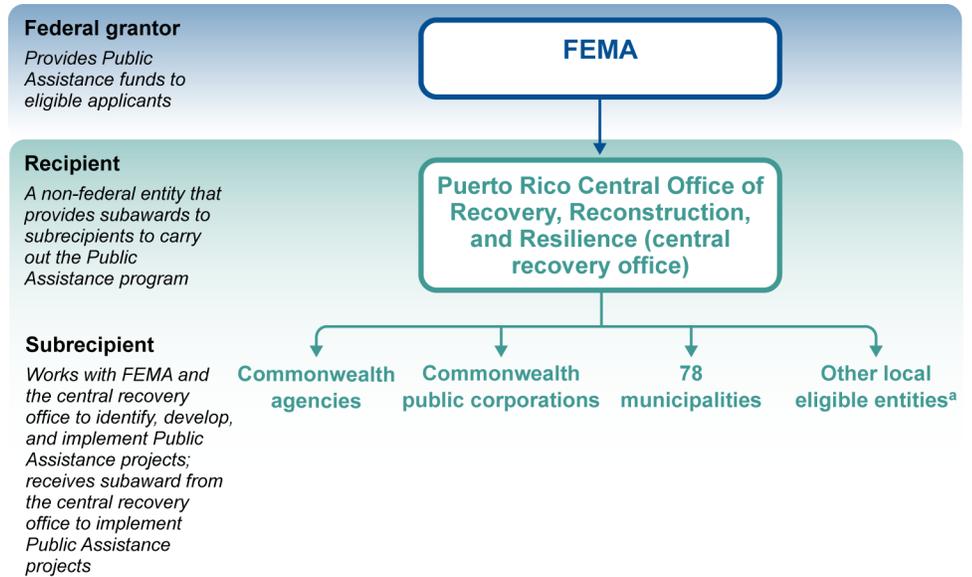
Source: Federal Emergency Management Agency. | GAO-20-221

^aThe Disaster Recovery Reform Act of 2018 amends the definition of Category Z management costs. See Pub. L. No. 115-254, § 1215, 132 Stat. 3186, 3449 (codified at 42 U.S.C. § 5165b(a)).

Entities Involved in Puerto Rico’s Recovery

Given the immense scale and scope of devastation, disaster recovery in Puerto Rico is a complex and dynamic process involving a large number of entities. As shown in figure 3, implementing the Public Assistance program involves recovery partners from the federal government; the Commonwealth of Puerto Rico; and Puerto Rico government agencies, public corporations, municipalities, and eligible nonprofits in Puerto Rico. These recovery partners play a role in implementing the Public Assistance program by developing projects and providing or receiving grants and sub-grants (subawards).

Figure 3: Entities Involved in Implementing Federal Emergency Management Agency (FEMA's) Public Assistance Program in Puerto Rico



Source: GAO analysis of Federal Emergency Management Agency documents. | GAO-20-221

^aOther local eligible entities include eligible private nonprofit organizations that provide eligible services such as education, utility, emergency or medical, among others.

FEMA. FEMA administers the Public Assistance program in partnership with Puerto Rico and makes Public Assistance grant funding available to Puerto Rico.

Puerto Rico Central Office of Recovery, Reconstruction and Resilience. Puerto Rico was required, as a condition to receiving Public Assistance grant funding, to establish an oversight authority supported by third-party experts and provide centralized oversight over recovery funds. In October 2017, the governor of Puerto Rico established the Central Office of Recovery, Reconstruction, and Resilience (central recovery office) to be the recipient for all Public Assistance funding consistent with the conditions provided in Amendment 5 to the President's disaster declaration.¹⁶ The central recovery office is a non-federal entity that provides a subaward to an applicant to carry out part of the federal program. As a recipient of federal funds, the central recovery office must

¹⁶Puerto Rico; Amendment No. 5 to Notice of a Major Disaster Declaration, 82 Fed. Reg. 53,514 (Nov. 16, 2017).

oversee subrecipients to ensure that they are aware of and comply with federal regulations.¹⁷ According to central recovery office officials, the office was also established to ensure coordination with FEMA across the numerous partners in recovery.

Commonwealth agencies, local entities, and private non-profits. Puerto Rico's agencies, such as the Department of Housing, and public corporations, such as the Puerto Rico Electric Power Authority, act as subrecipients. Specifically, they work with FEMA and the central recovery office to identify, develop, and implement Public Assistance projects. Local entities, including Puerto Rico's 78 municipalities and eligible private non-profits that provide critical services, are also subrecipients of FEMA Public Assistance funding. As subrecipients, these entities receive subawards from the central recovery office to carry out work under the Public Assistance program.

Alternative Procedures for Public Assistance Funds

According to a November 2017 amendment to Puerto Rico's major disaster declaration, FEMA must obligate all large project funding for Public Assistance permanent work through alternative procedures due to the extraordinary level of infrastructure damage caused by Hurricane Maria, as well as Puerto Rico's difficult financial position.¹⁸

To develop projects under the Public Assistance program, FEMA and Puerto Rico officials are to collaborate to identify and document the damage caused by a disaster to a particular facility.¹⁹ These officials are to then use the damage description to formulate the scope of work—or activities required to fix the identified damage—as well as the estimated cost of these activities.

Under the standard Public Assistance program, FEMA will fund the actual cost of a large project, and will increase or reduce the amount of funding based on the cost of completed eligible work. In contrast, in Puerto Rico,

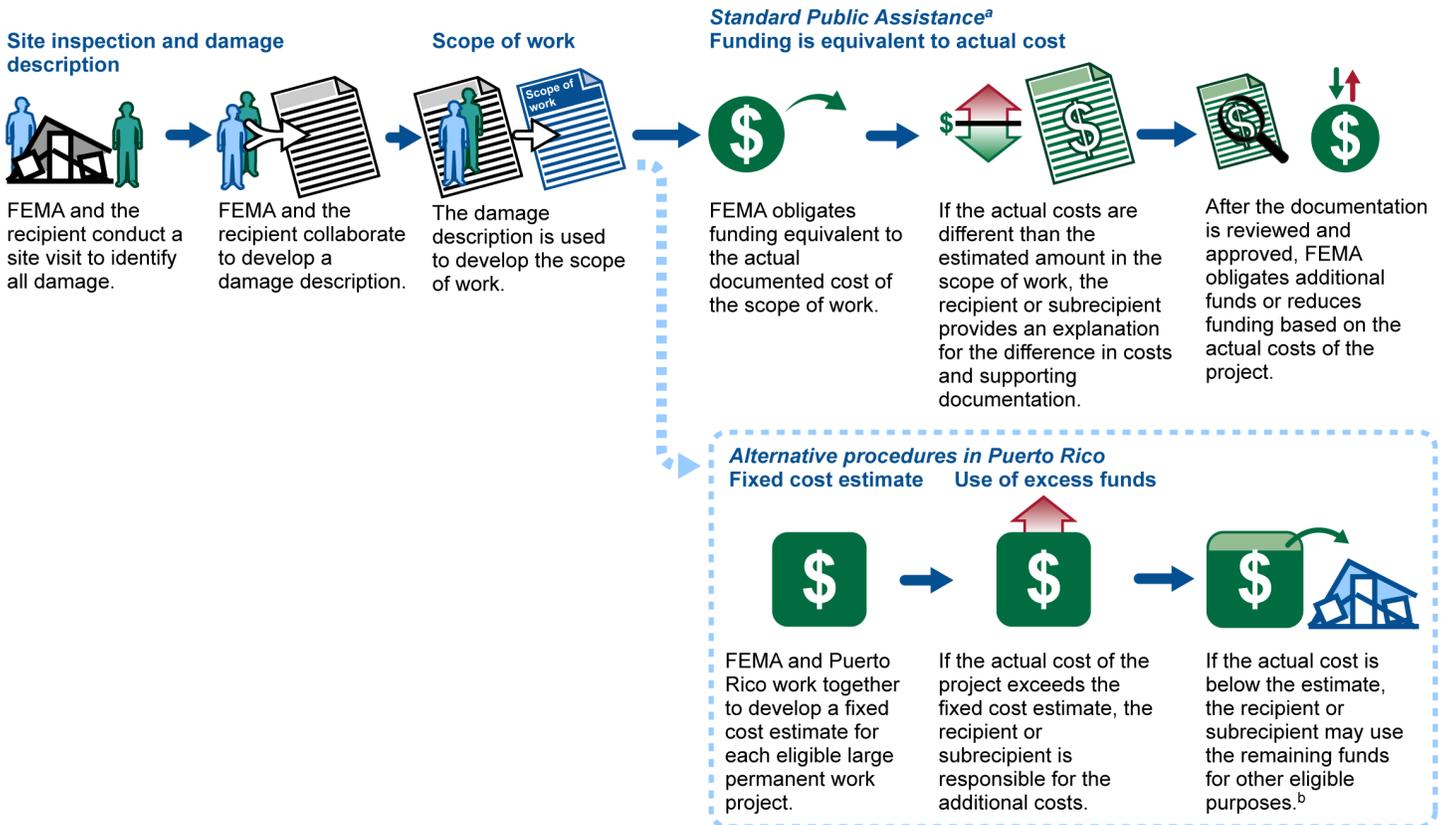
¹⁷Federal regulations adopted by DHS that govern federal grant awards require that recipients of federal grant awards, including states and territories, must monitor subrecipients to ensure they are aware of, and comply with, federal regulations. See 2 C.F.R. § 200.331.

¹⁸See 82 Fed. Reg. 53,514.

¹⁹Facility means any publicly or privately owned building, works, system, or equipment, built of manufactured, or an improved and maintained natural feature. 44 C.F.R. § 206.201(c).

the alternative procedures require that the central recovery office and subrecipients work collaboratively with FEMA to develop a fixed cost estimate. According to FEMA officials, once this fixed cost estimate is agreed to and obligated, subrecipients have flexibility within that fixed cost estimate to rebuild in the manner that they find most appropriate. Subrecipients could do the actual work used to develop the fixed cost estimate, or they could put funds towards another FEMA approved project. Unlike the standard Public Assistance program, the subrecipient is responsible for actual costs that exceed the fixed cost estimate. If actual costs are less than the fixed cost estimate, the subrecipient may use all or part of excess funds for other eligible purposes, such as for additional cost-effective hazard mitigation measures to increase the resiliency of public infrastructure, as detailed in figure 4 below.

Figure 4: Standard Public Assistance and Alternative Procedures for the Federal Emergency Management Agency’s (FEMA) Public Assistance in Puerto Rico



Source: GAO analysis of FEMA documents. | GAO-20-221

^aPermanent work projects with an estimated cost of under \$123,100 (the threshold for large projects) are administered using the standard Public Assistance program in Puerto Rico.

^bExamples of eligible purposes include additional cost-effective hazard mitigation measures to increase the resiliency of public infrastructure, or funding for activities that improve the recipient's or subrecipient's future Public Assistance operations or planning.

The Bipartisan Budget Act of 2018

Section 20601 of the Bipartisan Budget Act of 2018 authorized FEMA, when using the alternative procedures, to provide assistance to fund the replacement or restoration of disaster-damaged infrastructure that provides critical services—such as medical and educational facilities—to an industry standard without regard to pre-disaster condition.²⁰ It also allows for restoration of components not damaged by the disaster when necessary to fully effectuate restoration of the disaster-damaged components to restore the function of the facility or system to industry standards. For example, through the Act, FEMA may fund the restoration of a disaster-damaged school building—which provides a critical service—to accepted industry standards applicable to the construction of education facilities. Therefore, according to FEMA policy, if the school building was not up to industry standards, or in poor condition prior to the 2017 hurricanes, the Act allows FEMA to fund the restoration of this building to a better condition than it was in prior to the storms. Further, the Additional Supplemental Appropriations for Disaster Relief Act of 2019 (Supplemental Relief Act), which was signed into law on June 6, 2019, provides additional direction to FEMA in the implementation of section 20601.²¹ Following the Supplemental Relief Act, FEMA issued additional

²⁰See Pub. L. No. 115-123, § 20601(1), 132 Stat. 64 (2018). For the purposes of our report, discussion of the Bipartisan Budget Act of 2018 refers specifically to section 20601. Critical services include public infrastructure in the following sectors: power, water, sewer, wastewater treatment, communications, education, and emergency medical care. See 42 U.S.C. § 5172(a)(3)(B). Section 20601 applies only to assistance provided through the Public Assistance alternative procedures program for the duration of the recovery for the major disasters declared in Puerto Rico and the U.S. Virgin Islands following hurricanes Irma and Maria. Further, the Additional Supplemental Appropriations for Disaster Relief Act of 2019, which was signed into law on June 6, 2019, provides additional direction to FEMA in the implementation of section 20601. Pub. L. No. 116-20, tit. VI, § 601, 133 Stat. 871, 882 (2019). Specifically it directs FEMA to “include the costs associated with addressing pre-disaster condition, undamaged components, codes and standards, and industry standards in the cost of repair” when calculating the whether a facility should be repaired or replaced.

²¹We reported in June 2019 that FEMA and Puerto Rico officials have reported challenges with the implementation of the flexibilities authorized by section 20601 of the Bipartisan Budget Act. Officials from Puerto Rico's central government stated that they disagreed with FEMA's interpretation of the types of damages covered by section 20601 of the Bipartisan Budget Act of 2018. In response, FEMA officials in Puerto Rico stated they held several briefings with the central recovery office to explain FEMA's interpretation of the section. [GAO-19-594T](#).

guidance in September 2019 that includes information on eligibility and applicable industry standards.

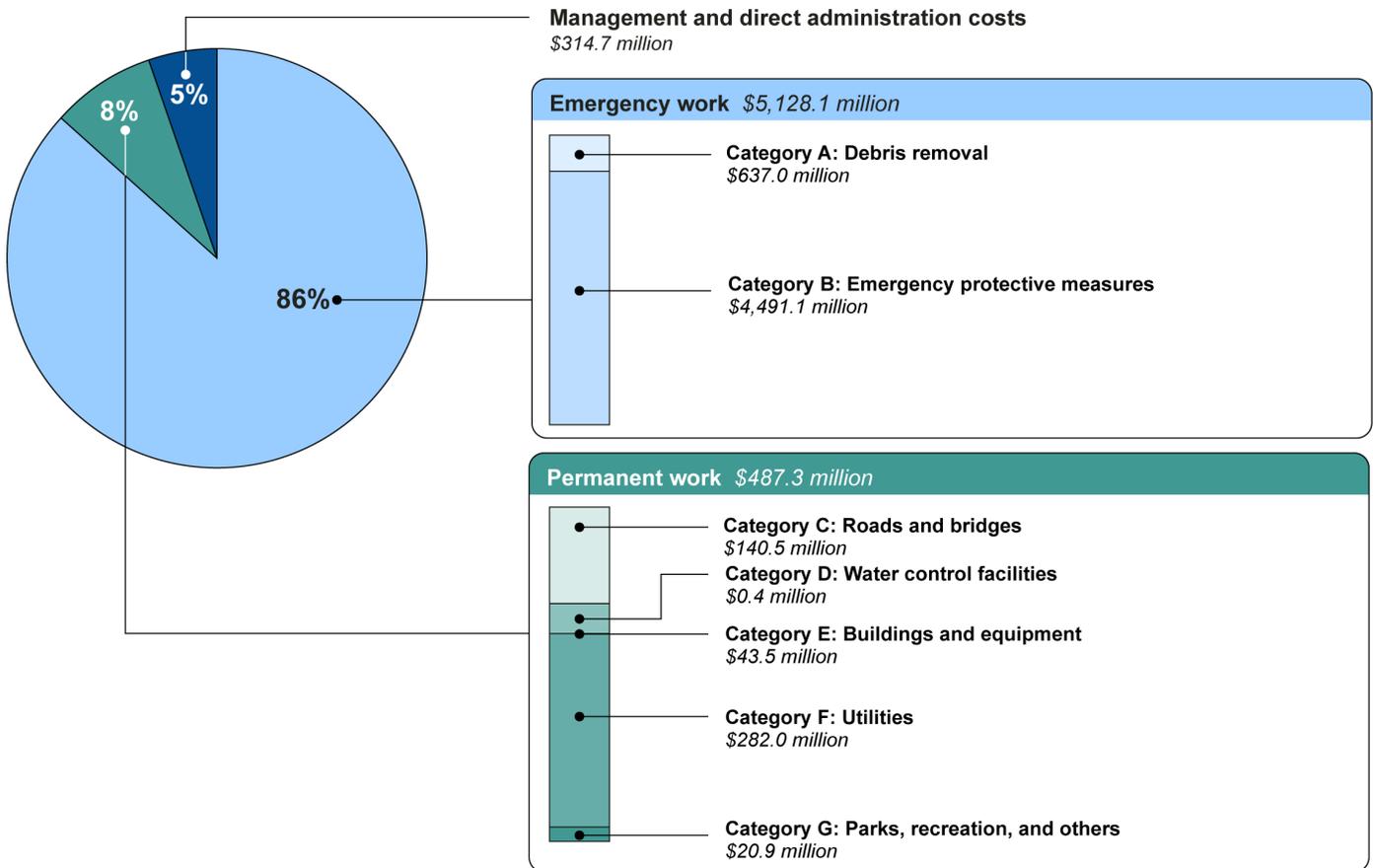
FEMA Obligated Nearly \$6 Billion for Public Assistance in Puerto Rico as of September 2019, but FEMA and Puerto Rico Face Significant Challenges in Developing Projects

Status of FEMA Public Assistance Funding in Puerto Rico

Since the 2017 hurricanes, FEMA has obligated nearly \$6 billion in Public Assistance program funding for 1,558 projects across Puerto Rico, according to our analysis of FEMA's data as of September 30, 2019 (see fig. 5).²² Specifically, FEMA had obligated approximately \$5.1 billion for emergency work projects (categories A and B), \$487 million for permanent work projects (categories C through G), and \$315 million for management costs (Category Z).

²²These data include Public Assistance program grant funding and do not include obligations and expenditures for, among other things, direct federal mission assignments, in which a federal agency is tasked with providing eligible emergency work or debris removal services to a territory or state, or for other categories of mission assignments. For example, these data do not include obligations for direct federal assistance through mission assignments for temporary emergency power and grid restoration efforts in Puerto Rico.

Figure 5: Federal Emergency Management Agency (FEMA) Public Assistance Obligations in Puerto Rico as of September 30, 2019



Source: FEMA's Emergency Management Mission Integrated Environment (EMMIE) and Integrated Financial Management Information System (IFMIS) data as of September 30, 2019. | GAO-20-221

Note: Numbers might not total 100 percent due to rounding. Emergency protective measures include activities to lessen the immediate threat to life, public health, or safety such as search and rescue operations and providing medical care and transport. On October 5, 2019, the Disaster Recovery Reform Act of 2018 amended the definition of management costs to include any indirect cost, any direct administrative cost, and any other administrative expense associated with a specific project. See Pub. L. No. 115-254, § 1215, 132 Stat. 3186, 3449 (codified at 42 U.S.C. § 5165b(a)). Recipients and subrecipients for disasters or emergencies declared from Aug. 1, 2017 through Oct. 4, 2018 were able to opt to use FEMA's interim policy implementing the amended definition or to use previous existing options, which reimburse management (indirect) costs and direct administrative costs separately. Puerto Rico as a recipient opted to use the new interim policy, whereas several subrecipients opted to use previous options, such that the total obligations for Category Z include both management and direct administrative costs.

Of the nearly \$6 billion FEMA has obligated, Puerto Rico has expended approximately \$3.9 billion as of September 30, 2019—about 65 percent of total Public Assistance program obligations to Puerto Rico—to reimburse subrecipients for completed work. As shown in table 1, Puerto Rico has

expended about \$3.7 billion for emergency work projects, \$39 million for permanent work projects, and \$104 million for management costs.

Table 1: Federal Emergency Management Agency’s (FEMA) Public Assistance Obligations to Puerto Rico and Expenditures for Hurricanes Irma and Maria by Category of Work as of September 30, 2019

Public Assistance work category	Obligated amount (in millions)	Expended amount (in millions)	Percent expended
Emergency work	5,128.12	3,712.51	72
A - Debris Removal	637.02	427.09	67
B - Protective Measures	4,491.10	3,285.42	73
Permanent work	487.34	38.63	8
C - Roads and Bridges	140.52	32.80	23
D - Water Control Facilities	0.44	0.15	34
E - Public Buildings	43.46	4.00	9
F - Public Utilities	282.03	1.07	<1
G - Recreational or Other	20.89	0.62	3
State management (Category Z)	314.65	104.05	33
Total	5,930.11	3,855.19	65

Source: GAO analysis of data from FEMA’s Emergency Management Mission Integrated Environment and Integrated Financial Management Information System | GAO-20-221

The majority of FEMA’s obligations and the funding Puerto Rico expended as of September 30, 2019, are for emergency work because these projects began soon after the disasters struck and focused on debris removal and providing assistance to address immediate threats to life and property. In contrast, permanent work projects take time to identify, develop, and ultimately complete as they represent the longer-term repair and restoration of public infrastructure, such as a sports center in Caguas, Puerto Rico, as shown in figure 6 below.

Figure 6: Damaged Sports Complex in Caguas, Puerto Rico



The covering of a basketball court in Caguas ripped from its foundations.

Source: GAO. | GAO-20-221

FEMA and Puerto Rico Face Significant Challenges in Developing Public Assistance Projects

FEMA and Puerto Rico officials identified challenges in developing Public Assistance projects in Puerto Rico. Specifically, they cited: (1) delays in establishing a cost estimating guidance for projects in Puerto Rico, (2) the large number of damaged sites that require finalized fixed cost estimates, and (3) challenges with the implementation of the flexibilities authorized by section 20601 of the Bipartisan Budget Act.

Delays in establishing cost estimating guidance. Given the importance of reaching mutual agreement on fixed cost estimates for alternative procedures projects, FEMA and Puerto Rico have taken a deliberative approach to establishing the data and procedures that will be used to develop these fixed cost estimates. This includes, among other things, adapting the way FEMA estimates costs to the specific post-disaster economic conditions in the territory, including developing exceptions to FEMA's cost estimating guidance. According to FEMA, these exceptions were developed to account for risk, including higher anticipated costs due to increased demand for labor, equipment, and materials in Puerto Rico's post-disaster economy. To develop these

exceptions, FEMA and the central recovery office established a Center of Excellence staffed with mutually agreed upon representatives. FEMA used cost estimators from RAND Corporation (RAND) as their chosen representatives, while the central recovery office hired separate contractors as their representatives. According to FEMA officials, the Center of Excellence was established, among other things, to involve Puerto Rico in developing cost estimating guidance and to ensure that the exceptions made to FEMA's Cost Estimating Format were agreeable to both parties. However, this approach has been beset by delays. For example, it took nearly one year for Puerto Rico to hire its chosen representatives to the Center of Excellence. According to FEMA, the central recovery office did not select members for the Center of Excellence until February 2019, which delayed progress on the development of finalized fixed cost estimates for permanent work. In July 2019, FEMA leadership signed an agreement establishing the exceptions to FEMA's cost estimating guidance based on an assessment conducted by a panel of FEMA engineers. These exceptions are intended to address certain costs specific to post-disaster conditions in Puerto Rico, for example adjustments to account for increased labor and material costs.

Large number of damaged sites requiring a fixed cost estimate. In addition, FEMA and Puerto Rico officials have cited the large number of sites requiring damage assessments, project development, and mutually agreed-upon fixed cost estimates as a challenge. As of September 30, 2019, FEMA identified a total of 9,344 damaged sites in various stages of development. According to FEMA, 6,304 sites (67.5 percent of total sites identified) have completed damage assessments; 3,021 sites (32.3 percent of total sites identified) are pending the completion of damage assessments to begin project development; and 19 projects (0.2 percent of total sites identified) have finalized fixed cost estimates.²³

According to FEMA guidance, October 11, 2019, was the deadline for completing fixed cost estimates for Public Assistance alternative procedures projects.²⁴ However, on October 8, 2019, officials from the central recovery office requested an extension to the deadline, which

²³As of September 30, 2019, Puerto Rico expended funding on 14 of the 19 obligated projects with finalized fixed cost estimates. FEMA officials stated that the final number of projects and fixed cost estimates is subject to change and will depend on how subrecipients choose to group projects under alternative procedures.

²⁴FEMA, *Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work* FEMA-4339-DR-PR (April 2018 and September 2019).

FEMA granted. FEMA officials acknowledged that significant work remains on the part of Puerto Rico, subrecipients, and FEMA towards developing fixed cost estimates for all Public Assistance alternative procedures projects in Puerto Rico. According to FEMA officials, as of October 2019, FEMA and Puerto Rico are working together to establish specific time frames for the completion of fixed cost estimates.

Implementation challenges with Section 20601 of the Bipartisan Budget Act of 2018. Puerto Rican government and FEMA officials identified challenges with the implementation of the flexibilities authorized by section 20601 of the Bipartisan Budget Act. As previously discussed, this section of the Act allows for the provision of assistance under the Public Assistance alternative procedures to restore disaster-damaged facilities or systems that provide critical services—such as medical and educational facilities to an industry standard without regard to pre-disaster condition.²⁵ Officials from Puerto Rico’s central government stated that they disagreed with FEMA’s interpretation of the types of damages covered by section 20601 of the Bipartisan Budget Act of 2018. In response, FEMA officials in Puerto Rico stated they held several briefings with Puerto Rico’s central recovery office to explain FEMA’s interpretation of the section, and released new guidance in September of 2019.²⁶ It is too soon to assess the impact this guidance may have on current and future projects, but we will continue to examine this in future work.

We will continue to monitor the status of FEMA’s cost estimating process, the development of the remaining fixed cost estimates for permanent

²⁵The Bipartisan Budget Act of 2018 authorized FEMA, when using the Public Assistance alternative procedures, to provide assistance to fund the replacement or restoration of disaster-damaged infrastructure that provide critical services to industry standards without regard to pre-disaster condition. Pub. L. No. 115-123, § 20601(1), 132 Stat. 64 (2018). Critical services include public infrastructure in the following sectors: power, water, sewer, wastewater treatment, communications, education, and emergency medical care. See 42 U.S.C. § 5172(a)(3)(B). Section 20601 applies only to assistance provided through the Public Assistance alternative procedures program for the duration of the recovery for the major disasters declared in Puerto Rico and the US Virgin Islands following hurricanes Irma and Maria. Further, the Additional Supplemental Appropriations for Disaster Relief Act of 2019, which was signed into law on June 6, 2019, provides additional direction to FEMA in the implementation of section 20601. Pub. L. No. 116-20, tit. VI, § 601, 133 Stat. 871, 882 (2019). For the purposes of our report, discussion of the Bipartisan Budget Act of 2018 refers specifically to section 20601.

²⁶FEMA, *Implementing Section 20601 of the 2018 Bipartisan Budget Act through the Public Assistance Program.*, FEMA Recovery Policy FP-104-009-5 Version 2. (September 2019)

work and the impact of FEMA's new guidance on the implementation of section 20601 of the Bipartisan Budget Act.

FEMA Has Adapted Cost Estimating Guidance to Specific Conditions in Puerto Rico, but Could Take Further Action to Fully Align the Guidance with Best Practices

FEMA Has Adapted Its Guidance to Estimate Public Assistance Costs to Address Post-Disaster Conditions in Puerto Rico

As Puerto Rico is responsible for any costs that exceed fixed cost estimates for large infrastructure projects under the alternative procedures, FEMA has adapted its guidance for estimating costs to ensure that these estimates accurately reflect the total costs of Public Assistance projects. As previously mentioned, FEMA and Puerto Rico established a Center of Excellence to develop proposed exceptions to adapt FEMA's Cost Estimating Format—the agency's standard guidance used for Public Assistance cost estimating nationwide—to more accurately estimate costs in Puerto Rico. After consideration of these proposals, FEMA approved two exceptions: (1) a cost factor to account for local labor, equipment, and material costs in Puerto Rico, and (2) a future price factor and price curve to account for anticipated rises in construction costs over time due to the massive influx of disaster recovery funds, coupled with limited material and labor resources in Puerto Rico.

- **Cost Factor:** According to FEMA officials, during the development of a cost factor by the Center of Excellence, FEMA learned that Gordian, a company that provides local cost indices called RSMeans which FEMA uses as part of their standard Cost Estimating Format, was developing four localized cost indices to apply to San Juan, urban areas, rural areas, and remote island (the islands of Vieques and Culebra) areas of Puerto Rico. FEMA officials told us that these cost indices compile location-specific construction costs for each of the four areas. In 2019, a panel of FEMA engineers assessed the methodologies proposed by RAND, the Center of Excellence, and the RSMeans localized indices for Puerto Rico. On July 12, 2019, in

agreement with the panel's assessment, FEMA decided to use RSMeans's localized cost indices to act as the cost factor for fixed cost estimates in Puerto Rico beginning on September 27, 2019. For fixed cost estimates developed before this date, FEMA used a different cost index that RSMeans had previously developed for San Juan. According to FEMA, cost estimates signed before September 27, 2019 using RSMeans's San Juan cost index as the cost factor are considered final.

- **Future Price Factor and Curve:** According to FEMA officials, FEMA began using a future price factor—an economic model based on expected construction conditions to estimate construction costs across ten years—in July 2019 to estimate costs in Puerto Rico. FEMA is using this future price factor along with the cost factor. FEMA has also asked RAND to develop a future price curve, an analysis that will adjust as time goes on to account for changing economic conditions, to eventually replace the future price factor. FEMA estimates that RAND will take until November 2019 to develop the future price curve, and that the future price factor is being used in the meantime. FEMA officials stated that cost estimates produced using the future price factor are considered final and will not be eligible for revisions in the future once FEMA implements the future price curve.

According to FEMA officials, the use of the cost factor combined with the future price factor and curve are intended to adapt FEMA's cost estimating guidance to the specific post-disaster economic conditions in Puerto Rico.

FEMA Cost Estimating Guidance Met Most Cost Estimating Best Practices, but FEMA Could Take Further Action to Fully Align with Best Practices

FEMA's cost estimating guidance for Public Assistance fully or substantially met nine of the 12 steps from GAO's *Cost Estimating and Assessment Guide* (GAO Cost Guide).²⁷ However, the guidance partially met two and minimally met one of the remaining cost estimating steps, as shown in figure 7 below. The GAO Cost Guide outlines best practices for cost estimating and presents 12 steps that, when incorporated into an agency's cost estimating guidance, should result in reliable and valid cost estimates that management can use to make informed decisions.²⁸ A reliable cost estimate is critical to the success of any construction

²⁷FEMA, *Cost Estimating Format for Large Projects Instructional Guide V2.1*, (September, 2009); FEMA, *Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work FEMA-4339-DR-P*, (September, 2019)

²⁸[GAO-09-3SP](#).

program. Such an estimate provides the basis for informed decision making, realistic budget formulation and program resourcing, and accountability for results. For example, FEMA, Puerto Rico and subrecipients rely on cost estimates to help ensure that funding is sufficient for the costs of the Public Assistance projects carried out under the fixed cost estimate. Accurate and reliable cost estimating is especially important in Puerto Rico where all large permanent Public Assistance projects are being developed under the alternative procedures, which require a fixed cost estimate that cannot be revised once the award is made. Given Puerto Rico's financial situation, accurate cost estimates are necessary so that Puerto Rico has adequate funds to complete Public Assistance projects.

Figure 7: GAO Assessment of Federal Emergency Management Agency (FEMA) Cost Estimating Guidance for Public Assistance Projects Compared to the 12 Steps for Developing a Reliable and Valid Cost Estimate

12 steps for cost estimating		Assessment of FEMA's guidelines and guidance
Phase	Step	
Initiation and Research	1. Define the estimate's purpose	Fully met
	2. Define the estimating plan	Substantially met
Assessment	3. Define the program's characteristics	Substantially met
	4. Determine the estimating structure	Fully met
	5. Identify ground rules and assumptions	Substantially met
	6. Obtain the data	Partially met
	7. Develop the point estimate and compare to an independent cost estimate	Substantially met
Analysis	8. Conduct a sensitivity analysis	Minimally met
	9. Conduct a risk and uncertainty analysis	Partially met
	10. Document the estimate	Substantially met
Presentation	11. Present estimate to management	Substantially met
	12. Update the estimate	Substantially met

Source: GAO analysis of Federal Emergency Management Agency documents. | GAO-20-221

Note: Our assessments of FEMA's cost estimating guidance in comparison with the 12 steps identified in GAO Cost Estimating and Assessment Guide fall in the following categories:

Fully met: FEMA provided complete evidence that satisfies the elements of the step;

Substantially met: FEMA provided evidence that satisfies a large portion of the elements of the step;

Partially met: FEMA provided evidence that satisfies about half of the elements of the step;

Minimally met: FEMA provided evidence that satisfies a small portion of the elements of the step; and

Not met: FEMA provided no evidence that satisfies any of the elements of the step.

For example, on the basis of our analysis, we determined that FEMA’s guidance fully met the step to “define the estimate’s purpose” because it describes the estimate’s purpose, level of detail required, and overall scope. In addition, the guidance provides a time frame for which the estimates must be developed and reach agreement. FEMA’s guidance substantially met another step, “identify the ground rules and assumptions”, because it provides measures to ensure assumptions are not arbitrary, are founded on expert judgments, and are documented. However, we rated this step as substantially met instead of fully met because FEMA’s guidance does not address all of GAO’s best practices for ground rules and assumptions. For example, it does not discuss the risk of an assumption being incorrect and the resultant effect on the cost estimate. Additionally, FEMA guidance substantially met the step to “document the estimate” because it contains, among other things, basic information about the project and the estimate; a description of the scope of work; the basis for the estimate; and supporting backup information. However, we assessed this step as substantially met instead of fully met because FEMA policy does not require documentation to include a discussion of high risk areas.

Further, we found that FEMA’s guidance for cost estimating does not fully or substantially meet three steps: (1) conduct a sensitivity analysis; (2) obtain the data; and (3) conduct a risk and uncertainty analysis.²⁹

Sensitivity analysis (Minimally met): We found that FEMA’s cost estimating guidance only *minimally* met the best practice regarding sensitivity analysis. A sensitivity analysis addresses some of the uncertainty in a cost estimate by testing assumptions and other factors that could change cost. By examining each assumption or factor independently, while holding all others constant, the cost estimator can evaluate the results to discover which assumptions or factors most influence the estimate. A sensitivity analysis also requires estimating the high and low uncertainty ranges for significant cost driver input factors. According to the GAO Cost Guide, when an agency does not identify the effect of uncertainties associated with different assumptions, this increases the chance that decisions will be made without a clear understanding of these impacts on costs.

²⁹For a summary of our assessment for each of GAO’s 12 steps, see appendix II.

According to FEMA officials, FEMA's cost estimating guidance accounts for construction, cost, and market risks over time which allows FEMA to plan and estimate costs for unknown or unforeseen circumstances such as cost escalation or overhead. In addition, FEMA officials stated that their use of RSMeans unit costs, a benchmark industry standard based on ongoing iterative analysis of construction costs nationwide, allows FEMA to account for fluctuations and uncertainties in the market. However, we rated this step as *minimally* met because FEMA guidance does not indicate that cost estimators are to conduct a sensitivity analysis as part of FEMA's cost estimating process. Specifically, the guidance does not require that an estimator examine the effect of changing assumptions and the effect these changes could have on a cost estimate. Since the guidance does not direct estimators to conduct a sensitivity analysis, estimators may not fully understand which variable most affects the cost estimate and FEMA risks making decisions without a clear understanding of the impact of costs.

Obtaining the data (Partially met): We found that FEMA's cost estimating guidance only *partially* met the best practice for obtaining data—assembling information to serve as the foundation of a cost estimate. The quality of the data obtained affects a cost estimate's overall credibility. Depending on the data quality, an estimate can range from a mere guess to a highly defensive cost position. We found that FEMA did not meet some of the best practices for obtaining data. Specifically, FEMA's guidance did not outline procedures for making sure data was validated using historical data as a benchmark for reasonableness. In addition, FEMA's guidance did not stipulate that data be normalized to remove the effects of inflation or analyzed with a scatter plot to determine trends and outliers. As mentioned previously, FEMA used a city cost index based on San Juan as an interim measure to estimate costs throughout Puerto Rico until September, 2019 when FEMA began using additional cost indices to target costs in particular regions of Puerto Rico. Similarly, FEMA has been using a static future price factor as an interim measure until a more dynamic and iterative future price curve is finalized. FEMA does not plan to adjust cost estimates developed using these interim measures. Without adjusting these costs when better data becomes available consistent with the obtaining the data step, FEMA risks creating estimates that may not be based on accurate data.

According to FEMA, estimates are developed based on historical costs or nationally available industry standard data. In addition, FEMA officials stated that FEMA does not revisit cost estimates to reflect updated market conditions or newly available cost information because FEMA

uses an industry standard cost database that is updated quarterly. FEMA officials stated that the interim measures used to estimate costs are intended to enable work to continue and cost estimates to be developed while the future cost curve is being developed. However, we rated the step relating to obtaining data as *partially* met because without finalizing the future cost curve, and updating estimates to reflect this information, estimates may not be based on accurate data. Additionally, while the use of industry standard cost estimating resources addresses some best practices for this step such as data normalization and data validation, industry data is only one of many sources referenced in FEMA's guidance. For other data sources identified, FEMA guidance does not describe a process to analyze the data for cost drivers or to adequately document the data.

Risk and uncertainty analysis (Partially met): We found that FEMA's cost estimating guidance does not include best practices consistent with performing a statistical analysis of risk to determine a range of possible costs and the level of confidence in achieving the estimate. By conducting a risk and uncertainty analysis, a cost estimator can model the effect of schedules slipping and missions changing, allowing for a known range of potential costs. Having a range of costs around a point estimate is useful to decision makers because it conveys the level of confidence in achieving the most likely cost and informs estimators about potential risks.³⁰ We found that FEMA's cost estimating guidance does not require a statistical analysis of risks to be performed to determine a range of possible costs. While contingencies are accounted for within the guidance, they are not derived from a statistical analysis, nor do they reflect a level of confidence in the estimate.

According to FEMA, risks associated with changing costs and conditions over the life of a Public Assistance alternative procedures construction project is not a risk that the federal government takes on. Rather, the risk is transferred to the recipient and subrecipients responsible for executing work using Public Assistance alternative procedures funding. In addition, FEMA officials told us that alternative procedures funding is not always used to restore facilities to pre-disaster condition, and therefore may not represent the final cost of work completed. In addition, the procedures are designed to incentivize subrecipients to manage grants and use excess funds for eligible work, as described earlier. However, GAO's Cost Guide

³⁰[GAO-09-3SP](#).

states that point estimates alone are insufficient for good decision-making. For management to make good decisions, the program estimate must reflect the degree of uncertainty, so that a level of confidence can be given about the estimate regardless of the entity holding the risk. In the case of alternative procedures projects in Puerto Rico, where actual costs that exceed the estimate are borne by the recipient or subrecipient, estimates that accurately reflect the degree of uncertainty are important in establishing a level of confidence about the estimate.

While FEMA fully or substantially met nine of the 12 steps in the GAO Cost Guide, FEMA could improve its cost estimating guidance to ensure that all best practices in the 12 steps in the GAO Cost Guide are fully met. In doing so, FEMA could further enhance the reliability of its cost estimating guidance.

FEMA Has Developed Public Assistance Program Policies and Guidance over Time for Puerto Rico, but Recovery Partners Reported Challenges

FEMA Public Assistance Program Policies and Guidance for Puerto Rico

In response to the complexity of the recovery, as well as the nature of change in a recovery environment, FEMA has developed and issued guidance that is specific to the implementation of the Public Assistance program in Puerto Rico. As previously discussed, disaster recovery in Puerto Rico is a complex and dynamic process that requires the coordination of many entities, including FEMA, the government of Puerto Rico, and numerous subrecipients. Recovery in Puerto Rico also involves the use of Public Assistance structures including alternative procedures and new flexibilities afforded to FEMA under the Bipartisan Budget Act of 2018.

FEMA officials told us that many elements of the Public Assistance process in Puerto Rico are the same as in other declared disasters across the United States. Therefore, according to FEMA officials, the

standard guidance for the Public Assistance program, *Public Assistance Policy and Procedures Guide* (Policies and Procedures Guide), generally applies in Puerto Rico.³¹

FEMA has also developed policies and guidance to address the specific recovery circumstances in Puerto Rico. For example, in April of 2018 and September of 2019, FEMA published the Public Assistance Alternative Procedures Guide for Permanent Work to clarify how FEMA would implement the program in Puerto Rico.³² This guidance describes the scope and limitations of the alternative procedures; highlights changes to aspects of the Public Assistance program to which these procedures apply; identifies responsibilities for certain activities; and documents timelines for key actions and decisions. FEMA also issued a policy on the agency's implementation of section 20601 of the Bipartisan Budget Act as it applies in Puerto Rico in September of 2018, detailing the applicability of the section to specific critical services and outlining eligible industry standards for purposes of authorized projects, among other things. Following the Supplemental Relief Act, FEMA issued guidance in September 2019 that includes additional information on eligibility and applicable industry standards. According to FEMA officials, FEMA has also developed and implemented training specific to recovery in Puerto Rico. This training has included presentations to the central recovery office and subrecipients on the flexibilities of the Bipartisan Budget Act and alternative procedures, among other things.

Recovery Partners in Puerto Rico Identified Challenges with the Accessibility of FEMA Public Assistance Policies and Guidance

FEMA has iteratively developed, refined, and clarified Public Assistance guidance in Puerto Rico to respond and adapt to changing recovery conditions since the 2017 hurricanes. While iterative and responsive guidance is necessary in a complex and changing recovery, the pace of change necessitates that all involved recovery entities have real-time accessibility to current applicable FEMA guidance. Officials from the central recovery office and four Puerto Rico government agencies we spoke with stated that they did not consistently have the guidance they

³¹Other guidance applicable to Puerto Rico but not developed specifically for the island's recovery include the *Public Assistance Alternative Procedures for Direct Administrative Costs*, and *Instruction on Implementation of the Environmental Planning and Historic Preservation Responsibilities and Program Requirements*.

³²FEMA. *Public Assistance Alternative Procedures (Section 428) Guide for Permanent Work* FEMA-4339-DR-PR (Washington, DC: April 2018 and September 2019).

needed to implement the Public Assistance program.³³ For example, an official from one Puerto Rico agency said that they delayed starting on any large Public Assistance projects through alternative procedures because they were waiting for FEMA to issue additional guidance. Similarly, we reported in March 2019 that four municipal officials stated that they were waiting on additional instruction from FEMA to establish more clear and consistent guidance to begin projects in Puerto Rico.³⁴

According to FEMA officials, the agency works with Puerto Rico government officials and subrecipients to provide relevant guidance and technical assistance throughout the Public Assistance project development process. However, we found that pertinent guidance may not be shared with key recovery partners. For example, FEMA officials told us that the *Standard Operating Procedure for Alternative Procedures* (SOP) was available as of March 2019, but remains in draft form as of October 2019, pending finalized information about cost estimating procedures. This SOP provides instruction on specific procedures to implement the Public Assistance alternative procedures guide. In April 2019, FEMA officials described the SOP as a “living document”; they also stated that the draft SOP is in effect and has been sent to the central recovery office for further dissemination to subrecipients. While the SOP document is still in draft, according to FEMA officials, it is operative guidance that FEMA expects the central recovery office to disseminate to subrecipients. However, in June 2019, central recovery office personnel told us they did not view the SOP as being in effect as it was still in draft form. As such, central recovery office officials stated they had not distributed the SOP to subrecipients. FEMA officials stated that they rely on the central recovery office to disseminate at least some FEMA guidance and policy to subrecipients in Puerto Rico, including municipalities and government agencies. As the recipient for all Public Assistance funding in Puerto Rico, the central recovery office is responsible for monitoring and providing technical assistance to subrecipients to ensure that federal funding is used in accordance with

³³During interviews with officials from six selected agencies and public corporations and 10 selected municipalities, officials identified various challenges. When we report the number of agencies, public corporations, or municipalities that identified a particular challenge, this does not necessarily indicate that the remaining agencies, public corporations, or municipalities did not also experience the challenge. Rather, it indicates that those agencies, public corporations, or municipalities did not raise the challenge during our interviews.

³⁴[GAO-19-256](#)

federal statutes, regulations, and the requirements of the grant.³⁵ FEMA officials also stated that subrecipients have an assigned FEMA point of contact to assist them through the project development process, including communicating policy information and updates. However, municipal and Puerto Rico agency officials we spoke to said that confusion persisted in part due to changing points of contact.

FEMA's reliance on the central recovery office or individual FEMA staff to deliver and distribute FEMA guidance poses a risk that the guidance is not made accessible to all partners involved in recovery, including subrecipients. While FEMA officials told us that FEMA assigns a point of contact to subrecipients to provide guidance and other necessary information throughout the project development process, Puerto Rico officials described a significant amount of "back and forth" with FEMA regarding requests for clarification, guidance, or instruction. FEMA officials acknowledge that FEMA has faced difficulties in disseminating information in Puerto Rico. According to FEMA officials, FEMA does not maintain a repository of Public Assistance policies and guidance available to all relevant recovery partners. The accessibility of FEMA guidance is especially important because FEMA releases iterative guidance to respond and adapt to changing recovery circumstances, such as updated legislation, among other things. Misunderstandings across recovery partners about guidance applicability raise concerns that subrecipients do not understand which guidance is currently in effect or how they should proceed in accordance with FEMA policy. Without real-time access to the totality of FEMA's current applicable guidance, recovery partners risk using guidance that has been revised or replaced.

According to FEMA's National Disaster Recovery Framework, the federal government has the role of ensuring that information is distributed in an accessible manner such that all partners are informed of and aware of the recovery process.³⁶ Developing a repository of current applicable policy and guidance and making it available to all relevant recovery partners in Puerto Rico, including subrecipients, would improve the accessibility of the information and provide greater assurance that recovery partners are aware of current applicable guidance.

³⁵See generally 44 C.F.R. part 206; 2 C.F.R. § 200.331.

³⁶FEMA. *National Disaster Recovery Framework*, Second Edition (Washington, D.C.: June, 2019).

Puerto Rico and FEMA Have Structures in Place to Manage and Oversee Public Assistance Funding and FEMA Has Instituted Additional Controls to Mitigate Risk

Puerto Rico Established an Office to Manage and Oversee Public Assistance Funding and Help Ensure Compliance with FEMA Policy

Following the 2017 hurricanes, Puerto Rico took several steps to provide management and oversight of the Public Assistance program to ensure the program is implemented in compliance with applicable laws and regulations, as well as FEMA policies and guidance. Specifically, Puerto Rico (1) established a central recovery office to provide management and oversight of recovery funds; (2) developed an administrative plan, as required by FEMA policy; (3) developed an internal controls and recovery management plan; and (4) created a system to oversee and assess subrecipient risk.

First, in accordance with Amendment 5 to the President's disaster declaration, the central recovery office has been supported by third-party experts to help it establish its structure and carry out its management and oversight mission. Specifically, the central recovery office has hired contractors to help perform the following functions:

- **Design a management guide and assess subrecipient risk.** According to central recovery office officials, the office hired contractors to develop management protocols and guidance to ensure compliance with federal and state law, regulation, and guidance. The office also tasked these contractors with developing a system to oversee subrecipients using risk-based oversight.
- **Provide technical assistance.** Central recovery office officials also hired contractors to provide technical assistance and advise Puerto Rico's government agencies and municipalities regarding recovery processes. This includes helping subrecipients define the scope of

damages, and providing technical assistance to develop Public Assistance projects, among other things. The recovery office also tasked these contractors with overseeing grant accounting and reviewing reimbursement requests from subrecipients for eligible Public Assistance work performed.

- **Develop data systems to track the central recovery office's work.** The central recovery office launched an online transparency portal, with the assistance of contractors, that is intended to provide a breakdown of FEMA Public Assistance and other federal funding made available for disaster recovery in Puerto Rico.³⁷ According to central recovery office officials, in addition to the development of the online transparency portal, contractor personnel also developed systems to track internal recovery data.

Second, to meet FEMA reporting requirements, the central recovery office developed an administrative plan—or FEMA State Agreement—in 2019 for the Public Assistance program following the 2017 hurricanes. This plan outlines the central recovery office's management and oversight activities as well as the procedures that Puerto Rico must follow in implementing the programs. Puerto Rico is responsible, as required in the FEMA State Agreement, to ensure that subrecipients are in compliance with the conditions of the disaster grant award. For example, the plan emphasizes FEMA's requirement that Puerto Rico submit quarterly progress and financial reports on the status of projects.³⁸ Further, the plan describes Puerto Rico's specific roles and responsibilities for managing and overseeing the program. For example, according to the Puerto Rico 2019 Public Assistance Administrative Plan, the central recovery office is responsible for, among other things, processing requests for time extensions to complete projects and conducting quarterly reviews, site inspections, and audits to ensure program compliance.

Third, in addition to the administrative plan, in March 2019, the central recovery office released the Disaster Recovery Federal Funds Management Guide (management guide) that includes an internal controls plan and other policies and procedures for managing recovery

³⁷<https://www.recovery.pr/>

³⁸For Public Assistance program projects to comply with the requirements of 2 C.F.R. § 200.331, monitoring and reporting program performance, among other things, grantees are responsible for managing the day-to-day operations of grant and subgrant supported activities. Grantees must monitor grant and subgrant supported activities to ensure compliance with applicable Federal requirements.

funds. The management guide's 14 chapters outline roles, responsibilities, policies and procedures on various recovery functions including procurement, payment and cash management, and subrecipient management and oversight, among other things. FEMA officials told us that they reviewed portions of the management guide, including sections on the central recovery office's payment and cash management plan and subrecipient oversight. Further, FEMA worked with the central recovery office to make revisions to the plan, which included, adding clarifying information and correcting instances of duplication in the guidance, among other things.

In addition, the central recovery office, with the help of contractors, is taking steps to assist subrecipients in meeting compliance requirements and supplementing their management capacity. FEMA and Puerto Rico government agency officials cited varying levels of capacity to manage federal grant funds, including Public Assistance funding. For example, agency officials at one government agency we spoke with stated that they were performing their own federal grants management and had prior experience managing large federal funds. Other Puerto Rico government officials we interviewed reported that central recovery office contractors have helped augment capacity to oversee federal funds. For example, officials from one subrecipient, a Puerto Rico public corporation, said that their agency did not have prior experience managing federal funds on such a large scale. The official told us that in order to bolster the capacity of the agency to oversee these grant funds, central recovery office contractors work closely with the agency to help them manage Public Assistance funding. Similarly, officials at one Puerto Rico government agency stated that the central recovery office offered help on uploading and validating grant data.

Fourth, as detailed in its management guide, the central recovery office has also developed criteria to evaluate subrecipients' risk of noncompliance with federal laws and regulations, as well as FEMA policy. According to the procedures outlined in the central recovery office's management guide, each subrecipient is to be assessed annually to determine whether they are at a low, moderate, or high risk for noncompliance. The central recovery office is to place additional award conditions on subrecipients with risk factors identified through the risk assessment process. These may include additional oversight and more frequent on-site visits from the central recovery office. Additionally, central recovery office guidance states that corrective actions are to be taken in cases when deficiencies are found during audits.

FEMA Has Instituted Additional Controls to Protect the Federal Investment in Puerto Rico's Recovery

In March 2019, we reported that FEMA instituted a manual reimbursement process in November 2017 for subrecipients in Puerto Rico for federal funds, including Public Assistance funds, to mitigate fiduciary risk and decrease the risk of misuse of funds.³⁹ Specifically, FEMA officials stated that they decided to institute this process because the government of Puerto Rico had expended funds prior to submitting complete documentation of work performed.⁴⁰ According to FEMA officials, they also decided to institute the manual reimbursement process due to Puerto Rico's financial situation, weaknesses in internal controls, and the large amount of recovery funds, among other things.

The manual reimbursement process required that FEMA review each reimbursement request before providing Public Assistance funds to mitigate risk and help ensure financial accountability. In Puerto Rico, the manual reimbursement process requires that the central recovery office fill out the Office of Management and Budget's Standard Form 270 and submit supporting documentation to FEMA before obligated funds can be withdrawn by Puerto Rico through the central recovery office and reimbursed to subrecipients.⁴¹ Subsequently, FEMA must review the submitted Standard Form 270 and all project documentation for completeness, compliance, and accuracy before disbursing funds to the recipient. In cases where FEMA requires additional documentation to process a Standard Form 270 request, FEMA will submit requests for information asking the central recovery office to supply the information needed for FEMA to complete the review.⁴²

³⁹Federal grant award regulations allow FEMA to impose additional grant award conditions in specific circumstances, such as to mitigate risk and ensure fiscal accountability of the recipient or subrecipient. See 2 C.F.R. §§ 200.205, 200.207; see generally 2 C.F.R. part 200. These additional award conditions may include requiring payments as reimbursements rather than advance payments; withholding authority to proceed to the next phase until receipt of evidence of acceptable performance within a given period of performance; requiring additional, more detailed financial reports, among other conditions.

⁴⁰The central recovery office is responsible for collecting and submitting all documentation requested by FEMA from subrecipients.

⁴¹Standard Form 270: Request for Advance or Reimbursement.

⁴²Additional documentation requested by FEMA to process a Standard Form 270 request includes, among other things, copies of contracts, cost of labor estimates, bid documents, and evidence of payment.

On March 25, 2019, FEMA and the government of Puerto Rico, through the central recovery office, signed an agreement allowing the central recovery office to directly access federal grant funds and reimburse subrecipients for Public Assistance work they perform. During FEMA's review of the central recovery office's management guide, FEMA asked for revisions to sections, including chapters related to payment and cash management and subrecipient management and monitoring. According to the March 2019 agreement, these policies and procedures were developed in collaboration with FEMA, and comments and concerns provided by FEMA were addressed. FEMA officials also told us that they sampled Public Assistance grant documentation for completeness to ensure that the reimbursement requested was eligible for payment. According to FEMA officials, FEMA communicated minor discrepancies with the central recovery office for resolution, but said that they did not find any significant discrepancies during their completeness review. On April 1, 2019, FEMA removed the manual reimbursement process and began a transition to allow the central recovery office to make direct payments to subrecipients.

In July 2019, FEMA announced that it would reinstate the manual reimbursement process due to, "ongoing leadership changes within the Puerto Rican government, combined with continued concern over Puerto Rico's history of fiscal irregularities and mismanagement."⁴³ FEMA said that these additional steps are being taken in order to protect the federal investment in Puerto Rico's recovery.

We previously reported that FEMA and central recovery office officials told us that the manual reimbursement process caused delays in reimbursements, but once FEMA increased the number of personnel devoted to reimbursement reviews, delays decreased. In September 2019, FEMA once again lifted the manual reimbursement process following a meeting between FEMA and Governor Vázquez's senior leadership. According to FEMA, the agreement to remove the manual reimbursement process is contingent on Puerto Rico's continued ability to implement the mutually-acceptable internal controls plan. FEMA officials also stated that they are selecting samples from fiscal year 2019 to test Puerto Rico's internal controls, and plan to move to a quarterly testing routine after testing for fiscal year 2019 is complete.

⁴³FEMA, *FEMA to Reinstate Manual Drawdown Process for the Commonwealth of Puerto Rico* (July 25, 2019)

As part of our ongoing review, we will continue to monitor the central recovery office's management and oversight of Public Assistance funding, as well as of FEMA's oversight of the federal investment in Puerto Rico's recovery.

Conclusions

After the devastation of the catastrophic 2017 hurricane season, FEMA and Puerto Rico face a recovery of enormous scope. Puerto Rico estimates that \$132 billion in funding will be needed to repair and reconstruct the infrastructure damaged by the hurricanes through 2028, and FEMA has identified nearly ten thousand damaged sites in need of Public Assistance funding. FEMA has taken steps to adapt its guidance to estimate costs to post-disaster conditions in Puerto Rico, but strengthening its cost estimating guidance could help FEMA provide greater assurance that its cost estimating guidance for Public Assistance projects is reliable. In addition, given the large number of individuals and entities involved in Puerto Rico's complex recovery, ensuring that all recovery partners have easy access to the most current applicable policy and guidance could help clarify which FEMA guidance and policies are in effect.

Recommendations for Executive Action

We are making the following two recommendations to FEMA:

The FEMA administrator should revise FEMA's cost-estimating guidance for Public Assistance projects to fully align with all 12 steps in the GAO Cost Estimating and Assessment Guide. (Recommendation 1)

The FEMA administrator should develop a repository for all current applicable Public Assistance policies and guidance for Puerto Rico and make it available to all recovery partners, including subrecipients. (Recommendation 2)

Agency Comments and Our Evaluation

We provided a draft of this product to FEMA, DHS and Puerto Rico's Central Office of Recovery, Reconstruction, and Resilience (central recovery office) for comment. In its comments, reproduced in appendix III, DHS concurred with our recommendations. FEMA also provided technical comments, which we incorporated as appropriate.

DHS concurred with our first recommendation that FEMA revise its cost-estimating guidance for Public Assistance projects to fully align with all 12 steps in the GAO Cost Estimating and Assessment Guide. DHS stated

that FEMA will create a quality assurance checklist as an addendum to FEMA's Cost Estimating Format (CEF) to ensure that cost estimates reflect best practices from the GAO Cost Estimating and Assessment Guide. This action is a positive step to addressing our recommendation and we will monitor FEMA's efforts to complete this work.

In DHS's concurrence to our second recommendation that FEMA develop a repository for all current applicable Public Assistance policies and guidance for Puerto Rico to be made available to all recovery partners, DHS requested that GAO consider this recommendation resolved and closed as implemented. DHS stated that FEMA maintains Public Assistance policy and guidance documents, including those specific to Puerto Rico, on the agency's public web site, which FEMA stated it will continue to update. DHS also stated that FEMA maintains non-publicly available reference documents on the agency's internal web site through the Grants Manager and Grants Portal systems. As we noted in our report, Puerto Rico's recovery is a complex and dynamic process that requires the coordination of many recovery partners, including numerous municipalities and commonwealth agencies. For this reason, ensuring that information is distributed in an accessible manner would provide greater assurance that all recovery partners are aware of the most current and applicable Public Assistance policies and guidance. We will monitor FEMA's public and internal web sites, including policy and guidance updates, to assess whether the actions outlined by FEMA meet the intent of our recommendation.

COR3 also provided comments to our draft report, which we reproduced in appendix IV. In its comments, COR3 stated that it works with Public Assistance applicants to, among other things, provide technical assistance and training, and to monitor projects. COR3 also stated that it has established joint efforts with FEMA to improve COR3's technical assistance, as well as compliance and monitoring efforts.

We are sending copies of this report to the appropriate congressional committees, the Secretary of Homeland Security, the Administrator of FEMA, the Puerto Rico government, and other interested parties. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you and your staff have any questions, please contact me at (404) 679-1875 or curriec@gao.gov. GAO staff who made key contributions to this report are listed in appendix V.



Chris P. Currie
Director, Homeland Security and Justice

List of Requesters

The Honorable Michael B. Enzi
Chairman
Committee on the Budget
United States Senate

The Honorable Ron Johnson
Chairman
The Honorable Gary C. Peters
Ranking Member
Committee on Homeland Security and Governmental Affairs
United States Senate

The Honorable Marco Rubio
Chairman
Committee on Small Business and Entrepreneurship
United States Senate

The Honorable Rand Paul, M.D.
Chairman
Subcommittee on Federal Spending Oversight
and Emergency Management
Committee on Homeland Security and Governmental Affairs
United States Senate

The Honorable Maxine Waters
Chairwoman
Committee on Financial Services
House of Representatives

The Honorable Bennie G. Thompson
Chairman
Committee on Homeland Security
House of Representatives

The Honorable Carolyn Maloney
Chairwoman
The Honorable Jim Jordan
Ranking Member
Committee on Oversight and Reform
House of Representatives

The Honorable Nydia Velázquez
Chairwoman
Committee on Small Business
House of Representatives

The Honorable Peter DeFazio
Chairman
The Honorable Sam Graves
Ranking Member
Committee on Transportation and Infrastructure
House of Representatives

The Honorable Al Green
Chairman
Subcommittee on Oversight and Investigations
Committee on Financial Services
House of Representatives

The Honorable Peter T. King
Ranking Member
Subcommittee on Emergency Preparedness, Response and Recovery
Committee on Homeland Security
House of Representatives

The Honorable Emanuel Cleaver, II
House of Representatives

The Honorable Michael McCaul
House of Representatives

The Honorable Gary Palmer
House of Representatives

The Honorable Ann Wagner
House of Representatives

Appendix I: The Status of Public Assistance Program Funding in Puerto Rico

Since September 2017, the Federal Emergency Management Agency (FEMA) obligated nearly \$6 billion in Public Assistance grant funding for 1,558 projects across Puerto Rico as of September 30, 2019.¹ Specifically, FEMA had obligated \$5.13 billion for emergency work projects (categories A and B), about \$487 million for permanent work projects (categories C through G), and \$315 million for management costs, (category Z).² As of that date, Puerto Rico expended nearly \$3.9 billion—about 65 percent of total Public Assistance obligations to Puerto Rico—to reimburse subrecipients for completed work. Of this, Puerto Rico expended about \$3.7 billion (96 percent of all expended funds) for emergency work projects, \$38.6 million (1 percent) for permanent work projects, and \$104 million (3 percent) for management costs.

The majority of FEMA's obligations and the funding Puerto Rico expended as of September 30, 2019 are for emergency work projects because these projects began soon after hurricanes Irma and Maria struck and focused on debris removal and providing assistance to address immediate threats to life and property. In contrast, permanent work projects take time to identify, develop, and ultimately complete as they represent the longer-term repair and restoration of public infrastructure. While the data in this appendix represent the status of Public Assistance funding as of September, 2019, the amount of grant funding FEMA obligates and Puerto Rico expends will likely increase over time as additional projects are finalized and approved.

Emergency Work. As of September 30, 2019, FEMA obligated a total of \$5.13 billion for approximately 1,200 emergency work projects across

¹The Public Assistance program provides funding for debris removal efforts, life-saving emergency protective measures, and the repair or replacement of disaster-damaged publicly-owned facilities, roads and bridges, electrical utilities, and more. An obligation is a definite commitment that creates a legal liability of the government for the payment of goods and services ordered or received. For the purposes of this report, obligations represent the amount of grant funding FEMA provided through the Public Assistance program for specific projects in Puerto Rico. An expenditure is an amount paid by federal agencies, by cash or cash equivalent, during the fiscal year to liquidate government obligations. For the purposes of this report, an expenditure represents the actual spending by Puerto Rican government of money obligated by the federal government. These data do not include obligations and expenditures for, among other federal disaster assistance programs, direct federal mission assignments, in which a federal agency is tasked with providing eligible emergency work or debris removal services to a territory or state, or for other categories of mission assignments.

²Management costs are any indirect cost, any direct administrative cost, and any other administrative expense associated with a specific project.

Puerto Rico. These projects focus on debris removal activities and providing assistance to address immediate threats to life and property.

- **Category A: Debris Removal.** FEMA obligated \$637.0 million and Puerto Rico expended \$427.1 million for 331 projects focused on debris removal activities in Puerto Rico under category A.
- **Category B: Emergency Protective Measures.** FEMA obligated nearly \$4.5 billion for 871 projects under Category B. Of this, Puerto Rico has expended \$3.29 billion. For example, FEMA has obligated more than \$140 million to the Puerto Rico Aqueducts and Sewer Authority under category B to fund emergency protective measures, including using back-up generators to supply water to the island after Hurricane Maria, among other things.

Permanent Work. As of September 30, 2019, FEMA has obligated about \$487.3 million for 159 permanent work (Categories C through G) projects in Puerto Rico. These projects focus on the restoration of disaster-damaged infrastructure or systems.

- **Category C: Roads and Bridges.** FEMA obligated \$140.5 million and Puerto Rico has expended \$32.8 million for 20 projects focused on the permanent repair of roads and bridges in Puerto Rico, such as the damage illustrated in figure 8 below.

Figure 8: Collapsed Segment of Road near Maricao, Puerto Rico, September 2018



Source: GAO. | GAO-20-221

- **Category D: Water Control Facilities.** As of September 30, 2019, FEMA has obligated \$435,493 for three projects, of which approximately \$150,000 has been expended. This includes work on heavy water control infrastructure, such as berms or levees.
- **Category E: Buildings and Equipment.** FEMA obligated \$43.5 million and Puerto Rico expended nearly \$4 million for 87 projects focused on repairing and rebuilding damaged public buildings and equipment, such as the school shown in figure 9 below.

Figure 9: Damaged School Building in San Juan, Puerto Rico, March 2019



Classroom with moldy floors and water damage on the walls at a school in San Juan, Puerto Rico.

Source: GAO. | GAO-20-221



Interior damages to a school in Puerto Rico from water infiltration with standing water and moldy walls.

- **Category F: Utilities.** Of the \$487 million FEMA obligated for permanent work projects, the largest share, \$282 million was obligated for nine projects related to utilities, such as architectural and engineering design services for design work for electricity grid recovery projects. For example, in June 2019, FEMA obligated \$111 million for architectural and engineering design services for design work for electricity grid recovery projects. Puerto Rico has expended just over \$1 million of the funding obligated for projects related to repairing utilities.
- **Category G: Parks, Recreational and Other Facilities.** FEMA obligated approximately \$20.9 million and Puerto Rico has expended just over \$600,000 across 40 projects focused on repairing parks, playgrounds, and other facilities.

Appendix II: Summary of GAO's Assessment of the Federal Emergency Management Agency's (FEMA) Cost Estimating Policies and Guidance

GAO's Cost Estimating and Assessment Guide (GAO Cost Guide) outlines best practices pertaining to cost estimating principles, presenting 12 steps to create high-quality estimates.¹ These steps are generally applicable in a variety of circumstances and range from defining the purpose of the estimate to obtaining data to presenting the estimate to management for approval. Application of these principles should result in reliable and valid cost estimates that management can use to make informed decisions. To assess the extent to which FEMA's cost estimating policy aligns with these best practices, we compared FEMA's information to the GAO Cost Guide. Specifically, we reviewed FEMA documents containing cost estimating information pertinent to Public Assistance projects including FEMA's Public Assistance Alternative Procedures Guide for Permanent Work FEMA-4339-DR-PR (Alternative Procedures Guide) and FEMA's Cost Estimating Format (CEF) for Large Projects Instructional Guide V2.1 (dated September 2009). We compared FEMA's guidance for developing cost estimates outlined in these documents against the 12 best practices described in the GAO Cost Guide.² We assessed the extent to which these documents aligned with the best practices on a five point scale.

- **Fully met.** FEMA provided complete evidence that satisfies the elements of the step.
- **Substantially met.** FEMA provided evidence that satisfies a large portion of the elements of the step.
- **Partially met.** FEMA provided evidence that satisfies about half of the elements of the step.
- **Minimally met.** FEMA provided evidence that satisfies a small portion of the elements of the step.
- **Not met.** FEMA provided no evidence that satisfies any of the elements of the step.

Taken together, FEMA's documents provided cost estimating information that either substantially or fully meets nine of the 12 cost estimating steps. Furthermore, the information partially met two of the 12 steps, and minimally met one of the 12 steps. Table 1 summarizes GAO's

¹GAO, *GAO Cost Estimating and Assessment Guide Best Practices for Developing and Managing Capital Program Costs*, [GAO-09-3SP](#) (Washington, D.C.: March, 2009)

²[GAO-09-3SP](#)

Appendix II: Summary of GAO's Assessment of the Federal Emergency Management Agency's (FEMA) Cost Estimating Policies and Guidance

assessment of the extent to which FEMA's information aligns with the 12 steps identified in the GAO cost guide.

Table 2: Assessment of Federal Emergency Management Agency's (FEMA) Cost Estimating Guidance for Public Assistance Compared to Cost Estimating Best Practices Identified in GAO's Cost Estimating and Assessment Guide

GAO's 12 step cost estimating process	GAO's Assessment of FEMA's available information	FEMA's guidelines and guidance compared to GAO's Cost Estimating and Assessment Guide (GAO Cost Guide)
1. Define the estimate's purpose	Fully met	<p>The purpose of a cost estimate is determined by its intended use and its intended use determines its scope and detail. To determine an estimate's scope, cost analysts must identify the customer's needs.</p> <p>FEMA's Alternative Procedures Guide and Cost Estimating Format (CEF) describe the estimate's purpose, level of detail required, overall scope, and provide a timeframe for which the estimates must be developed and agreed to.</p>
2. Develop the estimating plan	Substantially met	<p>An analytic approach to cost estimates typically entails a written estimating plan detailing a master schedule of specific tasks, responsible parties such as the estimating team, and due dates. An estimating team should include experienced and trained analysts. In addition, enough time should be scheduled to collect data, including visits to contractor sites to further understand the strengths and limitations of the data that have been collected. If the time allotted to develop the estimate is limited, then the schedule constraint should be clearly identified in the ground rules and assumptions, so that management understands the effect on the estimate's quality and confidence.</p> <p>FEMA guidance describes the estimating team, cost estimating approach, roles, and access to subject matter experts. FEMA states "highly qualified cost estimators" will be used; however, this statement is not supported because FEMA does not describe the level of experience nor training required of the cost analysts. Lastly, FEMA guidance does not require the development of a master cost schedule.</p>
3. Define the program's characteristics	Substantially met	<p>The key to developing a credible estimate is having an adequate understanding of the project that usually takes form in a technical baseline. A technical baseline should include a description of the project, define the requirements, and document the underlying technical and project assumptions necessary to develop a cost estimate and update changes as they occur.</p> <p>FEMA documentation describes a "scope of work" which provides an understanding of the work required to repair or replace a damaged facility. Similar to a technical baseline, the scope of work drives the cost estimate. FEMA documentation describes who develops the scope of work, revisions, how the scope of work informs the cost estimate, agreement to the scope, and questions to determine if the scope of work addresses damage caused by the disaster. We rated this step as substantially met instead of fully met because it is not evident how the scope of work addresses acquisition strategy or risk.</p>

**Appendix II: Summary of GAO's Assessment
of the Federal Emergency Management
Agency's (FEMA) Cost Estimating Policies and
Guidance**

GAO's 12 step cost estimating process	GAO's Assessment of FEMA's available information	FEMA's guidelines and guidance compared to GAO's Cost Estimating and Assessment Guide (GAO Cost Guide)
4. Determine the estimating structure	Fully met	<p>A work breakdown structure is the cornerstone of every project because it defines in detail the work necessary to accomplish a project's objectives. For example, a typical "work breakdown structure" reflects the requirements and what must be accomplished to develop a project, details common elements, and provides a basis for identifying resources and tasks for developing a project cost estimate.</p> <p>FEMA documentation describes the CEF as providing "a uniform method of estimating costs for large projects" that "accounts for costs incurred across the entire spectrum of eligible work (from design to project completion)." The CEF is structured into eight parts, with each part broken down at least one level. The CEF Guide contains definitions of each part, as well as descriptions for what is included, how the part is calculated, and how it relates to other parts or the scope of work. The CEF Spreadsheet's Total Project Summary tab shows child elements summing to the parent element, and each parent element summing to the project total.</p>
5. Identify ground rules and assumptions	Substantially met	<p>Cost estimates are typically based on limited information and therefore need to be bound by the constraints that make estimating possible. These constraints are usually made in the form of assumptions. It is imperative that cost estimators document all assumptions well and test them for risk to portray the effects of any assumptions changing or failing, so that management fully understands the conditions the estimate was based on. Such documentation and analysis provides management with an invaluable perspective on its decision.</p> <p>Additionally, cost estimators must ensure that assumptions are not arbitrary and that they are founded on expert judgments rendered by experienced project and technical personnel.</p> <p>The CEF Guide provides measures to ensure assumptions are not arbitrary, are founded on expert judgments, and are documented. However, we rated this step as substantially met instead of fully met because the CEF Guide does not address all GAO best practices associated with ground rules and assumptions. For example, the CEF Guide does not discuss the level of risk if an assumption changes or fails and its effect on the estimate, nor defines the effects of delaying program content.</p>
6. Obtain the Data	Partially met	<p>Credible cost estimates are rooted in historical data. Estimators usually develop estimates for new projects by relying on data from existing projects and adjusting for any differences. Thus, collecting valid and useful historical data is a key step in developing a sound cost estimate. One way of ensuring that the data are applicable is to perform checks of reasonableness to see if the results are similar.</p> <p>The CEF Guide describes acceptable data that are to be used, data sources, priority of data, evaluation of data received, and selecting the appropriate cost data to use. FEMA has implemented a cost factor to adjust for local costs of labor, equipment, and materials and a future price factor to adjust for expected increases in construction costs. However, the future price curve, which FEMA intends to take the place of the future price factor currently in place, has not yet been finalized. Furthermore, there are several best practices in the GAO cost guide related to data that are not included in the FEMA guidance. For example, analyzing data for cost drivers and data normalization are not discussed.</p>

**Appendix II: Summary of GAO's Assessment
of the Federal Emergency Management
Agency's (FEMA) Cost Estimating Policies and
Guidance**

GAO's 12 step cost estimating process	GAO's Assessment of FEMA's available information	FEMA's guidelines and guidance compared to GAO's Cost Estimating and Assessment Guide (GAO Cost Guide)
7. Develop the point estimate and compare to an Independent Cost Estimate	Substantially met	<p>This step pulls all the information together to develop the point estimate. This step includes determining the best estimating methodology, and validating the estimate.</p> <p>The CEF for Large Projects is a Microsoft Excel-based template used for developing estimates for certain permanent work large projects. The CEF Guide's appendix E provides an overview as well as guidance on how to use the CEF tool. We rated this step as substantially met because FEMA guidance does not consider the following activities: expressing the point estimate in constant-year dollars or performing cross-checks on cost drivers.</p>
8. Conduct a sensitivity analysis	Minimally met	<p>A sensitivity analysis should be included in all cost estimates because it examines the effects of changing assumptions and ground rules. Without a sensitivity analysis, the cost estimator will not fully understand which variable most affects the cost estimate.</p> <p>FEMA's CEF reflects construction estimate uncertainties and includes a range of values around estimating factors to account for contingencies. However, FEMA guidance does not instruct estimators to perform a sensitivity analysis on cost estimates for alternative procedures projects. A sensitivity analysis is where a cost estimator examines the effect on the cost estimate of changing one assumption or cost driver at a time while holding all other variables constant.</p>
9. Conduct a risk analysis	Partially met	<p>Quantitative risk and uncertainty analysis provides a way to assess the variability in the point estimate. Having a range of costs around a point estimate is more useful to decision makers because it conveys the level of confidence in achieving the most likely cost and also informs them on cost, schedule, and technical risks.</p> <p>Risk is accounted for in Part C of the CEF, which "reflects construction estimate uncertainties and is designed to address budgetary risks associated with project unknowns and complexities in determining the scope of work." However, we rated this step as partially met because FEMA's guidance does not require a statistical analysis of risks be performed to determine a range of possible costs and the level of confidence in achieving the estimate, which are best practices GAO has identified.</p>
10. Document the estimate	Substantially met	<p>Documentation provides total recall of the estimate's detail so that the estimate can be replicated by someone other than those who prepared it. Documentation also serves as a reference to support future estimates. Documenting the cost estimate makes available a written justification showing how it was developed and aids in updating it as key assumptions change and more information becomes available. According to the Cost Guide, estimates should be documented to show all parameters, assumptions, descriptions, methods, and the calculations used to develop the cost estimate.</p> <p>FEMA guidance describes three different mechanisms for documenting the estimate: "Complete the Project Worksheet" (PW), "CEF Project Reporting," and documentation within the CEF via the CEF Fact Sheet tab and the CEF Notes tab.</p> <p>The documentation contains basic information about the project and the estimate; description of the scope of work; supporting backup information; logic, assumptions, and reasoning for the selection of factors used; and the basis of the CEF estimate, including source data. This step was rated as substantially met instead of fully met because FEMA policy does not require documentation to include a discussion of high risk areas.</p>

**Appendix II: Summary of GAO's Assessment
of the Federal Emergency Management
Agency's (FEMA) Cost Estimating Policies and
Guidance**

GAO's 12 step cost estimating process	GAO's Assessment of FEMA's available information	FEMA's guidelines and guidance compared to GAO's Cost Estimating and Assessment Guide (GAO Cost Guide)
11. Present estimate to Management	Substantially met	<p>FEMA policy describes an estimate submission package for approval, to include the Excel file containing the CEF estimate, the project worksheet, and all applicable supporting documentation. The contents of the CEF Excel file contain the majority of items the GAO Cost Guide states are necessary for presenting the estimate to management.</p> <p>We rated this step as substantially met instead of fully met because FEMA policy does not require the estimate submission package to contain a discussion on the results of the third-party independent expert panel's validation, how any differences were resolved, nor a discussion of how the estimate was determined to be reasonable.</p>
12. Update the estimate	Substantially met	<p>Cost estimates should be updated whenever requirements change and the results should be reconciled and recorded against the old estimate baseline. The documented comparison between the current estimate (updated with actual costs) and the old estimate allows the cost estimator to determine the level of variance between the two estimates. In other words, it allows estimators to see how well they are estimating and how the project is changing over time.</p> <p>Step 7 of the Cost Estimating Format Development Process is "CEF Project Reporting," during which the CEF "will be revised periodically, as data from actual projects become available" and will occur on an as-needed basis. However, we rated this step as substantially met instead of fully met because FEMA policy does not explain how actual costs, technical, and schedule data are archived for future use.</p>

Source: GAO analysis of Federal Emergency Management Agency Documents | GAO-20-221

Note: Our assessments of FEMA's cost estimating guidance in comparison with the GAO Cost Estimating and Assessment Guide ([GAO-09-03SP](#)) fall in the following categories:

- Fully met: FEMA provided complete evidence that satisfies the elements of the step;
- Substantially met: FEMA provided evidence that satisfies a large portion of the elements of the step;
- Partially met: FEMA provided evidence that satisfies about half of the elements of the step;
- Minimally met: FEMA provided evidence that satisfies a small portion of the elements of the step; and
- Not met: FEMA provided no evidence that satisfies any of the elements of the step.

Appendix III: Comments from the Department of Homeland Security

U.S. Department of Homeland Security
Washington, DC 20528



**Homeland
Security**

January 22, 2020

Chris P. Currie
Director, Homeland Security and Justice
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Re: Management Response to Draft Report GAO-20-221, "PUERTO RICO
DISASTER RECOVERY: FEMA Actions Needed to Strengthen Project Cost
Estimation and Awareness of Program Guidance"

Dear Mr. Currie:

Thank you for the opportunity to review and comment on this draft report. The U.S. Department of Homeland Security (DHS) appreciates the U.S. Government Accountability Office's (GAO) work in planning and conducting its review and issuing this report.

The Department is pleased to note GAO's recognition of the Federal Emergency Management Agency's (FEMA) efforts to adapt its cost estimating guidance to specific conditions in Puerto Rico and the substantive alignment of FEMA's guidance with GAO-identified best practices. In partnership with Puerto Rico recovery stakeholders, and in furtherance of FEMA's mission of helping citizens and first responders before, during, and after disasters, DHS and FEMA remain committed to providing effective and timely recovery assistance to disaster survivors of the 2017 hurricanes in Puerto Rico.

The draft report contained two recommendations, with which the Department concurs. Attached find our detailed response to each recommendation. DHS previously submitted technical comments under a separate cover.

Again, thank you for the opportunity to review and comment on this draft report. Please feel free to contact me if you have any questions. We look forward to working with you again in the future.

Sincerely,



JIM H. CRUMPACKER, CIA, CFE
Director
Departmental GAO-OIG Liaison Office

Attachment

**Attachment: DHS Management Response to Recommendations
Contained in GAO-20-221**

GAO recommended that the FEMA Administrator:

Recommendation 1: Revise its FEMA cost-estimating guidance for Public Assistance [PA] projects to fully align with all 12 steps in the GAO *Cost Estimating and Assessment Guide*.

Response: Concur. To more accurately estimate costs for infrastructure projects in Puerto Rico funded under the PA Program’s alternative procedures, FEMA and Puerto Rico established a Center of Excellence to develop proposed exceptions to adapt FEMA’s Cost Estimating Format (CEF), the agency’s standard guidance used for PA cost estimating nationwide. After consideration of proposed exceptions, FEMA approved two exceptions: (1) a cost factor to account for local labor, equipment, and material costs in Puerto Rico; and (2) a future price factor and price curve to account for anticipated rises in construction costs over time due to the massive influx of disaster recovery funds, coupled with limited material and labor resources in Puerto Rico.

To further improve the alignment of PA Program guidance with the steps outlined in the *GAO Cost Estimating and Assessment Guide*, FEMA’s Public Assistance Office will create a job aid addendum to the existing FEMA CEF for Large Projects Instructional Guide, Version 2.1, dated September 2009 (FEMA CEF Guide).

This job aid will include a quality assurance checklist to ensure cost estimates reflect best practices from the *GAO Cost Estimating and Assessment Guide*, as appropriate to validate that risk analyses are incorporated into their cost estimations.

Estimated Completion Date: September 30, 2020.

Recommendation 2: Develop a repository for all current applicable Public Assistance policies and guidance for Puerto Rico and make it available to all recovery partners, including subrecipients.

Response: Concur. FEMA presently maintains a comprehensive repository of PA policy and guidance documents that are accessible to the general public via the FEMA website. This website page entitled “Policy, Guidance, and Fact Sheets”¹ contains a section entitled “Disaster-Specific Guidance” that provides links to disaster-specific PA guidance documents, including those pertaining to the 2017 hurricane season (Hurricanes Harvey, Irma and Maria). This includes the Public Assistance Alternative Procedures

¹ <https://www.fema.gov/public-assistance-policy-and-guidance>

Guide for Permanent Work in Puerto Rico, FEMA-4339-DR-PR, dated September 2019, which is designed to clarify implementation of PA policy in Puerto Rico.² In addition, the FEMA website page entitled “Cost Estimating Format for Large Projects”³ contains a link to the FEMA CEF Guide.

On its website, FEMA’s Public Assistance Office will continue to upload, maintain, and make accessible to the general public (including Puerto Rico stakeholders and subrecipients) all PA policies and guidance that specifically pertain to Puerto Rico. FEMA’s Public Assistance Office will also continue to maintain and make accessible to the general public some archived former versions of PA policies and guidance that were superseded by newer policy and guidance.

For reference documents not publicly available, such as the Puerto Rico-specific cost factor documentation, FEMA provides access to its employees; Central Office of Recovery, Reconstruction and Resiliency personnel; and applicants via its intranet-based Grants Manager and Grants Portal.

We request that GAO consider this recommendation resolved and closed as implemented.

² <https://www.fema.gov/media-library/assets/documents/170544>

³ <https://www.fema.gov/cost-estimating-format-large-projects>

Appendix IV: Comments from the Commonwealth of Puerto Rico



GOVERNMENT OF PUERTO RICO
Central Recovery and Reconstruction Office
of Puerto Rico

January 10, 2020

Chris P. Currie, Director-HSJ
U.S. Government Accountability Office
441 G Street, NY
Washington, DC 20548

Re: COMMENTS TO GAO 20-221 report

Dear Mr. Currie:

Upon my designation as Governor's Authorized Representative of Puerto Rico (GAR) in July 2019, at COR3 we've been working incessantly, focused on the people of Puerto Rico, managing processes based on efficiency and transparency to ensure the continued reimbursement of the recovery funds.

After reviewing the content of the GAO-221 draft report, please find below our comments as GAR and as Executive Director of the Central Office for the Recovery, Reconstruction, and Resiliency (COR3).

As mentioned in the draft report, COR3 has continuously accomplished its commitment with the Public Assistance Program (PA) applicants, improving and expediting the processes, including but not limited to establishing timely technical support, providing tools and models for reports, performance improvement training and monitoring projects in public agencies, corporations, municipalities and private non-profits (PNPs).

All our efforts and achievements are detailed the Administrative Plan policies, internal controls and particularly, on the approved procedures for payment and cash management. As part of our transparency and prevention efforts, we developed a new and improved compliance structure for COR3, including special attention to the areas of prevention, detection and corrective actions in compliance with the federal and local regulations, for COR3, both as a state entity and operationally as a grantee. This effort is equally applied to our subrecipient monitoring process from kickoff to the closeout. And, to ensure actual fund disbursement information is available to our citizens, COR3 has an online transparency portal (www.recovery.pr) which outlines all federal funds that have been obligated and disbursed, as well as guides for the subrecipient's project cycle.

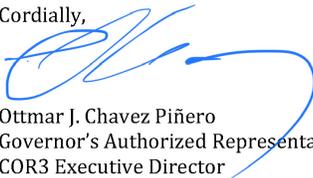
Although we've been through some key FEMA personnel turnover (ex. points of contacts and Federal Coordinating Officers) we took each of these opportunities to strengthen our

working relationship with the FEMA team in every way possible to make sure we “build-back-better” Puerto Rico. By coordinating and establishing joint efforts with FEMA on process regulations and standard procedures, we will be more helpful to our subrecipients by providing improved design procedures, technical assistance, compliance with actual systems and monitoring our recovery projects.

Our COR3 team will continue to search and provide alternatives to reach our goal to ensure fund disbursement transparently through a healthy administration and improve the recovery process together with the governor and the resident commissioner, being more efficient and more transparent. The more transparent and efficient we become, the fewer the obstacles and issues we will have to face to accelerate the reconstruction and development of Puerto Rico.

If you have any questions or would like to discuss our comments, please feel free to contact me at your convenience.

Cordially,



Ottmar J. Chavez Piñero
Governor’s Authorized Representative
COR3 Executive Director



Appendix V: GAO Contact and Staff Acknowledgments

GAO Contact

Chris Currie, (404) 679-1875 or curriec@gao.gov.

Staff Acknowledgments

In addition to the contact named above, Joel Aldape (Assistant Director), Taylor Hadfield (Analyst in Charge), Michelle Bacon, Brian Bothwell, Lorraine Ettaro, Eric Hauswirth, Heidi Nielson, Danielle Pakdaman, Amanda Prichard, Kevin Reeves, and Mary Weiland made key contributions to this report.

GAO Related Products

U.S. Virgin Islands Recovery: Additional Actions Could Strengthen FEMA's Key Disaster Recovery Efforts. [GAO-20-54](#). Washington, D.C.: November 19, 2019.

Disaster Resilience Framework: Principles for Analyzing Federal Efforts to Facilitate and Promote Resilience to Natural Disasters. [GAO-20-100SP](#). Washington, D.C.: October 23, 2019.

Disaster Recovery: Recent Disasters Highlight Progress and Challenges. [GAO-20-183T](#). Washington, D.C.: October 22, 2019.

Wildfire Disasters: FEMA Could Take Additional Actions to Address Unique Response and Recovery Challenges. [GAO-20-5](#). Washington, D.C.: October 9, 2019.

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2017 Disaster Relief Oversight: Strategy Needed to Ensure Agencies' Internal Control Plans Provide Sufficient Information. [GAO-19-479](#). Washington, D.C.: June 28, 2019.

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