



Government of Puerto Rico
Office of Management and Budget

Infrastructure Supporting Public WiFi and Wireless Broadband Across Puerto Rico

Request for Proposals and Program Procedures

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1. Overview

1.1. Introduction

The Puerto Rico Office of Management and Budget (OMB), through its Broadband Program (BP), seeks qualified entities to deploy and operate public WiFi hotspots in identified locations within municipalities (Grant Program). In addition to the required WiFi hotspots, Applicants can request funding to deploy additional infrastructure supporting fixed and mobile wireless broadband service throughout Puerto Rico. Supporting infrastructure will include but not be limited to smart poles, towers, aerial and buried fiber backhaul, microwave backhaul, and primary and backup power systems. The WiFi service within identified WiFi zones shall be offered to the public **free of charge** and Grant Program Recipients will be required to provide operations, maintenance and upgrades of the WiFi hotspots for at least ten years.

This Grant Program will cover the costs of the WiFi zones including WiFi equipment and supporting infrastructure, and the costs of additional underlying supporting infrastructure for fixed and mobile broadband wireless service. However, the Grant program will not cover the costs of the fixed or mobile wireless hardware itself or its installation. No matching funds are required for this Grant Program. Nonetheless, successful Applicants (Recipients) will be required to offer service from each applicable funded location using hardware they furnish and install. It is the intention of this Grant Program that supporting infrastructure in addition to the required WiFi zones will be deployed to improve network redundancy and resiliency, and improve performance and affordability.

The “minimum biddable unit” for this Grant Program is a single municipality. Municipalities identified in the first or subsequent rounds of this RFP process will include required free public WiFi hotspot zones to be constructed and operated by Recipients. In addition to building the required WiFi hotspot zones within municipalities, Applicants may identify additional areas to construct new or improved supporting infrastructure within their selected municipality(s) (biddable units) and request funding for infrastructure including but not limited to structures, backhaul, as well as primary and backup power systems. These additional areas are not required to provide WiFi service and can be used to facilitate fixed or mobile broadband service. The additional supporting infrastructure can be commercialized and monetized by grant Recipients to support the costs of ongoing operations, maintenance, and upgrades to the required free WiFi service network.

This Grant Program will provide funds for the construction/rehabilitation of structures such as towers, smart poles, cabinets, prefabricated buildings, and other installations; backhaul including aerial and buried fiber and microwave; power including primary and backup power, equipment used for the public WiFi hotspot zones, and other underlying supporting infrastructure. The Grant Program will not provide funds to cover costs related to last mile fixed wireless access equipment or mobile wireless

access equipment. All costs for last mile fixed wireless equipment or mobile wireless equipment and its installation must be covered by Recipients.

The inclusion of grant funding available for infrastructure that could facilitate fixed and mobile wireless coverage without a free public WiFi requirement is intended to enable Recipients to generate revenue sufficient to cover the ongoing costs of operations, maintenance, and upgrades to the public WiFi hotspot zones. Recipients must meet a long-term obligation of at least **ten (10) years** for continued WiFi hotspot operations. Preference will be given to Applicants that can commit to operate, maintain, and upgrade the WiFi network longer than ten years.

This Grant Program will serve as the foundation for ongoing funding to support wireless infrastructure costs for free public WiFi hotspot zones within participating municipalities. Applicants can submit the required basic information with their initial application, and in subsequent applications, as new municipal public WiFi zones are identified on a rolling basis, Applicants can limit their response to the newly available municipalities.

Recipients will be required to participate in the Federal Communications Commission's Affordable Connectivity Program (ACP) and any successor program, Government-wide. For services enabled by supporting infrastructure funded under this Grant Program, including any fixed or mobile wireless services, Recipients will be required to offer, to ACP qualified households, at least one data service that is fully subsidized under the ACP program. For fixed wireless networks the fully subsidized data service must meet a minimum of 25 Mbps download and 3 Mbps upload (25/3 Mbps) and be offered for a minimum of **three (3) years**. For mobile wireless networks the fully subsidized service must include unlimited talk and text, mobile data and 10GB of mobile hotspot capacity per month, and the service must be offered for a minimum of **three (3) years**. Preference will be shown to applications proposing a more robust, fully subsidized service, or applications that commit to offering the fully subsidized services described above for longer than three (3) years.

Please note, while the required term to provide a fully subsidized service to ACP qualified households is **three (3) years**, the required term for Recipients to operate, maintain and upgrade the free public WiFi hotspots is **ten (10) years**, as noted above.

Applicants will be required to submit a plan to monetize the underlying infrastructure supporting the public WiFi zones and additional supporting infrastructure, including but not limited to poles, colocation space, conduit, power, fiber or microwave backhaul or Radio Access Network (RAN) equipment and additional services. It is anticipated that revenue generated from the supporting WiFi infrastructure and additional infrastructure will cover the ongoing costs of operations, maintenance, and network upgrades for the public WiFi network. This Grant Program will show preference toward Applications that demonstrate a sustainable business plan for long-term public WiFi network operations.

Any fixed wireless service provided from funded supporting infrastructure must be capable of providing 100/20 Mbps service. Any mobile service provided from funded supporting infrastructure must provide 5G service at a minimum.

1.2. Background and Purpose

Efforts are underway in Puerto Rico to deploy wireline broadband infrastructure to all housing units and small businesses as a part of the Federal Communications Commission's (FCC) *Uniendo a Puerto Rico* program. These projects will take a significant amount of time to complete, especially in areas previously deemed economically unviable for broadband service, creating a gap in access. Accordingly, WiFi hotspot zones and infrastructure supporting fixed or mobile broadband service will complement this effort and help address the delay in broadband availability. The deployment of WiFi hotspot zones will also help address issues of affordability. Providing access to free WiFi service in underdeveloped areas will incentivize and promote economic growth, resulting in social benefits.

The objective of the program outlined in this Request for Proposals is to provide **free** standard WiFi 6 (802.11ax) with an upgrade path to WiFi 7 in identified locations, and infrastructure supporting the deployment of broadband fixed and mobile wireless service in additional areas in Puerto Rico.

OMB has requested that municipalities recommend where the WiFi hotspot zones should be installed to provide the maximum benefit to local residents. Additionally, OMB has secured guarantees from the municipalities that the public WiFi hotspot zones — provided they adhere to the specifications covered herein—will experience an expedited zoning and easement process. During the project, OMB will liaise between the municipalities and the Recipient to ensure an efficient process. It is important to note that the public WiFi hotspot locations described by this program are areas where free WiFi service will be made available, and those areas may require the installation of several WiFi access points to provide full coverage.

1.3. Funding Mechanism

The Puerto Rico Broadband Program, under OMB, will provide the funding for this Grant Program. Governor Hon. Pedro R. Pierluisi created the Puerto Rico Broadband Program through Executive Order 2022-40 on July 11, 2022. The primary purpose of this program is to coordinate, authorize, and execute the disbursement of local and federal funds assigned to the construction of broadband infrastructure in Puerto Rico. Grant funds will be made available from the local Puerto Rico Broadband Infrastructure Fund, appropriated by OMB and as established in the Commonwealth's certified Fiscal Plan.

OMB will provide grants that support the design, construction, and deployment of identified WiFi hotspot zones as detailed in the scope of work and supporting wireless infrastructure in additional areas. Applicants are required to submit a business plan

that demonstrates a sustainable model to operate, maintain, and upgrade the WiFi zones on an ongoing basis.

This WiFi Grant Program does not require matching funds. However, applicants are expected to demonstrate how they will monetize the free public WiFi locations and additional supporting infrastructure, such as fiber and microwave backhaul, colocation space, and power in such a way as to cover costs of ongoing operations, maintenance, and upgrades to the public WiFi hotspot zones. The Grant Program will not cover the costs of any last mile fixed wireless equipment or mobile wireless equipment, or its installation. Recipients will have a long-term obligation to operate, maintain, and upgrade the WiFi hotspots locations for a minimum of **ten (10) years**.

2. Scope and Requirements

2.1. Scope of Services

Applicants must submit a detailed scope of work outlining the business plan for project funding, operations, maintenance and upgrade plan, implementation schedule, and projected revenue that will cover ongoing operations costs to meet the objectives laid out in this section. Applicants must select which of the municipalities for which it plans to provide services. The full list of municipalities and their required hotspot zones is available in GIS format as well as Annex A: Municipalities and Locations for Service.

To meet the objective of this Grant Program, Recipients will use the awarded grant at a minimum to:

- Design and construct **free** WiFi hotspot locations to serve identified public WiFi zones across Puerto Rico that meet the general, hardening, and redundancy specifications for the hotspot locations detailed in Annex B: WiFi Hotspot Specifications.
- Install WiFi equipment to serve targeted WiFi zones that meet the speed and latency requirements detailed in Annex C: WiFi Requirements;
- Connect the hotspots to backhaul via the Applicant's chosen method;
- Identify, design and construct locations in addition to the identified WiFi zones that provide the underlying, supporting infrastructure for fixed or mobile wireless broadband service, as detailed in Annex D: Design Standards;
- Execute a sustainable monetization strategy for its **free** WiFi hotspot zones and additional supporting infrastructure including backhaul, providing or leasing space for fixed or mobile wireless broadband service, or connecting and providing service to additional structures passed during backhaul deployment, and any required fiber backhaul;
- Operate, maintain, and upgrade the WiFi hotspots on an ongoing, long-term basis for a minimum of a **ten (10) year** period.

2.1.1. Performance Requirements

Aesthetics

All equipment (access points, antennas, power supplies, etc.) should not negatively impact the appearance of publicly visible areas, and municipal owned property.

Frequency Coordination and Radio Frequency Analysis

Any design planning will incorporate an analysis of existing radio frequencies and their signal strengths—leading to interference mitigation/prevention and coordination with existing WiFi networks.

Security

Proposed equipment must offer the latest security methods utilizing industry-standard technologies. The system must be upgradeable by way of firmware, software, or ROM upgrades as new security technologies are standardized.

Back Haul Requirements

The proposal will include options for acquiring or for the provision of Internet service for the WiFi network.

Performance and Reliability

Any implemented WiFi hotspot location should maintain a minimum of 99% uptime of any managed device and connectivity. The proposed coverage area should have a less than a 10% geographic coverage gap where there is little to no signal strength, while maintaining average latency levels of less than 70 ms.

It is preferred, but not required that the WiFi hotspot locations and supporting infrastructure have “self-healing” capabilities in the event of device failure or connectivity issues. Contact and support numbers and information will be provided on the landing page to report and escalate outages and/or other unanticipated network issues.

Physical Requirements

All outdoor equipment must operate in an ambient temperature range of -40 degrees to +140 degrees Fahrenheit and have enclosure and cable connections that are weatherproof and able to withstand shock, vibration, and high wind speeds. Further details can be found in Annex B: WiFi Hotspot Specifications.

2.2. Reporting Requirements and Additional Responsibilities

Recipients are required to provide progress reports to OMB on a rolling basis throughout the Grant Period. Each of the two Grant Period phases, discussed at greater length in 3.1, will require different reporting frequencies.

- Grant Period – Phase I, Construction: Report and presentation, as requested by OMB, quarterly until this phase is complete.
- Grant Period – Phase II, Operations: Report and presentation, as requested by OMB, annually for ten (10) years.

OMB may request updates from Recipients and audit funded projects for the minimum ten-year period required for WiFi hotspot operation. This will be codified in the grant disbursement agreement between OMB and Recipients.

Recipients will be required to participate in the Federal Communications Commission's Affordable Connectivity Program (ACP) and any successor program, Government-wide. For services enabled by infrastructure funded under this Grant Program, including any fixed or mobile wireless services, Recipients will be required to offer at least one data service that is fully subsidized under the ACP program or successor program. For fixed wireless networks the fully subsidized data service must be a minimum of 25/3 Mbps and must be offered for a minimum of three (3) years. For mobile wireless networks, the fully subsidized service must include unlimited talk and text, mobile data, and 10 GB of mobile hotspot capacity per month, and the service must be offered for a minimum of three (3) years. Preference will be shown to applications proposing a more robust, fully subsidized service.

Any fixed wireless service provided from funded, supporting infrastructure must be capable of providing 100/20 Mbps service. Any mobile service provided from funded, supporting infrastructure must provide 5G service at a minimum.

2.2.1. Landing / Initial Connection Page

Applicants must provide an initial Landing or Connection Page that will require the user to register for the WiFi Service. This Landing or Connection Page will have Government and Municipal Branding as well as the Applicant's Branding. User registration information shall be protected with all cybersecurity measures required to protect personally identifiable information and cannot be used for Applicants' promotion or marketing campaigns without the prior consent of the user. Applicants must only collect enough information to meet regulatory and legal requirements.

2.2.2. Ad Insertion

Recipients may be required to facilitate ad insertion on behalf of the municipality or the Commonwealth. Recipients will not be permitted to insert ads of their own. Recipients may be required to include a reasonable number of ads on behalf of the municipality or the Commonwealth. Recipients will not be permitted to insert ads of their own.

2.2.3. Public Service Announcements

Recipients may be required to facilitate public service announcements on behalf of the municipality or the Commonwealth.

2.2.4. Joint Trench Agreement

Recipients may be required to enter into a joint trench agreement, or similar agreement, with the Commonwealth if their approved application involves

underground construction for the placement of conduit. The agreement may address issues such as joint engineering of the trench and conduit system to allow for the placement of Commonwealth-owned conduit and for the placement of handholes to access Commonwealth conduit.

2.3. Proposal Required Components

Applicants will be able to download application materials and submit their applications via a secure upload using the online portal located at smartisland.pr.gov. All required deliverables must be completed, and all required supporting documentation must be submitted. The application must include a supporting narrative document and completed Excel-based Project Workbook; OMB will provide a template for the Project Workbook. Applicants will also have the opportunity to provide additional, optional information to support their application.

Information that is required to complete an application is described below:

2.3.1. Project Description

Applicants must provide a brief description of the project.

2.3.2. Project Cost

Applicants must provide a breakdown of all capital and operational costs in the Project Workbook supplied by OMB (see sheets 4. Capital Budget and 5. Operating Budget). Project costs must be reasonable and appropriate to design, deploy, and operate the WiFi hotspots, their underlying supporting infrastructure, and additional supporting infrastructure. Capital costs and operational costs are organized by predefined categories in the Project Workbook.

2.3.3. Broadband WiFi Service Capabilities

Applicants must demonstrate they have sufficient, related experience to successfully operate a public WiFi network. Applicants must demonstrate they can provide a broadband WiFi service that meets the capabilities detailed in Annex C: WiFi Requirements and describe in detail how they will provide this service to each of the locations that they select from the list of available municipalities in Annex A: Municipalities and Locations for Service. Applicants will provide this information as part of their narrative response and can upload additional information to support these criteria.

2.3.4. Financials, Monetization Plan, O&M and Additional Services

Applicants must use the provided Project Workbook to detail capital costs (sheet 4. Capital Costs), projected revenue (sheet 6. Projected Revenue) and ongoing operational costs (sheet 5. Operating Costs). Applicants must submit a plan to monetize supporting infrastructure assets, the revenue from which will cover the costs of ongoing operations, maintenance, and upgrades of the WiFi system. This shall

include any plans to offer services in addition to the required free public WiFi, such as mobile data and voice service, fixed wireless broadband service, or plans to provide facilities to third party service providers for mobile or fixed wireless services. In addition to information submitted in the Project Workbook, applicants will also provide a narrative description of their monetization plan and additional service offerings enabled by the project. The Grant Program does not cover any costs related to last mile fixed wireless equipment or mobile wireless equipment. Applicants can provide additional information about any planned additional services as part of their narrative response and can upload additional information to support these criteria.

Applicants must demonstrate a sustainable plan to operate, maintain and upgrade the WiFi hotspots for at least ten (10) years. Applicants that clearly demonstrate a plan to operate, maintain and upgrade the WiFi hotspots for beyond ten (10) years will be preferred. Applicants wishing to demonstrate a plan to operate the WiFi hotspots beyond the minimum required ten years must complete the Supplemental Workbook which collects financial information for years beyond year ten.

2.3.5. Local Business Preference

Special consideration will be given to those Applicants currently operating wireless facilities in Puerto Rico. Applicants should note the extent of their network and how this will assist them in lowering the cost to provide service by, for example, providing improved backhaul. Applicants will provide a description of their existing presence and services in Puerto Rico as part of their narrative response and can upload additional information to support this criterion.

2.3.6. Implementation Plan

Applicants must provide an implementation plan with their proposal. The implementation plan will be refined and further developed with input from OMB and the selection committee before the grant award. The Implementation Plan shall be subject to additional changes throughout the implementation process as directed by OMB. The Implementation Plan will be detailed in the narrative response with technical information included in the Project Workbook, and Applicants can provide additional information about their Implementation Plan by uploading additional information to support these criteria. At a minimum, the implementation plan must contain:

- Specific installation details for each WiFi hotspot location and additional locations, including but not limited to structure (such as smart pole or rooftop), backhaul required (such as buried or aerial fiber or microwave), the path of any fiber backhaul, power, hardening, and other relevant details. Applicants include these details for each WiFi hotspot location and any additional location in the provided consolidated Project Workbook template.
- A sample, narrative plan, and implementation methodologies that have been used with other similar size and scope projects.

- Detailed tasks, timelines, dependencies, and any other information that Applicant would include in a typical implementation plan for OMB to evaluate.
- A price schedule for a representative sample of any proposed additional services (fixed or mobile wireless, fiber or microwave backhaul, colocation space, etc.).

2.3.7. Network Design Plan/Sample

Applicants must provide detailed information about their plans to design the WiFi network and additional supporting infrastructure including WiFi hotspot site design and provide detailed information about additional supporting infrastructure such as coverage design, power design, backhaul design, and all other relevant design information. If Applicant will be working with a third-party design firm, it must provide detailed information about that firm's WiFi and wireless design capabilities. At the least, Applicants must provide a high-level or conceptual design for the WiFi zones, and additional locations and supporting infrastructure for which they are requesting funding.

The high-level design may be provided as shapefiles or similar GIS files and must include, at a minimum, points representing wireless access point locations, additional structure locations, backhaul paths for both wireline and wireless backhaul, and coverage areas produced with an RF propagation tool using appropriate ground clutter data. Each WiFi hotspot and additional supporting infrastructure point locations must be an individual layer using the same numbering convention as used in the provided Structure Location Table inside the Project Workbook. If third party backhaul will be utilized, the high-level design should indicate where the interconnection point will be and describe the third party backhaul at least as a narrative. In addition to providing high-level design information in the form of GIS files, Applicants can provide additional information as part of their narrative response and can upload it to support these criteria.

Network architecture map(s) for all portions of the proposed network design, including for the backhaul system, WiFi equipment, etc; this should be in the form of an ESRI shapefile (preferable), Google Earth KMZ, QGIS geopackage, JSON, or other related georeferenced file type format. These files must encapsulate, at a minimum, the discussed portions of the network. Applicants must also provide a basic bill of materials with pricing for all portions of the proposed network, including backhaul, WiFi antennas, etc., and specifications sheets for any equipment, including antennas and WiFi equipment.

2.3.8. Applicant Network Information

Applicants must include network footprint information on how they will integrate their new infrastructure with their existing network. Applicants shall provide

information on their existing network infrastructure, including key backhaul routes and colocation facilities.

2.3.9. Applicant References, Organization and History

For the purposes of this RFP, Applicants must provide references from the sources listed below. Applicants will provide this information as part of their narrative response and can upload additional supporting information to support these criteria.

- Financial References: Include the bank or savings and loan institution (provide one financial reference that shows the credit worthiness to implement and maintain a system).
- Client References: Name and provide contact information for clients that most accurately reflect the business performance and ability to fulfill contract obligations (provide three (3) customer references).
- Resumes of key personnel who will be working on this project from the applicant's organization.
- Applicants must provide a detailed description of their organization.

2.3.10. Marketing Plan & Materials

Applicants must describe their plan to market and advertise the availability of the WiFi zones and any other service that is enabled by the supporting infrastructure. Marketing and advertising costs should be included in the anticipated operational costs. Applicants will provide this information as part of their narrative response and can upload additional information to support these criteria.

2.3.11. Network Testing Plan

Applicants must describe their plan to test, troubleshoot, and activate WiFi hotspots and WiFi service areas. They must use an industry-standard testing methodology, such as those provided by the Institute of Electrical and Electronics Engineers (IEEE) and detail said methodology. Applicants will provide this information as part of their narrative response and can upload additional information to support these criteria.

2.3.12. Service Level Agreement

Applicants must provide a list of all service level agreements (SLAs) for users of the WiFi service, which includes information on topics such as—but not limited to—speed, performance and latency of service, help desk answer times, and onsite break fix. Applicants will provide this information as part of their narrative response and can upload additional information to support these criteria.

2.3.13. Reporting Analytics

Applicants must describe their plan for ongoing reporting. Recipients must provide a quarterly report that reflects their performance with respect to each of the SLAs submitted in their response. Recipients must provide regular reports on network

utilization and related metrics. Applicants will provide this information as part of their narrative response and can upload additional information to support these criteria.

2.3.14. Cyber Security

Applicants must provide the necessary equipment and security measures to prevent malicious internal or external actors from intercepting signals and harming connected users. Network connections must be secure and sent data must be encrypted. Connecting to the secured network must require a password or network security key via a login page making use of the .pr.gov domain extension. Firewall protection must be available for Windows, Mac, iOS, and Android devices, and configured so that pages accessed through the secured network only load via HTTPS, to ensure that communication to and from websites is secure, and insecure pages must be blocked. Login page must include a Terms of Service link and a Privacy Policy link with corresponding policies and processes, informing users what navigation activities will be permitted and how data is utilized, shared, controlled, owned, and, upon request, deleted.

2.3.15. Landing / Initial Connection Page

Applicants must provide an initial Landing or Connection Page that will require the user to register to the WiFi Public Service. This Landing or Connection Page will have Government and Municipal Branding as well as the Applicant's Branding and will make use of the .pr.gov domain extension. User registration information shall make use of the identity and access management (IAM) mechanism indicated by the Puerto Rico Innovation and Technology Service (PRITS), will offer multifactor authentication by default, and cannot be used for Applicants' promotion or marketing campaigns without the prior consent of the user and/or Municipality.

2.4. Proposal Format

Applicants will submit their applications to the OMB Broadband Portal using a secure upload system located at smartisland.pr.gov. All required sections of the application must be addressed, and all required supporting documentation must be provided.

An Excel-based Project Budget Workbook template will be available as a download from the online grant portal. Applicants should complete that Workbook and upload it when complete to the proper section of the online grant application portal. In addition to the Project Workbook, Applicants will be required to submit a narrative response addressing any required information not included in the Project Workbook. The narrative can provide any additional information supporting their application. A narrative response template will be provided. Applicants should use a simple and clear file naming convention so application reviewers can easily identify what criteria any additional information supports.

3. Process and Instructions

3.1. Timeline

Subject to any changes notified to potential Applicants by OMB in accordance with the conditions set out in this document, the following timescales shall apply to this grant process:

Activity	Date
RFP Released	April 12, 2023
Application Portal Open	April 24, 2023
Deadline for Submission	June 23, 2023
Awardees Notified	August 18, 2023
Grant Period – Phase I	One week after Execution of grant disbursement agreement
Grant Period – Phase II	One week after receiving Notice to Proceed from OMB

As noted in the above table, the Grant Period will constitute two distinct phases. Phase I will include design, permitting, construction, and test and turnup of the public WiFi hotspot locations and additional supporting infrastructure and services. The period of performance for Phase I is **18 months**. This phase will begin upon completion of a grant disbursement agreement between OMB and Recipients and will conclude after OMB reviews and approves the results of the WiFi testing and turn-up process and the final installations of additional supporting infrastructure. Phase II will begin one week after OMB approves the WiFi testing and turn-up results and the final installations of additional supporting infrastructure. Phase II will include Recipients reporting on operations, maintenance, and upgrade of the public WiFi hotspot zones and additional supporting infrastructure and services, as requested by OMB for a period of **ten (10) years**. Recipients will have an opportunity to request a Phase I extension due to delays outside of the control of the Recipient such as natural disasters, significantly adverse weather, supply chain delays, etc.

3.2. Submission Instructions

The information that must be submitted is listed in the Application Checklist. All required documents must be submitted through the secure OMB Broadband Portal by the Deadline for Submission. Applicant’s tender response must remain open for acceptance by OMB for a period of **90 days** from the Deadline for Submission. A tender response not valid for this period may be rejected by OMB.

3.3. Eligible Applicants

OMB encourages all qualified entities to submit tenders for this project provided there are no conflicts of interest. Qualified entities may include, inter alia:

- private businesses and firms,
- governmental entities,
- universities,
- nonprofit organizations, and
- community development organizations.

Applicants must have demonstrable experience operating wireless infrastructure. Applications proposing satellite backhaul of WiFi hotspots will be considered. Partnerships between complementary entities are eligible to apply, including but not limited to public private partnerships.

Applicants must be registered in Puerto Rico's Administration of General Services and have an active RUP identification, also be registered in the Technology Providers Registry in the Puerto Rico Innovation and Technology Services.

3.4. Funding Process and Eligible Costs

This grant program will operate on a receipt reimbursement basis. During Phase I, receipt reimbursement of approved, eligible deployment costs will occur monthly. In addition to providing OMB the receipts and invoices for reimbursement, the awardee must deliver to OMB an itemized report of the costs using the provided template. OMB will only reimburse eligible costs. Below is a list of eligible costs.

3.4.1. Eligible Costs

- WiFi hardware and equipment costs.
- Tower and pole costs: Includes the construction of new towers (where required infrastructure does not exist) and costs involved with structural changes to existing towers.
- Fiber optic cable associated hardware and installation costs.
- Wireless backhaul hardware and installation costs.
- Reasonable make-ready and one-time pole licensing costs, excluding recurring pole attachment payments.
- Equipment shelter, land, site preparation, and site restoration costs.
- Professional services: Includes engineering and project management costs involved in designing and constructing the proposed project.
- Testing and turn-up.
- Other upfront costs: Includes any other upfront costs not covered in other categories, such as site preparation, permits, required licenses, sales tax applicable to new equipment purchases, shipping and warehousing expenses, and miscellaneous minor material.
- Equipment other than last-mile or mobile electronics.

- Long-term leases, defined as leases for a duration longer than one (1) year, of facilities required to provide broadband service for the proposed project. Long-term leases can include leases for land, colocation space, indefeasible rights of use, etc. Please note long-term lease costs can only be reimbursed within the Grant Program's 18-month period of performance.
- Internal labor costs.
 - If approved, internal labor costs incurred as part of eligible project activities are only reimbursable up to the proportion of employees' time spent exclusively on relevant project activities during the period for which reimbursement is sought.
 - Internal labor costs can include personnel costs such as salaries and fringe benefits for staff and consultants required for carrying out a Capital Project (such as project managers, program directors, subject matter experts, equity consultants, grant administrators, financial analysts, accountants, and attorneys).
 - When seeking reimbursement, Applicants must submit such costs as line-items and provide supporting documentation for the expense. Supporting documentation shall include:
 - Timesheets and time spent by each employee on project activities;
 - Total time spent by each employee during the period for which reimbursement is sought; and
 - An hourly cost that may include employee salary, itemized payroll taxes, and benefits.
 - Costs that appear excessive and/or without justification and costs not considered eligible will not be reimbursed.

All eligible costs must be reimbursed within the Phase I period of performance. No costs will be reimbursed after the conclusion of Phase I.

3.4.2. Ineligible Costs

- Internal administrative activities.
- Fundraising activities.
- Computers or office equipment.
- Software, such as management or accounting software.
- Vehicles.
- Equipment owned or leased by the customer, including routers and modems, and any other costs beyond the network interface point.
- Operating expenses.
- Expenses incurred prior to the date of the grant award contract execution by all parties.
- Acquisition of any spectrum licenses.
- Payment of interest or principal on outstanding debt instruments, or other debt service costs.

- Fees or issuance costs associated with the issuance of new debt.
 - Satisfaction of any obligation arising under or pursuant to a settlement agreement, judgment, consent decree, or judicially confirmed debt restructuring plan in a judicial, administrative, or regulatory proceeding.
- ❖ Last mile fixed wireless equipment and mobile wireless equipment or their installation are not covered by this grant program.

3.5. Evaluation Criteria and Scoring Model

Applicants will be rated on evidence of their capacity, commitment, and experience to fulfill the responsibilities, the experience of the organization, and their proposed price. The specific criteria and scoring method are summarized in Section 3.5.1 and expounded in Section 3.5.2.

3.5.1. Evaluation criteria details

- 1. Project Cost (Pass/Fail).** Applicants must provide all capital costs and operational costs in the Project Workbook supplied by the Program. Project costs must be reasonable and appropriate to design, deploy, and operate the WiFi hotspot locations and additional supporting infrastructure.
- 2. Broadband WiFi Service Capabilities (Pass/Fail).** Applicants must provide WiFi service in required WiFi hotspot zones that meets the capabilities detailed in Annex C: WiFi Requirements, and describe in detail how they will provide this service to each of the required WiFi hotspot zones they select from the list of required hotspot zones detailed in Annex A: Municipalities and Locations for Service. Applicants must demonstrate their experience with WiFi network deployment and operation, as well as the operation of other fixed and mobile wireless broadband networks.
- 3. Financials, Monetization Plan and Additional Services (Pass/Fail).** Applicants must complete a budget template provided by OMB including information on capital costs, projected revenue, and ongoing operational costs. Applicants must demonstrate a plan to monetize public WiFi hotspot locations and additional supporting infrastructure assets, the revenue from which will cover the costs of ongoing operations, maintenance, and upgrades of the WiFi system. This shall include any plans to offer services in addition to the required free public WiFi, such as mobile data and voice service and fixed wireless broadband service or plans to provide facilities to third party service providers of mobile or fixed wireless service.

- 4. WiFi Sustainability (400 Points).** Applicants that clearly demonstrate a method and financial model to operate, maintain, and upgrade the public WiFi hotspot locations on a long-term, ongoing basis will be granted additional points. Applicants demonstrating the ability to operate the public WiFi hotspot location for at least 20 years will be awarded full points. Applicants demonstrating the ability to operate the public WiFi hotspot locations between 10 and 20 years will be awarded 50% of available points. Applicants that do not demonstrate a plan to operate the public WiFi hotspot locations for at least 10 years will not receive any points in this category.

Please note, Applicants seeking points in this scoring criterion must demonstrate their ability to sustainably operate, maintain and upgrade the public WiFi network for longer than the minimum required ten years. To do so, Applicants must use the supplied Supplemental Workbook which accepts financial information for years ten through twenty. If an Applicant clearly demonstrates their ability to operate the public WiFi network beyond the minimum required ten years in order to receive the scoring points in that category, and if awarded, the Applicant will be required to enter into a grant disbursement agreement with the OMB specifying operations, maintenance and upgrade of the public WiFi network for the number of years the applicant demonstrates sustainable operations in the Supplemental Workbook.

- 5. Project Rurality (300 Points).** Applications that propose additional supporting infrastructure in more rural, unserved parts of municipalities will be awarded up to 300 points.
- 6. Local Business Preference (200 points).** Additional points will be awarded to those applicants currently operating wireless facilities in Puerto Rico. Applicants should note the extent of their network and how this will assist them in lowering the cost to provide service by, for instance, providing easier backhaul access points. Applicants with the entirety of their operations in Puerto Rico will receive full points, applicants doing business in Puerto Rico and other jurisdictions will receive 50% of points in this category.
- 7. Implementation Plan (Pass/Fail).** Applicants must provide a summary draft Implementation Plan with their proposal. The Implementation Plan will be refined and further developed with input from OMB and the selection committee before the grant award. The Implementation Plan shall be subject to additional changes throughout the implementation process as directed by OMB. The Applicant must provide the following at a minimum:
- a. Applicants must submit a sample plan and their implementation methodologies used with other similar size and scope projects;

- b. Plan should include at a minimum, tasks, timelines, dependencies, and any other information that Applicant would include in a typical implementation plan for OMB to evaluate; and
- c. Provide a price schedule for a representative sample of the proposed services (i.e. monthly recurring charges, non-recurring charges, etc.).

8. Network Design Plan/Sample (Pass/Fail). Applicants must provide detailed information about their plans to design the public WiFi hotspot zones and additional supporting infrastructure, including site design, target area coverage design, power design, backhaul design, and all other relevant design information. If Applicant will be working with a third-party design firm, it must provide detailed information about that firm's wireless design capabilities. At the least, applicants must provide a high-level or conceptual design for the public WiFi hotspot locations and additional supporting infrastructure for which they are requesting funding.

9. Applicant References (Pass/Fail). For the purposes of this RFP, Applicants must provide references from the sources listed below. The work performed for the client references must have been of a similar size and scope to that of OMB's proposed system.

- a. Financial References: Include the bank or savings and loan institution (provide one financial reference that shows the credit worthiness to implement and maintain a network).
- b. Client References: Name and contact information of clients that most accurately reflect the business performance and ability to fulfill contract obligations (provide three (3) customer references).

10. Marketing Plan & Materials (100 Points). Applicants must describe their plan to market and advertise the availability of the public WiFi hotspot locations and additional supporting infrastructure as well as any other service that is enabled by the underlying supporting infrastructure. Marketing and advertising costs should be included in anticipated operational costs.

11. Network Testing Plan (Pass/Fail). Applicants must describe their plan to test, troubleshoot, and activate the public WiFi hotspots and additional supporting infrastructure. They must use an industry-standard testing methodology, such as those provided by the Institute of Electrical and Electronics Engineers (IEEE), TIA/IEC, and ITU-D/ ITU-R detail said methodology.

12. Service Level Agreement (Pass/Fail). Applicants must provide a list of all SLA's for types of services provided (i.e. service scope, general availability, response times and escalations, break-fix, planned maintenance, system performance and reporting, SLA audits, etc.).

13. Reporting Analytics (Pass/Fail). Applicants must describe their plan for ongoing reporting. Recipients must provide a quarterly report during Phase I of the Program that reflects Recipient’s performance with respect to each of the SLAs submitted in their response. Recipients must provide regular reporting on network utilization and related metrics.

3.5.2. Proposal Evaluation Sheet

Applicants’ Evaluation Criteria	POINTS			
	Exceptional	Meets	Deficient	Fail
	100%	50%	0%	DQ
WiFi Sustainability	400	200	0	DQ
Project Rurality	300	100	0	DQ
Small Business Preference	200	100	0	DQ
Marketing Plan & Materials	100	50	0	DQ
Total	Up to 1000	Up to 500	0	DQ

Table 1: Proposal Evaluation Sheet

Applicants’ Evaluation Criteria	Pass	Fail
Project Cost	Pass	Fail
Broadband WiFi Service Capabilities	Pass	Fail
Financials, Monetization, O&M, Additional Services	Pass	Fail
Implementation Plan	Pass	Fail
Network Design Plan/Sample	Pass	Fail
Applicant References	Pass	Fail
Network Testing Plan	Pass	Fail
Service Level Agreement	Pass	Fail
Reporting Analytics	Pass	Fail

3.5.3. Selection Process

A committee of OMB staff and/or consultants will review the proposals and evaluate them based on the aforementioned criteria. OMB reserves the right to request additional information from the Applicant on an as-needed basis during the evaluation. During the process, OMB may solicit the Applicant to expand or limit the scope of work and, as a result, adjust the grant amount accordingly to the agreed adjusted terms.

4. Terms and Conditions

This section of the grant Program Procedures sets out OMB's general tender conditions related to this grant award process ("Grant Process").

Application of these Tender Conditions – By participating in this Grant Process and/or by submitting a tender response it will be implied that the Applicant accepts and will be bound by all the provisions of this Grant Process and its Annexes. Accordingly, tender responses should be on the basis of and strictly in accordance with the requirements of the Program Procedures.

Third party verifications – Applicant's tender response is submitted on the basis that it consents to OMB carrying out all necessary actions to verify and assess the information that has been provided; and the analysis of Applicant's tender response being undertaken by third party(s) commissioned by OMB for such purposes if it deems so.

Amendments to the grant Program Procedures – At any time prior to the Response Deadline, OMB may, at its own discretion, amend the Program Procedures. Any such amendment shall be issued to all potential Applicants and disclosed within a reasonable timeframe to ensure potential Applicants have time to take such amendment into account. Accordingly, if merited and at its own discretion the Deadline for Submission may be extended by OMB.

Disqualification – Any breach of these Terms and Conditions will be ground for the rejection of a tender response or the disqualification of the Applicant. Furthermore, any material errors and/or omissions resulting in significantly adverse changes relating to any information supplied by the Applicant, at any stage in this Grant Award Process, may also be considered grounds for the rejection of a tender response or the disqualification of the Applicant.

In addition, if the Applicant or any of its representatives attempts to:

- inappropriately influence this Grant Process;
- enter into an arrangement with any other party such that either party shall refrain from submitting a tender response;
- enter into any arrangement with any other party (other than another party that forms part of Applicant's consortium bid or is Applicant's proposed sub-contractor) as to the prices submitted; or
- collude in any other way

OMB shall be entitled to reject the Applicant's tender response in full and to disqualify the Applicant from this Grant Award Process. By participating in this Grant Award Process the Applicant accepts that OMB shall have no liability to a disqualified potential applicant in these circumstances.

Annex A: Municipalities and Locations for Service

LOC ID	Project Name	Municipio	Latitude	Longitude	Location Type
1	Kids Castle	Adjuntas	18.168666	-66.725996	Park
2	Downtown	Adjuntas	18.162428	-66.723188	Plaza
3	Plaza San Antonio	Aguadilla	18.49293	-67.098129	Plaza
4	Parque Los Chorritos	Aguadilla	18.494249	-67.147655	Plaza
5	Plaza	Aguadilla	18.429838	-67.154248	Plaza
6	Paseo Marina Real	Aguadilla	18.424175	-67.155184	Waterfront
7	Piscina de Olas	Añasco	18.274605	-67.152050	Park
8	Francisco Pagan Park	Añasco	18.285738	-67.138754	Park
9	Public Plaza	Añasco	18.282218	-67.140238	Plaza
10	Polideportivo	Arecibo	18.456263	-66.724489	Park
11	Arasibo	Arecibo	18.469615	-66.732087	Building
12	Dog Park	Arecibo	18.473925	-66.72898	Park
13	Public Plaza	Arecibo	18.471925	-66.715912	Park
14	Poblado	Cabo Rojo	18.025186	-67.174103	Waterfront
15	Combate	Cabo Rojo	17.981369	-67.213452	Waterfront
16	Plaza	Cabo Rojo	18.086896	-67.146167	Plaza
17	Jose's Park	Camuy	18.484712	-66.843105	Park
18	Public Plaza	Camuy	18.48428	-66.844672	Plaza
19	Las Cavernas	Camuy	18.345829	-66.822245	Park
20	Public Plaza	Canóvanas	18.379041	-65.901023	Plaza
21	Sport Park	Canóvanas	18.377208	-65.903025	Street
22	Parque Villarán	Canóvanas	18.379033	-65.891854	Park
23	Ferry Terminal	Cataño	18.443236	-66.116526	Waterfront
24	Cataño Boardwalk	Cataño	18.441583	-66.12072	Waterfront
25	Municipal Theater	Cayey	18.115871	-66.167318	Street
26	Aponte's Park	Cayey	18.111386	-66.169978	Park
27	Public Plaza	Cayey	18.112731	-66.166264	Plaza
28	Public Plaza	Ceiba	18.264581	-65.64831	Plaza
29	Ferry Terminal	Ceiba	18.229459	-65.618325	Waterfront
30	Public Plaza	Ciales	18.336505	-66.468405	Plaza
31	Paseo Lineal	Ciales	18.354116	-66.468922	Street
32	FMZ Plaza	Cidra	18.175687	-66.16079	Plaza
33	Sport Park	Cidra	18.181261	-66.159943	Park
34	Mirador	Cidra	18.176229	-66.150512	Street
35	Public Plaza	Coamo	18.080529	-66.356318	Plaza
36	Velódromo	Coamo	18.069057	-66.363697	Park
37	Geothermal Spring Water Park	Coamo	18.036822	-66.373756	Park

38	Bonet Park	Comerio	18.215321	-66.227427	Park
39	Comerio Plaza	Comerio	18.218387	-66.226508	Plaza
40	El Salto	Comerio	18.263243	-66.20846	Street
41	Public Plaza	Corozal	18.340683	-66.317246	Plaza
42	Polideportivo	Corozal	18.347338	-66.322681	Street
43	Downtown	Culebra	18.301223	-65.302463	Waterfront
44	Flamenco	Culebra	18.329108	-65.320283	Park
45	Edgar Martinez Park	Dorado	18.452663	-66.292537	Park
46	El Dorado	Dorado	18.454584	-66.249463	Park
47	Amphitheater & Plaza	Dorado	18.459495	-66.262096	Plaza
48	Seven Seas	Fajardo	18.368907	-65.635177	Park
49	Marina Ferry	Fajardo	18.333488	-65.629777	Waterfront
50	Las Croabas	Fajardo	18.362344	-65.625014	Street
51	Public Plaza	Guanica	17.972313	-66.907878	Plaza
52	Los Kioskos	Guanica	17.96683	-66.931115	Street
53	Playa Santa	Guanica	17.936758	-66.954847	Beach
54	Public Plaza	Guayama	17.985099	-66.113591	Plaza
55	Sport Park	Guayama	17.98069	-66.114484	Park
56	Pozuelo Boardwalk	Guayama	17.937147	-66.183138	Waterfront
57	Public Plaza	Guaynabo	18.358047	-66.112293	Plaza
58	The Boardwalk	Guaynabo	18.35927	-66.115513	Waterfront
59	Sport Park	Guaynabo	18.374847	-66.112625	Park
60	Public Plaza	Gurabo	18.255492	-65.972395	Plaza
61	Kids World	Gurabo	18.255513	-65.977693	Park
62	Two Bridges	Gurabo	18.263408	-65.983495	Street
63	Urban Market	Hormigueros	18.139472	-67.127056	Street
64	Bobby Cruz	Hormigueros	18.136895	-67.119206	Park
65	Juanita Theater	Hormigueros	18.139581	-67.127478	Street
66	Nestor Morales Park	Humacao	18.148908	-65.835785	Park
67	Public Plaza	Humacao	18.150164	-65.826961	Plaza
68	The Arts	Humacao	18.144196	-65.817418	Street
69	Plaza de Recreo	Isabela	18.50088	-67.023783	Plaza
70	Centro Deportivo	Isabela	18.488476	-67.027033	Park
71	Mickey Coll	Isabela	18.498829	-67.022053	Street
72	Paseo Escute	Juncos	18.228769	-65.92393	Street
73	Downtown	Juncos	18.227906	-65.921936	Plaza
74	The Park	Juncos	18.230725	-65.926767	Park
75	Plaza La Revolución	Lares	18.294766	-66.877726	Plaza
76	Mariana Bracetti	Lares	18.299559	-66.879392	Street
77	Los Patriotas	Lares	18.299783	-66.875562	Plaza
78	Castañer	Lares	18.180832	-66.834329	Plaza

79	Baseball Park	Las Piedras	18.194035	-65.883282	Park
80	Track and Field	Las Piedras	18.191839	-65.88312	Park
81	Public Plaza	Las Piedras	18.182364	-65.864717	Plaza
82	Public Plaza	Loiza	18.432432	-65.879966	Plaza
83	Julia de Burgos Boardwalk	Loiza	18.433416	-65.881844	Waterfront
84	La Pocita	Loiza	18.454529	-65.971926	Waterfront
85	Plaza LMR	Manatí	18.427058	-66.493154	Plaza
86	Acropolis	Manatí	18.424513	-66.471409	Street
87	History Plaza	Manatí	18.428611	-66.493248	Street
88	Public Plaza	Maricao	18.180771	-66.979887	Plaza
89	State Park	Maricao	18.140651	-66.973983	Street
90	Online Coffee	Maricao	18.182302	-66.984043	Park
91	Plaza Jose D Quiñonez	Moca	18.394694	-67.11377	Plaza
92	Parque La Moca	Moca	18.398757	-67.119878	Park
93	Juán Sanchez Park	Moca	18.392135	-67.109446	Park
94	Juán Jose Plaza	Morovis	18.325764	-66.406411	Plaza
95	Public Plaza	Morovis	18.325968	-66.407868	Plaza
96	Pepe Huyke	Morovis	18.329727	-66.408452	Park
97	Gelito Ortega	Naranjito	18.302252	-66.246695	Street
98	Public Plaza	Naranjito	18.300993	-66.245377	Plaza
99	Las Lagrimas	Naranjito	18.285318	-66.25467	Street
100	Public Plaza	Orocovis	18.226995	-66.391753	Plaza
101	Lumin Park	Orocovis	18.219659	-66.379808	Street
102	Lopez Track	Orocovis	18.248905	-66.406461	Park
103	La Guancho	Ponce	17.965493	-66.614833	Waterfront
104	Plaza Degetau	Ponce	18.011342	-66.614003	Plaza
105	Plaza del Mercado	Ponce	18.014577	-66.613482	Street
106	Kennedy Park	Quebradillas	18.469867	-66.936696	Park
107	La Chiva	Quebradillas	18.454764	-66.954327	Park
108	Public Plaza	Quebradillas	18.473616	-66.938144	Plaza
109	Public Plaza	Río Grande	18.380843	-65.829865	Plaza
110	Placita Alfredo	Río Grande	18.379479	-65.828959	Plaza
111	Malpica Center	Río Grande	18.357283	-65.870783	Park
112	Porta Coeli	San Germán	18.081996	-67.042451	Plaza
113	Farmer's Market	San Germán	18.081101	-67.035649	Plaza
114	The Pier	San Juan	18.463713	-66.110468	Waterfront
115	Ballajá	San Juan	18.468214	-66.119846	Plaza
116	La Placita	San Juan	18.397489	-66.050588	Plaza
117	Paseo La Princesa	San Juan	18.463398	-66.117263	Plaza
118	Plaza de la Convalencia	San Juan	18.397537	-66.05095	Plaza
119	Public Plaza	Trujillo Alto	18.354152	-66.007402	Plaza

120	Bicentennial Walkway	Trujillo Alto	18.356409	-66.004271	Plaza
121	La Cascada	Trujillo Alto	18.355763	-66.003896	Plaza
122	Sport Park	Utuaado	18.275309	-66.708278	Park
123	Farmers Market	Utuaado	18.265683	-66.698116	Street
124	Public Plaza	Utuaado	18.265278	-66.699971	Plaza
125	Hector Flores Plaza	Vega Alta	18.413648	-66.330606	Plaza
126	Public Plaza	Vega Alta	18.411984	-66.329924	Plaza
127	Cerro Gordo	Vega Alta	18.480526	-66.340227	Park
128	Vega Baja Plaza	Vega Baja	18.444522	-66.387329	Plaza
129	Puerto Nuevo	Vega Baja	18.490851	-66.398473	Park
130	Tortuguero Recreational Park	Vega Baja	18.454589	-66.421477	Park
131	Bieke Pier	Vieques	18.15189	-65.442871	Waterfront
132	Waterpark	Villalba	18.130628	-66.481018	Park
133	Sport Park	Villalba	18.120725	-66.501204	Park
134	Public Plaza	Villalba	18.128373	-66.492465	Plaza
135	Public Plaza	Yabucoa	18.050234	-65.879487	Street
136	Parque del Niño	Yabucoa	18.044992	-65.856925	Park
137	Boulevard del Puerto	Yabucoa	18.050309	-65.831701	Waterfront
138	La Concha Acustica	Yabucoa	18.048524	-65.881089	Street

Annex B: WiFi Hotspot Specifications

Environmental Requirements:

Operating:

- Temperature: -40° C to +55° C (-40° F to +140° F) with full solar loading
- Humidity: 5% to 95% non-condensing internal
- Rated for operation in all weather conditions
- Operating Altitude: 3,000 m
- Water and Dust Rating: IP67 or better
- Salt Tolerance: Tested to ASTM B117-07A Salt Spray 200hrs or better
- Wind Survival: Up to 170 Mph
- Shock and Vibration ETSI 300-19-2-4 or better

Storage and transportation:

- Temperature: -40° C to +70° C (-40° F to +158° F)

Installation Details:

For outdoor access points (APs):

- Mount the APs out of reach to keep people from tampering or defacing the units. Recommended minimum installation height is 12 ft in outdoor environments or higher.
- Indoor installation height will be evaluated on a case-by-case basis.
- Mount the AP high enough for the signal to travel over any obstructions such as plants or outdoor furniture.
- Make sure that the AP is securely mounted to keep it from being dislodged by wind or other weather elements.
- AP locations should be selected to optimize network performance for end users.
- Make sure to ground the AP to protect it during lightning storms.
- Connect APs using outdoor-rated CAT6 cable or fiber optic drop cables.
- Use of PoE extenders is permitted to extend range of CAT6 cable.
- All equipment (APs, antennas, power supplies, etc.) should not negatively impact the appearance of publicly visible areas. Use concealment or shrouding as necessary.
- Provide battery backup power of at least four hours.

For Indoor Aps:

- In “drop-ceiling” tile applications, APs shall be attached to the ceiling “T” grid wherever possible. Alternative installation must be preapproved with OMB technical staff, in writing.
- Cables shall exit the ceiling space in the corner of the ceiling tile and shall be hidden from view.
- In locations where APs are mounted to sheet rock or are wall mounted, cables shall be routed and attached so that they are hidden from view.
- Access point locations should be selected to optimize network performance and QA/QC for network users.
- Make sure to ground the AP to protect it during lightning storms.
- Connect APs using indoor rated CAT6 cable or indoor plenum fiber optic drop cables.
- Use of PoE extenders is permitted to extend range of CAT6 cable.
- All equipment (APs, antennas, power supplies, etc.) should not negatively impact the appearance of publicly visible areas. Use concealment or shrouding as necessary.
- Provide battery backup power of at least four hours

Access Point Labelling and Identification:

- All APs shall be identified on an “As-Built” map provided by the Recipient, with the MAC address of the primary ethernet connection of the AP.
- A label shall be fastened on each AP that includes the BSSID’s of each radio. The last 6 characters of the BSSID will be sufficient.
- The labels shall be readable 12 ft away.

Annex C: WiFi Requirements

The WiFi service provided by the Recipient must meet the following criteria at minimum:

- Guaranteed initial minimum speed of 25 Mbps download and 3 Mbps upload for WiFi on every user device (i.e. tablet, smart phone, etc.), during peak hours
- Guaranteed minimum speed, download and upload, must increase by 50% every twenty-four months
- Voice-over-IP (VoIP) capable

Access Points (AP's) – Indoor:

- The indoor wireless solution shall provide solid connectivity for a dense device load in an indoor setting.
- Minimum device load per indoor radio shall be 40 devices.

Access Points (AP's) – Outdoor:

- The outdoor wireless solution shall provide a stable connection for a dense device load in an outdoor setting.
- Minimum device load per outdoor radio shall be 200 devices.

Additional Access Point Specifications

All access points must support the following features and specifications:

- 802.11ax (WiFi 6 – 6E Certified)
- Can support up to 1024-QAM Modulation
- At least two (2) radios per AP, each supporting 2.4GHz or 5.0GHz spectrums that can support dual 5.0GHz radio operation.
- Antennas that support 4x4 MIMO and four (4) spatial streams for both bands.
- AP must have a dedicated and separate dual band radio for spectrum analysis, synthetic client, and location analytics
- Must support 802.3bz 2.5Gb Ethernet connections.
- AP should have no local web console or management interface.
- AP must be able to function in “Survivability Mode” where all AP's will continue to function normally with a last known good configuration; without connection to the controller/cloud.
- AP must support LLDP and/or CDP protocols.
- AP must be 802.11at (PoE+) compliant with power applications based on LLDP negotiation.

Must support the following IEEE specifications:

- 802.11r – <https://ieeexplore.ieee.org/document/4573292>
- 802.11v – <https://ieeexplore.ieee.org/document/5716530>
- 802.11k – <https://ieeexplore.ieee.org/document/4544755>
- 802.11w – <https://ieeexplore.ieee.org/document/5278657>

Management Platform:

- Preferably supports zero-touch-provisioning (ZTP).
- Must support Management Frame Protection.
- Must support automatic and scheduled firmware updates to APs.
- Should have privileged access management to support different administrative roles.

Must support the following functions:

- Engine or module that correlate events and for rapid root-cause identification.
- Advanced anomaly detection that identifies negative trends.
- Troubleshooting module that gathers and correlates pertinent information and identifies root cause to problems as opposed to reading through logs.
- System must be able to automatically record anomalous activity as it happens for troubleshooting without requiring the need to recreate the problem.
- System should be able to detect AP failure and issue automatic RMA's and be able to report on the details of the failure.
- Radio management must automatically optimize RF settings as conditions change based on user experience measurements and not be based solely on legacy RF scanning.
- System should collect pre and post connection data in near real-time from every user and measure the overall experience.
- System must monitor the user authentication process and report details on any issues.
- System must monitor DNS and DHCP requests and report details on any issues.
- Reporting must support natural human language and avoid the use of error codes.
- User experience reporting must include the following information from the user device perspective:
 - Coverages
 - Device capabilities
 - RF usability (RSSI, SNR, Channel Utilization, retry rates, etc.)
 - Connection failures

- Roaming failures
- AP association failures

Operations should focus on client experience by measuring the following indicators:

- RF coverage experience.
- Client connection experience (time to connect) that includes:
 - Association
 - Authorization
 - DHCP acquisition
 - Client roaming experience
 - Client throughput experience
 - Client connectivity failures
 - System must automatically perform mitigation and/or radio adjustments based on client experience and report on this activity.

Native support for the following authentication methods for client/AP connections:

- RADIUS-MAC – Supports Windows 2019 NPS RADIUS.
- Embedded Azure Authentication – without additional or external systems or platforms.
- Embedded guest captive portal with guest user self-registration.
- Embedded guest captive portal with sponsored access.

Licensing:

- Licensing must include regarding system, AP features, and functions.
 - All features and functions must be enabled without the need for an additional or further license.

Annex D: Design Standards

All supporting infrastructure shall be designed and analyzed using a risk category of II in accordance with the Puerto Rico Building Code 2018 (IBC 2018). In addition, supporting structures should adhere to their respective design standards based on structure type as follows (but not limited to):

- Telecommunication towers shall be analyzed and designed in accordance with the ANSI/TIA-222 H Standard.
- Utility poles shall be analyzed and designed in accordance with the 2017 NESC and the ANSI/TIA-222 H Standard.
- Light and traffic poles shall be analyzed and designed in accordance with ASSHTO and the ANSI/TIA-222 H Standard.
- Billboards shall be analyzed and designed in accordance with the ASCE 7-16 and the ANSI/TIA-222 H Standard.