UW-IT Wi-Fi Services Requirements Guide:
PROJECT MANAGEMENT

UW Facilities - Section 27 17 53 Wireless Communications

CONTENT

OVERVIEW - UW-IT Wireless Services and Mobile Communications Requirements Guides

All UW projects must include Wi-Fi services and in addition, for new construction and space renovations of 50,000 sq ft or more, Public Safety and Cellular DAS must also be incorporated:

WI-FI SERVICE - Service managed and operated by UW-IT Wireless Services Team.

PUBLIC SAFETY DISTRIBUTED ANTENNA SYSTEM (“PS DAS”) - Service managed and operated by EH&S with UW-IT Mobile Communications Team consulting.

CELLULAR DISTRIBUTED ANTENNA SYSTEM (“Cellular DAS”) - Service managed and operated by cellular carrier with UW-IT Mobile Communications Team consulting.

The following collection of requirements guides should help project participants better understand these services and how UW-IT Wireless Services and Mobile Communications teams are engaged and integrated into the overall project. While all guides should be helpful for the Project Manager, some are geared toward specific teams.

UW-IT Wi-Fi Services Requirements Guide: Project Management
- Provides the UW Project Manager with information to help integrate the design and deployment of UW-IT Wi-Fi Services into the project plan.

UW-IT Wi-Fi Services Requirements Guide: Architecture and Engineering Designs
- Provides the Wi-Fi Design Engineer with information needed to create and deliver a UW-IT Wi-Fi service design.

UW-IT Wi-Fi Services Requirements Guide: Service Installations
- Provides the Wi-Fi service installation team with information needed to install a UW-IT Wi-Fi service based on the final pre-installation design.

UW-IT Wi-Fi Services Requirements Guide: Post-Installation Surveys
- Provides the Wi-Fi post-installation survey team with information needed to test the installed UW-IT Wi-Fi service to ensure it meets service standards and all vetted service requirements.

UW-IT Requirements Guide: Public Safety Distributed Antenna Systems (Public Safety DAS)
- Provides EH&S and the Project Manager with information needed for the inclusion of a Public Safety DAS.

UW-IT Requirements Guide: Cellular Distributed Antenna Systems (Cellular DAS)
- Provides the Project Manager with information needed for the inclusion of a Cellular DAS.

REQUIREMENTS

R1 - Required UW-IT Wireless Services and Mobile Communications Change Reviews and Approvals

Once service requirements have been collected and the service design process starts, any subsequent changes with the potential to impact the service requires review and advanced approval by the appropriate UW-IT service team before incorporation in the design and service implementation.

Service quality can be affected by many environmental and use-specific factors, all of which are considered in the service design process. Proposed changes to these factors - inclusive of customer requirements - after the onset of the design work will be reviewed by the UW-IT Wireless Services team or Mobile Communications team, as appropriate, and considered in the context of the overall design. Some of the many factors considered in the design include the following:

- architecture (e.g., new room, change in wall location, stairwells, elevators, etc.);
- environment (e.g., building materials, furniture, cabling);
- space type (e.g., office space, lab, auditorium);
- people using the service (e.g., students, medical staff, researchers, guests);
- devices (other than laptops, tables, and phones) using the service (e.g., cameras, freezers);
- apps using the service (e.g., Wayfinder);
- density of devices by location (e.g., 50 devices in small room vs 2 devices in large room);
- use profiles in each location (e.g., sporadic video streaming; students in large lecture hall simultaneously accessing Internet sites; big data uploads/downloads);
- appropriate RF frequencies;
- target delivery dates and project delays of six or more months which may require updates to equipment and equipment costs.

The UW-IT service teams appreciate your cooperative communication throughout the project regarding changes that have the potential to impact the resulting quality and delivery of the services.

R2 - UW-IT Wireless Services and Mobile Communications Project-Related Communications and Coordination

Collaboration Space and Document Sharing. At the outset of each project, a UW-IT Partner Project Service team member will create a dedicated online shared-access space where project-related information and documents can be accessed and managed by project team members. Documents in this space will include materials from the project's architecture team; UW-IT forms related to service requirements and installation details; the service design package; and more as needed.

Meetings. Project team members are required to attend various meetings relevant to their roles and project coordination efforts. These meetings may include one or more on-site walkthroughs; pre-design requirements identification; post-installation review; and regular (usually weekly) project team meetings. Meetings may be called by the Project Manager, the UW-IT Partner Project Service team member, or other project team members. Each participating project team – UW teams and third–party contractors – must ensure that an appropriate team member and/or leader attend all required meetings. The designated meeting attendees will be informed and up to date on the status of their team's responsibilities and work.

Professional and Timely Communications. Each project participant is responsible for appropriate and timely communications via email, document sharing, ticket systems, etc. If in doubt as to who to contact, send email to help@uw.edu and specify the project name in the subject line.

R3 – General Requirements

- Use current versions of the UW-IT wireless service forms and documents and follow the associated instructions and details.
- Use standard project management processes and tools to transparently integrate timelines, action owners, deliverables, and dependencies associated with each of the Wi-Fi service deliverable stages: design, installation, and post-installation survey.
- Provide a consistent framework for receiving and sharing timely project information and updates with the Wi-Fi service deliverables team.

PROCESS

P1 - Input Materials, Information, Resources

- Standard Project Management tools and data for the overall project
- UWConnect
- GoogleDrive – UW-IT Wireless Services collaboration space
- Assigned UW-IT Partner Project Service team member contact information
- UW DWG files for project location where service will be installed
- Low-voltage contractor qualifications (see below section P3 B 4) a).)
- Contact information for…
    - Project architecture team
    - Project Sponsor and Project Budget Owner
    - Occupants' Representatives
    - Contracted Third-Party Vendors

- UW-IT Partner Project Services team member
- UW-IT Wi-Fi Program Coordinator

P2 - Output Materials, Information, Resources

- Completed Wi-Fi Service Order Intake Form
- Final project documentation (text, spreadsheets, CAD drawings, designs, etc.) relevant to the installed wireless services to be shared with, and archived by, the wireless services team.

P3 - Wi-Fi Service Delivery Process Stages

A - High-Level Overview
Duration estimates are provided for initial planning purposes only.

1) Initiate a UW-IT Wi-Fi Service Request	*2 – 4 business days*
2) Documenting Requirements	*7-14 business days*
3) Wi-Fi Design	
a) Design Stages and Deliverables	*7-14 business days*
4) Wi-Fi Equipment Acquisition	*5 – 120 business days depending on needed equipment and shipping lead-times*
5) Wi-Fi Installation	
a) Low-Voltage Contractor	*10-15 business days assuming contractor is already in the UW vendor/contract system*
b) Wi-Fi Service Installation	*1 – 20 business days depending on complexity and volume of installation*
6) Service Delivery Completion	*1 – 5 business days*

B - Detailed Overview

1) Initiate a UW-IT Wi-Fi Service request.
   Initiate a UW-IT Wi-Fi service request when the following are available and confirmed:
   - Approved project funding;
   - Relevant CAD background drawings;
     - Floor Plans
     - Reflected Ceiling Plans
     - Furniture/Fixture Layouts (if available)

    - Outdoor Space Plans
- Other relevant project documentation/information as available.

To request initiation of a new Wi-Fi service project, send an email to help@uw.edu. Include the following information in the request:

Department Coordinating the Project
Funding Source
Project Manager (Name, email, phone)
Location of the Project (Bldg/rms)
Approximate Square Footage
Brief Description of the Project
Estimated Target Date for Wi-Fi Service Implementations/Changes

Once a UW-IT Partner Project Service team member has received the request the following tasks will be completed:

a) UW-IT Partner Project Services team member will create and share a link to a UW-IT collaboration space dedicated to the project.
   i) Once notified that the collaboration space is available, the PM or their designee should upload all relevant documents including the various CAD documents noted above.
b) UW-IT Partner Project Services team member will initialize and upload into the collaboration space a project-specific Wireless Information Form ("WIF"). This form will document installation related service information and includes details related to the provisioning and on-going operations of the Wi-Fi services.
c) UW-IT Partner Project Services team member will send the PM a UW-IT Wi-Fi Service Order Intake Form to be completed by the PM and PM's project team members. This form is intended to document requirements necessary for Wi-Fi design and should include all Wi-Fi pertinent information such as:

- Usage cases
    - Identifying types of spaces (e.g., auditorium, library, classroom, lab, etc.)
    - Identifying types of users (e.g., students, faculty, patients, guests, etc.)
    - Anticipated weekly peak usage
- Devices (other than laptops, phones, tablets, and standard printers)
    - VoIP phones

    - Other wireless devices e.g., handheld printers, Point of Sale (PoS) devices, wireless cameras, etc.
- Applications
    - E.g., location services, high-capacity data downloads, etc.
- Building Materials (e.g., concrete, metal, drywall, glass, etc.)
- Architectural Requirements (e.g,., no APs on trusses, AP color, etc.)
- Identification of outdoor spaces; mechanical and electrical spaces; elevator cars and stairwells; and unoccupied spaces within UW-controlled buildings.

d) Once the PM has returned the completed intake form to the UW-IT Partner Project Service team member, they will submit the form to the UW-IT Wi-Fi Program Coordinator who in turn will assign a Wi-Fi design engineer to the project. This step formally starts the project process within the UW-IT Wi-Fi team.

2) Wi-Fi Design

The UW-IT Wireless Services team is responsible for delivering an appropriate Wi-Fi service design for the project. This design may be generated by UW-IT staff or UW-IT may contract the design work to a qualified vendor. In either case, all design materials created for the project will be approved by the UW-IT Wireless Services team before they are delivered to the project.

Upon initiation of the Wi-Fi project, UW-IT Wireless Services will provide the Project Manager with a rough-order-magnitude ("ROM") project cost. This cost will be refined as the design is built and completed.

a) UW Design Reviews. It is the responsibility of the Project Manager to identify when reviews are required by either or both of the following UW groups: Design Review Board and the Grounds Improvement Advisory Committee. Whenever the design requires review and input from these groups, the PM will schedule the appropriate meetings. The resulting requirements will be added to the intake form allowing the Wi-Fi design engineer to incorporate these into the pre-installation design.

b) Design Stages and Deliverables

Rough-Order of Magnitude ("ROM") Cost: Upon initiation of the Wi-Fi project, UW-IT Wireless Services will provide the Project Manager with a rough-order-magnitude ("ROM") project cost to share with the Project Sponsors and Budget Owner. This cost will be refined as the design is built and completed.

Predictive Design: An initial design will be created using a commercial-grade Wi-Fi site survey utility with inputs from high-level initial project requirements and UW-IT Wi-Fi design standards.

Integrated Design: Once the Wi-Fi Site Functionality Requirements Form is completed – inclusive of any requirements from the UW Design Review Board and/or Grounds Improvement Advisory Committee - and the preliminary materials from the PM are in the collaboration space, the design engineer will enter the appropriate information and generate a more tailored integrated design.

> Note to PM: the design information related to the location of the APs along with a UW-IT DWG template will be provided by UW-IT to the Project Manager so that information about the Wi-Fi equipment can be included in the CAD drawings that are created and maintained by the project's architect. UW-IT does not prepare or update CAD drawings.

This Wi-Fi design will be reviewed to ensure it complies with the UW-IT "Architecture and Engineering Wi-Fi Design Requirements Guide."

Pre-Installation Design: Once all requirements have been iteratively integrated into the design, approved by the Project Manager and UW-IT Wireless Services team, the resulting installation design will be ready for use by the installation team. It will also inform the creation by the design engineer of the final Bill of Materials ("BOM").

Bill of Materials ("BOM"): the BOM will be created in conjunction with the installation design. It will include equipment consistent with UW-IT standards at the time the project is slated to be installed and presume receipt of equipment, installation, and Wi-Fi service operation within 180 days (about 6 months).

The Wireless Services team will coordinate with the PM to facilitate the placement by UW-IT of an equipment order per the BOM. Equipment will be paid for via direct charge to the designated project or departmental budget or via internal UW charge-back processes.

If placing the BOM order is substantially delayed by overall project issues or changes, it may be necessary to review the design and the BOM before later placing the order to ensure it reflects then-current equipment, standards, and pricing. The need for additional review due to overall project delays may impact design costs. To avoid future overall project cost increases and/or delays, it is the responsibility of the PM to notify the budget owner regarding the time-sensitivity around placing the order and installing the equipment.

3) Wi-Fi Equipment Acquisition

The Wireless Services team will coordinate with the PM to facilitate the order placement by UW-IT of all necessary equipment. Because UW-IT is a high-volume purchaser of Wi-Fi equipment, UW-IT can purchase the necessary equipment directly at favorable discounts.

The Project will be responsible for purchasing a) all necessary Wi-Fi equipment located outside of the UW-IT telecommunications closets and b) any power-over- ethernet (PoE) devices required to support outdoor APs that are housed in the telecommunications closet. Examples of project-purchased equipment include Access Points (APs), mounting brackets, antennas, and the outdoor AP POE devices. All other equipment located in the telecommunications closets (e.g., switches and controllers) will be purchased and installed by UW-IT.

Payment for this equipment may be made via direct charge to the designated project or departmental budget or via internal UW charge-back processes. UW-IT will own, support, and update the equipment as required.

Some Wi-Fi equipment may require several weeks or months of lead-time for delivery; but commonly used Wi-Fi service equipment such as APs and mounting kits are purchased in bulk by UW-IT and stored in an on-campus warehouse. This equipment is generally available quickly.

UW-IT will communicate with the PM on the placement, tracking, receipt, and billing of the equipment associated with these orders.

4) Installation

a) Low-Voltage Contractor

The installation of the UW-IT Wireless Services is completed by a UW-IT approved low-voltage contractor. The low-voltage contractor will

adhere to the UW-IT "Wi-Fi Services Installation Requirements Guide" as well as industry best practices to complete the Wi-Fi hardware installation. UW has standing contracts with several reliable firms.

The Wireless Services team has extensive experience with the performance of many Wi-Fi contractors; however, not all contractors are good matches for all projects. In advance of awarding a contract through the bidding process, the Project Manager should submit all low-voltage contractor candidates to UW-IT for review and approval as follows:

> Send email to help@uw.edu and identify the project and the low-voltage contractors who have responded to the bid and which contractors, if any, are preferred by the project to complete the installation.

An appropriate member of the UW-IT Wireless Services team will review and respond. If there is an issue with a preferred low-voltage contractor, a reason will be provided, and alternatives recommended.

> i) Low-Voltage Contractor Qualifications and Qualifications Submittals
>
> The low-voltage contractor must meet the following qualifications and submit evidence of qualifications prior to starting the work:
>
> - Demonstrated ability installing Wi-Fi networks using the equipment specified in the design.
> - Been in the wireless network installation business for a minimum of five (5) years.
> - In terms of size and cost, contractor will have successfully completed at least five (5) comparable wireless installation projects within the past three (3) years. Where installation projects had fewer than 35 access points, these must have been integrated into a Wi-Fi network consisting of at least 400 access points using similar equipment to that specified in the UW design.
> - Ensure and warrant that all installations meet the manufacturer's specifications as well as applicable requirements, standards and regulations from UW, local, state, and federal agencies.

- Employ individuals fully familiar with and qualified to install the designated Wi-Fi equipment and who can complete the installation and provisioning process per the Wi-Fi Installation Requirements Guide.
- Use only full-time permanent employees of the Contractor to perform all work related to the installation and deployment of this Wi-Fi service.

Submittal of contractor qualifications must be provided not more than two weeks in advance of the installation project start date and not later than the onset of the work. As the details of these qualifications may change throughout the work (e.g., new contractor staff are brought in and others released), the contractor is responsible for providing timely updates to qualifications.

b) Wi-Fi Service Installation

The PM will ensure that the necessary low-voltage contractor staff ("installers") have access to the collaboration space. The installers will access and become familiar with the following online information:

Pre-installation design materials
Wi-Fi Information Form ("WIF")
"UW-IT Wi-Fi Services Requirements Guide: Service Installations"

The installers will also be provided with a hardcopy of the floor plans associated with the design if required.

NOTE: Any field revisions the installers believe are needed for the design must be documented and approved in advance by the Wi-Fi design engineer before implementation. These documented/approved revisions must be delivered to the UW-IT Wi-Fi Program Coordinator upon completion of the installation.

The UW-IT Wi-Fi Program Coordinator will direct the PM and installers on how best to coordinate their work with various UW-IT groups to complete the installation and ensure that all information in the WIF is entered accurately.

Responsibilities of the installation team include the following:

- Gather required equipment; properly label all equipment.

- Document all equipment related information (label, MAC, model, etc.) in the Wi-Fi Information Form.
- Coordinate with the UW-IT Network Implementation team regarding the back-end provisioning for the service.
- Install equipment in the correct locations following guidelines as set out in the "UW-IT Wi-Fi Services Requirements Guide: Service Installations" document.
- Take 2-3 pictures of installed APs: front of device, device from ~10 feet away to see it in environmental context, and, if applicable, with the AP enclosure.
- Once installed, confirm with Wireless Services that all equipment is visible on the UW network.
- Document installation details in the WIF including location and relevant details about placement.
- Document and provide to UW-IT Wireless Services team all UW-IT pre-approved deviations from the pre-installation design documents; these will be used by UW-IT to generate an 'as built' design indicating actual, final installation locations for all APs.

5) Service Delivery Completion

The quality of the Wi-Fi services can be impacted by a variety of factors not initially identified when the design was completed: e.g., various building materials or proximity to other devices that use RF signals.

Once installed and all furnishings are in place but before the occupants have moved in, the UW-IT Wireless Services team will oversee the post-installation survey process. This process performs tests to validate that all APs and the service overall are functioning as intended. Where there may be issues, these will be corrected. Please refer to "UW-IT Wi-Fi Services Requirements Guide: Post-Installation Surveys" for more information about this activity.

If any adjustments were required during the post-installation survey period, the Wireless Services team will record these adjustments in the final 'as built' design materials and the project materials will be finalized.

The appropriate UW-IT team(s) will take the necessary steps to ensure that all network components are visible and monitored by the UW-IT Operations teams and the Wi-Fi installation project will be closed.