



PAWR Project Office

PAWR FAQs

Question 1, Topic: Production Services

- **Question:** Each platform will also consist of shared services plus some number of prototype and production services that it will control. Please clarify the definition of “production” services? Are “production” services defined as "GENI-style services in support of users of the platforms"? Can "production" services also be interpreted as saying the platform will be supporting production quality services to, for example, the local communities?
- **Answer:** The platform will not support "production" services for local communities. Production in this context means services facing the experimenters and researchers to use the platform reliably. Prototype defines exploratory services developed by the PAWR Project Office (PPO) and/or platform developers for experimenters and researchers that may or may not become production.

Question 2, Topic: Teaming

- **Question:** How quickly after June 1 will proposers be notified about the status of their proposal? Can there be team changes after the Preliminary Proposal is submitted?
- **Answer:** The PPO will send encourage/discourage messages to the responders within 14 days of the Preliminary Proposal submission deadline. Team personnel and institution changes are allowed after the Preliminary Proposal, but must be justified clearly.

Question 3, Topic: Partnerships

- **Question:** Please describe the process for pairing up with potential partners (i.e., Industry Consortium members). Should the matchmaking happen prior to Preliminary Proposal submissions or after Preliminary Proposal submissions? Additionally, how can proposers best engage with companies during proposal phases?
- **Answer:** During the Preliminary Proposal stage, please state the vision for your platform, unconstrained by the availability of equipment or services from the Industry Consortium. During this Preliminary Proposal stage, corporate and association members of the PAWR Industry consortium *may not* be:
 - Co-Principal Investigators;
 - Featured by name; or
 - Providers of unique capabilities to a single proposing team (i.e., not also made available to all proposing teams).

During all stages of the process, corporate and association members of the PAWR Industry consortium *may*:

- Provide feedback on technology, network, or application design to any platform proposer.

Proposers who submit a Full Proposal will receive a more detailed worksheet with benchmark pricing for equipment and services available from the Industry Consortium, and will be introduced to appropriate points-of-contact within companies represented in the Industry Consortium. During this stage, the PPO will coordinate with those submitting Full Proposals and the Industry Consortium to work through various equipment combinations and present potential options that might include staging of capabilities over a period of time.



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Question 4, Topic: In-Kind Contributions

- **Question:** Should the proposers reach out to Industry Consortium members during the Preliminary Proposal stage to find out what is being contributed to develop the network and services design?
- **Answer:** No – not until proposers have decided, after receiving feedback on their Preliminary Proposal, to submit a Full Proposal. During the Preliminary Proposal stage, we expect proposers to remain as unconstrained as possible and to propose a vision that enables fundamental wireless networking research, which can be leveraged to develop compelling applications. During the Full Proposal stage, the PPO will provide a more detailed description of Industry Consortium-contributed equipment and services and define points-of-contact for each Consortium member.

Question 5, Topic: In-Kind Contributions

- **Question:** During the Full Proposal stage, what if the vision of the proposers cannot be fulfilled with the equipment and services contributed by the Industry Consortium?
- **Answer:** There are two ways such gaps can be addressed. Proposers can always utilize cash to pursue equipment and/or service providers beyond the Industry Consortium. Alternately, any disconnect between a proposer's vision and the Industry Consortium contributions may be addressed during the Full Proposal technical negotiation stage. During this stage, the PPO will work with finalist proposers and the designated Industry Consortium points-of-contact to evaluate various equipment combinations and present potential options that might include staging of capabilities over a period of time.

Question 6, Topic: Award Composition

- **Question:** Please clarify the composition of the potential \$20 million award for each winning platform.
- **Answer:** As stated in the RFP the composition of each award will be, “approximately \$20 million in cash *and in-kind contributions* per platform over five years for this RFP, subject to the availability of funds/contributions.” This means that, on average, each winning platform will receive approximately \$12.5 million in cash and the remainder in the form of in-kind contributions from the Industry Consortium. As also stated in the RFP, each proposer who proceeds to the Full Proposal stage will be asked to include proposed cash funding in the Budget section of the proposal and proposed in-kind contributions from the Industry Consortium or any other sources (e.g., local resource contributions) in the Facilities, Equipment, and Other Resources section of the proposal.

Question 7, Topic: Budgeting

- **Question:** Some technology is not yet available commercially – how should this be accounted for in the Full Proposal budget?
- **Answer:** Note that no budgetary information is required for the Preliminary Proposal. For the Full Proposal, each proposing team will be provided with a more detailed worksheet with benchmark pricing for equipment and services available from the Industry Consortium. Through discussions with the PPO and Industry Consortium points-of-contact, each proposer will “pull” equipment and services valued at approximately \$7.5 million in retail value from the Industry Consortium worksheet as needed to meet the proposer's platform design requirements. Such equipment and services “pulled” from the Industry Consortium worksheet will be included in the



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Facilities, Equipment, and Other Resources section of the Full Proposal without reference to the pricing of that equipment or services. Any design, deployment, or operational requirements not met by the equipment and services provided by the Industry Consortium or other sources as in-kind contributions will require cash expenditures (up to an average of \$12.5 million over five years) and should be justified in the Budget section of the Full Proposal. Note that such cash expenditures may be “named” expenditures (e.g., custom-built 5G+ radios from equipment manufacturer “X”) or generic “unnamed” expenditures (e.g., commercially available radios that provide “Y” functionality, system integration services to provide “Z” functionality).

Question 8, Topic: Review Process

- **Question:** Please detail the review process, including how conflicts of interest will be avoided.
- **Answer:** Preliminary Proposals will be reviewed by un-conflicted members of the PPO. The PPO will provide encourage/discourage recommendations to proposers. For the Full Proposal, a panel of independent, un-conflicted experts primarily from academia, industry (excluding Industry Consortium members), local communities, and the government sector will be convened to review and evaluate proposals and provide recommendations to the PPO. At this stage and then again at the Site Visit stage, the PPO, in consultation with NSF and un-conflicted, designated representatives of the Industry Consortium, will make final selection and funding recommendations. Standard conflict-of-interest rules will be implemented at all stages of the review and award process.

Question 9, Topic: Advisory Board Participation

- **Question:** If a PAWR proposal includes an Advisory Board (AB), are members of that AB conflicted from reviewing that proposal (or from the whole process)? Are all employees of a named AB member's organization also conflicted? Is a reviewer who has a conflict with an AB member also in conflict with that platform proposal?
- **Answer:** AB members and all employees of that AB member's organization would be conflicted from reviewing a given proposal if there is any financial transaction between the platform proposer and the AB member, including reimbursement of travel expenses to attend a board meeting. In addition, any potential reviewer with a conflict of interest with the AB member will be excluded from reviewing that proposal.

Question 10, Topic: Sustainability

- **Question:** The discussion about sustainability seems to mostly speak about “stretching the money available.” However, the discussion does not seem to address long-term sustainability. Please clarify.
- **Answer:** Sustainability is a key guiding principle for the PAWR program. The PPO will evaluate the sustainability model beyond just stretching the current funding available. Platforms are envisioned to sustain themselves beyond the five years of NSF-Industry funding. Please refer to the Merit Review criterion that asks: “is the operational model sound? Is it financially sustainable? How will research on the platform be funded (e.g., user fees, local financial support)?”



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Question 11, Topic: Sustainability

- **Question:** Each research platform will be made available as a community resource in such a way that its operations can be sustained well beyond the platform deployment phase. Do you envision a specific model through which such broader research efforts would support sustainable operation of PAWR platforms?
- **Answer:** The PPO does not envision one specific sustainability model, and encourages proposers to suggest creative approaches for ensuring sustainability. As noted in another FAQ, funding from the PAWR program is expected to cover operating costs as platforms are established, stabilized, and institutionalized. However, each awardee is responsible for sustaining the testbed by generating revenue from usage fees and/or other sources before the end of the five-year period of initial funding and support from the PPO (via NSF and PAWR Industry Consortium funds). Note that future NSF-funded academic research projects may include support for PAWR platform usage fees, subject to the availability of funds.

Question 12, Topic: Teaming

- **Question:** Is there really a limit of three co-PIs and Senior Personnel combined?
- **Answer:** For the Preliminary Proposal, section 2, part 5 in the RFP365 system requests that you list all co-PI/Senior Personnel by providing the names and affiliations that bring direct expertise to your proposal. The Preliminary Proposal requires that you provide the two-page qualifications statement for the three most important personnel in addition to the PI, but please feel to mention other key personnel in the Team Qualifications section as well. We will request biosketches for all personnel at the Full Proposal stage.

Question 13, Topic: Eligibility

- **Question:** Are FFRDCs eligible to receive cost-reimbursement as a lead institution or a subawardee?
- **Answer:** Though FFRDCs are eligible to participate in the PAWR program, FFRDCs are ineligible to receive cost reimbursement (Federal or industry sources) as a lead institution or a subawardee.

Question 14, Topic: Testbeds

- **Question:** Let's say that there is a platform for a testbed at the campus and an experimenter wants to use a part of the testbed. It sounds like the desire is that there be some sort of back end system that the experimenter would use to set up the specific experiment and allocate necessary resources. Will the PPO take the lead on this and will it be available for all awarded testbeds to use? Also, will part of this back office development be done by one or more of the projects? If this is the case, then would a proposer put in no cost for this development and support?
- **Answer:** The goal for PAWR is to enable a wide ecosystem of researchers to use these platforms. Remote and on-demand experimentation capabilities are key. The services required to orchestrate the experiment lifecycle (authentication, user account management, etc.) will be a shared service available to all PAWR platforms at no cost. One can also envision a service bundle that each platform will host that has all such services pre-installed, but the configuration may be platform-specific. However, since some infrastructure components proposed may be developed by and be specific to the platform, the system integration work for these components will need to be budgeted to comply with the service framework requirements defined by the PPO. The question



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of where the implementation work is done will be discussed with the PPO at the Site Visit stage for finalists and will, in turn, affect the cost. Teams might also want to develop experimenter-facing services and the PPO framework model will be available with defined APIs for implementation. All of the above will ONLY be required at the Site Visit stage.

Question 15, Topic: Community Building

- **Question:** Is there an online forum to seek expressions of interest from potential industry or researcher partners to collaborate with communities in their visions?
- **Answer:** Yes -- please send such expressions of interest to pawr@us-ignite.org and the PPO will get back to you with potential partner suggestions.

Question 16, Topic: Eligibility FCC Experimental Licenses

- **Question:** Are municipalities excluded from obtaining FCC Experimental Licenses?
- **Answer:** Please refer to FCC eligibility criteria [\(<https://apps.fcc.gov/els/ProgramExpLicensePurposeOption.do>](https://apps.fcc.gov/els/ProgramExpLicensePurposeOption.do) here. The criteria states eligibility as:
 - College or university with a graduate research program in engineering that is accredited by the Accreditation Board for Engineering and Technology (ABET);
 - Research laboratory;
 - Hospital or health care institution; and
 - Manufacturer of radio frequency equipment; or a manufacturer that integrates radio frequency equipment into its end product.

Question 17, Topic: Platform Sites

- **Question:** The RFP mentions that each proposal should describe how at least 10-20 sites will be deployed over the initial five-year period-of-performance. Should the sites be evenly distributed?
- **Answer:** There is no PPO guidance on distribution and or number of sites. The technical vision will need to be realized by providing topologically significant sites with necessary backhaul capabilities that further fundamental research. Proposers need to balance the number of sites and when they are made available in the first three years to allow for experimentation by the platform developers as well as experimenters.

Question 18, Topic: Eligibility

- **Question:** Are local companies, which are not part of the Industry Consortium, eligible as the lead organization?
- **Answer:** No, the lead organization must be either a University/College or a Non-profit, non-academic organization. For-profit organizations that are not members of the PAWR Industry Consortium may also participate within proposing teams, but may not submit proposals as the lead organization.



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Question 19, Topic: Platform Design

- **Question:** Can communities have multiple “islands?”
- **Answer:** Yes. The proposing community can have multiple islands sometimes geographically separated, but they are expected to behave as a single network/platform.

Question 20, Topic: Design

- **Question:** What is the recommended geographic scope of the proposed platform?
- **Answer:** The geographic scope of the proposed platform is up to the proposer. However, it is crucial that the geographic scope of the platform have a critical mass of users (i.e., as stated in the RFP, “Proposed platforms should be designed to support a critical density of users complementing the focused research area. As an illustration, a spectrum-sharing research platform might require a small pool of users across a large geographical area whereas a low-powered IoT radio platform might require a large pool of users in a building”).

Question 21, Topic: Eligibility

- **Question:** Does the PAWR program limit international participation?
- **Answer:** Yes -- the PAWR RFP restricts eligibility to research activities using the facilities, equipment, and other resources of campus(es) located in the U.S. only.

Question 22, Topic: Teaming

- **Question:** Can proposers take steps to prevent access to FCC experimental spectrum from being lost in six months?
- **Answer:** FCC program experimental licenses may be granted for periods of 6 months, 2 years or 5 years (uncommon). Platform operators will need to define processes and policies for management of experimental licenses, which will be discussed ONLY at the Site Visit phase of the RFP process.

Question 23, Topic: Teaming

- **Question:** As the PAWR program will require a significant amount of collaboration, should Industry Consortium members be written into the proposal as a PI or co-PI? Is there a limit regarding the number of co-PIs?
- **Answer:** Industry Consortium members should not be written into the proposal as PI, co-PIs, or Senior Personnel. There is no limit on the number of co-PIs permitted, although for Preliminary Proposals, the RFP requests 2-page qualification statements for just three of the co-PIs/senior personnel.

Question 24, Topic: IP

- **Question:** Please expand the PPO’s intellectual property (IP) policy. Is there any additional guidance the PPO can provide?
- **Answer:** The IP policy for NSF-funded research to be conducted on the platforms for advanced wireless research is included within the “Other Information” section of the PAWR website and the RFP365 submission system. Policies on other forms of IP will be published before Full Proposal submission.



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Question 25, Topic: Allowable Activities

- **Question:** Can the PPO provide examples of activities that are allowed and not allowed?
- **Answer:** Please refer to the RFP, which describes a large number of allowable and unallowable activities.

Question 26, Topic: Interoperability

- **Question:** Please provide additional details regarding “interoperability.” Should the experiment be exportable to other platforms?
- **Answer:** The goal of the PAWR program is to serve a broad set of experimenters including existing NSF efforts as well as other platforms created in this program. The context of interoperability is defined at an abstraction called a federation. A federation allows different platforms to establish mutual trust and common policies to facilitate the sharing of resources among members. The capability to deploy an experiment or a workflow across platforms depends on the level of compliance with the federation guidelines. It is not mandatory for experiments to be exportable to other PAWR and non-PAWR platforms, but proposed platforms will be asked to develop tools to support the standard set of shared service APIs and experiment lifecycle services defined by the PPO.

Question 27, Topic: IP

- **Question:** When new IP is generated, who will be granted access to the IP?
- **Answer:** The IP policy for NSF-funded research to be conducted on the platforms for advanced wireless research is included within the “Other Information” section of the PAWR website and the RFP365 submission system. Policies on other forms of IP will be published during the Full Proposal stage of the initial RFP.

Question 28, Topic: Cost Sharing

- **Question:** Please confirm that cost sharing is not permitted. How should proposers account for facilities and equipment?
- **Answer:** As stated in the RFP, “Voluntary committed cost sharing is prohibited. Proposers and/or proposing partners (i.e., cities/communities, universities, and/or industry) may contribute resources to a given research platform, such as development facilities, backhaul, deployment sites, power supply, network operations support, and any capabilities needed to expedite permitting and other regulatory approvals typically required to deploy and operate wireless networks and support the broader goals outlined in this RFP for the PAWR program. These resources should not be included in the Budget or Budget Justification sections of the Full Proposal; instead, all such resources necessary for, and available to, a project must be clearly described in the ‘Facilities, Equipment and Other Resources’ section of the Full proposal.”

Question 29, Topic: User Fees

- **Question:** How will user fees be established?
- **Answer:** Proposers are expected to provide a plan for sustaining the proposed platform beyond the initial funding period. User fees may be selected as one of the tools for ensuring sustainability, but it is up to the proposer to suggest how those fees will be established.

Question 30, Topic: Industry Consortium

- **Question:** In the presentation that was shared at Proposers’ Day, are “Partner Industries” defined



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as Industry Consortium partners or local industry partners?

- **Answer:** Partner Industries could be defined as local industry or as an Industry Consortium partner. If you include an industry partner in a response to this RFP, the partner's contribution will be independent and outside of anything the Industry Consortium member may contribute to the PAWR program.

Question 31, Topic: Construction

- **Question:** Will the constructed test bed be available for use for research purposes and industry use? As an example, if a community requests to build 20 nodes and company later requests to build 20 nodes in the future what happens?
- **Answer:** The Industry Consortium has 50% access time on the PAWR platform as this is a joint effort by NSF and the Industry Consortium. Future expansion requests will be handled by the PPO collaboratively with the NSF, Industry Consortium and the winning Community. As technology and service needs evolve over time, the PPO anticipates that there may be upgrades and or expansions that need to be managed based on funding availability and architecture/platform elasticity.

Question 32, Topic: Key Performance Measures

- **Question:** For the “vision” merit review criteria, please clarify what it means for the platform design to be “well motivated.” Additionally, please clarify any key performance indicators that describe success in terms of outcomes.
- **Answer:** The PPO expects to see alignment between the technical vision put forward in the proposal (e.g., architectural choices, technologies to be supported) and the research to be enabled by the platform. Key performance indicators will include operational metrics (i.e., deploying the platform on time and on budget, availability of the platform) as well research metrics measuring the impact of the platform on the research communities (e.g., unique research enabled, research papers, patents, training of personnel/students).

Question 33, Topic: Geographic Scope

- **Question:** What does the PPO see as the ideal geographic scope (i.e., community-wide, county-wide, multiple counties, etc.) of the platform?
- **Answer:** PAWR platforms are expected to support a critical density of users and usage scenarios. The enabled research areas will be complemented by the geographic deployment of the platform. Please refer to the PAWR RFP pages 9-10 for more clarification.

Question 34, Topic: Industry Vision

- **Question:** Does the PPO have additional details to share regarding the industry vision?
- **Answer:** Additional vision information from the Industry Consortium may be provided after the Preliminary Proposal stage. For the Preliminary Proposals, the PPO and the Industry Consortium would like proposers to put forward *their* visions, unconstrained by any other influence.

Question 35, Topic: Guidance

- **Question:** NSF is making a large investment – do you have any best practices or lessons learned to share what should or should not be done?
- **Answer:** Please refer to the NSF Communities of Practice Workshop report linked on the



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advancedwireless.org website for best practices and past experiences of distributed testbed development and operation.

Question 36, Topic: Diversity

- **Question:** How important is diversity regarding the “Alignment with PAWR Vision?” Is diversity crucial within a single platform?
- **Answer:** Individual platform proposers may wish to focus on one or more technology topic areas.

Question 37, Topic: Staffing

- **Question:** Are there any constraints regarding the amount of funding that can be used to cover staffing costs?
- **Answer:** There are no constraints on staffing costs, but proposers are advised to balance infrastructure costs and operational costs to maximize utilization of funds. All costs budgeted must be justified. This information will only be required at the Full Proposal stage.

Question 38, Topic: Funding

- **Question:** If a proposal is selected to be awarded, how will the \$20 million in cash and in-kind resources be awarded? Will awarded projects have milestones that need to be met for cash and in-kind resources to be made available?
- **Answer:** The PPO will issue a subaward agreement to the winning platform(s) with the funding to be provided by NSF and a separate award agreement with the cash and in-kind resources to be provided by the Industry Consortium. Yes, awarded projects must have a project plan that includes milestones that need to be met before cash and in-kind resources are disbursed.

Question 39, Topic: Event Materials

- **Question:** Will presentation materials become available on your website?
- **Answer:** Presentation materials are available on <http://www.advancedwireless.org> under the “Proposers’ Day” header.

Question 40, Topic: Event Materials

- **Question:** Will a recording of PAWR Proposers’ Day be made available after the event concludes? Will an attendee list be shared with PAWR Proposers’ Day participants?
- **Answer:** Yes, a recording of the event is available [here](https://www.youtube.com/channel/UCVWsbgmOVcSgvTprN58Ut0A) (<https://livestream.com/internetsociety/pawrrfp>) and on the [PPO YouTube channel](https://www.youtube.com/channel/UCVWsbgmOVcSgvTprN58Ut0A) (<https://www.youtube.com/channel/UCVWsbgmOVcSgvTprN58Ut0A>). The Proposers’ Day attendee list was shared with meeting participants via email.

Question 41, Topic: Priorities

- **Question:** Does the PPO have a consolidated view of the objectives of PAWR, with weights and priorities?
- **Answer:** Proposers are encouraged to refer to the review criteria specified in the RFP.

Question 42, Topic: Platform Use

- **Question:** Will only Industry Consortium members be allowed to use the platform for their research, or would other industry stakeholders also be allowed to use the platform? Assuming other industry stakeholders are able to use the platform, would they be expected to pay for use of



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the platform?

- **Answer:** Other industry stakeholders will be able to use the platforms; the exact pricing model will be determined at a later date.

Question 43, Topic: Partners

- **Question:** The RFP talks about three stakeholders: university researchers, private sector companies, and local communities. In this context, does "private sector companies" mean "Industry Consortium?"
- **Answer:** It means both members of the Industry Consortium and any other private sector companies that may choose to participate.

Question 44, Topic: For-Profit Participation

- **Question:** How can for-profit organizations that are not members of the PAWR Industry Consortium participate in the PAWR program? Can these for-profit organizations be directly involved in the proposed platform so long as they don't receive compensation for such participation?
- **Answer:** Yes -- for-profit organizations that are not members of the Industry Consortium may be active participants on a proposing team, but may not lead such a team.

Question 45, Topic: Support Letters

- **Question:** Can letters of support be included at the Preliminary Proposal and Full Proposal stage?
- **Answer:** Letters of support should not be included at the Preliminary Proposal stage, but are allowed in the Full Proposal Stage. There are no limitations on the number of letters of support that can be included.

Question 46, Topic: Other Federal Programs

- **Question:** Is the DARPA Spectrum Collaboration Challenge (SC2) program connected to the PAWR program?
- **Answer:** No, the SC2 program is not connected or associated with the PAWR program.

Question 47, Topic: Citations

- **Question:** Can preliminary RFP responses include citations?
- **Answer:** Please cite all sources used. Please upload a bibliography to the Appendix section of RFP365. This does not count towards the page limit for that section.

Question 48, Topic: Testbeds

- **Question:** Does every part of the testbed have to support remote experimentation? Can some testbeds only be accessible locally, meaning interested users may have to travel to use the testbeds?
- **Answer:** It is not a requirement for every part of the platform to support remote experimentation. The PPO understands certain scenarios such as mobility-oriented components (i.e, vehicles or drones) require local control. Experimenters with "bring-your-own-devices" (BYOD) may also require local control. However, a majority of components of the platform should strive to support remote and on-demand experimentation.



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Question 49, Topic: Platforms

- **Question:** Does every part of the platform have to be built out of software-defined radios (SDRs), or are off-the-shelf components also acceptable?
- **Answer:** Please refer to the RFP section: PAWR Platform Design Elements, which articulates support for both white box (SDR) and black box (COTS) components as part of the platform. However, programmability is a key guiding principle, so proposers must justify usefulness and support of COTS components.