

## PPO – Data Management Plan

This data management plan is intended to capture, protect, and preserve records and data generated during the Platforms for Advanced Wireless Research (PAWR) program. It addresses both the Project Management Data that will be developed over the course of the PAWR Project Office (including internal and external interactions, inputs, decisions, and actions) and Research Platform Data gathered or provided to the PAWR Project Office on the PAWR Research Platforms (including their configurations, management structures, performance characteristics, and utilization). Because the PAWR Project Office is managing a unique collaboration among government, the wireless industry, academia, and civic partners, it is particularly important to be able to capture lessons learned from the interactions among these stakeholders and the PAWR Project Office.

The data are expected to be useful for four purposes:

- A. Transparency and data-driven decision-making by all parties (as it happens)
- B. Evaluation and lessons learned (guiding mid-course corrections)
- C. Archival history and re-analysis (for the record)
- D. Supporting OMB A-133 audits (to meet federal standards)

The PPO Project Director is responsible for designating data custodians for all the types of data described in this data management plan, and periodically reviewing compliance with data management. In addition, the evaluation of the PPO will have as one of its focus areas an annual review and update of the project's data management practices.

The following seven categories correspond to the CISE recommendations for data management plans.

1. *The types of data, metadata, samples, physical collections, software, curriculum materials, and other materials to be collected and/or generated in the course of the project.*

Project Management Data:

- a. Important or formal documents received or sent by the Project Office that play a role in significant management decisions of PAWR will be preserved. Many of these may be exchanges with the National Science Foundation and other government partners (including the FCC), the Industry Partners, the Research Platforms, the civic, academic, and industry partners of the Research Platforms, and wireless researchers. These documents may be in electronic or paper form and may include memoranda of important input or decisions reached. Documents to be preserved should be sent (or copied) to [PAWR-records@us-ignite.org](mailto:PAWR-records@us-ignite.org) for preservation.
- b. Internal Project Office documents and records that set context or play important roles in decision-making will be preserved including project plans, risk registers, progress reports, board and committee meeting packets (including agendas) and subsequent minutes, actions items, and/or trackers that are produced. Key Performance Indicators (KPIs) are included. Not included will be personnel evaluations, letters, and actions, and routine business correspondence not related to stakeholders (e.g., routine invoicing and bill payment).
- c. Documents received or sent by the Project Office with respect to allocating time on the Research Platforms for research or any other purpose, and information received on how those allocations were used and the research results obtained including references to any publications or presentations which resulted from the allocation.

- d. The summarized results of surveys of stakeholders and research users; this should be transparent if those results do not reveal any proprietary information.
- e. Software tools generated by the PPO staff in the performance of their duties. These should be transparent data and open sourced (e.g., via GitHub) where reasonable. Pointers to the open sourced data will be provided in the PPO Transparency Wiki.

Research Platform Data:

- a. Data generated and disseminated during the Research Platform Outreach and Selection Process.
- b. Data sent to or received from the Research Platforms of all kinds including schedules, security plans, organizational data, plans and timelines, configurations, results of commissioning or calibration tests, correspondence with the civic or academic partners,, and all other documents described under the commissioning and operations phases in the proposal. Also included are key performance indicators and actual utilization data including records of failures, downtimes, re-configuration, and maintenance. Not included are the data generated by individual researchers (which should be covered by their own data management plan), personnel evaluations, letters, or actions, or routine correspondence (e.g., setting up meetings) that is not involved in decision-making or evaluation. Note that Research Platforms will be required to have their own data management plans that will provide equivalent transparency and preserve the same broad sets of information as this data management plan.

Any other data that may be useful for understanding context, decision-making, or evaluating PAWR may be sent to [PAWR-records@us-ignite.org](mailto:PAWR-records@us-ignite.org) for preservation.

2. *The standards to be used for data and metadata format and content (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies).*

In general, information being preserved will be kept in its original form to avoid losing any contextual or product-specific information. The US Ignite PPO plans to use Microsoft Office document formats and Google G-Suite document formats. Project Management data including Earned Value Management data will be kept in Oracle Primavera or a similar project management system. Information exchanged with stakeholders will usually be in Portable Document Format (PDF) for maximum compatibility. Document metadata will include authors and dates. It is anticipated that all information will be kept in widely-used standard formats.

3. *The physical and/or cyber resources and facilities (including those supplied by third parties) that will be used to store and preserve the data after the grant ends.*

For external and transparent data, the PPO intends to use a Wiki or similar technology which permits and records updates and changes and attributes them to a responsible individual (often the data custodian). The Wiki will be backed up by a commercial service on a weekly basis if not more often.

One reason for the choice of a Wiki format is to permit Research Platforms and Researchers to use this method of data management for their own data; this will permit all PAWR data to be searched in a single

search of a single database. Wiki branches will be created upon request to satisfy the needs of Research Platforms and Researchers. Research Platforms may be required to use the PAWR Wiki for their own transparent information.

For internal data, the PPO intends to use Google Drive technology which can limit access to named individuals or roles or categories of individuals. In addition, the Google G-Suite records updates and changes in a document history that can be reviewed and undesirable changes revoked if necessary. Final preservation copies from online sources such as G-Suite and Wikis will be converted to an open document standard like PDF for archiving. Google Takeout supports direct export of G-Suite documents to standard document types including Portable Document Format (PDF). Wikis and other online documentation tools will support publishing to a standard document format as well for inclusion in the archive.

The PPO will work with its academic partners to provide long-term storage at an academic or nonprofit library or via the RENCI DataNet Federation, providing an endowment to do so, if necessary to ensure the materials remain open to the public for a minimum of ten years after the conclusion of the PPO.

4. *The policies for access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements.*

Transparency information will be posted to a PAWR Wiki or equivalent which will also record the person posting, date, and time. Any modifications will also be tracked and can be revoked if malicious.

Transparency information includes publicly available information on the PPO and the Platforms to include (among other things):

- An easy on-ramp to learning about and using PAWR Research Platforms
- Descriptions and configurations of the Research Platforms
- Information on how to obtain an educational, trial, or startup allocation on a Research Platform
- Information on how to successfully apply for a large allocation on a Research Platform
- The Technical Report Series
- Upcoming events and how to attend them
- Presentations and recordings (when made) of previous events
- PPO personnel and contact information
- This Data Management Policy and other similar governing policies of the PPO

The PAWR Industry Consortium and Committees and other stakeholders will be asked what other materials should also be made transparent. For example, the Research Committee will be asked if granted allocations should be made transparent. Similar to NSF practice, we expect that proposals themselves will not be made transparent.

Other management information which may not otherwise be made transparent will nevertheless be preserved for the purposes of gathering lessons learned, aiding evaluation, and preserving an historical record of the PPO. Access to these records will be available to their authors, those with whom the materials were originally

shared, and designated evaluators. After 24 months and in consultation with the National Science Foundation, consideration will be given to making the materials publicly available in an archive where they do not involve specific personnel actions or evaluations and do not disclose proprietary information.

Intellectual property of any stakeholder or the PPO should be so designated on any document so that proprietary or sensitive information can be protected as need and/or for the length of time specified.

5. *The policies and provisions for re-use, re-distribution, and the production of derivatives.*

Transparency information may be freely re-used, re-distributed, or used in the production of academic derivatives when the source of the original information is properly acknowledged.

6. *The plans for archiving data, samples, and other research products, and for preservation of access to them after the award ends.*

Research products will be the subject of individual data management plans for each academic or joint academic-industry research product. Industry research will be archived and preserved following the policies of the industry researcher and their company. However, the PPO encourages all research to be made available transparently along with the raw research data.

7. *The roles and responsibilities of all parties with respect to the management of the data (including contingency plans for the departure of key personnel from the project) after the grant ends.*

This data management plan will be reviewed and amended by the PPO Project Director and Co-PIs in consultation with the PAWR Industry Consortium, Research Committee, and the National Science Foundation. At the internal project management kickoff, the record-keeping responsibilities of the PPO will be emphasized with specific time given to identifying appropriate information to be preserved, methods of preservation, and taking care with sensitive, personal, proprietary, or otherwise protected information.

As new staff members come on board the PPO, an important part of their onboarding process will be the review of the data management plan and a discussion of the kinds of documents they are likely to handle which require preservation and/or special handling due to their nature.

A part of the PPO evaluations should include feedback on execution of the data management plan.

After the grant ends, all of the transparent information will continue to be made public as described above. Proprietary and protected information will be kept in those categories unless there is a time limit specified for proprietary data (and the PPO will encourage not less than 24 months).