DARE UK

SAFER Project

(SAIL Advancing Federated Exploration and Readiness)

End of Project Report
DARE UK Early Adopter Programme

Swansea University
(Secure Anonymised Information Linkage (SAIL) Databank)

March 2026

UK Research and Innovation
HDRUK Health Data Research UK
ADR UK Data-driven change

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1. Executive Summary

1.1 What is the SAFER project?

The SAFER Project (SAIL Advancing Federated Exploration and Readiness), based within the Secure Anonymised Information Linkage (SAIL) Databank (https://saildatabank.com/), a world-leading Trusted Research Environment (TRE) at Swansea University, was funded by Data and Analytics Research Environments UK (DARE UK) as part of the Early Adopter Programme. The project explored how approved researchers and projects could, in the future, build on existing secure data access processes to access and use data securely across different TREs while continuing to protect privacy and meet legal and ethical requirements.

SAFER focused on the governance, trust, and public-facing foundations needed to enable federation, ensuring that clear rules, strong safeguards, and public confidence support any future technical solutions.

1.2 The problem it is addressing

At present, researchers who need to use data from more than one TRE often face slow, complex, and fragmented approval processes. Each TRE may operate under different legal frameworks, governance checks, technical systems, and access models. Even when research has a clear public benefit, these differences can lead to significant delays and duplication of effort.

1.3 Why SAFER was funded

SAFER was funded to explore how this situation could be improved by laying the foundations for a federated approach to data access. Rather than moving or copying data between systems, federation enables approved researchers to securely access data already held across multiple TREs, with strict governance, legal controls, and security safeguards.

As one of the longest-established and world-leading operating TREs, the SAIL Databank drew on its extensive experience to help shape governance approaches that align with DARE UK's vision for a federated UK research data network. By supporting safe and responsible research across different organisations, regions, and legal settings, SAFER contributes to the development of a more joined-up, efficient, and trusted UK research data system.

1.4 What SAFER did

Over the course of the project, SAFER focused on assessing SAIL's readiness for federation. This included reviewing all of SAIL's existing governance and operational policies and processes (the rules, oversight processes, and decision-making structures that guide how data is accessed and used), and engaging extensively with researchers, data owners, governance bodies, technical experts, and members of the public.

The project examined approval processes, legal agreements and operational procedures to understand how they might operate when research involves more than one TRE. The review explored how responsibilities, approvals and oversight could work across organisations while maintaining SAIL's existing safeguards and trusted operating model.

SAFER also considered the security and compliance implications of federation. This included reviewing existing security standards, certifications and compliance frameworks to ensure that exploring federated approaches would not weaken the strong protections already in place for sensitive data.

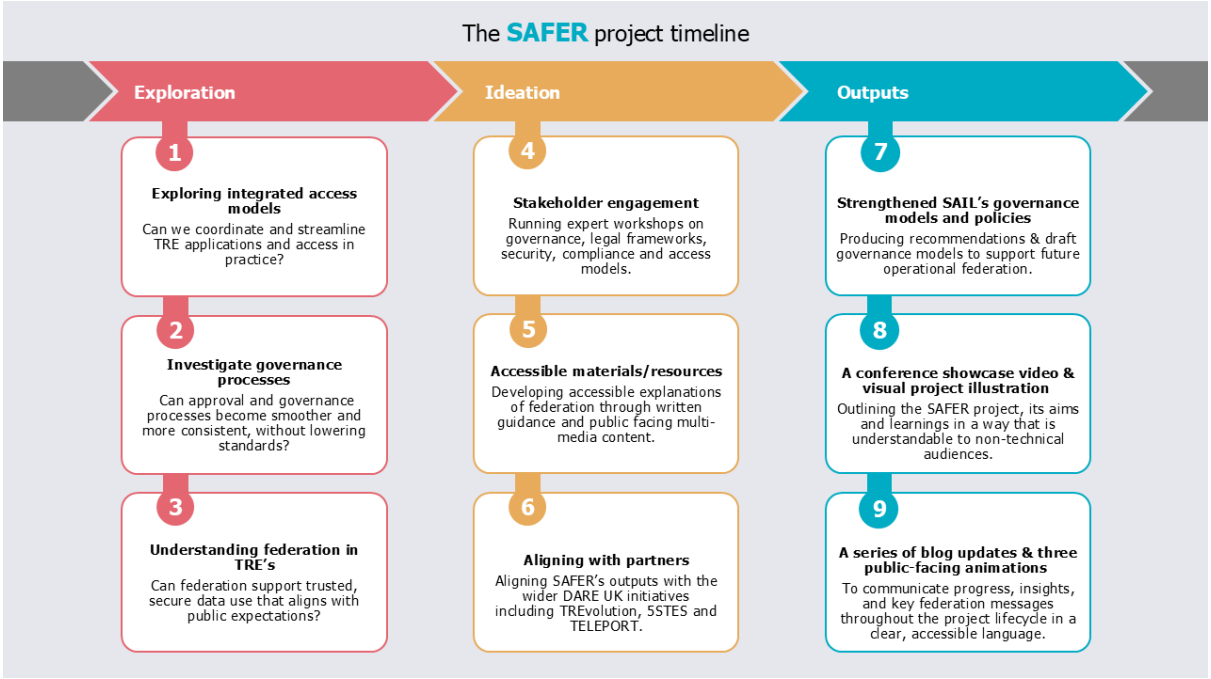
The team also developed draft governance model options for federated working, as well as for working alongside the DARE UK TREvolution programme, to ensure that governance and trust considerations align with emerging technical capabilities. A strong emphasis was placed throughout on trust, accountability, transparency, and public expectations.

This work has provided SAIL with a clearer understanding of the governance, operational and engagement requirements needed to support future federation. Further information and access to SAFER outputs, including animations and project resources, can be found on the SAFER webpage: https://saildatabank.com/governance/federation/

1.5 Key Activities Undertaken

The following figure highlights several key activities which the SAFER project undertook, including:

- Reviewing SAIL's catalogue of governance policies, legal agreements and operational procedures to assess readiness for federation, and exploring how approval processes and oversight could operate across multiple TREs.
- Engaged with stakeholders, including researchers, governance experts, policymakers and members of the public to gather perspectives on federation.
- Developed draft governance approaches and supporting materials to guide future federation activity.
- Produced accessible resources to explain federation and support public understanding.



1.6 Expected Benefits for UK Research and the Public

Through SAFER, insights from legal, policy, technical, and public perspectives were brought together to clarify what is needed to enable safe, large-scale research across organisational and regional boundaries.

The project strengthens Wales's role within UK and international health research collaborations and supports Welsh Government priorities around innovation, digital infrastructure, and data-driven improvement.

By working closely with the DARE UK TREvolution programme, SAFER helps ensure that strong governance, clear access pathways, and public trust underpin future technical solutions.

In the longer term, this work supports faster, more efficient research while ensuring data remains protected and used responsibly, delivering greater public value from existing data and stronger assurance around how it is accessed.

2. Project Purpose and Vision

2.1 Why Federation is Needed

Research that delivers real public benefit increasingly depends on information held across more than one organisation or system. Health and public service data, for example, is often stored in separate TREs, each set up to protect privacy, comply with the law, and meet public expectations about how data should be used.

These TREs work well individually, but they are not always easy to use together. When a research project requires data from multiple TREs, the process can become slow and complicated. Researchers may need to complete multiple application forms, go through separate approval panels, and follow different rules for each environment. Data owners and governance teams may also need to review similar requests multiple times. This can lead to duplication, inconsistent processes and delays, even where the research is clearly worthwhile and in the public interest.

As research questions become more complex and wide-ranging, these challenges are becoming more common. Studies that examine long-term outcomes, rare conditions, or differences across regions often cannot rely on data from a single source. Without better ways of working across TREs, important research risks being delayed or not happening at all.

Federation offers a way to address these challenges by enabling coordinated access across multiple systems while maintaining strong protections. Federated approaches allow approved researchers to access and analyse data securely within each TRE, where data and results are securely held and accessed via approved federated mechanisms. Different federation models may be used depending on the needs of a particular research project.

In some models, data remains in its original, secure setting, and only approved results are combined. In others, approved data can be securely brought together for analysis, with strong safeguards in place. In all cases, results remain subject to strict disclosure controls that build on SAIL's existing processes and assurances. Each organisation keeps control over its data, applies its own safeguards, and remains responsible for ensuring that access is appropriate and lawful to approved researchers and projects.

Federation aims to improve how data is used without reducing safety or protections. It is about making the process clearer, more consistent, and more efficient for everyone involved. For researchers, this could mean a more understandable route to access when working across multiple environments. For data owners and TRE operators, it could reduce unnecessary repetition while maintaining oversight and accountability. For the public, it offers the potential for more efficient research insights without weakening data protection.

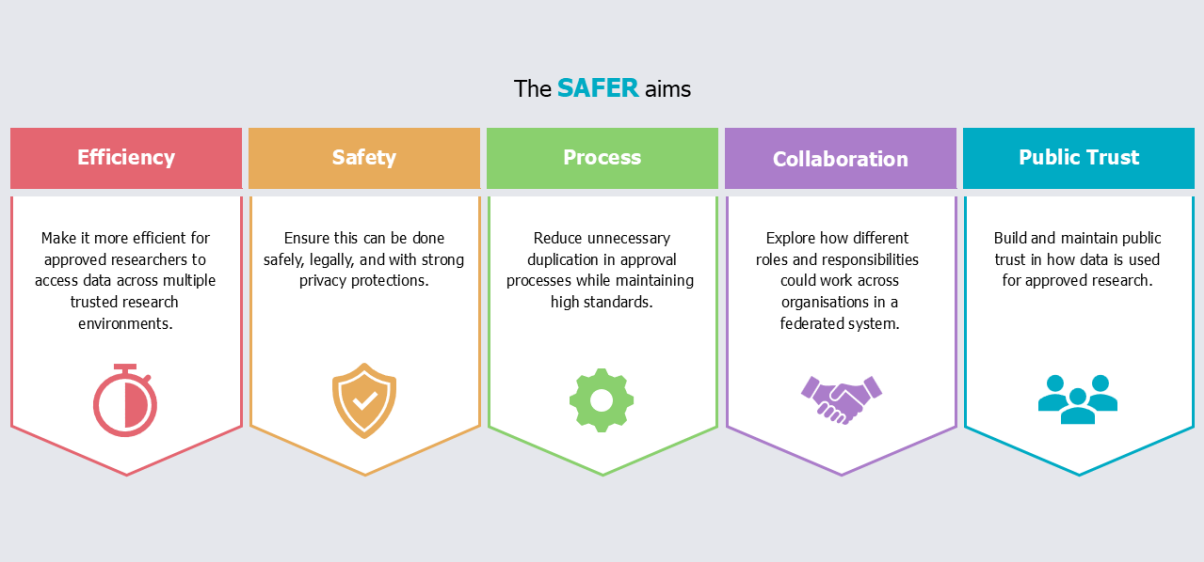
At the same time, federation raises important questions. These include how approvals should work across organisations, how responsibilities are shared, and how complex processes can be explained clearly to build and maintain public trust. If these issues are not addressed carefully, federation could

risk adding complexity rather than reducing it. These challenges confirm why projects like SAFER are necessary. Before federation can be put into practice, there must be a clear understanding of why it is needed, what problems it should solve, and the conditions that must be in place to make it safe, lawful, and publicly acceptable.

For further information on the available federated approaches, please see SeRP (https://serp.ac.uk/), TREvolution (https://dareuk.org.uk/trevolution/) and DARE UK (https://dareuk.org.uk/).

2.2 SAFER's Aims

The following figure highlights several key considerations that emerged during exploration of how federation could operate safely and effectively across trusted research environments.



2.3 Long-Term Ambition

The long-term ambition is to support a future UK-wide federated research data system that enables collaboration across an approved federated system/network, while maintaining strong governance, clear accountability and public confidence.

3. Overview of TREvolution capabilities and SAFER's Role

3.1 What is TREvolution?

TREvolution's principal deliverables focus on the technical elements of delivery, including software, technical tools, and infrastructure that facilitate federation. SAFER's focus is complementary, as it provides an operational governance framework to deliver federation in the 'real world' through the development of policies, procedures, standard operating procedures and template legal agreements.

The challenge for SAFER was to provide governance solutions for a range of query models where partner organisations may have differing roles and responsibilities dependant on the project proposal. SAFER's remit was to integrate the potential federation models being developed by TREvolution into existing TRE processes. These processes have not historically been developed to support federation, and the challenge was therefore to adapt SAIL to this new world whilst retaining credibility and trust in its existing governance. SAFER's review was a 360-degree, comprehensive review of all elements of operationalising the service.

SAFER also drew on learning from existing DARE UK initiatives, including 5S-TES and TELEPORT, to understand how projects using federated analytics could work in practice and what governance implications these create for TRE operators, data owners and researchers. SAFER's findings were based on established models using either distributed queries, federated learning, or the concept of a 'pop up' TRE, where data is brought together under an overlay model.

4. Impact of Using TREvolution Capabilities

4.1 Process and Governance Improvements

The primary goal of the technical solutions to federated analytics that TREvolution has been pursuing is to connect multiple sources of physically distributed data, enhancing the current pathway for multi-site studies (such as combining analytics across the four nations of the UK). The technology itself is based on improved data connectivity and the TREs, which contain the relevant data for each analysis and provide a securely deployed solution for deploying parallel or sequential analytical payloads (workflows/tasks) onto the data to obtain results based on standardised methodology.

One area which is integral to the success of the technical enhancement is the governance and TRE operations element. Laced over and above the purely technical constructs of analysis are the networking elements that enable secure site-to-site connectivity within agreed consortia, as well as the ability to provide initial approvals harmoniously and to control the egress of results and outputs through agreed frameworks.

To this end, as well as the technical deployments, the configuration of governance processes within networked consortia at the beginning of the project to ensure like-minded approaches to governance is considered, although the starting point is that this is still convened, with each site providing its own distinct approvals according to its own processes. The end goal is that application forms and, indeed, review processes could be harmonised through tooling such as Director, which will be connected to all other parts of the technical process, including the submission layer for analyses and the deployed federation tooling (5S-TES/Teleport).

4.2 Improvements in user experience for TRE users or partner organisations

With the initial deployment of TREvolution products focusing on technical networking and connectivity needed to enable federated analysis across multiple sites, governance processes and pathways will inevitably need to adapt so that data can be accessed more efficiently through these frameworks, without compromising the trust and maturity that current TREs have built through their established operational approaches.

4.3 How does federation offer a solution?

Federation of this type offers a solution because it will focus on an end to end set of tools both for analyses but also for governance approvals which will eventually enable users to apply through an aligned process mirrored across the nations who have entered into creating a federated network, while also allowing the same controls to be applied throughout federated projects and at their end to ensure consistency of output egress (also known as disclosure control) and maintenance of the five safes.

4.4 Early Case Study: Collaboration Across Trusted Research Environments

Although federation is not yet operational, several large research studies already demonstrate the value of trusted research environments working together. One example is the largest UK-wide study

ever carried out, using data from 67 million people across the four nations to understand the impact of COVID-19 vaccination on the population. This research brought together data and expertise from TREs and secure data environments across the UK to understand how vaccination affected different groups and communities. By combining insights from multiple regions, researchers were able to generate findings that would not have been possible using data from a single system alone. These types of studies highlight the potential benefits of federation. By enabling trusted research environments to work together more efficiently in the future, federation could make it easier for approved researchers to answer complex questions that require data from multiple organisations while maintaining the same strong safeguards for privacy and security. (https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(23)02467-4/fulltext).

Future research programmes are also exploring how linked data can help address major public health challenges, such as understanding cancer inequalities across populations. Initiatives such as Cancer Data Driven Detection (CD3) aim to bring together data from diverse sources to improve early detection and outcomes. Federation could help support this type of research by enabling secure, coordinated analysis across multiple trusted systems.

(https://news.cancerresearchuk.org/2023/05/30/harnessing-the-power-of-cd3/
https://www.adruk.org/news-publications/publications-reports/exploring-cancer-inequalities-in-wales-through-linked-administrative-data/)

5. Stakeholder Engagement and Public Involvement (PIE)

Stakeholder engagement and public involvement were central to SAFER's approach. Exploring future data federation could affect many groups, so it was important to hear directly from the people involved and those it may impact.

Consultation was a key part of the project, and engagement was carried out with a range of groups, including researchers, data partners, governance experts, policymakers, and members of the public. Public perspectives were gathered through the SAIL Databank's public and patient advisory group, the Consumer Panel, alongside additional engagement sessions designed to explain federation in clear, accessible language and to understand public expectations around privacy, safety, and accountability.

Wider stakeholder engagement was also undertaken with organisations, including the Welsh Government, Public Health Wales, Digital Health and Care Wales, and information governance panels. These discussions helped identify practical considerations, governance concerns and operational challenges that may arise when Trusted Research Environments work together in a federated model. The activity formed part of SAFER's original roadmap, ensuring that the views of researchers, data partners, governance bodies and the public informed governance development.

Feedback from these activities helped us understand concerns, identify benefits, and improve how complex ideas were communicated. Involving people throughout the project has helped build shared understanding and maintain trust in how this work is being explored.

5.1 Approach

Our key stakeholders and public contributors were engaged throughout the project and participated in workshops, interviews, several consultations and facilitated discussions to identify priorities, challenges, and practical solutions. Public contributors were recruited through SAIL's established Consumer Panel, ensuring that input reflected general public values, expectations, and levels of

understanding rather than technical expertise. They were recognised and supported for their time, in line with established public involvement guidance.

Our stakeholders also placed strong importance on ensuring that public voices were involved throughout the project, not just at the end. This ongoing engagement provided reassurance that views were genuinely listened to, considered carefully, and used to shape the development of guidance, governance models, and communications.

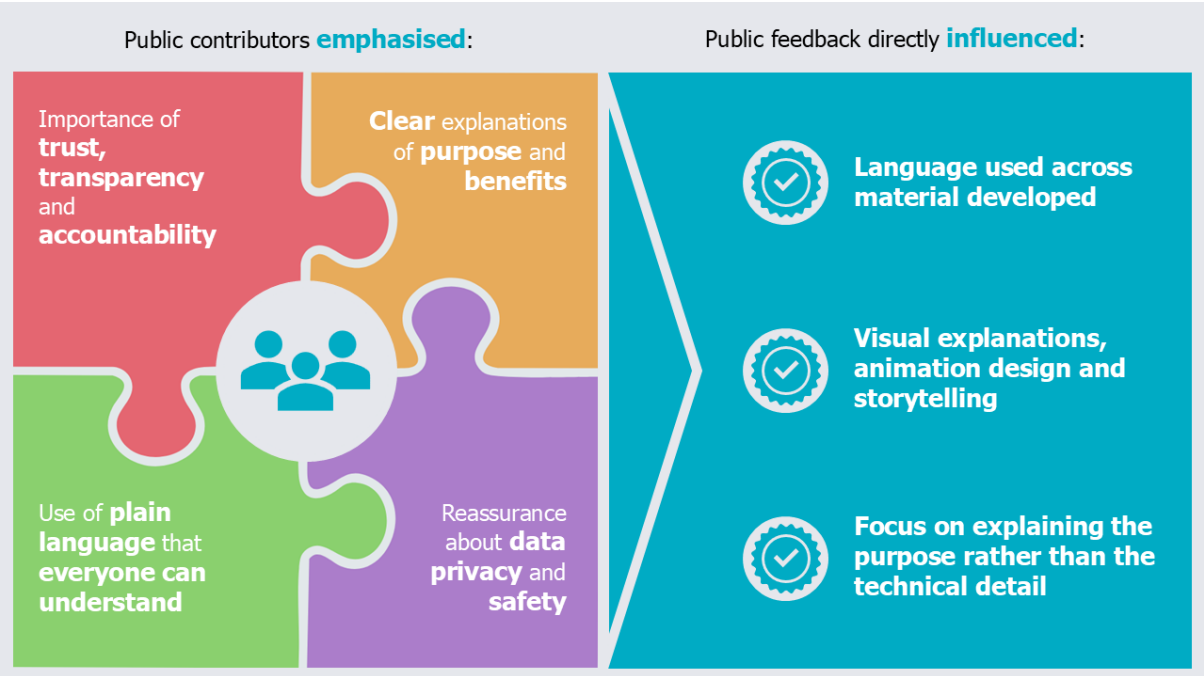
5.2 Engagement Approach and Participants

Stakeholder engagement involved a wide range of participants, including researchers, governance specialists, data partners, policymakers and members of the public. Public perspectives were gathered through the SAIL Databank public and patient advisory group (the Consumer Panel), alongside dedicated consultation sessions, workshops, and wider sector engagement events.

Across these engagement activities, approximately 100 participants contributed to the project, including over 40 attendees at the SAFER stakeholder conference. Those involved represented organisations from across the UK research, policy, governance and public sectors, alongside members of the public involved through the Consumer Panel. Bringing together these perspectives helped ensure that governance, operational and public trust considerations were explored from multiple viewpoints.

5.3 Key Themes from Engagement

Engagement sessions explored how federation could work in practice, stakeholders' concerns, and the conditions needed for it to operate safely and effectively. These discussions highlighted several themes that helped shape the project's approach and priorities.



There was also recognition that federation could enable research that is currently difficult to conduct, including studies that require large populations or data from multiple regions. At the same time, stakeholders highlighted that governance standards must remain strong and consistent across organisations to ensure data continues to be used responsibly.

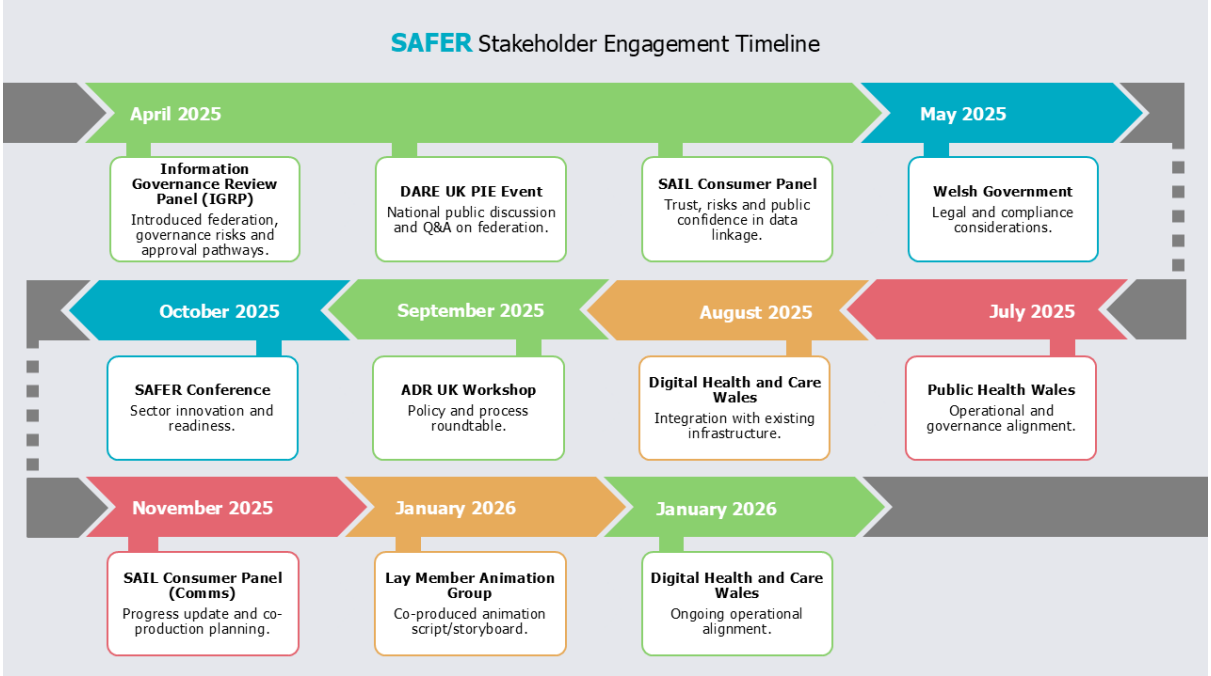
5.4 Challenges and lessons learnt

- Federation is difficult to explain in lay terms because of the many definitions used.
- Different audiences need different explanations, as each group approaches federation with its own level of knowledge, experience and concerns.
- Visual infographics are essential to capture a wider audience.
- Trust must be actively earned and maintained by being open, clear and transparent at every stage.
- Risks are seen as manageable but require careful oversight, especially when combining datasets.
- Managing expectations about what federation can deliver removes barriers to cross TRE research.
- Meaningful engagement takes time, but this investment significantly improved the quality and clarity of the project's outputs.

6. Engagement Activities and Insights

6.1 Overview of Sessions

The timeline below highlights key engagement sessions held during the project.

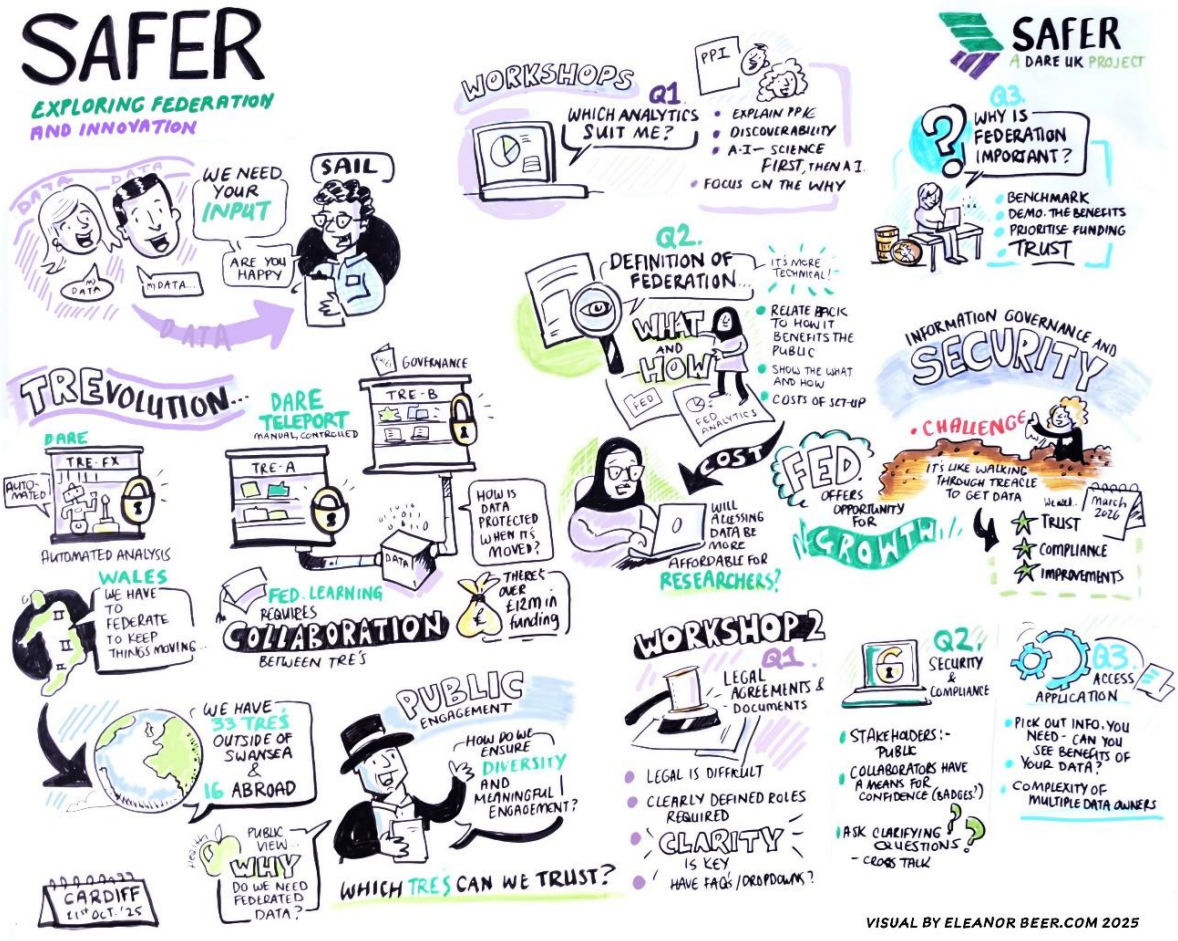


In addition, the SAFER team has continued to build transparency and awareness through regular blog posts and updates that highlight project progress, lessons learned, and next steps. These communications helped keep both professional and public audiences informed and engaged as the project evolved.

The SAFER conference, Exploring Federation and Innovation, brought together researchers, members of the public, policymakers, and data governance experts for an in-person stakeholder engagement event led by the SAIL Databank in collaboration with DARE UK, SeRP, HDR UK, and ADR UK. The event brought together professionals from across the UK's data research landscape to discuss one of the key challenges associated with data federation: how to enable safe, legal, and efficient federated analysis

within and between TREs and Secure Data Environments (SDEs). The event included a series of presentations and six interactive workshop sessions covering a range of federated topics, with the SAFER team seeking input from attendees and encouraging participants to share their perspectives and experiences throughout the day.

Morning sessions focused on exploring the fundamental concepts and dimensions of data federation, as well as why federation matters for improving data research to benefit society. The afternoon workshops looked more closely into the legal, security, and procedural requirements involved in federated research, including the operational and legal considerations that would be required in practice. These discussions provided valuable insight into stakeholder priorities, governance considerations and practical challenges that will shape future federation development.


SAFER
EXPLORING FEDERATION AND INNOVATION
WORKSHOPS
Q1
WHICH ANALYTICS SUIT ME?
PPI
EXPLAIN PPIC
DISCOVERABILITY
A·I— SCIENCE FIRST, THEN A.I.
FOCUS ON THE WHY
SAFER
A DARE UK PROJECT
Q3.
WHY IS FEDERATION IMPORTANT?
BENCHMARK
DEMO. THE BENEFITS
PRIORITISE FUNDING
TRUST
WE NEED YOUR INPUT
SAIL
ARE YOU HAPPY
DATA
Q2.
DEFINITION OF FEDERATION...
IT'S MORE TECHNICAL!
WHAT AND HOW
RELATE BACK TO HOW IT BENEFITS THE PUBLIC
SHOW THE WHAT AND HOW
COSTS OF SET-UP
INFORMATION GOVERNANCE AND SECURITY
CHALLENGE
IT'S LIKE WALKING THROUGH TREACLE TO GET DATA
TREVOLUTION...
DARE TELEPORT
MANUAL, CONTROLLED
GOVERNANCE
TRE-B
TRE-A
TRE-FX
DARE
AUTOMATED
AUTOMATED ANALYSIS
HOW IS DATA PROTECTED WHEN IT'S MOVED?
COST
FED OFFERS OPPORTUNITY FOR GROWTH
WILL ACCESSING DATA BE MORE AFFORDABLE FOR RESEARCHERS?
TRUST
COMPLIANCE
IMPROVEMENTS
WALES
WE HAVE TO FEDERATE TO KEEP THINGS MOVING
FED. LEARNING REQUIRES COLLABORATION
BETWEEN TRE'S
THERE'S OVER £12M in funding
WORKSHOP 2
Q1
LEGAL AGREEMENTS & DOCUMENTS
LEGAL IS DIFFICULT
CLEARLY DEFINED ROLES REQUIRED
CLARITY IS KEY
HAVE FAQs / DROPDOWNS?
Q2.
SECURITY & COMPLIANCE
STAKEHOLDERS:- PUBLIC
COLLABORATORS HAVE A MEANS FOR CONFIDENCE (BADGES?)
ASK CLARIFYING QUESTIONS?
- CROSS TALK
Q3.
ACCESS APPLICATION
PICK OUT INFO. YOU NEED - CAN YOU SEE BENEFITS OF YOUR DATA?
COMPLEXITY OF MULTIPLE DATA OWNERS
WE HAVE 33 TRE'S OUTSIDE OF SWANSEA & 16 ABROAD
PUBLIC ENGAGEMENT
HOW DO WE ENSURE DIVERSITY AND MEANINGFUL ENGAGEMENT?
PUBLIC VIEW
WHY DO WE NEED FEDERATED DATA?
WHICH TRE'S CAN WE TRUST?
CARDIFF 21ST OCT '25
VISUAL BY ELEANOR BEER.COM 2025

6.2 Key Outcomes from Stakeholder Discussions

Feedback gathered through workshops, consultation sessions and wider engagement activities highlighted several common themes regarding the potential development of federation.

Participants broadly agreed that federation could improve the ability to answer complex research questions that require data from multiple organisations, such as studies of rare diseases, long-term population health trends and national policy questions. There was also strong support for the potential of federation to strengthen collaboration across the UK research system and make better use of existing data. Improved coordination between TREs could help reduce duplication in research processes while maintaining the safeguards already in place within these secure environments.

At the same time, stakeholders recognised that several practical issues would require careful consideration as federation develops. These included how responsibilities may be shared across organisations, how approval processes could operate when research involves multiple TREs, and how governance frameworks and legal agreements could support different federation models.

Participants also emphasised that strong governance, transparency and clear accountability must remain central to any federated approach. Maintaining public trust, ensuring robust legal frameworks and preserving the high standards already established within TREs were seen as essential conditions for any future development of federation.

6.3 Engagement with Data Partners

In addition to the conference workshops, SAFER also engaged directly with data partners and governance stakeholders to understand how federation could affect existing data access arrangements. These discussions focused on practical considerations from a data partner perspective, including how anonymisation safeguards would operate, how approval processes might work across organisations, and how responsibilities would be managed where multiple TREs are involved.

Data partners recognised the potential benefits of improved collaboration and more efficient research where studies require data from several organisations. At the same time, they emphasised that any future federation approach should avoid introducing unnecessary complexity for researchers and should build on existing trusted governance processes wherever possible.

Participants also highlighted the importance of ensuring that data partners remain involved in decision-making as federation develops, so that organisations contributing data continue to have confidence in how their data is accessed and used. These discussions helped identify practical considerations that will need further development as federation progresses and informed SAFER's assessment of governance readiness.

7. Overall Drawbacks and Recommendations for Improvement

7.1 Challenges Identified

While SAFER has made important progress in preparing for federated access to research data, several challenges have become clear that will need to be addressed in the future.

7.2 TRE

A key challenge for SAFER has been addressing the array of differences among potential partner organisations for a federated analytics network. Each partner will have spent many years developing and refining their processes. Whilst the governing law is the same in England and Wales, with a single

data protection regulator (the regimes in Scotland and Northern Ireland are substantively the same, with differences under devolution and in elements of the legal framework), individual TREs have developed their own compliance responses. These differences present a challenge for standard data sharing; however, the congruence of processes is the fundamental challenge for SAFER. Creating a framework of equivalence and maintaining minimum standards whilst facilitating research seamlessly has been the project's primary aim. This has been achieved through pragmatism and by ensuring that stakeholder views remain paramount.

7.3 Risk of additional bureaucracy

Federation introduces new steps to ensure research is safe and legal. While these steps are necessary, there is a risk that the process could become too slow or complicated if not carefully designed, adding time and effort for researchers and TRE staff. Throughout the project, there has been awareness of the requirement to create seamless processes which do not add to bureaucratic burden.

7.4 Cultural change is needed

Federation isn't just about technology; it's also about people working together differently. TRE teams, data owners, and researchers will need to adapt to shared decision-making, joint responsibilities, and new ways of working across organisations.

7.5 Uncertainty around responsibility

It isn't always clear who should make decisions or take responsibility if something goes wrong. Without clearly defined roles and processes, this could cause confusion or gaps in oversight.

7.6 Other practical challenges

Differences in TRE practices, such as how they verify identities, classify data, or run security audits, can complicate federation. Aligning multiple TREs takes extra time, resources, and effort. During stakeholder discussions, participants also raised questions about potential costs associated with federation. SAFER has begun considering how different federation approaches might operate in practice; however, detailed cost considerations were outside the remit of this project and will require further exploration as federation develops. It was recognised that improving coordination between TREs could help reduce duplication of processes over time. In the longer term, more streamlined approval pathways and improved collaboration may help reduce both the time and overall effort required for researchers to access data across multiple organisations.

8. Lessons Learned – reflecting on the adoption experience

The SAFER project has provided a variety of insights regarding safely and securely federated access to data across multiple organisations.

8.1 Maintaining and further building trust is essential

Trust cannot be assumed; it must be actively built and maintained. Engagement with stakeholders, including the public, has been critical to understanding challenges, expectations, and priorities.

Listening to feedback early and throughout the project helped shape guidance, visual explanations, and communications that are clear and reassuring.

8.2 Engagement makes a real difference

Bringing together researchers, data owners, technical experts, legal and governance teams, and public contributors helped us:

- Spot potential challenges early.
- Understand different perspectives and priorities.
- Create materials and explanations that everyone can understand.
- Develop mutual respect and understanding of each group's opinions and expectations.

8.3 What could have been done better

- Whilst engagements were wide and inclusive, creating visual explanations and simple analogies sooner would have helped non-technical audiences grasp federation concepts more quickly. However, through the engagement, audiences from different disciplines, organisations, and backgrounds appreciated hearing all perspectives (technical and non-technical) to better understand and appreciate the project's scale and complexity.
- While the project successfully involved key stakeholders from the start, there is always scope to refine guidance and communications shared to make them even more clearly accessible.

8.4 What worked well and should be repeated

- Early and ongoing engagement with public contributors, data owners, and technical experts helped ensure that a broad range of views was reflected in shaping governance approaches and communications throughout the project.
- Collaborative workshops that brought together a mix of experts and public contributors provided valuable insights that informed draft governance models, user guidance, and future federation activity.
- Using simple analogies and visual models helped explain federation clearly.
- Iterating materials based on feedback made our explanations and guidance much stronger.
- Ensuring adequate time was spent understanding the technical models and how these would apply in a TRE environment, prior to commencing governance modelling.
- Ongoing dialogue with those responsible for the technical solutions helped to shape the governance response.

8.5 Surprising insights

- Public contributors were most concerned about clarity, safety, and accountability rather than technical detail.
- Small differences in legal or governance rules between TREs can create big practical challenges.
- Researchers are keen for smoother, faster access to data, provided privacy and safety rules are respected.
- Considerations around the opportunities and challenges federation presents were a clear focus and part of many engagement sessions from all stakeholders, recognising potential capacity implications of operationalising federation across data partners, where impactful additional research would be enabled by federation as a benefit, whilst recognising the impact this additional research would have on already stretched data partner capacity.
- Across discussions, several priority areas emerged for future work. These include aligning governance processes between organisations, clarifying roles and responsibilities across federated environments, developing practical approval pathways for cross-TRE research, and continuing to improve public communication about how federation works and why it is beneficial.

9. Advice for Future Adopters and DARE UK

- Start by building clear, simple explanations of federation and its purpose for different audiences, using visuals and analogies wherever possible.
- Engage a broad range of TREs and stakeholders to understand governance procedures and identify potential points of friction or confusion.
- Recognise that federation is as much about people, trust, and culture as it is about technology, processes, communication, and clarity, and that these are as critical as the technical solutions.
- Continuously test guidance and resources with real users to ensure they are accessible, clear, and trusted before wider rollout.

10. Future Deliverables & Legacy

10.1 What will continue beyond the project?

- SAIL will build on the foundational review of its governance and legal frameworks, policies, and processes developed through SAFER, and will continue to build upon these to operationalise safe and secure federation.
- Continued use of lay-friendly federation messaging and explanations of any changes made to SAIL's existing processes and policies.
- Utilisation of animations available via the SAIL Website and used in stakeholder engagement and researcher induction to explain SAIL's approach to federation.
- SAIL to consider federation considerations being embedded into standard governance approaches whilst maintaining public trust and our established secure and world-leading TRE services.

10.2 What will influence future work (after SAFER funding ends)?

- Governance models developed through SAFER are helping inform UK-wide federation planning.
- Lessons from the project informing how federation is implemented through the wider DARE UK programme.
- Continued discussions across TREs and SDEs, which may present opportunities to join a secure federated network.

10.3 What tangible things will still be used?

SAFER also produced a range of practical outputs designed to support understanding of federation and inform future work. These outputs, including blogs, animations, conference materials and wider resources, are available on the SAFER webpage: (https://saildatabank.com/governance/federation/)

11. Conclusions and Future Direction

The SAFER project has delivered a clearer understanding of what is required to support federation across TREs in a safe, lawful and publicly acceptable way. Through governance reviews, stakeholder engagement, and consultation with data partners and the public, the project has identified the practical, legal, and operational considerations that must be addressed before federation can be implemented.

SAFER has created the foundations for a trusted, secure, and publicly acceptable approach to federation within SAIL that will continue beyond the life of the project. While federation is not yet operational (put into live, real-world practice), this project has helped clarify the governance, operational, and engagement requirements needed to move forward with confidence and readiness.

Through this work, SAFER has helped prepare SAIL for future federation by reviewing its existing governance policies, legal agreements, operational procedures and approval processes to understand how they could function when research involves multiple TREs. The project has also developed draft governance approaches, engagement insights and supporting materials for SAIL that will inform how federation could be implemented safely in practice.

As a result, SAIL now has a clearer understanding of the governance, operational and engagement considerations required to move towards federation.

SAIL will continue to build on:

- Refining governance models to ensure roles, responsibilities, and accountability are clearly defined across federated environments.
- Strengthen collaboration with other TREs to align governance approaches and explore shared approval pathways.
- Support technical federation pilots alongside the DARE UK TREvolution programme, ensuring governance and public expectations are embedded in implementation.

- Continue public and stakeholder engagement to embed clear communication, lay-friendly materials, and transparent processes as standard practice for federation.
- Develop the next stage of work, strengthening readiness and contributing to wider UK federation plans as funded projects and pilots build on the foundations of SAFER and DARE UK's TREvolution programme.
- The learning and materials developed through SAFER will continue to influence how federation evolves within SAIL and across the wider UK research community. As the DARE UK programme progresses towards operational models, SAIL is well placed to build on this work in collaboration with other TREs and partners.

12. Public Benefit Statement

By connecting Trusted Research Environments more effectively, federation helps approved researchers answer the questions that matter, improving care, shaping better services, and supporting healthier communities, while keeping people's data safe and ensuring it is responsibly managed.

13. Acknowledgements

We acknowledge the funding provided by DARE UK, which made this project possible. We also extend our sincere thanks to all contributors, workshop participants, partner organisations, data partners, and the SAIL Databank public and patient advisory group - the Consumer Panel, whose time, insight, and commitment have been invaluable to SAFER's success.

14. Public Contributor Reflections

The reflections below highlight the perspectives of some public contributors involved in the project.

Chris Kemp-Philp

"The ability to feed in from the beginning, and throughout the project, as a public contributor alongside researchers, technical experts, data owners and others, was one of the better examples I have experienced of co-production done well. I felt that our voices were heard, given equal weight, and that we were able to make a real difference through our contributions."

Sienna-Mae Yates

"From a public perspective, SAIL's ability to federate in the future has clear public benefit because it could support more coordinated, efficient and meaningful research across organisations while maintaining strong safeguards, governance and public trust."

Chris Davies

"The information shared with the Consumer Panel and at the SAFER Conference helped me understand the concept of federation and why it is important. I believe SAIL is well prepared for federation, and hopefully other Trusted Research Environments will follow."

Jan Davies

"I consider SAIL is ready for federation, hopefully other TRE's will catch up"

Ian Mortimer

"Optimising SAIL within a federated approach could create momentum for collaborative, safe research that benefits society."

Dr Fangzhou Huang

"As a member of the public, I found the SAFER project important because it focused on building public trust before technical developments are implemented. It showed how SAIL can collaborate with other TREs while keeping data secure and maintaining high research standards. Federation could support better research and outcomes for the public, and SAFER provides confidence that this will be done safely and transparently."

Jackie Evans

"Public involvement throughout the project was meaningful and impactful. As a contributor, I felt my input was valued and considered equally alongside technical and other stakeholders. I don`t think I have been part of such a project where PIE has been so well managed, highly valued and recognised. Public involvement ensures that research is relevant and has the potential to impact and improve people`s lives."

Public contributors listed above were involved through stakeholder engagement and public involvement activities and are acknowledged here for their valuable contributions to the project.

These reflections demonstrate the importance of involving the public throughout projects exploring new approaches to research data use, helping ensure developments remain transparent, trusted and focused on delivering public benefit.

Report Authors

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Contributing Team Members

We also acknowledge the wider SAFER project team, SAIL Databank team, and collaborators who contributed to the development of this work through governance review, stakeholder engagement, consultation activities and technical expertise.

Public Contributors

(named with permission)

We are particularly grateful to the **public contributors, members of the SAIL Consumer Panel**, whose time, perspectives and feedback helped shape the project's thinking, communications and outputs. Their involvement ensured that public views and expectations remained central to the project delivery and development.

Chris Davies, Jan Davies, Jackie Evans, John Gallanders, Dr Fangzhou Huang, Chris Kemp-Philip, Hameed Khan, Sienna-Mae Yates, Ian Mortimer and Dot Williams.

Appendices

Appendix A: Glossary

This glossary provides simple explanations of key terms used throughout this report.

Term	Definition
Approved Researcher	A researcher who has been authorised to access sensitive data within a secure research environment, under strict rules and oversight.
Anonymised Data	Data that has had personal details removed so individuals cannot be identified.
Consumer Panel	A group of public members who provide advice and feedback to ensure research and data use reflect public values and expectations.
Data and Analytics Research Environments (DARE) UK	UK-wide programme supporting the development of secure systems that enable use of sensitive data safely and responsibly.
Data Controller	The organisation legally responsible for deciding how data is used and ensuring it is protected.
Data Governance	The rules and processes that make sure data is used safely, legally, and ethically.
Disclosure Control	Checks carried out before research findings are released to ensure no individual can be identified.
Distributed Queries	A way of sending approved analysis code to multiple secure data environments so that the same analysis can run on each dataset separately
Escalation Routes	Agreed processes for raising and resolving issues if concerns or problems arise.
Federation / Federated Approach	A way of enabling researchers to work with data held in different secure systems in a coordinated way, while maintaining privacy, security, and oversight.
Federated Analysis	A research method that allows data from different secure environments to be analysed together in a controlled and approved way.
Federated Learning	A method that allows computer models or analyses to learn from data held in different secure locations without moving the data from those environments
Federated Network	A group of trusted research environments or secure data systems that work together using agreed technical and governance processes.
Five Safes (5-Safes)	A framework used to make sure data is accessed safely, covering safe people, safe projects, safe settings, safe data, and safe outputs.
5S-TES	Technical framework supporting federated analysis within the Five Safes model
Information Governance Review Panel (IGRP)	An independent panel that reviews research applications to ensure data is used appropriately and in the public interest.
Integrated Access Model	A more coordinated way for researchers to apply for and gain approval to access data across multiple Trusted Research Environments.
Governance Framework	The structure of rules, policies, and oversight processes that guide how data is accessed, managed, and protected.

Operational Federation	The stage at which federation moves from planning and design into live, real-world use.
Output Checking/Output Egress	The process of reviewing results before they leave a secure research environment to ensure that no individuals can be identified
Readiness	How prepared an organisation's policies, systems, and teams are to adopt a new way of working.
Public Benefit	The positive impact research has on society, such as improving services, informing policy, or supporting better health outcomes.
Public Involvement	The active involvement of members of the public in shaping research projects, policies, or programmes.
Secure Anonymised Information Linkage (SAIL) Databank	A secure trusted research environment based at Swansea University, enabling researchers to access anonymised data.
Secure Data Environment (SDE)	A highly secure system used to store and analyse sensitive data for research while protecting privacy and confidentiality.
Standard Operating Procedures (SOPs)	Documented processes that explain how tasks should be carried out consistently and safely within an organisation.
Stakeholder Engagement	The process of involving individuals, organisations, or groups who have an interest in or may be affected by a project
Trusted Research Environment (TRE)	A secure system that allows approved researchers to analyse sensitive data without removing it from a protected setting.
TREvolution	A DARE UK programme developing the technical tools and standards needed to support federation between secure platforms.
TELEPORT	A DARE UK initiative exploring technical approaches to enable secure federated data analysis.

Appendix B: Draft Governance Documents for Federation

The schedule of documents outlined below reflects a selection of policies, procedures and governance materials that have been created or amended as part of the SAFER project to support future federation within SAIL. These have been developed to explore how existing processes may need to adapt to accommodate federated working across Trusted Research Environments.

Schedule Number	Description
Schedule 1	Description of Federated Analytics Network (FAN)
Schedule 2	Support Services for Director
Schedule 3	Baseline Security Requirements for Partners
Schedule 4	Egress and Output Controls
Schedule 5	Approved Researcher Requirements
Schedule 6	Charging and Costing Process
Schedule 7	Data Retention Periods
Schedule 8	Entry of New Parties Form of Accession
Schedule 9	Terms of Reference FAN Governance Board
Schedule 10	FAN Governance Protocol
Schedule 11	Federated Analytics Models
Schedule 12	FAN Application Form
Schedule 13	FAN Audit Policy
Schedule 14	Agreed Query Format
Schedule 15	Federated Learning Licence
Schedule 16	Publications Protocol
Schedule 17	Data Processing Addendum
Schedule 18	Data Protection Roles and Responsibilities

A sample of these draft materials is included below. They are provided as illustrative examples only and do not represent finalised or approved processes. They are intended to demonstrate the types of updates and considerations that may be required as federation develops further.

Consortium Agreement	Consortium Agreement.pdf
Schedule 3 – Baseline Security Technical Schedule	Baseline Security Schedule.pdf
Schedule 9 – Terms of Reference Governance Board	Terms of Reference.pdf
Schedule 10 – Governance Protocol	Governance Protocol.pdf
Schedule 15 – Federated Learning Licensing Requirements	Federated Learning License.pdf