



JOINING FORCES FOR
MISSIONS

USING MIREL TO DESCRIBE PROJECT IMPACT





JOINING FORCES FOR
MISSIONS

USING MIREL TO DESCRIBE PROJECT IMPACT

What is MiREL?

- ❶ MiREL (Mission Readiness Level) combines Technology Readiness Levels (TRL) and Societal Readiness Levels (SRL) into a unified framework for assessing mission progress and impact.
- ❷ The framework helps researchers describe how their projects contribute to both technological advancement and societal uptake, recognizing that mission impact depends on the co-evolution of technical capability and societal embedding.
- ❸ MiREL provides a common language for planning, monitoring, and communicating progress across mission-oriented research and innovation.

Using MiREL to Describe Project Impact

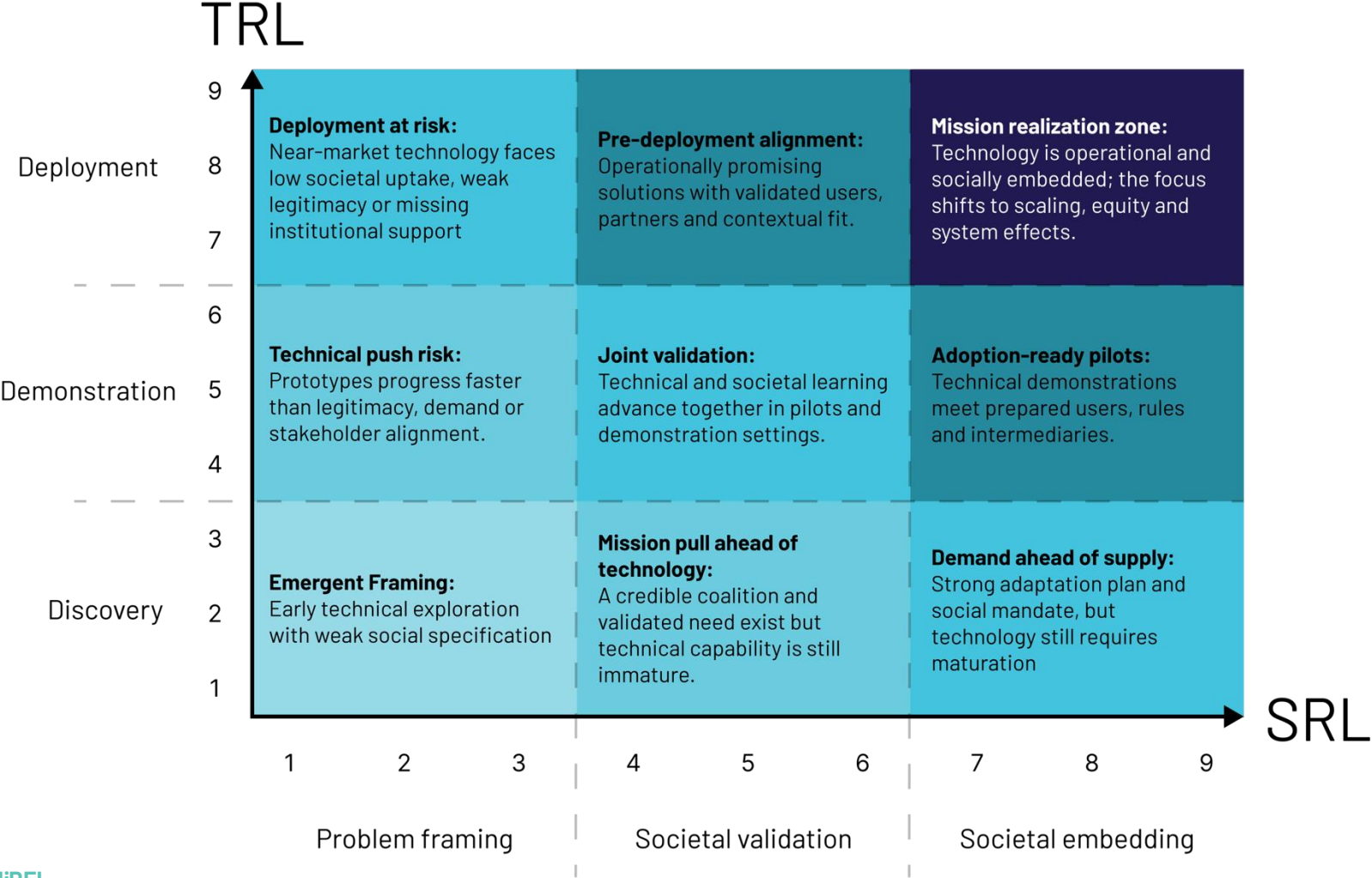
- ❶ Projects are assessed through both their technological maturity (TRL) and their societal readiness (SRL).
- ❷ Researchers should use MiREL to explain how project activities contribute to movement within the framework and towards higher mission readiness.
- ❸ The framework supports identification of contributions to mission tipping points, stakeholder uptake, implementation readiness, and long-term societal outcomes.
- ❹ MiREL shifts the focus from outputs alone towards readiness for real-world implementation and mission impact.

Click here to learn more about [MiREL](#)

Source: *Mission Impact as Pas de Deux between Technology and Society* (2026)



THE MIREL MATRIX



Click here to learn more about [MiREL](#)

Source: Mission Impact as Pas de Deux between Technology and Society (2026)

MIREL DIMENSIONS

Technology Readiness Levels (TRL)

Technology Readiness Levels (TRL) are a framework for assessing the maturity of a technology from initial scientific discovery to proven operation in a real-world environment. Originally developed by NASA and later adopted by the European Commission and many innovation funding programmes, TRL provides a common language for describing technological development and readiness. TRL 1 is the lowest level of technological maturity and TRL 9 is the highest.

TRL 1 – Basic principles observed and reported

Scientific research begins and fundamental principles are identified and documented.

TRL 2 – Technology concept formulated

Potential applications and technology concepts are defined, although practical implementation remains speculative.

TRL 3 – Experimental proof of concept

Analytical studies and laboratory experiments demonstrate the feasibility of the concept and establish proof of concept.

TRL 4 – Technology validated in laboratory environment

Key technological components are integrated and tested under controlled laboratory conditions.

TRL 5 – Technology validated in relevant environment

The technology is tested in conditions resembling the intended operational environment.

TRL 6 – Technology demonstrated in relevant environment

A prototype or representative model is demonstrated under realistic operating conditions.

TRL 7 – System prototype demonstrated in operational environment

A near-complete prototype is tested in the actual operational environment.

TRL 8 – System complete and qualified

The technology has been fully developed, tested, and qualified for deployment and use.

TRL 9 – Actual system proven in operational environment

The technology has been successfully deployed and proven through real-world operation.

Stage Overview

TRL 1-3: Discovery and Concept Development

Fundamental scientific knowledge is translated into technological concepts and early proof-of-concept demonstrations. The focus is on understanding feasibility and identifying potential applications.

TRL 4-6: Validation and Demonstration

Technologies are integrated, tested, and demonstrated in laboratory and increasingly realistic environments. The objective is to reduce technical uncertainty and verify performance under relevant conditions.

TRL 7-9: Deployment and Operation

Prototypes evolve into complete systems that are qualified, deployed, and ultimately proven through routine operation in real-world environments. At these stages the primary focus shifts from development to implementation and performance.

Kilde: NASA Technology Readiness Levels og NASA Earth Science Technology Readiness Level definitions.

Source: Nasa

Societal Readiness Levels (SRL)

Societal Readiness Level (SRL) measures how ready a technology, product, process, intervention, innovation, or project is for adoption and integration in society. The framework assesses societal adaptation, stakeholder involvement, implementation readiness, and impact potential. SRL ranges from 1 (lowest level of societal readiness) to 9 (highest level of societal readiness).

SRL 1: Identifying the problem and assessing initial societal readiness.

SRL 2: Formulating the problem, proposed solution(s), expected impact, and anticipated societal readiness. Relevant stakeholders are identified.

SRL 3: Initial testing of proposed solution(s) together with relevant stakeholders.

SRL 4: Validation of the problem through pilot testing in a relevant environment to substantiate the proposed impact and societal readiness.

SRL 5: Validation of the proposed solution(s) by relevant stakeholders in the field.

SRL 6: Demonstration of the solution(s) in a relevant environment and in collaboration with stakeholders to gather initial feedback on potential impact.

SRL 7: Refinement of the project and/or solution, including retesting in a relevant environment with stakeholders if necessary.

SRL 8: Completion and qualification of both the proposed solution(s) and the plan for societal adaptation.

SRL 9: Proven implementation of the project solution(s) in a relevant real-world environment.

Stage Overview

SRL 1-3: Exploration and Concept Development

The early stages focus on identifying societal challenges, proposing technical or social solutions, and conducting initial tests. Significant attention is given to understanding societal readiness, identifying key stakeholders, and determining how relevant communities and end-users should be engaged.

SRL 4-6: Validation and Demonstration

The proposed solution and underlying research hypotheses are tested and demonstrated in relevant contexts with stakeholder involvement. These stages emphasize validating impact potential and assessing society's readiness to adopt the solution. Expectations regarding societal adaptation should be clearly described and, where possible, incorporated into testing activities.

SRL 7-9: Implementation and Societal Adoption

The final stages focus on refining the solution, implementation, dissemination, and achieving real-world impact. Activities include executing plans for societal adaptation, raising awareness, engaging stakeholders, and ensuring successful uptake and integration into society.

DESCRIBING EXPECTED MOVEMENT IN MIREL

Figure 1. Tracking Progress Across the MiREL Matrix
 The MiREL matrix enables projects to be positioned according to their levels. As projects develop, their movement across the matrix provides a structured way to monitor progress, and visualize how the project advancement and mission-oriented implementation evolve together.

Example on Tracking Procces: Emergent Framing ⇒Mission Pull ahead of technology

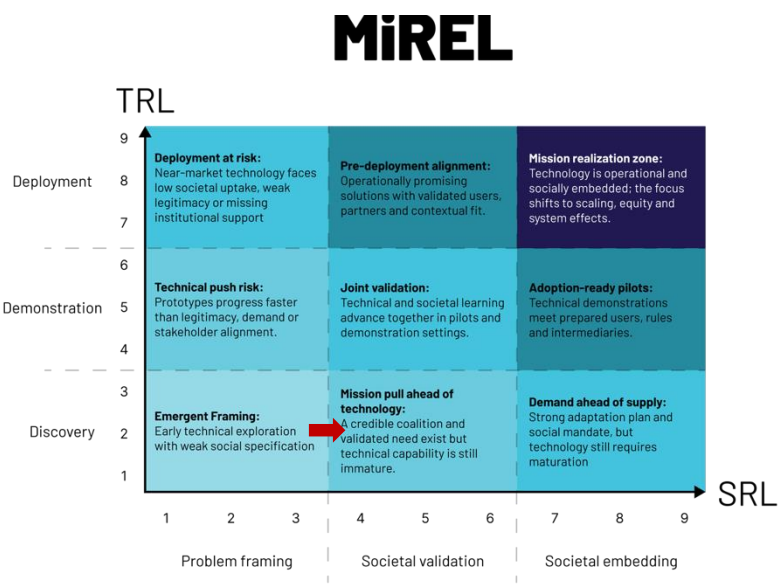
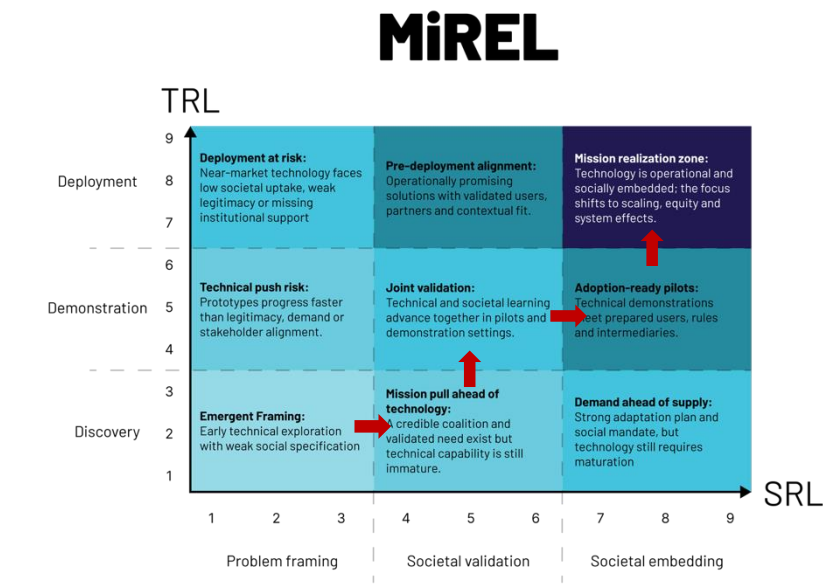


Figure 2. Pathway Towards the Mission Realization Zone
 MiREL supports strategic decision-making by illustrating how projects can progress towards the Mission Realization Zone, where technological maturity is matched by the societal readiness required for impact. This helps stakeholders maintain a shared understanding of project status, readiness gaps, and the pathway from research activities to tangible societal impact.

Example on the pathway to societal impact: Emergent Framing ⇒ Mission pull ahead of technology ⇒ Joint validation⇒Adoption-ready pilots⇒Mission realization zone



REFLECTING ON YOUR PROJECT'S MISSION READINESS

Guiding Questions

➤ **Current State:**

In which MiREL cell would you place the current state of the project or research effort?

➤ **Expected Impact:**

To which MiREL cell is the project expected to progress as a result of the proposed seed funding activities?

➤ **Pathway to Mission Realization:**

What activities, partnerships, and capabilities are needed to advance the project towards the Mission Realization Zone, and who should be involved in delivering them?

