



Transport
for NSW

Internal Document

Asset Technology Program

Version 2.1

Document Control

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1. Introduction

TfNSW supports the introduction of service, project delivery and technology innovations that present financial sustainability opportunities, improve safety, provide a more efficient and effective transport system. This is achieved through improvements in existing technology, new technology trials or engineering innovations prior to introduction across the network. The Technology Program provides a formalised process and associated funding focused on the improvement of assets and engineering business processes across the Transport cluster.

As available funding is finite, project proposals will be assessed and prioritised with an overarching aim of maximising TfNSW's return on investment against safety, financial sustainability, network performance, customer outcomes, and technology introduction.

2. Purpose

This document defines the process and procedures for managing the Technology Program to ensure technology projects deliver value for money and align with TfNSW's medium and long term strategies.

3. Scope

This document describes the associated business processes and management of the TfNSW Technology Program, including project proposal and business case from problem identification to the evaluation and selection of the preferred solution.

It provides details of the application process, including the project proposal information that is required for the evaluation of project proposals as well as the reporting requirements for approved projects deployed through this program. It also provides guidance for the evaluation of the value presented by each project once completed.

This document also sets out the eligibility criteria for projects which may be nominated for inclusion within the program. Examples of projects may be provided but this should not limit the scope of applications to the Technology Program.

4. Reference documents

The following documents are useful references and / or referenced in this document:

- Future Transport Strategy 2056
- TfNSW 10 Year Blueprint
- Asset Management Framework

- Assets and Services Plan
- Strategic Assets and Services Plan
- TfNSW Environmental Sustainability Plan 2018 – 2023
- Transport for NSW Cost-Benefit Analysis Guide
- Waratah Research Network Attestation Requirements

5. Terms and definitions

The following terms and definitions apply in this document:

asset custodian / client division the entity accountable for the end to end lifecycle management and performance of assets (including asset condition, risk and reporting) on behalf of the asset owner to achieve agreed customer and community outcomes.

AMB Asset Management Branch

AMCCB Asset Management Configuration Control Board

EOI expression of interest

EOFY end of financial year

PMO program management office

RISSB Rail industry safety and standards board

RMS Road and Maritime Services

Technology project a project proposed for inclusion in the technology program

TfNSW Transport for New South Wales

TPWG technology program working group

I&P Infrastructure and Place

6. Project Eligibility

This program is intended to fund innovations related to research and engineering for the improvement of existing engineering assets or engineering business processes. A technology project may relate to any asset life cycle phase: from planning to disposal. A technology project is seen as an initiative which endeavours to add value to Transport by improving safety or customer outcomes, or trials new technologies prior to committing to wider network implementation. Technology projects should also result in improvements to the delivery of normal business or contribute to financial sustainability. In order to be considered for inclusion within the technology program a project shall:

- demonstrate a clear need – solve an existing or future problem
- be technology focused (including the development or implementation of new technologies and innovations) or be business improvement focused
- have clear deliverables – with clear and measurable outcomes
- demonstrate value & benefit
- be developed in accordance with the technology program procedure

Projects eligible for inclusion in the Technology Program may include:

- Research, development, trialling, monitoring, approval and audit of new or alternative materials, systems, products, technologies, procedures.
- Innovative applications of materials and technologies
- Knowledge transfer including:
 - development and delivery of training for new or innovative technologies
 - research and investigation of best practice methodologies
 - cross-cluster integration of procedures to deliver a consistent approach

The technology program is not intended to deliver normal business functions including:

- Development or maintenance of standards, specifications and guidelines*
- Ongoing licencing fees for existing software associated with the delivery of normal business functions
- Support for existing software applications
- Provision of technical support and advice for construction and maintenance projects and programs
- Attendance at or hosting of conferences and other similar functions
- Maintenance of asset registers, information or drawings
- Representation at Austroads, RISSB and other national peak industry body committees which do not bear direct and measurable benefits to TfNSW
- Funding for venue hire, traveling and hospitality costs associated with knowledge transfer or representation.

Projects may also be required to engage with other strategic programs in order to ensure alignment, deliver outcomes and deploy trials.

*Any R&D or innovation and collaboration that is required to develop standards may be considered based on the presented value and use case. This will generally exclude any effort involved in writing the standard and the TfNSW labour cost for the R&D element.

7. Roles and Responsibilities

The following project roles and responsibilities shall be identified for the purpose of managing and delivering the technology program:

- **Project manager** – after the need is identified, the project manager defines the problem, identifies options, recommends a preferred option, prepares the business case, manages the project, provides monthly status report to the Sponsor and prepares the final report. This is the responsible party for the delivery of the project and would typically be a member from a delivery division such as I&P but could be a member of any asset steward or asset custodian.
- **Stakeholders** – (Problem owners) ensures the need and problem have been well defined and endorses the preferred option, business case and final report. Typically this would be the relevant asset custodian.
- **Sponsor** – confirms the need is valid and endorses the preferred option, business case, release of funding, and final report. The sponsor will also review monthly reports and provide status updates by exception with regards to project delivery risk. This would typically be the Director of Engineering or delegated director within AMB engineering or asset management teams and is the accountable party for the project. The project sponsor is required to liaise directly with the project managers to receive updates and reports on project financials and status. Submissions raised by a Sponsor will require endorsement by alternative Sponsors as determined by the PMO.
- **PMO** – the program management office (PMO) is responsible for administering the program and ensuring the expression of interest business case has been prepared with all necessary information, tracking of approved projects and consolidating all reports for the management of the program. The PMO is responsible for allocating the project sponsor based on engineering discipline.
- **Evaluation panel** - The Evaluation Panel will be convened under the overarching accountability of the Asset Management Branch and the technology program working group (TPWG). It will comprise of members or representatives of the TPWG which may include leadership from multiple TfNSW divisions, Sponsors and Stakeholders. The evaluation panel is responsible for recommending approvals for project funding and final reports to the executive director AMB or their delegate.
- **Working group** – is the technology program working group (TPWG) provides governance, oversight and direction for the implementation of the Technology Program. The TPWG TOR provides additional context for the purpose and scope of the working group.

8. Program Management

8.1 Evaluation Panel

The PMO will facilitate the evaluation sessions and convening the panel to evaluate submissions and provide recommendations to the executive director or their delegate regarding funding of submissions. The evaluation panel will meet as required until funds have been fully allocated for the forthcoming FY. The PMO will distribute project status reports (PSR) for completed projects to the evaluation panel for review and facilitate panel sessions as required to endorse recommendations.

8.2 Asset Technology Program Working Group

The TPWG will meet typically meet monthly but this may be increased as required to facilitate the needs of program. The ATPWG will review the progress of projects within the program for the current financial years (including financial performance and outputs against the submission) see sections 16 and 17 for further information. The PMO is responsible for providing monthly reporting updates to the program stakeholders at the TPWG. The project sponsors and project managers are responsible for providing (by exception) updates on project status and budget.

Any project changes, including scope, schedule, budget must be reported by the project sponsors to the PMO and associated variations will be reviewed and processed.

8.3 Project Reporting Requirements

Project updates (by exception) must be reported by the project sponsors at the monthly Asset Technology Program Working Group. Updates must be provided by sponsors 1 week prior to the working group being held to enable all updates to be collated and distributed by the PMO two business days prior to the meeting.

Project Managers are required, on a monthly basis, to provide project updates to the YTD financial spreadsheet distributed. This includes commentary around project status, updates to the actual and forecast costs on a month-by-month basis and justification for any changes to scope, schedule or budget.

8.3.1 Project Sponsor Reporting

Project sponsors are required to provide monthly reports to the PMO for the projects they are sponsoring. The project updates should be reported on by exception through the ProgSR and the monthly ATPWG.

8.3.2 Project Manager Reporting

Project Managers are required to provide monthly updates to the PMO through finance reporting which must include, cashflow updates, accruals and project updates. Variations should be submitted by exception as described in Section 10.5.

9. Technology Program Procedure and Timeline

The procedure described in this document applies to all TfNSW or TfNSW-related projects submitted for inclusion in the Technology Program, irrespective of whether it is delivered by a TfNSW agency, academia or industry partners.

The technology program procedure is owned by Asset Management Branch and comprises of five stages outlined below:

- a) Submission of an Expression of Interest
 - Problem definition & Options Analysis by stakeholder & project manager (Green)
 - Sponsorship by Sponsor (Purple)
- b) Submission of a Business case
 - Project proposal, costing, resourcing and delivery plan (Blue)
 - Sponsorship by Sponsor (Purple)
- c) Evaluation for inclusion within the technology program
 - Business case evaluation and ranking by evaluation panel (Yellow)
 - Approval recommendation & funding allocation (Yellow)
- d) Deployment of project
 - Project deployment (Orange)
 - Monitoring by the PMO and TPWG (Orange)
- e) Final evaluation and recommendation
 - Review and evaluation of final project report (Yellow)
 - Evaluation and acceptance of recommendations

In cases where projects are in more advanced stages of development they may proceed to apply directly through the submission of a business case. Details of the technology program process are described in section 10. Through each stage of the project feedback is provided to the project sponsor and project manager to ensure the purpose and outcomes of the project align with this framework.

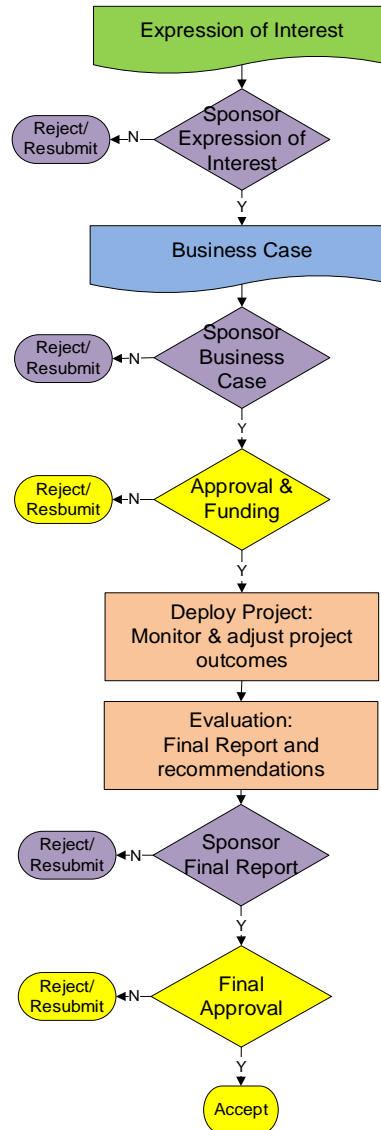


Figure 1 – Technology Program Procedure

Consideration of proposed projects, project prioritisation and endorsement of proposed projects is planned for May of each year to enable project delivery to commence from the start of the financial year. Table 1 below provides timeline for the operation of the technology program.

Stage	Timeline
Submission of Expression of Interest	Anytime
Submission of Business Cases	Anytime ¹
Evaluation for approval of funding	1st May - 30th June
Deployment & monitoring of project	1st July - 30th June
	Quarterly Fiscal Reporting
Project Status Report and approval	Or 2 months post EOFY or project completion

Table 1 Technology Program Timeline

Note 1 For funding consideration for the next Financial Year, Business Cases must be submitted prior to 30th March.

10. Technology Project Process

The process described in this document applies to all TfNSW or TfNSW-related projects submitted for approval for inclusion in the Technology Program, irrespective of whether it is delivered by a TfNSW agency, academia or industry partners.

The process of developing a technology project includes the following stages:

- Problem definition
- Options development
- Business case development
- Evaluation for approval
- Project deployment
- Final Evaluation

The typical project process is depicted in Figure 2, Appendix A. Further information for each stage within the process is provided in sections 10.1 to 10.6.

Project sponsors are allocated according to discipline as outlined in Table 2 below. Where there is uncertainty around the appropriate sponsor the PMO will nominate the sponsor.

Discipline	AMB Sponsor
Asset Management	Senior Manager Asset Information & Reporting
Civil Engineering Infrastructure	Director Civil Engineering Infrastructure
Corridors and Infrastructure	Director Corridor Infrastructure & Engineering
Energy, Networks and Systems	Director Energy Networks & Systems
Fleet Engineering	Director Fleet Engineering
Interchanges and Buildings	Director Interchanges & Buildings
Signals and Control Systems	Director Signals & Control System Engineering
Telecom Engineering	Director Telecom Engineering

Table 2 Technology Program Sponsors by Discipline

10.1 Problem definition

After the need has been identified, the problem shall be well defined. This will enable options analysis and final evaluation to be more successful. The solution does not necessarily need to be identified at this stage as this may prevent alternatives from being considered.

The project manager and the stakeholder/problem owner shall together define and agree on the existing problem, risk drivers and/or potential opportunities.

10.2 Options development

Rather than identifying only one solution, investigation into other possible options shall also occur. Where multiple solutions are identified, a multi-criteria options analysis shall be performed. Options analysis shall consider the financial and non-financial benefits which are to be weighed against the costs of each option. Further guidance on the development of cost benefit analysis (CBA), option development, option evaluation and cash flow can be found in the Transport for NSW Cost-Benefit Analysis Guide.

A recommended option shall be agreed between the problem owner and the project manager.

At this stage of the process, the need and the preferred option may be endorsed by the sponsor through an expression of interest. An expression of interest may be submitted using the example template for Expression of Interest in Appendix B.

10.3 Business case development

A request submitted for inclusion to the Technology Program shall be made using the example template for the Technology Program Project Business Case in Appendix C.

The business case details all the necessary information for the assessors to evaluate the submissions and determine the funding prioritisation based the principles of improving safety and customer outcomes and also value to Transport. This includes the following information criteria:

- Technical and technology related goals
- Project plan and work breakdown structure including project milestones
- Affordability and whole of lifecycle cost, including forecasting and cash flow for the entire duration of the proposed project, not just a single financial year
- Financial savings, revenues and non-financial benefits
- Discussion and analysis on how the project may provide benefits in the following areas:
 - Reliability, Availability, Maintainability
 - Resilience, Durability and Sustainability
 - Security and Safety

- Supportability, Upgradability and Disposability
- Modularity, Constructability and Manufacturability
- Transportability
- Interfaces
- Customer satisfaction and usability
- The applicable value criteria for the ATP are documented further in Appendix C and are as follows;
 - Financial
 - Safety
 - Environmental
 - Reliability
 - Resilience
 - Customer
 - Operations
 - Strategy

For further information and guidance regarding the definition and process of determining value creation for financial and non-financial benefits refer to the Asset Management Value Creation Toolkit.

- Breakdown of project costs
 - Labour (Direct Labour Costs)
 - Procurement (Other Direct Costs)
 - Operation expenses (admin, travel, training etc.) (Indirect Costs)
 - Internal delivery
 - External delivery
 - NSW Government cash contributions and in-kind contributions
- A monthly forecast of the cash flow

The following information must be included in the business case to provide inputs to the Research and Development Annual Data Collection (see Appendix F for further information):

- Category

- R&D: novel R&D where the outcome is unknown, uses a methodology which can be replicated, including data collection, analysis or linkage conducted for the purposes of R&D, randomised control trials and experimental interventions, evaluation of an R&D project or program pilot or policy intervention that has resulted from R&D
- R&D Enabling: investment in facilities, tools, human resources, equipment or other infrastructure that enables R&D to occur, including; precinct design and investment, co-contributions to capital works facilities or equipment, costs associated with making systematic data collections publicly accessible
- Research and Knowledge Translation: the results of research being included in or scaled to policy and program interventions, funding schemes investing in research and knowledge translation and capacity building activities, product development and research commercialisation, consultancies or specialised training (conducted by university academics)
- Intended project output
 - Intervention
 - Publication
 - Technology
 - Strategy
 - Product
 - Policy
 - Other
 - Unknown
- Technology Readiness Level
 - TRL1 – Basic principles observed and reported
 - TRL2 – Technology concept and/or application formulated
 - TRL3 – Analytical and experimental critical function and/or characteristic proof of concept
 - TRL4 – Component/subsystem validation in laboratory environment
 - TRL5 – System/subsystem/component validation in relevant environment
 - TRL6 – System/subsystem model or prototyping demonstration in a relevant end-to-end environment

- TRL7 – System prototyping demonstration in operational environment
- TRL8 – Actual system completed and qualified through test and demonstration in an operational environment
- TRL9 – Actual system proven through successful operations

10.4 Evaluation for approval

The evaluation panel will assess all the applications and business cases that have been submitted. Submission of a business case does not present any undertaking of warranty that financial commitment will be provided. As such, no project shall commence unless there is a written confirmation of approval from the AMB Secretariat on behalf of the evaluation panel.

Each proposed project shall be assessed against the following criteria:

- Net benefit to TfNSW and the community, including expected whole of life cost implications;
- Relevance to the strategic direction of TfNSW and its consistency with asset management objectives, Future Transport strategies and the TfNSW 10 Year Blueprint;
- Feasibility to deliver the project's outputs;
- Cost of the project;
- Expected completion time and clarity on the overall program;
- Ability and mechanisms needed in order to implement any changes into BAU;
- Stakeholders that should be or have been consulted including any outcomes from consultation;
- Cluster-wide engagement and support;
- Industry commitment, financial contribution and in-kind benefits;

The evaluation panel provides recommendations which are subject to the final approval and endorsement of Executive Director, Asset Management Branch or their delegate.

Funding is typically allocated on an annual basis in accordance with TfNSW budget provisions. Additional rounds of funding may be required if the budget cannot be fully allocated in a single round of funding. Planning for and endorsement of projects spanning multiple financial years does not give rise to warranties relating to future budget allocation. Existing projects which span multiple years shall be required to have their funding for each financial year confirmed at the beginning of each financial year before progressing.

Upon approval a WBS will be established within EQUIP and issued to the project manager to deploy funds to the project. Funding issued to transport agencies are issued through provision of a purchase order. Notification shall be issued to the project manager within the transport agency upon approval of the purchase order.

10.5 Deployment of project

The project is established within equip and funding is allocated to commence work on the project. Work on projects shall not commence until funding has been approved. The project manager is responsible for administering the project and for providing monthly reports to the PMO on the progress of the project. The report shall include:

- Status of the project, including any expected variations
- Work completed for that month
- Estimate of the percentage of work completed
- Establish or adjust a monthly forecast of the cash flow
- Actual Monthly expenditure and total year to date expenditure against the forecasted budget;
- Any deviations to the approved scope, benefits, budget, expenditure or any other risks to project delivery

Variation requests are required to change budget and scope and are to be submitted to the PMO. Approval is required from the Executive Director Asset Management Branch, or their delegate for additional funding.

Variations must be submitted by email request to techprogram@transport.nsw.gov.au, using the Variation Template in Appendix E. Monthly expenditure forecasts are required to be entered into Equip and into registers distributed by the PMO. Early identification of possible under-expenditure is essential and will enable reallocation of funds into other projects.

All projects are required to comply with TfNSW procurement policies and procedures.

10.6 Project Completion and project status reports

At the end of every financial year a final project status report (PSR) is required for continuing projects and completed. A project status report will also be required within a month of project completion where a project is completed before the end of financial year. A PSR report template has been provided in Appendix D.

The project manager shall complete the report which provides the project status and includes the project outcomes and recommendations, the value creation and benefits realised, lessons learnt and any opportunities for improvement. There may be a number of project types that are not strictly a trial of technology. The report shall be endorsed by the stakeholder/problem owner and the sponsor for the evaluation panel to review. The evaluation panel shall evaluate the final report along with other projects that have been completed and will provide a recommendation on the project outcomes to the Asset Management Configuration Control Board.

10.7 Program EOFY report

An EOFY year report due no later than 2 months after EOFY that summarises the position of the program and is submitted to the ED or their delegate for approval.

After EOFY final evaluation report shall be produced by the PMO and shall summarise:

- program actual spend vs forecasted spend (including variations)
- a summary of the value creation across the program
- a couple of pages with 4 examples of the top achievements and value added
- list of projects that met their commitments, those that didn't and projects that are recommended to continue funding

The report will also form the basis of contribution to other cluster reporting initiatives such as the Research and Development Annual Data Collection.

10.8 Multi-year Projects

Projects which are initially submitted for funding over multiple financial years do not need to resubmit business cases each financial year. The PMO will assess these projects on the basis of their original submission and work done to date.

Appendix A: Technology Project Process

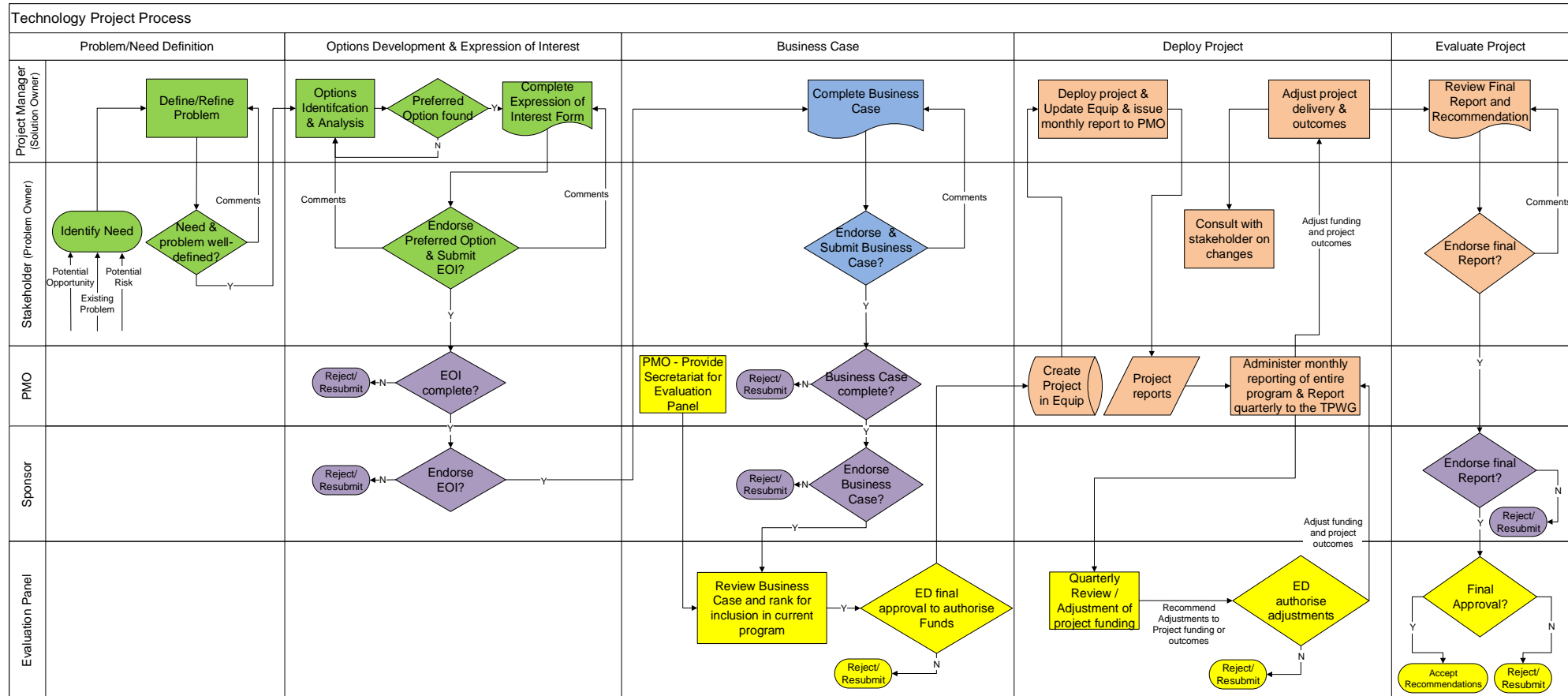


Figure 2 Technology Project Process

Appendix B: Expression of Interest Template

Appendix C: Business Case Template

Appendix D: Project Status Report Template

Appendix E: Variation Template

Appendix F: Waratah Research Network Information