

FORGE

POSTGRADUATE RESEARCH | PUBLIC SUMMARY

From infrastructure governance research to decision practice

Forge Practice | Wellington, New Zealand

Public research summary | September 2026

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How research into major infrastructure decisions helped shape the practice foundations of Forge and the Intelligent Decision Confidence Engine.

RESEARCH DOMAIN	PRIMARY FOCUS	PRACTICE LEGACY
Major infrastructure governance	Evidence, authority, assurance and delivery readiness	Forge Investment Architecture and IDCE

The central concern

Major investment decisions can be formally governed and heavily assured while still leaving a practical gap between the evidence available, the authority being exercised and the organisation's readiness to act.

This research examined that gap. It asked how governance and assurance arrangements shape the quality, traceability and confidence of major infrastructure decisions - and what a more disciplined decision architecture might need to make those relationships visible.

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Why the research was undertaken

Large infrastructure programmes are rarely constrained by technical complexity alone. They are also shaped by how evidence is assembled, how uncertainty is treated, how assurance functions interact, where decision rights sit and whether delivery readiness is distinguished from approval.

New Zealand's infrastructure system contains many established governance and assurance mechanisms. Business cases, sponsor oversight, independent review, delivery alliances, regulators, certifiers and formal approval processes all contribute to decision quality. Yet the presence of these mechanisms does not automatically create a coherent line from evidence to judgement, from judgement to authority, or from approval to delivery readiness.

The research was undertaken to understand why major decisions can remain vulnerable even where governance appears comprehensive. It focused on the practical interfaces between institutions and roles: who produces evidence, who tests it, who owns uncertainty, who is entitled to decide and what must be true before a decision can be treated as ready for delivery.

The study also responded to a recurring implementation problem. Lessons from major projects are often available, but they are dispersed across reports, assurance reviews, governance arrangements and professional experience. The research sought to translate those lessons into a clearer account of the conditions that support defensible investment decisions.

Research premise

> **Decision quality depends not only on the strength of individual analyses, but on the integrity of the system connecting evidence, professional judgement, assurance, authority and delivery.**

02 THE QUESTION

The question

The research asked how governance and assurance arrangements influence major infrastructure decision-making, and which practical controls are most important for maintaining evidence quality, accountability and public value.

Supporting questions examined how decision responsibilities are distributed, how assurance enters the decision process, where recurring weaknesses arise, and how useful guardrails can be designed without creating unnecessary process or duplicating existing roles.

The work was qualitative and comparative. It combined public evidence, institutional analysis and practitioner perspectives, using an abductive approach to move between observed practice and emerging explanations.

03 WHAT WAS EXAMINED

What was examined

AREA	WHAT THE RESEARCH EXAMINED
Governance	Decision rights, sponsor and board roles, oversight arrangements, accountability and escalation.
Evidence	How evidence was assembled, challenged, traced and converted into a decision position.
Assurance	Independent review, certification, verification and the risk of assurance being confused with decision authority.
Delivery readiness	The distinction between approval, organisational preparedness and the practical ability to execute.
Public value	How benefits, affordability, risk and long-term stewardship remain visible through decision and delivery.

The New Zealand case material included major transport, water and energy settings. It examined formal governance structures alongside the operating relationships between sponsors, delivery entities, boards, assurance providers, regulators and independent technical roles. International infrastructure-governance guidance was used as a comparator rather than as a substitute for New Zealand context.

The purpose was not to rank projects or retrospectively assign blame. It was to identify recurring system conditions that strengthen or weaken the confidence that can reasonably be placed in a significant investment decision.

What the research found

The research indicated that recurring decision weaknesses are usually relational rather than isolated. Problems arise at the joins between evidence, governance, assurance and delivery - particularly when ownership is unclear or one function is expected to compensate for another.

Evidence can be extensive without being decision-ready

Volume is not the same as sufficiency. Decision-makers need a traceable account of what the evidence establishes, what remains uncertain and which assumptions are carrying the conclusion.

Authority must be explicit

Professional analysis, independent assurance and governance advice can inform a decision, but none should silently substitute for the person or body authorised to make the commitment.

Assurance is strongest when its purpose and independence are clear

Assurance loses value when it duplicates management, becomes a procedural overlay, or is treated as approval. Its contribution depends on an identifiable question, scope and route to the decision-maker.

Readiness and approval are different judgements

A proposal may be strategically justified yet not ready to execute. Treating approval as evidence of readiness obscures capability, governance, commercial and delivery gaps.

Benefits and public value need durable ownership

Benefits can weaken when ownership is fragmented across organisational boundaries or when delivery milestones displace the longer-term purpose of the investment.

Off-ramps improve, rather than weaken, governance

Clear conditions, staging points and pause mechanisms allow uncertainty to be managed without forcing a premature binary decision.

> **Taken together, these findings support a view of investment decision-making as an architecture: a controlled system of evidence, roles, interfaces, tests and authority decisions rather than a single document or approval event.**

What it contributed to later practice

The research provided the intellectual and practical foundation from which Forge Practice and the Intelligent Decision Confidence Engine were subsequently developed. The later practice did not simply reproduce the research. It translated the findings into controlled methods for structuring and assessing significant investment decisions.

Forge Investment Architecture

Forge Investment Architecture applies the research at the system-design level. It structures how an investment proposition is framed, how the analytical approach is specified, how evidence and uncertainty are organised, how sector context is incorporated and how the matter reaches an authorised decision.

Its concern is the integrity of the decision pathway: the relationship between the proposition, evidence, analytical method, roles, readiness and authority.

Intelligent Decision Confidence Engine

IDCE applies the research at the assessment level. It examines whether confidence in a defined decision is justified by the evidence available, the treatment of assumptions and uncertainty, the integrity of authority, and the readiness represented at the decision point.

IDCE does not replace the business case, options method, assurance function or decision-maker. Its role is to make the basis and limits of decision confidence more explicit and traceable.

RESEARCH INSIGHT	LATER PRACTICE EXPRESSION
Evidence must connect to the decision	Evidence boundaries, provenance and evidence-to-conclusion traceability
Roles must not silently substitute	Explicit Architecture, IDCE, Assurance and Authority boundaries
Readiness is not approval	Separate readiness treatment and Authority determination
Uncertainty needs controlled treatment	Assumption, limitation, condition and off-ramp controls
Learning should be reusable	Repeatable architecture, assessment and sector-overlay structures

Public summary and proprietary boundary

This publication describes the research question, scope, approach, principal findings and contribution to later practice. It is intended to make the lineage of Forge's work visible without disclosing the controlled intellectual property developed after the research.

Included in this public summary

The research context; the broad questions examined; the areas of governance, evidence, assurance and readiness considered; the principal cross-cutting findings; and the relationship between those findings and the later development of Forge Investment Architecture and IDCE.

Not reproduced or disclosed

The underlying research instruments; interview material not otherwise authorised for publication; detailed analytical coding; controlled evidence records; proprietary assessment logic; scoring or decision rules; internal templates; technical specifications; prompts; operating controls; or the detailed methods subsequently developed through Forge and IDCE.

The boundary matters because research findings and a commercial practice method are not the same thing. The public value of the research can be communicated openly while the mechanisms developed to operationalise it remain controlled.

PUBLIC SUMMARY

> **This document describes the research question, scope, approach and principal areas of inquiry. It does not reproduce the underlying research instruments, analytical frameworks, decision tools or proprietary practice subsequently developed from the work.**

About the research

The work was completed as postgraduate research in engineering project management at the University of Auckland. It focused on governance and decision-making in major infrastructure, with New Zealand case material and international comparators.

About Forge

Forge Practice works at the point where complex investment propositions must become evidence-supported, authorised and delivery-ready decisions.