Problem Definition Guidance

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V1.0

Queensland Government

Contents

Introduction

What is the purpose of this document?

The purpose of this document is to provide problem definition guidance for IT proposals and business cases that Queensland Government agencies can follow.

This guidance is intended to provide a succinct and practical approach to developing robust problem definitions that convey to decision-makers the level of detail and planning that was undertaken to investigate a service need and clearly articulates the problem to be resolved.

What is problem definition?

Problem definition is a crucial step in the process of developing a proposal or business case. It involves developing robust problem statement(s) that help to:

1. Provide clarity and focus as to what problem(s) need resolving or opportunities there may be, and why
2. Identify why a proposal is worthwhile investing resources into
3. Determine if a proposal aligns with Whole of Government (WoG) and agency-specific strategic intent
4. Identify fit-for-purpose solutions that directly address core problems or opportunities.

Scope

Problem definition is only one component of an IT proposal/business case. This guidance does not cover solutioning or the defining of options to problem solve/realise the opportunity. Please refer to the Business Case Development Framework (BCDF) for further information on the holistic business case process – problem definition occurs in the 'Stage 1: Strategic assessment' phase of the framework.

Investment logic mapping (ILM) is an early-stage technique that assists in developing and documenting the logic that underpins a potential investment decision, before specific solutions are identified, and before a decision is made. Problem definition is a key initial step in the ILM process; however, ILM goes beyond problem definition by linking problem statements to targeted benefits, strategic responses and necessary business changes in a logical manner. While this guidance document does not cover ILM in detail, completing the ILM process is recommended to refine the problem definition and integrate it with the overall business case. ILM is recommended in the 'Next steps' section of this document. For more information, please refer to the BCDF's Investment Logic Mapping Guide.

Reference documentation

This document has been produced with reference to and in alignment with the Business Case Development Framework. In particular, the 'Stage 1: Strategic Assessment – conception' guideline and template, as well as the 'Investment Logic Mapping Guide' components of the BCDF have been leveraged.

Problem definition guidance – steps

This guide is structured into 5 steps to undertake problem definition within an IT business case/proposal below:

1. Understand the current state
2. Identify the core problems/opportunities
3. Problem analysis
4. Aligning problem definition with strategy
5. Statement of service need.

1. Understand the current state

An important first step in defining the problem or opportunity is to gather information, engage stakeholders, and analyse data to understand what's currently happening in the problem area/area of interest. Understanding the problems/opportunities requires:

- Preliminary research – including stakeholder consultation and data collection to substantiate and clearly explain the problem/opportunity
- A preliminary policy or regulatory review and/or a high-level economic analysis to build an evidence base
- Agreement of key stakeholders (including potential service delivery partners) on the key aspects of the problems/opportunities and why the problems/opportunities need to be addressed.

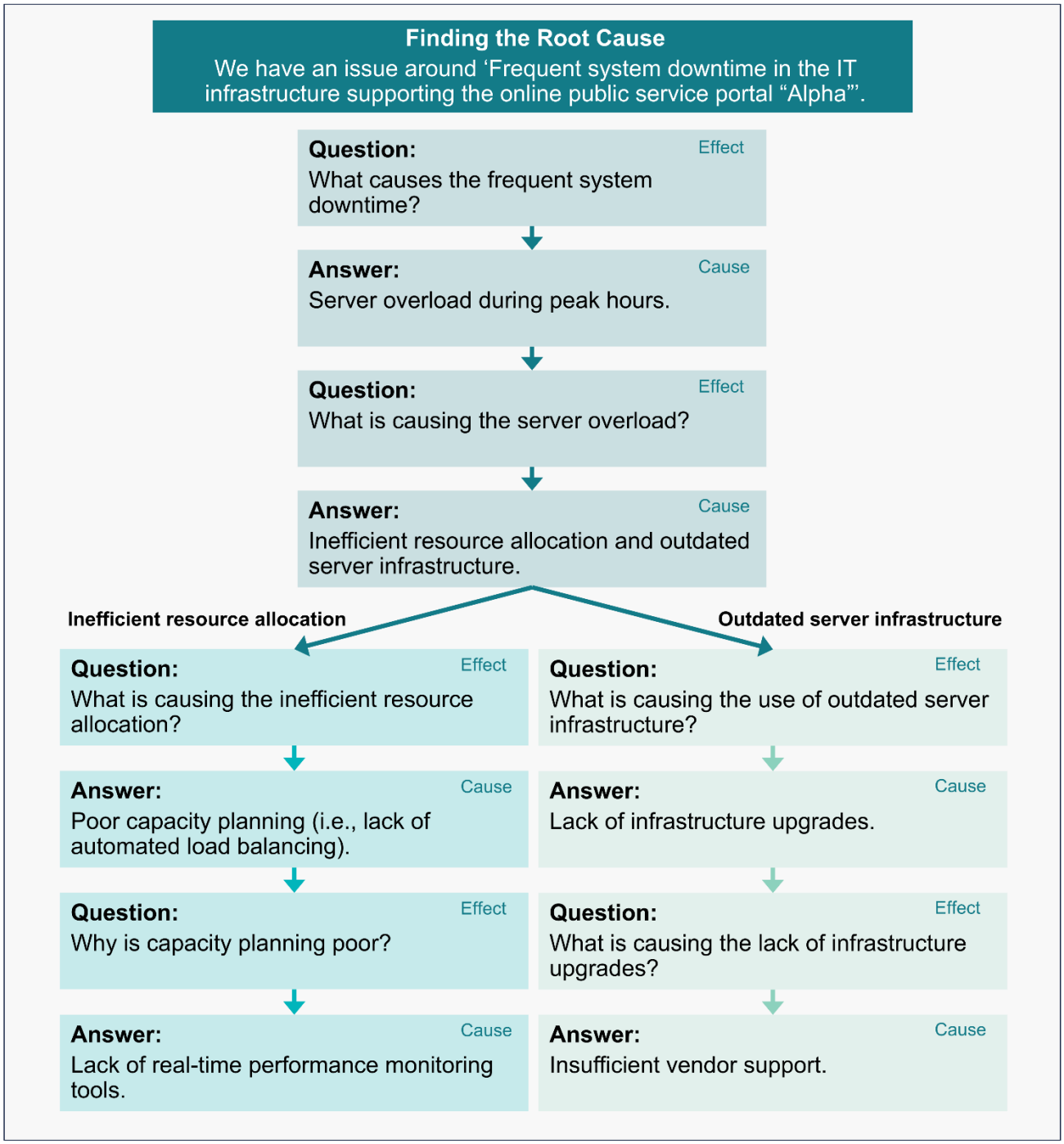
Using this information, a brief description should be created containing information on the current situation or process that is causing the issue and how the issue emerged. This could involve changes in the business environment, outdated systems, stakeholder feedback, or inefficiencies that have become apparent over time. Include relevant data and evidence to show why this is a concern.

2. Identify the core problems/opportunities

After a level of understanding is obtained about the problem area/area of interest, further analysis should be undertaken to define the problem/opportunity with clarity. The problem definition should focus on the challenge or opportunity that is being faced, and not the solution required. Note this should be done in conjunction with stakeholders who hold expertise or perspectives relevant to the area of interest.

To fully understand the problem area/area of interest, **root cause analysis** should be undertaken. Techniques such as cause and effect questioning and fishbone diagrams help to explore and identify multiple causes behind a problem or opportunity. In this guidance material, an example of cause and effect questioning has been provided below in Figure 1 to show an example of how to identify root causes to understand a problem area better. This in-turn will allow fit-for-purpose solutions to be identified.

Figure 1: Root cause analysis – cause & effect questioning



Note: This diagram has been adapted from the example provided within the BCDF's Investment Logic Mapping Guide (p13) to provide an ICT focus.

3. Problem analysis

Problem scoping

After undertaking root cause analysis to identify the core problems/opportunities, further analysis should be undertaken to identify:

- **Who is affected:** Identify the key stakeholders who are impacted by the problem/opportunity (internal teams, external customers, etc.)
- **Where it happens:** Specify if the problem/opportunity is localized to a particular business unit, system, or geographical area, or if it is widespread across the organization
- **What the problem boundaries are:** Clarify what's in and out of scope to keep the problem definition focused and manageable.

Impact assessment - cost of problem and value of the opportunity

Monetising the impact of the problem and/or opportunity helps identify the relative magnitude of the problem/opportunity and helps frame the solution envelope against the cost of options/initiatives. In mapping the problem/opportunity extent, scale and interrelationships, the assessment of the problem/value of the opportunity should be:

- Evidence based
- Described in detail, using sector-specific descriptive terms
- Quantified and monetised where possible.

The analysis should enable the reader to understand the context and extent of the service need, **including the implications of not proceeding** (i.e. if the problem were not to be solved). Some parts of the description of impacts may be further supported by qualitative description.

The analysis conducted in prior steps should provide sufficient information on the make-up of the problem/opportunity and associated root causes, to assess the impacts of the problem/opportunity.

Note:

Evidence should be robust and current. **Robust evidence** is based on sound assumptions and inputs. It uses defensible methodologies and any limitations are noted. **Current evidence** is evidence collected within the preceding three years and should be the most recent available data collection. If data is not available, then it should be prepared or otherwise new evidence should be collected, if practicable, taking into account the costs at this early stage of assessment.

Impact assessment techniques

Applicable tools which can be used to assess the impact of the problem/opportunity include:

- Deficiency analysis
- Use of vision standards
- Systematic assessment
- Gap and scenario analysis.

4. Aligning problem definition with strategy

Strategic alignment

It should be identified if the problems/opportunities align with:

- Agency ICT strategies
- Whole of Government (WoG) ICT strategies
- Queensland Government Enterprise Architecture (QGEA) directions and guidance.

Strategy alignment is key in conveying the importance of the problem being solved/opportunity for the agency, enabling prioritisation of problems/opportunities, facilitating stakeholder buy-in, and ensuring that the problem being solved/opportunity contributes to the long-term success of the agency.

Agency ICT strategies:

Agencies are responsible for linking their problems/opportunities to agency-specific ICT strategies and service delivery commitments.

Whole of Government (WoG) ICT strategies:

From a WoG perspective, the Queensland Digital Economy Strategy (DES) and Action Plan has been endorsed by Cabinet as the overarching strategic policy for Queensland digital transformation. The DES is founded on three focus areas and aims to accelerate the development, embedding and optimisation of digital technologies in Queensland over the next decade. The three focus areas and underlying priorities outlined within the DES are referenced below:

1. **Digital market:** Industry and government co-create a world leading digital economy
    - Improved connectivity for regional communities
    - Industries and businesses excel
    - Pipeline of talent for digital careers.
2. **Digital customer:** People and organisations benefit through a customer-centric government and digitally inclusive society
    - Close the digital divide
    - Contemporary digital government services.
3. **Digital government:** Government is digitally adept and enabled, with an engaged and empowered workforce
    - Digitally enabled government.

Note:
Strategic alignment is also important in the solutioning phases of business case development, in order to align the proposed solution with QGEA requirements, digital investment principles and QGEA principles.

Queensland Government Enterprise Architecture (QGEA) directions and guidance:

The Queensland Government Enterprise Architecture (QGEA) framework guides Queensland Government agencies on key information and communication technology issues. QGEA content is organised into nine key areas: artificial intelligence, customer experience, cyber security, digital capability, digital identity, employee experience, information, planning and investment, and reference models.

Problem/opportunity prioritisation

Based on strategic alignment and the impact of the problem/opportunity, problem statements should be **ranked** to give a broad indication of its relative importance compared to others identified. This builds a priority listing to identify subsequent strategic responses and business changes. If an ILM workshop is undertaken and problem or opportunity statements have been developed when explaining the service need, the workshop participants should agree on their relative importance.

5. Statement of service need

Statement of service need

After completing steps 1-4, a statement of service need can then be developed that is comprised of:

1. The problem or opportunity to be addressed (problem statement)
2. Why it is necessary to address the problem or opportunity now.

This statement should pull together information collated during the previous steps, and structure it in a compelling way. By including both the problem statement as well the reasoning of why it is necessary to address the problem or opportunity now, a holistic view of the problem and its strategic fit into the proposal/business case can be identified – setting a clear direction for future business case development. Once a statement of service need is developed, stakeholder agreement is key.

The service need must include **evidence** as to why the problem or opportunity should be addressed (i.e. an initiative developed in response to a current or future service need that may be ‘nice to have’ but is not supported by evidence that a response is necessary, should not be progressed).

Service need categories

The challenge in explaining the service need is to focus on the problem or opportunity itself and why it needs addressing, rather than focusing on potential solutions. Each proposal and agency differs in its problem and associated service need, but there are some common categories that typically define and shape a service need. These categories include:

Service need category	Description
Effectiveness: What impact does the problem or opportunity have on the effectiveness of service delivery?	• Explore details of the effects of the problem or opportunity economically, socially, financially and environmentally (include credible evidence) • Demand analysis may help capture areas of need, highlighting any potential substitution effects.
Regulatory: Is the service need statutory?	• Outline details of the statutory, regulatory or agency policy requirement and how this is or is not currently being met • Capture details of changes to statutory, regulatory or policy settings that have affected existing services.
Service failure: Is the service provided no longer fit for purpose or failing to meet the needs of customers/users?	Detail the extent of service failure and clearly articulate the effect on customers/users.
Extent: What are the broader linkages of the service need and associated problems or opportunities?	• Describe the geographic and demographic reach of the service need (include relevant maps and supporting graphics) • Give a summary of related projects and their potential effect on the benefits expected from the project, noting any potential opportunities for integration or coordination.
Improved efficiency and reduced costs: Is the service need related to existing efficiency issues?	• If the service delivery is affected by underperforming or a lack of infrastructure, capture and substantiate the facts • If the service need is met then quantify the effect of potential improvements.

Statement of service need template

The service need should focus on the problem/opportunity itself and why it must be addressed, not on potential solutions. The problem statement and service need should read logically, tell a cohesive story, and not be overly repetitive.

Sample statement of service need

Problem/opportunity 1: [Insert the first problem statement here]
Explain and describe the problem/opportunity here, providing the required evidence to demonstrate this is a problem or opportunity government must solve. Where possible quantify the cost of the problem and/or the value of the opportunity.
Service need analysis
Provide high-level evidence of the service need. Further detail of this evidence should be included in an appendix of the business case.

Please duplicate this table for each problem statement generated.

Problems or opportunities identified in the statement of service need must be supported by robust, transparent and detailed evidence. For example, demand analysis that would include methodology, key parameters, assumptions, sensitivity or scenario analysis and findings.

Worked example – problem definition

An example problem definition scenario has been provided below to highlight how the 5 problem definition guidance steps outlined within this document can be followed.

Background

The IT infrastructure supporting the online public service portal “Alpha” frequently experiences system downtime during peak usage hours. This downtime disrupts critical public services, causes delays, and lowers the overall reliability of the IT system. The current infrastructure was designed to handle a lower volume of traffic and relies on outdated servers and manual resource allocation. 1

Problem definition

The core problem is **server overload** due to inefficient resource allocation and outdated server infrastructure. Key contributing factors include: 2

- Poor capacity planning, largely because of the absence of automated tools for load balancing.
- Outdated server hardware that has not been upgraded in line with growing service demands.
- Lack of real-time performance monitoring tools, which hampers proactive issue resolution.
- Insufficient vendor support, inhibiting timely infrastructure upgrades.

As a result, this problem has had the following impacts and risks: 3

- System downtime has increased by 10% this year and led to public service disruptions, reducing citizen satisfaction with government services for 8,000 monthly users.
- Operational delays and resource reallocations have increased costs for IT teams by approximately $150,000 annually in manual interventions and recovery efforts.
- Non-compliance with performance service level agreements (SLAs) are resulting in penalties and reputational damage to the agency, valued at an estimated $500,000 in the last financial year.
- Increasing costs associated with maintaining the IT infrastructure due to the niche skillset required for maintenance of the legacy platform. Costs have increased 10% from prior year (an additional $50,000).

By modernising the IT infrastructure and automating resource management, the agency can enhance service reliability, reduce costs associated with manual interventions, and reduce non-compliance with SLAs.

Strategic alignment

Modernising the IT infrastructure directly aligns with the government’s strategic objectives of delivering uninterrupted, high-quality digital services to the public. The Queensland Government’s ICT strategy emphasizes improved system reliability, scalability, and the integration of modern technologies, such as automated resource management and cloud infrastructure. 4

By resolving the downtime issues, the agency will not only improve operational efficiency—through reduced manual interventions—but also significantly enhance citizen satisfaction by providing a more reliable service. This will ensure better service availability, resulting in higher trust in government digital platforms and smoother service delivery.

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Key	
1	Understand the current state
2	Identify the core problem(s)
3	Problem analysis
4	Aligning problem definition with strategy
5	Statement of service need

Tips for success in problem definition

This guidance has been produced as a result of agencies having difficulties articulating problem definition within IT business cases/proposals. Some common pitfalls in problem definition and tips to overcome these pitfalls are outlined below:

Common pitfall	Tip for success
Focusing on the symptoms of the problem rather than the core problem.	Focus on identifying the core problem or opportunity through root cause analysis, as outlined in step 2 of this guidance.
Framing the problem as being driven solely by a political imperative without considering broader needs.	Set out to identify the community need or underlying issue that triggered the political response.
Adopting a tactical view.	A tactical view is often asset or solution focused. A strategic view should be taken by considering long-term goals and broader impacts rather than focusing on specific assets or solutions.
Writing problem/opportunity statements that imply a particular solution.	Phrase problem/opportunity statements around the issue itself as opposed to a particular solution, to allow for broader solution options. For example, rather than referring to ‘motorway congestion’ as a problem, refer to the problem as 'long commute times'.
Focusing on the adequacy of existing solutions, instead of the impact on stakeholders.	Where possible, frame the problem/opportunity statement based on the impacts on stakeholders (e.g., productivity, work quality) rather than focusing solely on solution limitations.

Next steps

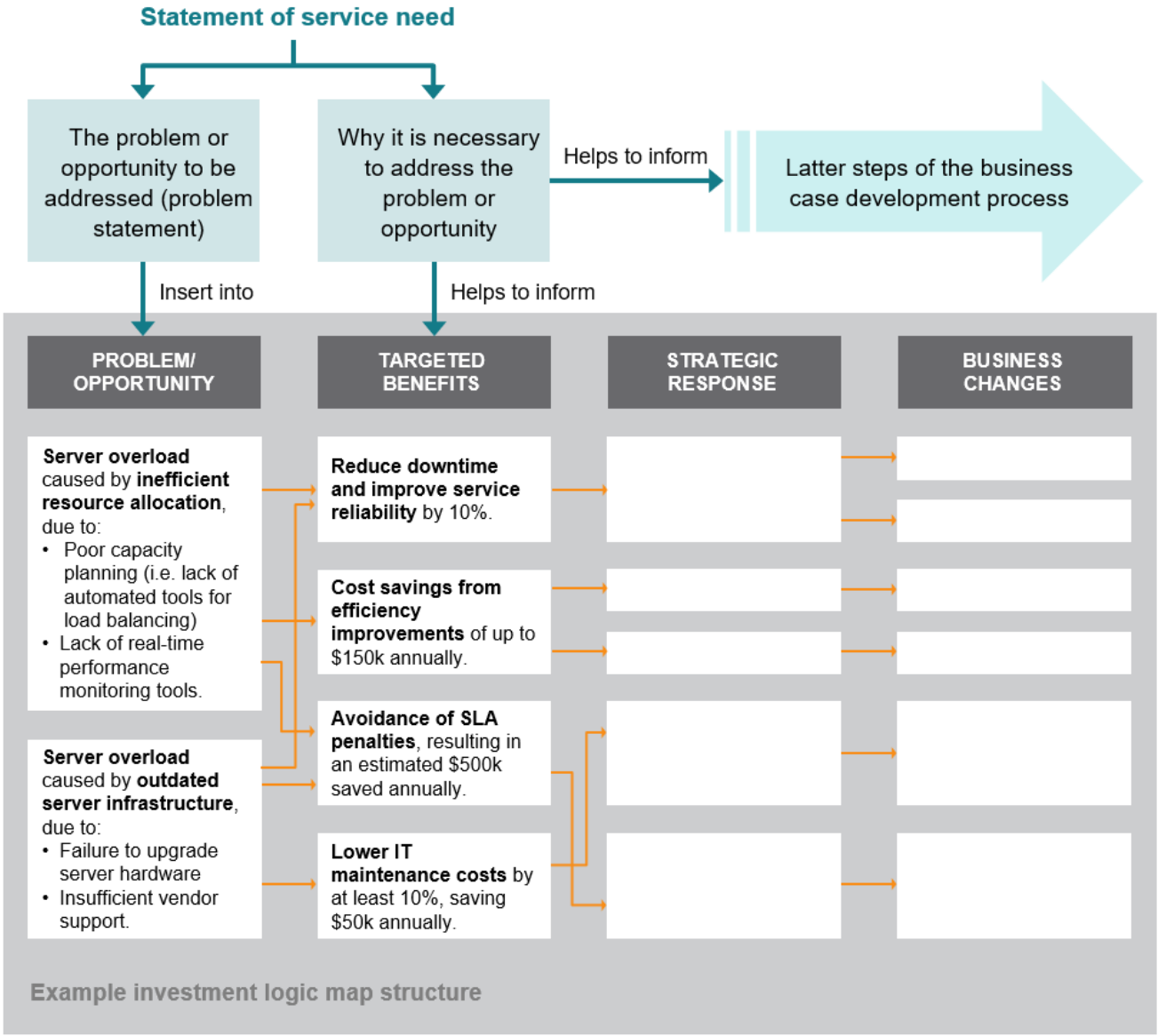
Once the problem/opportunity has been defined, a next step can be undertaking Investment Logic Mapping to help further refine the problem definition and achieve a shared understanding of the service need with key stakeholders, as well as to start linking the problem/opportunities to benefits, strategic responses and business changes.

The Business Case Development Framework will guide post-ILM activities.

Note:
To identify how a statement of service need produced from this guidance can be utilised to create an ILM, please refer to Appendix A for guidance. The two components of the statement of service need are mapped to an example Investment Logic Map structure to help agencies as they develop an ILM and the remainder of the business case.

Appendix A: Statement of service need within an ILM

An investment logic map summarises the service need, targeted benefits and strategic responses. It also identifies the changes required to address the service need while achieving the benefits. The below image highlights how the statement of service need produced from this guidance can be utilised to create an ILM.



Example investment logic map structure

Note: This diagram has been adapted from the diagram provided within the BCDF's Investment Logic Mapping Guide (p10) to indicate how the statement of service need can inform an investment logic map.

Appendix B: Problem definition guidance overview

The diagram below provides a brief overview of this guidance document.