Multi-criteria analysis (MCA) can be used to evaluate multiple criteria, both quantitative and qualitative, and to assess different alternatives and options to inform decision making.

The MCA guidance and template is recommended for use in most business case optineering processes to evaluate alternatives and options at the longlist and shortlist phases.
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INTRODUCTION

Multi-criteria analysis (MCA) can be used to assess multiple criteria, both quantitative and qualitative. MCA can be used to compare different alternatives and options and assist with conversations between investors and stakeholders to help inform decision making.

An MCA template (Excel spreadsheet) and accompanying instructions for users are available to download from InvestHub.


The MCA guidance in this document, and the template:

- provide a best practice process and approach to ensure robust and holistic assessment when moving from the longlist to shortlist of alternatives and options
- support investment decisions being made consistently and transparently across business cases
- embed the intervention hierarchy which ensures that a broad range of alternatives and options have been considered
- seek to create a replicable approach to scoring, such that a different group could apply the same assessment methodology and produce comparable results
- help identify environmental impacts and opportunities and aligns investment and Resource Management Act 1991 (RMA) and Public Works Act (PWA) obligations. In particular, this relates to the need for a robust, transparent and well-documented optioneering process throughout the entire business case development process, from the strategic case through to the implementation of the preferred option.

The integrity and robustness of MCA processes largely rely on the way they are done. To provide consistency and transparency across the process and methodology used, it is recommended you use this guidance and the template. It is acknowledged that all business cases have their own unique characteristics and the approach taken needs to align with the size and complexity of the problem/opportunity.

This guidance provides for flexibility in approach to accommodate a project's specific circumstances. If variations to this guidance are considered appropriate, or another MCA-type approach is preferred, the project team should clearly document the variations or different approach as part of the business case.

It is anticipated that MCA will be used as part of most business case optioneering processes to help investors and project teams evaluate alternatives and options at the longlist and at the shortlist phase to help identify a preferred solution. It is not intended to be applied when making detailed design decisions post the identification of the preferred solution.

MCA outputs support making trade-off decisions between different alternatives or options. MCA does not provide definitive answers about which is the best alternative or option. Critical thinking is important, especially when considering the right-sizing of possible solutions.

Key considerations when undertaking MCA include:

- Alternatives and options need to address the root causes of the problems identified in the strategic case.
- Only alternatives and options with true fatal flaws should be discounted at this stage.
- Synergies and conflicts between alternatives and options should be considered if packaged together.

BEFORE CONDUCTING AN MCA

To enable an MCA to be applied as part of the optioneering process, there are several things to do first.
**The strategic case**

The strategic case is the cornerstone for successive business case phases, and it will become the first section of the programme business case (PBC) or single-stage business case (SSBC) document. The strategic case should clearly articulate the problem or opportunity and identify the benefits sought.

**Generate alternatives and options**

After the strategic case has been created, a broad range of alternatives and options are generated using the intervention hierarchy and systems thinking.

**Do-minimum**

Assessment involves examining different options or courses of action. The ‘do-minimum’ must be defined before MCA is commenced. Comparing option criteria scores to the do-minimum could be accomplished by assigning a neutral score to a do-minimum and comparing all other option criteria scores against it.

**Early Assessment Sifting Tool (EAST)**

Prior to conducting the MCA, it may be useful to run the alternatives/options through the EAST. The EAST supports an initial ‘coarse screening’ of alternatives and options. The EAST is designed to quickly and robustly rule out alternatives and options, allowing for a more manageable MCA exercise. The EAST also assists in documenting why decisions have been made.

It is important that the rationale for discarding an alternative or option is well documented. This includes where an alternative or option does not align with investment objectives or there are fatal flaws.

**ROLES AND RESPONSIBILITIES IN THE MCA PROCESS**

It is important to have the right stakeholders involved when developing and assessing alternatives and options. A typical MCA assessment will include a range of different groups whose involvement will evolve over time.

Involvement of investment decision makers will ensure alignment to desired investment objectives. The involvement of investment partners, iwi and relevant stakeholders is strongly encouraged at appropriate times in MCA processes since it creates a stronger business case and ensures that issues to be addressed reflect different perspectives, which will in turn drive more robust outcomes.

In all cases the MCA process will be led by the project team, who may be advised by a relevant specialist or specialists. There may be instances where other parties complete specific assessments. The Waka Kotahi Environmental and Social Responsibility Standard provides guidance on the scope of additional assessments.

Subject matter experts (SMEs) may be used to provide specialist input on their topic to the assessment of options.

Depending on the scale and complexity of the activity, legal advice may be sought at different points in the process. Appendix 1 provides further guidance on the roles and responsibilities when undertaking MCA.

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1 The Environmental Standard is currently state highway focused; however, it is currently being updated to provide guidance on the scope of additional activities. The link to the current version is https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/environment-and-social-responsibility/national-standards-guidelines-and-specifications/esr-standard/
Te Ao Māori

Iwi have a special relationship with the Crown as Treaty of Waitangi partners and therefore have a partnership role with Waka Kotahi across the business case phases and project life cycle.

The project team should consider the timing, nature and extent of iwi involvement in the optioneering process. Relevant iwi should be consulted regarding their participation in the optioneering processes. This may include identification or preparation of Cultural Impact Assessment(s) and/or taking a more holistic perspective on activity impacts through their participation at optioneering workshops. The timing, nature and extent of iwi input will depend on the specific circumstances but as a rule the earlier the better to ensure both positive and negative Te Ao Māori impacts can be scoped.

It should be noted that multiple iwi and hapū groups may be affected by a project and may wish to contribute their own assessments separately from one another.

Different iwi groups may have different perspectives on optioneering processes. Practitioners should be aware that iwi may not wish to be involved in optioneering processes that could be perceived to not adequately represent iwi interests. Early engagement with iwi prior to starting an optioneering process, and a flexible approach, are encouraged to determine how iwi may wish to be involved.

REPLICABILITY AND TRANSPARENCY

The MCA assessment process used should be both transparent and replicable so that a different specialist would be able to follow the logic and methodology set out in the supporting documentation and replicate the result. Well-documented MCA processes mean that decision makers will be readily able to determine whether legal requirements (eg under the Resource Management Act (RMA) and Public Works Act (PWA)) have been met.

Where specialists have been involved, their background notes or reports presented at a decision conference should be included.

Where, in the course of developing the business case, an element changes – for example, new options or specialists are introduced, or material changes in the background environment occur – the change must be adequately referenced and assessed, including going back to consider all or relevant options afresh if necessary.

NEW OPTIONS/CHANGE CIRCUMSTANCES

If a viable and substantive new option arises after an MCA has been completed, specialists should be asked to complete a review of the new option using the same methodology used for the prior MCA, and fully document the outcomes. To the extent practicable, the same specialists who completed the original MCA should be involved.

Changed circumstances after an MCA has been completed should be addressed through a review of the prior MCA processes and a documented assessment of any changes necessary. For example, if, after an MCA process has been completed, a significant earthquake altered a coastline on which an MCA process was premised, a review of the MCA assessment would be required.

All specialists involved in assessment processes would also need to review and revise their assessments if necessary.

MCA GROUP ASSESSMENT TECHNIQUES

MCA is often a group-based assessment activity, since it typically requires input from a range of different specialists. Although a single, informed participant could complete low complexity and low risk MCA assessments, for the majority of activities it is anticipated that multiple participants will be involved in the MCA process.

There are two main methods of group decision-making techniques used for MCA scoring and selecting shortlists/preferred options. These can be broadly defined as decision conferencing, a
structured format among individuals in a meeting; and the Delphi method, where participants are physically remote and identify and evaluate ideas/scores independently.

Where practicable, it is recommended that a decision conferencing workshop method is used when undertaking MCA.

**DECISION CONFERENCING**

Decision conferencing provides for a structured format among individuals in a facilitated workshop, or across several workshops. A fundamental requirement is a comprehensive understanding of the activity or project involved. The exercise should be undertaken on the basis of agreed criteria and scoring approach.

SMEs may first independently establish provisional scores based on known evidence. This step may be completed prior to the meeting. At the workshop, each SME presents their own ideas and scores. These scores are then discussed, challenged and moderated to reach a consensus during the workshop.

The key features required for a decision conference are:

‘Attendance by key players, impartial facilitation,… and an interactive and iterative group process.’

**MCA CRITERIA**

The project team should select the appropriate criteria for their activity on a case-by-case basis. Investment objectives and critical success factors need to be included as part of all assessments. The reasoning for selection should be discussed and documented in the MCA report. If necessary, to understand the potential social and environmental impacts of the activity, the Waka Kotahi Environmental and Social Responsibility Standard can be used to guide environmental and social criteria in the longlisting and shortlisting process.

Care should be taken to avoid double counting in selecting and evaluating criteria. Specialists involved in an MCA should discuss and agree the scope of the criteria and the boundaries of their assessment to remove double counting.

The aim of criteria selection is to define:

- whether an alternative or option has strategic alignment with transport system objectives (including regional land transport plans (RLTPs) and Government Policy Statement on land transport (GPS)), strategies, plans and policies
- whether an alternative or option will deliver net benefits, ie benefits greater than costs
- the relative effects of the alternatives and options under consideration, and
- whether the alternative or option is achievable in relation to applicable legislation and regulations.

As the business case develops, a project may require more refined criteria, and criteria that may have been important at the commencement of the investigation may become less applicable. For example, an investigation of sub-aspects of a new route, such as connections to the local roading system at the indicative business case (IBC) stage, may require a substantially different set of MCA criteria from those that are applied during identification of the preferred route at the PBC stage. The criteria applied should always be reviewed for successive MCAs.

The identification and description of the criteria must be discussed and agreed upfront by the project team and, where necessary, key stakeholders. Further definition of a criterion may require the input of SMEs, as specific circumstances may need to be reflected.

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3 The Environmental Standard is currently state highway focused, however it is currently being updated to provide guidance on the scope of additional activities. The link to the current version is https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/environment-and-social-responsibility/national-standards-guidelines-and-specifications/esr-standard/
For activities likely to require approvals under the RMA, Part 2 of the RMA is relevant. Part 2 outlines the RMA’s purpose and principles. In identifying appropriate criteria for consideration, practitioners should ensure that relevant Part 2 matters are addressed through the specialist criteria selected. Advice should be sought from RMA planning specialists and/or legal counsel to ensure Part 2 matters are adequately provided for.

The table below provides a list of possible MCA criteria. Not all the criteria will be relevant to every activity or at every stage of business case development. Stakeholders/customer perspectives should not be a criterion in and of itself. The root causes of objections or support should be captured within the relevant criterion. It may be relevant to include specific issues of interest to stakeholders (i.e., road safety or visual impacts).

If appropriate, a project team may wish to add intermediate and maximum ranges in addition to the do-minimum to enable greater granularity.

The upfront cost of an activity should be included in an MCA process but should not be scored. The cost and fundability require a robust assessment separate to the MCA process.

Table 1: MCA criteria to select from

<table>
<thead>
<tr>
<th>Programme business case</th>
<th>Indicative business case</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investment (critical success factors)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment objectives</td>
<td>How does the alternative or option achieve investment objectives?</td>
<td>Alternatives and options need to be assessed for their ability to deliver against investment objectives. Investment objectives are derived from problem statements and benefit maps as part of investment logic map (ILM) sessions and are determined by a project team, based on stakeholder workshops.</td>
</tr>
<tr>
<td>Potential achievability (critical success factor)</td>
<td>What is the potential achievability of the alternative or option?</td>
<td></td>
</tr>
<tr>
<td>Technical</td>
<td>What are the technical or practical considerations that may prevent an option from achieving investment objectives, for example local site geography or existing contracts?</td>
<td></td>
</tr>
<tr>
<td>Safety and design</td>
<td>Are there significant health and/or safety risks associated with the option in its design, implementation, operation or maintenance? Does this option comply with the safe system approach? Can the risks be addressed in the design process to control it?</td>
<td></td>
</tr>
<tr>
<td>Consentability</td>
<td>What is the level of consenting complexity/difficulty? Are there risks of this adversely impacting on required project timeframes or other aspects of delivery?</td>
<td></td>
</tr>
<tr>
<td>Potential affordability (critical success factor)</td>
<td>What is the potential affordability of the alternative or options?</td>
<td></td>
</tr>
<tr>
<td>Capital/operational/maintenance</td>
<td>Does the cost of this option fit within the likely funding available? What factors might affect the ability of the project owner to afford the cost to operate and maintain the option over its projected life?</td>
<td></td>
</tr>
<tr>
<td>Potential value for money (critical success factor)</td>
<td>What is the potential value for money of the alternative or options?</td>
<td>Consideration of the balance between costs and benefits, usually through cost–benefit analysis. When a proposed project does not yet have a calculated benefit–cost ratio (BCR), the</td>
</tr>
</tbody>
</table>
Indicative Efficiency Rating (IER) tool can be used to calculate an IER for the project. The IER tool provides a rough estimate of monetised costs and benefits.

**Supplier capacity and capability (critical success factor)**
What is the potential level of supplier capacity and capability of the alternative or options?

Any external resourcing challenges, for example dependency on local construction firms or IT skills, including interdependencies across projects.

**Scheduling/programming (critical success factor)**
What is the potential scheduling/programming of the alternative or options?

When the alternative/option could be delivered and other timing requirements.

### Opportunities and impacts

#### Environment effects
What environmental effects are associated with this option? Environmental effects could include those related to ecology, water quality, stormwater, noise and vibration, visual impact, urban design, natural hazards, contaminated land, landscape, heritage (including archaeology), biodiversity, resource efficiency and air quality.

#### Social and cultural impacts
What social or cultural impacts are associated with this option? Social or cultural impacts may include, for example, human health, impacts on community in relation to jobs, recreation, services and severance, impacts on farming and business operations.

#### Climate change mitigation
What is the long-term carbon emissions impact of the alternative or option? That is, consistent with carbon budgets once available.

#### Mandatory

**Climate change adaptation**
Is the alternative or option exposed to climate change risk or other natural hazards over time?

**Cumulative impacts**
What cumulative impacts are there, if any, are associated with the option? Cumulative effects may be insignificant on their own, but may accumulate over time or space with other effects to become significant. Consider implementation, operation and maintenance phases. For example, air quality accumulating from increasing use of diesel engines in built up urban environments.

**Impacts on Te Ao Māori**
What, if any, impacts are there on Te Ao Māori? This includes areas of significance for Māori, Māori land and Kaitiakitanga (recognition that the environment is a taonga).

**Property impacts**
How does the option impact on property? Can the necessary property rights be obtained?

*Cost included as part of value for money; however, project teams may wish to record the cost of each option.

### Number of criteria

The number of criteria should generally reflect the risk, opportunity, complexity and variety of the options assessed. As a rule, practitioners should aim for about 8 to 12 criteria in an MCA – and no more than 15. Including too many criteria can result in criteria scoring ‘balancing out’, or key criteria
being outweighed by multiple other criteria. Also, double counting is more likely to occur if too many criteria are included. Some MCA will require fewer criteria than others; for example, a simple MCA process may use only four or five criteria, while a complex MCA could have significantly more.

Assessing criteria

SMEs advising on each criterion can provide indicative assessments for each option independently prior to the workshop. They should ensure that their assessment relates only to the specifics of the criterion as they have been applied to the particular activity, and that they do not comment on a matter or take into consideration a matter that is being considered in a different criterion.

SCORING: PURPOSE AND METHOD

Scoring allows for differentiation between options. The scoring system used needs to have sufficient range to sufficiently discern the benefits, disbenefits and/or effects of the various options.

There are a variety of scoring systems available. A 7-point scoring system, as detailed in table 2 below, will be appropriate for most activities. It can be used to rate quantitative and qualitative measures within the MCA template. The rating scale comprises a 7-point scale from -3 to +3. A summary of option performance can be obtained by adding these scores together. If desired, the total score or relative ranking of each option can be reported as part of the MCA table.

While Waka Kotahi recommends a 7-point scale as the standard approach, a 9- or 5-point scale can be applied where more or less granularity in scoring would better represent the evidence available.

If a project team deems the use of another scoring system more appropriate, this should be discussed and agreed with MCA technical specialists and the reasons for adopting that system well documented.

Scoring systems should be used consistently through the MCA and the activity lifecycle to enable fair comparison between options. Hence, if a new option is introduced or a reassessment is required, the same scoring system should be used.

**Figure 2: 7-point scoring system**

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Definition</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large positive (+ve)</td>
<td>Major positive impacts resulting in substantial and long-term improvements or enhancements of the existing environment.</td>
<td>3</td>
</tr>
<tr>
<td>Moderate positive (+ve)</td>
<td>Moderate positive impact, possibly of short-, medium- or long-term duration. Positive outcome may be in terms of new opportunities and outcomes of enhancement or improvement.</td>
<td>2</td>
</tr>
<tr>
<td>Slight positive (+ve)</td>
<td>Minimal positive impact, possibly only lasting over the short term. May be confined to a limited area.</td>
<td>1</td>
</tr>
<tr>
<td>Neutral</td>
<td>Neutral – no discernible or predicted positive or negative impact.</td>
<td>0</td>
</tr>
<tr>
<td>Slight negative (-ve)</td>
<td>Minimal negative impact, possibly only lasting over the short term, and definitely able to be managed or mitigated. May be confined to a small area.</td>
<td>-1</td>
</tr>
<tr>
<td>Moderate negative (-ve)</td>
<td>Moderate negative impact. Impacts may be short, medium or long term and are highly likely to respond to management actions.</td>
<td>-2</td>
</tr>
<tr>
<td>Large negative (-ve)</td>
<td>Impacts with serious, long-term and possibly irreversible effect leading to serious damage, degradation or deterioration of the physical, economic, cultural or social environment. Required major rescope of concept, design, location and justification, or</td>
<td>-3</td>
</tr>
</tbody>
</table>
requires major commitment to extensive management strategies to mitigate the effect.

The colours used above may allow a useful visual assessment to be undertaken as part of the MCA. This system is clear in its relationship with the do minimum, in that the neutral score is equivalent to the do-minimum.

SENSITIVITY ANALYSIS

Weights represent beliefs about how important a particular criterion is compared to other criteria. If all criteria are considered to be equally important then all weights are the same. However, some criteria are often considered more significant/material to an activity than others.

To both ensure transparency and recognise the significance/materiality of different criterion, the following steps should be followed:

- **Step one**: Undertake scoring with all criteria having equal weighting.
- **Step two**: Undertake sensitivity analysis. This enables the robust examination of the results by exploring their sensitivity to weighted changes to different criteria. All changes to weighting/data should be done systematically to assess their effect on results.
- **Step three**: Document the results and the reasoning applied.

While weighting can be used as part of sensitivity analysis, it should not be applied unilaterally to criteria to identify a ‘preferred option’ based on the scoring.

FATAL FLAWS

It may be beneficial to include a fatal flaw score in an MCA. A fatal flaw is a condition or circumstance that means the option will not be achieved or that a risk is so great that the option is not worth pursuing. Options that are highly difficult but not fatally flawed should remain in the mix and be scored accordingly.

If the EAST tool has been used, some fatal flaws should have already been identified and filtered.

Many fatal flaws relate to aspects which are not consentable under the RMA, or where property cannot be acquired, or where unresolvable legal challenges may arise. Engineering complexity is rarely a fatal flaw, although natural hazard exposure may be. Financially expensive options in and of themselves should not be considered fatally flawed.

CONSIDERING MITIGATION IN AN MCA

As part of option development and refinement, alternatives for avoiding significant adverse effects should be considered. If avoidance is not practicable then the reasons for this should be documented.

Individual specialists should first undertake an MCA assessment including standard ‘best practice’ mitigations (e.g. in a stormwater context, using erosion and sediment control measures to mitigate sediment runoff effects). Once completed, specialists must consider whether additional mitigation is required.

If additional practicable mitigation is identified, specialists should revisit their assessment and indicative scores to reflect this. This information should be recorded in the reporting materials, along with a description of the process by which agreement on mitigation was reached.

Mitigation for one criterion may result in changes to another. For example, adding a bridge to avoid an ecologically sensitive area may change whole-of-life costs and visual impacts.

If there is doubt about whether the additional mitigation or its flow-on impacts on other criterion is practicable and/or fundable, this should be discussed with the project team.

While the identification and assessment of effects and measures to avoid, remedy or mitigate them may be relevant at various stages of the optioneering process, it is more likely to be relevant later
in the process (eg shortlist assessment) when more detailed information on the options is available.

Social and distributional effects

If an alternative or option has negative effects on particular vulnerable social groups (elderly, low income, disabled, etc.), the project team should consider whether additional measures can be introduced to avoid, remedy or mitigate this.

CRITICAL STATUTORY REQUIREMENTS FOR THE OPTIONEERING PROCESS

There are a number of legislative requirements to consider during all business case optioneering and decision-making processes. In particular, robust, transparent and well documented optioneering and decision-making processes are critical to meet the statutory requirements under the Land Transport Management Act (LTMA), Resource Management Act 1991 (RMA) and Public Works Act 1981 (PWA). Rather than adding unnecessary layers of complexity, these legislative obligations generally reflect best practice and are likely to enhance business case processes and outcomes.

Land Transport Management Act 2003

The LTMA sets out the legislative requirements that govern Waka Kotahi investment from the National Land Transport Fund (NLTF). When Waka Kotahi is approving proposed activities or a combination of activities, it must be satisfied that key legislative requirements under section 20 have been met, including that an activity or combination of activities:

- is consistent with the GPS
- is efficient and effective
- contributes to Waka Kotahi objectives
- has, to the extent practicable, been assessed against other land transport options and alternatives.

In addition, the LTMA places a number of obligations on the way Waka Kotahi undertakes its functions. In particular it requires Waka Kotahi to:

- exhibit a sense of environmental and social responsibility
- facilitate participation by Māori in land transport decision making
- ensure transparency in decision making, use of revenue and expenditure.


Investment proposals requiring approvals under the RMA, and/or requiring compulsory acquisition of land under the PWA, may be required to meet certain tests associated with optioneering and decision-making processes. This influences business case development processes and decisions across the entire business case development process – a thread that runs from the strategic case through to the implementation of a preferred solution.

These RMA and/or PWA requirements mean Waka Kotahi and its investment partners must clearly demonstrate:

- adequate consideration of alternatives throughout the entire optioneering process, from longlisting onwards. It is not necessary to consider all possible alternatives and options or evidentially eliminate alternatives that are clearly speculative or suppositious. In terms of the requirements under the RMA, an organisation is also not required to select the ‘best’ option. What is necessary is to demonstrate that an appropriate broad range of alternatives has been adequately considered.
- systematic and transparent optioneering and decision-making processes
a sound argument for why any proposed physical works are ‘reasonably necessary’ (under the RMA) including the ability to demonstrate ‘reasonable need’ for any land required (PWA)

appropriate recognition and provision for the principles of Te Tiriti o Waitangi in relation to managing the use, development, and protection of natural and physical resources and the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga

consideration of a proposal’s social, cultural, environmental and economic effects and appropriate action considered to avoid, remedy or mitigate any adverse effects.

While the specific RMA and/or PWA requirements associated with a particular project are not known until at least the indicative business case (IBC) stage, it is necessary to ensure that all optioneering and decision-making processes meet these requirements from the outset, to ensure they are sufficiently robust to support any subsequent RMA approval or PWA requirements.

Seeking early input from Waka Kotahi property, RMA planning, technical and legal specialists into the business case process (particularly from longlisting onwards) will help support integrated decision making and ensure these processes meet the necessary legislative requirements.

The process of refining alternatives and options from a longlist to a shortlist, then to a preferred solution involves an increasingly refined sifting process with progressively more detailed and focused investigations and information filtering. The inclusion of ‘environmental’ criteria in optioneering processes will almost always be appropriate from the longlist stage onwards with increased granularity required at the shortlist stage.

It is likely that specific environmental criteria will be required to assess different physical options (eg different greenfield transport corridors). Identification of appropriate environmental criteria should be based on an assessment of constraints, opportunities and risks applicable to the area in question.

**MCA OUTPUTS**

The output from an MCA process will be a report detailing the methodology followed, the assessment of the options by criteria, the scoring of options by criteria and the basis for the scores, any further analysis, such as application of weighting through the sensitivity analysis, next steps and recommendations. For large or complex activities with complex MCA processes, undertaking a peer review on an MCA process is recommended.

The documentation of the MCA process may contain the following elements:

Summary of prior business case development (updated if EAST used)

- overview of project
- how previous spatial planning and strategic assessment outputs have been considered
- past optioneering work, including EAST outputs
- discussion on do-minimum
- discussion of objectives.

Methodology and approach

- description of agreed process for undertaking MCA, including stakeholder input
- description of methodology, including scoring (identifying departures from previous methodology, if relevant)
- description of assumptions
- identification and description of criteria.

MCA outputs

- assessment of criteria for each alternative or option (using MCA template)
- mitigation discussion
DEFINITIONS

Alternatives
An alternative is a strategic way of responding to a problem or opportunity applying a whole-of-system approach (can include corridor or network planning), such as exploring the potential for different land use arrangements or encouraging greater use of other modes to address projected growth in network demand. Alternatives may have been identified as part of development strategies and spatial plans but may also be developed as part of the Business Case Approach (BCA). In addition, the assessment of alternatives needs to meet RMA and PWA requirements as described above. In developing alternatives, it is important to consider the intervention hierarchy, which addresses:

- demand – for example, ways in which the need for travel can be reduced
- productivity – for example, by making sure the current system is optimised as far as reasonably practicable
- supply – for example, provision of new services or infrastructure.

Options
Options represent different ways to achieve an outcome or objective. For example, if it had been decided that the best way to address a particular problem was to improve an intersection for safety or efficiency reasons, options could include building a roundabout, installing traffic signals, or grade separation. The assessment of options needs to meet RMA and PWA requirements as described above.

Fatal flaws
A fatal flaw is a condition or circumstance that means the option will not be able to be achieved or that the risk is so great that the option is not worth pursuing. Fatal flaw analysis involves a high bar. Options that are highly difficult but not fatally flawed should remain in the mix and be scored appropriately.

Many fatal flaws relate to aspects which are not consentable under the RMA, where property cannot be acquired, or where unresolvable legal challenges may arise. Engineering complexity is rarely a fatal flaw, although natural hazard exposure may be. Financially expensive options in and of themselves should not be considered fatally flawed.

Investment objectives
The investment objectives specify the strategic outcomes for the proposed investment. Investment objectives are easily derived from information gathered during conversations in the development of the strategic assessment, around the identified problem/opportunity and the benefits associated with solving the problem. This information is entered into a ‘formula’ as follows:

\[ \text{[the effect of the problem]} + \text{[the selected benefit]} + \text{[the baseline and forecast impact on the benefit measure]} = \text{SMART investment objective}. \]

Project objectives
Project objectives are those objectives specific to the preferred solution. These are important from an RMA perspective as they will be required to support the designation and consenting phase and are the objectives against which a consent application or notice of requirement is evaluated. The project objectives will be strongly informed by the investment objectives and while the purpose,
framing and focus of investment and project objectives are different they should not significantly diverge. Planning and legal input on project objectives should be sought to ensure they are pitched correctly and reflect relevant case law.
## APPENDIX 1: ROLES AND RESPONSIBILITIES IN THE MCA PROCESS

<table>
<thead>
<tr>
<th>Role</th>
<th>Investment objectives</th>
<th>Project objectives</th>
<th>MCA options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investor/Project team</td>
<td>Develop investment objectives</td>
<td>Develop project objectives</td>
<td>Input into MCA process</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Investor may provide background and investor context to support</td>
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<td>expert evidence on alternatives.</td>
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<td></td>
<td>Project team ongoing role in MCA processes as activity is developed and</td>
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<td></td>
<td></td>
<td></td>
<td>refined prior to lodging of a notice of requirement (NOR) and/or consent</td>
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<td></td>
<td></td>
<td>applications.</td>
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<td>Activity planner or MCA expert adviser may give evidence on</td>
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<td></td>
<td></td>
<td></td>
<td>alternatives assessment process.</td>
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<tr>
<td>Stakeholder</td>
<td>May provide input to development of investment objectives</td>
<td>May provide input to development of project</td>
<td>May have ongoing role in MCA processes as activity is developed and</td>
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<tr>
<td></td>
<td></td>
<td>objectives</td>
<td>refined prior to lodgement of NOR and/or consent applications.</td>
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<tr>
<td>Iwi/Māori</td>
<td>May provide input to development of investment objectives</td>
<td>May provide input to development of project</td>
<td>May have ongoing role in MCA processes as activity is developed and</td>
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<tr>
<td></td>
<td></td>
<td>objectives</td>
<td>refined prior to lodgement of NOR and/or consent applications.</td>
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<td></td>
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<td>May provide input to project objectives</td>
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<tr>
<td>SME</td>
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<td>May provide input to project objectives</td>
<td>May have ongoing role in MCA processes as activity is developed and</td>
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<td></td>
<td></td>
<td>May provide input to project objectives</td>
<td>refined prior to lodgement of NOR and/or consent applications.</td>
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<td>May provide input to project objectives</td>
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<td></td>
<td>Undertake provisional scores</td>
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<td>Input into MCA process</td>
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<td>Complete Cultural Impact Assessment if required</td>
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<td>Undertake provisional scores</td>
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<tr>
<td>Role</td>
<td>Investment objectives</td>
<td>Project objectives</td>
<td>MCA options</td>
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<tr>
<td>Legal advisor</td>
<td>May provide input into project objectives and should review consenting objectives</td>
<td>May advise on MCA process</td>
<td>Depending on the scale and complexity of the activity, legal advice may be sought at different points in the process. It may be desirable to seek high-level legal advice or review when the methodology for the MCA process is being developed for an activity, and also when the consenting strategy is being prepared. For large or complex activities, it may be helpful to engage more specific legal advice early in the process, for example, to assist in defining activity objectives against which an MCA process can be completed. The Waka Kotahi planning team should be contacted (<a href="mailto:consents@nzta.govt.nz">consents@nzta.govt.nz</a>) to work through the activity-specific requirements in this regard. May have ongoing role in review of MCA processes as activity is developed and refined prior to lodgement of NOR and/or consent applications.</td>
</tr>
<tr>
<td>SMEs within Waka Kotahi</td>
<td>May provide input to development of investment objectives</td>
<td>May provide input to project objectives</td>
<td>May advise on and provide specific input to MCA process. Input into MCA process</td>
</tr>
<tr>
<td>Consenting specialists within Waka Kotahi</td>
<td>May provide input to project objectives and/or help project team to develop/review NOR objectives</td>
<td>May advise on and provide specific input to MCA process</td>
<td>Ongoing role in MCA processes as activity is developed and refined prior to lodgement of NOR and/or consent applications.</td>
</tr>
<tr>
<td>Alternatives or MCA specialist</td>
<td>Input to development of project objectives</td>
<td>Advise on MCA process</td>
<td>Depending on the scale and complexity of the activity, it may be advisable to appoint an alternatives specialist. This role runs the alternatives assessment process, including coordinating the specialist inputs, facilitating workshops, undertaking subsequent analysis and ultimately preparing an overarching report on the process. They may also be required to give evidence at a hearing on the process followed. A vital role of this specialist, if appointed, will be to ensure consistency of approach both between specialists and throughout MCA processes at different stages of the activity.</td>
</tr>
</tbody>
</table>