*Guidelines for Preparing MoTI Business Cases*

# Appendix 3

# Option Development For MoTI Business Cases

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**Option development** is the third of the four steps used to prepare a business case. It involves developing cost-effective improvements to address the performance problems identified and defined in steps one and two.

It relates directly to the problem definition step outlined in Appendix 2 and therefore it should reference the causes of the problems and how they will be addressed by the proposed solution(s).

Each option involves a particular scope, schedule and cost. Early in project development this is usually less accurate than later on when more information is available. The assumptions need to be clearly stated regardless of the phase of development.

Ideally options should be cost effective, but at times this is not possible due to constraints.

Sometimes the best option will consist of a combination of a number of different actions rather than a single action.

### *The Base Case*

The list of options must always include the Base Case, where the existing facility receives the minimum level of expenditure required to deliver acceptable service. This is sometimes referred to as the “do minimum”.

It is important not to overstate the scope of do minimum, which typically includes maintenance funding, and rehabilitation funding if it will be required within the next 25 years.

For severely deteriorated bridges, rehabilitation may not be cost effective. However, replacement should not automatically be assumed to be the do minimum. If there are alternate routes for traffic, the do minimum may be to close the existing bridge and reroute traffic.

In the option evaluation step which follows, each option will be compared to the base case.

***The Proposed Case***

This refers to one or more improvement alternatives which address the problems and their causes. Things to bear in mind:

**Begin with a clear understanding of the root causes of the identified deficiencies.** Start with robust problem identification and definition before generating improvement options.

**Show that a comprehensive range of options was developed.** A project proposal should not be presented in isolation. It may appear attractive because it addresses the problems, but it may not be the best solution. A range of possible solutions should be developed, using creative and lateral thinking. These may include rehabilitation or maintenance actions which could defer the need for a capital expenditure, or reduce its cost. It may be possible to phase in the improvement.

**Avoid "confirmation bias".** I.e. avoid hunting for information that confirms initial assumptions which may be skewed, or based on incomplete information. Inaccurate assumptions can severely limit the creative development of options.

**Determine the appropriate scope of the option.** Understand which project design elements are critical to addressing the problems, and which ones are not. The Ministry follows the Transportation Association of Canada's "design domain" principles where the interaction between design elements is understood and applied during the designer's decision making, rather than relying on ideal standards, or applying multiple minimum standards without considering the consequences. There are a number of tools available to assess which design standards are the most practical (e.g. the Ministry's Design Criteria Sheet*) and how design elements interact (e.g. the Interactive Highway Safety Design Manual, or IHSDM).

**Understand the ambient conditions.** It may not be cost-effective to plan for design standards which significantly exceed those of the highway corridor in the vicinity of the project.

**Document the cost estimate.** The Ministry has developed guidance and tools available at: http://www.th.gov.bc.ca/publications/planning/index.htm
Assumptions about unit costs, quantities, and risks need to be made clear. See also Appendix 5.

**Show that a reasonable process was followed.** Consultation with all relevant stakeholder and user groups is an important part of the overall justification behind a recommended option. Different perspectives and areas of expertise can broaden the range of options. It is often useful to have an independent review of options from one or more people outside the project team.

**Understand the safety context.** For each option make a note of its effectiveness in terms of collision mitigation and the source for the information. Key information sources include "Collision Modification Factors for BC" available on the ministry's internet website, AASHTO's "Highway Safety Manual", and the CMF Clearinghouse available on the web. ICBC input is desirable.

* http://www.th.gov.bc.ca/publications/eng_publications/geomet/TAC/TAC_2007_Supplement/Ch1300-2007.pdf
Pages 37-50

**The following may all have an influence when developing options:**

- Discussions with local governments on land use and zoning (e.g. to moderate future demand or to prepare for known future demand)
- The role of non-auto transportation modes (e.g. transit and cycling) and the role of trucks
- Using existing highway capacity more efficiently (e.g. more sophisticated signal technology)
- The need to preserve and protect highway infrastructure (e.g. access management)
- Optimal timing and phasing of the project (e.g. timing it to coincide with necessary rehabilitation work will improve cost effectiveness, or a rehab option may delay the need for a capital improvement)
- Project delivery (e.g. cost-sharing with partners, private-public partnerships)
- Materials and methods of construction (e.g. innovative thinking by a multi-disciplinary team)
- Community values and preferences (e.g. they may affect the choice of “design domain” or context sensitive design and solutions)
- Stakeholder input should be documented (any non-starters can typically be screened out early)
- Be aware of the next step in project development: option evaluation (see Appendix 4). The quantifiable project benefits (safety, travel time, and vehicle operating costs over a 25 year analysis period) must offset the project costs in order to get a positive net present value (benefit/cost ratio >1). Understanding this can help to shape the option through iteration.

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