Guidelines for Preparing MoTI Business Cases

Appendix 2

Problem Definition for MoTI Business Cases

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Problem definition determines the root causes of problems which have been identified using performance criteria (see Appendix 1).

In many cases, the causes of a deficiency are not obvious, and detailed study is required. This step is critical to the success of the entire process, as cost effective options cannot be developed without a full understanding of the reasons for the problems.

Problem definition is therefore a key part of the overall justification behind a recommended improvement.

Mobility problem definition:

- As per Appendix 1, mobility problems are identified on rural two lane highways where 60% or more of vehicles are following slower vehicles, or where trucks or other slow moving vehicles impede traffic flow on upgrades and downgrades.
- The cause of mobility problems on rural two lane highways is primarily a lack of sufficient passing opportunity to enable dispersion of traffic queues. The queues may be caused by:
    - difficult terrain where steep grades impede heavy vehicles and sub-optimal alignment often occur
    - relatively high traffic volumes of advancing and opposing vehicles
    - insufficient dashed centerline (passing zones)
    - the presence of accesses
    - surface condition or other factors
- On urban highways, mobility problems are identified where there is poor travel speed during the peak AM and/or PM time periods. This can be caused by many factors including high travel demand, lack of alternative routes serving key origins and destinations, insufficient laning for through or turning movements, poor signalized intersection or interchange spacing, excessive and/or poorly located driveway accesses, suboptimal signal timing, and other issues.
- Business case documentation of urban mobility problem definition should refer to all of these causes and any other relevant factors.

Safety problem definition:

- There are a number of valid methods for identifying safety problems as described in Appendix 1 “Problem Identification for MoTI Business Cases”
- Safety problem definition can be complex. Generally the process involves an analysis of collision data, a review of any past studies, a review of site geometry and operations, stakeholder consultation, and a site visit to identify crash patterns (crash type, frequency, severity, rate, temporal patterns, location, density, direction) and other safety concerns/issues. The site is then further evaluated to identify contributing factors to these crash patterns and concerns/issues. Contributing factors fall into 3 general categories: human, vehicle, and roadway/environment. Countermeasures are then selected to address the identified contributing factors in the subsequent “option development” step.
- Contributing factors can vary significantly and include:
    - geometry, clear zone, signing, and other design/traffic engineering issues
    - human factors
    - speed differential
    - conflicts between through and turning movements
    - presence of heavy trucks, cyclists and pedestrians
    - visibility (lighting, weather, sightline obstructions)
    - road surface condition
- More guidance on safety problem definition can be found in section 2 of MoTI’s “CMP and Project Level In-Service Road Safety Review Guidelines”:

http://www.th.gov.bc.ca/publications/planning/Guidelines/CMP_Safety_Review_Guidelines_Nov2010.pdf

Important external reference documents for safety problem definition:

- Canadian Guide to In-Service Road Safety Reviews, TAC, January 2004
- Highway Safety Manual, AASHTO, 2010

Reliability is the general availability of a highway in terms of how it is affected by planned and unplanned closures.

Planned closures may result from significant construction work or from proactive avalanche management activities.

Unplanned closures may result from vehicle collisions or from a number of different natural hazards such as avalanches, floods, landslides, forest fires etc.

The Ministry currently does not possess the necessary data to set quantitative criteria for identifying reliability problems. However, the causes of road closures are typically well understood in any given area, so it should be possible to define such problems in the business case as a result of project planning and design.