

Prioritization of technologies/Infrastructure

Multi Criteria Decision Analysis

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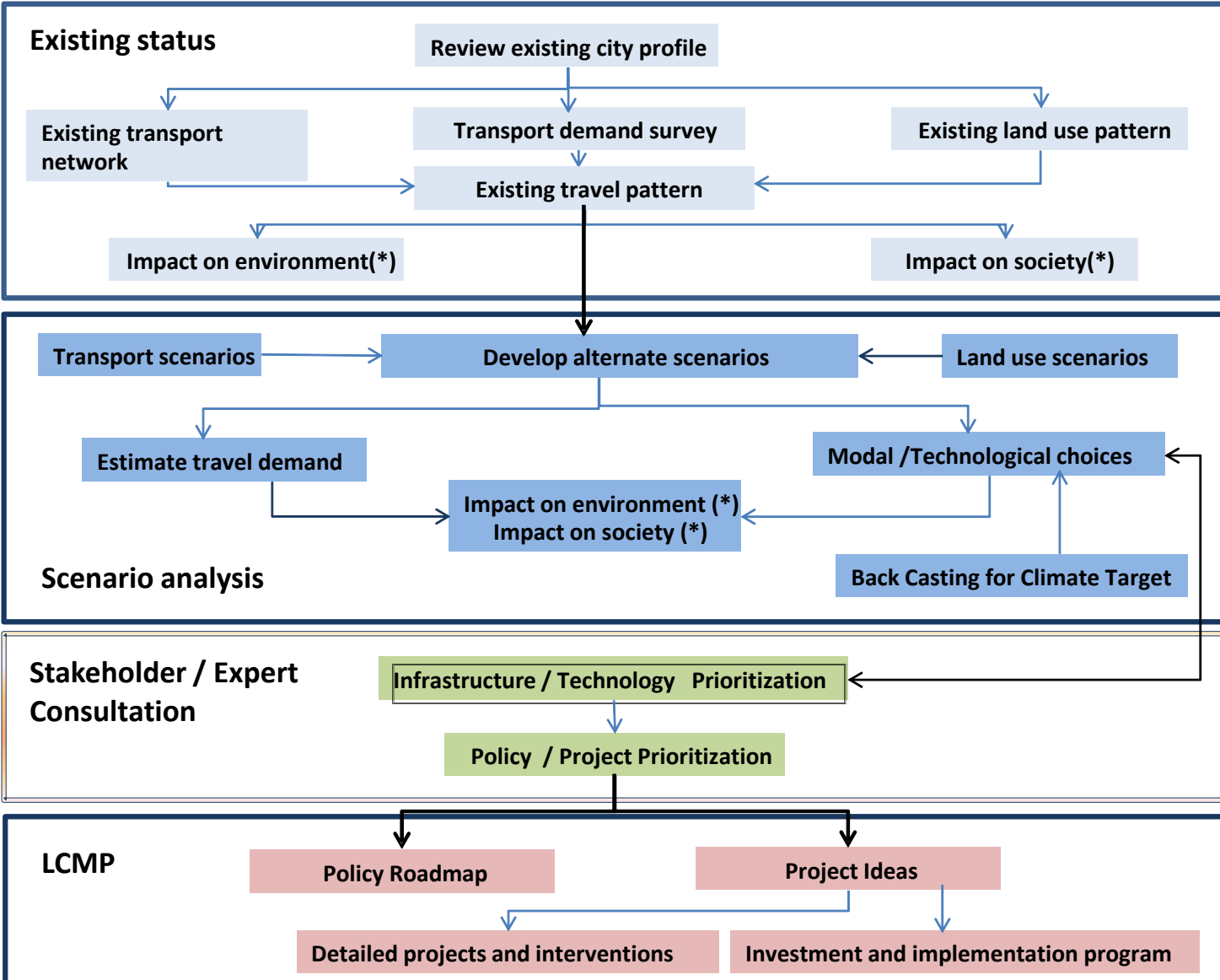
New Delhi, India

Outline

- Overview of MCA
- Steps in Applying MCDA
- MCA in prioritizing options for LCMP
- Scoring
- Weight

A simple hypothetical example entwined
with the explanation of the steps

Methodology framework for LCMP



What is MCA?

- A Decision Analysis Technique
- It is a subjective analysis based on:
 - Criteria, scores and weights;
 - Human judgment in determining the criteria, scores and weights
 - Documented process to enable ex-post review and could be used for public scrutiny of assessment
- Allows comparison of apples and oranges.

Detailed Steps in MCA

- 1. Establish the decision context.**
 - 1.1 Establish aims of the MCDA, and identify decision makers and other key players.
 - 1.2 Design the socio-technical system for conducting the MCDA.
 - 1.3 Consider the context of the appraisal.
- 2. Identify the options to be appraised.**
- 3. Identify objectives and criteria.**
 - 3.1 Identify criteria for assessing the consequences of each option.
 - 3.2 Organise the criteria by clustering them under high-level and lower-level objectives in a hierarchy.
- 4. 'Scoring'. Assess the expected performance of each option against the criteria. Then assess the value associated with the consequences of each option for each criterion.**
 - 4.1 Describe the consequences of the options.
 - 4.2 Score the options on the criteria.
 - 4.3 Check the consistency of the scores on each criterion.
- 5. 'Weighting'. Assign weights for each of the criterion to reflect their relative importance to the decision.**
- 6. Combine the weights and scores for each option to derive an overall value.**
 - 6.1 Calculate overall weighted scores at each level in the hierarchy.
 - 6.2 Calculate overall weighted scores.
- 7. Examine the results.**
- 8. Sensitivity analysis.**
 - 8.1 Conduct a sensitivity analysis: do other preferences or weights affect the overall ordering of the options?
 - 8.2 Look at the advantage and disadvantages of selected options, and compare pairs of options.
 - 8.3 Create possible new options that might be better than those originally considered.
 - 8.4 Repeat the above steps until a 'requisite' model is obtained.

MCDA: The Decision Context

- The Context: Urban population growth and resultant demand for mobility a challenge now and into the future.
- AIM: Recommend to urban authorities prioritized options for safe access and economic mobility with minimal environmental impacts.
- Setting up the system for conducting MCD
 - Process steps
 - Information package for assessment – who and how
 - Whom to and how to consult
 - Who's perspective and who decides
 - Decision makers
 - Stakeholders

Identifying options

- General criteria for selecting options:
 - be comprehensive in assessing the options.
 - be open to possibility of adding dropping options.
 - contribute to the objectives
- Source of options identification:
 - Primarily will come from the needs of mobility/accessibility to addressed based on analysis
 - Relevant literature, e.g., GIZ literature on issue, Publication on options for mitigating emissions from transport sector by UNEP Risoe
 - Expert Judgment

The Objective and Criteria

- A clear objective most critical to a clear framework for assessment.
- Objectives define the criteria which are the measures to assess or evaluate the contribution of option to the objective.
- Criteria should be operational – specific and measurable
- Options that

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https://www.yunbaogao.cn/report/index/report?reportId=5_15889

