Need for a holistic assessment of urban mobility measures

Holistic Impact Assessment Method – Combining CBA and MCA effectively

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Overview

Why do we need a holistic appraisal approach?

What are the key characteristics of the TIDE impact assessment method?
Sustainable transport:
• Increases liveability
• Improves accessibility and social equity
• Has a positive effect on health
• Reduces urban air pollution
• Needs little investments
• There is evidence that such measures are economically viable

Expansion of the urban motorway:

2 Million Euro travel time savings

Has a high return on investments:
Benefit to cost ratio 3:1*

* Factors not included: induced traffic, noise effects, CO\textsubscript{2} emissions, real estate value, quality of life….

Postponed

Approved for funding
Cost-benefit Analysis for sustainable urban transport measures

Challenges

- An accurate CBA requires a high amount of data
- Travel time dominates CBA results
- CBAs do not encapsulate the full range of externalities

Potential Consequences

- Socio-economic benefits or costs are underrecognized
- CBAs may favour traditional measures (e.g. road expansion)
- Some benefits of sustainable transport measures are not reflected in the CBA results

CBA

Yes

Congestion charge
Cycling infrastructure
Bus priority
People friendly streets

No
THE HOLISTIC IMPACT ASSESSMENT APPROACH – COMBINING CBA AND MCA
The proposed approach

- Simplified method based on MCA and optional CBA
- Steps:
  1. Describe project and alternatives
  2. Identify effects and indicators
  3. Impact assessment
  4. Normalisation
  5. Criterion weighting
  6. Visualisation and interpretation
  7. Sensitivity analysis
  8. Communicate results

Broad range of indicators can be included!
Translate the performance figures to a comparable scale

**Maximum score approach:**

\[ \text{Score } C1(A) = \frac{x_{C1(A)}}{x_{C1(\text{max})}} \times F_{scale} \]

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Normalised score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Diesel</td>
</tr>
<tr>
<td>Investment</td>
<td>- €6.22m</td>
</tr>
<tr>
<td>Operation/Maintenance</td>
<td>- €6.82m</td>
</tr>
<tr>
<td>CO(_2) emissions</td>
<td>-60.2kt</td>
</tr>
<tr>
<td>Passenger comfort</td>
<td>-4</td>
</tr>
</tbody>
</table>
### Example - Results

<table>
<thead>
<tr>
<th>Impacts</th>
<th>CBA</th>
<th>Normalised score</th>
<th>Weights</th>
<th>Weighted normalised scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Diesel (BAU)</td>
<td>CNG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monetary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment</td>
<td>-€6.22m</td>
<td>-€9.72m</td>
<td>-€3.5m</td>
<td>-6.4  -10</td>
</tr>
<tr>
<td>Maintenance</td>
<td>-€2.4m</td>
<td>-€3.6m</td>
<td>-€1.1m</td>
<td>-6.8  -10</td>
</tr>
<tr>
<td>Fuel</td>
<td>-€4.4m</td>
<td>-€2.4m</td>
<td>+€1.9m</td>
<td>-10   -5.4</td>
</tr>
<tr>
<td>GHG emission</td>
<td>-€1.22m</td>
<td>-€1.16m</td>
<td>+€0.06m</td>
<td>-10   -9.6</td>
</tr>
<tr>
<td>Local air pollution</td>
<td>-€5.4m</td>
<td>-€4.6m</td>
<td>+€0.8m</td>
<td>-10   -8.4</td>
</tr>
<tr>
<td>Economic results</td>
<td>∑-€19.6m</td>
<td>∑-€21.4m</td>
<td>BCR: 0.63</td>
<td>-600.8  -643.6</td>
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<tr>
<td>Non monetary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise</td>
<td>-6</td>
<td>-2</td>
<td>-10</td>
<td>-3.3  -100</td>
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<tr>
<td>External city image</td>
<td>1</td>
<td>3</td>
<td>3.3</td>
<td>10    29.7</td>
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<tr>
<td>Passenger comfort</td>
<td>-4</td>
<td>-1</td>
<td>-10</td>
<td>-2.5  -50</td>
</tr>
<tr>
<td>PT non-user comfort</td>
<td>-5</td>
<td>-1</td>
<td>-10</td>
<td>-2    -40</td>
</tr>
<tr>
<td>Overall results</td>
<td></td>
<td></td>
<td>-63.5</td>
<td>-41.2  -761.1</td>
</tr>
</tbody>
</table>

An economic assessment can be integrated!
Example - Results

**Diesel (BAU)**

- Score: -63.5
- BCR: 0.63
- Score: -41.22

**CNG**

- Weighted Score: -761
- Weighted BCR: 0.63
- Weighted Score: -607
New options for data collection and low cost measures

Positive incentives through technology

Smarter transport choices
- Mode
- Time
- Share
- Stay
- Adapt

Reduced use of CFV enabling carbon and energy benefits

http://empowerproject.eu/
Conventional assessment methods are often not suitable for sustainable mobility measures.

Approaches like the TIDE impact assessment method account for a wider variety of effects.

A range of decision support tools exist for individual purposes.

→ Integrated Transport Planning needs integrated assessment and decision support tools.

→ What is needed in terms of assessment and decision support tools to accelerate the implementation of sustainable transport measures?

→ Is it possible to combine existing decision support tools?
THANK YOU

Further information:

Impact assessment methodology for urban transport innovations - A handbook for local practitioners

Methodologies for cost-benefit and impact analyses

www.tide-innovation.eu

http://evidence-project.eu
References (extract)


