SOLUTIONS: Current issues in assessment

Gordon Mitchell, Anil Namdeo & Sarah Gawthorpe

School of Geography, University of Leeds
Institute for Transport Studies, University of Leeds
Overview

- Appraisal Framework
- Issues in Assessment
  - Generic issues
  - Criteria selection
  - Criteria prediction
  - Summative assessment
- Key issues summary

Edge expansion
(Source: Cambridge Futures)
SPECIFY ISSUES & ASSESSMENT CRITERIA

SPECIFY DESIGNS (City, neighbourhood)

SCOPING ASSESSMENT (OPTIONAL)

ASSESSMENT
- City LUTI modelling
- Zonal interaction; Microsimulation
- Neighbourhood design exercise

ENHANCED ASSESSMENT

REPORTING / SUMMATION

Assessment
What is an appropriate assessment baseline?

- A trend baseline can halve apparent impact (EAC, 2005)
- SOLUTIONS?
  A trend baseline is OK for comparing ‘forms’ with the same growth rate
Environmental feedback?

- Environmental quality a key factor in household / firm location choice

- Key criteria (Buttner et al. 2003):
  - Air quality & noise important at disaggregate spatial level;
  - Density and open space at the zonal level

- SOLUTIONS aims to quantify factors at necessary scale, but unable to feedback to LTM given WP schedule
Sensitivity testing?

- Results robust under exogenous variable assumptions?
  - Demographic change
  - Economic growth
  - Fuel prices
  - Technology

- Limited opportunity for ST using the LASER model (£)

Potential for more ST for other case study cities?
INCLUDED, e.g…

- Land take – exclude as value is factored into CBA?
- Vitality – excludes as pre-judges a sustainable urban form?

EXCLUDED, e.g…

- Water demand
  ODPM SCP criticised for lack of attention to water
  Safe to exclude water demand as a variable insensitive to urban form?

- Any double counting?
- Sensitive to LU/T?
- Any fatal omissions or exclusions?
Criteria prediction issues

A. Capital investment?

- Assume investment for trend applies to all options to simplify assessment

- Realistic?
  Different forms imply different infrastructure solutions
  - some may be counter-intuitive

- Need to assess utility demands?
B. Can LUTM for 4 case cities provide data needed for enhanced assessment?
C. Spatial disaggregation

Some criteria require higher spatial resolution:
- Population
- Exposure to pollution / noise
- Open space fragmentation / quality
- Equity

Need to develop LTM zonal data disaggregation capability

Existing network capability – but very large study area problematic?

PROPOLIS Vector-Raster routine
Spiekerman and Wegener (2000)
LASER network 1997-2016

1997 network
- 36,000 links
- 42,213 km

2016 network
- + 0.89% links
- + 0.97% total length

Link length, vehicle flow, vehicle speed to post-processing...
Toxic emissions

(LASER region; Trend option)

Provisional results
Fuel use and CO₂ emission

(LASER region; Trend option)

Provisional results
Noise

(LASER region; Trend option)

Provisional results
Severance

(LASER region; Trend option)

Provisional results
Route Stress & Accidents
(LASER region; Trend option)

Provisional results
Summative Assessment

- **Performance matrix**
  - A ‘rich’ database essential for writing design guidance
  - Identification of ‘best’ designs difficult – aggregation also needed
    - Reductive systems?
    - Directional system?
    - Weighting systems?

<table>
<thead>
<tr>
<th></th>
<th>£</th>
<th>CO₂</th>
<th>Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design 1</td>
<td><img src="#" alt="Green" /> <img src="#" alt="Red" /> <img src="#" alt="Red" /></td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Design 2</td>
<td><img src="#" alt="Red" /> <img src="#" alt="Green" /> <img src="#" alt="Green" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design 3</td>
<td>--</td>
<td><img src="#" alt="Green" /> <img src="#" alt="Red" /></td>
<td></td>
</tr>
<tr>
<td>etc</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A clear signal is needed!

Solutions
Reduction to common unit(s)

- Some reductive metrics…
  - Money ~ CBA / ISEW (£)
  - Ecological footprint (ha)
  - Quality of life indices

- Application to SOLUTIONS?
  - All are contentious to some degree
  - Application to pre-determined assessment criteria difficult:
    can reduce some criteria, but not all

London’s EF is 6.6 ha/capita cf. a global capacity is 2.18 ha/capita (GLA, 2003)
**Directional systems**

- **Advantages**
  - Widely used to show progress to / from a reference state or target
  - Simple; All criteria easily included
  - Highlighting extreme results guides mitigation / option choice

- **Problems**
  - Results sensitive to break points
  - ‘Inviolable thresholds’ (e.g. STA) preclude opportunity for trade-offs
  - Interpretation burden remains

*Arup’s Sustainable Project Assessment Routine tool*
**Scoring / Weighting (MCA)**

- **Advantages**
  - Widely used
  - Stakeholder values recognised
  - Clear option comparison
  - Cost-benefit ratio possible

- **Application to SOLUTIONS?**
  - Weighting controversial (but sensitivity test possible)
  - Relevant tool with just 4 options?
• **Criteria selection**
  Any fatal omissions or unnecessary inclusions? (See Table 1 of paper)

• **Criteria measurement**
  Which of the difficult to quantify criteria are most important? (see Table 2 of paper)

• **Criteria Summation**
  What system(s) of summative assessment will best support the performance matrices?
- Further details
  www.suburbansolutions.ac.uk

- Feedback please to
  g.mitchell@leeds.ac.uk

Thank you