The wider costs of large roads on health and wellbeing

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1 COMMUNITY SEVERANCE (BARRIER EFFECT)

- Road infrastructure and high motorised traffic levels and speeds reduce mobility of pedestrians
- Lack of methods to identify, measure, and monetise severance

2 A NEW METHOD TO MONETIZE SEVERANCE

A. Direct effects (on pedestrians)
  - Increased risk of social exclusion
  - Less physical activity
  - External effects of motorised traffic

B. Wider effects (on travel behaviour)
  - Do not travel → increased risk of social exclusion
  - Do not walk → less physical activity
  - Travel by car → external effects of motorised traffic

3 DIRECT EFFECTS

A. Stated preference survey

Each participant answers 8 questions, with different number of road lanes, median strip (Y/N), traffic levels, traffic speeds, and value of cost saving

B. Random-effects logit model

<table>
<thead>
<tr>
<th>Coeff.</th>
<th>Trade-off value with saving (£)</th>
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</thead>
<tbody>
<tr>
<td>Constant</td>
<td>●</td>
</tr>
<tr>
<td>Saving</td>
<td>●</td>
</tr>
<tr>
<td>Lanes=3</td>
<td>● 1.63</td>
</tr>
<tr>
<td>No medium strip</td>
<td>● 1.47</td>
</tr>
<tr>
<td>Density=medium</td>
<td>● 1.10</td>
</tr>
<tr>
<td>Density=high</td>
<td>● 2.45</td>
</tr>
<tr>
<td>Speed=30mph</td>
<td>● 0.50</td>
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Ex: On average, people are willing to forego a saving of £2.45 in order to avoid crossing a road with high traffic density (one time)

4 WIDER EFFECTS

A. Household survey

AND rate the amount of traffic on the busiest road near you

B. Multinominal logit model

C. Effect of high traffic levels on probability of each choice (vs. low traffic levels)

D. Effect on number of trips

E. Costs

Ex: The health costs of the reduction of walking trips caused by high traffic densities (comparing with low densities) are £38/year/person

5 CONCLUSIONS

- People attach a monetary value to avoid crossing a busy road. That value is an indicator of the disutility caused by motorised traffic on pedestrians
- High traffic densities decrease the probability of walking and increase the probability of using car or not travelling. The monetary values of the resulting changes in the number of walking, car, and total trips are indicators of the impact of traffic on health, external effects, and social exclusion