Accessibility Modelling for Healthcare Facilities Development: A Case of Reconfiguration Using GIS Tools

Omid Titidezh
Civil & Building Eng. Dept, Loughborough University, UK
Healthcare Improvement and Accessibility

- "To create a fairer NHS, we have to focus on improving access to health and social services", Darzi Review: Interim Report, October 2007
- "Poor access to healthcare imposes costs on both the patient and the health provider", Social Exclusion Unit "Making the Connections" 2003
- "around 20% of people find it difficult to travel to hospital; 32% without a car, 49% of local transport plans identify problems in transport access to health services. Half of older people have difficulty getting to London hospitals and a third to their doctor", Social Exclusion Unit
Healthcare Accessibility and Transport

- "The NHS accounts for 5% of all road traffic in England and travel is responsible for 18% of the NHS carbon footprint in England." Taking the Temperature-Towards an NHS response to Global Warning, 2007. London: NHS Confederation and NEF

- "Transport can be a barrier to accessing care. The Social Exclusion Unit estimates that 1.4 million people miss, turn down, or simply choose not to seek health care because of transport problems", Department of Health 2006 "Our health, Our care, Our say"

- "80% of respondents find it difficult to access healthcare other than by private car", North Cornwall PCT’s transport survey

- "Unemployment and low incomes are both linked to poorer health, which can be made worse in rural areas by limited access to transport", Dorset PCT Health Strategy, 2008 to 2011
Research Questions and Objectives

- Why the accessibility study for healthcare facilities is important?
- What are the transport implications to better accessibility to healthcare facilities?
- What are the most important factors to consider in terms of accessibility to a healthcare facility?
- How accessibility could be improved to provide fairer healthcare services?
- How people would be encouraged to access the healthcare facilities by walking, cycling or using public transport?
- How the role of accessibility can be integrated with EIA process?
Recommendation to Improve Accessibility of the Case Study
Loughborough and Hinckley

- In Loughborough: Loughborough General Hospital would move from Pinfold Gate in downtown to the Loughborough Hospital on Epinal way.
Loughborough and Hinckley

- In Hinckley: Hinckley and District Hospital in downtown, would move to Hinckley and Bosworth Community Hospital.
Questionnaire Design and Survey

- **Section 1 – purpose and mode of travel**
- **Section 2 – about individual sites**
- **Section 3 – further information**
- **Background Information (Optional)**
Survey and Data Analysis

- 256 web respondents
- 377 hard copy respondents

Travel frequency during past 12 months to the four hospitals:

- Patient: 500 to 600
- Visitor: 200 to 300
- Staff: 0 to 50

Hinckley, 147, 23%
Loughborough, 481, 77%
From and How

- Work: 7%
- Leisure: 0%
- Home: 93%

Usual mode of transport which is used for the healthcare service:

- Large Leicester hospitals
- Travel to the Dentist
- Travel to the GP
- Walk
- Cycle
- Motorbike
- Taxi/Friend
- Car
- Public Transport
- Ambulance
- Voluntary
## Items and Rank

Please rank the following items according to which has the highest importance for you when accessing the community hospital sites?

*(Please write your rank in the boxes provided where 1 is most important and 9 is least important. Please use all numbers 1 to 9)*

<table>
<thead>
<tr>
<th>Rank</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Travel time</td>
</tr>
<tr>
<td></td>
<td>Travel cost</td>
</tr>
<tr>
<td></td>
<td>Travel distance by foot</td>
</tr>
<tr>
<td></td>
<td>Quality of care provided to you</td>
</tr>
<tr>
<td></td>
<td>Building and facilities quality</td>
</tr>
<tr>
<td></td>
<td>Safe and secure street access</td>
</tr>
<tr>
<td></td>
<td>More services provided locally</td>
</tr>
<tr>
<td></td>
<td>Availability of public transport</td>
</tr>
<tr>
<td></td>
<td>Provision of car parking</td>
</tr>
</tbody>
</table>
Walking and Age

Maximum distance which is suitable to access a bus stop on foot

- Less than 100m (109 Yards) - 22%
- 100 -200m (219 Yards) - 15%
- 200–300m (328 Yards) - 9%
- 300–400m (437 Yards) - 7%
- 400–500m (547 Yards) - 5%
- More than 500m (547 Yards) - 42%

Age and maximum distance which is suitable to access a bus stop on foot

Distance (m) vs Age intervals (16-49, 50-59, 60-69, 70-79, 80+)

- 0-200 m
- 200-500 m
- 500+ m
6700 users can access to the hospital:

- Max 200m walking to get the bus stop
- Max 10 min by using bus
- Max 250m walking to the hospital location
Recommendations

- **STUDY APPROACHES**
  - Survey
  - Existing Data
  - GIS Modeling

- **SITE SPECIFICATION**
  - Infrastructure
  - User Concerns
  - Care close to home

- **SCENARIO TECHNIQUES**
  - Current Situation
  - Future Demand
  - Future Transport arrangement
Thanks for your attention

cvot@lboro.ac.uk