The science and politics of Promoting Physical Activity in urban spaces

Cross-Cultural Perspectives on Urban Sustainability and Health: Smart Solutions for Smart Cities in India

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What affects our decision to Walk?

• Major Factors
  • Availability of Walking spaces (Density domain)
  • Accessibility of Walking spaces (Safety Domain)
  • Awareness of need for PA (Knowledge domain)
  • Affordability (Time) for doing PA (Economic domain)

• Physical Environment
  • **Pavement:** Width and height of Pavement, Obstructions, Continuity, Integration with other levels
  • **Parks** – Cleanliness, Safety, **Air-pollution**
### Walkability Score – An environmental assessment tool

<table>
<thead>
<tr>
<th>Domain</th>
<th>Sub-domain</th>
<th>Variable</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street</td>
<td>Foot path</td>
<td>Presence</td>
<td>Absent</td>
<td>Present</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Type</td>
<td>Mud</td>
<td>Bricked</td>
<td>Tiled/cemented</td>
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<tr>
<td></td>
<td></td>
<td>Status</td>
<td>Discontinuous</td>
<td>Continuous</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Obstructions</td>
<td>Complete</td>
<td>Partial</td>
<td>Absent</td>
</tr>
<tr>
<td>Street lights</td>
<td></td>
<td>Presence</td>
<td>Absent</td>
<td>Present</td>
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<tr>
<td></td>
<td></td>
<td>Nature</td>
<td>Discontinuous</td>
<td>Continuous</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Condition</td>
<td>Majority not working</td>
<td>Majority working</td>
<td></td>
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<tr>
<td>Zebra crossing</td>
<td></td>
<td></td>
<td>Absent</td>
<td>Present</td>
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<tr>
<td>Fast running vehicles</td>
<td></td>
<td>Garbage disposal</td>
<td>Disposed openly everywhere</td>
<td>Disposed in a restricted area</td>
<td>Disposed in dustbins/No open disposal</td>
</tr>
<tr>
<td>Transport</td>
<td></td>
<td>Bus stop</td>
<td>&gt; 1km</td>
<td>&lt; 1km</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Auto stop</td>
<td>&gt; 1km</td>
<td>&lt; 1km</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other transport</td>
<td>&gt; 1km</td>
<td>&lt; 1km</td>
<td></td>
</tr>
<tr>
<td>Access to Facility</td>
<td>School</td>
<td>Outside the community</td>
<td></td>
<td>Within the community</td>
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<td></td>
<td>General store</td>
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<tr>
<td></td>
<td>Parks</td>
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<td></td>
<td>Recreational centers</td>
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<td></td>
<td>Gym</td>
<td></td>
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<td></td>
<td>Play ground</td>
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</table>
Neighborhood environment Audit of Ballabgarh

• **Community Audit:** A process of direct observation in which the researcher directly goes into the community to measure its various attributes.

• 10 colonies in Ballabgarh (Haryana) were studied.

• Key results:
  - Density of PA sites – 6.9 per square kilometer
  - Median (95% CI) community walkability score: 9.8 (7.5-10.5)
  - Proportion physically inactive: 56%
  - Proportion indulging in leisure time physical activity: 28%
  - Mean Hours spent in recreation-related physical activities/ week (mean) 1.3 (1.0-1.7)
Community Audit - Indore

- 90 clusters from 30 randomly chosen wards from Indore (Madhya Pradesh)

<table>
<thead>
<tr>
<th>Domain</th>
<th>Indicator</th>
<th>Indore (2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neighborhood Environment</strong></td>
<td>Median Number of parks per colony</td>
<td>1 (0-1)</td>
</tr>
<tr>
<td></td>
<td>Median Community walkability Score</td>
<td>8.5 (8-10)</td>
</tr>
<tr>
<td><strong>Physical Activity</strong></td>
<td>Proportion physically inactive (%)</td>
<td>24 (22-26)</td>
</tr>
<tr>
<td></td>
<td>Hours spent in travel-related physical activities/week (mean)</td>
<td>5 (4-6)</td>
</tr>
<tr>
<td></td>
<td>Hours spent in recreation-related physical activities/ week (mean)</td>
<td>&lt;1 (0-0)</td>
</tr>
<tr>
<td><strong>Overweight</strong></td>
<td>Body mass index (Kg/M2) (mean)</td>
<td>26 (26-26)</td>
</tr>
<tr>
<td></td>
<td>Overweight or obese (WHO cut-off) (%)</td>
<td>54 (50–59)</td>
</tr>
</tbody>
</table>
Quality of Parks in Indore

Of the 67 PA sites, 77% had free access, 37% were restricted for use by children.

![Bar chart showing various amenities at green sites and their percentages](chart1.png)

Of the 67 PA sites, 77% had free access, 37% were restricted for use by children.

### Various Amenities at the green sites (n=67)

- Free Space: 91%
- Benches: 88%
- Garbage bins: 78%
- Street Lights: 83%
- Open Gymnasium: 36%
- Walking Track: 68%

### Proportion of parks with litter or security hazards (n=67)

- Garbage: 22%
- Dung/faeces: 13%
- Broken Glass: 8%
- Liquor Bottles: 3%
- Drug paraphernalia: 18%
- Open/Drain manhole: 13%
- Gamblers: 6%
- Drunkards: 24%
- Stray Animals: 12%
- Absence of Security: 49%
The Chennai Urban Population Study [CUPS] Physical activity using a validated tool was collected among 479 individuals at baseline (1998) in Asiad colony and among 705 people after seven years (2004)

**Intervention:** Education regarding the benefits of physical activity provided by mass awareness programs like public lectures and video clippings. In response to the awareness programs, the colony residents constructed a public park with their own funds.

**RESULTS:** The number of subjects who walked more than three times a week increased from 13.8% at baseline to 52.1% during follow-up \([p < 0.001]\).

**CONCLUSION:** This study is a demonstration of how community empowerment can lead to increased physical activity.

Delhi Experience : Bus Rapid Transit (BRT) Corridor

• An open BRT system from Ambedkar Nagar to Moolchand flyover (5.8 km.) since April 2008.

• Traffic segregated into bus lanes (PT), motorized vehicle (MV) lanes and Non-motorized transport (NMT; cycles and pedestrians)

• Integrated Automatic Signaling system minimizes conflicts.

• Cyclists move on 2.5 m wide segregated outer lanes on both the sides of the corridor. Features to reduce vehicular and ensure safety included.

• Continuous & wide footpaths provided on both sides of the road to support existing pedestrian flows.
## Impact of BRT Corridor in Delhi

<table>
<thead>
<tr>
<th>Domain</th>
<th>Indicator</th>
<th>Non-Motorized Transport</th>
<th>Public Transport</th>
<th>Personal Motor Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>Average speed of vehicle (kmph)</td>
<td>Mixed Traffic</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Walk - 4 Cycle - 8</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BRT</td>
<td>Walk - 4 Cycle - 12</td>
<td>17</td>
</tr>
<tr>
<td>Time</td>
<td>Total time saved (%) if travel the entire stretch</td>
<td>Vehicle users</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>2500</td>
<td>12369</td>
<td>11790</td>
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<tr>
<td></td>
<td></td>
<td>Mean time saved per user* N of users</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>Safety</td>
<td>Probability of meeting a fatal accident per 100,000 total users of the system/mode</td>
<td>Pre-BRT</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>0.095</td>
<td>0.000</td>
<td>0.006</td>
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<tr>
<td></td>
<td></td>
<td>Post BRT</td>
<td>0.002</td>
<td>0.000</td>
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</tbody>
</table>

Fate of BRT in Delhi and rest of India

• Delhi BRT was disbanded in 2016 being branded as a “FAILURE”.

• Major reasons
  • Motorists in Delhi wealthier than bus passengers/ cyclists and walkers.
  • “Too little, Too Late”-
    • Poor implementation – covered a short stretch, traffic management of feeder roads were not planned appropriately.
    • Carving out bus lanes from existing overcrowded 3 lane roads, with leftmost lane used by hawker/parking/stuck trucks.

• Other Cities adopting the BRT concept
  • Ahmedabad (Janmarg system 45 km long). Surat and Indore are building complete systems as well, and Pune-Pimpri-Chinchwad, Naya Raipur, Hubli-Dharwad, and Bangalore, among others, are planning full systems.
Smart Cities Mission, India: opportunity not to be missed

- Centre will invest 14 million US$ for each of five years in 100 cities across the country

- Transport Features include
  - Creating walkable/cyclable localities – reduce congestion, air pollution.
  - Preserving & developing parks, playgrounds, and recreational spaces to enhance quality of life, reduce urban heat effects
  - Transit Oriented Development (TOD), public transport and last mile connectivity

Cities will strive towards attaining specified benchmarks in the services, including:

- Transport
- Building Planning
- Water Supply
- Solid Waste Management
- Sewerage and Sanitation
- Wi-Fi Connectivity
- Health Care Facilities
- Electricity
- Education
Air-Pollution – a new consideration in urban transport decisions

• Move towards improved public transport and clean vehicles/fuels
Conclusions

• Urban Environment including green spaces, public transport is key to promote physical activity of the population.

• We need to improve Science of measurement of urban environment
  • Multi-faceted measurements - Develop appropriate indicators, tools using GIS
  • Setting Norms for Built or neighborhood environment

• Evaluation of population level interventions are challenging
  • Academics must respond better to it and develop evaluation frameworks
  • Improve the communication of science to community

• Engaging with Community & Policy makers
  • Community Empowerment is essential for success of any such program.
  • How can we engage with politics of it more meaningfully?