ANALYSIS OF PERFORMANCE EVALUATION FOR BUS BASED PUBLIC TRANSPORT WITH REFERENCE TO SERVICE LEVEL BENCHMARKS

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Objective

• To evaluate the Level of Service being offered by BRTS, City Bus and Mini Bus Services in Bhopal, based on the User Opinion Survey

• Compare the scores achieved with respect to User Perception and the LOS achieved on Service Level Benchmarks (SLBs)
Methodology

1. Literature Review
2. Identification of various Evaluation Parameters
3. Comparative Analysis of Indian Methodology for Evaluation and User Perception for Public Transport
4. Study the prevalent Public Transport Evaluation Process in India & abroad
5. Study findings, Conclusions and Recommendations based upon Analysis
Literature Review

- According to World Bank Report on “Monitoring and Evaluation for Results” Benchmarking has been described as below:

To benchmark is to compare performance against a standard. As part of an effort to improve the effectiveness of Monitoring and Evaluation (M&E) in the policy cycle, benchmarking can be useful in three ways. First, benchmarking can help place an outcome in context. Was the achievement good, bad, or indifferent? Second, benchmarking can help assess the reasonableness of targets that may be set. Third, benchmarking can help identify specific regions or subgroups whose exceptionally good or poor results hint at what factors drive performance.

- Definition clearly highlights that Benchmarking is a tool for Evaluation and Monitoring the Process and Outcomes
Literature Review

- National Coordinating Centre for Public Engagements, Bristol - Briefing Report, Series 1 titled “Summary: Auditing, Benchmarking and Evaluating Public Engagement” states that for effective evaluation, the flow of enquiry is as below:

- Audit
- Benchmarking
- Evaluation
Literature Review

- The Report also marked difference between Audit, Benchmarking and Evaluation, which are as below:

<table>
<thead>
<tr>
<th>Audit</th>
<th>Benchmarking</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measures what is being done</td>
<td>Identifies problem areas and areas of excellence</td>
<td>Assesses the value of what is being done</td>
</tr>
<tr>
<td>A cyclical series of reviews</td>
<td>An ongoing process</td>
<td>A series of individual assessments over time</td>
</tr>
<tr>
<td>Collects routine data</td>
<td>Exchanges information</td>
<td>Collects complex data</td>
</tr>
<tr>
<td>Review of what practitioners actually do</td>
<td>Review of best practice in a sector</td>
<td>Evaluative research methodology can vary but should be rigorously defined</td>
</tr>
<tr>
<td>Not possible to generalise from the findings</td>
<td>Possible to make comparisons across a process or sector</td>
<td>Often possible to generalise the findings</td>
</tr>
</tbody>
</table>
Bhopal

- Bhopal, capital city of Madhya Pradesh, used to move on Tempos and Mini Buses.
- With JnNURM, Bhopal started operation of Bus based Public Transport Service under banner of BCLL
- BRTS System operational in Bhopal since October 2013.
- The interesting fact, till date almost 200 Mini Buses, which offer inferior quality service to commuters, are operating on the road, profitably, major question – Why?
## Indian Benchmarking Practice

### Public Transport facilities

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&gt;= 60</td>
<td>&gt;= 0.6</td>
<td>&gt;= 1</td>
<td>&lt;=4</td>
<td>&lt;= 1.5</td>
<td>75 - 100</td>
</tr>
<tr>
<td>2</td>
<td>40- 60</td>
<td>0.4 - 0.6</td>
<td>0.7 - 1</td>
<td>4 - 6</td>
<td>1.5 - 2.0</td>
<td>50 - 75</td>
</tr>
<tr>
<td>3</td>
<td>20 - 40</td>
<td>0.2 - 0.4</td>
<td>0.3 - 0.7</td>
<td>6 - 10</td>
<td>2.0 - 2.5</td>
<td>25 - 50</td>
</tr>
<tr>
<td>4</td>
<td>&lt; 20</td>
<td>&lt; 0.2</td>
<td>&lt; 0.3</td>
<td>&gt; 10</td>
<td>&gt; 2.5</td>
<td>&lt;= 25</td>
</tr>
</tbody>
</table>

**Overall Level of Service of Public Transport facilities City wide**

Calculated Lost = (Lost1 + Lost2 + Lost3 + Lost4 + Lost5 + Lost6) and identify overall Lost as mentioned below

<table>
<thead>
<tr>
<th>Overall Lost</th>
<th>Calculated Lost</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt; 12</td>
<td>The City has a good public transport system which is widespread and easily available to the citizens. The system provided is comfortable.</td>
</tr>
<tr>
<td>2</td>
<td>12 - 16</td>
<td>The City has public transport system which may need considerable improvements in terms of supply of buses/coaches and coverage as many parts of the city are not served by it. The frequency of the services available may need improvements. The system provided is comfortable.</td>
</tr>
<tr>
<td>3</td>
<td>17 - 20</td>
<td>The City has a public transport system which may need considerable improvements in terms of supply of buses/coaches and coverage as most parts of the city are not served by it. The frequency of the services available needs improvements. The system provided is not comfortable as there is considerable overloading.</td>
</tr>
<tr>
<td>4</td>
<td>21-24</td>
<td>The city has very poor/no organized public transport system</td>
</tr>
</tbody>
</table>
Evaluating PT in Bhopal on SLBs

• Data collected from Bus Operators / BCLL
• Data Collected on:
  – Bus Available
  – Staff
  – Operating expenditure
  – Station Boarding/Alighting
  – Route wise Ridership
Evaluating PT in Bhopal on SLBs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Calculation</th>
<th>Value</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence of Organized Public Transport System in Urban Area (%)</td>
<td>220/520</td>
<td>42 %</td>
<td>2</td>
</tr>
<tr>
<td>Extent of Supply Availability of Public Transport</td>
<td>220/2000</td>
<td>.11</td>
<td>4</td>
</tr>
<tr>
<td>Service Coverage of Public Transport in City</td>
<td>232/697</td>
<td>.33</td>
<td>3</td>
</tr>
<tr>
<td>Average Waiting Time for Public Transport User (mins)</td>
<td>20</td>
<td>--</td>
<td>2</td>
</tr>
<tr>
<td>Level of Comfort in Public Transport</td>
<td>.72</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>%age of Fleet as per Urban Bus Specification</td>
<td>220/520</td>
<td>42 %</td>
<td>3</td>
</tr>
</tbody>
</table>

| LOS Achieved Overall LOS                                                  | 15          | 2     |     |
User Perception Survey
Methodology

Score Calculation:

Users were asked to rate the service parameter in the range of 1 to 10 marks (1 being lowest and 10 highest)

Cumulative Score for each System was calculated and was converted into percentage taking the number of responses in consideration.
Study Details

The interviews were conducted at following Bus Stops
- Board Office Square
- Habibganj Railway Station

<table>
<thead>
<tr>
<th>Service Type</th>
<th>Commuter Interview (in nos.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus Rapid Transit (BRT)</td>
<td>38</td>
</tr>
<tr>
<td>City Bus</td>
<td>34</td>
</tr>
<tr>
<td>Mini Bus</td>
<td>36</td>
</tr>
</tbody>
</table>
Glimpse of the Survey
Survey Findings

• It was observed that female passengers preferred BRTS over Mini Bus service.
• Age Distribution in the BRTS is Normative whereas Mini Bus users are in the age group of 20-50 years, and is least preferred by the Young and Elderly.
Survey Findings

• More than 70% of BRTS users are holding Graduate or above Degree whereas more than 75% of the Mini Bus users are under Graduate.

• More than 60% users of Mini Bus service have monthly income less than 10000
Survey Findings

Marks scored by various Bus based PT System
Survey Findings

**Accessibility:** As per the survey, BRTS System scored highest (65%), and Mini Bus scored (38%) in Accessibility criteria.
Survey Findings

- **Safety**: BRTS scored 80% whereas Mini Bus scored 35%
- **Frequency**: Mini Bus scored 62% whereas City Bus and BRTS scored 58%, 41% respectively. In other words, the frequency of BRTS Service is even inferior to the City Bus service.
Survey Findings

**Driver Behavior:** Scores achieved by BRTS and City Bus, are 80% and 70% respectively. It was observed that Mini Bus Drivers and Conductors are not properly dressed and force the passengers to board their bus (to maximize profits) and this ended up in users giving only 40% score to Mini Bus Service in Driver Behavior criteria.
Survey Findings

**Speed/Travel Time:** The scores of BRTS, City Bus and Mini Bus Services are 82%, 61% and 45% respectively. The scoring clears that BRTS service is the fastest Public Transport Service in Bhopal, as perceived by Commuters.
Survey Findings

**Space Availability:** As per the survey, City Buses are the most crowded, followed by Mini Bus and BRTS. Commuters gave 79% marks to BRTS, 65% marks to Mini Bus, whereas City Bus Service scored only 40% on the Space Availability criteria.
**Survey Findings**

**Cleanliness/Hygiene:** The users gave only 28% marks to Mini Bus on Cleanliness criteria whereas BRTS and City Bus scored 85%, 78% respectively.
Survey Findings

**Comfort:** The Mini Bus Service scored nearly 20% whereas BRTS and City Bus Service scored 90% and 78% respectively, making BRTS as most comfortable service.
Survey Findings

**Value for Money:** As per the user interview, the fare range of BRTS Service is from INR 10 – INR 30 whereas that of City Bus fare range is INR 8 – INR 25. On the other hand, Mini Bus service is offered on fare slab of INR 5 – INR 10 – INR 15 only. On many parallel stretches the fare of BRTS is just double that of Mini Bus fare. The users on Value for Money criteria gave BRTS, City Bus and Mini Bus service 50%, 53% and 78% respectively.
Survey Findings – Final Scores

The scores of various parameters were added and the average mark scored by each Service was calculated. BRTS scored maximum 73.9%, followed by City Bus Service which scored 62% marks and lastly Mini Bus service, which scored 47.2% marks.
Comparative Analysis of Scores

Mini Bus service can improvise upon the Safety, Comfort and Cleanliness parameters. Mini Bus service has scored well in Frequency, Seat Availability and Value for Money.

BRTS and City Bus services are Comfortable, Safe and Clean but need to work on Last Mile Connectivity, Accessibility, Frequency, and must review Fare Structure to increase the patronage and Scores.
Scores by PT Users

- In previous study the scores given by users to Mini Bus, City Bus and BRTS Service is as below:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Service Type</th>
<th>Fleet Size</th>
<th>Score Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mini Bus</td>
<td>300 (approx)</td>
<td>47.2 %</td>
</tr>
<tr>
<td>2</td>
<td>City Bus</td>
<td>199</td>
<td>62.0 %</td>
</tr>
<tr>
<td>3</td>
<td>BRTS</td>
<td>20</td>
<td>73.9 %</td>
</tr>
</tbody>
</table>

Cumulative Score (Weighted Mean)

\[
\frac{(300 \times 47.2) + (199 \times 62.0) + (20 \times 73.9)}{519} = 53.90 \%
\]
Understanding from Literature Study

• Benchmarking Public Transport in India is a LOS based Evaluation
• Indian SLB have 6 categories of Benchmarks, which are as mentioned below:
  – Presence of organized Public Transport System in Urban Areas (in %)
  – Extent of Supply Availability of Public Transport
  – Service Coverage of Public Transport in City
  – Average Waiting Time for Public Transport users
  – Level of Comfort in Public Transport, and
  – %age of fleet as per Urban Bus Specification
Study Findings

• Scores achieved by PT Service of Bhopal
  – SLB --- LOS-2
  – The User’s Perception --- 53.90%

• Benchmarking not reflecting real time scenario

• Parameters and Methodology, needs rationale
Limitations & Challenges

- Data Collection visit to Office/Depot revealed following Limitations and Challenges, in Indian context
  - Inadequate Staff
  - No budget for extensive Survey requirement
  - Less Technical Know How and Analytical Skills
  - Lack of Disclosure, Reporting & Monitoring mechanism
  - Lack of Incentives and Disincentives
Conclusions

Public Transport users are diverse. They have diverse characteristics like Gender, Age, Qualification, Income etc. The decision of establishing and operating a Public Transport service should not be focused to a particular Commuter Category rather should be inclusive.

The Public Transport service should not be evaluated in isolation, but it should be evaluated in regards to accessibility to the Transit Stop, First and Last Mile Connectivity, Integration of Public Transport with Land Use and with other Modes of Transport including Multi Modal Integration.
Conclusions

Public Transport should address the travel need of Mass and not just Class, as observed in the case of BRTS Bhopal.

The Benchmarking Parameters should also include the Financial Criteria for evaluating a particular system. A service well established but which is not affordable by the users, makes no sense. The fare mechanism should be introduced to make Purchasing Power of the users as one of the most important criteria in Fare Fixation.
Thank You !!