BENCHMARKING URBAN TRANSPORT-A STRATEGY TO FULFIL COMMUTER ASPIRATION

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What is Benchmarking ?

- 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

What is Benchmarking ?

- 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 |
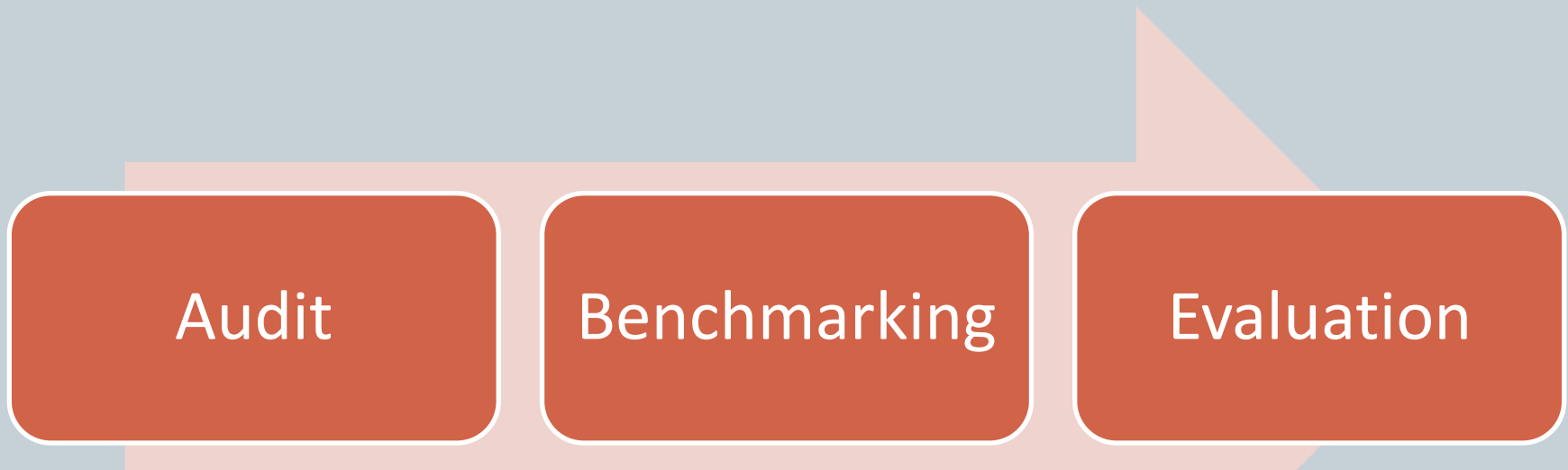
- This clearly indicate Benchmarking as an Evaluation Tool

Benchmarking UT in India

Public Transport facilities

Level of Service	1. Presence of Organized Public Transport System in Urban Area (%)	2. Extent of Supply Availability of Public Transport	3. Service Coverage of Public Transport in the city	4. Average waiting time for Public Transport users (mins)	5. Level of Comfort in Public Transport	6. % of Fleet as per Urban Bus Specification
1	>= 60	>= 0.6	>= 1	<=4	<= 1.5	75 - 100
2	40- 60	0.4 - 0.6	0.7- 1	4 – 6	1.5 – 2.0	50 - 75
3	20 - 40	0.2 - 0.4	0.3 - 0.7	6 – 10	2.0 – 2.5	25 - 50
4	< 20	< 0.2	< 0.3	> 10	>2.5	<= 25

Overall Level of Service of Public Transport facilities City wide

Calculated LoS = (LoS_1 + LoS_2 + LoS_3 + LoS_4 + LoS_5 + LoS_6) and identify overall LoS as mentioned below

Overall LoS	Calculated LoS	Comments
1	< 12	The City has a good public transport system which is wide spread and easily available to the citizens. The system provided is comfortable.
2	12 - 16	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.
3	17 - 20	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 over loading.
4	21-24	The city has very poor/no organized public transport system

Literature Study

Study Title	Indicators Identified
Benchmarking Accessibility and Public Transport Network Performance in Copenhagen and Perth	Financial Ratio, Service indicators, Resource utilization, Maintenance, Perceived Service quality, safety and security
Assessing the Performance of Public Transport operations in Dehradun	Presence of Organized PT System, extent of supply/availability of PT Sytsem, Service Coverage, Waiting Time, Level of Comfort, Bus specifications
City Services Benchmarking: Public Transport in San Francisco	Cost effectiveness and efficiency, Service Quality, Maintenance Administration, Productivity (delivered/perceived service quality)

Literature Study

Study Title	Indicators Identified
An analysis of Public Bus Transit Performance in Indiana	User service, Financial performance, Bus productivity, labour productivity
Benchmark Rankings for Transit Systems in the United States	Passenger Trips, Revenue, Speed, Expenses, Area Population, Population Density, Fleet Size
Bus Transit Service Quality Monitoring in UK: A Methodological Framework	Physical indicators, Operational Indicators
Evaluating Urban Bus Performances: A Comparative Analysis of Brazilian Methodologies	Fleet Age, Service Depot, Fitness, Timetable, Fleet Size, Ridership, User Complaints, Penalties, Fleet Renewal Policy, Fuel Consumption (operating ratio)
Public Transport Performance Measurement System for Switzerland	TEMPORAL-On time performance, Headway adherance, Speed etc. SPATIAL-Passenger load, section ridership etc.
Service Level Benchmarks for Urban Transport, India	Presence of Organized PT System, extent of supply/availability of PT Sytsem, Service Coverage, Waiting Time, Level of Comfort, Bus specifications

Literature Study

Study Title	Indicators Identified
Quality Factors in Public Transport	Time, Space, Obstructions, Reliability, Availability
Guide to Sustainable Transportation Performance Measures	Accessibility, Bicycle and Pedestrian mode share, vehicle miles travelled per capita, Mixed land use percentage, affordability, PT occupancy, transit productivity
Transit Performance Measurement	Financial Indicators, Ridership, Routes, Service Quality, Level of Service-Revenue Miles, number of complaints, Safety
Transit System Evaluation Process	Physical parameters, Accessibility, vehicle miles travelled, occupancy, Transit and Operational productivity
A Balanced Approach to Normalizing Bus Operations Data for Performance Benchmarking	Passenger trip length, passenger kilometers, network efficiency, vehicle planning capacity, commercial speed, revenue and vehicle hours

Literature Study

Study Title	Indicators Identified
Two Level Evaluation of Public Transport Performances	Macro- Operation time, operating speed Micro- Dwell Time, Intersection delay, speed per segment, running time
Diagnosing Transportation: Developing Key Performance Indicators to Urban Transportation System	Affordability and Accessibility, Mobility, Operational efficiency, Environmental and Resource conservation, Safety
A Methodology for Performance Measurement in Public Transport Industry	Cost, Productivity, Resource utilization, Maintenance, Perceived Service Quality, Safety and security
Public Transport Capacity and Quality: Development of LOS based Evaluation Scheme	Time, Space, Obstructions, Reliability, Availability
A Framework for Urban Transport Benchmarking	Network Density, Asset Utilization, Occupancy, Safety, Reliability, Operating Ratio, Fuel consumption, age of bus fleet

Indicators – Physical

- Population of the City
- Fleet Size
- Utilization Ratio of Bus
- Depot and Maintenance Facility
- Average age of the Fleet
- No. of Breakdowns
- Carrying Capacity
- Bus Stops/Total Stops
- Ridership

Indicators - Operational

- Fleet Fuel Efficiency - Mileage (km/litre)
- Operating kilometers per day
- Revenue Miles
- Dead Run / Dry Run
- Duration of operation
- Passenger Kilometers
- Passenger Kilometers per litre
- Speed (Avg and Running)
- Maintenance Cost per Bus per Day

Indicators – Financial

- Operating Cost
- Traffic Revenue
- Operating Ratio and IRR
- Profit/Loss
- Fare Box Revenue as %age of Operating Cost
- Passenger Kilometers (Revenue) also termed as Bus Productivity
- Quantifiable Social Benefits

Indicators - Organizational

- Labour Productivity

- Staff per Bus

- Passenger Kilometers per Employee per day

- Incentives and Penalties

Indicators – Perception

- Passenger Density/Average Occupancy at given time
- Safety
- Cleanliness
- Satisfaction
- Number of Complaints/day
- Accidents/month
- Thefts or Sexual Harassment Cases/Month
- Illumination in Bus and Stops
- Fatalities per 1000 km
- On time Performance (%age)
- Online Tracking, VMS and ITS facility

Indicators - Social

- Provision for Travel Concession for elderly, differently able, Students and poor

- Monthly travel expenditure as %age of Salary

- Transfer of Inflation on Fares

- %age of total Trips on Public Transport

Indicators - Environmental

- Carbon Emissions
- Suspended Particulate Matters (SPM)
- Carbon Credits
- Modal Shift in favor of Public Transit
- Noise Level
- Per capita Energy Consumption
- Emission per km

Understanding of Benchmarking

- Benchmarking is a mean to Evaluate
- The Parameters for Benchmarking are an important factor for effective Benchmarking and Evaluation
- Parameters for Benchmarking Urban Transport can be broadly classified into following categories:
    - Physical
    - Operational
    - Financial
    - Organizational
    - Perception
    - Social
    - Environmental

Questions in Mind

- Is the present Public Transport Service Evaluation Process, based on Service Level Benchmarks (SLBs) in India, reflecting current scenario ?

- Do we need to include other Parameters and Indicators for evaluating Public Transport and rationalize the Public Transport Evaluation Mechanism ?

- What are the other Parameters and Indicators which should be included in the Evaluation Methodology to make it effective ?

- What is the perceived weight allocated by the User to various Parameters and Indicators used for Public Transport Evaluation ?

Basic Concept of Evaluation

Inter alia comparison amongst the Sample should be balanced

"Can we evaluate 2nd Std Student on Higher Secondary Scorecard ???"

No !!!

The Research

To *understand the Commuters and their Aspirations* from Public Transport Services operating in their City, a Study was carried out in various Public Transport Modes operating in Bhopal

About the Study

The interviews were conducted to understand the Commuter Profile at following Bus Stops
- Board Office Square
- Habibganj Railway Station

Service Type	Commuter Interview (in nos.)
Bus Rapid Transit (BRT)	38
City Bus	34
Mini Bus	36

Glimpse of the Survey

The Service

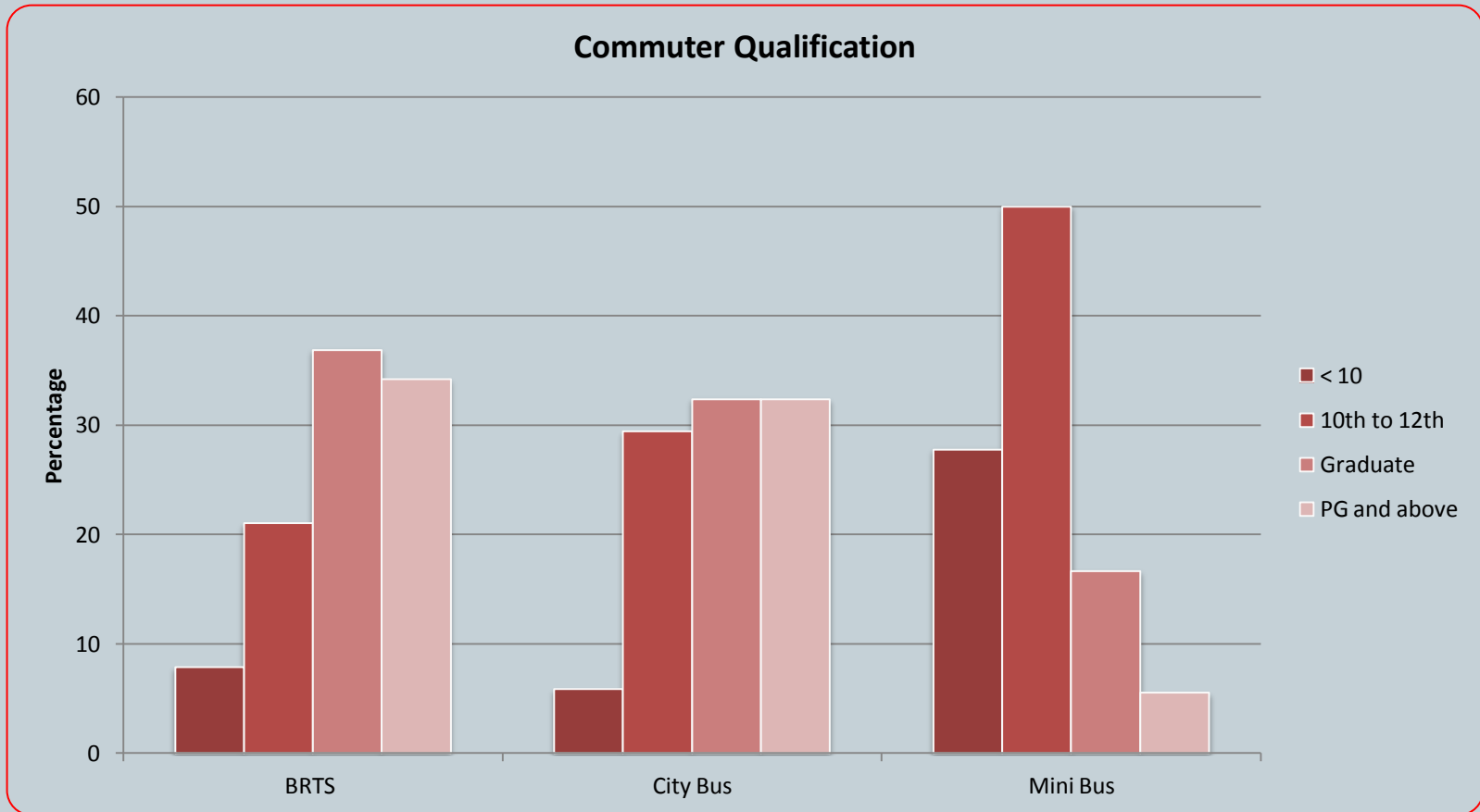The BRTS

Mini Bus Service

Standard Bus Service

The Survey Finding

Commuters Age Profile

The Survey Finding

Gender Profile bar chart showing Male and Female percentages across BRTS, City Bus, and Mini Bus transit types, with green downward arrows pointing to the Female bars.

The Survey Finding

Commuter Qualification

Legend:
- < 10
- 10th to 12th
- Graduate
- PG and above

Y-axis: Percentage (0–60)

X-axis categories: BRTS, City Bus, Mini Bus
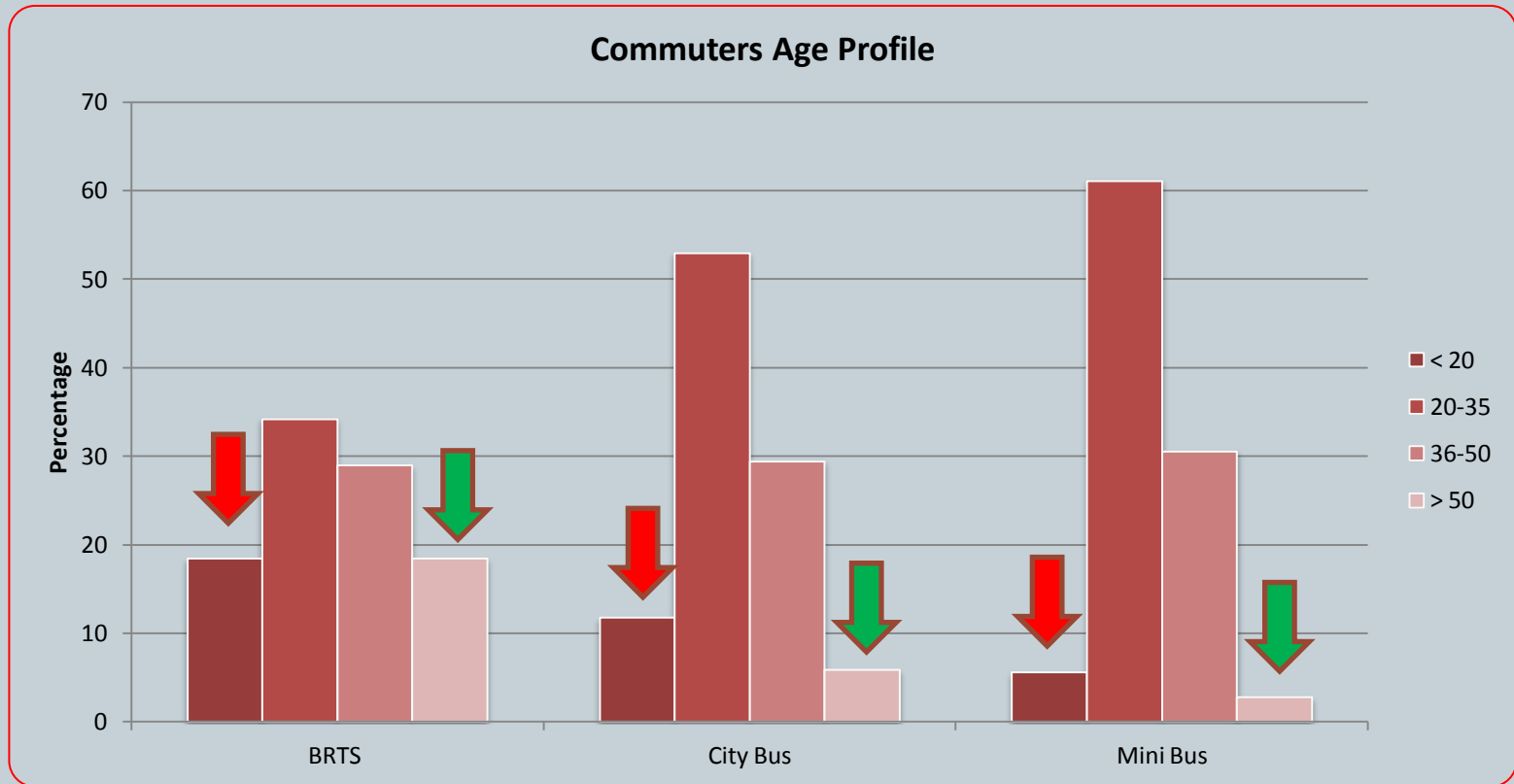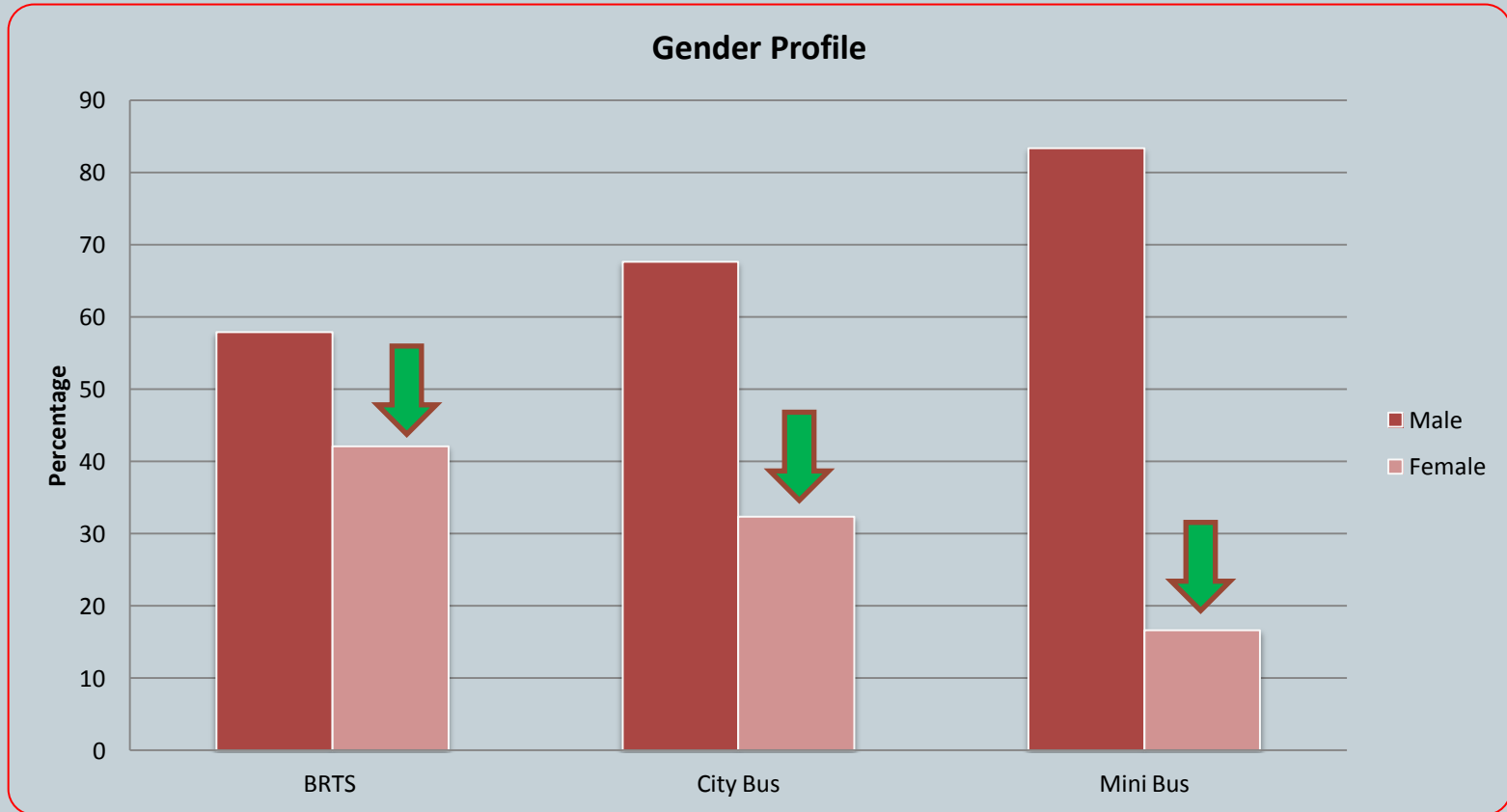
The Survey Finding

The Study Finding

The Respondents were also requested to rate the priority of the aforementioned identified attributes on the Scale of 1-10, where 1 is least important and 10 is most important, the analysis of this Response is still in progress.

The Study Findings

- It was quite evident from the Study that:

    - Aspiration of the Commuters from the Public Transport Service is having strong co-relation with the Socio-Economic Characteristic of the Commuter

    - The Benchmarking of the Service Levels offered by Public Transport, shall take into account, the Socio-Economic Character of the City

Research Outcome

Analysis on effectiveness and accuracy of current Benchmarking and Evaluation practice, in India

Set of Parameters and Indicators to evaluate Public Transport Services, with rationale for inclusion.

"A CITY/UA CLASSIFICATION based DYNAMIC SERVICE LEVEL BENCHMARKING METHODOLOGY for INDIAN CITIES"

Thank You !!!