Planning of Public Transport under PPP
### Composition of Vehicles (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>2 &amp; 3 Wheelers</th>
<th>Cars</th>
<th>Buses</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951</td>
<td>9</td>
<td>52</td>
<td>11</td>
<td>28</td>
<td>100</td>
</tr>
<tr>
<td>1971</td>
<td>31</td>
<td>37</td>
<td>5</td>
<td>27</td>
<td>100</td>
</tr>
<tr>
<td>1991</td>
<td>66</td>
<td>14</td>
<td>2</td>
<td>18</td>
<td>100</td>
</tr>
<tr>
<td>2012</td>
<td>76</td>
<td>13</td>
<td>1</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

- With 1% of vehicles as buses, the quality of public transport can be imagined?
## Vehicle Growth Rates

<table>
<thead>
<tr>
<th>Type of Vehicle</th>
<th>% of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two wheelers</td>
<td>13.3</td>
</tr>
<tr>
<td>Cars / Jeeps &amp; Taxis</td>
<td>12.2</td>
</tr>
<tr>
<td>Buses</td>
<td>4.6</td>
</tr>
<tr>
<td>Goods vehicles</td>
<td>8.4</td>
</tr>
<tr>
<td>Other Vehicles</td>
<td>8.8</td>
</tr>
</tbody>
</table>

*Source: CIRT report, 2015 – DPR for CERT*

- Public Transport vehicles (buses) have the lowest growth rates.
### STUs – Form of Organization

<table>
<thead>
<tr>
<th>Form of Organization</th>
<th>No. of STUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Transport Corporations</td>
<td>24</td>
</tr>
<tr>
<td>Govt. Companies</td>
<td>13</td>
</tr>
<tr>
<td>Municipal Undertakings</td>
<td>7</td>
</tr>
<tr>
<td>Govt. department undertakings</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>56</strong></td>
</tr>
</tbody>
</table>

*Source: CIRT Publication on STU performance, 2013-14*
# Share of Public Sector Buses

<table>
<thead>
<tr>
<th>Year</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>32</td>
</tr>
<tr>
<td>1976</td>
<td>45</td>
</tr>
<tr>
<td>2012</td>
<td>8</td>
</tr>
</tbody>
</table>

*Source: CIRT report 2015 on DPR for CERT*
Bus Service and Operations Design

- Travel demand assessment
- Route planning
- Operations plan – schedule, frequency, etc
- Fare structure and collection system design
- Costing and financial analysis
- ITS and control systems design
- Marketing strategy, branding and promotion
- Institutional options
Cumulative Annual Growth Rate (CAGR) of Population from 2001 to 2011 is 3.3% (2001-2011)

Population Gross Density in 2011 is 56 persons/ha whereas Net Density is 127 persons/ha
Work Participation Rate (WPR) has increased from 34.5% (2001) to 36% (2011)

Growth of workers in secondary sector is higher (CAGR-7.4%) compared to other sectors
Growth Direction of the City

LU&LC-1991 - Nashik city

LU&LC-2011 - Nashik city

Legend:
- built_Up
- vegetation
- fallow_Land
- Waste_Land
- Road
- Restricted
Travel Desire Line Diagram
Stages in Route Planning

- Rationalize Route Structure into:
  - Trunk Services
  - Standard Bus Services
  - Feeder Services
Route and Service planning for city bus service......
Methodology for Identification of Routes

1. Review of Secondary Literature
   - Identification of Data Gaps
     - Identification of Data to be Collected
       - Movement Pattern (OD)
       - Willingness to Pay / Shift
       - Existing PT / IPT Demand
       - Existing PT / IPT Supply
       - Existing Travel Characteristics
   - Reconnaissance Survey
     - Identification of Primary Surveys
     - Identification of Primary Network
   - Stakeholder Consultation

2. Data Analysis & Interpretation
   - Data Collation
     - Origin Destination
     - Boarding Alighting
     - Volume & Occupancy
   - Finalization of Survey Locations
     - Conducting Primary Surveys
     - Finalization of Routes & Infrastructure
     - Identification of Routes

3. Origin
4. Destination
5. Boarding
6. Alighting
7. Volume & Occupancy
Route Planning

Surveys to be conducted

- Road Network Inventory
- Classified Traffic Volume Count
- Origin and Destination Survey
- Speed and Delay survey
- Occupancy survey
- Bus Boarding-Alighting Survey
- Willingness to Pay Survey
Types of Bus Route Network

- **RADIAL** - Suitable for cities with strong central core around which the development has taken place. Population density reduces from CBD to fringes.
Types of Bus Route Network

- **RADIAL AND CIRCULAR** - Suitable for cities where the activity centers are developed along radial corridors
Types of Bus Route Network

- **GRID** - Suitable for cities having multiple activity centers spread uniformly through out
Types of Bus Route Network

- **TRUNK AND FEEDER** - Suitable for cities that have evolved linearly along a major corridor and the activity centers are spread parallel to the corridor.
Route Classification

- Corridor Routes
- Activity Routes
- Residential Routes
Types of Bus Route Network – **Trunk Route**
Route Planning
Nigadi to Shivaji Nagar
Route length – 17.8 Km
## Selection of Buses Based on Ridership

\[
\text{Fleet Size} = \frac{2 \times (\text{One Way Travel Time} + \text{Terminal Dwell Time})}{\text{Frequency}}
\]

<table>
<thead>
<tr>
<th>Bus size</th>
<th>Capacity (Seats)</th>
<th>Load Factor</th>
<th>PPHPD for head ways in seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>Head way in secs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Micro bus</td>
<td>12</td>
<td>0.70</td>
<td>1008</td>
</tr>
<tr>
<td>Mini</td>
<td>22</td>
<td>0.70</td>
<td>1848</td>
</tr>
<tr>
<td>Midi</td>
<td>34</td>
<td>0.70</td>
<td>2856</td>
</tr>
<tr>
<td>Standard 12 M</td>
<td>70</td>
<td>0.70</td>
<td>5880</td>
</tr>
<tr>
<td>3 axle 15 m</td>
<td>90</td>
<td>0.70</td>
<td>7560</td>
</tr>
<tr>
<td>Articulated 18 m</td>
<td>130</td>
<td>0.70</td>
<td>10920</td>
</tr>
<tr>
<td>Double arti 25 m</td>
<td>170</td>
<td>0.70</td>
<td>14280</td>
</tr>
<tr>
<td>Double deck</td>
<td>110</td>
<td>0.70</td>
<td>9240</td>
</tr>
<tr>
<td>Double deck Arti</td>
<td>230</td>
<td>0.70</td>
<td>19320</td>
</tr>
</tbody>
</table>
Infrastructure - Interchange Facilities

Interchange Location
- Karve Putla
- Maruti Mandir
- Pune Station
- Gunjan Talkies
- ISI Company
- NEI Company/Chandan Nagar
- Shadal Baba Durga
- Deccan College
- Vishrantwadi
- Dhayari Phata
- MG Stand
- Wakad Phata
- Dange Chowk
- Sangvi Phata
- Pune University Gate
- Shivaji Nagar Station
- PMC
- PMC
- Swargate
- Engineering College

Map showing locations including:
- Pune University
- Shivaji Nagar Station
- PMC
- Swargate
- Karve Putla
- Maruti Mandir
- Vishrantwadi
- ISL Company
- NEI Company
- Gunjan Theatre
- ISL Company
- NEI Company
- ISL Company
- NEI Company
A Cycle of Privatization in Passenger Transport

Before 1950

Private Sector

RTC Act, 1950
1950-1980

Public Sector

1980 onwards

Public Private Partnership

2005 onwards
Private sector in Passenger Transport
Evolution & Growth

- **Market Share of Private Sector**
  - 1951: 85%
  - 1961: 65%
  - 1971: 57%
  - 1981: 77%
  - 1991: 89%

- **Policy of ‘Nationalization’**
- **Growth of STUs**
- **Increase in Losses of STUs**
- **Nationalization Process Phased Out**
- **Central Funding Support withdrawn for loss-making**
- **STUs asked to cater to surplus demand through private sector**

- **Formation of STUs under the RTC Act of 1950**
- **7th Five Year Plan**

**Timeline:**
- 1951
- 1956
- 1961
- 1966
- 1971
- 1976
- 1981
- 1986
- 1991
- 1996
- 2001
- 2006
Private sector in Passenger Transport
Evolution & Growth

Market Share of Private Sector

- 1951: 85%
- 1961: 65%
- 1966: 57%
- 1971: 77%
- 1976: 89%

Financial allocation for STUs in budget outlay

- 1951: 7.4%
- 1961: 1.25%
- 1981: 11.1%
- 2001: 1.1%

Share of buses in total registered vehicles

Formation of STUs under the RTC Act of 1950

7th Five Year Plan
Private Sector in Urban Road Transport: Evolution and Growth

- 7th Five yr. Plan (1985-90)- Exclusive focus on urban transport
- Delinking of urban services from rural/inter city services of STUs
- Urban services an unviable proposition
- Loss making STUs keep showing interest in rural/inter city services
- Options for involvement of Private sector were explored
Early attempts at privatization in city bus services: Delhi

- **Kilometerage** Scheme launched in 1964 as “Kilometerage” Scheme
  - Hire Charges not acceptable to Private Operators
  - Scheme failed.

- The “Blueline Era”: Small-scale private operators given permits for operation
  - Unfair practices, unregulated operations.
  - Scheme ended in 2009.

- “Cluster” Scheme launched in 2009 on Gross Cost model.

- “AOCC” Scheme launched after failure of Kilometerage Scheme
  - Overlap of routes with DTC led to unfair practices on roads
  - Scheme called off in 1976.

- “Kilometer” Scheme relaunched in 1979 with higher acceptable Hire Charges.
  - Continued successfully until agitation by DTC workers against collection of fare in private buses
  - Eventually converted to “Charge n Retain” – Net Cost Model.
  - Got phased out owing to increase in input costs and infrequent fare revision.
The case for Public-Private-Partnership: Recent trends

- Policy thrust towards PPP in city bus operations in 2005
- National Urban Transport Policy, 2006
- Bus-funding scheme & “Jawaharlal Nehru National Urban Renewal Mission” (JnNURM)
- 61 cities, 27 Special Purpose Vehicles (SPVs)
City Bus Operations through PPP: recent attempts

- Basic philosophy behind PPP: Distributing to each the functions they are best capable of performing
- Began with ‘Indore Model’
Types of Contracts

- Gross Cost Contract
- Net Cost Contract
- Franchises
- Less Public Funding
- Less Regulation

Service Contract
(Most commonly used in Urban Bus Transport)

Competition for the Market

- Public Monopoly
- Less Regulation

Competition in the Market

- Concessions
- Quantity Licenses
- Quality Licenses
- Open Market

Para-Transit

Training Material in Contracting
Type of contract

Service Contracts

Cost Plus

Gross Cost

Route Based

Area Based

Kilometerage Cost
Operator states the unit costs of the service (cost per km, per hour or per vehicle day)
Ex. Helsinki (Finland)
Ex. Goteborg (Sweden)
AMTS
JANMARG
SITILINK
BOGOTA
Delhi -cluster

Minimum Cost
Operator states the whole cost of operating the contract
Ex. London (before 1993)

Cost per Passenger
Operators are repaid based on the cost per passenger
Ex. Santiago (Chile)

Net Cost

Route Based

Area Based

Min. Subsidy/Max. Premium
Operators state minimum subsidy required or maximum premium offered to the authority
Ex. London (after 1993)
Surat, Rajkot, Indore, Vadodara, Jodhpur, Delhi-Blue Line, Delhi Metro Feeder, Bhopal
The public authority reimburses operating costs plus a management fee.

The fares are collected by the public authority.

The operator does not bear either cost or demand risk.
## Cost plus Contracts – Pros and Cons

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contracting is simple</td>
<td>No incentive for operator to reduce costs, increase patronage or improve efficiency</td>
</tr>
<tr>
<td>Flexibility in change in services</td>
<td>Difficult for SPV to monitor costs</td>
</tr>
<tr>
<td></td>
<td>Revenue collection with SPV</td>
</tr>
</tbody>
</table>
Suitability of the Arrangement
Gross Cost Contract

- Authority has the resources to manage the revenue collection activity effectively
- Avoid on-street competition for passengers
- Wants to establish a sustainable procedure to constantly test the market (flexibility in changing the route, schedule, fleet size)
- To facilitate integration between modes
- Provide free or discounted interchange between all routes in all areas
- Avoid discrimination against concession fare passengers
- Greater compatibility with complex subsidy mechanism
- Avoid the need to apportion off bus revenues between operators
### Gross Cost – Pros and Cons

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy bid process and contract management</td>
<td>Risk of revenue leakage borne by public entity</td>
</tr>
<tr>
<td>Flexibility in changing schedules based on needs</td>
<td>No incentive for high ridership</td>
</tr>
<tr>
<td>Flexibility in changing fares</td>
<td>Need effective monitoring</td>
</tr>
<tr>
<td>Flexibility in changing in services</td>
<td>Financial commitments of public authority can be high</td>
</tr>
<tr>
<td>Limited potential for disputes</td>
<td>Higher cost of staffing, monitoring operation &amp; revenues</td>
</tr>
<tr>
<td>Better integration between modes/services</td>
<td></td>
</tr>
<tr>
<td>Avoid discrimination against concession fare passengers</td>
<td></td>
</tr>
</tbody>
</table>
Gross Cost with Incentives

• Quality Incentives

  □ Typically gross cost contracts with significant bonuses or penalties linked to service targets

• Revenue Incentives

  □ Typically gross cost contracts with incentives linked to revenue targets
Principles of Contract
Gross Cost Contract

Gross cost contract must incorporate the following:

• The agreement should specify the performance standards and quality standards
• The contract should specify the routes, stoppages and minimum frequency of the buses
• The agreement should provide for enforcement of the standards and norms mentioned above
• The agreement should specify the duration for which the arrangement is valid
• The agreement should specify extent to which the shared infrastructure can be used by the private operators
• In case there is a clause for escalation of the gross cost (consideration for the contract) then the agreement should specify the trigger points and formula for calculation of the escalated consideration
Suitability of the Arrangement
Net Cost Contract

- The demand for the bus service is established in an accurate and credible manner

- The transport authority does not have the inclination and/or the resources to manage the revenue collection activity

- The transport authority intends to transfer the demand risk to the private sector and the private sector has the appetite to take and manage the risk

- The authority wishes to give the operator an incentive to increase revenue and ridership

- The authority is comfortable on giving the operator some flexibility to amend routes and schedule to make the network as attractive as possible

- Not possible in the environment of unregulated externalities and regulated fare

- Not suitable in unregulated IPT market
<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of revenue leakage borne by operator</td>
<td>Risk of passenger capture techniques being adopted</td>
</tr>
<tr>
<td>Effective incentive for high ridership</td>
<td>Need to specify fares and other details upfront</td>
</tr>
<tr>
<td>Financial commitments of public entity are low</td>
<td>Complex tendering and contracting process</td>
</tr>
<tr>
<td></td>
<td>Difficult to make changes (route, schedule, fleet size) during contract period</td>
</tr>
<tr>
<td></td>
<td>Potential for disputes high</td>
</tr>
</tbody>
</table>
Principles of Contract
Net Cost Contract

Net cost contract must incorporate the following:

- The transport authority must decide on the allocation of initiative between itself and the operator. This defines the responsibility for taking the major decisions such as fare setting, levels of service and operations.

- The contract would specify the revenue share (shared by the operator with the authority) or the revenue grant levels (paid by the authority to the operator) and the terms of payment.

- In case the operator is sharing a portion of the revenue with the authority, then the contract must specify the revenue accounting and reporting requirements.

- The contract would specify the performance standards and quality controls standards.

- The contract may (depending upon who has the responsibility of the decision) specify the routes, stoppages and minimum frequency. Even if the private operator defines these aspects, the authority might provide some minimum levels to ensure basic service.

- The contract would specify the extent to which the operator can avail the common facilities.
Contract documents – Gross Cost

- Duration
- Fare revision
- Cost revision
- Provision of infrastructure
Contract documents – Net Cost

- Duration
- Fare revision
- Cost revision
- Provision of infrastructure
- Change in routes
- Change in service plan
Selection of appropriate model

Selection of contracting model depend on various factors:

- Capacity (financial as well as human resource) of public authority
- Risk appetite of private operators
- Legal and regulatory framework
- Competition from informal and IPT sectors

In Indian context gross cost contract with quality incentives most appropriate
Structuring contracts

- Risk allocation
  - Fare risk
  - Enforcement risk
  - Infrastructure risk
  - Pilferage/Leakage risk
  - Operational risk
## Distribution of Tasks and Risks

<table>
<thead>
<tr>
<th>Task</th>
<th>Gross Cost Contract</th>
<th>Net Cost Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production risk</td>
<td>Operator</td>
<td>Operator</td>
</tr>
<tr>
<td>Revenue risk</td>
<td>Authority</td>
<td>Operator</td>
</tr>
<tr>
<td>Fare specification</td>
<td>Authority</td>
<td>Authority</td>
</tr>
<tr>
<td>Frequency</td>
<td>Authority</td>
<td>Operator/Authority</td>
</tr>
<tr>
<td>Route extension / New route</td>
<td>Authority</td>
<td>Operator/Authority</td>
</tr>
<tr>
<td>Service planning responsibility</td>
<td>Authority</td>
<td>Operator</td>
</tr>
<tr>
<td>Service / Fare Integration</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Public sector Administration</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Monitoring requirement</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Service level quality</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Service quality control</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>On street competition</td>
<td>Low</td>
<td>High (if more than one operator for a route/zone)</td>
</tr>
<tr>
<td>Passenger Demand Response</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>No. of bidders</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Modal Integration</td>
<td>Easy</td>
<td>Difficult</td>
</tr>
</tbody>
</table>
Fundamental of Operations Contract

- Duration of services, scope of services
  (including operating schedule, time schedules, routes)
- Compliance with all laws, standards and requirements
- Performance standards
- Reporting obligations
- Penalties and incentives
- Financing and provision of additional services
- Provision of infrastructure facilities
- Sharing of non fare box revenues
- Cost and fare revision mechanism
Quality Indicators

Possible quality indicators

• Fleet utilization
• Vehicle utilization
• Up-keeping of the bus
• Adherence to Schedule, punctuality
• Crew behaviour, driving practices
• Customer information
• Customer service
• Equipment, special services
• Rate of accidents
Case Study - Bhopal

- SPV contracts and monitors
- Hand holding support by UMTC
- Buses procured by SPV (funded under JnNURM) and contracted to private operator on *net cost basis*
- No subsidy from SPV
- Exclusivity provided on routes initially but not enforced
- Automatic fare revision formula but not implemented
- Issues with expansion of service
- System sustainability: marginal profit
Case Study – Ahmedabad, BRTS

• SPV contracts and monitors
• Buses procured by operator and operating on gross cost + incentives basis
• Minimum guaranteed kms committed by SPV
• SPV has financial as well as manpower support from MC
• Fare revision linked with change in fuel price & WPI, periodic revision on 1st April of every year
• Cost/km revision wrt change in fuel & WPI
• Incentives/penalties linked with pre-defined performance parameters
• Change in schedule, fleet size at the discretion of SPV
• System sustainability: breaking even
Case Study - Jaipur

- SPV contracts and monitors

- Buses procured by SPV (funded by JnNURM) and operated by RSRTC on reimbursement of cost basis

- Fare collected by conductors of SPV

- SPV has no resources for monitoring

- No Fare revision mechanism

- Performance parameters- not defined

- System sustainability: in loss
Case Study – Mira Bhayandar

- SPV (MBMC) contract & monitor
- Financing of buses by private operator
- Royalty offered- Rs 1/km (Rs 180/bus/day) for 10 year
- Revenue to SPV (FY 11-12)- Rs 3.6 million
- Increase in royalty linked with increase in fare
- Fare revision mechanism- not defined
- Infrastructure for maintenance- by operator
- Performance parameters-defined
Fate of recent Attempts in PPP

- Kota
- Jalgaon
- Jodhpur
- Jaipur
- Rajkot
- DMRC feeder
- Jalandhar
- Vadodhra
- Ujjain
- Indore
- Bhopal

Closed or early terminated

Single operator
No system expansion since inception
Recent Attempts in PPP: Issues

<table>
<thead>
<tr>
<th>Change in the routes by the operators from the original routes</th>
<th>Original routes found unviable</th>
<th>No service on unviable routes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over crowding of passengers in peak hours</td>
<td>Underestimation of fleet size</td>
<td>Adverse for the image of public transport</td>
</tr>
<tr>
<td>Non-adherence to the schedule &amp; routes</td>
<td>Lack of effective monitoring</td>
<td>Lack of confidence among the commuters</td>
</tr>
<tr>
<td>Low level of participation during bidding</td>
<td>High risk anticipation</td>
<td>Operators only for viable routes, Monopoly in service</td>
</tr>
<tr>
<td>Poorly maintained buses</td>
<td>Lack of infrastructure</td>
<td>Image of the system affected Life of buses goes down</td>
</tr>
<tr>
<td>Absence of dedicated top level management</td>
<td>Necessity not appreciated</td>
<td>Lack of ownership of the overall system</td>
</tr>
<tr>
<td>Skeleton Staffing in the SPV</td>
<td>To prevent situation of STUs</td>
<td>Non-delivery of regulatory functions</td>
</tr>
</tbody>
</table>
Root Problems

1. Absence of Fare policy
2. Absence of a robust institutional structure
3. Inadequate operations planning for the system
Absence of Fare Policy

- Private sector doesn’t show much interest
- Private operator quotes low license fee
- Unwarranted practices post inception of operations

Absence of Fare policy
Absence of Robust Institutions

- Officers having additional responsibilities with short tenure - **short vision**
- Skelton structure of SPVs (2-3 employees with no job commitment) - **ownership**
- Not efficient to deliver the functions - **monitoring**
- Allocation of resources (land, right of adv.) - **maintenance & sustenance**
- Minimal paid up capital - **no financial independence**
Inadequate Operation Planning

- Routes changed after inception of operations
- Operation on only profitable routes
- Only viable routes bid out

- Inadequate operations planning
Before Contracting
- Identification of viable/unviable routes and formation of clusters
- Have a business plan ready (expenditure vs revenue \~ affordability \~ type of bus)
- Identification of suitable PPP model depending on route/cluster viability
- Provision of depot land & infrastructure for maintenance
- Exclusive administrator in SPV with no additional charge and longer tenure
- Minimum staffing in SPV for monitoring and regulation

During Contracting
- Fare revision & its implementation mechanism in place
- Compensation against concessions
- Concession period \( \geq \) design life of the bus
- Include all components of cost inputs while revising the cost/km (Gross cost)
- Provision of Initial Moratorium period (4-6 months)\- Net cost
- Link incentives/penalties with Service quality parameters

After Contracting /during operation
- Frequent monitoring of patronage for dynamic route/schedule planning
- Penal action (or provision) for freebees or defaulters
- Facilitate coordination with other departments i.e. traffic police, RTO
- Safeguard patronage through rationalization or regulating IPT
- SPV should play a role of a facilitator than a regulator
Existing National & State Road Network
Activity centers in bhopal city

- Core City
- New Market (CBD)
- Arera Col & Shahpura
- MP Nagar & Board Office
- BHEL
- Mandideep
- Urban Growth Center
- Urban Growth Center
- Bairagarh

Map illustrating the activity centers in Bhopal city.
# Urban Transport Scenario in 2009

<table>
<thead>
<tr>
<th>Modes</th>
<th>Share of passenger Trips (%)</th>
<th>Remarks (Total No. of Vehicles)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Transport Mode</td>
<td>5.3</td>
<td>Rapid Transit (0)</td>
<td>00.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard Bus (BCLL) (39)</td>
<td>05.3</td>
</tr>
<tr>
<td>Intermediate Public Transport</td>
<td>49.0</td>
<td>Mini-Bus (600)</td>
<td>31.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tata Magic (500)</td>
<td>12.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Auto (3,000)</td>
<td>05.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Taxi</td>
<td>00.5</td>
</tr>
<tr>
<td>Private Mode</td>
<td>37.4</td>
<td>Two Wheeler (300,000)</td>
<td>34.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cars (100,000)</td>
<td>4.9</td>
</tr>
<tr>
<td>Non-motorized Mode</td>
<td>8.3</td>
<td>Cycle + Cycle Van</td>
<td>8.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Mini Buses Operating Before Project Interventions
Mini Buses Operating Before Project Interventions
Rationalization of Existing Route Structure - Bhopal

- Rationalized Route Structure into:
  - Trunk Services, (BRT Buses)
  - Standard Bus Services (BCLL Bus)
  - Feeder Services (IPT i.e. Minibus and Tata Magic).

Network Developed

Traffic Assignment

Public Transit Assignment
Route Structure

- Four Level Public Transportation System envisaged:
  - Trunk Corridors (BRT Routes)
  - Standard Routes (BCLL Bus Routes)
  - Complementary Routes (for Mini Buses)
  - IPT Feeder Service (Tata Magic Routes)
Trunk Routes (BRT Routes)

- Trunk Routes connecting major activity centers by Bus Rapid Transit System.
  - Farthest Activity centre should be accessible within 45 min. of journey time
  - Peak hour Frequency <=5 min.
Standard Routes (BCLL Bus Routes)

• Standard routes connecting major origin destination pairs of the city.
  • Route length will be within 25km and average turn around time 1.5 to 2 hrs.
  • Sharing few links with Trunk routes.
Complimentary Routes (Mini Bus Routes)

• These are complementary to Trunk and standard routes.
  • Routes covering less dense Public transit demand corridors.
  • Route length will be within 15km and average turn around time 1.0 to 1.5 hrs.
IPT Feeder Service (Tata Magic Routes)

- These are feeder service to all above mentioned PT systems.
- Mainly catering intra-zonal trips.
- Maximum route length 6km.
Complementary & IPT Routes)
INTEGRATED PUBLIC TRANSPORTATION SYSTEM

- Trunk Routes (BRT)
- Standard Routes (BCLL Bus Routes)
- Complementary Routes (Mini Bus Routes)
- IPT Routes (Tata Magic Routes)
Route Rationalization for Bhopal City

- **Trunk Routes**: connecting major activity centers by Bus Rapid Transit System
- **Standard routes**: connecting major origin destination pairs of the city
- **Complementary/ IPT**: These are complementary feeder service to Trunk and standard routes
## Bus Fleet Estimation for Bhopal

### Bus Fleet Requirement for Trunk and Standard Bus Routes

<table>
<thead>
<tr>
<th>Route</th>
<th>Route Length in Kms</th>
<th>Existing No of Bus Stops</th>
<th>Proposed No of Bus Stops</th>
<th>Span of Operation in Hrs</th>
<th>Headway in Mins</th>
<th>Fleet (at 95% Fleet utilisation)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trunk Routes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR1</td>
<td>16.95</td>
<td>20</td>
<td>35</td>
<td>18</td>
<td>4</td>
<td>31</td>
</tr>
<tr>
<td>TR2</td>
<td>23.75</td>
<td>28</td>
<td>49</td>
<td>18</td>
<td>4</td>
<td>45</td>
</tr>
<tr>
<td>TR3</td>
<td>13.68</td>
<td>19</td>
<td>28</td>
<td>18</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td><strong>54.39</strong></td>
<td><strong>67</strong></td>
<td><strong>112</strong></td>
<td></td>
<td></td>
<td><strong>98</strong></td>
</tr>
<tr>
<td><strong>Standard Routes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR1</td>
<td>9.85</td>
<td>15</td>
<td>21</td>
<td>18</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>SR2</td>
<td>11.18</td>
<td>21</td>
<td>23</td>
<td>18</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>SR3</td>
<td>13.57</td>
<td>16</td>
<td>28</td>
<td>18</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>SR4</td>
<td>8.73</td>
<td>17</td>
<td>18</td>
<td>18</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>SR5</td>
<td>7.88</td>
<td>14</td>
<td>17</td>
<td>18</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>SR6</td>
<td>7.56</td>
<td>13</td>
<td>16</td>
<td>18</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>SR7</td>
<td>17.24</td>
<td>18</td>
<td>35</td>
<td>18</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td><strong>76.01</strong></td>
<td><strong>114</strong></td>
<td><strong>159</strong></td>
<td></td>
<td></td>
<td><strong>113</strong></td>
</tr>
</tbody>
</table>

---

The above table provides the necessary fleet requirements for both trunk and standard bus routes in Bhopal, considering the distance, existing and proposed number of bus stops, span of operation, and headway. The fleet requirement at 95% fleet utilization is also indicated for each route.
## Route wise Bus fleet Details

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Low Floor-AC</th>
<th>Semi Low Floor- non AC (650mm)</th>
<th>Semi Low Floor- non AC (900mm)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR1</td>
<td>0</td>
<td>0</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>TR2</td>
<td>0</td>
<td>0</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>SR1</td>
<td>0</td>
<td>0</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Cluster A (TR1+TR2+SR1)</td>
<td>0</td>
<td>0</td>
<td>78</td>
<td>78</td>
</tr>
<tr>
<td>TR3</td>
<td>10</td>
<td>0</td>
<td>32</td>
<td>42</td>
</tr>
<tr>
<td>SR5</td>
<td>0</td>
<td>20</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>SR4</td>
<td>0</td>
<td>0</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>Cluster B (TR3+SR5+SR4)</td>
<td>10</td>
<td>20</td>
<td>51</td>
<td>81</td>
</tr>
<tr>
<td>SR2</td>
<td>4</td>
<td>0</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>SR3</td>
<td>6</td>
<td>0</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>SR6</td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>SR7</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Cluster C (SR2+SR3+SR6+SR7)</td>
<td>10</td>
<td>0</td>
<td>56</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>20</td>
<td>185</td>
<td>225</td>
</tr>
</tbody>
</table>
### Bus Depots & Terminals

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Location of Depots</th>
<th>Area</th>
<th>Capacity</th>
<th>Scheduled Completion dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bairagarh</td>
<td>10 Acres</td>
<td>225 Buses</td>
<td>31-10-2010</td>
</tr>
<tr>
<td>2.</td>
<td>Anand Nagar</td>
<td>3 Acres</td>
<td>75 Buses</td>
<td>30-11.2010</td>
</tr>
<tr>
<td>3.</td>
<td>Nav Bahar Mandi</td>
<td>4.5 Acres</td>
<td>100 Buses</td>
<td>31-12-2010</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Location of Terminals</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Habibganj ISBT</td>
<td>75 Buses</td>
</tr>
<tr>
<td>2.</td>
<td>Nadra Bus Stand</td>
<td>50 Buses</td>
</tr>
<tr>
<td>3.</td>
<td>Jawahar Chowk</td>
<td>50 buses</td>
</tr>
<tr>
<td>4.</td>
<td>City Depot</td>
<td>75 buses</td>
</tr>
</tbody>
</table>
Several Stakeholder consultations were made to take the comments on draft route rationalization plan prepared by UMTC such as:

- Public Representatives (Local Ministers, MLAs, Municipal Counselors)
- Eminent Persons of Bhopal city.
- Private Minibus & Tata Magic operators.
- Officials of Traffic police.
- Officials of Transport Department.
- Officials of Distt. Administration
- Officials of Public work Department.
- Officers of Bhopal City Link Ltd.
Consultation With Public Representatives
Participation During Stakeholder Consultation
Approval of Route Rationalization

• Approval of Mayor in Council (MIC) on 24.09.09
• Approval of Main Council of Bhopal Municipal Corporation on 22.10.09
• Approval & Recommendation by Divisional Transport Authority on 16.04.09
• Based on recommendation of Divisional Transport Authority 27 rationalized Urban Transport Routes, Notified by State Transport Authority on 01.07.2010
• Based on recommendation of Divisional Transport Authority 03 IPT/CR & 01 SR, Total 04 rationalized Urban Transport Routes, Notified by State Transport Authority on 31.01.2011
Notification of State Transport Authority
# Notified Public Transport Routes

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Description of routes</th>
<th>Number of Routes</th>
<th>Route length (in KM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Trunk Routes</td>
<td>3</td>
<td>67.64</td>
</tr>
<tr>
<td>2</td>
<td>Standard Routes</td>
<td>8</td>
<td>123.60</td>
</tr>
<tr>
<td>3</td>
<td>Complimentary /IPT Routes</td>
<td>20</td>
<td>250.24</td>
</tr>
</tbody>
</table>
New Low Floor Modern Buses
Inauguration of the Modern Low Floor Bus operations
Response of Private Minibus operators on Implementation of New Route Plan
मैजिक वाहन संचालकों ने दिया धनन
भोपाल 9 अगस्त 2021 (न्यायिक). नगर
सेवा में समावेशित एवं मैजिक वाहन
स्वामी चालकों ने नगर लाभकारी नीतियों के निलाम
स्वामी शाहजहाँ नगर में धनन
प्रदर्शन किया. शासन की नीतियों से
खफाकु रुप संचालकों ने तख़्ताल
धनन से संबंधित बड़े कारणों के भी
प्रदर्शन कर रहे. आदिशिक कर रहे
संचालक का कहना था कि नीतियों
के कारण आदिशियों द्वारा एवं
परिसर का चित्रण निर्भर कर दिया गया
किसन संचालन में महत्व प्रदिक आप
होते है. जनता एवं दशक के लिए के भाव
अनुसार इस समय आप
या नीतिया नत्यशाली होना होता
है। आदिशिकियों बाकी से साथ
आदिशिकियों होगा. जिसमें यह
सभी सममति से निर्भर
लिया गया कि अगर
ही मानी ते अदालत में
बसों तो बस ऑपरेटर जाएँ अदालत
रोज़ न्यूज़ न्यूज़ न्यूज़
भोपाल. राजनीति
के एक तत्कालीन पर
किसी तरह से, इसको
लेकर चल रही
लड़ाई अब सड़क पर
आ गई है। दरअसल
आपातकालीन माह में
चलाना जा रही लोक
फ्लोर बसों के विरोध के लिए
राजनीतिक दोषा
12 बजे मिनी बस एवं
मैजिक ऑपरेटरों को
बैठक संयुक्त हुई। जिसमें यह
सभी सममति से निर्भर
लिया गया कि अगर
ही मानी तो संयुक्त मोर्चे
अदालत में दरवाजा
लिया गया इस्माइल, शाहीद खान, गणेश चतुर्वेदी, अदृश्य गनी खान
लोग उपस्थित थे।
 Hague के अनुसार भोपाल नगर वाहन सेवा संयुक्त मोर्चे के अनुसार
बर का कलेक्टर का घरेलू कर कार्यालय के सामने धरना
प्रदर्शन किया। इसे दौरान आप
बाहर से बाहर नहीं होती है, तो
19 अक्टूबर
कहा जाए। बैठक के बाद भी मानी
वही तेसी कर ली गई है।
इसी प्रकार उन्होंने आदिशिकियों से परिचय दिनी
के भी अदालत ले जाने की बात
लौगिक व एसी बसों
का संचालन एक साथ
Press Coverage of Implementation of New Route plan

Transporters asked to give choice of routes

Do sio se jyada minibusen khud hat jaayenge rut se

Rojgara par asar nahi

Anny maaron pe chaleni minibus and Data Majik

Minniebans ke liye permit jari honge
Inaugural trip of Ladies special Bus
Improvement in PT share and it’s impact on vehicular emissions

Nearly 80,000 passenger trips were shifted from other modes of Transport to Bus Transport

<table>
<thead>
<tr>
<th></th>
<th>From Mini Buses</th>
<th>From Tata Magic</th>
<th>From Two wheelers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode Shift (%age)</td>
<td>60%</td>
<td>25%</td>
<td>15%</td>
<td>100%</td>
</tr>
<tr>
<td>No of Passengers</td>
<td>48000</td>
<td>20000</td>
<td>12000</td>
<td>80000</td>
</tr>
<tr>
<td>trips per day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Vehicular</td>
<td>1600</td>
<td>2500</td>
<td>8000</td>
<td>12100</td>
</tr>
<tr>
<td>Trips</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avg. Veh. Utilisation</td>
<td>150</td>
<td>120</td>
<td>40</td>
<td>-</td>
</tr>
<tr>
<td>(Km per day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Kms</td>
<td>224000</td>
<td>300000</td>
<td>320000</td>
<td>844000</td>
</tr>
<tr>
<td>Reduction CO Emissions</td>
<td>158</td>
<td>32</td>
<td>153</td>
<td>343</td>
</tr>
</tbody>
</table>

CO emissions from buses due to shift of passengers from other modes = 140 tons.

The net reduction in CO levels is 203 tons per day.