Urban Bus Specifications - II
Backdrop

- National Urban Transport Policy, promulgated in 2006, indicated technologies for public transport with focus on bus based systems
- Need felt for bus specifically designed for urban services
- Recommendatory Urban Bus Specifications (UBS) released by MoUD in 2008
- Supplementary specifications issued in 2009 for ITS
Backdrop contd.

- Scheme for financial assistance for procurement of city buses under JnNURM launched in January 2009
- Recommendatory UBS became mandatory for purchase of buses under the scheme
- 13400 buses were procured
## Variants Sanctioned under JnNURM Scheme

<table>
<thead>
<tr>
<th>Floor Height (MM)</th>
<th>Engine</th>
<th>Fuel</th>
<th>AC</th>
<th>Non AC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Front</td>
<td>Rear</td>
<td>CNG</td>
<td>Diesel</td>
</tr>
<tr>
<td>Upto 900</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>650</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>400</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Midi- 33-39 Seater</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Mini- 24-32 Seater</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
Lessons learnt

- Large number of variants - 27
- Delay in development of prototypes and procurement and delivery
- ITS not integrated but retrofitted
- Maintenance complexities
- Specifications not detailed enough leading to lack of clarity in tender documents
Constitution of Committee for preparation of revised bus specifications

• Committee under the Chairmanship of OSD (UT) & EO JS, MoUD constituted in April 2012 to draft revised urban bus specifications (UBS –II)

• Committee comprises representatives of Ministry of Road Transport & Highways, Ministry of Heavy Industries, SIAM, IABM, ASRTU, CIRT, ARAI, Bus Manufacturers, OEMs, Experts etc.

• UMTC and CEPT providing assistance to the Committee
Objectives of UBS II

- Improved comfort for passengers and drivers
- Better safety features including improved accessibility for PWDs
- Standardisation of features
- Adoption of cutting edge technology integrated with ITS
- Improved fuel efficiency
- Separate specifications for buses for BRT operations
- Emphasis on detailing of specifications
- Introduction of new variants- premium, articulated and bi-articulated buses
# Variants under UBS-II

<table>
<thead>
<tr>
<th>Type</th>
<th>Floor Ht.</th>
<th>Length (max)</th>
<th>Width (max)</th>
<th>Seating Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variants for City buses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>900*/650/400 mm</td>
<td>12 m</td>
<td>2.6 m</td>
<td>&gt;34</td>
</tr>
<tr>
<td>Midi</td>
<td>900*/650/400 mm</td>
<td>9 m</td>
<td>2.5 m</td>
<td>22-34</td>
</tr>
<tr>
<td>Mini</td>
<td>900/650/400 mm</td>
<td>6 m</td>
<td>2.2 m</td>
<td>12-22</td>
</tr>
<tr>
<td><strong>New variants - Premium segment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>650/400 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midi</td>
<td>650/400 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Applicable for cities population < 1 mn
## Variants under UBS-II

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<tr>
<th>Type</th>
<th>Floor Ht.</th>
<th>Length (max)</th>
<th>Width (max)</th>
<th>Seating Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variants for BRTS buses</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>900/650/400 mm</td>
<td>12 m</td>
<td>2.6 m</td>
<td>&gt;34</td>
</tr>
<tr>
<td><strong>New variants for BRTS buses</strong></td>
<td></td>
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<td>Midi</td>
<td>900/650/400 mm</td>
<td>9 m</td>
<td>2.5* m</td>
<td>22-34</td>
</tr>
<tr>
<td>Mini</td>
<td>900/650/400 mm</td>
<td>6 m</td>
<td>2.2 m</td>
<td>12-22</td>
</tr>
<tr>
<td>Articulated</td>
<td>900 mm</td>
<td>18 m</td>
<td>2.6 m</td>
<td>60</td>
</tr>
<tr>
<td>Bi-Articulated</td>
<td>900 mm</td>
<td>24 m</td>
<td>2.6 m</td>
<td>90</td>
</tr>
</tbody>
</table>

* Being considered for 2.2 m also
Key Features - Urban Buses II
Key Features – Passenger Comfort

- Air-suspension system with optional kneeling facility
- Wider gangway ≥ 700 mm
- Wider doors ≥ 1200 mm
Key Features – Driver’s Comfort

- Transmission system - options for automatic, automated manual and manual*
- Hydraulic power steering with height & angle adjustment
- Rear view camera for reversing
- Standards for driver’s cabin
  - Better cooling & ventilation
  - Noise levels ≤ 84 Db(A) (≤ 75 Db(A) for prem. Segment)
- Single controller for ITS
Facilities for PWDs

Ramp for Wheelchair user

Exclusive area with bells
Key Features - Safety

- Mandatory door closure for movement of bus and
  viz a viz
- Electro pneumatic controlled doors
- Disc brakes (preference)
- Design Type approval: Roll over test as per AIS 031
Key Features - Operation

- Higher acceleration ≥ 0.8m/s/s (≥ 0.9m/s/s for prem.)
- Engine location & fuel: optional
- Approach & departure angle: 8.5° & 9°
- Life of bus: 12 years or 100,000 kms whichever is earlier
Addition of New Standards

- Air conditioning system - standards and tests defined
- Noise standards
- Standards for harshness & vibration (prem. Segment)
Premium Segment

- Bus with much advanced features to attract car users
- Higher accelerations
- Longer design life
- Comfortable seating
- More advanced driver’s area
- Added features for entertainment
- Stringent standards for noise, vibrations and harshness
Key Features - ITS

Multiplex wiring

- Simplifies wiring harness
-Eliminates fuses & relays
-Uninterrupted power supply though multiplexing to IT systems
- Receives diagnostic data from electrical systems, engine, transmission etc
-Increases vehicle reliability
Key Features - ITS

Vehicle Health Monitoring and Diagnostics System

- Higher uptime
- Monitoring of driver performance
- Optimizing operating costs of by monitoring fuel/oil levels etc.
- Availability of critical bus health parameter online
Key Features - ITS

2. Vehicle Health Monitoring system (VHMD)
Key Features - ITS

Single Driver Console

– Single Driver Console for route selection, passenger information system, security cameras, vehicle location and vehicle health
– Driver Console to display up to 4 cameras
– Two Way Voice communication with Control Centre
– ‘Pop up’ warnings on console
Key Features - ITS

PIS inside and outside integrated with audio announcement system

– Display and announcement in up to 3 languages
– Location based information display
– Display and announcement of pre recorded messages
– Display of special signs
Key Features – Buses for BRT
BRTS System Elements

- **OPEN OR CLOSED SYSTEM**

- **VEHICLES**
  - Full Flat floor inside

- **RUNNING WAYS**
  - Centre Median or Side Kerb
  - Right of Way - Wider or Narrow

- **STATIONS**
  - Level Boarding - Prepayment of Fare
  - Station platforms location

- **ITS**

- **OPERATIONS PLAN**
Key Features - BRTS Vehicles

• Mini and Midi bus application for BRTS
  – Context: Narrow urban roads; less hourly demand but frequent service requirement
  – Issues: Floor height to match 12 and 18 meter BRTS bus & level boarding; doors on driver side

• Standard Bus
  – Context: Urban Roads; moderate to high demand; frequent service
  – Issues: retrofitting to BRTS existing stations

• Articulated Bus
  – Context: Urban roads; high demand and capacity

• Bi - Articulated Bus
  – Future requirements for cities with greater demand
Key BRTS Features – Level Boarding

• Level Boarding – Boarding and alighting platform on the same level plane as the floor

Level Boarding: Ahmedabad BRTS
Source: CoE-UT CEPT University

Level Boarding:
Source: Issues and Technologies in Level Boarding in BRT 2008
A Discussion Paper created by West Start CALSTART 200
Key BRTS Feature – Uniform Floor

- Uniform Floor – No steps inside the bus; ease of dispersion of passengers inside vehicles

Key BRTS Feature – Doors

- Wide Doors / Multiple Doors – Faster boarding and alighting

Level Boarding: Ahmedabad BRTS
Source: CoE-UT CEPT University
Key BRTS Feature – Docking

Precise & safe docking with the bus stop platform
BRT Bus 12m layout

DIAGRAM FOR ILLUSTRATION ONLY
Not to Scale

All dim. are in mm (drawing is not to scale)
BRT Bus 18m layout

Drive & Non driver side door for median & side station @ 400/650/900 mm ht to match BRTS platform height
Partition between doors for both Driver and Non driver side Tractor Gate
Extra optional front Non Driver side gate with steps
No of doors ; steps will depend on the operational characteristics of the city and context
For discussion......

• Expectations of operators and users from UBS
• Quality control of bus body
• Maintenance support by OEMs
• Benchmarking of performance indicators-tyre, battery, fuel efficiency
• Compliances with disability act
Thank You