Brief Insights on the Global Bus Market
8 Transformational Shifts in Passenger Mobility

- **Multi-modality**
  Transit Buses, Urban Rail, and Taxis

- **Shared Mobility**
  Intent to Check Expense and Beat Traffic

- **Mobility Integration**
  Smartphone Enabled Seamless Commuting

- **Dedicated Road Lanes**
  Preference for Shared Mobility Models

- **Last Mile Connectivity**
  Route Flexibility in Public Transit Services

- **Leveraging Big Data**
  Fleet Readiness and Meet Peak Hour Demand

- **Electric Mobility**
  Transit Buses to Pioneer Zero Emission Drive

- **Battery & Charging Tech**
  OEMs entering new markets and partnerships
Global HD Bus Market – CAGR of 8.6%

Snapshot of Global Heavy-duty Bus Market, 2015 and 2022

N.A. ~ 79k ~ 115k
S.A. ~ 29 k ~ 56 k
Europe ~ 32 k ~ 49 k
Russia ~ 11 k ~ 27 k
China ~ 79 k ~ 115 k
India ~ 34 k ~ 71 k
Other markets ~ 26 k ~ 63 k

~ 224 k in 2015
~ 400 k in 2022

LEGEND:
Normal font = 2015 values
BOLD font = respective 2022 values

HD Buses includes - Transit Buses, Coaches, Shuttle Buses, and School Buses more than 9m in length and more than 8T GVWR

Source: Frost & Sullivan analysis
Global HD Transit Bus Market – CAGR of 8.4%

Snapshot of Global Heavy-duty Transit Bus Market, 2015 and 2022

Source: Frost & Sullivan analysis

LEGEND:
Normal font = 2015 values
BOLD font = respective 2022 values

Transit Buses includes – City/Urbam Buses more than 9m in length and more than 8T GVWR
The Green Push – From 1 in 7 to 1 in 3

Snapshot of Global Hybrid and Electric HD Transit Bus Market, 2015 and 2022

- N.A. ~3.3k (4.2%)
- Europe ~8.3k (10.6%)
- Russia ~2.2k (2.8%)
- China ~34.1k (43.6%)
- Other markets ~7.8k (9.9%)
- India ~10.4k (13.2%)
- S.A. ~12.3k (15.7%)

~18.9K in 2015
~78.4K in 2022

% denotes the respective region’s forecast share of new energy buses in total global HD transit bus sales in 2022.

Source: Frost & Sullivan analysis
Middle East Region Poised for Strong Growth

- Turkey expected to grow at ~4.4% CAGR, reaching ~4000 units by 2022
- Iran expected to grow at ~27% CAGR; reach ~3000 units by 2022

~11,500 units

CAGR 8.7%

~20,500 units

2022

- GCC 50%
- Iran 19%
- Egypt 16%
- Turkey 15%

- GCC, Middle East, Turkey, Iran expected to adopt hybrid & electric vehicles at a higher rate –
  a. to showcase itself as attractive destination
  b. gain expertise in advanced technologies
Case Study: Urban Transport in Tehran (1/2)

- Iranian economy expected to grow annually at a rate of 4% - 6% from 2016 to up until 2022
- Will be reflected in the commercial vehicle industry through high growth rates, return to the stable growth levels by 2020
- Emission regulation upgrades in 2017 and 2020 will spur on demand in 2016 and 2019
- Iran’s public bus fleet needs 17,000 new vehicles
- Tehran’s bus fleet currently has 6,500 vehicles, 40% of which needs to be replaced.
## Case Study: Urban Transport in Tehran (2/2)

<table>
<thead>
<tr>
<th>Bus Systems</th>
<th>BRT</th>
<th>Regional Bus</th>
<th>Local Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Capacity</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Fare Collection</td>
<td>Off Vehicle</td>
<td>Off Vehicle</td>
<td>In Vehicle</td>
</tr>
<tr>
<td>Operators</td>
<td>Public</td>
<td>Private</td>
<td>Private &amp; Public</td>
</tr>
</tbody>
</table>

- The BRT system in Tehran has 8 corridors covering 130 km with daily passenger demand of 2 million.

- Tehran’s public bus fleet transports 4.5 million passengers daily with close to half of it commuting through the BRT system.

### HD Bus Forecast, Iran, 2011 - 2022

<table>
<thead>
<tr>
<th>Year</th>
<th>Unit Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>6,377</td>
</tr>
<tr>
<td>2012</td>
<td>5,223</td>
</tr>
<tr>
<td>2013</td>
<td>1,002</td>
</tr>
<tr>
<td>2014</td>
<td>462</td>
</tr>
<tr>
<td>2015</td>
<td>975</td>
</tr>
<tr>
<td>2016f</td>
<td>2,125</td>
</tr>
<tr>
<td>2017f</td>
<td>2,913</td>
</tr>
<tr>
<td>2018f</td>
<td>3,867</td>
</tr>
<tr>
<td>2019f</td>
<td>5,125</td>
</tr>
<tr>
<td>2020f</td>
<td>5,910</td>
</tr>
<tr>
<td>2021f</td>
<td>6,874</td>
</tr>
<tr>
<td>2022f</td>
<td>7,932</td>
</tr>
</tbody>
</table>
Key Predictions

- Middle East, South Asia, Africa emerge as key growth regions for transit bus market for the period up to 2022. With 29% of total share, China will remain as the biggest market in 2022.

- Alternate energy powertrains, both hybrid/ electric and natural gas expected to gain market adoption. Russian OEMs’ expertise with natural gas powertrains will play a major role in technology uptake, especially in the Eastern European markets.

- Significant opportunities exist for Turkish bus manufacturers to grow market presence in Middle East, Africa, Eastern Europe markets. OEMs in these markets will increasingly face competition from Turkish, Indian, Chinese manufacturers.

- Iran and Egypt expected to emerge as hubs in Middle East. That said, Iran’s policies expected to adequately safeguard domestic players from the surge in foreign competition.
Future of collective mobility – Scenario 2035?

- truly Carbon neutral
- Connected
- Customized

“Walking is the only form of transportation in which a man proceeds erect - like a man - on his own legs, under his own power. There is immense satisfaction in that.”

Edward Abbey, Postcards from Ed: Dispatches and Salvos from an American Iconoclast
Thank you for your attention

Ananth Srinivasan
Consultant, Mobility
Direct: +49 69 770 3334
Email: ananth.srinivasan@frost.com
Frankfurt Office