National Workshop on Developing Clean and Efficient Vehicle Policy for Bangladesh
Bangladesh

- Major arterial Road: 21,462 Km
- Rural Road: 97,180 Km
- Urban Road: 4,245 Km
- Rail track: 2,877 Km
- Stations: 444 nos.
- Seaports: 3
- Inland river ports: 33
- Length of waterway: 24,000Km (Navigable 5968km)
- International Airports: 3
- Domestic airports: 7

- Area: 147,570 km²
- Population density: 953/km².
- Per Capita income: USD 1827
Vehicle Fleet in Bangladesh

- Car ownership (per 1000): Bangladesh - 1.8, Dhaka - 15
- Motorcycle ownership (per 1000): Bangladesh - 11.87

Source: BRTA 2018
Transport Sector in Bangladesh

Without Motorcycle

- 38% Jeep
- 11% Microbus
- 7% Bus & Minibus
- 6% Pickup
- 7% Passenger Car
- 8% Truck
- 26% Others

CO\textsubscript{2} emission in Transport sector

- 74% LDV
- 26% HDV

- 70% Truck & Bus
- 20% Car
- 7% Others
- 3% Shipping
- 4% Rail & Aviation

Source: BRTA 2018
Transport Sector in Bangladesh

Sector wise Consumption of petroleum from 2012 to 2017

Source: BPC 2017
Project Title

Developing Clean and Efficient Vehicle policy to reduce emission and energy use from the road transport sector in Bangladesh.
• **Goal**: Establish baseline fuel economy figures (i.e. average Lge /100km) for the vehicle fleet in Bangladesh

• Why undertake a baseline development?
  • Know the types of vehicles plying in Bangladesh
  • Provide a basis for tracking progress in improving fuel economy
  • Develop appropriate policies for improving vehicle fuel efficiency
Activities of the Project

Carry out an inventory of newly registered (locally manufactured and/or imported new and second-hand) vehicles in the country including electric vehicles

- data gathering and analysis for yearly new registration data (for both new and second-hand imported vehicles that have entered the vehicle registry), following the Global Fuel Economy Initiative (GFEI) baseline methodology.
The data to be collected will include disaggregated number of registered vehicles in 2005, and subsequent years up to 2017 (used and new) by:

- vehicle type (passenger cars, Jeep, Micro bus, Pickup)
- fuel type (diesel, gasoline, LPG, electric vehicles, hybrid)
- vehicle age or year of manufacture
- vehicle make
- vehicle model
- engine displacement
- engine power
- rated vehicle fuel efficiency (Lge/100km, Liter/100 km, CO₂ g/km, km/liter)
1. Conducted an inventory of newly registered vehicle (locally manufactured and/or imported new and second-hand)
   - Data from 2005 to 2017, following the Global Fuel Economy Initiative (GFEI baseline methodology).
2. Estimated the average auto fuel economy baseline and trends for Bangladesh
   - For Light Duty Vehicle (LDV) (Car, Microbus, Jeep and Pickup)
3. Suggested Clean and efficient vehicle policy and development schemes
   - Reviewed national legislation and policies, including taxation related to vehicle fuel economy issues and EVs; identified stakeholders and potential barriers
   - Arranged workshop to present results and gather policy suggestions
Data Collection

Inputs

• Vehicle make and model
• Year of first registration
• Model production year
• Engine displacement
• Engine power
• Fuel type
• No of Cylinder
• Test cycle (NEDC, US EPA, JC08)

Output

• Rated fuel economy (L/100km, and CO₂ emission, gCO₂/km)
• Fuel economy and CO₂ emission data were collected as per GFEI guideline. Mostly from relevant manufactures and other online published data
Results of Base Line Survey
90% of the car in Bangladesh are from Toyota
• Car registration is in decreasing trend in the recent years
• Displacement range of car mostly falls into 1001-1500 cc category
• 80% of the Microbus in Bangladesh are from Toyota
• Microbus registration is in increasing trend in the recent years
• Displacement range of car mostly falls into 1501-2000 cc category
• 63% of the Jeep in Bangladesh are from Toyota, followed by Mitsubishi and Nissan
- Jeep registration is in increasing trend in the recent years
- Displacement range of Jeep mostly falls into 1501-2000 cc category, but other ranges are also frequent
67% of the car in Bangladesh are from Toyota, followed by Mitsubishi.
• Pickup registration is slightly increasing in the recent years
• Displacement range of Jeep mostly falls into 2001-2500 cc category
Dhaka has 193276 number of registered LDVs from the year 2005-2017

**In car category**

- Comprises 74.77% of total LDVs
- 63 different models from 30 different companies
- 90% of those cars are from Toyota.
- 1001-1500 cc is the common displacement range

**In Microbus category**

- 2nd largest share in LDV
- 46 different makes where 14 of them are dominating
- 79.17% share comes from Toyota
- 1501-2000 cc is the common displacement range
In Jeep category

- 3rd largest share in LDV
- 33 makes and 33 common models since 2005
- 37% Jeep is from Toyota
- 1501-2000 cc is the most common displacement range
- 20% are new Jeep

In Pickup category

- least share in LDV
- 34 makes since 2005 but only 12 models are common
- 2001-2500 is the dominating displacement range
- 30% new Pickup import which is the highest in LDV category
How to calculate Fuel Economy and CO₂ emission?

Average Fuel Economy

\[
\frac{\sum^n_i \text{Number of registered LDV of model } i \text{ in that year} \times \text{Fuel economy of model type } i}{\text{Total vehicle registered during that year}}
\]

Average CO₂ Emission

\[
\frac{\sum^n_i \text{Number of registered LDV of model } i \text{ in that year} \times \text{Emission of model type } i}{\text{Total vehicle registered during that year}}
\]

Units:
• Fuel Economy : L/ 100km
• CO₂ : gm/km
## Fuel Economy and CO₂ Emission in Bangladesh - Year-wise Results

<table>
<thead>
<tr>
<th>Year</th>
<th>Fuel Economy</th>
<th>CO₂ Emission</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>8.98</td>
<td>217.33</td>
</tr>
<tr>
<td>2008</td>
<td>8.01</td>
<td>189.08</td>
</tr>
<tr>
<td>2010</td>
<td>7.04</td>
<td>165.9</td>
</tr>
<tr>
<td>2012</td>
<td>7.43</td>
<td>176.85</td>
</tr>
<tr>
<td>2014</td>
<td>7.5</td>
<td>179.46</td>
</tr>
<tr>
<td>2015</td>
<td>7.07</td>
<td>171.19</td>
</tr>
<tr>
<td>2016</td>
<td>6.99</td>
<td>169.06</td>
</tr>
<tr>
<td>2017</td>
<td>6.9</td>
<td>166.35</td>
</tr>
</tbody>
</table>
Both fuel economy and CO₂ emission is improving in Bangladesh.
### Fuel Economy and CO2 Emission in Bangladesh

<table>
<thead>
<tr>
<th>Year</th>
<th>Car</th>
<th>Jeep</th>
<th>Microbus</th>
<th>Pickup</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>5.85</td>
<td>9.59</td>
<td>8.56</td>
<td>9.76</td>
</tr>
<tr>
<td>2015</td>
<td>5.75</td>
<td>8.15</td>
<td>8.4</td>
<td>9.29</td>
</tr>
<tr>
<td>2016</td>
<td>5.81</td>
<td>7.37</td>
<td>8.39</td>
<td>9.5</td>
</tr>
<tr>
<td>2017</td>
<td>5.8</td>
<td>7.26</td>
<td>8.62</td>
<td>9.35</td>
</tr>
</tbody>
</table>

** Improvement is more prominent in Jeep category**
## Fuel economy and CO₂ emission of the LDVs in each category

<table>
<thead>
<tr>
<th>LDV Type</th>
<th>Make</th>
<th>% in the Bangladesh vehicle fleet</th>
<th>% in the sample</th>
<th>Fuel Economy (l/100km)</th>
<th>CO₂ Emission (gm/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>Toyota</td>
<td>90.46%</td>
<td>84.20%</td>
<td>5.88</td>
<td>135.41</td>
</tr>
<tr>
<td></td>
<td>Nissan</td>
<td>2.17%</td>
<td>1.60%</td>
<td>6.09</td>
<td>139.95</td>
</tr>
<tr>
<td></td>
<td>Suzuki</td>
<td>1.64%</td>
<td>0.83%</td>
<td>5.53</td>
<td>128.05</td>
</tr>
<tr>
<td></td>
<td>Mitsubishi</td>
<td>1.63%</td>
<td>4.91%</td>
<td>5.92</td>
<td>140.28</td>
</tr>
<tr>
<td></td>
<td>Honda</td>
<td>0.70%</td>
<td>0.22%</td>
<td>6.1</td>
<td>141.95</td>
</tr>
<tr>
<td>Jeep</td>
<td>Toyota</td>
<td>37.09%</td>
<td>26.82%</td>
<td>8.8</td>
<td>216.1</td>
</tr>
<tr>
<td></td>
<td>Mitsubishi</td>
<td>24.95%</td>
<td>31.18%</td>
<td>10.13</td>
<td>234.55</td>
</tr>
<tr>
<td></td>
<td>Nissan</td>
<td>12.44%</td>
<td>22.00%</td>
<td>7.11</td>
<td>186.44</td>
</tr>
<tr>
<td></td>
<td>Honda</td>
<td>10.43%</td>
<td>9.27%</td>
<td>5.68</td>
<td>134.8</td>
</tr>
<tr>
<td></td>
<td>Hyundai</td>
<td>5.69%</td>
<td>3.82%</td>
<td>7.12</td>
<td>218.07</td>
</tr>
<tr>
<td>Microbus</td>
<td>Toyota</td>
<td>79.17%</td>
<td>58.19%</td>
<td>8.4</td>
<td>203.27</td>
</tr>
<tr>
<td></td>
<td>Mitsubishi</td>
<td>3.26%</td>
<td>11.79%</td>
<td>11.81</td>
<td>281.12</td>
</tr>
<tr>
<td></td>
<td>Suzuki</td>
<td>3.20%</td>
<td>16.20%</td>
<td>6.1</td>
<td>143.4</td>
</tr>
<tr>
<td></td>
<td>Nissan</td>
<td>3.17%</td>
<td>6.53%</td>
<td>8.33</td>
<td>219.14</td>
</tr>
<tr>
<td></td>
<td>Hyundai</td>
<td>1.89%</td>
<td>7.29%</td>
<td>7.69</td>
<td>201.3</td>
</tr>
<tr>
<td>Pickup</td>
<td>Toyota</td>
<td>32.67%</td>
<td>36.30%</td>
<td>13</td>
<td>305.1</td>
</tr>
<tr>
<td></td>
<td>Mitsubishi</td>
<td>20.40%</td>
<td>38.38%</td>
<td>8.23</td>
<td>226.48</td>
</tr>
<tr>
<td></td>
<td>Nissan</td>
<td>14.82%</td>
<td>4.66%</td>
<td>8.79</td>
<td>231.12</td>
</tr>
<tr>
<td></td>
<td>Tata</td>
<td>9.97%</td>
<td>8.79%</td>
<td>10.31</td>
<td>240.97</td>
</tr>
<tr>
<td></td>
<td>Ford</td>
<td>5.91%</td>
<td>2.23%</td>
<td>7.56</td>
<td>196.56</td>
</tr>
</tbody>
</table>
**Fuel economy and CO₂ emission is increasing with increased displacement range**

<table>
<thead>
<tr>
<th>LDV Capacity Range (CC)</th>
<th>Fuel Economy (l/100km)</th>
<th>CO₂ Emission (gm/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤1000</td>
<td>5.018337</td>
<td>119.5654</td>
</tr>
<tr>
<td>1001-1500</td>
<td>5.782796</td>
<td>135.2595</td>
</tr>
<tr>
<td>1501-2000</td>
<td>6.919067</td>
<td>177.9945</td>
</tr>
<tr>
<td>2001-2500</td>
<td>10.18904</td>
<td>251.4269</td>
</tr>
<tr>
<td>2501-3000</td>
<td>8.943825</td>
<td>224.1055</td>
</tr>
<tr>
<td>≥3001</td>
<td>11.664</td>
<td>276.48</td>
</tr>
</tbody>
</table>
Where Bangladesh Stands?

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-OECD Average</th>
<th>Global Average</th>
<th>Bangladesh Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>8.5</td>
<td>8.8</td>
<td>8.98</td>
</tr>
<tr>
<td>2008</td>
<td>8.5</td>
<td>8.3</td>
<td>8.01</td>
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<tr>
<td>2010</td>
<td>8.4</td>
<td>8.1</td>
<td>7.04</td>
</tr>
<tr>
<td>2012</td>
<td>8.2</td>
<td>7.8</td>
<td>7.43</td>
</tr>
<tr>
<td>2014</td>
<td>8</td>
<td>7.6</td>
<td>7.5</td>
</tr>
<tr>
<td>2015</td>
<td>7.9</td>
<td>7.6</td>
<td>7.07</td>
</tr>
</tbody>
</table>
Summary of the Study

• From year 2005 to 2017, improvement in fuel economy was 23.16% and reduction in CO$_2$ emission was 24.46%.

• In recent years Jeep with improved fuel economy import has increased in the LDV category which is one of the main reasons for higher fuel economy value along with the advanced technology of the imported vehicles.

• Bangladesh has improved average fuel economy value compared with Non-OECD country average and global average. In the year 2015, non-OECD and global average fuel economy was 7.90 l/100km and 7.6 l/100km where in it was 7.07 l/100km.
Stakeholder Consultation meeting at BRTA

Stakeholder Consultation meeting with Auto mobile Club at BUET
THANK YOU.

QUESTIONS/SUGGESTIONS?