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.

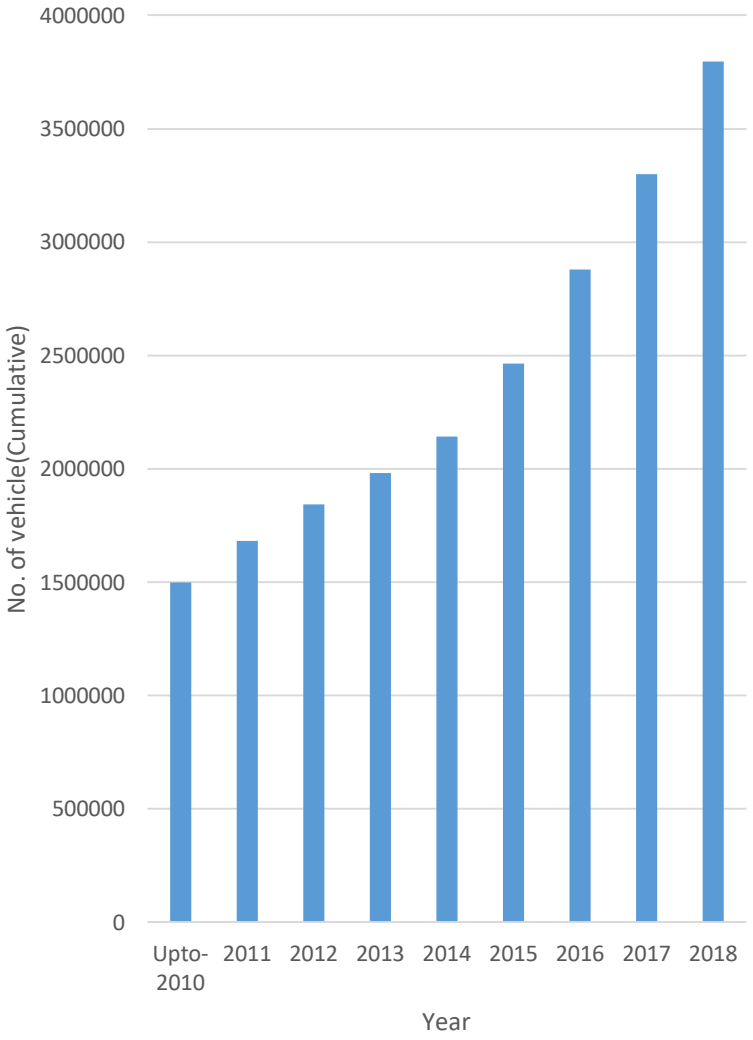
Seaports : 3

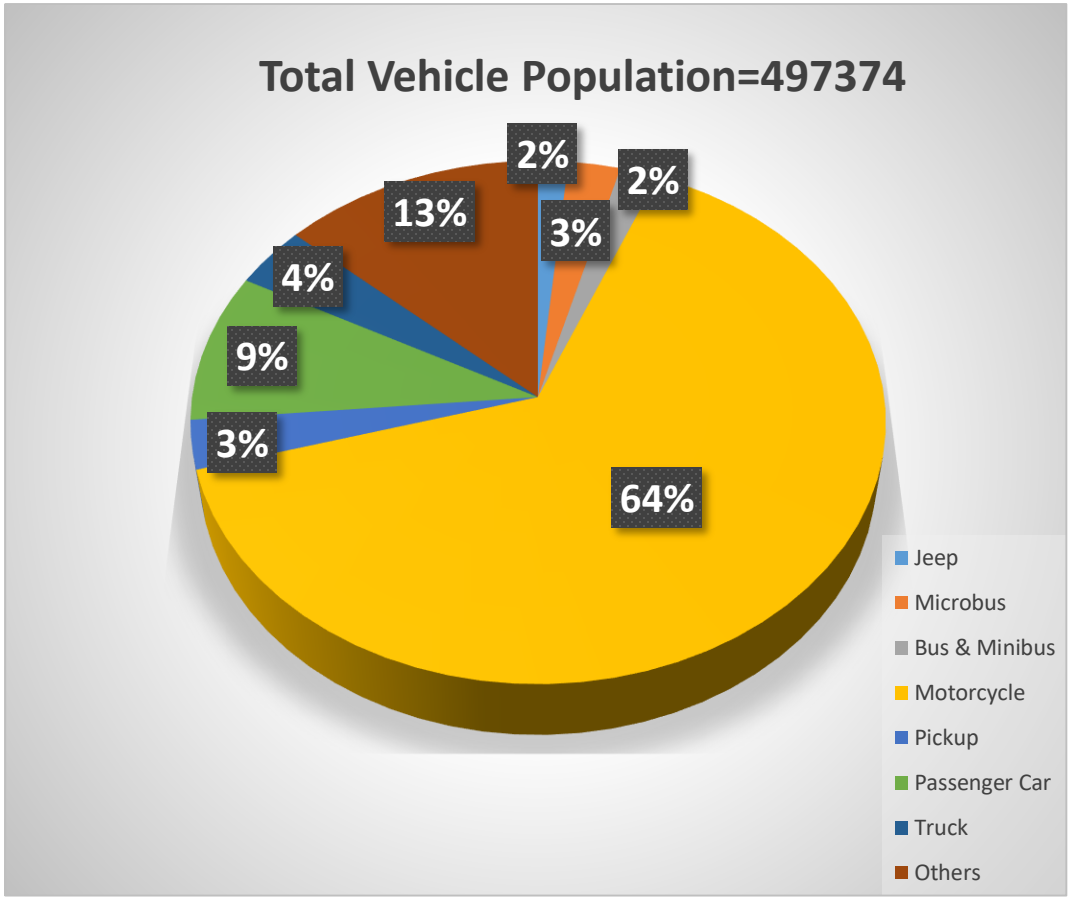
- Inland river ports : 33
- Length of waterway : 24,000Km (Navigable 5968km)

- International Airports : 3
- Domestic airports : 7

- Area : 147,570 km^2
- Population : 157.45 mil.
- Population density : 953/km2.
- Per Capita income : USD 1827

Vehicle Fleet in Bangladesh

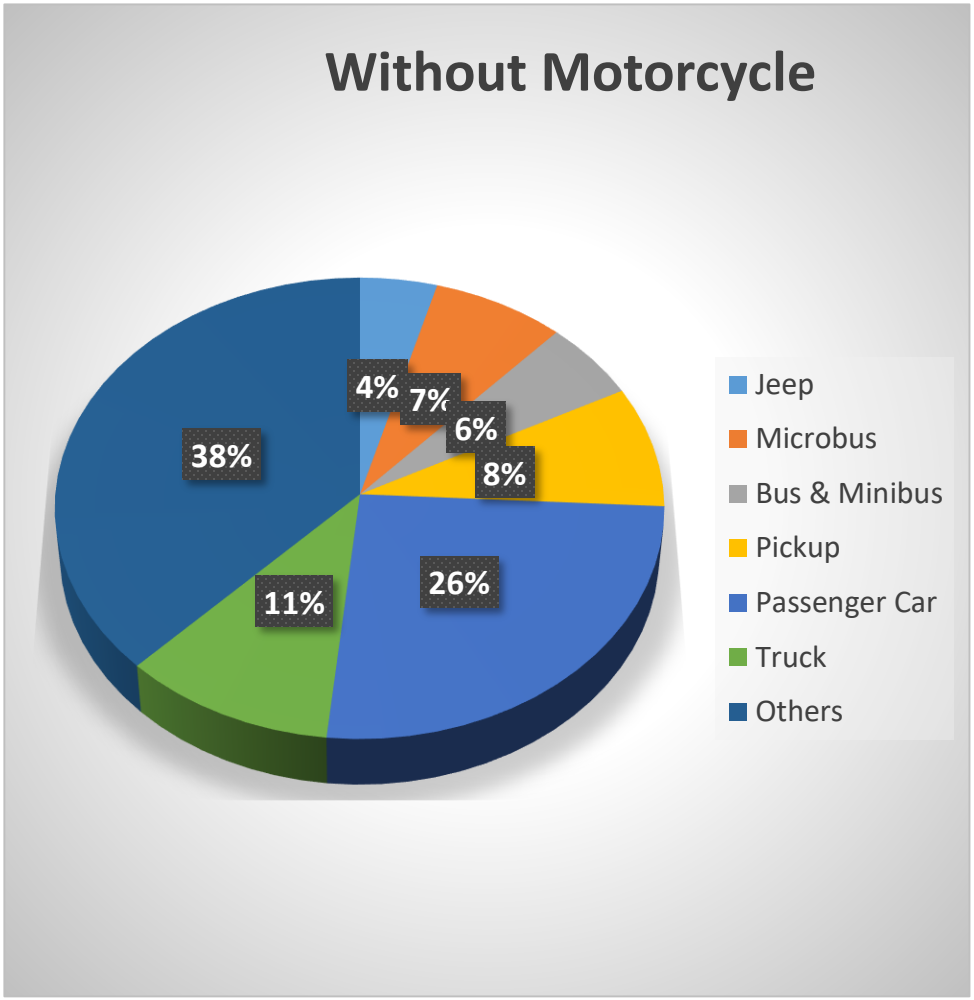


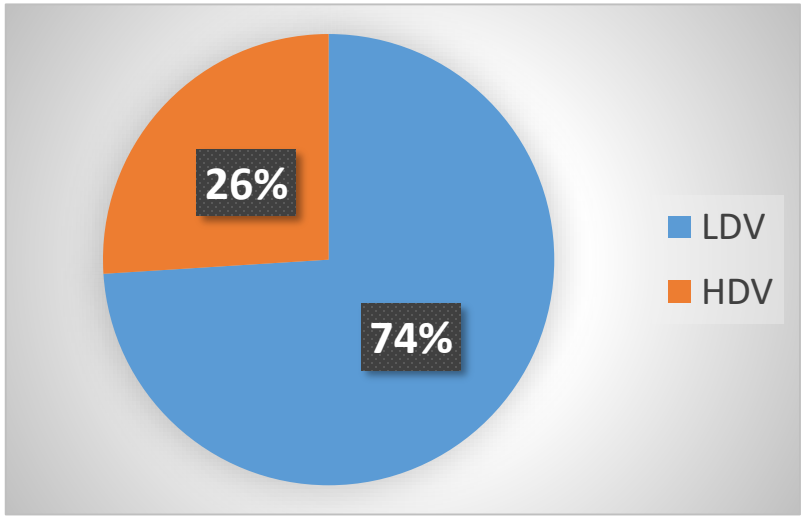


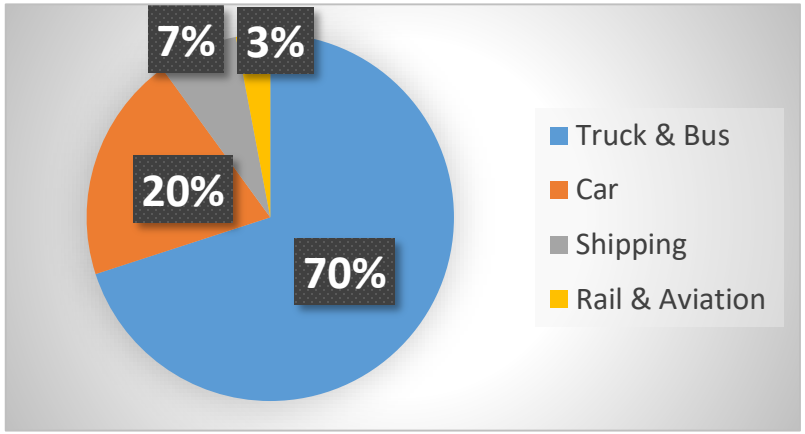
- **Car ownership (per 1000)** : **Bangladesh - 1.8**
  Dhaka -15
- **Motorcycle owner ship(per1000)** : **Bangladesh - 11.87**

Source : BRTA 2018

Transport Sector in Bangladesh



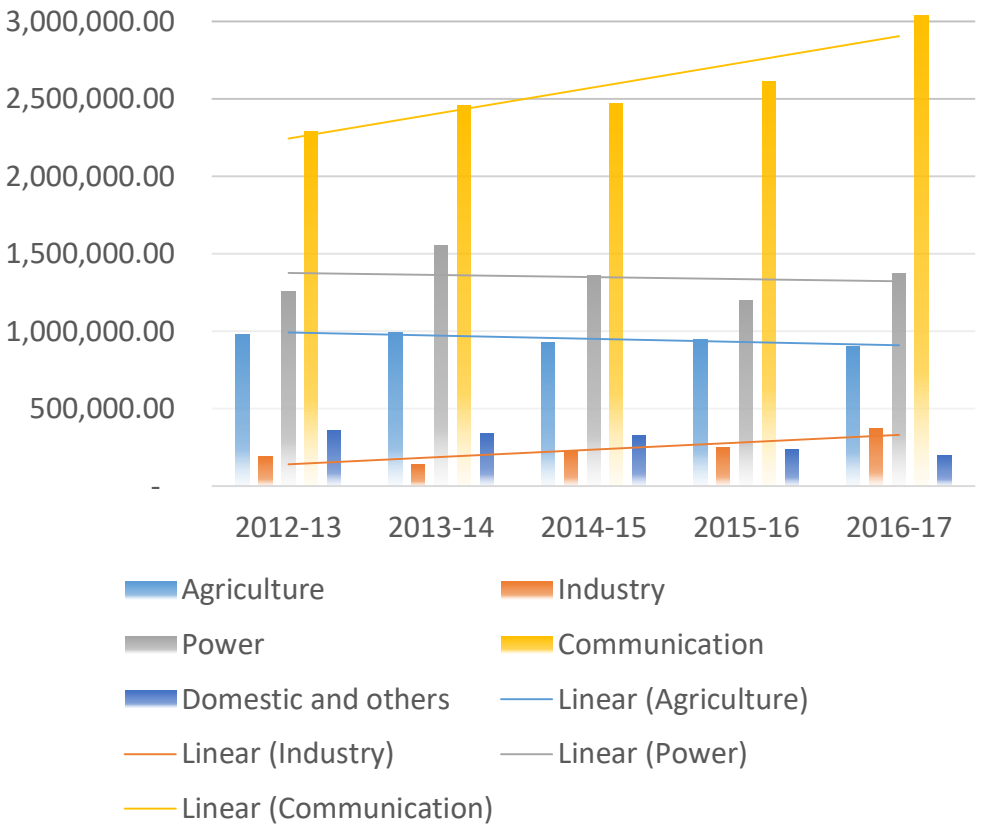




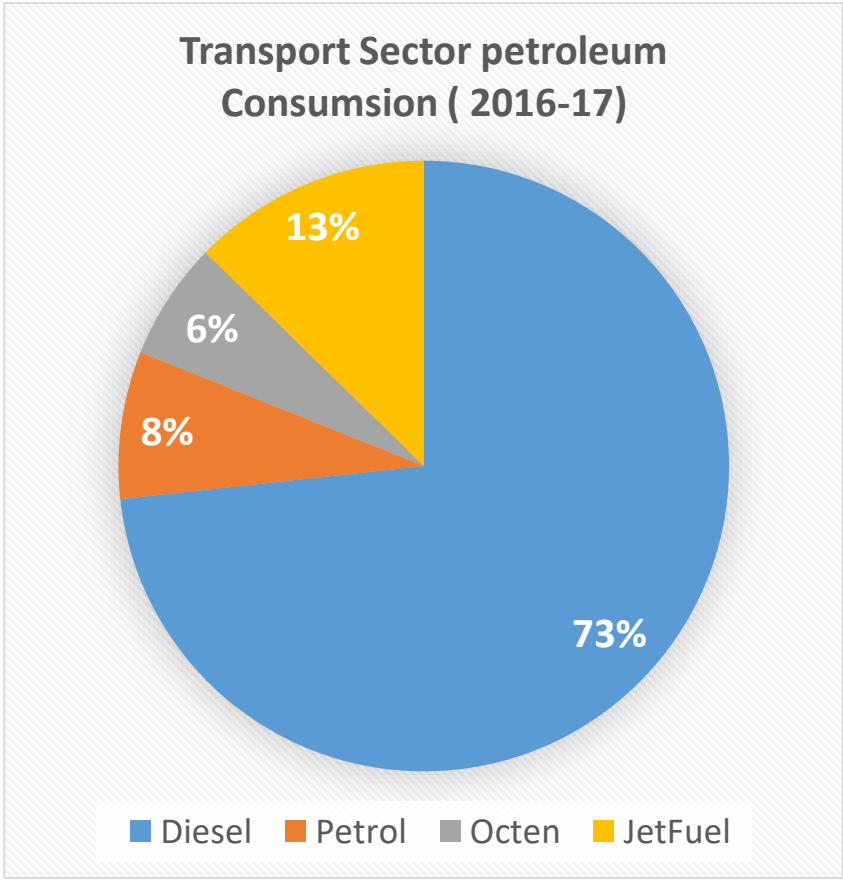
CO_2 emission in Transport sector

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 of the Project

- **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.

Activities of the Project

- 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, CO_2 g/km, km/liter)

Project Activities

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)**

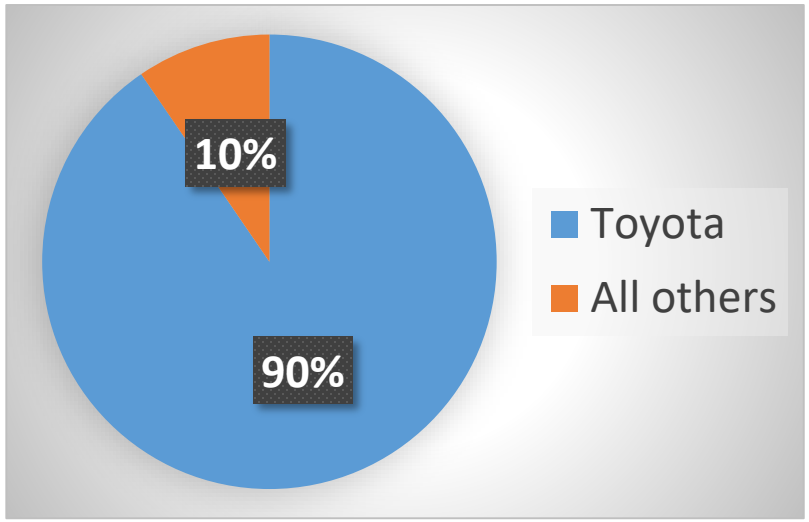
Output

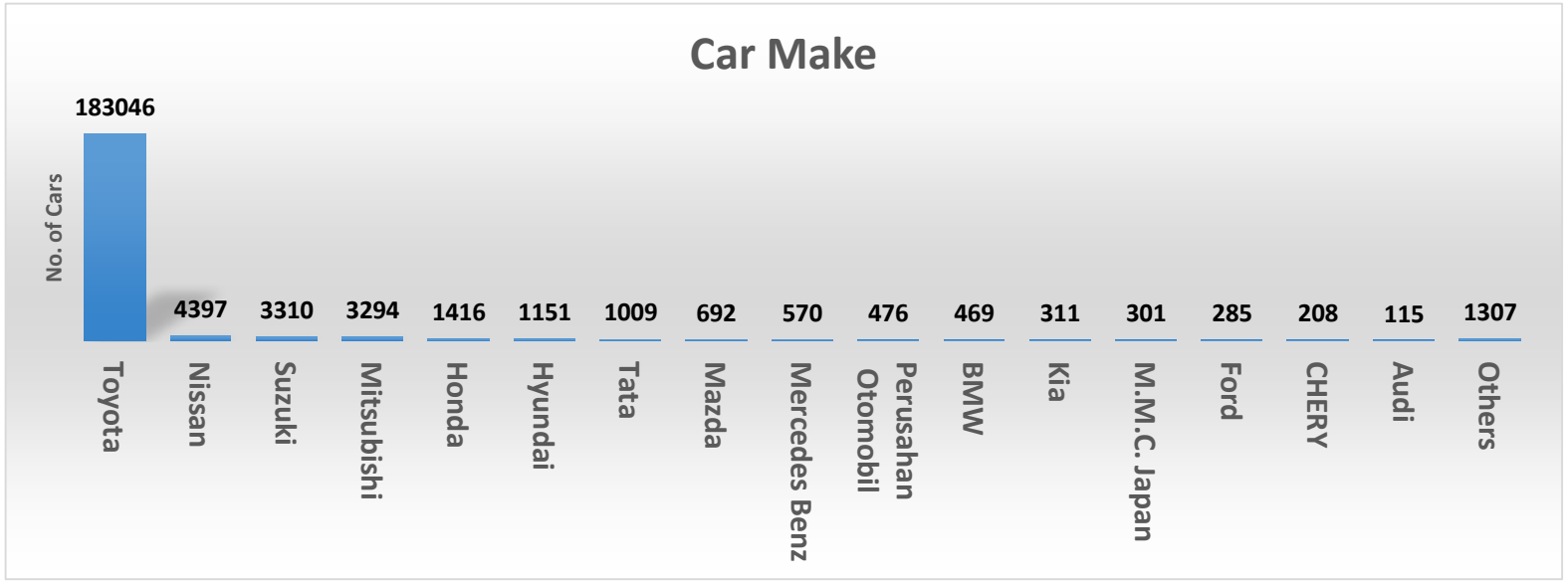
- **Rated fuel economy (L/100km, and CO_2 emission, gCO2/km)**
- **Fuel economy and CO2 emission data were collected as per GFEI guideline. Mostly from relevant manufactures and other online published data**

Results of Base Line Survey

Baseline Survey

Car

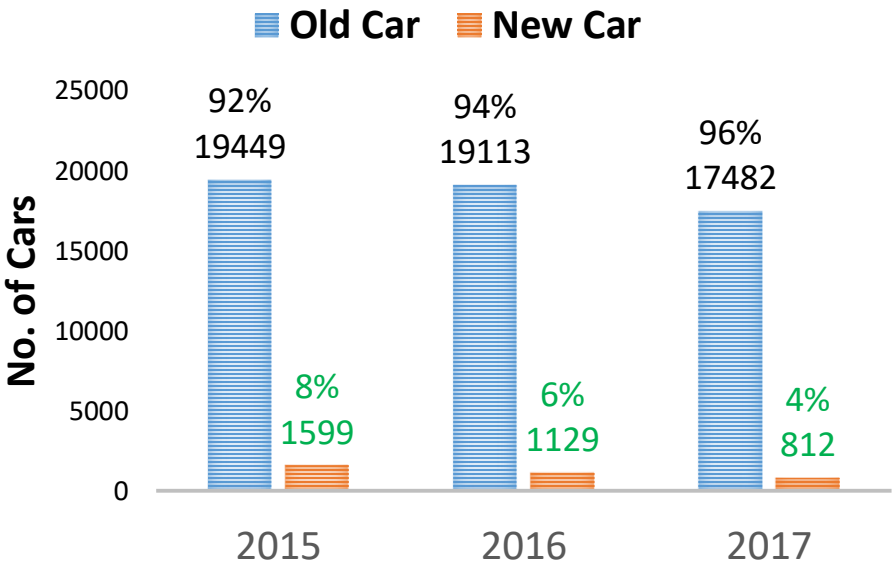


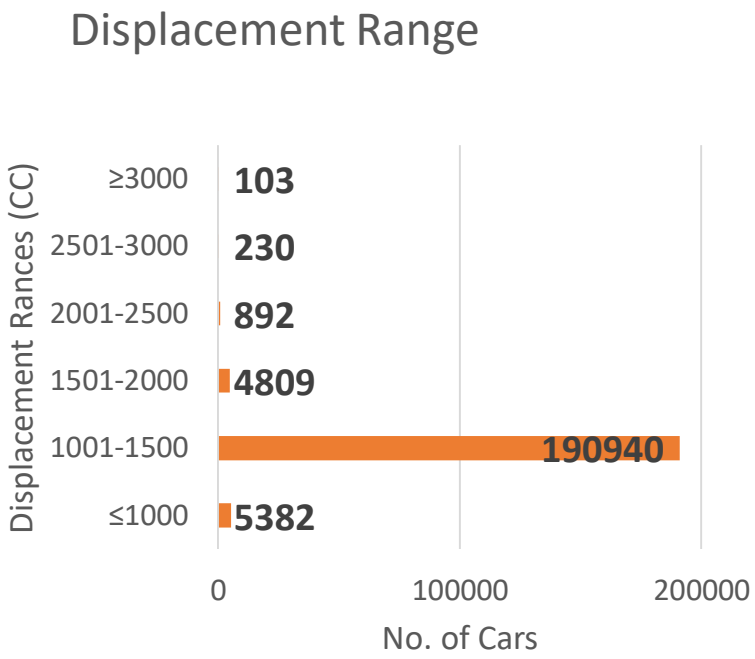


- **90% of the car in Bangladesh are from Toyota**

Baseline Survey

Car

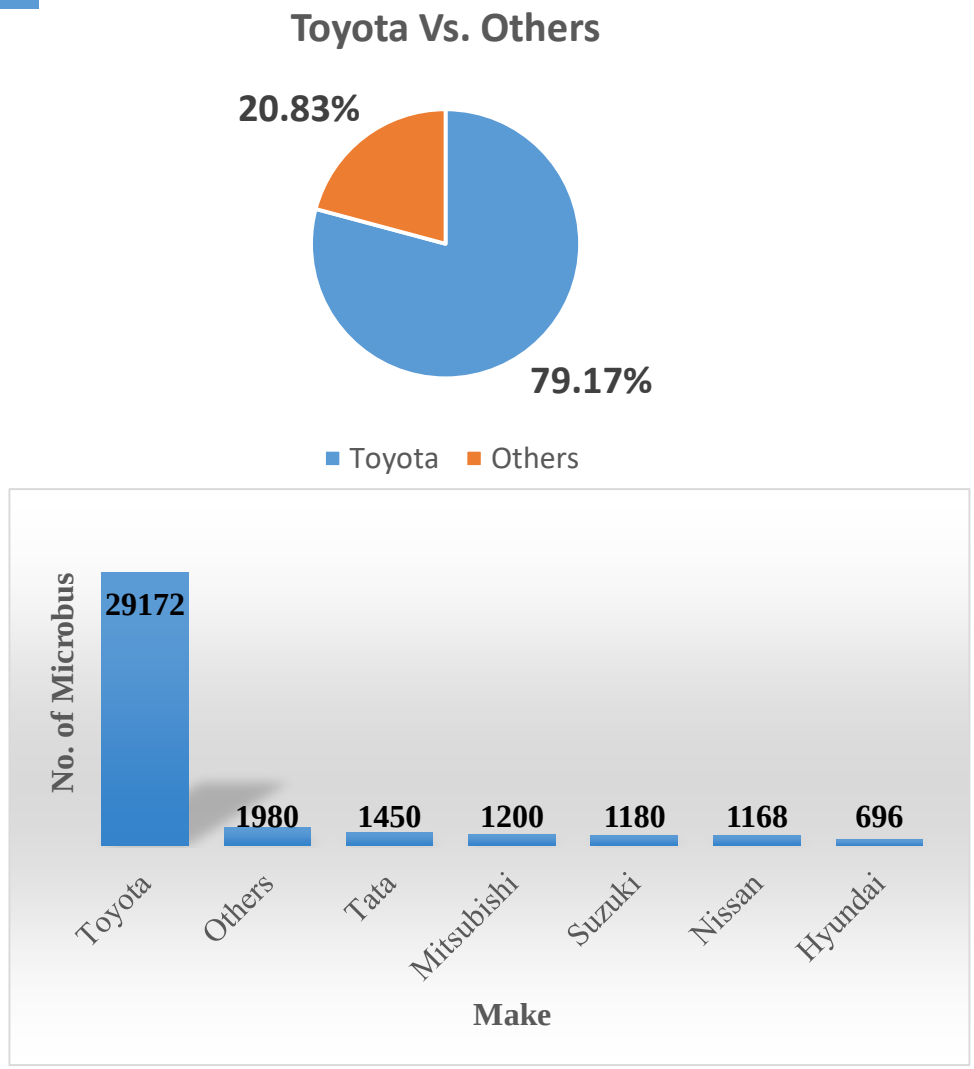




- **Car registration is in decreasing trend in the recent years**
- **Displacement range of car mostly falls into 1001-1500 cc category**

Baseline Survey

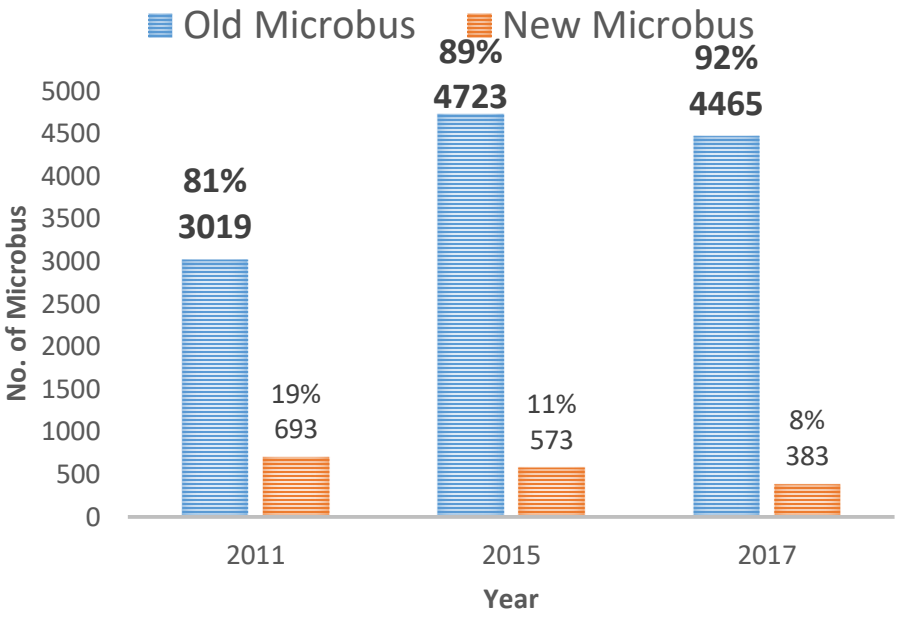
Microbus

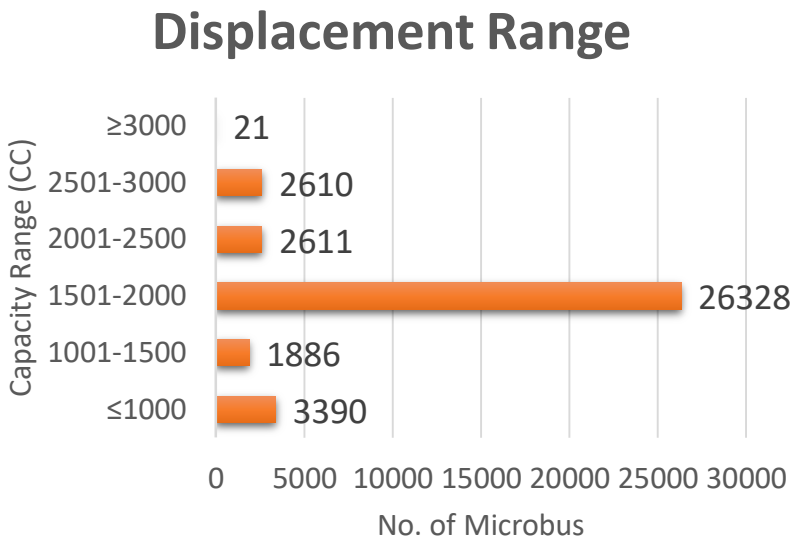


- **80% of the Microbus in Bangladesh are from Toyota**

Baseline Survey

Microbus

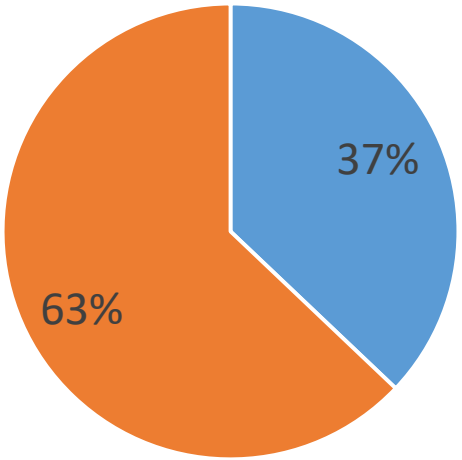


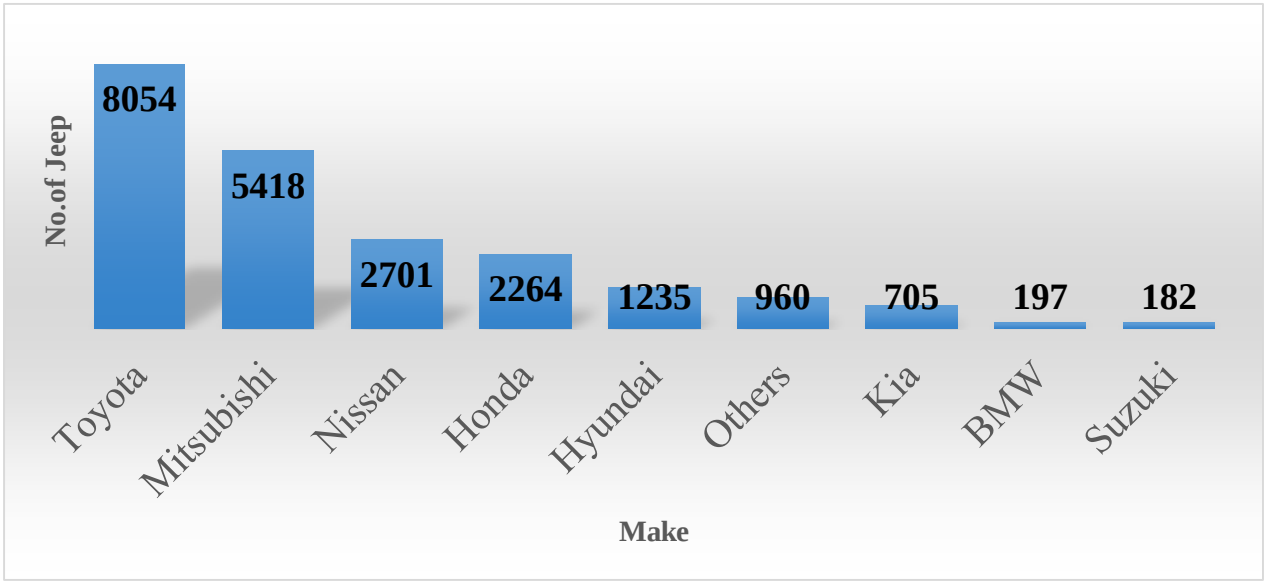


- **Microbus registration is in increasing trend in the recent years**
- **Displacement range of car mostly falls into 1501-2000 cc category**

Baseline Survey

Jeep

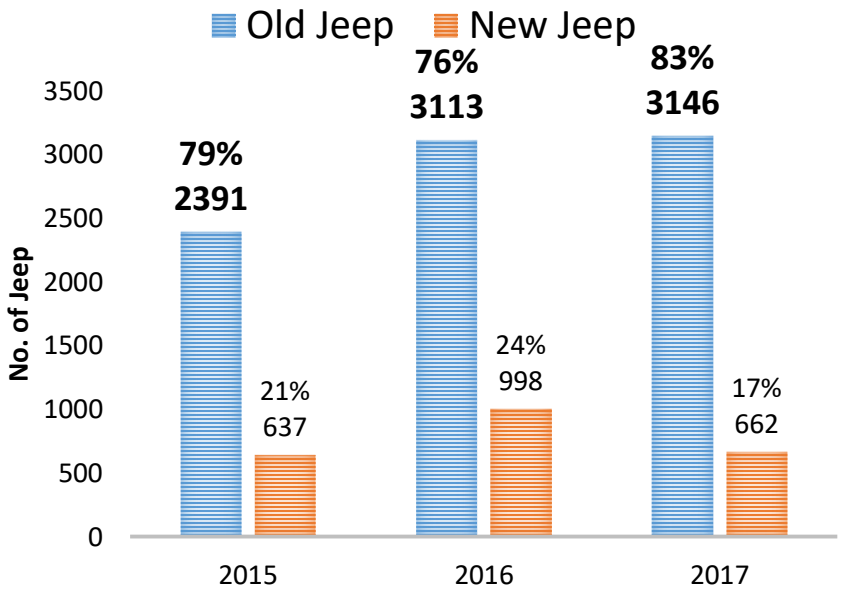


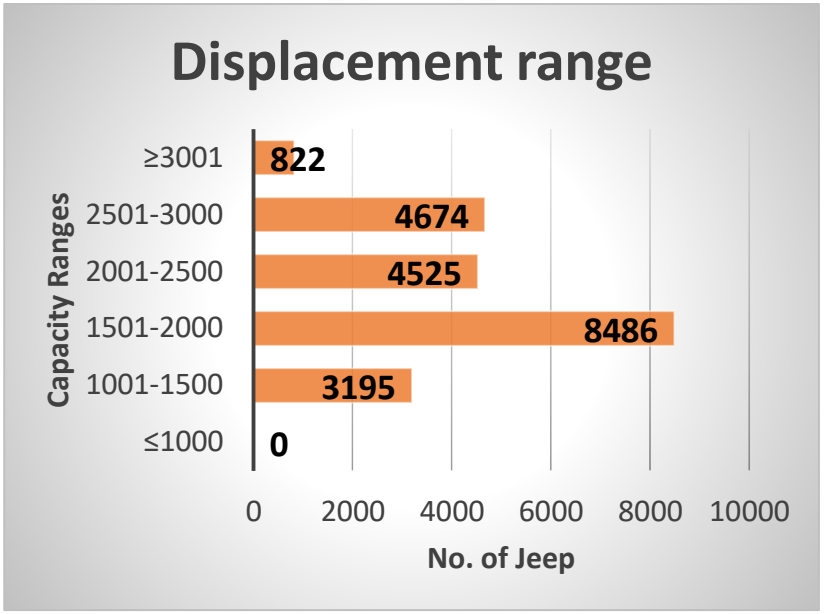


- **63% of the Jeep in Bangladesh are from Toyota, followed by Mitsubishi and Nissan**

Baseline Survey

Jeep

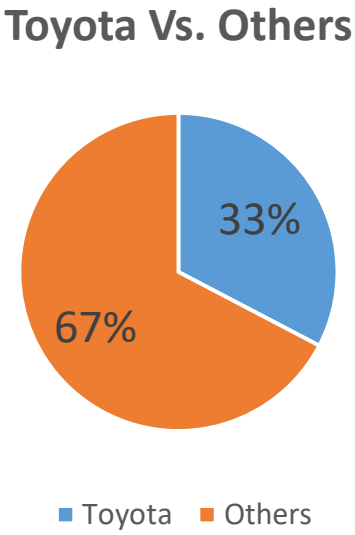


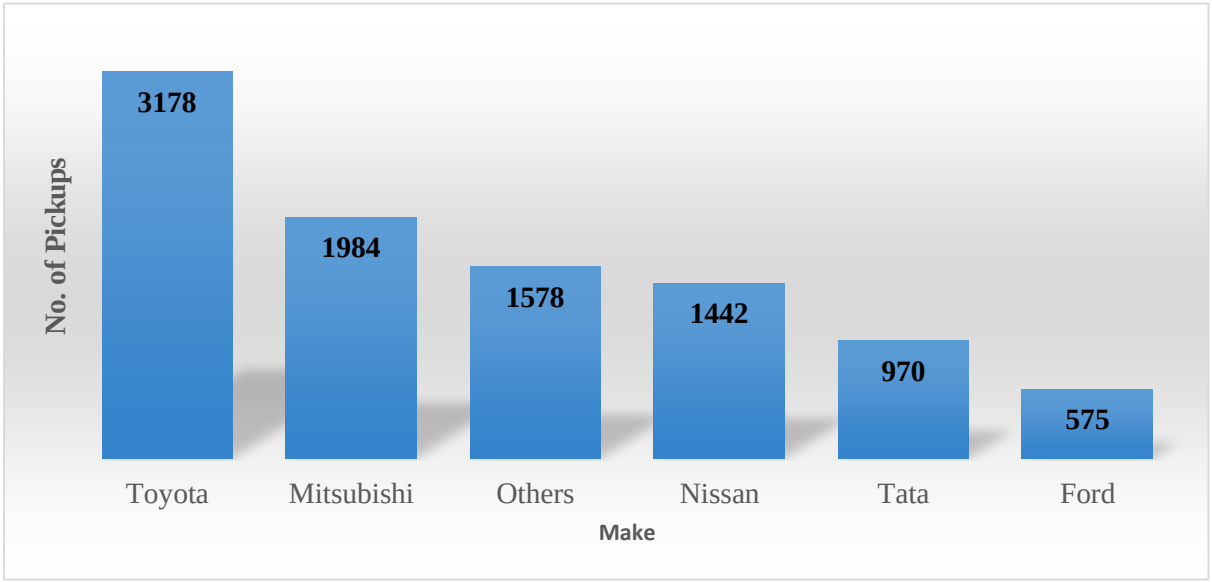


- **Jeep registration is in increasing trend in the recent years**
- **Displacement range of Jeep mostly falls into 1501-2000 cc category, but other ranges are also frequent**

Baseline Survey

Pickup

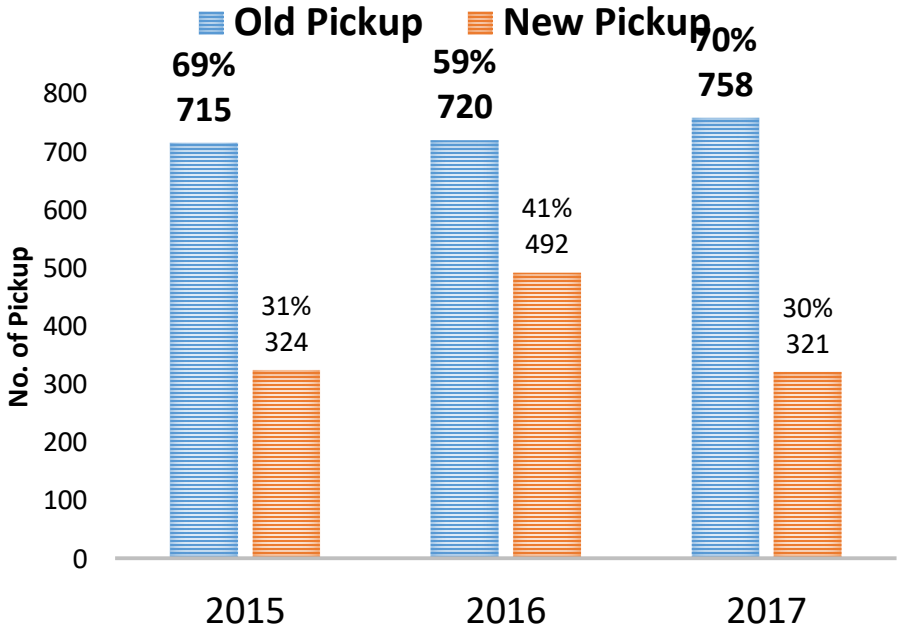


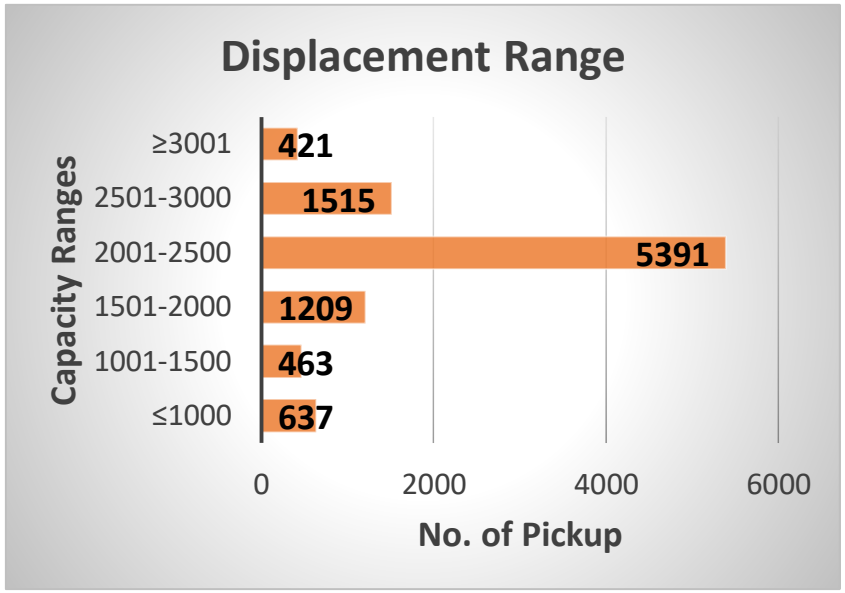


- **67% of the car in Bangladesh are from Toyota, followed by Mitsubishi**

Baseline Survey

Pickup





- **Pickup registration is slightly increasing in the recent years**
- **Displacement range of Jeep mostly falls into 2001-2500 cc category**

Baseline Survey: Findings Summary

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

Baseline Survey: Findings Summary

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 CO_2 emission?

Average Fuel Economy

$$= \frac{\sum_i^n Number\ of\ registered\ LDV\ of\ model\ i\ in\ that\ year * Fuel\ economy\ of\ model\ type\ i}{Total\ vehicle\ registered\ during\ that\ year}$$

Average CO_2 Emission

$$= \frac{\sum_i^n Number\ of\ registered\ LDV\ of\ model\ i\ in\ that\ year * Emission\ of\ model\ type\ i}{Total\ vehicle\ registered\ during\ that\ year}$$

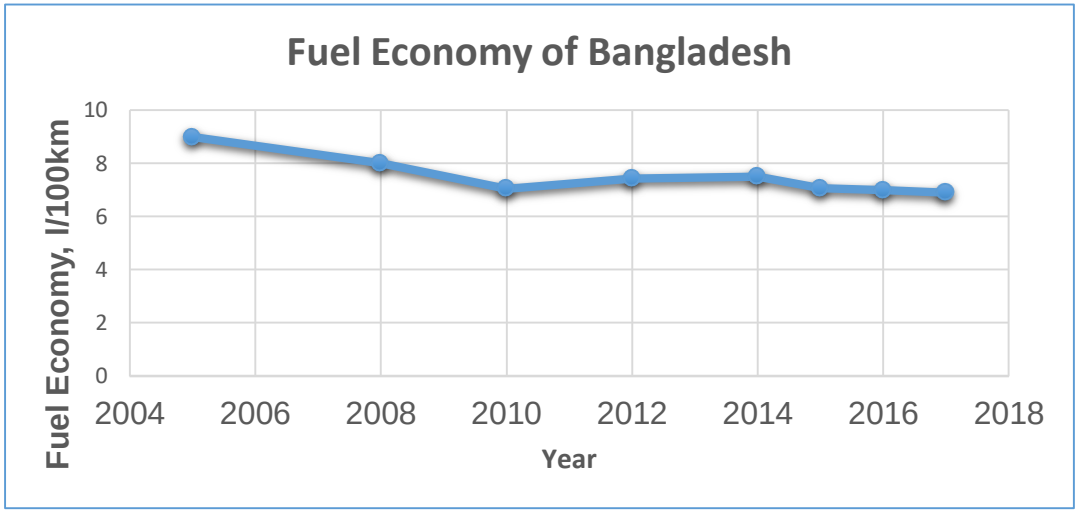
Units:

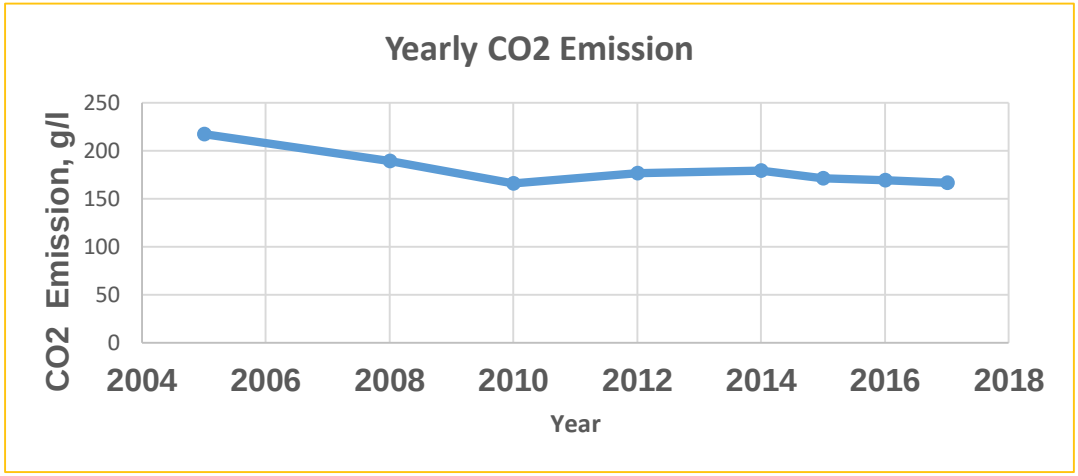
- Fuel Economy : L/ 100km
- C02 : gm/km

Fuel Economy and CO_2 Emission in Bangladesh- Year-wise Results

Year	Fuel Economy	CO_2 Emission
2005	8.98	217.33
2008	8.01	189.08
2010	7.04	165.9
2012	7.43	176.85
2014	7.5	179.46
2015	7.07	171.19
2016	6.99	169.06
2017	6.9	166.35

Fuel Economy and CO2 Emission in Bangladesh

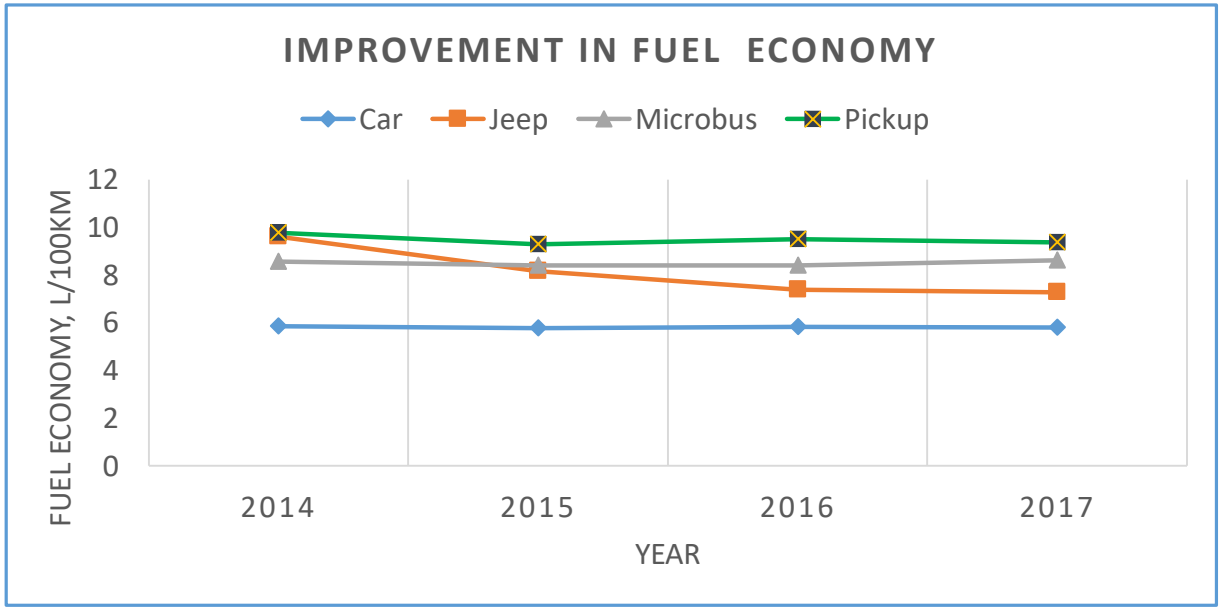




Both fuel economy and CO_2 emission is improving in Bangladesh

Fuel Economy and CO2 Emission in Bangladesh

Year	Car	Jeep	Microbus	Pickup
2014	5.85	9.59	8.56	9.76
2015	5.75	8.15	8.4	9.29
2016	5.81	7.37	8.39	9.5
2017	5.8	7.26	8.62	9.35



** Improvement is more prominent in Jeep category

Fuel economy and CO_2 emission of the LDVs in each category

LDV Type	Make (Top 5 in the fleet)	% in the Bangladesh vehicle fleet	% in the sample	Fuel Economy (l/100km)	CO_2 Emission (gm/l)
Car	Toyota	90.46%	84.20%	**5.88**	**135.41**
	Nissan	2.17%	1.60%	**6.09**	**139.95**
	Suzuki	1.64%	0.83%	**5.53**	**128.05**
	Mitsubishi	1.63%	4.91%	**5.92**	**140.28**
	Honda	0.70%	0.22%	**6.1**	**141.95**
Jeep	Toyota	37.09%	26.82%	**8.8**	**216.1**
	Mitsubishi	24.95%	31.18%	**10.13**	**234.55**
	Nissan	12.44%	22.00%	**7.11**	**186.44**
	Honda	10.43%	9.27%	**5.68**	**134.8**
	Hyundai	5.69%	3.82%	**7.12**	**218.07**
Microbus	Toyota	79.17%	58.19%	**8.4**	**203.27**
	Mitsubishi	3.26%	11.79%	**11.81**	**281.12**
	Suzuki	3.20%	16.20%	**6.1**	**143.4**
	Nissan	3.17%	6.53%	**8.33**	**219.14**
	Hyundai	1.89%	7.29%	**7.69**	**201.3**
Pickup	Toyota	32.67%	36.30%	**13**	**305.1**
	Mitsubishi	20.40%	38.38%	**8.23**	**226.48**
	Nissan	14.82%	4.66%	**8.79**	**231.12**
	Tata	9.97%	8.79%	**10.31**	**240.97**
	Ford	5.91%	2.23%	**7.56**	**196.56**

Fuel economy and CO2 emission for LDVs of different capacity range for 2017

LDV Capacity Range (CC)	Fuel Economy (l/100km)	CO_2 Emission (gm/l)
≤1000	5.018337	119.5654
1001-1500	5.782796	135.2595
1501-2000	6.919067	177.9945
2001-2500	10.18904	251.4269
2501-3000	8.943825	224.1055
≥3001	11.664	276.48

****Fuel economy and CO_2 emission is increasing with increased displacement range**

Where Bangladesh Stands?

Year	Non-OECD Average	Global Average	Bangladesh Average
2005	8.5	8.8	8.98
2008	8.5	8.3	8.01
2010	8.4	8.1	7.04
2012	8.2	7.8	7.43
2014	8	7.6	7.5
2015	7.9	7.6	7.07

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?