

# Transport System in Bhutan

## 4<sup>th</sup> Regional Environmentally Sustainable Transport Forum

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# Structure

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# 1. Country profile

- 1.1 Bhutan is a landlocked country situated in the eastern Himalayas
- 1.2 It is bordered by Tibetan region of China in the north and India on the rest.
- 1.3 The country is covered mostly by rugged mountains, with elevations ranging from about 100m in the foothills to over 7,500m in the north.
  - Capital city - Thimphu
  - Land area - 38,394 sq. km.
  - Population - 672,425 (based on 2005 census)
  - Pop. growth rate - 1.3% annually
  - Urban population - 30.9%
  - Rural population - 69.1%
  - Literacy rate - 56%
  - Int'l Airport - 1 at Paro (located 54 km south west of Thimphu)

## 2. Transportation system

- 2.1 Being a land-locked country, road is the principal mode of transport.
- 2.2 Bhutan's road network is narrow and winding owing to rugged terrain. As a result, the cost of building and maintaining road infrastructure is very high.
- 2.3 With about 4,900 km of road network, the road density is about 7 km for every 1,000 inhabitants. As a result, almost one-third of the country's rural communities have no access to road and therefore continue to walk for almost 2-3 days to reach the nearest road-head.
- 2.4 Air transport is limited to some neighbouring countries in the region, and Rail transport is non-existent at the moment.

## 2. Transportation system .....

- 2.5 The national highway (171 km) which connects the capital city, Thimphu from the border town of Phuentsholing is designated as the Asian Highway Route (AH48).
- 2.6 Land transport services—passenger and freight transport, are fully operated and managed by the private sector.

### 3. Trend in motorization

3.1 Motorization has been modest → increasing 3 times over 11 years' period → giving vehicle ownership of about 53 per every 1,000 population:

- 1997 → 13,684
- 2007 → 35,703

3.2 In terms of modal split:

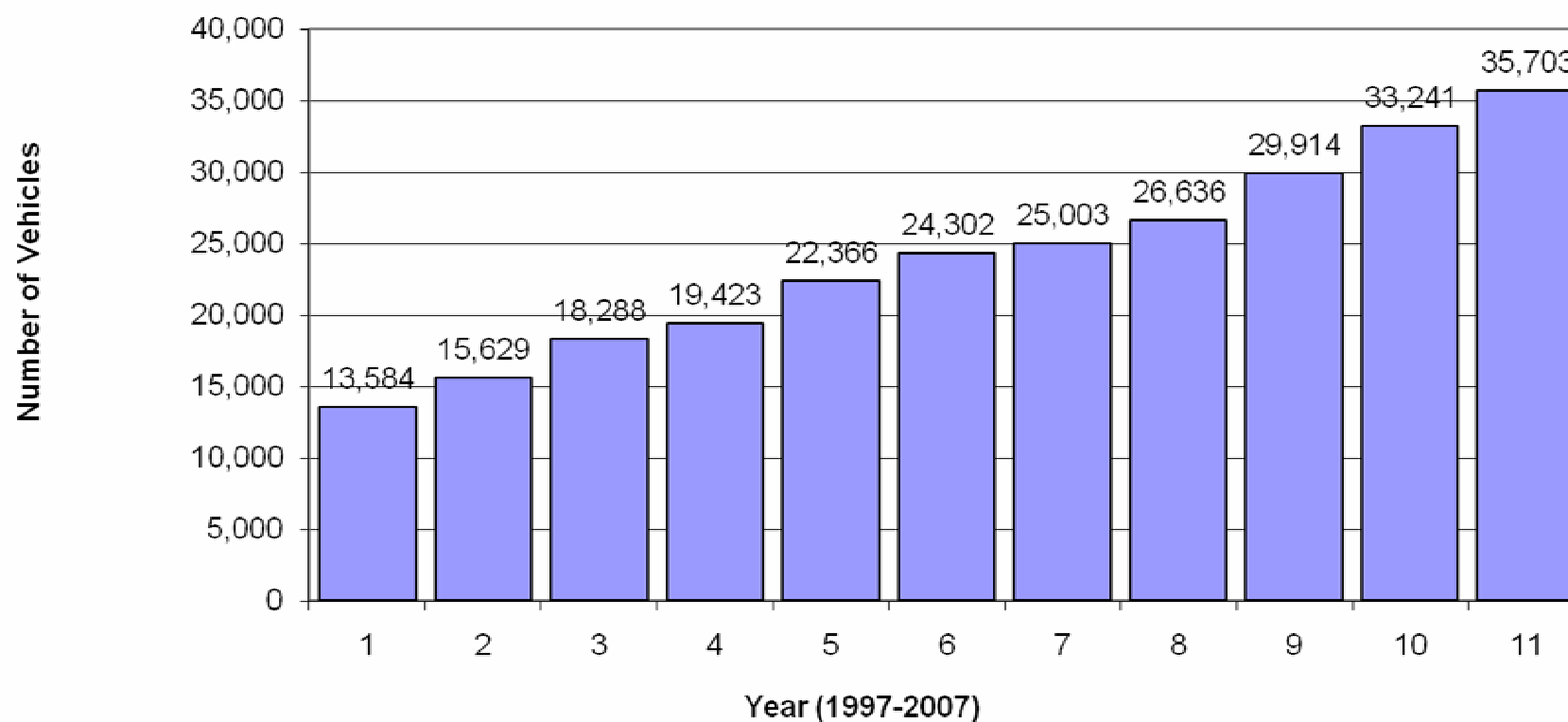
- 55% → light vehicles
- 21% → two-wheelers
- 14% → heavy vehicles (trucks and buses)
- 6% → taxis
- 4% → others

3.3 Transport demand management: Study undertaken in 2005/2006 indicated the following transport use pattern:

- 42.9% → personalized cars
- 28.2% → taxis
- 25.5% → public transport buses
- 3.3% → two-wheelers

### 3. Annual growth in motor vehicles

Annual Increase in Motor Vehicles 1997- 2007



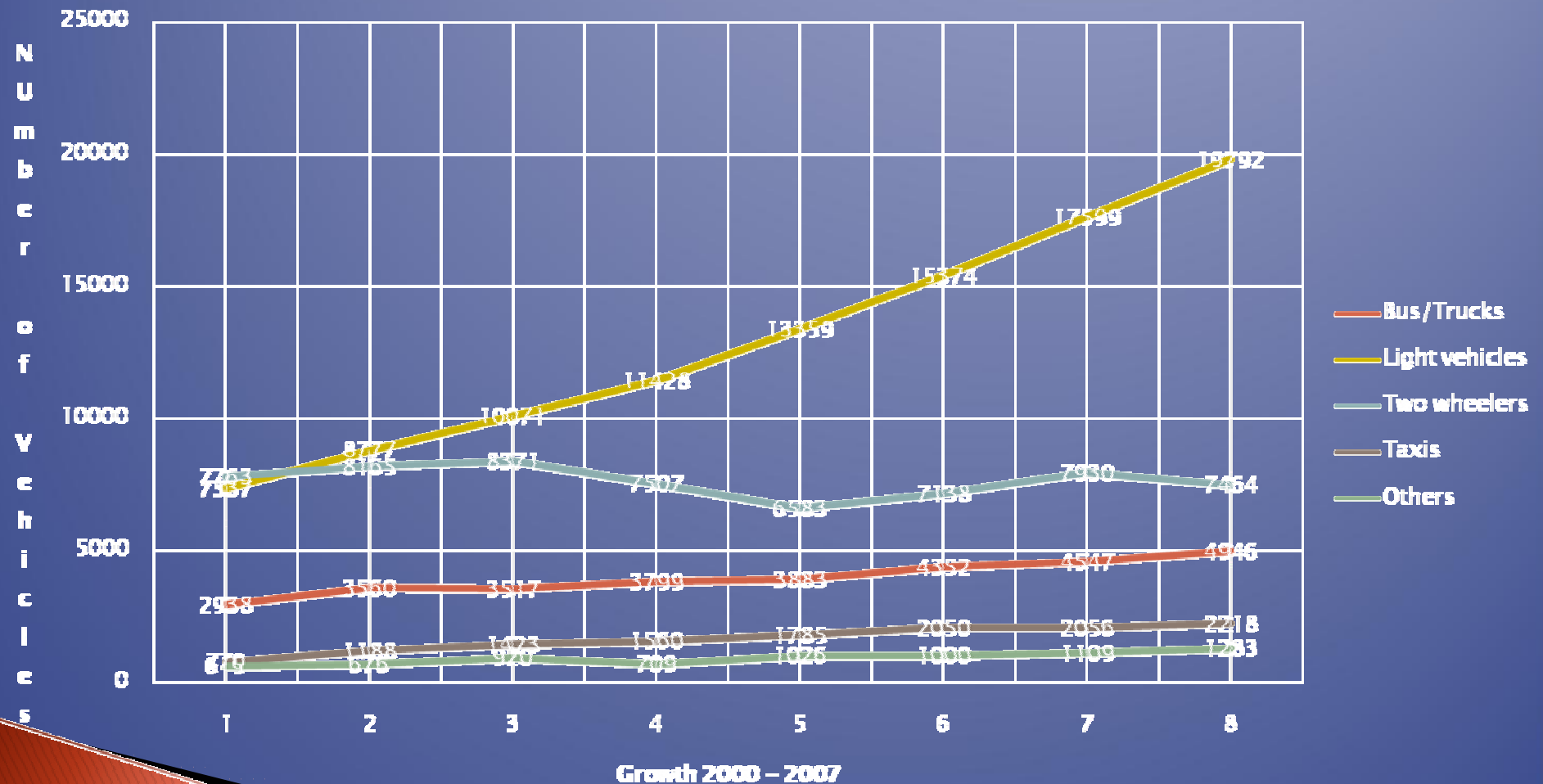
### 3. Vehicle Growth by Category

Vehicle type	2000	2001	2002	2003	2004	2005	2006	2007
Bus/Trucks	2938	3560	3517	3799	3883	4352	4547	4946
Light vehicles	7337	8777	10071	11428	13359	15374	17599	19792
Two wheelers	7763	8165	8371	7507	6583	7138	7930	7464
Taxis	770	1188	1423	1560	1785	2050	2056	2218
Others	615	676	920	709	1026	1000	1109	1283
<b>Total</b>	<b>19423</b>	<b>22366</b>	<b>24302</b>	<b>25003</b>	<b>26636</b>	<b>29914</b>	<b>33241</b>	<b>35703</b>



### 3. Vehicle growth by Category - Graph

Vehicle Growth by Category



## 4. Non-motorized Transport

- 4.1 Non-motorized transport is almost non-existent. Even the use of cycle is limited to few towns. Therefore, there is no facility for cyclists.
- 4.2 Good network of foot-path in the Capital city. However, it is still adequate. Other towns need to develop these facilities.
- 4.3 No special facility for disabled, elderly and other disadvantaged groups, so far as transport is concerned

## 5. Vehicle emission

- 5.1 Vehicle emission testing was introduced only in 2000
- 5.2 Bhutan depends entirely on fossil fuel (diesel and petrol) imported from India. Transport energy options such as hydro-electric power, Battery, LPG or CNG, are yet to be explored.
- 5.3 Fuel imports from India have increased from 79,462 kilolitres in 2004 to 85,157 kilolitres in 2005 registering 7% growth. This was equivalent to 6% of the country's GDP in 2005.
- 5.4 The Road Safety & Transport Authority is responsible for monitoring compliance to vehicle emission standards, approved by the National Environment Commission.
- 5.5 Two private agents have been licensed since 2005 to undertake emission testing of vehicles throughout the country.
- 5.6 Study of emission test result in 2006 indicated that almost 17% Petrol engines vehicles and 7.5% Diesel engine vehicles failed the standard
- 5.6 Despite this, emission standard has been revised since March 2008 → 4.5% CO (Petrol) and 75 HSU (Diesel)

## 6. Road safety

6.1 Motor vehicle accident rate has risen significantly over the years:

- 196 → 1997
- Peaked at 940 → 2006
- Declined to 523 → 2007

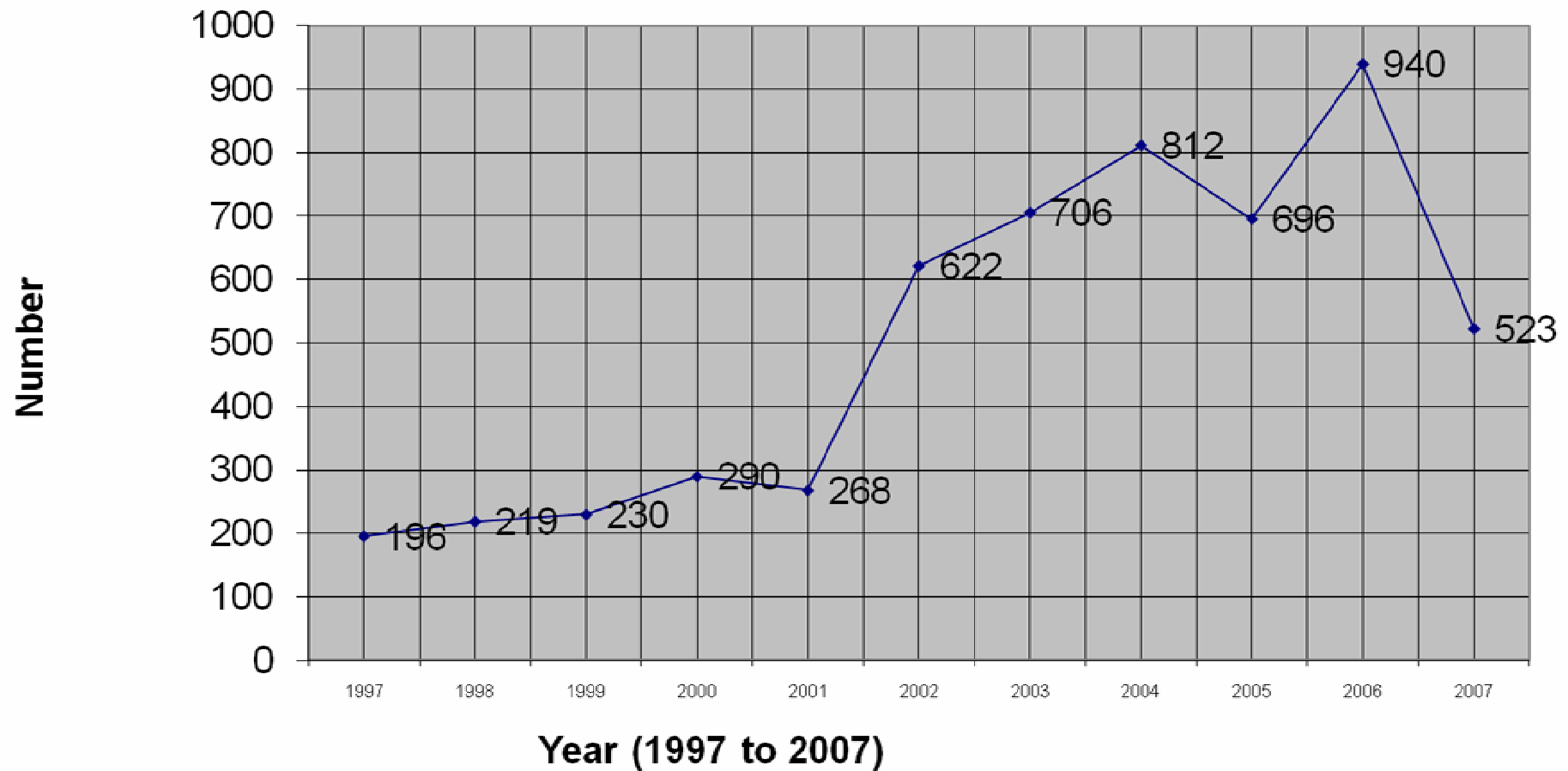
6.2 Crash profile

- 636 → died; 3030 → injured between 1997 and 2007
- 539 cases involving pedestrian accidents were recorded during the same period.
- About 52% of crashes involved light vehicles, followed by truck accidents - about 40%

6.3 Although the figures appear small, these are considered high when compared to the country's population.

## 6. Motor vehicle crash Data

Motor Vehicle Accident Data



## 6. Causes of road crashes

An earlier study of the road accidents in 2005 indicated the following main causes of road crashes:

- human error (reckless driving, speeding) 69%
- mechanical failure 11%
- road and weather related 10%
- unlicensed Driving 6%
- drink drinking 4%

## 7. Problems and challenges

- 7.1 Lack of trained transport professionals
- 7.2 Inadequate or unreliable passenger transport services in remote areas, mainly due to high operating cost, seasonal flow of passengers and low earning
- 7.3 Unsustainable urban transport due to dramatic increase in private vehicle ownership
- 7.4 Growing problems related to traffic congestion, high rate of road crashes and environmental pollution, with road network increasing only marginally
- 7.5 Low traffic enforcement due to the lack of trained enforcement professionals, safety equipment and limited mobility
- 7.6 Growing number of young drivers on the roads is seen as a major road safety concern
- 7.7 Low capacity and facilities for post accident management

## 7. Problems and challenges .....

- 7.8 Lack of reliable Accident database and investigation capability
- 7.9 Inadequate financing for road safety programs
- 7.10 Limited potential for introducing alternative transport energy



## 8. Conclusion

- 8.1 Road is the principal mode of transport in Bhutan, with air transport serving a small section of the country's population
- 8.2 Good progress has been made in the transportation sector that has eased the life of rural as well as urban population
- 8.3 Future requirements are however, numerous
- 8.4 Growing number of personalized vehicles is competing with urban transport system and therefore making it not so viable
- 8.5 Road safety and vehicle pollution are visible problems, requiring urgent intervention
- 8.6 There is also a need to develop skills of transport professionals, through support from development partners and donors