



# Country Presentation on EST Bangladesh

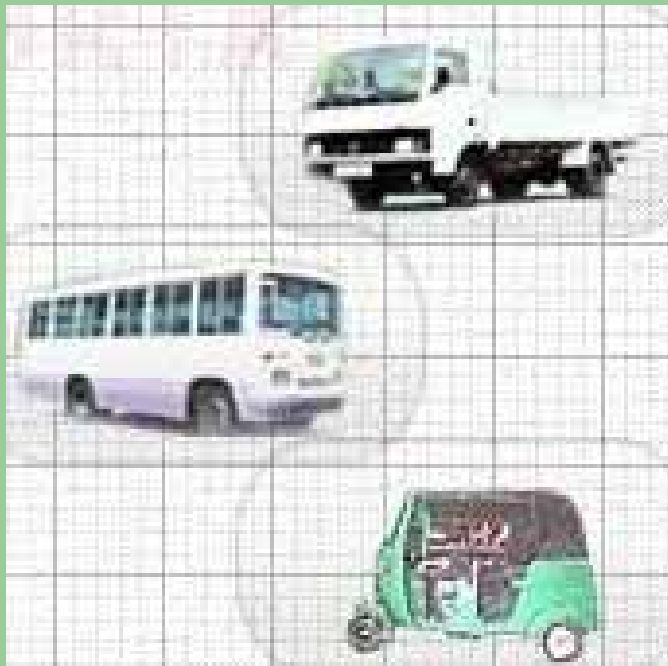
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# ROAD NETWORK OF BANGLADESH



# Road Network Map of Bangladesh



## A VIEW OF BANGABONDHU BRIDGE (4.8 KM)



# A VIEW OF BANGABONDHU BRIDGE





# Country Profile:

- ❖ Bangladesh is a south Asian country having 147,570 Sq. km (56977 sq. miles) land, bordering North and West by India, East by India and Myanmar and South by the Bay of Bengal.
- ❖ Population(2007):
  - ❖ Total : 143.91 M
  - ❖ Urban (including metropolitan) : 37.65 M ( 26.16 %)
  - ❖ Rural: : 106.26M (73.84 %);
  - ❖ Metropolitan : 1 8.56 M (12.9 %)
- ❖ Population density : 975.2 person/sq. km
- ❖ GDP (in crore taka) : 467,497
- ❖ Per Capita Income : 520 US Dollar.
- ❖ Life Expectancy :
  - ❖ Male : 64.7
  - ❖ Female : 65.9



# Modes of Transport

- Roads
- Waterways.
- Railways.
- Airways.

Air traffic is insignificant (less than 0.5% of the traffic volume) compared to other modes of transport. This presentation will be confined to other three modes of transport.





## Types of Transport used in different modes

Mode of Transport	Passenger		Goods	
	Motorized	Non-motorized	Motorized	Non-motorized
Roads	Motorized	Non-motorized	Motorized	Non-motorized
Railways	Motorized	-	Motorized	-
Waterways	Motorized	Non-motorized	Motorized	Non-motorized



# Road Network of Bangladesh

Road Length ( kilometer), 2007			
Class of Roads	Paved	Unpaved	Total
National Highway	3,485	85	3,570
Regional Highway	4,117	206	4,323
Zila Road	9,719	3,959	13,678
Upazila Road	21,277	14,889	36166
Union Road	11,778	30,551	42329
Village Road	13,316	1,58,019	1,71,335
<b>Total</b>	<b>63,692 (23.47%)</b>	<b>207,709 (76.53%)</b>	<b>271,401</b>

Source: RHD Master plan/LGED



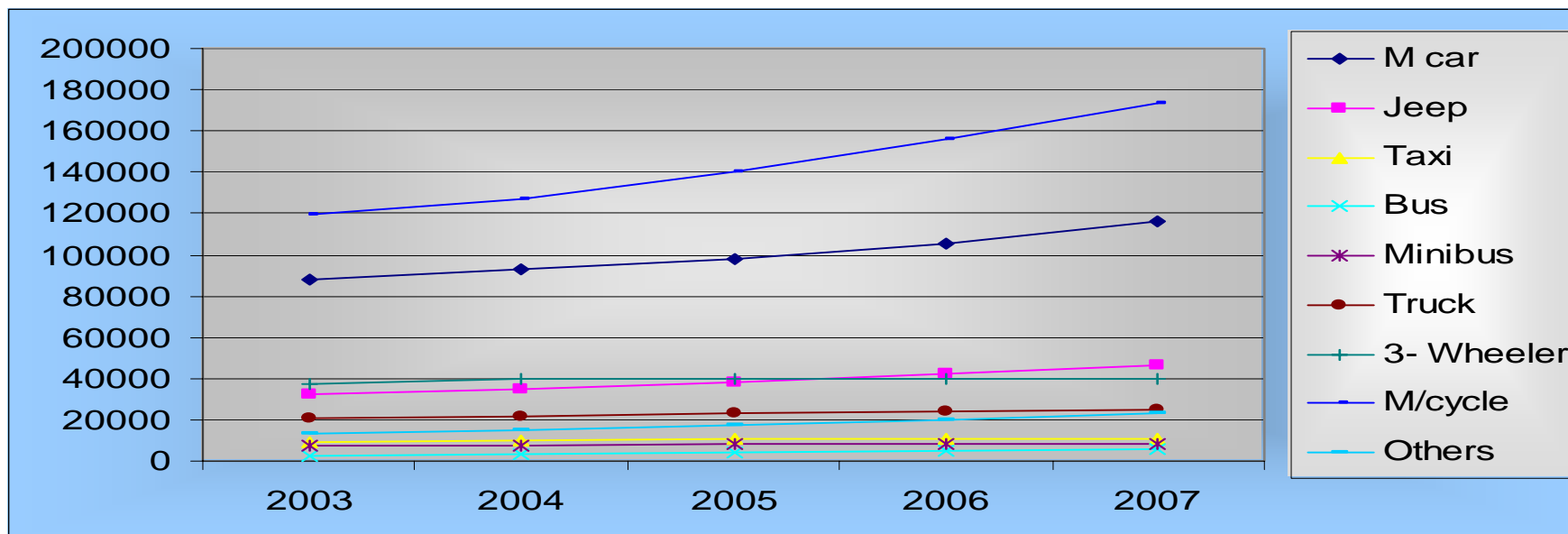
# Transport Scenario in Dhaka

- ❑ Total Area : 1529 sq. km (DCC)
- ❑ Road available for transport : 2250 km (approx.)
  - ❑ 434 km (4 Lane)
  - ❑ 1408 km (2 Lane)
  - ❑ 386 km (lanes and by-lanes)
  - ❑ 330 km footpath
  - ❑ Road area 7-9 % of total area
- ❑ Motorized vehicle : 3,79,174  
2-wheeler : 155,742; 3-wheeler: 13,521; Car/Jeep/M. bus:144,569;  
Mass transport: 22,006; Cargo truck: 22,142; others: 21,194
- ❑ Non-motorized vehicle : about 500,000 (approx.)



# Registered vehicles in Dhaka

Vehicles Class	Up to 2003	2004	2005	2006	2007	Total
Private Use (% increase)	239,556	14,720 (-16%)	21,815 (48%)	28,235 (29.4)	31,919 (13%)	<b>336,245</b> <b>(74.8%)</b>
Public Use	90,088	7414 (117%)	4984 (-63%)	5728 (15%)	5023 (-12%)	<b>113237</b> <b>(25.2)</b>
<b>Total</b>	<b>329644</b>	<b>22134</b>	<b>26799</b>	<b>33963</b>	<b>36942</b>	<b>449482</b>





## Non-motorized vehicles in Bangladesh

Type of transport	Year						
	Up to 2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	Total
Rickshaw (000 nos) (% increase)	1594	114 (7.15%)	112 (-1.75%)	99 (-11.6%)	61 (-38.4%)	60 (-1.6%)	2040 (96.4%)
Bullock cart Total no.	59000	58000	56000	55000	54000	52000	52000 (2.45%)
Push cart (% increase)	18668	989 (5.3%)	1042 (5.36%)	1591 (5.27%)	1073 (-32.55%)	637 (-40.6%)	24000 (1.15%)
<b>Total</b>	<b>1,671,669</b>	<b>113989</b>	<b>112042</b>	<b>99591</b>	<b>61073</b>	<b>58637</b>	<b>2116,000</b>

Source: BBS

# Driving License

Category of Driving License	Up to 2003	2004	2005	2006	2007	Total
Professional (% increase)	439,482	15,670 (3.57%)	17,584 (12.21%)	18,231 (3.68%)	19,212 (5.4%)	5,10,179 (63.43%)
Non-Professional (% increases)	251,781	8,269 (3.3%)	8,277 (0.1%)	11,107 (34.2%)	14,643 (31.8%)	294,077 (36.37%)
Total	6,91,263	23,939	25,861	29,338	33,855	8,04,256



# Waterway facilities

## Water routes

Total network of river system	24,000 km consisting of rivers, canals, creeks, water bodies etc. occupying 11% area of the country.
Navigable for longer sized vessels	6000 km. (during monsoon i.e. between mid November and end of February)
Navigable round the year	3600 km.

Source: BITSS Consultant's Report



# Water Vessels

## Vessels

Type of Vessels	Private sector				Public sector			Total		
	No	Average Capacity (no/ton)	Passenger ('000 no)	Cargo ('000 ton)	No	Passenger ('000 no)	Cargo (000 ton)	No	Passenger ('000 no)	Cargo ('000 ton)
Passenger	1800	120	220	-	60	10	-	1860	230	-
Cargo	2000	500	-	1000	30		4	2030	-	1004
Tankers	110	900	-	110	10		10	120	-	120
Bay crossing	140	900	-	130	30		30	170	-	160
Total	4050			1240	130	10	44	4180	230	1284

## Country boats

Type of boats	1998-99	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Motorized (000 nos)	65	65	66	67	67	68	69	70
Passenger (000 nos)	135	138	135	126	118	110	111	113
Cargo (000 nos)	73	74	72	71	68	65	66	67
Total('000' nos)	273	277	273	264	253	243	246	250



# Containers handling Scenario of Chittagong Port Authority

❖ Container Handled					
❖ Unit	❖ 2003	❖ 2004	❖ 2005	❖ 2006	❖ 2007
❖ TEU Handled % increase)	❖ 6,24,560	❖ 6,88,772 (10.28%)	❖ 7,83,353 (13.73%)	❖ 8,76,186 (11.85%)	❖ 9,58,020 (9.34%)

❖ Container Carried:

❖ Dhaka bound is : 70%

❖ Out of Dhaka bound container traffic, 11% is carried by railway, 5% by Road as intact while the remaining part are transported as loose cargo.

Transport Cost/TEU by various Modes			
Mode	Total Transport Cost / TEU ( in US\$)	Distance (km)	Cost/TEU km (in US \$)
Road	332	264	1.26
Rail	320	340	0.94
IWT (Provisional) I	165	304	0.5

Source: Chittagong Port Authority/ Mr. Hadi Hossain, Member, Planning & Admin, CPA



## Rail Track and vehicle/wagon/locomotive

Rail route kilometers, 2007			
Meter Gauge	Broad Gauge	Dual Gauge	Total
1800.88	659.33	374.83	2835.06

Vehicles & Locomotive Statistics			
Item	Broad Gauge	Meter Gauge	Total
Coaching Vehicles	324	1092	1416
Freight Wagons	2686	9757	12443
Locomotives (Diesel)	77	208	285

- Number of passenger trains operated daily : 227
- Number of freight trains operated daily : 51

Source: Economic Review 2007/Bangladesh Railways



# Modal Share (Passenger & Cargoes) 2007

Mode of Transport	Passenger (million)	Passenger-km (billion)	Freight (million tons)	Freight (billion ton-km)
ROAD	1734	66.62	86	12.90
RAIL	46	4.59	2.97	0.78
IWT	105	11.61	32	4.13
TOTAL	1885	82.82	120.97	17.81

Transport Modes	Carrying capacity		% Capacity utilization	
	Passenger in m no.	Cargo in m ton	Passenger	Cargo
Road, mass transport capacity (carried)	1534 (1183)	118 (80)	77.12	67.8
Rail	55.92 (45.8)	13.69 (2.97)	82	21.69
IWT	92 (105)	40 (32)	91.3	80

Source: BITSS consultant's report/Bangladesh Railway information book/BRTA



# EST Initiatives

- ❖ Introduction of “The Bangladesh Environment Conservation Regulations, 1997”;
- ❖ Introduction of unleaded gasoline in Bangladesh (July, 1999);
- ❖ Revision of ambient air quality standards (July, 2005);
- ❖ Revision of new and in-use vehicle emission standards (July, 2005)
- ❖ Phasing out diesel- run Two stroke three-wheelers by environment friendly CNG fueled 3-wheelers in capital Dhaka and port city Chittagong in 2003 and 2005 respectively.
- ❖ Replacement/conversion of all Diesel bus/minibus by CNG fueled bus/minibus by 2008 in Dhaka & Chittagong Metropolis;



## EST Initiatives (cont.)

- ❖ Providing Govt. land to private entrepreneurs to establish CNG re-fueling stations;
- ❖ Providing funds to convert Govt. vehicles into CNG fueled vehicles into CNG fueled vehicles;
- ❖ Established a regulatory Commission named “Energy Regulatory Commission” for regulating CNG affairs.
- ❖ Undertaking Circular Water ways around Dhaka City.

## EST Initiatives (Cont.)

- AQMP Study (2005) : Reduction of Diesel Pollution in Dhaka
- Import of all old buses and trucks should be stopped;
- Import of old Diesel engines should be stopped;
- Retiring of Old Diesel Vehicles in Dhaka;
- Replacement of Diesel vehicle by CNG vehicle in Dhaka City;
- To operate Diesel engines of EURO II and above;
- To use Diesel with Sulfur content less than 500 ppm;
- To encourage CNG transport vehicles by reducing Custom Duties;

# Significant Achievements

- Introduction of 13,000 CNG 3-wheelers in Dhaka City as replacement of about 40,000 two stroke 3-wheelers in 2003;
- Introduction of 13,000 CNG 3-wheelers in Chittagong City in 2005;
- Introduction of CNG buses in Dhaka City in parallel with Diesel vehicles from 2003. At present there are 1600 CNG buses in Dhaka City;
- All 4500 Diesel bus/mini-buses plying in Dhaka, have been converted into CNG buses;
- A Circular water way has been introduced around Dhaka city from 2007 in order to reduce traffic congestion and pollution;



# Future Implementation Plan

## Public Transport Planning:

- ❑ Strategic Transport Planning (STP) for Dhaka, 2005 for an implementation period of 20 years (approved by the Govt. in 2008);
- ❑ National Land Transport Policy (NLTP), 2004 for at least 30 years with a view to establish a transport system which is safe, cheap, modern, technologically dependable, environment friendly and acceptable in the light of globalization;
- ❑ An Integrated Multi-Modal Transport Plan (IMTP) awaiting approval of the Government emphasizing on maintaining of existing assets and infrastructure and encouraging more investment in Roads and Inland Water transport, the main objectives of which are reducing transport cost and improving efficient expenditure in the transport sector.





# Public Transport Planning (cont.)

## Recommendation under STP, 2005

- ❖ High quality mass rapid transit system (BRT and Metro); (Both BRT and Metro will certainly reduce pollution and at the same time facilitate mass transit);
- ❖ Basic level of road improvements plus several additional important access and circulation roads, most notably the Eastern and Western Bypasses (50 road projects); (Congestion as well as pollution will be reduced);
- ❖ Average travel speed is high for public transportation users, moderate for users of individual type transportation;
- ❖ Highest number of person kilometres of travel;
- ❖ No highest or lowest ratings for any of the goals;
- ❖ High initial cost (USD 4.2 billion excluding the BR investment); exceeding potential financial capability;
- ❖ Annual operating subsidy; large for Metro component, small for BRT component; However, these are rich factors;



## Physical Infrastructures under STP

The physical components of STP recommendations are as follows:

- **42 road projects** together with an **additional 8 projects** for increased access with a **cost of \$ 967m**;
- Introduction of **Metro and BRT** in Dhaka and reaching to the surrounding satellite towns (**205 km** of mass transit) costing **\$ 3.1bn**;
- Pedestrian facilities on arterial roads;
- NMT transportation facilities on arterial roads and those used by NMT traffic;
- Completion of **eastern portion of Circular Waterway**;
- Completion of major **improvements to railway system** including track, signaling and operations;



## Physical Infrastructures made as per STP

- ❖ The Dhaka Eastern Bypass construction is underway;
- ❖ Bijoy Sarani- Shahid Tajuddin Road (an important East-west link within DCC) construction is underway;



## Road Transport:

- The Road and Highways Department under MOC is responsible for planning, design, construction, improvement and maintenance of the primary and secondary road network in the country. Bangladesh is a river-bound country, so roads networks contain a significant numbers of medium and large bridges;
- For effective and efficient management of road network, the Government has recently created a Division called ' Bridge Division' in the MOC for construction and maintenance of bridges over 1500 mtrs;
- Jamuna multi-purpose bridge has already been constructed connecting northern part to the Capital Dhaka through road and rail in 1998;
- Feasibility study on 5.58 km Padma Bridge is going on, the construction of which is expected to begin next year ( 2010-2011) and is scheduled to be completed by 2013;
- The feasibility study on the 2<sup>nd</sup> Jamuna bridge and another Padma bridge will commence soon;
- The Mukterpur bridge has been constructed connect the isolated district Munshigonj with Dhaka in 2008;



## Rural Road Connectivity:

### Main Objectives:

The main objectives of the rural road connectivity is development of road Communication to link growth centres, union parishad headquarters, upazila parishads, social service institutions like schools, and hospitals with the national road network on a priority basis.

### Adaptation of Policies and Strategies:

- ❖ Road Master Plan;
- ❖ Road Maintenance Plan;
- ❖ Prioritization of Maintenance over new construction;
- ❖ Exploration of technological options to construct quality roads;
- ❖ Maximization of employment generation for the poor;
- ❖ More involvements of Local Government Institutions



## Rural Road Connectivity (cont.)

### Challenges:

- Lack of availability of land;
- Local conflict in prioritizing roads for development;
- Shortage of skilled manpower at union level;
- inadequate flow of funds;
- Overloaded trucks causing early damage to the pavement;
- Number of gaps in road network increasing road development costs;
- Frequent inundation by annual floods;



## Rural Road Connectivity (cont.)

### Achievement:

A remarkable physical achievement was incurred from 2005 to 2008:

- ❖ **C**onstruction of 11,804 km rural roads;
- ❖ **C**onstruction of 79,796 m bridge and culverts;
- ❖ 3,099 km roadside tree plantation;
- ❖ **C**onstruction/development of significant number of growth centers, markets, union parishad complexes, cyclone shelters and Ghats;



## Public Transport Planning (cont.)

### Significant policy objectives under the NLTP:

- To provide a safe and dependable transport service;
- To maintain an economic and environmental balance;
- Commensuration of traffic growth with economic development;
- Introduction of integrated transport system;
- Greater private sector participation;
- Expansion of the role of transport in the ever increasing economic activities;
- To ensure optimum utilization of Government funds;
- Poverty alleviation;





# Multimodal Integration

An Integrated Multi-Modal Transport Plan (IMTP) awaiting approval of the Government emphasizing on maintaining of existing assets and infrastructure and encouraging more investment in Roads and Inland Water transport, the main objectives of which are reducing transport cost and improving efficient expenditure in the transport sector. On the other hands, the NLTP depicts better integration with Inland Water Transport Policy. The salient features of the NLTP are as follows:

- ❖ Where tariff levels for passenger and freight are regulated, these will be reviewed across all modes of transport to ensure that costs to users are at a minimum consistent with other policy objectives;
- ❖ The Government will take steps to ensure that investment decisions across all modes of transport are subject to the same financial and economic criteria;



## Multimodal Integration (cont.)

- ❖ Physical integration between water, road, and rail modes will be encouraged where there are benefits to users, costs reductions or environmental improvements;
- ❖ Where integration is in the public and operators' interests, operators will be encouraged to publicize each other's services;
- ❖ Financing systems for modal integration will be considered by Government so that schemes are not held back by the unwillingness of Individual sectors to pay. The Government will establish a mechanism for aiding multi-modal schemes, and will publish advice on criteria for funding as early as possible;
- ❖ Services and infrastructure in the water sector will be studied so that an analysis can be made of potential opportunities integration, and competition where appropriate. Investment decisions in the road and rail sector should take account of the inland water transport strategy, and vice versa.



## Transport Demand Management (TDM)

So far this issue has not been addressed by the Government or any research group. There are some studies on this issue by some individuals, which are quite insignificant. However, the STP, 2005 recommended TDM, which covers a variety of potential programs and actions, to be implemented on a voluntary basis, through incentive programs or made mandatory by ordinance or regulation.

# Future Implementation Plan (cont)

## Non motorised Transport (NMT)

- Rickshaw
- Rickshaw Van
- Bullock carts
- Push carts
- Country boats



## NMT (cont.)

*Non-Motorized transport plays a very important role in over-all transportation system of the country, especially in rural Bangladesh.*

*National roads are designed for strategic movement by mechanized transport, so motorized and non-motorized vehicles cannot safely operate together.*

*In the NLTP, safer NMT operation has been fostered. Extracts from the plan are as follows:*

- ❖ Better design and traffic management will be implemented to ease the congestion effects of NMVs and also to include safety components;
- ❖ Where National Roads pass through urban areas, measures will be taken to segregate motorized and non-motorized vehicles. Where it is possible to provide service roads, non-motorized vehicles will be banned from National Highways carriageways, otherwise special lanes for NMV's will be provided by the side of National Highways;



## NMT (cont.)

- ❖ Safe standards of non-motorized vehicles will be improved;
- ❖ Law enforcing agencies will ensure that various vehicles behave responsibly in using the road space allocated for them;
- ❖ Progressive bans on rickshaws in main urban roads will be introduced, as a part of a program of improved public transport;
- ❖ The Government will conduct a study to assess the need for quantify control, and the social impacts of reduction of rickshaw demand in Dhaka;
- ❖ As part of the Road Safety program, rickshaw pullers will receive education in traffic and road behavior;



## NMT (cont.)

- ❖ provision of exclusive pedestrian and bicycle lanes have not been addressed properly both in cities and highways, however, some measures like foot overpasses and good footpaths for pedestrian, provision of seat reservation for elderly, physically impaired, children and women has been made in buses and minibuses in cities;
- ❖ Usages of bicycles in cities is insignificant. However, in rural Bangladesh, bicycle makes a significant part of NMT modes. Lanes and bylines for bicycles have not yet been made in cities. However, NLTP recommends segregation of NMT from MMT by providing special lanes for NMT by the sides of National roads passing rural areas. *A 50 km special lane for NMT has been made on experimental basis in such a part of National Highways;*



## Land-use measures for pollution reduction

At present there exists no land use policy to follow for reduction of pollution in transport sector. However, the recommendation of the STP to introduce BRT and Metro in Dhaka city will subsequently reduce pollution and simultaneously will optimize land-use;

The STP, 2005 recommendation for land-use are as follows:

- The Government will create a Unitary Authority that will be responsible for the planning of both land use and transportation systems in order to achieve integration between transportation and land use development. Whereas the two functions are currently separated, this new Unitary Authority will have responsibility for both functions and will also be empowered to grant or refuse planning permissions in accordance with the STP and Structure Plan;





## Land-use measures for pollution reduction (cont.)

- ❖ The Government will create systems such that the climate will be amenable to encourage the public to participate in the policy drafting and comment on the Policy as drafted. Continuity with the STP will be ensured by the existence of a permanent Steering Committee which will monitor developments and advise the Unitary Authority.



## Road Safety measures and public health issues

It is true that no remarkable works in respect of road safety and public health has been done till today. However, National Road Safety Council (NRSC) with the Honorable Minister for Communication in the chair have been formed in 1995. The NRSC could not function properly. However, as an apex body it delivered some directives according to which the following decisions/programs have been taken:

- Awareness building among different stake-holders like drivers, conductors, pedestrians, passengers, students of road side schools etc.;
- Identifying accident black-spots on highways and rectifying the road designs for mitigation;
- Road safety awareness programs to license seeking drivers before test of competence is taken;



## Road Safety measures and public health issues

### First Aid

- ❖ First Aid training for police and commercial vehicle drivers/conductors and refueling station staff;
- ❖ RTA casualty training for graduate doctors and para-medics;
- ❖ Providing First Aid lesson and kits in schools, colleges, social worker, Fuel stations and Dispensary;

### Hospital Data:

- ❖ Hospitals regularly maintain RTA casualty records;
- ❖ Development of injury surveillance system in hospital;
- ❖ System developed to cross check RTA casualty figures from police sources and hospital sources;



## Road Safety measures and public health issues

### Trauma Centers:

- ❖ Establishment of primary trauma centers at every 70 km along major highways; (ongoing)
- ❖ Establishment of secondary trauma centers in hospitals; (ongoing)
- ❖ Establishment of central trauma centers in major cities; (ongoing)



## Road Safety measures and public health issues

**The Bangladesh Environment Conservation Regulations, 1997 sets the following standards of vehicular exhaust gases and sound:**

- ❖ Gasoline and Natural Gas vehicles shall be fitted with Catalytic converter;
- ❖ Diesel vehicles shall be fitted with particulate filters;

### Standard for Emission from Motor Vehicles

Parameter	Unit	Standard Limit
Black Smoke	Hartridge Smoke Unit (HSU)	65
Carbon Monoxide	gm/km	24
	percent area	04
Hydrocarbon	gm/km	02
	ppm	180
Oxides of Nitrogen	gm/km	02
	ppm	600



## Road Safety measures and public health issues

### Standards for Sound originating from Motor Vehicles

Unit	Standards	Remarks
DbA	85	As measured at a distance of 7.5 meters from exhaust pipe
DbA	100	As measured at a distance of 0.5 meters from exhaust pipe



## Road Safety measures and public health issues

### Achievements under Environment Conservation Regulations:

As old vehicles comprise the greater portions of country's vehicle fleet, use of Diesel particulate filters and catalytic converters are limited to new vehicles only. However, standard of exhausts and sound are being controlled to some extent.

- ❖ Fitness Inspections (yearly) at Vehicle Inspection Centres ( VIC) and Roadside Inspections under the Environmental Conservation Regulations by BRTA;
- ❖ Roadside Inspection by DOE and jointly by BRTA and DOE;
- ❖ Initiative for establishment of five more VICs at five locations and procurement of more Roadside Inspection vehicles and instruments;



# Major EST Challenges:

- Cope up with increasing transport demand and land use;
- Introducing high quality mass transit system (Metro) at Dhaka requiring heavy initial investment;
- High initial cost (USD 4.2 billion excluding the BR investment) exceeding potential financial capability;
- Maintaining stringent vehicular exhaust standards due to old vehicle fleet and limited physical infrastructures;
- Maintaining effective physical multi-modal integration;
- Maintaining the Dhaka Circular Waterways to keep it operational round the year;





## Recommendations:

- ❖ **Construction of major roads, bridges, arterial roads as well as supporting facilities as per planed schedule;**
- ❖ **Effective and efficient integration of different transport modes when and where necessary;**
- ❖ **Maintaining ecological balance right from planning of project;**



**THANK YOU FOR YOUR  
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