

# SUSTAINABLE AND INCLUSIVE TRANSPORT DEVELOPMENT IN BANGLADESH

**Sarwar Jahan**

**Professor**

**Department of urban and regional planning**

**Bangladesh University of Engineering and  
Technology**

# CONTENTS

## ▣ INTRODUCTION

- Present Status of Transport System and Services
- Transport Demand: Status and Trend
- Institutional Arrangement
- Weaknesses of the Institutional Arrangement

## ▣ NATIONAL PRIORITIES FOR DEVELOPMENT OF TRANSPORT AND URBAN TRANSPORT

## ▣ URBAN TRANSPORT: CURRENT STATUS OF URBAN TRANSPORTATION

- Insufficient transport infrastructure and services
- Institutional deficiency
- The varied traffic mix and increasing number of private cars
- The absence of a dependable public transport system
- Inadequate traffic management practices

## ▣ DEVELOPMENT OF SUSTAINABLE AND INCLUSIVE TRANSPORT SYSTEMS: ISSUES AND CHALLENGES

# CONTENTS

## ▣ WAYS FORWARD

- Developing Public Transport Alternatives
- City-Specific Measures
- Strengthening Linkages with Cities and Towns around Metropolitan Areas
- Coordinated Development of Land Use and Transportation
- Making Better Use of Existing Road Infrastructure by Proper Traffic Management
- Reforming Existing Institutions
- Developing Multimodal Transport

## ▣ CONCLUDING REMARKS

# INTRODUCTION



## INTRODUCTION

- An efficient transport system is essential for promoting economic development.
- Transport system in Bangladesh comprises a number of distinct modes and services, notably railways, roads, road transport, ports, inland water transport, coastal shipping, airports and airlines etc.
- However, roads and inland water transport are the dominant means of transport carrying more than 90% of total traffic generated in the country and will continue to dominate the transport landscape in the foreseeable future.
- Public sector is mainly responsible for development and maintenance of transport infrastructure in Bangladesh.
- Presently in Bangladesh there are about
  - ❑ 55,000 kms of paved roads
  - ❑ 2,877 route-kilometers of railways
  - ❑ 3,800 kms of perennial waterways which increases to about 6,000 km during the monsoon
  - ❑ 2 seaports
  - ❑ 2 international airports (i.e. Dhaka and Chittagong) and 8 domestic airports.

## INTRODUCTION

- ▣ Public sector is mainly responsible for development and maintenance of transport infrastructure in Bangladesh.
- ▣ The public sector is involved in transport operations in road, inland water transport (IWT) and ocean shipping alongside the private sector.
- ▣ In the road transport and IWT sub-sectors, the private sector is dominant.
- ▣ In ocean shipping, however, public sector still predominates, although the private sector has considerably increased its role in recent years.
- ▣ Recently private sector has also become important operator in air transport, both domestic and international.
- ▣ Involvement of the private sector in railway operation, however, is very limited.

## Present Status of Transport System and Services

- ▣ Bangladesh witnessed rapid growth of transport sector since independence. The overall annual growth rate was nearly 8.2 percent for freight transport and 8.4 percent for passenger transport
- ▣ The relative roles of transport modes are evolving with road transport expanding at the expense of railways and inland water transport because of its inherent technical and cost advantages.

## Railways

- ▣ Bangladesh Railway (BR) provides, environment-friendly less hazardous and less expensive transport services. It has got a total network of 2,877.10 route kilometres (broad gauge 659.33 km, dual gauge 374.83 km and metre gauge-1,842.94 km).
- ▣ For many years railways played a significant role as a dominant mode of land transport because of its less hazardous and less expensive transport services. In recent years the railway has been losing its market share to other modes, especially the road because of its flexibility and capability to provide door to door service. Policy shift of the successive governments in favour of road has also been responsible for the decline of railway's share of passenger and freight traffic.



## Inland Water Transport (IWT)

- ▣ Inland Water Transport (IWT) is an extremely energy efficient, environmentally clean and economical mode of transport. But it has not been able to realize its full growth potential partly because of the road bias of the infrastructure development policy of the government. Bangladesh has about 14,000 kms of waterways (rivers/canals) of which about 5,968 kms. remain navigable during monsoon and 3865 kms of rivers/canals are navigable during the dry season.
- ▣ The water transport network of the country not only caters to the inland movement of freight and passengers but also plays an important role in the transportation of import and export items through the ports of Chittagong and Mongla.
- ▣ Currently, most of these waterways suffer from navigational hazards like shallow water and narrow width of channel during dry weather, siltation, bank erosion, absence of infrastructure constrained by the absence of proper surface road links to facilitate the smooth transit of cargo.



## Road Transport

There has been tremendous expansion of road network in the country since independence. In 1971 total length of paved roads was 3000 kms which increased to about 55,000 kms. at present. Dhaka is connected with the major urban centres and the sea ports by roads. The Roads and Highways Department (RHD) manages several categories of roads. As recorded in 2012, the total length of road under RHD is 21,462 km. 16.52 percent of these roads are national highways while 19.93 percent and 63.55 percent are regional highways and feeder roads respectively.

Year	National Highway (km)	Regional Highway (km)	Feeder Road 'A' type (km)	Total (km)
2001	3086	1751	15962	20799
2004	3372	4832	13823	22378
2008	3462	4128	13255	20865
2012	3544	4278	13640	21462

## Local Government Engineering Department (LGED)

- ▣ The Local Government Engineering Department (LGED) is also involved in the development of urban and rural roads. Since its inception up to June 2012, LGED has so far constructed, reconstructed and rehabilitated a total of 82,260 km. upazila, union and rural roads, as well as 1,162,666 metre bridges/culverts on these roads.

## Mechanised Vehicles on Roads

- ▣ There has been significant increase in the number of mechanized vehicles on roads in recent years. Between 1999 and 2011 mechanised vehicles on roads increased by about 9% annually. Growth rates of smaller vehicles, especially, car, auto-rickshaw, motorcycles etc. were higher than the larger vehicles such as bus and truck.

## Estimated Number of Mechanized Vehicles on Road by Type and Year

Mode/Year	1998-99	2000-01	2002-03	2004-05	2006-07	2008-09	2010-11	Annual Growth Rate (%)
Bus/Minibus	26308	27853	31848	34388	36526	39088	41143	4
Jeep/Microbus	21479	23711	27253	30212	35727	43083	51652	8
Truck	42791	46759	50786	55082	59674	65064	79462	5
Car/Taxi	57691	63168	73423	82291	90962	106664	125177	7
Auto-rickshaw	72150	75775	84693	99930	111046	135875	163722	7
Motorcycle	174208	200264	239884	281599	366031	501825	640719	11
Other	10905	13838	18422	23268	29676	38161	57995	15
Total	405532	451368	526309	606770	729642	929760	1159870	9

**Source: Bangladesh Bureau of Statistics (BBS), 2012**

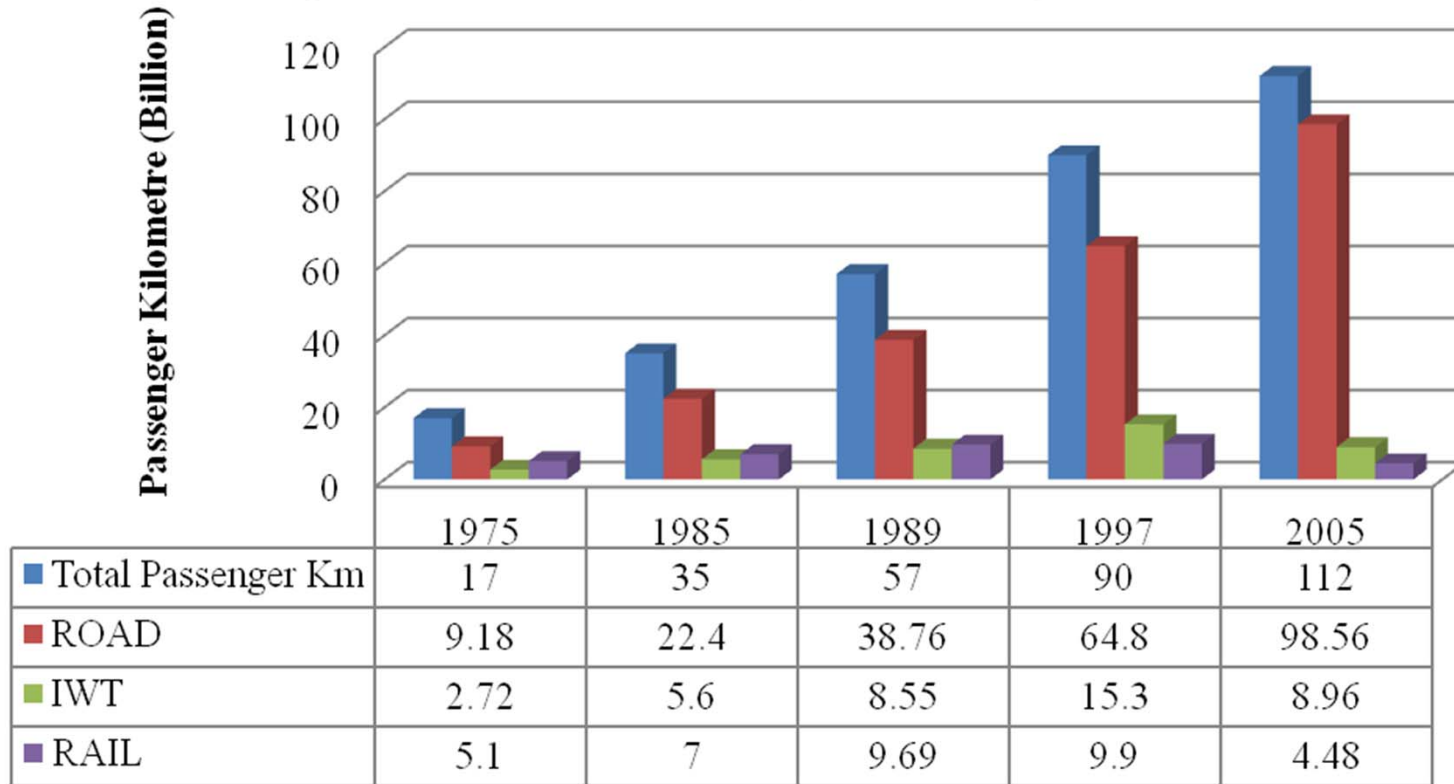


## Transport Demand: Status and Trend

- ▣ There are considerable variations in the projection of traffic on road by various studies.
- ▣ Bangladesh Road Master Plan study carried out in 1990-91 estimated that the average annual growth of both freight and passenger traffic would be around 5- 6%.
- ▣ Bangladesh Road Master Plan (2005-25), on the other hand, estimated that the growth of both freight and passenger traffic would be around 6.4% per year for the period 2010-2015 and 6% over the Master Plan period (2005-25).
- ▣ The Road Master Plan observes that the road network will need to respond to these challenges. Over the next twenty years, many of the major National Highways will require to be widened to accommodate this extra traffic, and this major programme of works needs careful phasing in the plan.

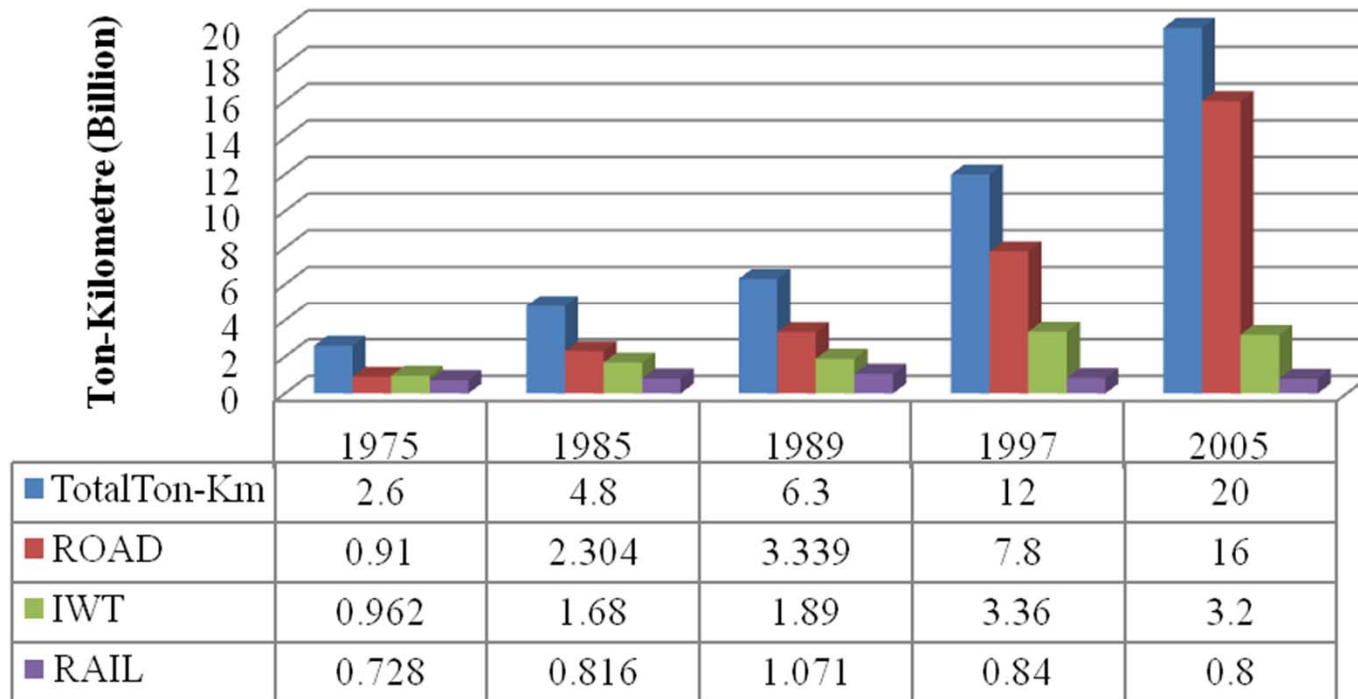


**Figure : Growth of Passenger Traffic by Mode**



Source: Bangladesh Transport Sector Review (The World Bank publications), People's Republic of Bangladesh: Revival of Inland Water Transport-Options and Strategies, 2007, Bangladesh Integrated Transport Sector Study, 1997, Planning Commission

**Figure : Growth of Freight Traffic by Mode**



Source: Bangladesh Transport Sector Review (The World Bank publications), People's Republic of Bangladesh: Revival of Inland Water Transport-Options and Strategies, 2007, Bangladesh Integrated Transport Sector Study, 1997, Planning Commission

## Institutional Arrangement

- ▣ Both public and private sector institutions are involved in the management and development of the transport sector. Public sector involvement in the transport sector, especially road, rail and IWT consists of ownership and operation of a number of State Owned Enterprises and Authorities that include
- ▣ Roads and Highways Department (RHD),
- ▣ Bangladesh Road Transport Authority (BRTA),
- ▣ Bangladesh Road Transport Corporation (BRTC) and
- ▣ Dhaka Transport Coordination Authority (DTCA) under the Ministry of Transport and Communication;
- ▣ Local Government Engineering Department (LGED) under the Ministry of Local Government, Rural Development and Cooperatives;
- ▣ Bangladesh Inland Water Transport Authority (BIWTA) and Bangladesh Inland Water Transport Corporation (BIWTC) under the Ministry of Shipping, and
- ▣ Bangladesh Railway under the Ministry of Transport and Communications.

## Weaknesses of the Institutional Arrangement

The institutional set-up for planning, development and management of the transportation sector suffers from a number of serious deficiencies.

- ▣ There is no effective coordination among the institutions that leads to severe competition among the modes thus hindering sustainable development of the transport sector.
- ▣ There is no assessment as to whether a particular mode of transport could undertake a particular task more economically and with less damage to the environment. Consequently, the transport system is characterized by sector bias, inappropriate modal mix and lack of integration within and among various modes of transport.
- ▣ Fragmentation of responsibilities leads to system inefficiency and the top-down approach to planning fails to take opinions of all stakeholders into account thereby lowering the capacity of the system to respond to demand.
- ▣ Another important weakness of the institutional arrangement is the lack of capacity in terms of knowledge in various fields of transportation such as efficiency and performance of different technologies and modes in use, life cycle costs of different modes, management systems needed for large transport networks that are undergoing rapid transformation, the requirements for multimodal transport planning, and the interaction of the transport sector with other sectors of the economy, society and the environment.

# NATIONAL PRIORITIES FOR DEVELOPMENT OF TRANSPORT AND URBAN TRANSPORT



# National Priorities for Development of Transport And Urban Transport

- ❑ Development efforts and investment decisions during the last few decades have been driven by individual project considerations, without definitive policy objectives with the result that the roles of some important modes of transport have been marginalized.
- ❑ There has been a significant change in the relative roles of transport modes with road transport expanding at the expense of both railways and inland water transport.
- ❑ Investment on road sector as percent of transportation investment increased from about 32% in 1974-75 to about 89% in 2009-2010. Investment on railway and waterway, on the other hand, declined quite sharply during the last three decades and together accounted for only about 10% of the total investment in the transport sector in 2009-10.
- ❑ Realizing the drawbacks of such an approach the government is now paying more attention to multimodal transport development.

## Modal Shares (in percent) of Annual Transport Investment

Year	Transportation Sector Investment as % of Annual Development Budget	Investment as % of Transportation Investment		
		Roadway	Railway	Waterway
1974-75	11.56	32.4	7.3	40.30
1979-80	13.79	42.0	30.6	27.4
1984-85	11.59	35.9	36.3	27.8
1989-90	12.01	49.6	29.9	20.5
1994-95	16.91	78.3	14.7	7.0
1999-00	18.81	88.0	9.0	3.0
2004-05	19.00	88.6	8.0	3.4
2009-10	19.20	88.9	7.8	3.3

## National Priorities for Urban Transport

- Until recently urban transport received very little attention at the national level. Rapid urbanization in Bangladesh during the last few decades increased transport demand quite significantly leading to severe congestion on roads and deterioration in urban environment. Such a situation led the government to place more emphasis on infrastructure development especially in Dhaka and Chittagong metropolitan areas.
- Such supply side measure has not been able to ease the situation and there has been a policy shift towards more sustainable development of the transport sector. According to the Sixth Five Year Plan transport interventions in urban areas would aim at developing an integrated and balanced system in which all modes (motorized and non-motorized) can perform efficiently and each mode can fulfil its appropriate role in the system.
- As regards Dhaka metropolitan area, the plan observes that reducing congestion in city roads would require considerable reduction of dependency on private automobiles, taxi cabs, baby taxis, and non-motorized transport modes such as rickshaws. Steps, therefore, will be taken for increasing the number of large-size buses including double-decker buses and introduction of Rapid Bus Transit through the use of high capacity dedicated bus lanes. Elevated expressways and rail-based mass transit systems will also be considered as parts of a long-term integrated transport strategy for Dhaka Metropolitan Area.

# URBAN TRANSPORT: CURRENT STATUS OF URBAN TRANSPORTATION



## Urban Transport: Current Status

- ▣ Rapid urbanization in Bangladesh during the last few decades increased transport demand quite significantly leading to severe congestion on roads and deterioration in urban environment. Such trends are likely to continue as further urbanization takes place. The impact of such rapid growth has major consequences on the ability of the transport sector to provide mobility for all people as they seek to take advantage of employment, education, health and social opportunities. Unless properly checked and controlled, the consequent growth in congestion and pollution will adversely affect the health and quality of life of the urban residents.
- ▣ Major Problems of urban transportation in Bangladesh can be described in terms of the following:
  - **Insufficient transport infrastructure and services**
  - **Institutional deficiency**
  - **The varied traffic mix and increasing number of private cars**
  - **The absence of a dependable public transport system**
  - **Inadequate traffic management practices**



## Insufficient transport infrastructure and services

- ▣ Urban road network should usually consist of primary roads, secondary roads, collector roads and access roads.
- ▣ As almost all the urban centres in the country are not planned, road networks, intersections and links have not been built on the basis of modern principles of road design.
- ▣ The problems are worse at intersections.
- ▣ The road space not only fail to meet the minimum requirement in most of the big cities, but also does not cater to the needs of the pedestrians, cyclists, disabled or the children

## Road facilities in different City Corporations

City Corporation	Population	Metalled Road (Km)	Semi Metalled Road (Km)	Unmetalled Kacha Road (Km)	Total (Km)	LOS-Metalled Road (m/ person)	LOS-Total Road (m/ person)
Barisal	328278	233	36	324	593	0.71	1.81
Chittagong	2592439	250	90.5	47	378	0.10	0.15
Dhaka	8906039	1594	104	533	2231	0.18	0.25
Khulna	751230	158	67	18	243	0.21	0.32
Rajshahi	449756	346	225	0	571	0.77	1.27
Sylhet	485138	217	0	12	229	0.45	0.47
Total	13512880	2798	522.5	934	4245	0.21	0.31

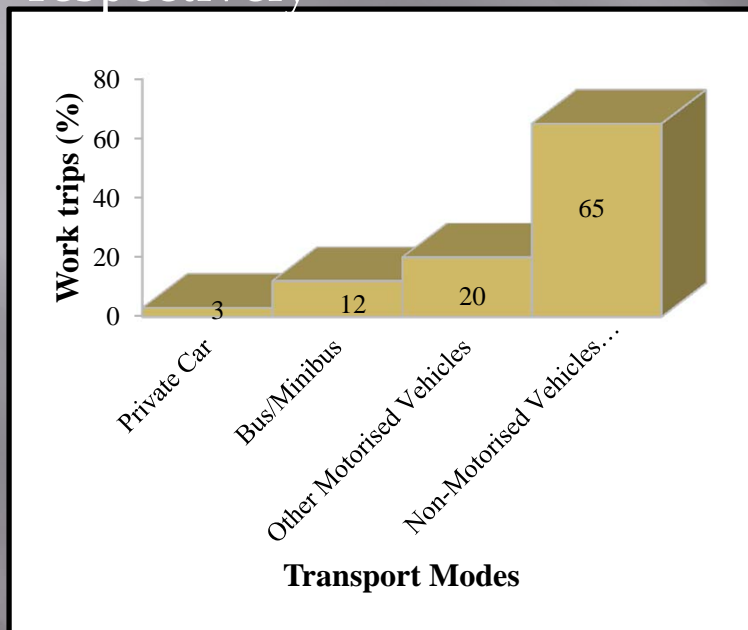
**Source: BBS District Statistics, 2011**

# Institutional Deficiency

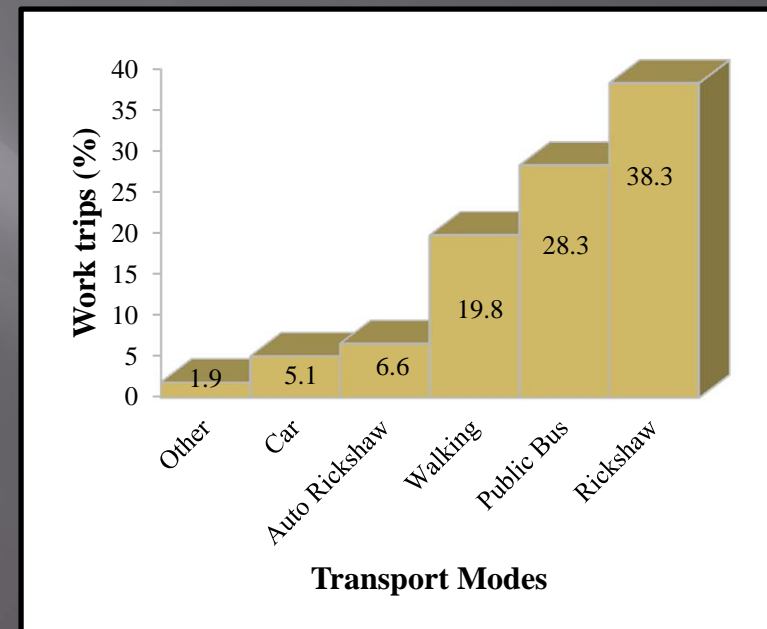
- ▣ Multiplicity of organizations dealing with transportation sector
- ▣ Lack of coordination
- ▣ Absence of clear policy framework with regard to the transport sector
- ▣ Absence of any focus on intermodal priority for efficient resource use
- ▣ Lack of detailed analysis of economic costs and externalities for resource allocation
- ▣ Lack of capacity and shortage of resources
- ▣ Lack of good governance
- ▣ Top-down planning approach with little cognizance of stakeholders' views
- ▣ Weak law enforcement
- ▣ Low level of public participation in maintenance of infrastructure

## The varied traffic mix and increasing number of private cars

Private passenger cars in Dhaka account for only 5% of the total trips and about 25% of the vehicles but occupy about 39% of the road space. Public buses on the other hand, account for about 28% of the total number of trips but occupy only 6% of the road space. Rickshaws' share of trips and road space is 38% and 40% respectively



(a) In urban Areas



(b) In Dhaka City

## The absence of a dependable public transport system

- ▣ It is unfortunate that despite being a megacity with a large number of residents, Dhaka does not have a Mass Transit (MRT) in any form to move a huge number of people at a time at high frequency. Public transport in Dhaka is road based and consists of non-motorized such as rickshaws and motorized transport such as buses, minibuses, human haulers, taxis and autorickshaws. Buses are the only mode which can carry a large number of people at one time and has the potential to cater to all income groups. But the number of operational buses is not more than 20 to 25% of the number required to meet the demand. Moreover bus service in the city is characterized by overcrowding, long waiting time and journey time, lack of comfort, difficulty in transferring from one route to another, long distance to and from bus stop etc.



## Inadequate traffic management practices

- ❑ Insufficient number of traffic police and traffic signals, flaws in traffic markings, violation of traffic rules and regulations, lack of pedestrian facilities can also be cited as some of the main reasons for traffic congestion in urban areas.
- ❑ Another reason is the encroachment of road space by vendors and traders which leads to a chaotic situation on roads in busy areas.
- ❑ Lack of education and awareness on the part of road users, especially drivers and pedestrians, also results in accidents and indiscipline on the roads. Pedestrians are frequently found to cross wide and even busy streets everywhere and any time risking their life. Due to lack of any system of drivers' education rickshaw pullers and drivers of motorized vehicles do not understand traffic rules and often violate such rules leading to traffic congestion and even accidents.

# DEVELOPMENT OF SUSTAINABLE AND INCLUSIVE TRANSPORT SYSTEMS: ISSUES AND CHALLENGES

# DEVELOPMENT OF SUSTAINABLE AND INCLUSIVE TRANSPORT SYSTEMS: ISSUES AND CHALLENGES

## National Transportation

- ▣ Poor transport planning and inefficient traffic engineering
- ▣ Weak traffic management and enforcement, and inefficient utilization of road space.
- ▣ Low investments and maintenance
- ▣ Inadequate institutional framework (involving four ministries, nine transport sector SOEs and lack of co-ordination and autonomy of transport SOEs).
- ▣ Excessive focus on road development, inappropriate modal mix and lack of integration within and among various modes of transport.

## Urban Transportation

- ▣ Absence of proper transportation planning
- ▣ Fragmentation of organizational responsibilities
- ▣ Inefficient use and overcrowding of major roads by low capacity vehicles,
- ▣ Inadequate road space,
- ▣ Poor traffic control and management,
- ▣ Absence of a reliable and dependable mass transit system
- ▣ Absence of adequate pedestrian and bicycling facilities.

## Transport output and modal shares

Year	Passenger				Freight			
	Total Pass-km (billion)	Share (%)			Total Ton-km (billion)	Share (%)		
		Road	IWT	Rail		Road	IWT	Rail
1975	17	54	16	30	2.6	35	37	28
1985	35	64	16	20	4.8	48	35	17
1989	57	68	15	17	6.3	53	30	17
1997	90	72	17	11	12	65	28	7
2005	112	88	08	04	20	80	16	4

Source: Bangladesh Transport Sector Review (The World Bank publications): Revival of Inland Water Transport-Options and Strategies, 2007 and Bangladesh Integrated Transport Sector Study, 1997, Planning Commission





# WAYS FORWARD: SUSTAINABLE AND INCLUSIVE TRANSPORT DEVELOPMENT

# Sustainable Mobility

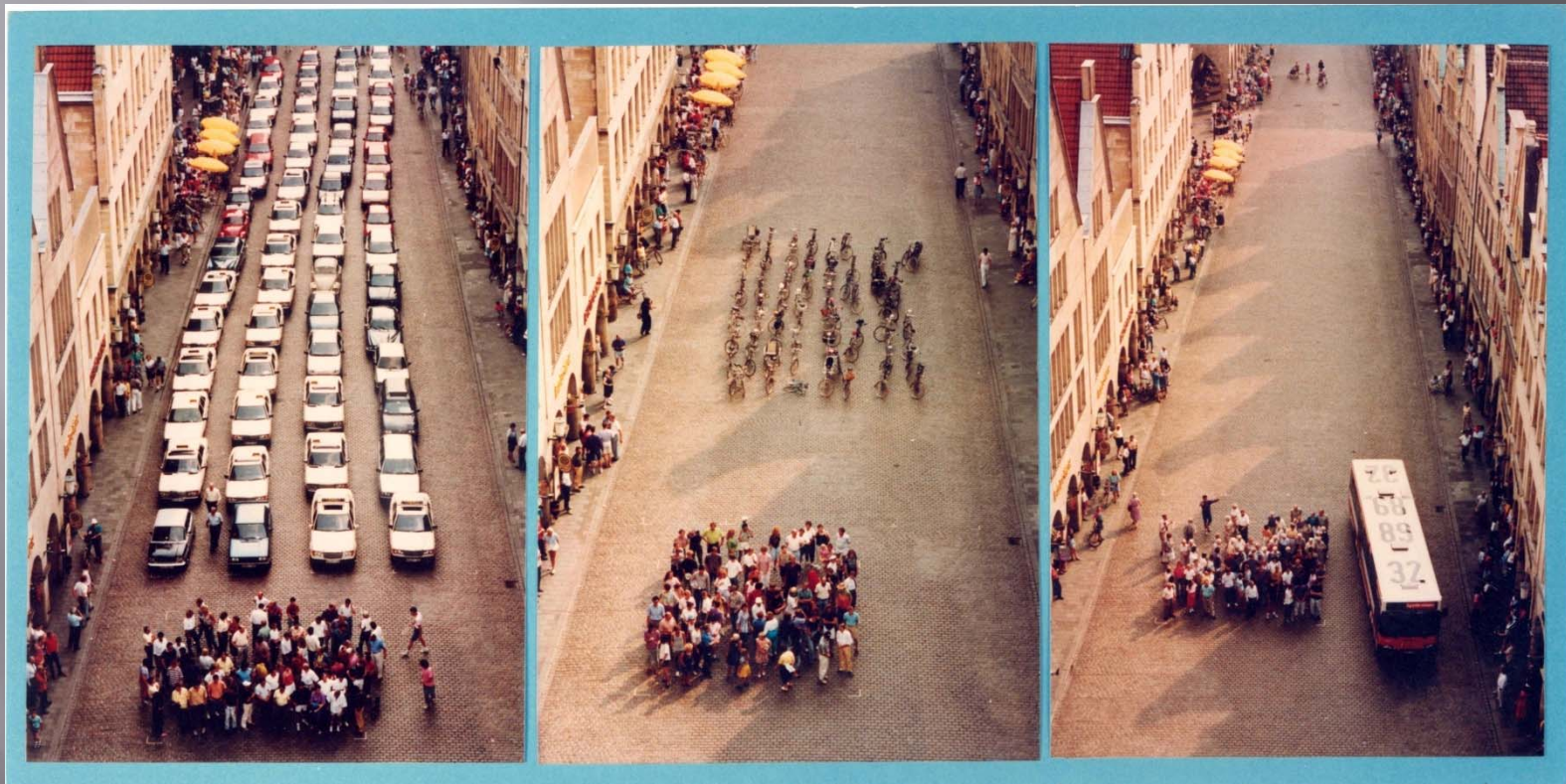
- ▣ Sustainable mobility refers to a set of interrelated measures designed to satisfy the needs of mobility of people for today and tomorrow.
- ▣ It aims to create a sustainable transportation system that will be
  - accessible to all,
  - will improve the safety and security of its users,
  - reduce air and noise pollution,
  - lower energy consumption,
  - improve the efficiency and cost-effectiveness of the transportation of persons and goods and
  - enhance the attractiveness and quality of the urban environment (Sustainable Urban Mobility Plans, 2011).
- ▣ Sustainable development focuses on improved access to facilities and to using each mode for what it does best.

## Developing Public Transport Alternatives

- ▣ For the reduction of congestion in city roads, especially in Dhaka Metropolitan Area, it would require considerable reduction of dependency on private automobiles, taxi cabs, baby taxies. Steps, therefore, should be taken to increase the number of large-size buses including double-decker buses on truck routes and buses of optimum sizes on other routes. Introduction of Rapid Bus Transit through the use of high capacity dedicated bus lanes should be given due consideration. Rail-based mass transit systems should also be considered as parts of a long-term integrated transport strategy for Dhaka Metropolitan Area.
- ▣ Non-motorized transport, such as bicycles should be considered as forming part and parcel of a long term urban transport solution and therefore investments should be oriented towards this way of transport. Walking is a main way of transport for the urban poor, suggesting significant investments in walkways and rearrangements of public space in favour of pedestrians. It is to be noted that walking, cycling and public transport are all more healthy than using the car and are promoted as active transport (Banister, D., 2008).

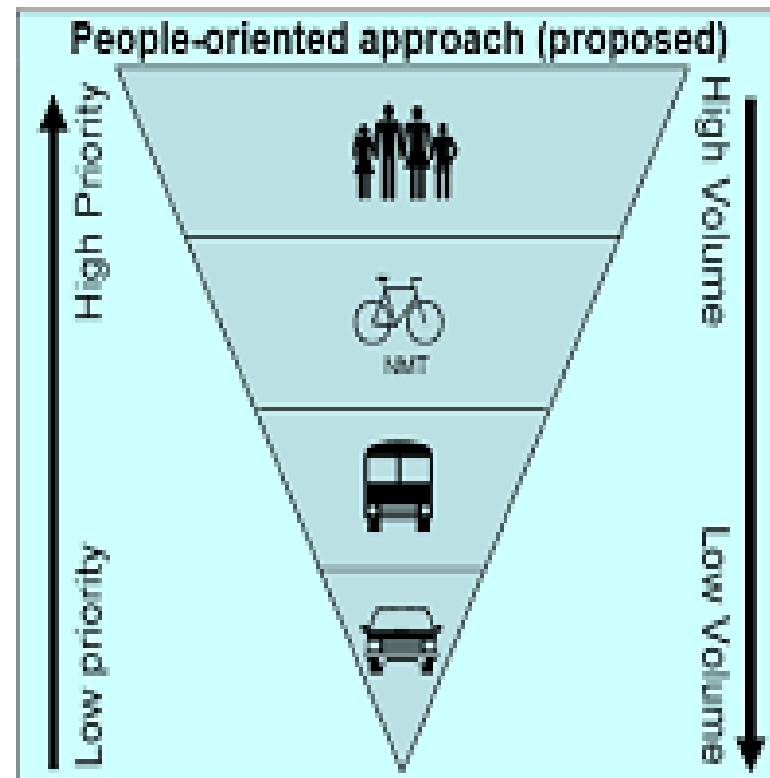
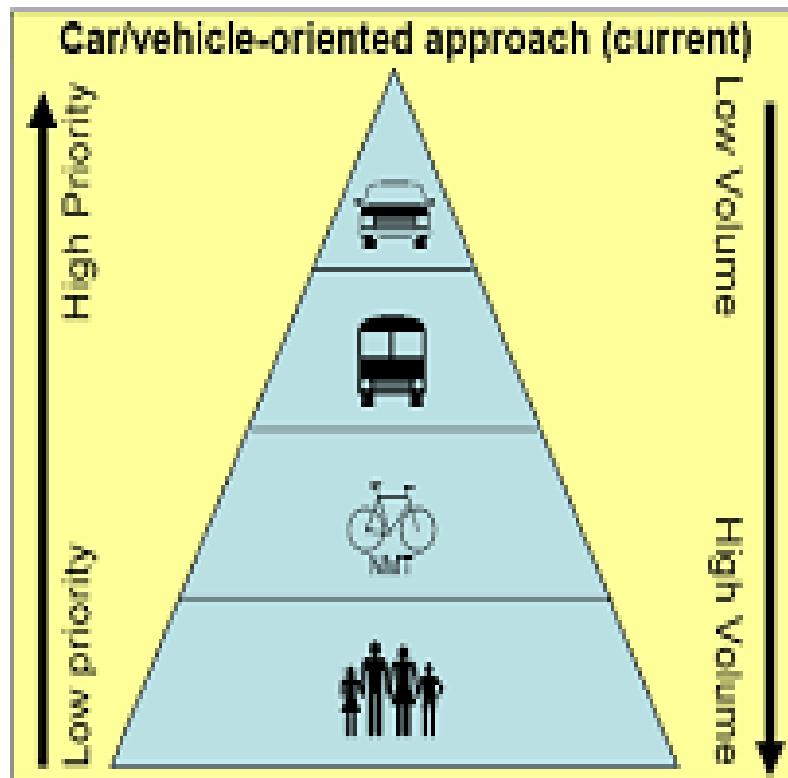


## Required Road Space for Different Modes Carrying Same Number of People





# Vehicle vs. People Oriented Approach for Transport Development under Mixed Mode Traffic



## City-Specific Measures

- ▣ Measures for controlling congestion and pollution may not be the same for every city or urban area since these result from a combination of several factors. While some urban areas are more adversely affected by a certain set of factors, others may be most affected by a different set of factors. This makes local initiatives very important to identify city-specific causal factors and then formulate city-specific strategies. Thus, strategies for dealing with traffic problems should be developed locally in the light of the factors giving rise to such problems.

## Strengthening Linkages with Cities and Towns around Metropolitan Areas

- ▣ One way of easing pressure on housing and transportation sectors of metropolitan areas, especially the capital city, is to strengthen transportation linkages with surrounding urban centres. Comfortable bus and rail-based commuter services will encourage people to stay in surrounding satellite towns and commute to their work places in the city. This will take some pressure off the city roads.

## Coordinated Development of Land Use and Transportation

- ▣ While planning for new infrastructure, considerations should be given to developing an effective road hierarchy, giving access to underused land, and creating safe environmental areas. It is also essential to channel the growth of an urban area in such a manner that it is guided by the transport network rather than the transport system being guided by the urban form that develops. Land use planning, therefore, should be directed towards developing transport corridors early so that urban growth takes place along such corridors and not in a haphazard manner. Emphasis should also be given to coordinated land-use and transport planning in order to encourage spatial development patterns that facilitate access to such basic necessities as workplaces, schools, health care, markets, places of worship, and leisure, thereby reducing the need to travel.



## Making Better Use of Existing Road Infrastructure by Proper Traffic Management

- ▣ The problem of traffic jam can be reduced significantly by improving management of traffic. However, this would require capacity building improvement in terms of manpower and equipment. By enforcing compliance of traffic rules, driver training, proper licensing, better maintenance and fitness of vehicles etc., pressure on existing infrastructure can be reduced considerably. When excessive traffic volume (mainly resulting from use of private vehicles) puts extreme pressure on existing infrastructure, demand management may be required to ease the situation.

## Reforming Existing Institutions

- ▣ A separate organization to deal with planning and regulation of transport services within the metropolitan areas is required. Dhaka Transport Coordination Board was created in 1998 which was later renamed as Dhaka Transport Coordination Authority in 2010. This authority, however, does not have any land use planning or regulatory functions nor does it have any authority over such agencies as RAJUK and BRTA which are concerned with land use planning and regulatory functions. Without strong coordination among these authorities, the purpose for which DTCA was created may not be realized.

## Developing Multimodal Transport

- ▣ Development of a 'Multimodal Transport System' which has now become a major issue in modern sustainable transport development, has particular significance for Bangladesh with her acute resource scarcity (CPD, 2001). Thus there is an urgent need for an optimum mix of modes and minimization of consumption of resources.
- ▣ The implementation of multimodal practices requires an integrated policy approach to guide transport investment decisions. These are based on making appropriate assessments of the impacts of different modes of transport, to ensure that investments meet the overall policy objective of sustainable development and poverty reduction.

## Concluding Remarks

- ▣ Transport interventions in urban and national contexts should aim at improving transport and traffic infrastructure so as to meet existing and potential demands, and developing an integrated and balanced system in which all modes (motorized and non-motorized) can perform efficiently and each mode can fulfil its appropriate role in the system. The main objective of transport strategies should be to support sustainable mobility by considering their economic, social and environmental impacts.



THANK YOU