

Course Code: CE 455
**Course Title: Traffic Engineering and
Management**

Lecture 1: Introduction

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Course Content

- ❑ Introduction to Traffic management concepts
- ❑ Traffic engineering administration and legislation
- ❑ Traffic accident
- ❑ Grade separation and interchanges
- ❑ Pedestrian and bicycle facilities
- ❑ Urban bypass
- ❑ Urban public transportation

Course Content

- ❑ Freight movement
- ❑ City road and street networks
- ❑ Environmental aspects of highway traffic and transportation projects
- ❑ Elements of traffic flow
- ❑ Traffic flow capacity

Text Book/materials

- Transportation Engineering: planning and design, 4th edition, paul H. Wright, norman J. Ashford, robert J. Stammer.
- Class lecture materials.

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Outline:

- ❑ Objectives of traffic engineering and management
- ❑ Traffic problems in Dhaka city and its remedies
- ❑ Traffic congestion cost around the world
- ❑ Losses due to traffic congestion

Common objectives of traffic engineering included the following:

- Providing high efficient traffic flow through ample research and innovative design efforts.
- To produce free flow of traffic.
- Use research to design roadways and highways that increase traffic safety (strategic implementation of stop signs, traffic signs, and traffic lights)

Usually, to successfully implement the above-mentioned objectives, traffic engineers will be required to study an abundance of data, research, and literature on the characteristics of traffic, the operations of traffic, traffic administration, traffic planning, and the geometrical design of traffic, amongst other things. In addition to studying data, many traffic engineers will execute a number of studies that will give them the appropriate data for traffic optimization. Some (of the many) studies include:

- Accident studies
- Traffic capacity studies
- Speed studies
- Traffic volume studies
- Parking studies
- Origin and destination studies
- Traffic flow characteristics studies

In addition to the enhancement of traffic flow, construction of roadways, and installation of road signs and lights, traffic engineers also work hard to improve traffic calming in residential areas. This includes neighborhood traffic control, traffic mitigation, neighborhood traffic safety plans, traffic abatement, roadway pavement marking, and signing plans. Believe it or not, these are efforts taken to ensure that residents are safe in their neighborhood—including children and the elderly.



Traffic jam: The ugly side of Dhaka's development



Traffic jam: City road in Europe

Causes of Traffic Problem in Dhaka city:

❑ Increased population and centralization

❑ Heterogeneous vehicles

Simultaneous presence of motorized and non-motorized vehicles on the same street

❑ Traffic mismanagement

Violation of Traffic rules and regulations

❑ Poor planning

Poor transportation and infrastructure planning

INCREASED POPULATION AND CENTRALIZATION



Dhaka is the head quarter of all type of organization.



The increasing population obviously increases the demand for more vehicles on the streets.

Heterogeneous Vehicles



Human puller to latest model automobile, mechanical to non-mechanical, slow to fast-moving, nothing left on the roads of Dhaka.

Traffic Mismanagement.....



Insufficient number of traffic police and traffic signals, flaws in traffic markings.



Traffic police do not do their duties properly.



The buses do not stop at the bus stops, they stop just at the intersection points, and rickshaws always follow them.



The pedestrians cross the busy streets even if there is no crosswalk. People do not usually use the over bridges or underpasses.

Poor Planning.....



Dhaka City has very inadequate road networks, which are only 8 or 10 percent of the total city area, whereas the acceptable ratio is 25 percent.



One of the main problems of Dhaka City is its very limited Public Transport System.



Unplanned railway crossing- When a train passes, lots of vehicles have to wait near the rail crossing, which causes serious traffic congestion at the interval of every 15 minutes as an average.

Way For Remedies.....

- Decentralization.
- Thinking Vertically.
- Long Rail Network throughout the city.
- Changing the location of the Kamalapur Station.
- Public Transport instead of Private Transport.
- Co-ordination among the works of different Ministry of the Government.
- Should change the mentality.

Traffic Congestion Costs

Cost of US cities ranges between USD 35 billion to USD 48 billion.

US loses roughly 2 % of GNP in traffic congestion

UK loses 5 % of GNP

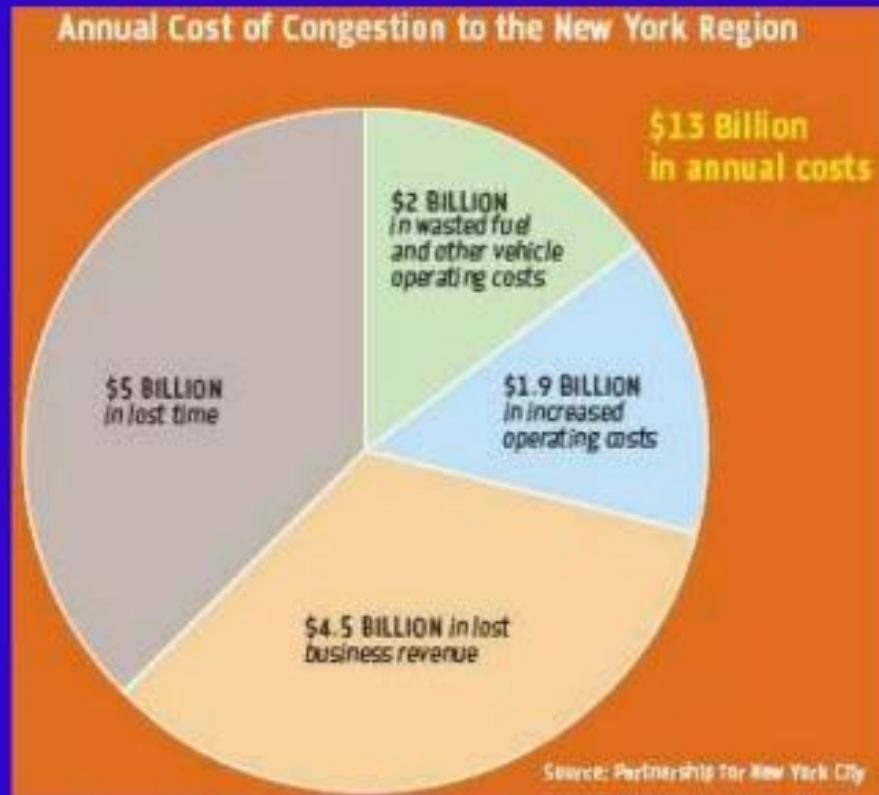
Traffic Congestion Costs

Traffic jams cost Moscow USD 1.3 billion a year.

Traffic congestion costs the South African business USD 18 billion a year.

Traffic congestion in Dhaka eats up USD 3 billion a year.

Traffic Congestion Costs



Traffic Congestion



Losses due to Traffic Congestion

- Time loss for passengers.
- Fuel loss.
- Loss of pay for employees.
- Loss of life due to not reaching hospital in time.
- Increased road accidents due to over speed taken to make up the lost time.

Losses due to Traffic Congestion

- Increased carbon dioxide emission.
- More atmospheric pollution.
- More diseases due to increased pollution.
- Increased mental tension for passengers.
- Increased cost of travel.
- Increased cost of transporting products.
- Increased cost of doing business.

Ambulance trapped in Traffic Jam



Vehicle pollution



Traffic Congestion & Road accidents

1.2 million people are killed in road accidents every year.

Over speed resulting from time lost in traffic jams is a major cause for road accidents.

At least 20,000 lives can be saved, every year, if traffic congestions are reduced.

Road Accidents



Time loss due to congestion

More than 1000 million passengers travel by road every day, worldwide.

If a passenger lose 1 minute everyday , in traffic congestion, total annual time loss is

700,000 YEARS !!!

Time loss due to congestion

Yes, Unbelievable, but true. We lose human time equivalent to 700,000 years , every year, because of traffic congestion.

Calculation :

Number of road passengers / day = 1,000,000,000

Average time loss / person per day = 1 minute

Total time loss / day = 1,000,000,000 minutes

Total time loss for a year = 365,000,000,000 minutes

= $365,000,000,000 / (60 * 24 * 365) =$ **700,000 YEARS**

Need of the hour

Nations should invest billions of dollars to reduce traffic congestion, **immediately.**

It will pay off in a year !!!

How to reduce Traffic Congestion

- Infrastructure development.
- Express highways to be built.
- Private participation in road development.
- Low budget development of junctions .
- Widening of busy roads.

How to reduce Traffic Congestion

- More public transport systems.
- Develop waterways wherever possible.
- Expand Railway network.
- Implement Metro Rails in Metros and big cities.
- Promote Suburban railways.