




AAiT

Addis Ababa Institute of Technology
አዲስ አበባ ተክኖሎጂ ስጦታ-ቴክኖሎጂ
Addis Ababa University
አዲስ አበባ ዩኒቨርሲቲ

SCHOOL OF CIVIL AND ENVIROMENTAL ENGINEERING

Transport Engineering CENG 3201

A decorative graphic on the left side of the slide consists of a vertical black line intersecting a horizontal black line. To the left of the vertical line are three overlapping squares: a blue one at the top, a red one in the middle, and a yellow one at the bottom. The horizontal line is a thick grey bar that spans the width of the slide.

Chapter 1 Introduction to transportation Engineering

Tamru T.

**2012 EC (2019/20GC)
1st Sem**



Definition

- **Transportation is**
 - All about moving goods and people from one place to another.
 - Safe, efficient, reliable, and sustainable movement of persons and goods over time and space.





Definition cont...

Transportation engineering

- Focuses on the infrastructure of transportation
- Design runways, build bridges, layout roads and plan docking facilities.
- Look at traffic patterns, determine when new transport facilities are needed and come up with better ways
- Application of technology and scientific principles to the planning, functional design, operation, and management of facilities





The characteristics of transportation system

- Multi-disciplinary
- Multi-sector
- Multi-problem
- Multi-objective
- Multi-modal





Elements of a transportation system

➤ **Infrastructure:**

which includes Road, canal, rail, air Transfer points

Supporting elements (signs, signals, safety)

➤ **Vehicles:**

which includes Planes, trains, autos, buses, ships, trucks

➤ **Operators/Content :**

which includes Drivers, pilots, freight, passengers





History of transportation engineering

- Humans had migrated by their feet
- Use domesticated animals to carry goods
- Built machines and devices, like sleds and travois, to help them carry more.
- Establishing trading routes
- Well-used paths became more and more permanent.
- These paths became the first roads
- Maintain the roads and look at ways in which they could be made easier to travel
- The first transportation engineers.





History of cont...

- ✓ Four critical dimensions of change in transportation system
- ✓ Change in values of the public
- ✓ Changes in the technology
- ✓ Change in operational policy
- ✓ Change in the demand





Major disciplines of transportation

1. **Transportation Planning:-** Involves the development of a transport model
2. **Geometric Design:-** Deals with physical proportioning of other transportation facilities
 - Cross-sectional features,
 - Horizontal alignment,
 - Vertical alignment and
 - Intersections





Major disciplines cont....

3. **Pavement Design:-** Deals with the structural design of roads, both (bituminous and concrete)
 - Drainage design
 - Functional design
 - Structural design

4. **Traffic Engineering:-** Covers a broad range of engineering applications with a focus on
 - The safety of the public,
 - The efficient use of transportation resources, and
 - The mobility of people and goods





Additional disciplines of transportation

1. **Public transportation:-** study of the transportation system that meets the travel need of several people by sharing a vehicle.
 - Characteristics of various modes;
 - Planning,
 - Management and operations; and
 - Policies for promoting public transportation
2. **Financial and economic analysis:-** tries to quantify the economic benefit which includes saving in travel time, fuel consumption, etc. (We will cover basic concept in Chap 2)





Additional disciplines cont...

3. **Environmental impact assessment** :- attempts in quantifying the environmental impacts and tries to evolve strategies for the mitigation and reduction of the impact due to both construction and operation.
4. **Accident analysis and reduction**:- looks at the causes of accidents, from the perspective of human, road, and vehicle and formulate plans for the reduction.
5. **Intelligent transport system**:- offers better mobility, efficiency, and safety with the help of the state-of-the-art technology.





Factors in Transportation Development

- Economic Factors
- Geographical Factor
- Political Polices
- Military
- Technological Factor
- Urbanization
- Competition





Role of transportation in society

- **Economic role of transportation:**

Transportation contributes two kinds of utilities:

- place and
- time utility

- **Social role of transportation**

- Growth of Urban Centers
- Size and Pattern of Settlement
- Formation of settlements





Role of transportation cont...

- Environmental role of transportation
 - Safety
 - Air Pollution
 - Noise pollution
 - Energy consumption
- Other impacts
 - Aesthetics
 - Social life and social pattern





Modes of Transportation

- Means by which people and freight achieve mobility
 - ✓ Road transportation
 - ✓ Pipelines
 - ✓ Maritime transportation
 - ✓ Air transportation
 - ✓ Rail transportation
 - ✓ Intermodal transportation



QUESTIONS?

