# Transportation Engineering

Transport Planning and Traffic Engineering Course

Part I

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# Definitions

- Transportation Engineering:
  - It is the application of technology and scientific principles to the planning, functional design, operation and management of facilities for any mode of transportation in order to provide for the safe, efficient, rapid, comfortable, convenient, economical, and environmentally compatible movement of people and goods
- Transport Planning Type:
  - Long Term
  - Intermediate action
  - Short Term
- Transportation:
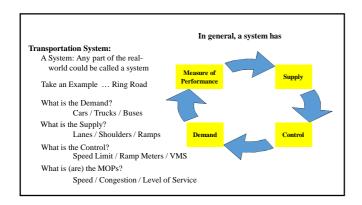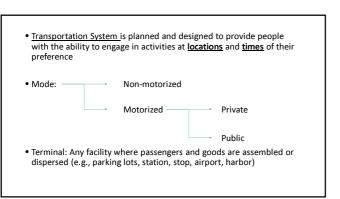  - It is a movement of people or goods from place to another

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- Trip:
  - It is a movement of people or goods between two points using a certain mode (Car, bus, train, etc…)
  - Point 1: Origin "O" point of the trip start
  - Point 2: Destination "D" point of the trip end.
- Passenger Trip:
  - Purpose (Work, home, shopping, etc…)
  - Time period (hour/ day)
  - Area Type (urban, rural)
  - Mode
- Goods:
  - Ton
  - Number of Goods vehicles

**In general, a system has**

**Transportation System:**
A System: Any part of the real-world could be called a system

Take an Example … Ring Road

What is the Demand?
  Cars / Trucks / Buses
What is the Supply?
  Lanes / Shoulders / Ramps
What is the Control?
  Speed Limit / Ramp Meters / VMS
What is (are) the MOPs?
  Speed / Congestion / Level of Service

Measure of Performance → Supply → Control → Demand → Measure of Performance

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- Transportation System is planned and designed to provide people with the ability to engage in activities at **locations** and **times** of their preference

- Mode:
  - Non-motorized
  - Motorized
    - Private
    - Public

- Terminal: Any facility where passengers and goods are assembled or dispersed (e.g., parking lots, station, stop, airport, harbor)

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## Transport need and Density

- Specific Transportation needs:
  - Transportation needs/ population
  - Trip/ person, ton/ person (per unit of time)
- Transportation Network Density:
  - Network length / Area
  - $Km/ Km^2$
- Transportation Trips static volume:
  - Summation of trips
  - Trips (per unit of time)

- Transportation Trips dynamic volume:
  - Summation of (trip * trip length)
  - Trip.km (per unit of time)
- Static Transport density:
  - Static volume / network length
  - Trip/km (per unit of time)
- Dynamic Transport density:
  - Dynamic volume / network length
  - Trip.km/km (per unit of time)
- Average Transport distance:
  - Dynamic Transport density / Static Transport density
  - Dynamic Transport / Static volume
  - km (per unit of time)