General Information about Transportation Systems

Definitions

Transportation

"The services provided for the movement of people and goods (freight) from one place to another to create time and space utility."

Transportation Engineering

- planning, design, construction, operation and maintenance of all kinds of transportation facilities.

In more technical terms:

- “The application of technological and scientific principles to the planning, functional design, operation and management of facilities or any mode of transportation in order to provide for the safe, rapid comfortable, convenient, economical and environmentally compatible movement of people and goods.”

Traffic Engineering

- “That phase of transportation engineering which deals with the planning, geometric design and traffic operations of roads, streets and highways, their network, terminals, abutting lands and relationship with other modes of transportation.”

Ideal Transportation

- dependable
- safe
- rapid
- economical
- environmentally compatible

Additionally, it should minimize noise, minimize air and water pollution, and be energy efficient.

Main Attributes of Transportation Systems

- **Efficiency and suitability:**
  - The transport modes should be chosen by considering type of terrain, the distance, demand, properties of commodities to be transported.
- **Economy:**
  - High benefits with low investment should be achieved.
- **Speed:**
  - Higher speed increase productivity.
- **Safety :**
  - Safety is essential in transportation. Safety increases the benefits both in monetary and intangible benefits.

Classification of Transportation Systems

1- Overland Transportation Systems

2- Water Transportation Systems

3- Air Transportation Systems

Classification of Transportation Systems

1- Overland Transportation Systems
   - Highway transportation
   - Rail transportation
   - Continuous flow systems
2- Water Transportation Systems
   - Sea transport
   - Inland water transport systems
3- Air Transportation Systems
   - Air carriers
   - General Aviation

Highway Transportation

The main goals are:

- The provision of high level of service with continuous flow, without interruption (i.e. minimize travel time and delay).
- The provision of comfortable, convenient and safe movement (i.e. high standards).

There are different classification schemes for different purposes.

- geometry (design class) or
- administration or their function.

Classification by Design Type

In general there are four main groups as follows:

- Freeways or motorways
  - (2x2, 3x3, 4x4 or 2x3, 3x4 etc. figures indicates number of lanes in each direction)
- Multilane divided highways
  - (2x2, 3x3, 4x4 or 2x3, 3x4 etc. figures indicates number of lanes in each direction)
- Multilane undivided highways
  - (2x2, 3x3, 4x4 etc. figures indicates number of lanes in each direction)
- Two lane highways, and three lane highway segments

Classification by Administration

Classification according to administration will vary from country to country since administrative units are not the same in different countries.

Turkey:

Class	Authority
Motorways	General Directorate of Highways
State Highways	General Directorate of Highways
Municipal roads	Municipalities
Village roads	Ministry
Forest Roads	Ministry

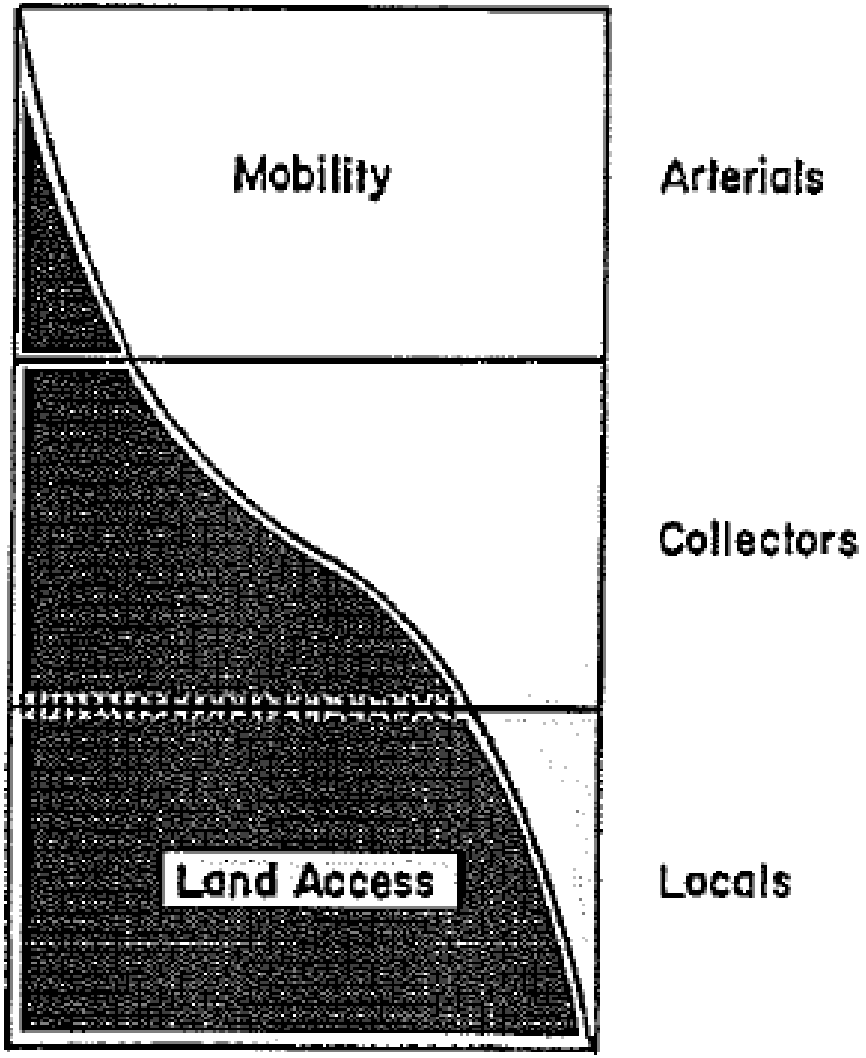
Classification by Function

The main grouping is as follows:

- Primary movement (Freeways, main arterials)
- Transition (Highway ramps)
- Distribution (Secondary arterials)
- Collection (Collector)
- Access (Local access roads)
- Terminals (parking facilities)

In some references, the roads that have both distribution and collection functions are collected under the same group called either distributers or collectors.

Classification by Function



Classification by Function

- **Table 1.1 Highway Functions and Classification**

Subcategory	Rural	Urban
	Freeways	
Freeways (Motorways)	High standard divided multilane highways with full control of access	High standard divided multilane highways with full control of access
Expressways	Facilities with substantial control of access, but having some at-grade crossings or entrances.	Facilities with substantial control of access, but having some at-grade crossings or entrances.
	Arterials	
Major or Principal Arterials	Serving significant corridor movements, often between areas with populations over 25,000 to 50,000.	Principal service for through movements, with very limited land-access functions that are incidental to the mobility function.
	High-type design and alignment prevail.	High-type design prevails.

Classification by Function

Collectors		
Major Collectors	Serve generators of intra-county importance not served by arterials; provide connections to arterials and/or freeways	No subcategories usually used for urban collectors.
Minor Collectors	Link locally important generators with their rural hinterlands; provide connections to major collectors or arterials.	Provide land access and circulation service within residential neighborhoods and/or commercial/industrial areas; collect trips from local generators and channel them to nearby arterials; distribute trips from arterials to their ultimate destination.
Local Roads		
Residential	No subcategories generally used in rural classification schemes.	Provide land access and circulation within residential neighborhoods.
Commercial	Provide access to adjacent lands of all types; serve travel over relatively short distances.	Provide land access and circulation in areas of commercial development.
Industrial		Provide land access and circulation in areas of industrial development
Terminals		
	Services (Roadside parking and petrol stations).	Bus stations, curb parking, roadside pick-up points, other parking facilities.