-: TRANSPORTATION ENGINEERING :-

→ Transportation engineering is the science of safe and efficient movement of people and goods.

→ It contributes to the economic, industrial, social and cultural development of any country.

→ Transportation is vital for the economic development of any region since commodity produced, whether it is food, clothing, agricultural products, industrial production or medicine, needs transportation at all stages from production to distribution.

→ Transportation is required for carrying raw materials like seeds, manure, coal, steel, oil, etc. when used for production stage.

→ In distribution stage, it is required from the production centres, namely farms and factories to the marketing centres and later to the retailers and consumers for distribution.

Planning and Design aspects of Transport Engg.

PLANNING :- The planning aspect of transport engg. relate to the urban planning and involve technical forecasting decisions and political factors.

→ It includes forecasting of passenger travelling. which involves an urban transportation planning model, requiring the estimation of trip generation, trip distribution (destination choice), mode choice, and route assignment (which routes are being used).

→ Passengers trips are the focus of transport engg. because they often represent the peak of demand on any transportation system.

DESIGN ASPECT :- It include the sizing of transportation facilities (how many lanes or capacity the facility has), determining the materials and thickness used in pavement and designing the geometry such as vertical and Horizontal alignment of the roadways or track.

→ Operations and management involves traffic engg., so that vehicles moves smoothly on the road or track.

Different Modes of Transport :-

→ The basic modes of transport are by land, water and air.

→ Land has given scope for development of road and rail Transport.

→ Water and air have developed waterways and airways, respectively.

→ The roads or highways not only include the modern highway system but also the city streets feeder roads and village roads, catering to a wide range of road vehicles and pedestrains.

→ Railways have been developed both for long distance transportation and for urban travel

→ Waterways include oceans, rivers, canals and lakes for the movements of ships and boats.

→ The four major modes of transportation are :-

1.) Roadways or highways.

2.) Railways

3.) Waterways

4.) Airways.

1.) Roadways or highways :-

→ It is the only mode that could give maximum service to one and all.

→ It also has the maximum flexibility for travel with reference to route, direction, time, speed of travel, etc. through any mode of road vehicle.

2.) Railways :-

→ This mode of transportation is advantageous between stations both the passangers and goods, particularly for long distances.

→ Railway tracks serve as arteries for transportation by land and the roads could serve as a feeder systems for transportation to the interior parts and to the intermediate localities between the railway stations.

3.) Waterways :-

→ Transportation by water is the slowest among the four modes, but it is the most economical mode of transport.

→ Water transport needs minimum energy to haul unit load through unit distance.

→ Transportation by water is possible between the ports on the sea routes or along the rivers or canals where inland transportation facilities are available.

Traffic signs

1) Regulatory signs
2) Warning signs
3) Informatory signs

1) Regulatory Signs

STOP
Stop

Give way

Straight prohibited
or No Entry

One - Way Sign

Vehicle prohibited in Both directions.

All Motor Vehicles Prohibited

Truck Prohibited

Pedestrians Prohibited

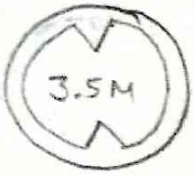
Right turn Prohibited

Left turn Prohibited

U-Turn Prohibited

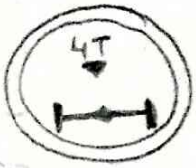
Overtaking Prohibited

Horn Prohibited

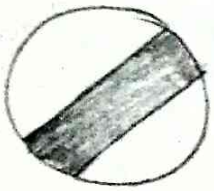


Height limit

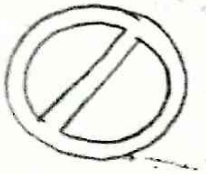
Width limit



Axle Load limit

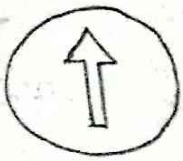


Restricted ends signs

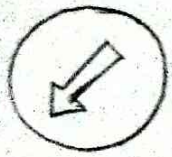


No Parking

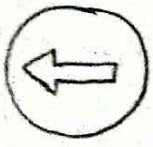
No stopping or Standing



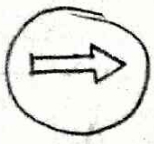
Compulsory Ahead Only



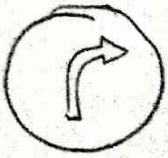
Compulsory keep left



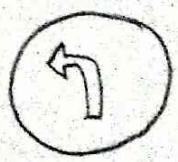
Compulsory turn right



Compulsory turn right



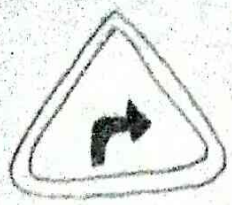
Compulsory turn right ahead



Compulsory turn left ahead

2) Cautionary Signs :-

General design



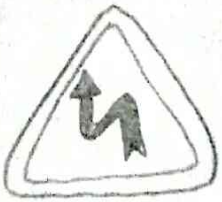
Right hand curve

Left hand curve

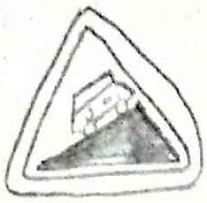
Hair pin bend right

Hair pin bend left

Right reverse band

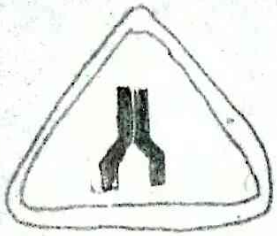


left reverse band



Steep ascent

Steep descent

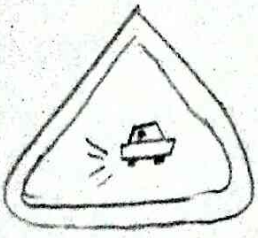


Narrow road ahead

Side road ahead

Narrow bridge

Slippery road



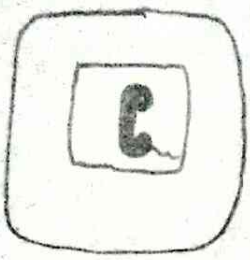
Loose gravel

Cycle crossing

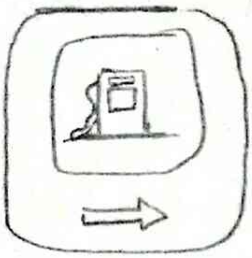
Pedestrian crossing

School ahead

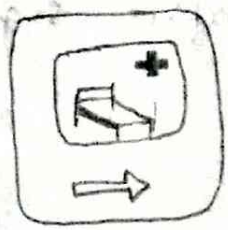
3.) Informatory signs :-



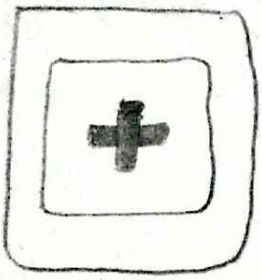
Public Telephone



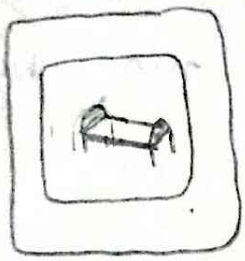
Petrol Pump



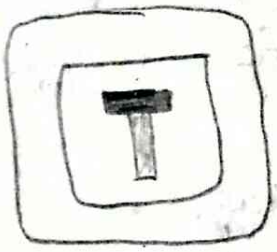
Hospital



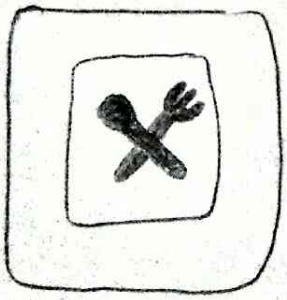
First - aid Place



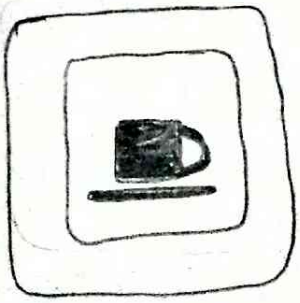
Resting place



No Through Road



Eating place



Light Refreshment

Traffic Signals :- These are traffic regulatory sign which regulate the traffic and accidents.

1) Cycle 2) Phase 3) Interval

Types of traffic signals :-

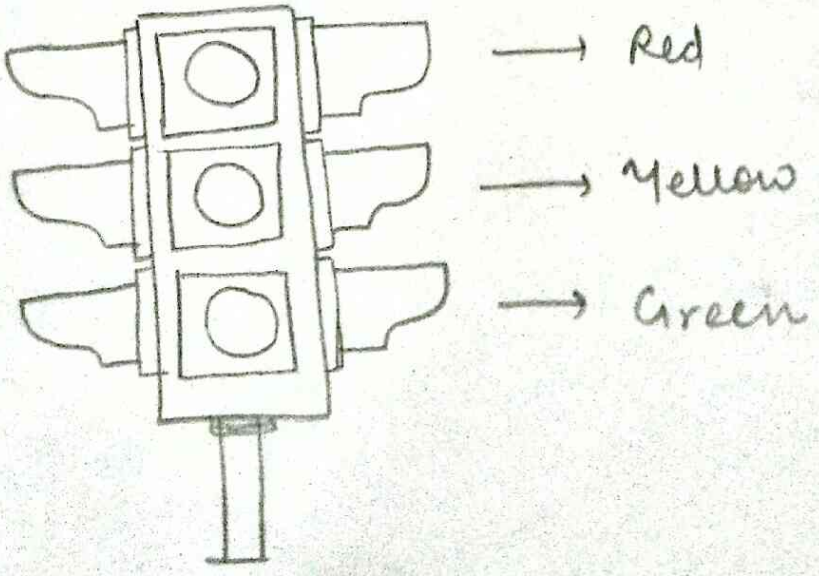
1) Traffic control signals
   - Fixed time signals
   - Manually operated signals
   - Traffic actuated signals
2) Pedestrian Signals
3) Special traffic signals

Advantages :-

i) Orderly movement of traffic, so increases capacity.
ii) Reduces accidents
iii) Signals also give, importance to the minor roads.
iv) Automatic traffic signal may be better.

Disadvantages :-

i) Rear end collision may increase.
ii) Improper design may lead to violation of system.
iii) Failure of signal system may cause confusion to road users.



Traffic signal

Accidents Studies :→ Accidents Studies are used to find out reason and cause behind accident and to take precutive measures in term of design control.

Causes of road accident

1. Driver's fault due to over speeding :- A greater speed surely gives a feeling of rush to the driver beat at the same time increase the risk of his vehicle hitting another vehicle.

2. Talking on Phone :- When you talk on a phone while driving, then conversation distracts your mind & chance of accidents increase. Always avoid using a phone while drivi

3. Drunk driving : Alcohol interferes with the very basic elements of driving such as vision, reflex and sense of judgment so don't mix drink & drive.

4. Riding without a helmet : Head is most susceptible to injuries during a fall so protecting it with a helmet subst reduce the chances of fatality.

5. Not Wearing seat belt :

6. Breaking traffic Rule

7. Ignorance of road signs

8. Poor Road infrastructures

9. Driving in fog.

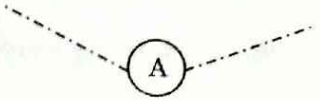
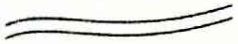
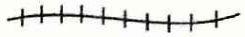
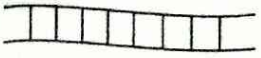
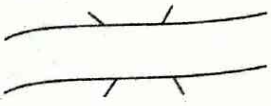
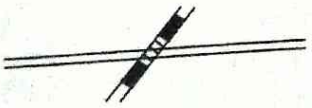
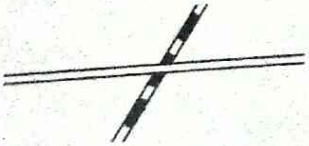
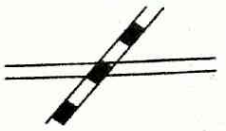
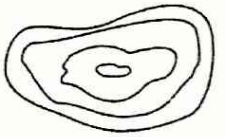
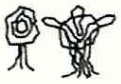
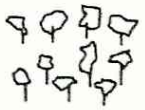
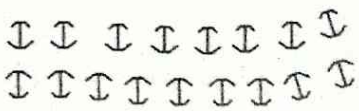
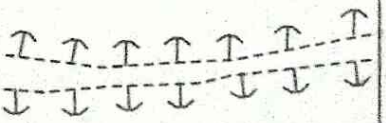
10. & Parking on main road.

Road safety Assessment

1. Make licensing and driving tests stricter.
2. Enforcing the heavy vehicles to fix reflective tapes over them to be clearly visible during night time. Mandatory registration of Criminal case if the vehicle is overloaded.
3. Imprisonment & heavy penalty for drunken driving.
4. Mandatory annual fitness checks of the school buses as well as drivers.
5. Mandatory vehicle fitness checks for all vehicle owners.
6. Flyovers, grade separation, service roads, pavements, monitored crossing near schools and other safety features have to be the Primary focus while designing new road infrastructures.
7. Road safety awareness in India is very poor therfore there is a need to educate and make people aware of the road safety through various events and programs. This can be done with the help of schools, colleges, NGOs, transport and trade unions.
8. There is also a need to follow and organize Road safety programms in India on a regular basis through road safety march, street plays, painting, essay and quiz competitions and through regular programs for school kids, pedestrians, drivers of commercial vehicles, auto drivers, bus drivers, truck drivers, two wheeler drivers, cyclists etc.
9. There is a dire need for road safety management in our country. Smart traffic manag ment needs to be implemented in all the major cities of India.
10. Installation of more CCTV cameras for better monitoring of traffic.

CONVENTIONAL SYMBOLS [SURVEY]

Table 3.1

Chain line	
Triangulation station	
Traverse station	
Building	
Shed with open side	
Shed with closed side	
Temple, mosque and church	
Path	
Unfenced road	
Fenced road	
Railway line: Single	
Railway line: Double	
Road bridge	
Level crossing	
Road over railway	
Road under railway	
Boundaries without pillars	
Boundaries with pillars	
Township or taluka boundaries	
River	
Pond	
Electric line	
Tree	
Orchard	
Woods	
Grass	
Cutting	
Embankment	
North line