

Keeping in view different modes of Transportation compare railways with highways

Ans:

① Railways

- ① The transportation along the railway track could be advantageous by railway between the station both for passengers and goods particularly for long distance.
- ② It depends upon road system road serve as a feeder system
- ③ Gradient should be minimum.
- ④ Total cost is higher than road transport
- ⑤ Not readily available due to shortage of wagons
- ⑥ It is ideal for bulk cargo and it is ideal for long distance
- ⑦ Less employment potential.
- ⑧ Rail is about $\frac{1}{5}$ to $\frac{1}{6}$ of the pneumatic wheel tyre on the highway

(b) Highways:-

- (i) it gives the maximum service to one and all
Highways road transport door to door service provided
- (ii) it gives maximum flexibility for travel with reference to route choice, direction times and traveling speed.
- (iii) steeper gradient can be provided.
- (iv) Total cost is less than that of rail transport.
- (v) Readily available
- (vi) it is ideal for non bulk cargo for less quantity and it is useful for any distance
- (vii) Higher employment potential
- (viii) Tractive resistance of pneumatic wheel tyre and highway is 5 to 6 times more than that of railway wheel on the steel track.
- (ix) Higher degree of accident due to flexibility of movement

Question # 02: you are a transportation engineer (3)
you have been asked to conduct office study
a preliminary step for design of new highway
what reference material you will study and what data use.
Ans:-

Office study:-

(a) Data examination:- The first phase in any highway location study is the examination of all available data of the area in which the road is to be constructed.

⇒ This phase is usually carried out prior to any field or photogrammetric investigation.

⇒ Data sources:-
National or provincial department, transportation
agriculture, geology, hydrology and mining

→ existing engineering report

→ Maps

→ Aerial photographs

→ Charts

⇒ The type and amount of data collected and examined depend on the type of highway being considered.

(b) ⇒ Area characteristics covered in data collection
Engineering, including topography geology climate
and Traffic volumes
Social and demographics including land use
and zoning patterns.

⇒ Environmental including Type of wild life location of Recreational historie and archeological sites and possible effect of air noise and water pollution (4)

⇒ Economice; including unit cost of construction and the trend of agricultural commercial and industrial activities

(c) preliminary analysis of the data

It indicate whether any of the specific site should be excluded from further consideration because of one or more of the above characteristics

→ At the completion of this phase of the office study the engineer will be able to select general areas through which the highway can traverse

⇒ Reconnaissance survey

The object of this phase of study is to identify several feasible routes each within a band of a limited width with a few hundred feet

• Aerial photography is widely use to obtained the required information

→ feasible route is identified by stereoscopic examination of aerial photography

- Terrain and soil condition
- serviceability of routes industrial and population areas. ⑤
- crossing of other transportation facilities
such as river, rail roads and highways
- Directness of routes
- Control point between two endpoint
- Feasible routes identified are the plotted on photographic base maps.

preliminary location survey

During this phase of study the position of the feasible routes are set as closely as possible

- Establishing of all control points
- Determining preliminary vertical and horizontal alignment
- Economic Evaluation
 - Road user
 - construction cost
 - maintenance.
 - Road user benefits
- Environmental evaluation
highway construction at any location
significant impact on surrounding
- The final location survey is a detail layout of the selected route

Question # 03

(6)

What is importance of vehicles performance in highway design

Ans:-

A design vehicle is selected to represent all vehicles on the highway

- For each purpose of geometric design each design vehicle has larger physical dimension and a larger minimum turning radius than most vehicle in its class.
- The vehicle type selected as the design vehicle - has larger physical dimensions and select the largest one. That is likely to use the highway with considerable frequency
- Acceleration and deceleration rates of vehicles are often critical parameters in determining highway design
- The rate often govern the dimension of such design feature.

- ① Freeway ramps
- ② Climbing or passing ramp
- ③ Turnout bays for buses
- ④ Acceleration and deceleration lanes
- ⑤ Highway alignment
- ⑥ Determine the need for truck climbing lanes.
- ⑦ passing and stopping sight distance.

Question # 04
Write short note on direction distribution ②
on design of highway.

Ans:-

- Highway must be design to adequately serve the peak hour traffic volume in the peak direction of flow.
- Total hourly traffic in both direction is used to design two lane roads.
- in the design of highway with more than two lanes and on two lane roads where important intersection are encountered or where additional lane are to be provided later knowledge of the hourly traffic volume for each direction of travel is essential.
- Directional traffic is used for multi lane roads and streets.
- Typically one direction contribute by 55-70% in total traffic although occasionally 80% is observed.

$$\text{Formula} = DPTV = AADT \times K (\text{Peak hr}) \times D (\text{Peak dir} - \%)$$

K = proportion of daily traffic in peak hour

D = proportion of peak hour traffic in peak direction