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Section :- "B"

Subject :- Highway And Traffic Engineering

Department :- Civil Engineering

Semester :- "Six"

Q No 1
Ans:-

Modes Of Transportation:-

Transport modes are the mean by which passengers and freight achieve access and mobility between origin and destination. They fall into one of three basic categories depending over what medium is used to travel upon.

- * Land (road, rail And pipelines).
- * In Water (Shipping).
- * Air (aircraft).

Different Modes of Transportation:-

2

Highways:-

Car, Bus, Truck, non-motorized etc.

Railways:-

Passenger And Goods (Freight trains)

Airways:-

Aircraft, Helicopters And Hot-air balloon.

- Fastest among all other modes.
- More Comfortable.
- Time Saving
- uneconomical.

Inland Waterways:-

Ships, Boats, Submarine etc.

- Slowest among all other modes.
- It needs minimum energy to drag unit load through unit distance
- This can be possible between ports on the sea routes or along the rivers.
- Economical.

3

Continuous Flow System:-

Pipeline, belts, elevator, ropeway etc.

Compare between Railway And Highway:-

Railways:-

The transportation along the railways track could be advantageous by railways between the station both for the passengers and goods particularly

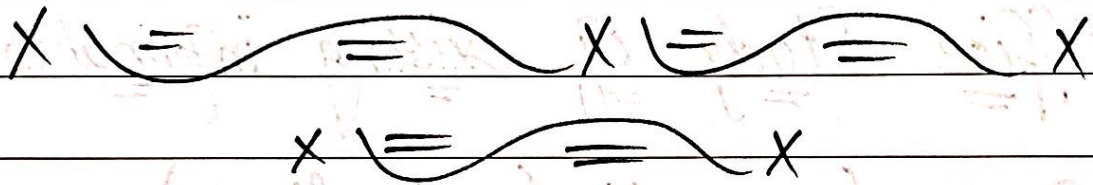
For long distance.

- It depends upon the road transport i.e road could serve as a Feeder System.
- Energy required to drag a unit load through unit distance by the railway is only $\frac{1}{4}$ to $\frac{1}{5}$ of that required by road.
- Safety (minimum Crash rate if handled Carefully else Severe Crash can occur).

Highways:-

- It give the maximum service to one and all.
- It gives maximum flexibility for travel with reference to route choice, direction, time and travel with speed.
- It provide door to door service.

- Other modes are depend on it.
- It required small investment for the government.
- Motor vehicles are cheaper than other carries like rail engines.
- It save the time for short distance.
- High degree of accident due to flexibility of movement.



Q No 2

Ans -

I am a transport engineer
First we have taken.

Phases Of Highway Location Process:-

- office Study of existing information
- Reconnaissance Survey.
- Final location Survey.
- Preliminary location Survey.

Office Study of existing information

Data Examination (office Study) :- The

first phase of 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:-

- we can collect data from nationally provincial departments, agriculture geology hydrology and mining.
- > From Maps.
 - > From Charts.
 - > Aerial Photographs.

Area Characteristics Covered

IN Data:-

- Engineering including topography, geology climate and traffic volumes.
- > Social and demographic, including land use and zoning patterns.
 - > Economies, including unit costs

for construction and the most trend for agricultural commercial and industrial activities.

Preliminary Analysis of the

Data :-

will indicates any of the specific site should be excluded from further consideration because of one or more of the above characteristics.

For Example:-

If it is found that a site of historic and archaeological importance is located within an area being considered for possible route location it may be immediately decided that any route any

that traverses that ~~to~~ site should be excluded from further consideration.

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

Preliminary Location Survey:-

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

- 1) Establishing all the control points.
- 2) Determining preliminary vertical and horizontal alignments are used to evaluate the economic and environment feasibility of the alternative routes.

Economic Evaluation :-

Economic evaluation of each alternative route is carried out to determine the future effect of investing the resources necessary to construct the highway.

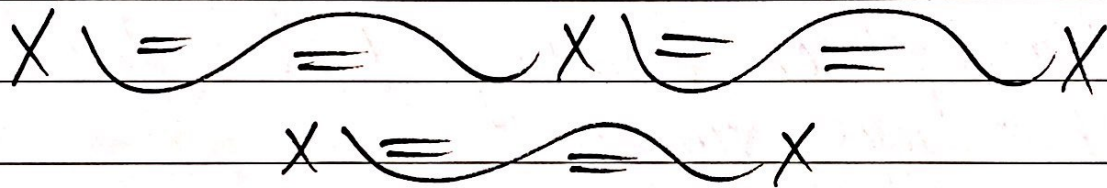
→ Factors Considered In Economic

Evaluation :-

- Road user costs.
- Construction costs.
- Maintenance costs.
- Road user benefits.
- Provide information on the economic resources that will be gained or lost if a particular location is selected.

- Environmental Evaluation:-

- Highway Construction at any location.
- Significant impact on Surroundings.
- A highway - an integral part of the local environment.
- Environment includes plants, animals and human communities and encompass social, physical, natural and man-made variable.



Q No 3

Ans:-

Importance of Vehicle:-

The importance of vehicle performance in highway design.

"The acceleration and deceleration of the vehicle or motor, bus etc are often critical parameters in determining highway design.

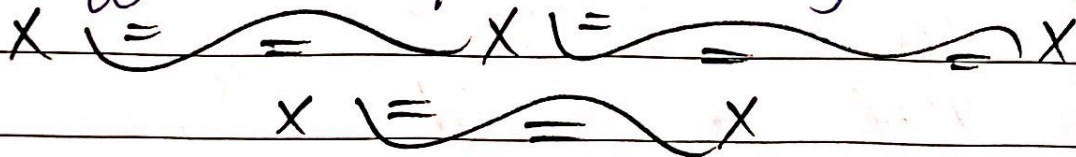
The design factors are following.

- Passing or climbing lanes.
- Freeways ramp.
- Acceleration and deceleration lanes.
- Turn out bays for buses.
- Determine the need for truck climbing lanes.
- Highway alignment (passing and stopping sight distance).

Driver Performance And Human

Factors:-

- Consideration of driver performance is essential to proper highway design and operation.
- The suitability of a design vests as much on how effectively drivers are able to use the highway.
- when driver use a highway designed to be compatible with their performance is aided.
- when a design is incompatible with the capabilities of drivers the chance for driver errors increase, and crashes or inefficient operation may result.



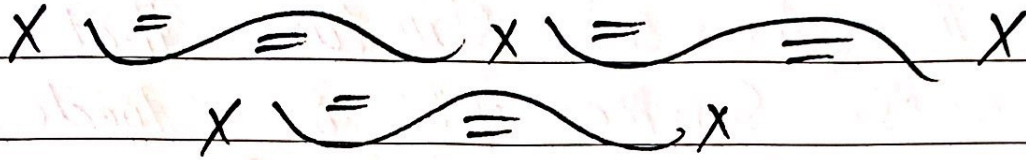
Q No 4

Ans:-

Directional Distribution:-

- The directional distribution may be define as highway must be designed to adequately serve the peak hour traffic flow
- The total hourly traffic in both directional is used to design two lane roads.
 - In the construction of highway with more than two-lane and on two-lanes roads where importance intersection are encountered or where additional lanes are to be provided later. Knowledge of the hourly traffic volume for each direction of travel is essentive directional traffic is used for multilane roads and streets.

→ Typically and direction contributes by 55-70% in total traffic although occasionally 80% is observed.



Q No 5

Ans:-

Distress :-

Distress is a condition of the pavement structure that reduces serviceability or leads to a reduction in service life.

Classification :-

Surface distress mode can be broadly classified into the following three groups.

→ Fracture :-

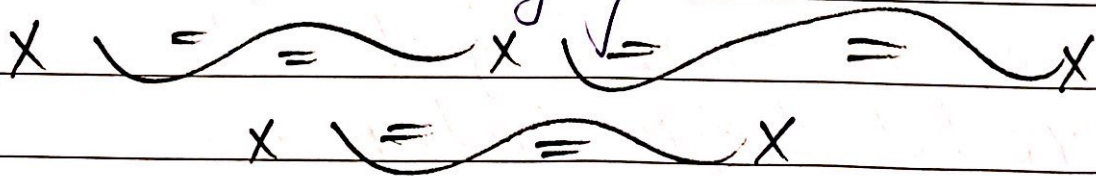
This could be in the form of cracking or breaking due to moisture and fatigue thermal changes.

→ Distortion :-

This is define as the deformation which can result from such things as excessive loading, densification, Consolidation or Subgrade issues.

→ Disintegration :-

This is the form of stripping or raveling or removal of paving materials which can result from such things as loss of bonding chemical reactivity, traffic abrasion, aggregate degradation or binder aging.



Q_{No}6Ans:- Alligator Cracking:-

⇒ Alligator

Cracking may be considered a combination of fatigue and block cracking.

⇒ It is a series of interconnected cracks of various stages of development.

⇒ Alligator cracking develops into a many-sided pattern that resembles chicken wire or alligator skin.

⇒ occur in areas subjected to repeated traffic loadings.

⇒ Chicken-wire cracking; spider web cracking, map cracking, etc.

⇒ Indicative of fatigue failure of

of Pavement due to repeated traffic loads.

⇒ Block Cracking :-

• A Pattern of Cracks that divides the Pavement into approximately rectangular pieces with sides generally longer than one foot.

• Rectangular blocks vary in size from approximately 0.1 m^2 to 10 m^2 .

• Possible Cause: Shrinkage of asphalt.

⇒ Longitudinal Cracking :-

Cracks
Predominantly parallel to pavement centerline. Location within the lane (wheel path versus non-wheel path) is significant.

• Possible Causes:-

Expansion and Contraction of Pavement material roadbed Settlement, Poorly Constructed Paving Joints .

⇒ Transverse Cracking:-

• Cracking across the centerline, not due to reflection Cracking .

• possible Causes:

Expansion and Contraction of Pavement material, roadbed Settlement, poorly Constructed Paving Joints .

Causes:-

- Slab longer than required
- Excessive thermal stresses .
- Crack Sealing, Full-depth rigid repair, Dowel bar retrofit .