

Highway Safety

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Abstract—The construction of Structure and highway is very important for development of any nation. Major part of economy of nation depends on the highway because in India the transportation mainly depends on highway. There is a heavy loss occurs when accidents happened on the highway. The many goods like milk, milk products, fruits, vegetables etc. reach on their destination on a limited or fixed time. Due to accidents the jam held on the highway. For reduction of accidents and improvement in economy, the safety of highway is necessary. The main goal of this research paper is highway safety and the method used in highway safety. Highway safety depends on the factors mainly traffic volume, pavement design, crash factor, curve provided in highway, alignment of highway. The statistical method of analysis and application of GIS is used for highway safety assessment.

Keywords: Highway safety assessment, Accident, Traffic volume, Pavement design, GIS

Introduction

Road traffic accident responsible for billions of death worldwide each year. It has largest contributors. Road traffic accident are often covered in the media simply as events—not as a leading killer of people and an enormous drain on a country's human, health and financial resources. By formulating highway safety as health and development story with in-depth information and data, writers have chance to influence the way story are told conceivably. Traffic volumes on highways vary with both time and space. Temporal variation occurs with respect to hour, day and month of the year.

The highway type, location and route choice behavior of road users cause spatial variation. Even if traffic streams are investigated for the same time and location, the variations of traffic volumes could differ substantially when each vehicle class travelling in the traffic stream is analyzed separately.

Factor affecting highway safety

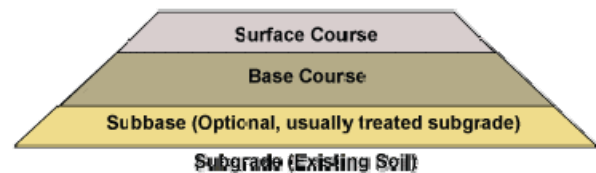
- Types of highway
- Types of pavement
- Pavement design
- Traffic volume
- Highway alignment
- Curve on highway

Types of highway

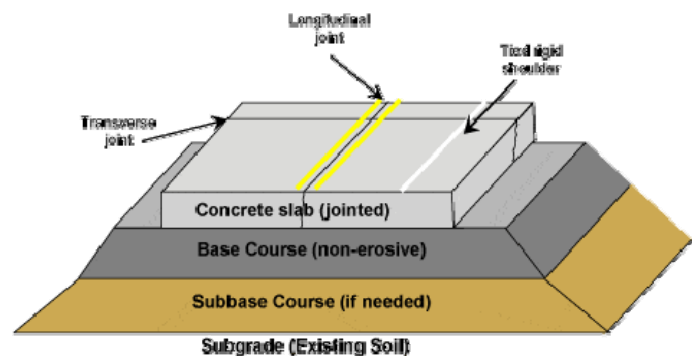
National highway
State highway
Major district road
Other district road
Village road

Types of pavement

Flexible pavement—Flexible pavement is defined as the consisting of a mixture of asphaltic or bituminous material and aggregates placed on a bed of compacted granular material of proper quality in different layers of the subgrade. Water bound macadam roads surface and stabilized soil roads with or without asphaltic toppings are examples of flexible pavements. Thus the strength of subgrade primarily affects the thickness of the flexible pavement.



Rigid pavement—A rigid pavement is constructed from cement concrete or reinforced concrete slabs. The design of rigid pavement is depend on providing a structural cement concrete slab of enough strength to resist the loads from traffic. The rigid pavement has rigidity and high modulus of elasticity to distribute the load over the soil.



Traffic volume study-

Traffic volume is a calculation of the total work done by a resource or facility, normally over 24 hours, and is measured in units of per lane per hours. It is defined as the product of the average traffic intensity and the time period of the study

Several method is adopted for measuring traffic volume study

- By Toll Plaza Ticketing
- Registration offices record
- Statistical Approach
- By Interviewing of each vehicle
- By Check posts on several place
- By using Modern Global Positioning Systems(GPS)

Importance of traffic volume study –

Traffic volume study Increase the efficiency and life of road, Reduces traffic volume at a particular section, Provide better means for development of infrastructures. It Provide better means to utilize other roads in case of special events in the city, provide estimate of number of vehicles against number of persons

Highway alignment-

Highway alignment is define as The position or lay out of center line of the highway on the ground. It includes straight path, horizontal deviation and curves .once highway is constructed then not change in alignment so it is design carefully .some disadvantage of highway alignment as-increase maintenance cost. Increase in vehicle operation cost Increase accident.

Factor for controlling alignment-Some special care in hill roads as Stability , Drainage , Geometric standards of hill roads ,Resisting length Obligatory points , Traffic ,Geometric design , Economics ,Other considerations

Highway safety assessment.

- (a) Behavior Modification incorporates Aggressive Driving, Distracted Driving, Impaired Driving, and Occupant Protection.
- (b) Design and Operations incorporates Intersections and Roadway Departure.
- (c) System Management includes Vehicle Safety and Incident Management.
- (d) Vulnerable Roadway Users has been updated to include High Risk Drivers, Motorcycles, and Non-Motorized Users

(e) Designing for pedestrians and cyclists-

Pedestrians and cyclists are among the most vulnerable road user and in some countries constitute over half of all road deaths. Interventions aimed at improving safety of non-motorized users.

- Design Sidewalks of suitable width for pedestrian traffic Pedestrian close to the desire line which allow pedestrians to cross roads safely.
- Use Segregated pedestrian routes and cycle lanes away from the main highway.
- Construct Overbridged (tend to be unpopular with pedestrians and cyclists due to additional distance and effort).
- Make Underpasses (these can pose heightened risk from crime if not designed well, can work for cyclists in some cases).
- Use Traffic calming and speed humps concept.
- Low speed limits that are rigorously enforced, possibly by speed cameras.
- Shared space schemes giving holding power of the road space and equal priority to all road users, regardless of mode of use.
- Construct Pedestrian barriers to prevent pedestrians crossing dangerous locations

Conclusion

From the above data it is concluded that these concept are helpful for highway safety and it helps for the movement of vehicle from one place to another place without any damage ,it also helps to improve the social and economic condition for the growth of any nation .

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Figure from google.com/highway pavements