

Study and Design of Flyover Bridge on Major Road Junction in Yavatmal

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Abstract— The project deals with the study and design of flyover bridge on major road junction in Yavatmal. The project area is having very high density of traffic flow. The common public felt in inconvenient to cross the ‘Bus Stand Road Junction’. The location of this project is at four road Junction at bus stand square Yavatmal, which is facing major traffic problems and therefore the flyover bridge is essentially required at the junction for easy traffic flow. We are designing the flyover of 4.5m width. It is a single lane flyover which starts from Arni road towards the state bank road and is divided towards main market road from the main junction. It is An one way single lane flyover bridge. In this project we have to done a traffic survey on the road junction and then we have to design all the structural part of the flyover by taking reference from IRC, by limit state method. Flyover helps to streamline the traffic flow by helping to reduce traffic congestion problems.

Keywords: Piers, Abutment’s, Bridge deck, Girders, Traffic Survey

I. INTRODUCTION

Flyover bridge is a bridge that carries one road or highway line above another either with or without subsidiary roads, for communication between two sides. As the traffic on the road goes on increasing and we don’t have any space left in both the dimension, then the only option left will be to go with third dimension and that is done through the Flyover construction.

The first Flyover in India was allowed access on 14 April 1965 at Kemps Corner in Mumbai. The 48 feet long bridge was constructed in about 7 months. A flyover is a constructed built to span of physical obstacles such as a body of water, valley or road, for the purpose of providing passage over the obstacle. Design of flyover vary depending of the function of the flyover, the nature terrain where the flyover is constructed. The material used for construction and the fund available to built it.

The flyover Consist of number of spans with column (piers), deck and foundation. in order to construct the flyover, all these elements are to be analysed and design properly. A flyover has three main Element, that is substructure, superstructure and the finally deck of the bridge. The roads and bridges are very important for growth of economy of the country.



Fig. 1: The junction where we are designing a flyover

II. LITERATURE REVIEW:

Original review:

A. *N.D.Chhatbar, Pa.Shinkar*

In this paper the author was under taken to determine the effects of Flyover construction to the way of life of the motorists and commuters and general travelling public. Use various methods like benefit/cost ratio and net present value (NPV) methods are used for economic assessment. And conclude that in terms if Rupees an installation of Flyover at a costs and vehicle delay time in terms of cost are calculated and assess the Flyover bridge.

B. *Parthkumar K. Patel, Arvind M. Jain*

In this paper the author has works on the briefly study on the construction of the over bridge. And check the present ground condition. Evaluate the over bridge performance and impact on traffic condition. Various surveys are carried out and finally conclude that the total number of vehicle benefitted by an over bridge, average Delay time and saving in travel time and fuel consumption. These saving are calculated in terms

of rupee. Calculate that the bridge is appropriate and its yearly benefits are 24.5% and it is more than assumed direction 22.5%.

C. A.V.Arjun, L.Venkat, V.M.Naidu,

“Economic Feasibility”. And efficient Project Scheduling of Flyover in Visakhapattanam (India).

In this paper author have mainly carried out the economic feasibility of Flyover in Visakhapattanam (India) between Maddilapalem and satyam junction is carried out. The benefits acquired the construction cost of Flyover, feasibility study has been done. The Flyover construction is scheduling is carried out through different stages of construction. And a data base was Prepare for construction Manger to decide between economy and duration of the project.

Finally conclude that the peak our traffic at Madilapalem junction toward NAD at various times is calculates in PCU. And studied the benefits and cost concluded that the the construction of the single lane Flyover thoroughly feasible between Madilapalem and Satyam junction. By decreasing or increasing in number of casting beds for spine and cantilever segments, the duration of construction is varied.

D. T. Pramod Kumar

Deals with the analysis and design of super structure of road cum railway bridge across Krishna river proposed and downstream side of existing bridge between Mahanadu road of Sithanagaram and P.N. Bus station, Vijayawada. The bridge is made of through type steel truss which carries two railway tracks at lower level and a roadway of three lane carriage way in the upper level. The span length matches with that of existing nearby Railway Bridge. Analyses of top floor members, truss members and bottom floor members are done using STAAD Pro. The design of structural members of the truss, top floor and bottom floor members is done as per Indian railway standard code and Indian roads congress code. In which they concluded that Road cum railway bridge reduce the construction cost by providing single bridge for both railway traffic road traffic instead of providing two separate bridges. It meets the increased railway and road traffic needs across the river Krishna. It reduces the land acquisition problem by providing single bridge.

E. Sachin Kulkarni (2014)

Carry out a seismic evaluation case study for an existing RC bridge using nonlinear static (pushover) analysis. In the present study a 4 Span RC Bridge existed in SH-12 in Karnataka, India, was selected and by defining FEMA 356 Auto hinges conducted Nonlinear Static (Pushover) Analysis using (ATC r40) Capacity Spectrum Method and software SAP2000 was used to analyse the Bridge. The evaluation results presented here shows that the selected bridge does not have the capacity to meet the desired performance level and it requires retrofitting. From the Pushover Analysis the performance levels of bridge are studied. From the Analysis it is evident that Spectral Displacement Demand is more than the Spectral Displacement Capacity in the analysed Bridge. So the analysed bridge requires retrofitting.

F. A. V. Arjun, L. Venkat, V. M. Naidu

“Economic Feasibility and Efficient Project Scheduling of Fly-Over in Visakhapatnam (India) In this paper the author have mainly carried out the economic feasibility of a fly over in Visakhapatnam (India) between maddilapalem and satyam junction is carried out. The benefits acquired and construction cost of the flyover, feasibility study has been done. The flyover construction scheduling is carried out through different stages of construction. And a database was prepared for construction manager to decide between economy and duration of the project. Finally conclude that the peak hour traffic at maddilapalem junction toward NAD at various times is calculated in PCU. And studied the benefit and cost and concluded that the construction of a 4-lane fly over is thoroughly feasible between maddilapalem and satyam junction. By decreasing or increasing in number of casting beds for spine and cantilever segments, the duration of the construction is varied.

III. OBJECTIVE:

- The main objective of designing of Flyover bridge on major road junction in Yavatmal is to avoid excessive traffic.
 - To study and to make the suggestion on remaining traffic. And to make improvement in transportation by providing Flyover bridge.
 - To study traffic and road safety Issue at the flyover.
 - To assess the economic Evaluation of Flyover.
- Methodology:
- Design of Flyover Bridge requires a multidimensional study including topography, survey, traffic volume study, alignment study, field survey etc.
 - Traffic volume:
 - 1) The collection of traffic data is important in the planning and constructing of Flyover Bridge so in this study the direct manual method is used to collect data and obtained traffic volume.
 - 2) After the traffic volume study on the basis of traffic volume we fixed the alignment of the flyover of the bridge road.
 - Field Survey:
 - 1) Will go to the field and collect the soil sample to calculate the bearing capacity of soil, soil property and different type taste collect on the basis ok requirement of flyover bridge construction.
 - 2) Calculate the depth of water table on the field.

IV. SCOPE OF STUDY:

Scope of study is related to find out the probable causes of traffic jams in Yavatmal. In this project we can study on the designing of Flyover Bridge considering all the issues related to the environmental, Economic problems. Total saving Savings due to the fuel and delay time can be calculated

V. CURRENT SCENARIO:

City of Yavatmal is city and municipal council in the India State of Maharashtra. Yavatmal is around 90 kms away from divisional headquarters Amravati.

Area: City -90 km/s

Area rank -3 in Vidarbha
Elevation - 445m
Population (2011)
City – 250000
Density-2800km/s

VI. CONCLUSION:

This project concludes the planning and study of Flyover Bridge. This structure reduce the traffic control and enhance the safe driving. The structure is designed as per IRC. This project helps to minimize the road accident, traffic jams, It reduces the impact of sound pollution as well as air pollution on environment. And it improves the urbanization of rural areas, also improves the connection of various road system in easy manner.

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