

Review Paper on Study and Design of Railway Line to Connect Wardha-Yavatmal-Nanded District

Prof. Pranay P. Deogade¹ Abhishek U. Pawar² Vaishali G Bhagat³ Priti N. Dadanje⁴

Akshay N. Dhole⁵

¹Assistant Professor ^{2,3,4,5}Student

^{1,2,3,4,5}Department of Civil Engineering

^{1,2,3,4,5}Jagadambha College of Engineering & Technology, Yavatmal, India

Abstract— In this project we have aim to join rural area of Yavatmal District to surrounding urban area like Wardha & Nanded. Developing transportation infrastructure is the vital condition for fast and sustainable development of different region of country. In transportation railway service is primarily used by passage/people for travelling from rural area to urban area. In this project we have aim to join rural area of Yavatmal District to surrounding urban area like Wardha & Nanded. As Yavatmal city hasn't nearby Railway station up to 60Km. This project led to overall development of Yavatmal District and smooth transportation between three major Districts, this route provides direct connectivity between Nagpur and other District in Vidarbha Region & Marathwada Region. This route gives ease of transportation, comfortable & cheapest service as compare to other travelling facility like good transport, food facility, tourism & Service Parking lots of operation other service. As Yavatmal District known as Cotton City of Maharashtra and District has many Sugar and various Industries.

Keywords: Railway Routs, Geographical Map, Indian Railway, Soil Testing, Development

I. INTRODUCTION

Indian Railways represent the pride of an Indians. Indian Railways is an Indian state-owned enterprise, owned and operated by the government of India through the Ministry of Railways. Railways have been good medium of transportation for its passengers since 1851 when it was introduced in India (Bombay to Thane. During these 150 years, it has approximately touched each and every part of the country. It covers about 1, 15,000 km with 7500 stations As of December 2014; it transported over 27 million passengers daily. Indian Railways is known to be Asia largest railway network with modern couches with water and lavatory facility, technological self-sufficiency, long Distances sleeper class and a variety of air conditioned and non-air-conditioned services to suit every pocket of its passengers. Yavatmal city is governed by Municipal Corporation which comes under Yavatmal Metropolitan Region. The Yavatmal city is located in Maharashtra state of India. Present study is use to provide service gap in terms of expectation of passengers & service delivered by train, for that we are trying various three routs of railways by joining the villages by considering various aspect like time duration, location, regional importance and tourist spots. After all study we are finalized the rout which fulfil maximum aspects. We did review of Literature of railway development by Different author we make City profile of Yavatmal city to ensure population and need of railway station This route gives ease of transportation, comfortable & cheapest service as compare to other travelling facility like good transport, food facility,

tourism & Service Parking lots of operation other service. As Yavatmal District known as Cotton City of Maharashtra and District has many Sugar and various Industries

The length of the line may be 298 km with 77 km Wardha-Yavatmal section, and 221 km Yavatmal-Nanded section all bridges (2 major bridges on Yashoda river and Bhindi River and 26 minor bridges), and at least 54 railway under bridge have to design and there will be six tunnels. The railway line would operate in six tehsils and 90 villages in Wardha, Yavatmal, Washim, Hingoli and Nanded District of Maharashtra, India. When the line is commissioned it will provide direct connectivity between Nagpur and other Districts in Vidarbha region and Marathwada region.

II. LITERATURE REVIEW

- 1) Prof. Naveen Namala He has studied on laying of track with prototype model with proper embankment, considering slopes and drainage conditions. Using AutoCAD Software, the track will be designed. The Project for design of railway track with prototype model would confirm the Indian Standard "Code Practice for Railway Track Design" ISSN-2250:2459, CP-TS-958, 959, 979, IS- 2720, IS- 2386-1963 and design had done according to the specifications and standards. The track is designed well considering the suitable sleepers and ballast and provision of slope and drainage conditions.
- 2) AIRF (All India Railway Men's Federation) we get information that, Railways being a strategic industry. Transportation is a key arrangement in keeping the upward monetary bustle. Train carriage lodges a crucial position in exterior carriage, moreover in a nation like India, which is not abled with much of waterways and has a greater physical infrastructure space. Train transportation has a great value country like India, mainly in view of limited resources of natural oil and rich availability of coal, a power base is easily consumable for train transportation. In the form of direct or indirect via electric or coal energy. Indian Railways has a constructive edge over motorway, being since its birth in India more energy efficient" (Operating Department, Southern Railways Website, 01/01/2021)
- 3) Prof. J. Sadeghi suggests about recent extensive increases in axle loads, speed and traffic volume, along with the need to improve passenger comfort and reduce track life cycle costs, have caused the subject of Track design optimization to arise. Furthermore, complementary decision support systems require a more precise analytical and mechanistic approach to meet the design needs of modern railway track systems. These aspects highlight the necessity of a thorough review and revision of the current railway track designs. In this

paper, the algorithm and limitations of the current track designed approach were discussed.

- 4) Indian Railway Year Book, 2018-19 This book gives information that, Indian railways transportation network has played a Key role in weaving India in to a nation. This network has not only integrated markets but also people across length and breadth of the country. The facilities such as train running status and online enquiry at Indian rail.gov.in. And online ticket booking etc is a tremendous achievement (Indian Railway Year Book, 2018-19) the paper less tickets attracts new generation more which saves time and provide better facility manufactures power cars and Pantry Cars. Fire and Smoke detection system in all newly manufactured AC coaches, Double Acting AC compartment doors in all newly manufactured AC coaches, Fire extinguishers in all newly manufactured coaches, automatic plug type doors in all newly manufactured Humsafar and Uday train coaches (Indian Railway Year Book, 2018-19)
- 5) S. Alireza Seyedvakili suggest in his paper that they give information about mixed-integer programming for the railway network design problem with a new objective function is proposed. The model considers development projects (new line construction and existing line improvement), available budget, block capacity, and origin-destination matrix demand. The objective function is to minimize the total cost of direct and indirect (external) costs. We add the effect of railway network development on the road network to the model. The model can formulate the Predicted demand Capacity constraints and available budget are included and make the model a perfect decision support one. To evaluate the efficiency and effectiveness of the proposed model, it is implemented for the Iranian railway network. The result led to the selection of various projects (new lines and added capacity projects) to carry the projected demand. Modelling, solving the case study, and conducting sensitivity analysis showed the high performance of the proposed model.



Fig. 1: City map of Yavatmal

City Yavatmal	total	male	female
City population	116,551	58,549	58,002
Literates	96,726	49,821	46,905
Children (0-6)	11,360	5,991	5,369
Average literacy (%)	91.95%	94.79%	89.12%
Sex ratio	991		
Child sex ratio	896		

DISCRIPTION	
City	Yavatmal
Government	Municipal Council
Urban Agglomeration	Yavatmal Metropolitan
State	Maharashtra

- Yavatmal city is governed by Municipal Corporation which comes under Yavatmal Metropolitan Region.
- The Yavatmal city is located in Maharashtra state of India.
- As per provisional reports of Census India, population of Yavatmal in 2011 is 116,551; of which male and female are 58,549 and 58,002 respectively.
- Although Yavatmal city has population of 116,551; its urban / metropolitan population is 138,303 of which 69,687 are males and 68,616 are females.

III. METHODOLOGY

Firstly, we are surveying & studying the various contour & Terrain map of Yavatmal District for suitable Railway track. After detail study of terrain, we try to design three Various tracks by using different aspect like Distance coverage, time duration, tourist place, religious place. etc that's shows in map 1, 2 & 3.

A. MAP 1

we are trying to Join Darwha - Digras - to Mahur - Mahagaon - Umarkhed & so on Up to Nanded" but after detail study we noticed that the Distance will increase by 36 km & we need to provide two bridges on Painganga river which will Increase cost of project and in this route, we Can't connect middle city of Yavatmal District i.e. Pusad.

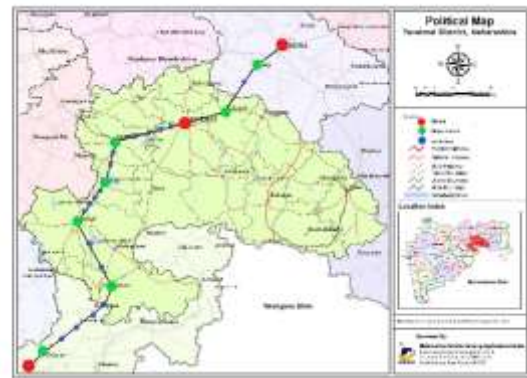


Fig. 2: Map No. 1

B. MAP 2

We are trying to Join Darwha, Digras- Pusad to Mahagaon, Umarkhed & so on to Nanded. After detailed study we know that after joining this track we can join maximum Area of Mahagaon taluka which is underdeveloped & this Route will reduced the Distance for Mahur which is holly & Religious place for Hindu. But In this track also there are hilly Range between Mahagoan and Umarkhed so we have to provide tunnels in it. But by using this route we can save the jungle area between the Pusad and Umerkhed but this Route Increase the Distance by 14 km as compared to map 3.



Fig. 3: Map No. 2

C. MAP 3

we are trying to Join Darwaha Digras - Pusad - Umarkhed & so on to Nanded but After detailed study on the terrain we knows that between Pusad & Umarkhed has big hilly as well as Jungle Area as compared to Map-2, also we a Unable to reach maximum are of Umarkhed & Mahagaon taluka , though this Route Reduce 14km as compare to map 2.

After All Study on Map we are assume to finalize the map no. 2 as it has maximum reach to Yavatmal District, has Religious Important, tourist part and Industrial Area like Sugar Industry.

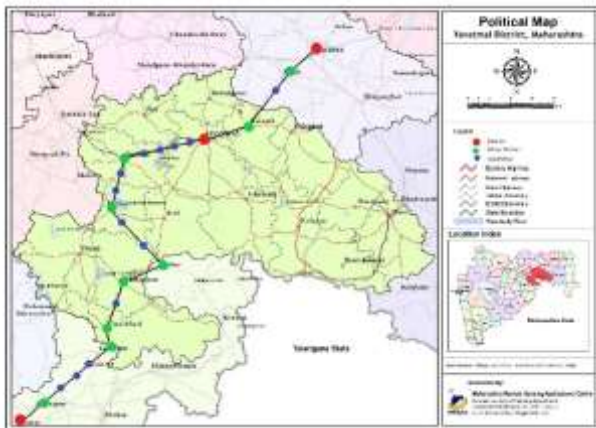


Fig. 4: Map No. 3

IV. BENEFITS OF RAILWAY IN YAVATMAL DISTRICT

- The transportation of fruits and vegetables by the Kisan Rail is granted a subsidy of 50% on the tariff chargeable by the Ministry of Food Processing and Industries. The farmers get this subsidy amount immediately which is beneficial to them.
- To increase the income in the farm sector by connecting production centres to markets as well as consumption centres.
- Also in Yavatmal District is known as cotton city it is good carrier. Also the good carrier for cotton and sugarcane.
- And also the lot of factory of cotton and sugar mills in Yavatmal District it is very easy to carrying goods to other District and states.
- The greatest advantage of the railway transport is that it is the most dependable mode of transport as it is the least

affected by weather conditions such as rains, fog etc. compared to other modes of transport.

- The rail transport is better organized than any other form of transport. It has fixed routes and schedules. Its service is more certain, uniform and regular as compared to other modes of transport.
- Its speed over long Distances is more than any other mode of transport, except airways. Thus, it is the best choice for long Distance traffic.
- Railway transport is economical, quicker and best suited for carrying heavy and bulky goods over long Distances.
- It is a cheaper mode of transport as compared to other modes of transport. Most of the working expenses of railways are in the nature of fixed costs. Every increase in the railway traffic is followed by a decrease in the average cost. Rail transport is economical in the use of labour also as one driver and one guard are sufficient to carry much more load. than the motor transport.
- Railway is the safest form of transport. The chances of accidents and i breakdowns of railways are minimum as compared to other modes of transport. Moreover, the traffic can be protected from the exposure to sun, rains, snow etc.
- The carrying capacity of the railways is extremely large. Moreover, its capacity is elastic which can easily be increased by adding more wagons.

V. SCOPE OF FUTURE WORK

- This Railway track would operate in six tehsil and 90 villages in Wardha, Yavatmal, Washim, Hingoli, and Nanded District of Maharashtra, India.
- When line is commissioned it will provide direct connectivity between Nagpur and other District in Vidharbha region and Marathwada region.
- After completion of this project rural talukas and villages will be help to developed fast.
- Advantage for rickshaw drivers.
- Advantage and employment for small venders.
- Future growth in import and export.
- As Yavatmal is cotton city of Maharashtra, there will lot of chances of development in cotton market of Yavatmal District.
- As Yavatmal having only one mode of transportation that is road transportation, Railway transportation will reduce rush of vehicles and provide smooth transportation.
- The employment in Yavatmal District will rise as Railway route comes in Yavatmal District.
- The market will enhance by early decaying fruits and vegetables can transport fatly by train it will beneficial to farmer.

VI. CONCLUSION

After study & designing the Wardha-Yavatmal- Nanded Railway track we are assuming that, the time duration between these cities Reduced by 30 to 40%. After doing Surveying we get Information that for completing this project, we need to built two major bridges on Yashoda River & Bhindi River with 26 minor bridges The total length of track probably will be 298 km having 77km Wardha-

Yavatmal & 221km from Yavatmal-Nanded. As Yavatmal District having some hilly Area so we need to Design 6 tunnel and 54 Underpasses. After Surveying and Analysing we suggest that Railway track may follow track. Wardha - Deoli - Bhindi - kalamb - Talegaon- Yavatmal – Darwha – Pusad - Mahagaon - Umarkhed – Hadgaon – Ardhapur - Nanded. If this project will complete their will be lots of employment enhancement in Yavatmal District. In Yavatmal only Road transportation facility is available & having very big Rush at Government & private, buses & taxis, this project will help to make convenient transportation. We are assuming that this project will enhance Infrastructure of Yavatmal in very short time

REFERENCE

- [1] "New Advances in Analysis and Design of Railway Track System" by Prof. J. Sadeghi (2012).
- [2] Railway Board. Indian Railway Year Book, 2018-19. New Delhi. Ministry of Railways, 2018.
- [3] "DESIGN OF RAILWAY TRACK WITH PROTOTYPE MODEL" by Prof. Naveen Namala. January 2017.
- [4] AIRF (All India Railway Men's Federation), History of AIRF-90 Glorious years of Struggle. New Delhi.
- [5] "New Model for the Railway Network Design Problem" By S. Alireza Seyedvakili.
- [6] S.C Ranwalaandsatish Chandra, Railway Engineering

