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TEAFFIC FEASIBILITY STUDY FOR THE PROPOSED HIMMATNAGAR TO MEHSANA RAILWAY LINK.

Jaimin M. Patel[1], Bhavya S. Patel[2], Dr. H. R. Varia[3], Hinal B. Thakar[4]

PG Student, Tatva Institute of Technological Studies, Modasa[1]

PG Student, Tatva Institute of Technological Studies, Modasa[1]

Professor, Adani Institute of Infrastructure Engineering, Ahmedabad[2]
Professor, Government engineering college, Modasa

Abstract— The proposed study is aimed to determine the feasibility of connecting Himmatnagar to Mehsana by railway link. In this study, railway link (i) Himmatnagar to Vijapur - a new broad gauge railway track construction of 25km and (ii) From Vijapur to Ambaliyasan - conversion of metre gauge to broad gauge of 41km are proposed. At present passengers from Sabarkantha and Aravalli district are going in Kachchh region by GSRTC and Luxury buses in large number from Himmatnagar. Using data traffic volume count, road network inventory, IPT survey, origin-destination survey data and Google maps.

Keywords— Feasibility, Road network inventory, CVC, O-D survey, IPT survey.

I. INTRODUCTION

Railroads are appropriate for long separation travel and development of mass items. Respected higher than street transport as far as vitality proficiency, land use, condition effect and wellbeing it's ceaselessly in bleeding edge amid national crisis. Indian Railways, a recorded legacy, are a significant power in our economy. Crossing almost two centuries It had been just in 1851 when the main train kept running in the nation for pulling development material in Roorkee and by sixteenth April 1853 the principal traveller train administration ended up operational running between Bori Bunder, Bombay and Thane. Fourteen railroad carriages conveyed with respect to 400 visitors from Bombay to Thane covering a separation of 21 miles, therefore denoting the formal birth of rail organize in India. It is intriguing to take note of that however the railroads were acquainted with encourage the business enthusiasm of the British it assumed a vital job in bringing together the nation.

The Railways in India are the key method of transportation for cargo and travellers. The railroads have assumed a significant job in the advancement of businesses and agribusiness. Indian railroads comprise of an immense system of 7031 stations spread over a course length of 63221 km, of this 13,000 km is energized, with an armada of 7817 trains, 5321 traveller administration vehicles, 4904 distinctive instructing vehicles and 228170 wagons 300 yards, 2300 great sheds, 700 fix shops, and 1.54 million labour. Indian Railways goes around 11,000 trains each day, of which 7,000 are traveller, prepares as on 31st March 2004. Indian railroads, the higher rail arrange in Asia and the worlds second biggest less than one administration are additionally credited with having a multi check and multi footing framework. The track kilometers in wide measure (1676 mm) are 86526 kms, meter check (1000 mm) are 18529 kms and tight measure (762/610 mm) are 3651 kms. Indian Railway has the refinement of being one of the greatest and busiest rail organizes on the planet conveying in excess of 16 million travellers and 11 Lakh tones of products every day. As far as headcount again Indian Railway scores as it utilizes more than 1.6 million representatives that are just second to the Chinese Army as far as individuals utilized. The Indian Railways have been a decent incorporating power for over 150 years. The Indian Railways organize ties the social, social and conservative texture of the nation and spreads the aggregate of nation running from north to south and east to west evacuating the separation boundary for it's everything individuals. The railroad system of India has united the entire of nation consequently making a sentiment of solidarity among the Indians. It has helped the financial existence of the nation and aided in quickening the improvement of industry and horticulture.

II. LITERATURE REVIEW

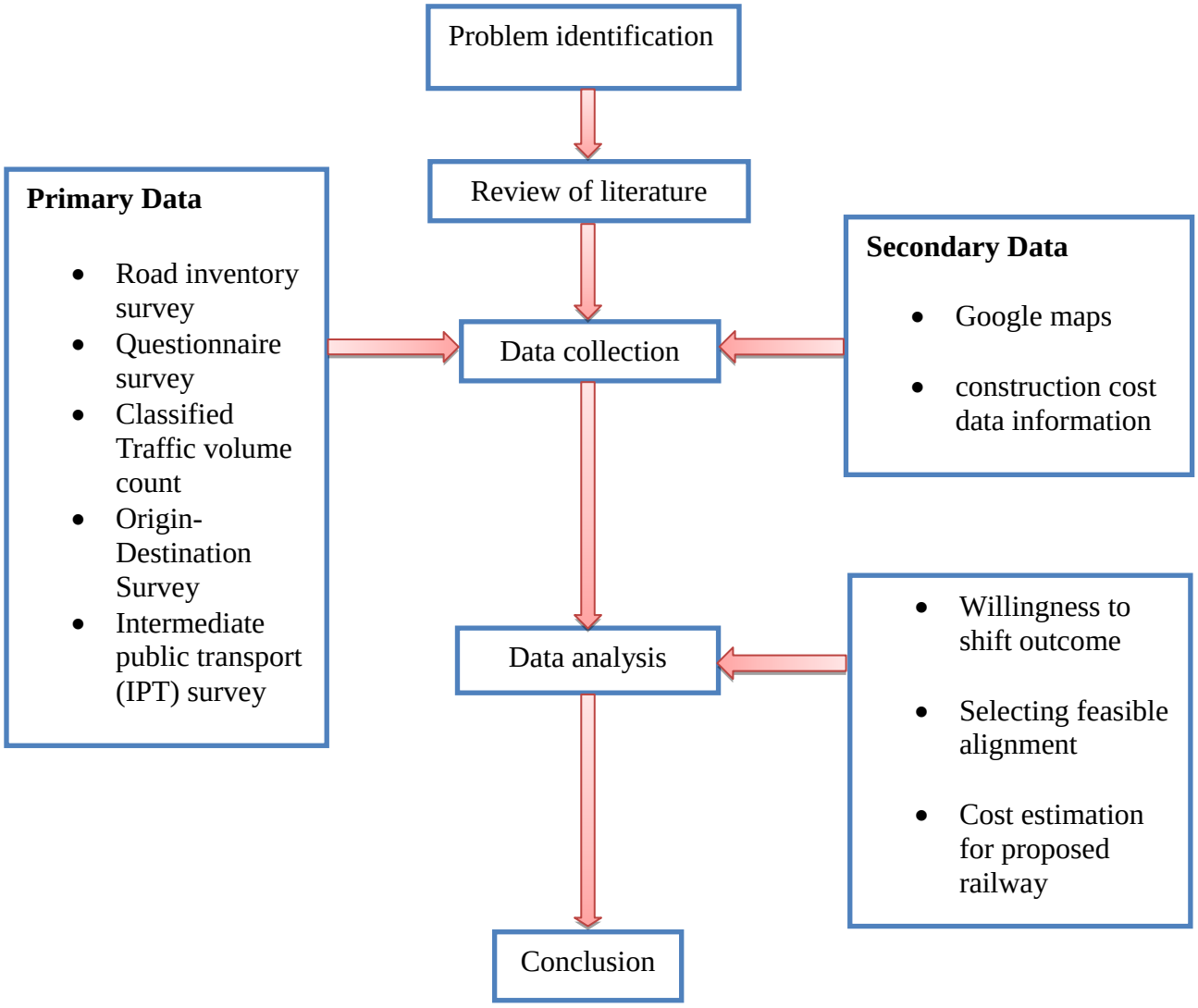
Ramteke et. al (2015) "Feasibility study of metro rail project in Nagpur city" have carried out the population of Nagpur had already exceeded 35 lakhs and in 2021 it will cross 50 lakhs. We can say that, at the time of 2016 PHPDT (Peak Hour Peak Direction Traffic) of this route will exceed the limit of 8000PHPDT (Peak Hour Peak Direction Traffic), so mass rapid transit system is necessary. As per Traffic Volume Count Survey the studied phases are feasible and the phase 3 will be after a decade. The benefit get within 3 years will be equal to total cost of project (9408 crore) when 13% of the population will use metro rail. It is the rapid mode of rail transportation with maximum carrying load in less time. So from that conclude Metro Rail will be feasible in Nagpur by 2016.

Gattuso and Restuccia (2013) "A tool for railway transport cost evaluation" they studied in that for cost evaluation and mainly taken two type of costs one was investment and another was operating cost. In investment cost they consider

infrastructure, rolling stock, track electric, land and rights station and signalling costs. In operating cost consider traction, depreciation, maintenance, salaries and access charges. Concluded from this paper is meant to provide transportation planners and policy makers with a systematic process for estimating costs that are representative of the area and service in question, for analysis and decision making purposes.

Siciliano et. Al (2016) "Adapted cost-benefit analysis methodology for innovative railway services" have concluded that the results the adapted methodology has taken financial costs like travel saving, safety improvements, Benefits from the reduction of externalities and calculate all values with the method net present value and internal rate of return. The estimation of costs derived from the application of standard conversion factors to the financial costs whose calculation has been developed as part of previous research.

III. METHODOLOGY & STUDY AREA



Himmatnagar is a district head quarter of Sabarkantha district. Prantij and Talod are the major industrial locations in Sabarkantha for Industry Sectors like Agriculture, ceramics, chemicals and milk processing and it also has nearer Tourist Destinations – Idar, Polo Forests, Vijaynagar. For the Industrial and Agricultural purpose people are moving daily on the intermediate station Vijapur for mainly agricultural purpose and Mehsana for commercial, agricultural, industrial as well as multiple uses.

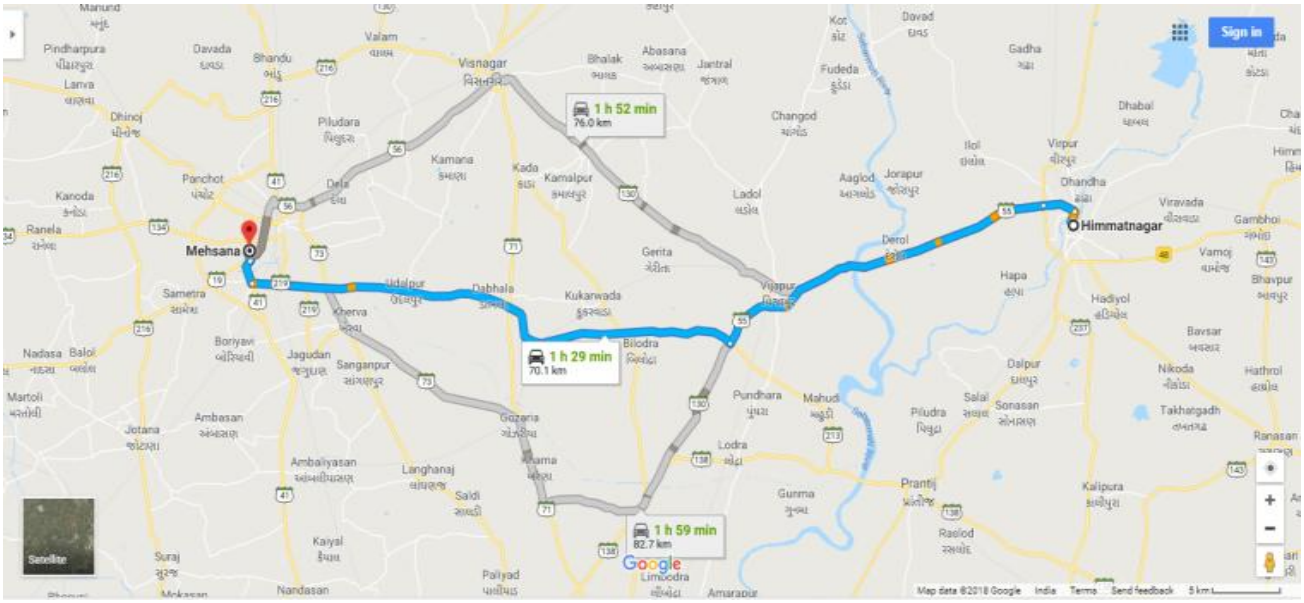


Figure 1: Study area map from Himmatnagar to Mehsana

IV. DATA COLLECTION AND ANALYSIS

4.1 Road Network Inventory Survey

Table 1: Road Network Inventory

Route No/Name	Length km	Width(m)	Shoulder(m)	Median(m)	Quality of riding surface	Facilities			Traffic control measures
						Intersection	Pedestrian	Parking	
RTO Circle to Derol	14	7.00	1.5	0.5	GOOD	Y	Y	Y	Y
Derol to Vijapur	11	7.00	1.5	0.5	GOOD	Y	Y	Y	Y
Vijapur to Pilvai	6	7.00	1.5	0.5	GOOD	Y	Y	Y	Y
Pilvai to Vihar	8	7.00	1.5	0.5	GOOD	Y	Y	Y	Y
Vihar to Dabhla	10	7.00	1.5	0.5	GOOD	Y	Y	Y	Y
Dabhla to Rampura	14	7.00	1.5	0.5	GOOD	Y	Y	Y	Y
Rampura to Palavasana	6	7.00	0.0	0.0	Uneven	N	N	N	Y

4.2 Classified volume count

Classified volume count of conducted of 6 hours on peak hours in Morning, Afternoon and Evening for the study for below four type of category.

Table 2: Total no of Vehicle Passing During Survey

Vehicle type	*Himmatnagar to Mehsana*	*Mehsana to Himmatnagar*
2 W	1129	1174
Car	331	286
4 W (Public)	212	246
Truck	629	593
Bus	29	31

4.3 Origin and destination survey

Table 3: Origin-Destination survey matrix

Origin Destination	HIMMATNAGAR	NAVALPUR	VIJAPUR	VIHAR	VASAI	MEHSANA	Total
HIMMATNAGAR	**0**	**156**	**364**	**76**	**92**	**412**	**1100**
NAVALPUR	**104**	**0**	**91**	**46**	**38**	**48**	**327**
VIJAPUR	**252**	**156**	**0**	**328**	**368**	**1652**	**2756**
VIHAR	**80**	**46**	**296**	**0**	**34**	**146**	**602**
VASAI	**46**	**40**	**296**	**54**	**0**	**482**	**918**
MEHSANA	**492**	**34**	**1662**	**386**	**548**	**0**	**3122**
TOTAL	**974**	**432**	**2709**	**890**	**1080**	**2740**	**8825**

4.4 Intermediate public transport Survey

Table 4: Origin Destination Matrix for IPT

Origin Destination	HIMMATNAGAR	NAVALPUR	VIJAPUR	VIHAR	VASAI	MEHSANA	Total
HIMMATNAGAR	0	13	114	14	12	62	215
NAVALPUR	4	0	10	0	19	22	55
VIJAPUR	12	10	0	102	110	220	454
VIHAR	0	0	110	0	6	55	171
VASAI	5	20	110	0	0	58	193
MEHSANA	124	17	214	110	58	0	523
TOTAL	145	60	558	226	205	417	1611

The decision of transport mode is a standout amongst the most significant great models in transport arranging. This is a direct result of the key pretended by open transport in arrangement making. Open transport modes utilize street space more effectively than private transport. The mode decision information investigation speaks into figure 2.

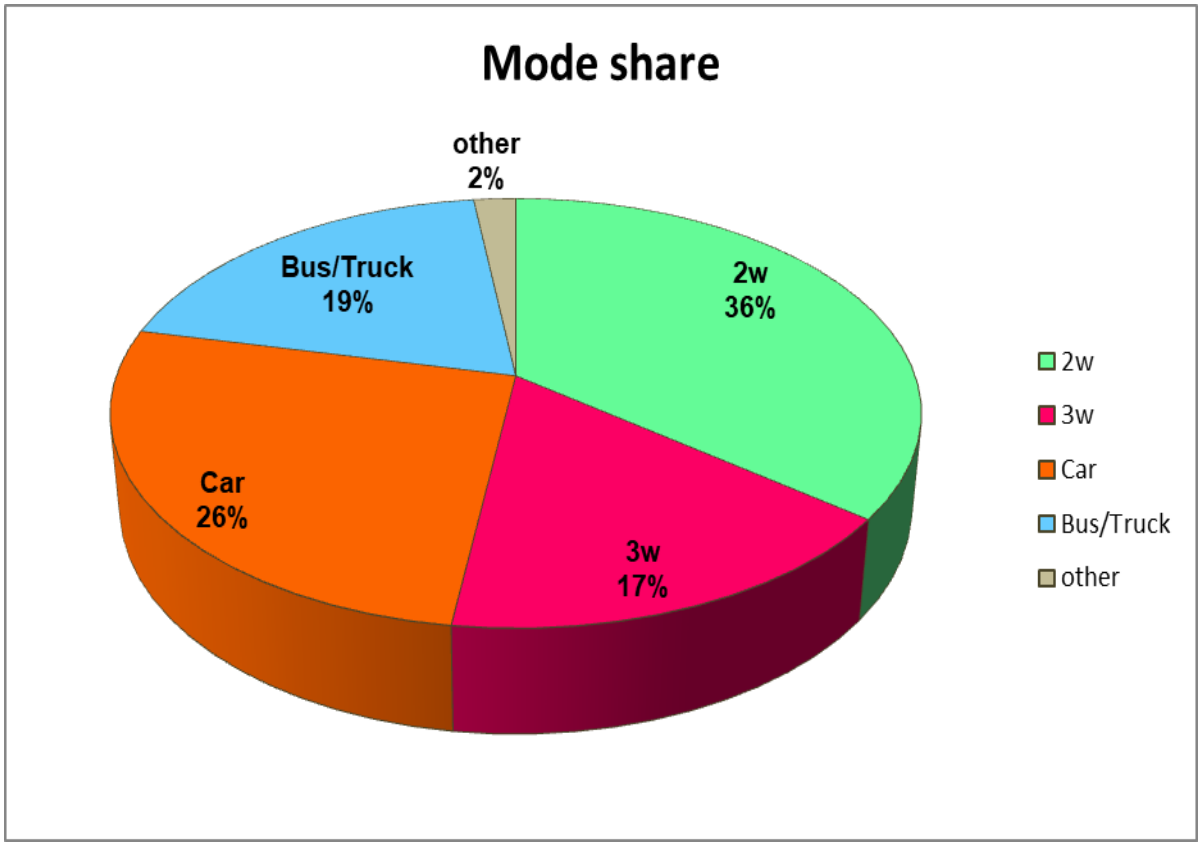


Figure 2: Mode share

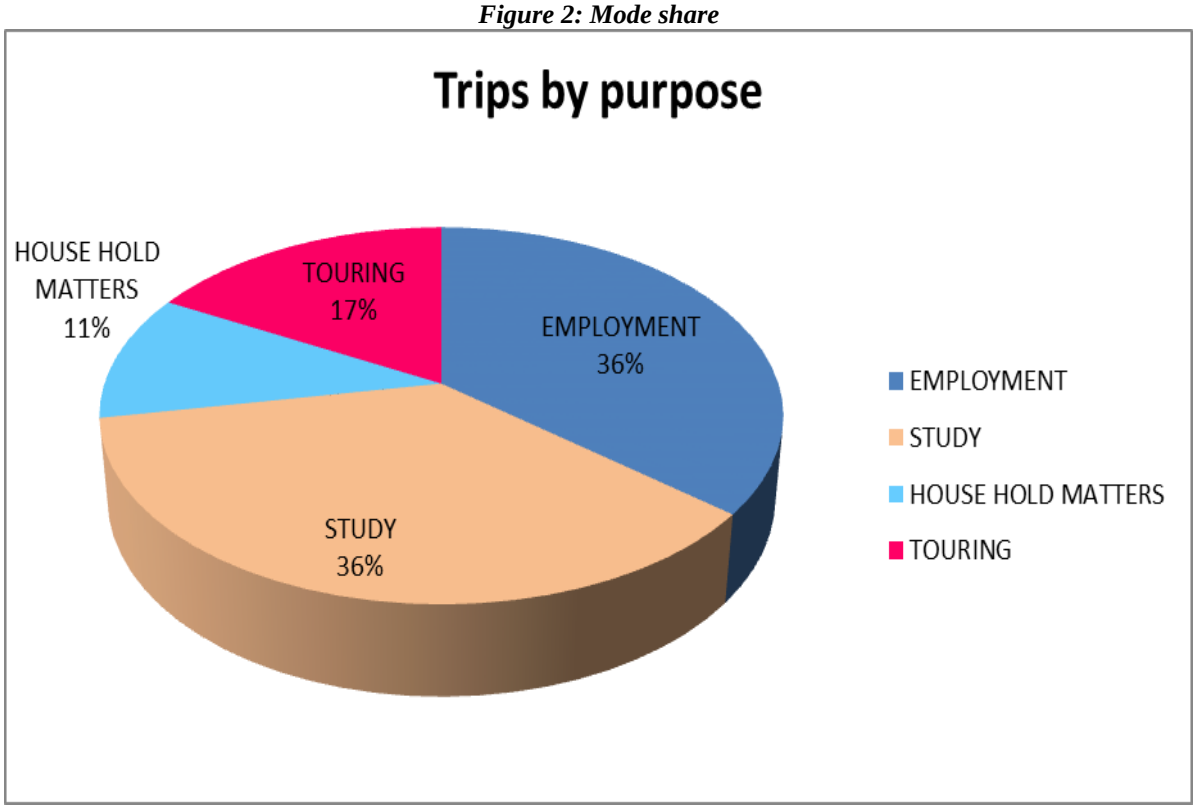


Figure 3: Trips by purpose

It is however being assumed that with improvement in public transport facility in the city with introduction of mini bus and increase in fleet size of bus network, more and more passenger attracted to public transport. Therefore, in order to undertake mode split, a willingness to shift survey was carried out in Himmatnagar, Vijapur and Mehsana. The figure 6.4 shows willingness to shift to train of passenger with different trip length. The passenger willing to shift increases as the trip length increases. On the whole, around 73% of the surveyed passengers are willing to shift to train system.

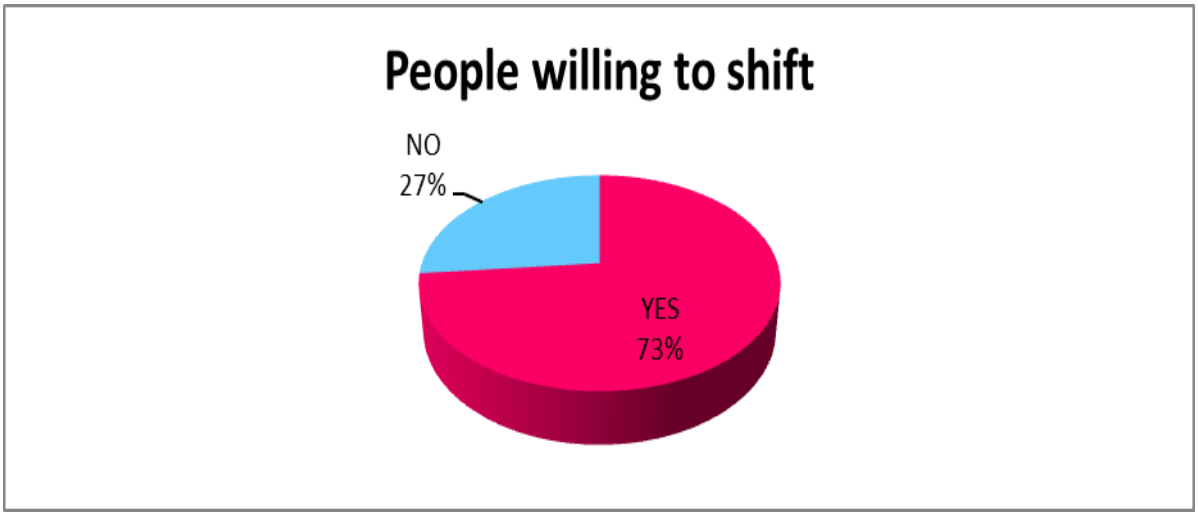


Figure 4: People willing to shift

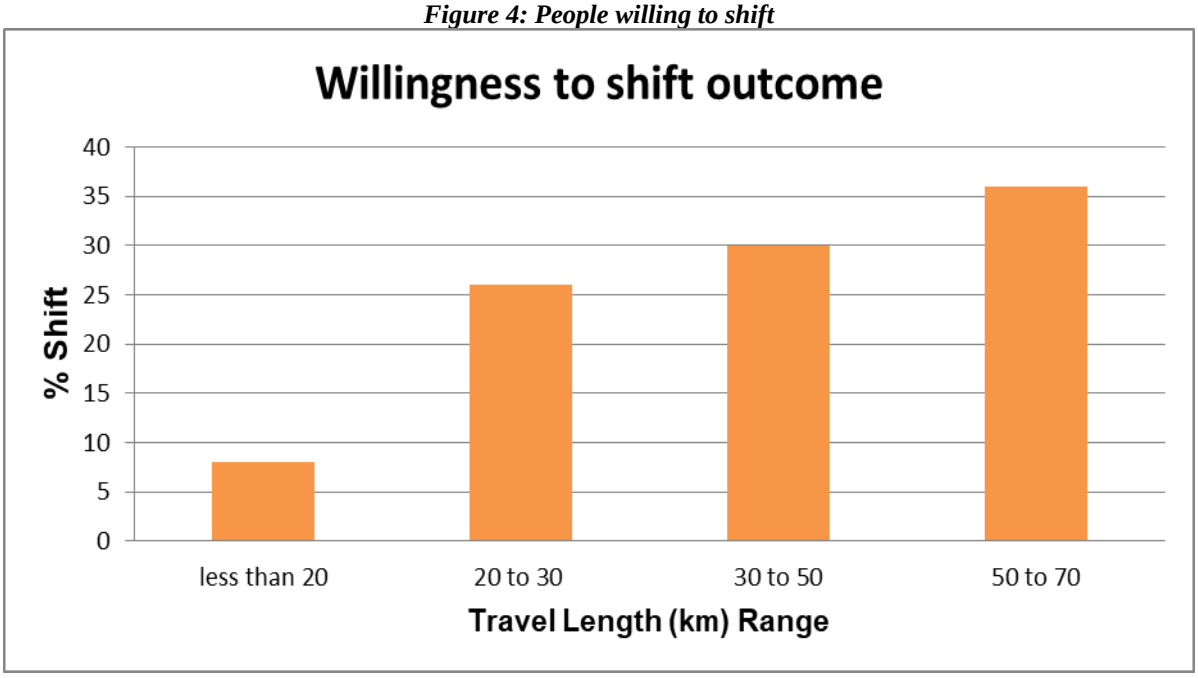


Figure 5: Willingness to shift with respect to Travel length

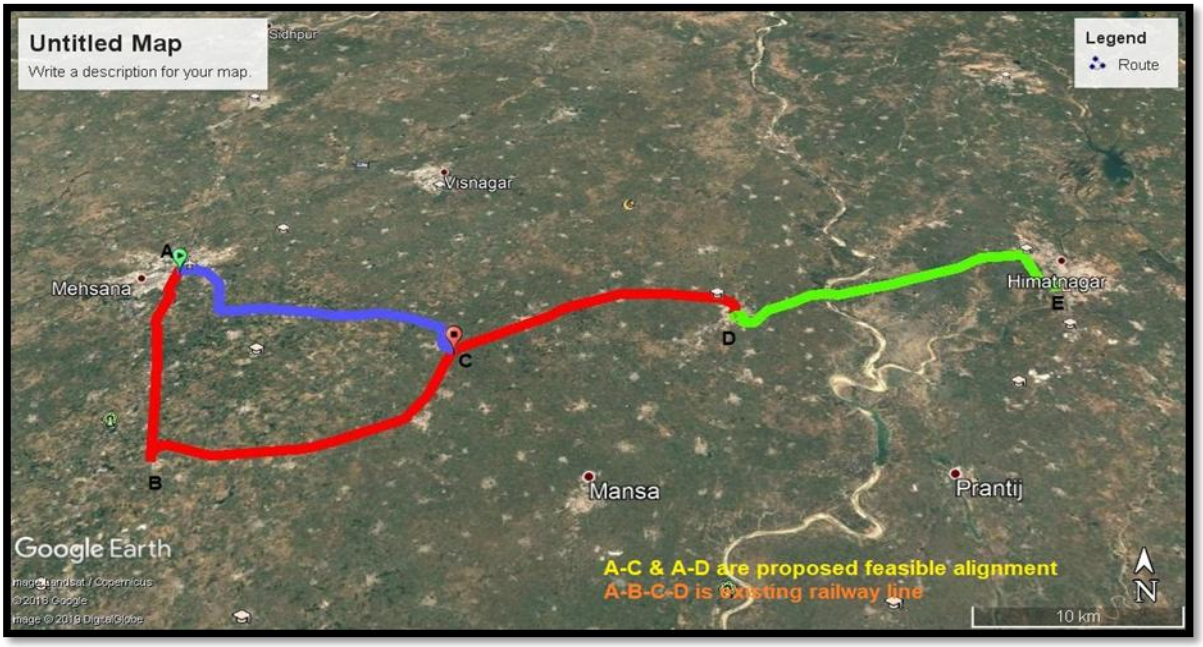


Figure 6: Feasible alignment for Himmatnagar to Mehsana railway link

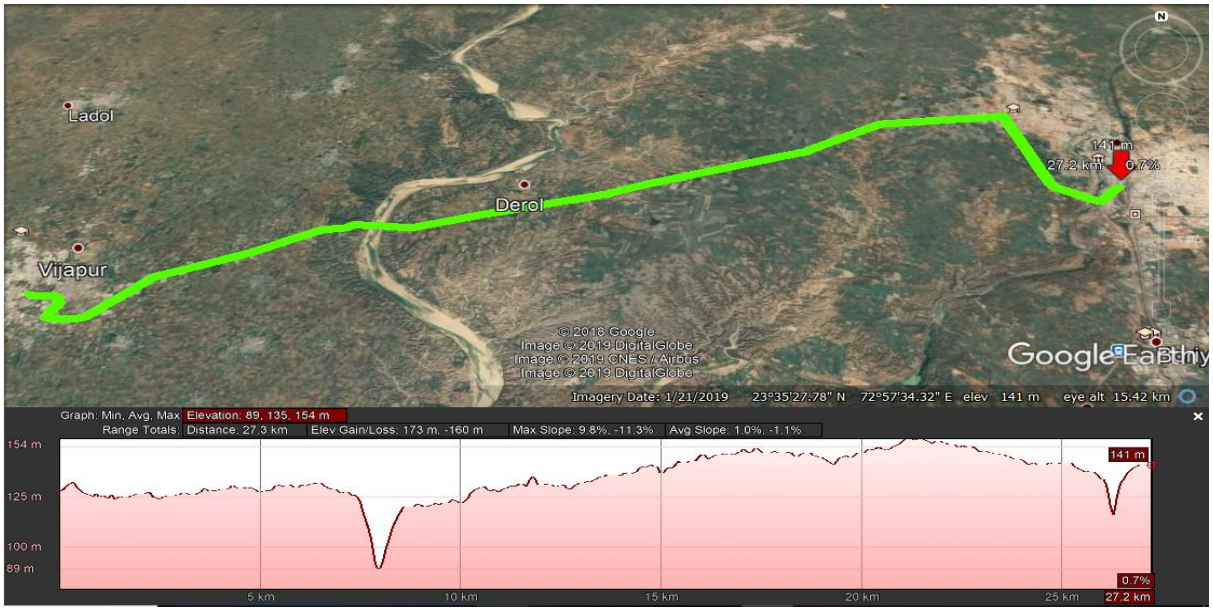


Figure 7: Feasible alignment from Himmatnagar to Vijapur with elevation graph

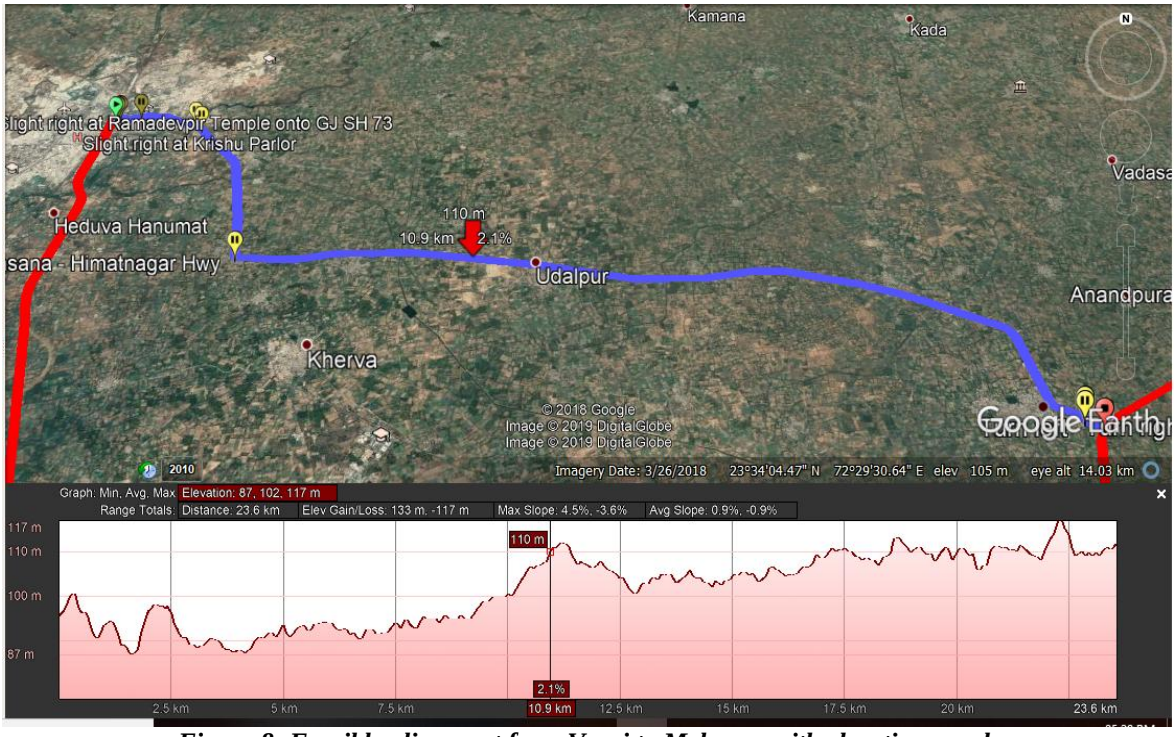


Figure 8: Feasible alignment from Vasai to Mehsana with elevation graph

Table 5: Estimated cost as per budget (2017-18)

PARTICULAR	LENGTH	Per Km Cost (Cr.)	TOTAL COST (Cr.)
HIMMATNAGAR to VIJAPUR	25 km	124.46	1447.81
MEHSANA to VASAI	24 km	55.13	1323.34
HIMMATNAGAR to MEHSANA	70 km	55.13	3859.75
Gauge conversion	41 km	4.31	176.93

V. CONCLUSION

- People are willing to travel by Train.
- Fares of other mode are relatively higher than train system.
- The new construction of railway link is possible and people are interested to travel by train because is cheaper And provide better services.

5.1 Future Scope

There are some areas which can be studied from the above research work.

- Impact on environmental characteristics.
- Impact on social characteristics.
- Alignment design should be properly done in future.
- For economical work, using of accident data and operation & maintenance cost of railway should be considered for work in future.

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