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CHALLENGES AND EFFECTS OF UPGRADING EXISTING HIGHWAYS;A CASE STUDY OF NH-12 KOTA -JHALAWAR SECTION) RAJASTHAN INDIA

Tiza Michael[1], Anand Kumar[2], Shubham Kumar[3]

[1]M. Tech Scholar, [2.3]B. Tech Scholar,

Department of Civil Engineering, Career Point University, Kota, Rajasthan (India)

ABSTRACT

This research work focuses on the challenges and effect of upgrading existing highways, the method used in obtaining these challenges were through site visitation and observation, many literatures were consulted in making this research a fruition. It is important to state thatNH-12(Kota -Jhalawar Section) Rajasthan India is only used as a case study in this work, some factors mentioned as challenges may not necessarily apply to the project but are general issues seen in the upgradation of existing highways.

***Key words*:** *Existing Highways,2-to-4 lane conversions, Re- Alignment, Upgrading etc.*

I. INTRODUCTION

Highways are designed in such a way they would be accommodate traffic volume at that time of design with a forecast on what the possible increment in traffic volume in the future years would be. Due to increase in traffic volume as a result of more vehicle ownership, increase in human activities such as educational activities, business activities and many more constitute the factors which necessarily leads to increase in volume of traffic thus exceeding the capacity of the highway which in turn leads to upgradation of existing highways to more lanes and sometimes to more durable materials such as upgrading from flexible pavements to rigid pavements in order to accommodate the present traffic volume and as well that of considerable future traffic volume. Accordingto Khanna et al (2015) The government of India has taken up National Highway Development programme which will be the highest project ever undertaken by the country. Theproject is said to envisage seven phases which is estimated to cost more than Rs. 2,35,690 crores during the period of 2005-2015. The program targets four/six laning of National Highways in India along highly trafficked corridors and upgradation of selected high density corridors which NH 12(Kota -Jhalawar Section) is not an exception.

II. AIM

The research is aimed at investigating the challenges that are faced as a result upgrading existing highways and as well the effects that may have in a considering some factors such as economic, cultural, environment etc.

III. OBJECTIVES

The objectives of the research are;

1. Investigate the Challenges as a result of upgradation of existing Highways.
2. Investigate the Economic effect of such projects.
3. Investigate the Environmental effect of upgrading existing highways.
4. Investigate the Social implication of upgrading existing highways.

IV. METHODOLOGY

The method used in obtaining the details of the challenges mentioned in this work was site visitation. The proposed upgradation of NH-12 (Kota -Jhalawar Section) was proposed to be executed on the left hand side according to the report obtained from Government of Rajasthan Public Works Department and questioning. The site was visited along the road stretch were work was in progress. Careful observations were made and as well questions asked to the workers on site.

V. CHALLENGES ENCOUNTERED IN UPGRADING EXISTING HIGHWAYS

Highways form a vital role in the economic prosperity of any nation, due to its importance, the Government at all levels desire to have a good road network to facilitate the movement of goods and services, however, the construction of these highways are very capital intensive projects thus leading to the higher cost on the government or the major client of the project, as the cost of upgrading existing highways will not be compared to the initial cost of construction of the highway, this is because the numerous factors to be considered like labour, cost of materials, cost of land acquisition, cost of survey, cost of earth machines , cost of construction etc. keeps increasing and hardly falls. Thus, the Cost will be significantly higher in upgrading existing highways after years of initial construction.

VI. COST OF LAND ACQUISITION

According to report from Government of Rajasthan Public Works Department. The right of way for the current or existing two -lane carriage way is between 15 – 30 meters. A proposal of about 50% (30 meters) more of the existing right of way is made which leads to 60 Meters all together. From the proposal, only 41.67 Ha [19.87 %] of the required 209 70 Ha is available, the remaining 81.11 % will be acquired, this will definitely cost a lot of money.

Table 1. Showing Land Requirement for Upgradation of NH 12

Total Land Required	Available land	Land to be Acquired
209 70 Ha	41.67 Ha [19.87 %]	From forest Department 65.450 Ha (31.21%) From Agriculture/Other private land 102.551 Ha

		[48.90%] Total Land to be acquire = 168.001 (81.11%).

Source; (Government of Rajasthan Public Works Department).

VII. COST OF COMPENSATION OF DEMOLISHED STRUCTURES

Some structures are demolished while in the process of upgrading highways, the owners of structures proposed for demolition have the right to fair compensation, transparency, rehabilitation and resettlement. Governments of most nations have made this a constitutional right of their citizens. However, in practice, it is difficult for this process to be fair, transparent and participative due to many factors, among which is inaccessibility of a common man to lay his dissatisfaction to the appropriate channels when treated unfairly or unjustly. This seem to be a serious challenge although there are laws guiding this, some people feel are above the law and tend to maltreat others.

VIII. LEGAL IMPLICATION

As stated above, some people may not be comfortable at the treatment obtained from agencies or institutions in the process of compensation, this leads to serious legal battles which in turn delays the project due to injunctions given by the appropriate court of justice while pending the final judgement.

IX. ENVIRONMENTAL FACTORS

As much as tremendous efforts have been made by environmental agencies and Governments of different nations to discourage deforestation. It becomes un avoidable in development projects such as town planning, upgradation of existing highways, construction of industries etc. The effects such as loss of habitat for animals, doing away of endangered species of both plants and animals, increase in greenhouse gas emissionswhich contributes significantly to global warming since there would be no plants readily available to absorb CO_2 for production of their food etc.

Fig.1 Falling Down of Trees.

X. ESCALATION IN CONSTRUCTION COST AND MATERIALS.

According to Vamsidhar et al (2014) the construction industry consumes 40 to 50% of the national five-year plan outlay and contributes 20% of gross domestic product to Indian economy. The cost of construction affects a project significantly so much such that many factors are as well affected. The scope is sometimes reduced to meet the daunting challenge of cost escalation. Delays in construction come in as a handy challenge, as stated by Khanna et al (2015), the proposed time for upgrading national highways in India to 4 and 6 lanes was from 2005-2015, however, it is obvious that the target is not met, perhaps due to finances among other reasons. Vamsidhar et al (2014) did a comparative analysis of cost escalation bulk materials among others from the year 2008 to 2013, the result of their findings are presented in the tables below.

Table 2. Comparison of Bulk construction material.

Item no	Item description	Unit	Basic rate					
			2008	2009	2010	2011	2012	2013
1	Cement	Bag	215.00	220.00	225.00	260.00	280.00	300.00
2	Reinforcement steel	Kg	26.00	29.00	32.00	38.00	45.00	62.00
3	Structural steel	Kg	39.00	42.00	38.00	45.00	55.00	85.00
4	River Sand	Cft	18.00	22.00	22.00	26.00	40.00	42.00
5	40mm aggregate	Cft	17.00	19.00	18.00	20.00	22.00	30.00
6	20mm aggregate	Cft	18.00	20.00	18.00	21.00	24.00	32.00
7	12mm aggregate	Cft	14.00	17.00	17.00	20.00	21.00	27.00
8	6mm aggregate	Cft	10.00	12.00	12.00	13.00	13.00	25.00
9	Quarry Dust	Cft	6.00	8.00	10.00	10.00	12.00	22.00
10	Bricks	No	3.25	3.25	4.00	4.00	6.50	7.00
11	Fly ash bricks 9"x4"x3"	No	2.75	2.75	3.50	4.50	5.50	6.00
12	Fly ash bricks 9"x4"x4"	No	3.50	3.50	4.50	5.00	6.00	6.50
13	Fly ash bricks 9"x9"x4"	No	14.00	14.50	16.00	18.00	20.00	20.00
14	RR Stone	No	9.00	10.00	11.50	11.50	12.00	12.00
15	Soling Stone	Cft	13.50	14.00	16.00	16.00	20.00	20.00
16	Solid Block, 200mm thick	No	23.00	25.00	26.00	30.00	30.00	31.00
17	Solid Block, 150mm thick	No	20.00	21.00	24.00	28.00	28.00	29.00
18	Solid Block, 100mm thick	No	11.50	13.00	16.00	18.00	25.00	26.00
19	Earth brought from Outside	Cft	3.50	4.00	4.50	6.00	7.00	7.00
20	Gravel	Cft	4.00	5.00	6.50	7.00	8.00	8.00
21	Brick aggregate	Cft	22.00	24.00	28.00	30.00	35.00	36.00
22	Plasticizer	Kg	62.00	68.00	70.00	76.00	80.00	80.00
23	Bitumen 80/100	Kg	32.00	36.00	38.00	40.00	41.00	45.00

Source; Vamsidhar et al (2014)

Table 3. Comparison tabular column for hiring equipments.

EQUIPMENT RENT								
Ite no	Item description	Unit	Basic rate					
			2008	2009	2010	2011	2012	2013
1	Road roller 8 to 12tonne capacity	Per hour	680	740	810	850	900	1100
2	JCB	Per hour	460	505	565	600	650	850
3	Bobcats	Per hour	235	260	294	300	300	350
4	Forklifts	Per hour	220	250	280	300	350	400
5	Dewatering pumps	Per hour	285	305	345	370	400	500
6	Excavators	Per hour	1220	1335	1490	1600	1800	2000
7	Concrete Mixers	Per hour	75	90	105	120	150	190
8	Truck	Per hour	210	240	260	270	300	375

Source; Vamsidhar et al (2014)

XI. UTILITY SHIFTING

This comes in as a major challenge, although in the proposed plan for NH 12 Kota - Jhalawar, only electric poles are marked for shifting , other utilities such as water pipelines, telephone poles etc. may not be affected in this case study, the implication this is while the process of upgrading reaches construction phase, there is a high possibility of fluctuations in electricity in towns and villages around and along the road stretch, thus leading to use of generators which increases the cost of living on the people and those who cannot afford the cost of procuring generators and fuel will be left with no other options than to go back to primitive ways of lightening their homes especially in the villages. In cases where water pipeline, gas pipelines, telephone lines are affected, this will be a serious issue to inhabitants around these places.

XII. CORRUPTION

English Oxford livingdictionaries definesCorruption as “dishonest or fraudulent conduct by those in power, typically involving bribery”.

This seems to be a serious issue generally in construction industries as those in power seeks to be received a fraudulentbenefit before performing specific tasks which they are supposed to do to start off a project, from the time of contract bidding through to the time of construction and even handing over/ commissioning. As much as the writers have not pointed out this issue of corruption in the case study used on NH-12. It is a general issue plaguing the construction industries all over the globe, both developing and developed nations, this leads to giving a blind eye to sub- standard materials, works etc. This leads to handing over highly substandard works to the client which in most cases the Government.

Fig.2 Corruption Practices

XII. SOCIAL CHALLENGES

Due to large number of commercial establishments and dense habitation at some locations, the need of 3 bypasses was necessary in the proposed upgradation of existing Highways. Many families find their livelihood or economic dependency from commercial activities near and around highways, but due to upgradation these activities are affected and suspended temporarily or permanently. This affects the psychological state of individuals and leads to subsequent death.

Fig 3. Economic Road Side Activities Likely to be Affected.

XIII. NATURAL OBSTACLES

Along the stretch of the road at some specific points, there would be natural obstacles such as hills, oceans, deep valleys etc. These form a major challenge as they coerce the process of realignment to get through such locations, the alignment away from these obstacles seems to be a readier solution in case of these natural obstacles, however where necessary, getting to align the highway through these natural geographic areas would increase significantly the cost and time ofconstruction. As seen in Fig.4 Along NH-12 is found a major Hill less

than 2 meters away from the existing pavement edge, this is obviously a challenge if upgradation is on the same side of the road stretch.There are also other examples of deep valleys, rivers etc.

Figure. 4 Natural Hill along the Road Stretch.

XIV. POLITICAL REASONS

Political reasons are obviously some of the reasons why road upgradation may have many challenges, if for instance a particular road stretch is due for upgradation due to increased traffic capacity which exceeds the holding capacity of such a road, policy makers may not consider adding such roads for national consideration due to political reasons, e.g If a road or highway is not located in a location where highly influential people emanate, it may not be considered or rather delayed for too long.

XV. RECOMMENDATIONS

From the above study, it is recommended that traffic studies should be done effectively and more lasting forecasting models be used in determining traffic volumes to avoid upgradation of highways within a short period of time.

Construction of highways should be taken seriously with good quality control measures, to avert partial or full upgradation and as well rehabilitationwithin a short period of time.

Contractors and politicians should be made to understand the importance of quality works and should not intrude and insist on profit at the detriment of the project and or the people and the environment.

It is recommended that in order to curb environmental degradation which emanate from infrastructural development, to provide aesthetically pleasing land scape of roadsides, to make provision for shade and pleasant drive to users of the road, to protect against erosion in deserted areas like Rajasthan were NH-12 upgradation is proposed, road arboriculture should be made a priority.

XVI. CONCLUSION

From the study, it is concluded that there are many factors which affects upgradation of existinghighways. It is important to create public awareness even to the uneducated populace about their rights and in compensation of

demolished structures, upgradation should as much as possible be done with minimum environmental degradation such as deforestation etc., laws should be enhanced to prosecute those involved in corrupt practices.

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TIZA MICHAEL TORY

ILAobtained B.Engr. (Civil Engineering) from Federal University of Agriculture Makurdi Nigeria,MBA (Construction Management) in India and Bachelor of Biblical Studies (BBS) from Canada, He is currently pursuing M. Tech (Transportation Engineering) from Career Point University Kota India. He has published many articles in accredited and recognised journals of national and international repute. He has presented his research in multiple International conferences.

ANAND KUMAR is a B. Tech student from Career Point University Kota, India.He has published in Journal of International repute and has presented in an International conference.

SHUBHAM KUMAR is a B. Tech student from Career Point University Kota, India.