DESIGN AND ENVIRONMENTAL IMPACTS OF KMP EXPRESSWAY: A REVIEW

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***Abstract*: The ultimate aim of this survey paper is to study and explore the design and Environmental impacts of KMP expressway. The objective of this study is to survey of all significant design and Environmental impacts arising from the construction and implementation of this project. The study seeks to establish present environmental conditions at the project site by available information supported by field studies and data available from secondary sources, wherever necessary; to predict the impacts on relevant environmental attributes due to the construction & operation of proposed project. It is essential therefore to recommend adequate mitigation measures for minimal impacts and to prepare an Environmental Impact Assessment (EIA) report including Environmental Management Plan (EMP) so as the construction works to be carried out in sound environmental standards.**

***Keywords*: Environmental impacts, KMP expressway, Environmental Management Plan, Environmental Impact Assessment.**

I. Introduction

Haryana is one of the partner states of National Capital Region. To gainfully exploit the potential of being in close proximity of the national capital and to meet the requirement of various land users for the developed land. Both inter and intra city traffic is increasing day by day as the state has developed some infrastructure in the NCR sub-region of Haryana. Moreover the connecting traffic from and to NH-1, NH-2, NH-8 and NH-10 is also increasing through Delhi.

The Hon'ble Supreme Court of India has ordered on 16.12.2001 and 15.07.2002 in writ petition (civil) 13029 of 1985 i.e. M. C. Mehta vs. Union of India that no heavy medium and light goods vehicle will ply on interstate route through Delhi. There can be no corridor or bypass joining different National Highways through Delhi. The corridor, if and when constructed will have to Bye pass Delhi. The Kundli-Manesar-Palwal Expressway in the state of Haryana has been conceived in the light of orders of Hon'ble Supreme Court of India [1].

In this context the Government of Haryana through Haryana State Industrial and Infrastructure Development Corporation (HSIIDC) has proposed to develop an expressway connecting above mentioned highways and bypassing Delhi [2].

The present document is an executive summary of the environmental impact assessment study of the project, which is a statutory requirement under the Pollution Control Laws of Uttar Pradesh Pollution Control Board for the project to be cleared.

Description of Environment

For rigorous impact evaluation it is important to evaluate specific requirements of ecological and human environmental constituents along the highway. Within the following paragraphs are listed the components of the system within which the information is gathered.

i) Climate

During the summer this area is very hot at around 113 ° F (45 ° C) and cool during winter. This country has a continental atmosphere. May and June are the coolest months, and December and January are the coldest. Total rainfall from July to September is 354,5 mm. The temperatures in the semi-arid are arid and semi-arid with annual rainfall of around 29 per cent.

ii) Ambient Air Quality

The pollutant levels at various monitoring stations are found to be lower than those recorded by CPCB, except for SO_2 which is more than recorded CPCB levels. The reason behind higher values of pollutants recorded from secondary source (HSPCB, Gurgaon) is that Gurgaon is a commercial and industrial city and pollution here is high.

But Primary data collected is a cumulative of various locations including habitations, roads, industrial etc, hence lower than data collected from secondary source.SO_2 levels at monitoring stations are higher than CPCB recorded values, but well within NAAQS. This is due to the vehicular movement on various National Highways from where (and from locations near it) the primary data was collected.

iii) Noise Quality

Throughout the background of the research, noise testing was performed at 5 sites protected by the environmental regulation of noise. For each position the noise rates were constantly tracked for 24 hours and the relative noise level was calculated daily. Station NQ3 (Commercial) was found to have recorded average equivalent day time noise levels and night time equivalent noise level was lower than the norms for commercial area. Station NQ5 (Residential) was found to have recorded average equivalent day time noise levels and night time equivalent noise levels was higher than the norms for residential area. This is due to traffic, ongoing commercialization and construction activities.

iv) Water Quality

Surface and ground water safety has been tracked at various sites as part of the EIA analysis.

v) Soils

In the EIA analysis soil was tracked in different places and the findings were evaluated, that the project route was typically placed on a standardized soil structure. The natural soil consists of sundry silt/ silty sand non-plastic (ML/SM) with minor intermediate zones of sandy clayey silty [6].

II. Review of Literature

A case study on the "Bridge Accident Review of Patna District" carried out by S K Singh and Ashish Mishra (2014) concluded that the pollution and avoidance of toad accident in the region was the key reason. R. K. Singh and SKSuman (2013) suggested the National Highway-77 Modell Accident Analysis and Forecast Test to recognize monthly and yearly variations of the accident rate, impact on the accident rate and to establish AADT model and road conditions. AADT models were created. On their calculation, the number of incidents with AADT has risen and better road quality has decreased [13]. This has been concluded.

P. For the major metropolitan cities of India, Pramada Valli (2014) developed road injury models. The report found that big strategies to reduce the rise of production cars and to enable citizens to take use of public transport needed to be changed to reduce the amount of injuries. The collected statistics from 178 countries of the global status study on road safety (2014) reveal that the amount of incident fatality in developing countries during the past decade has been substantially decreased. This was done by policy constructive steps and stringent law enforcement [14].

No reforms have been made in every country where the government is conscious of the issue. As contrast to other Asia, industrial growth takes place at a rather higher pace. That is why the accessible highways provide a wide number of cars. According to the 2003-2004 statistics, about 5,763 motor vehicles are accommodated in a surface area of 100 km2. However, at 31 March 2004, there were 25, 47,910 registered vehicles, currently about 28, 53,667 vehicles operated on highways in the country of Haryana. It suggests that a substantial proportion of traffic passes through the state of Haryana. This high traffic volume could lead to road accidents and lead to enormous economic and human resources losses if there are no adequate transport facilities [15].

According to statistical figures, about 10,000 automobiles in the different sections of the state were involved in road accidents in 2006-07. Unfortunately, there have been 4291 fatalities and 8471 casualties during this time as a result of traffic collisions. The study reveals that while simple road safety legislation exists in India, its implementation is incredibly slow. The amount of road deaths casualties in India is almost 8 percent each year and shows no signs of decline in wearing seat belts for automobile riders ranked 2 out of the 10. This resulted in the need for more robust road protection regulations in India thus improving enforcement [16].

India places 86 percent of the nations with just 7 percent of GDP invested by government on health care. It is therefore necessary to take initiatives by the government to improve the protection of Indian roads. Unfortunately, India has the lowest public safety record. The north portion of India is linked with Haryana State while NH-10 links Haryana State with the northern part of Rajasthan [17]. NH-1 is linked to NH-72 and NH -72.

The NH-2, NH-8 and NH-71 B National Highways link the study region with southern and central India. Today the NH-1 (Ambala Delhi), NH-2 (Palwal Delhi) and NH-8 (Behror Delhi) national highway have four lane carriages split, while NH-10 is partially four laned (Delhi Rohtak). Therefore, the Twolan highways are NH-71(SohnaPalwal-Rewari), NH-71A (Rohtak to Panipat), and NH-71B (Rewari). About 120 000 people die in road traffic collisions in India, while about 1300 000 suffer injuries per year. From 2010 to 2014 there has been a significant 6% spike from road accidents[18].

Public safety expert's note, though, the real figures may be larger, because often injuries are not recorded. According to the figures, every six minutes one death on the Indian road would rise, if the same conditions prevail, to one death per threesome minute by 2020. Even so, out of the approximately 1,4 million major road crashes in India annually, just 0,4 million are reported in the Study on Traffic Accidents (2014). There have been several traffic accidents in rural arc [19].

The Road Traffic Accidents (2014) research from the Traffic Education Institute in India has shown that the major risk factors for traffic accident fatality are speeding, combination of driving with alcohol, limited usage of helmets and seat belts and safety restraints. The 9th leading cause of death for traffic deaths in 2013. India constitutes nearly 10 percent of worldwide fatalities in traffic incidents. Although India represents just 1% of the registered motor vehicles, it represents 9% of accident fatalities. The estimated incident loss is about US$ 12.5 billion. It will not mention the economic strain on people who suffer significant injuries yearly with permanent injury. The demographic ranges aged 20-50 years represent 85 percent aged casualties of such deaths. Any of these people make their families bread[20].

M0RTH Study (2010-2015) has shown that, with respect to the accident rate per thousand cars, small states in India had a record of doubtfu1. In Arunachal Pradesh it was the strongest at 5.7% led by Sikkim at 3.6%. In contrast with all the Indians, there were about 21.5 "in Nagaland in 7 metropolitan areas, like Ahmedabad, Bangalore, Mumbai , Kolkata, Delhi , Hyderabad and Chennai in 1977, which dropped slightly by 5 percent to 16.9 percent in 2 city centres, compared with an overall national level of 28.4percent.

The National Crime Records Bureau data on accidental death and suicide in India indicate that in our world, 11 people die every hour due to injury and road incidents, with a plurality of unnatural reasons or deaths in the nation (37 percent). Mortality from traffic collisions and severe injury placed immense pressure on communities and community as a whole, the economic and social structure. Besides its loved ones, the family sacrifices its source of wealth. It is a difficult challenge and uncertainty to search for a new source of income. The wider spectrum of this includes kids who are required to quit school to work and elderly adults. Physical illness often has tremendous societal consequences. For starters, the damage to the neck forever discourages you from using the wheelchair for the remainder of your life. The family 's suffering is comparable, if not much greater, to that of the deadly wounded[22].

In the case of passenger traffic, Rohtak has more impact capacity. In a span of 50 km, the average number of journeys is reached. Roughly 19 percent of journeys are 150 to 200 km long. It has been found that More than 45% of the trips are job and industry focused, including two-wheelers, vans and vehicles. Recreational excursions are often very large and are performed in all forms of modes[23].

Hissar is the most important area in the case of freight traffic. Approximately 60% of cars are less than 200 km wide, which ensures they communicate locally. Approximately 90% of the trips span 500 kilometres. It demonstrates the effect on the corridor of certain areas of Haryana, the south of Punjab and northern Rajasthan. LCV operates in the areas mostly between Delhi-Hissar and Rohtak-Sirsa, which are quite awaited. The key goods on the corridor are nutritional grains and other everyday needs. This was also observed that about 29% of the vehicles was vacant[24].

Study of OD Matrices 2-aximity, 3-axle and multi-axle trucks showed that some 50% of trips taken by 2, 3, and multiaxle trucks are within 300 km and around 38% more than 800 km. 32% of trips were taken from Rajasthan , Gujarat, Madhya-Pradesh, Chattisgarh, Maharashtra, Goa, Andhra-Pradesh, Tamil Nadu and Karnhu. Approximately 86 per cent of LCV trips are 300 km away or less

52% of the other journeys were to Panipat, Sonipat, Rohtak, Chandigarh, Panchkula, Ambala, Yamunanagar, Kurukshetra and Karnal, Rajasthan, Gujarat , Madhya Pradesh, Chattisgarh, Maharashtra, Goa, Andhra Pradesh and to Keralah [25].

By general, cars are consuming fewer gasoline in the typical intersection by eliminating waits, thereby decreasing pollution around the intersection. Emission savings per car might not be very important, however, the overall savings may be substantial if they are multiplied to include all cars going through the intersection. Economic and social gains are often theoretically accomplished by rising disruptions and clearer traffic flows across the crossing[26].

With regard to road health, the Seagull model, namely the isolation of opposing vehicle line, gives one benefit to Tang & Levett (2009). Motors turning right from the T-crossing just have to concern themselves at any time with traffic from one direction. Consequently, it was also targeted at building seagull crossings, in particular right-angle accidents, to minimize such form of accidents [27].

Sandeep et al. (2012) observed that growing urban traffic demands contributed to numerous interventions being introduced to congestion management in traffic engineers, especially at marked intersections. Transport authorities used unorthodox approaches in various states where traditional steps were ineffective The world’s design was seen as an revolutionary solution to low-cost construction with the intent of reducing rivalry for longer, healthier times by halting at intersections with volumes which were substantially higher [28].

(2016) consider a run-off collision in Queensland, Australia to be one of the major forms of crashing. A possible danger to road users on both sides of the road is identified. The study says that a successful roadside architecture plays an important role in maintaining an atmosphere that is more tolerant, thereby reducing the risk and extent of road accidents. The Department of Transport and Main Roads, Queensland has established a software tool-Roadside Impact Severity Calculator (RISC)-to aid road engineering in roadside design; furthermore, RISC's applicability to establish a road safety maintenance plan will be evaluated by a better awareness of the interrelation of the severity index and road protection. The latest historical accident evidence shows that off-road

accidents and head-on incidents are responsible for much of Queensland 's major collisions. Risks both on the outside and medium sides are known as being a significant danger for vehicles who experience run-off accidents. The effective monitoring of roadside hazards is crucial to the the likelihood and/or seriousness of off-road crashes[29].

III. Conclusion and future work

This paper reviews of numerous analyzes and study papers have already been addressed, which inform us about the facts, methodology used and what work in that case can be further carried out. The necessity of this study arises from the fact that any project of this size should be examined at various stages to achieve the objective of safe operation of KMP expressway. It ensures safety for all vehicles passes through KMP Expressway and minimizes the risk and severity of accidents with minimal cost and environmental safety.

References

[1]. Athanasios Galanis, George Botzoris, Nikolaos Eliou, "Pedestrian road safety in relation to urban road type and traffic flow" , Transportation Research Procedia 24 (2017) 220–227.
[2]. Dinesh Mohan, Shrikant I. Bangadiwala, Andres Villaveces, "Urban street structure and traffic safety", JSR-01401
[3]. Francis John Gichaga, "The impact of road improvements on road safety and related characteristic", IATSS Research 41 (2017) 172-
[4]. Hitesh kumar, Mrs. Monika, "Research Paper on the Road Safety Audit and a Case Study on Kaithal, Kurukshetra Road Haryana, India", ISSN: 2455-6211, Volume 5, Issue 5, May- 2017, Impact Factor: 2.287
[5]. Lorenzo Domenichini, Valentina Branzi, Monica Meocci, "Virtual testing of speed reduction schemes on urban collector roads", Accident Analysis and Prevention 110 (2018) 38-51.
[6]. Luca Persia, Davide Shingo Usami, Flavia De Simone, Véronique Feypell De La Beaumelle , George Yannis, Klaus Machata, "Management of road infrastructure safety" - Transportation Research Procedia 14 (2016) 3436 – 3445.
[7]. Murat Gunduz, Bappy Ahsan, "Construction safety factors assessment through Frequency Adjusted Importance Index", IJIE 64 (2018) 155-162.
[8]. Rahul Goel, Parth Jain, Geetam Tiwari, "Correlates of fatality risk of vulnerable road users in Delhi", Accident Analysis and Prevention 111 (2018) 86-93.
[9]. Rahul Goel, "Modeling of road traffic fatalities in India", Accident Analysis and Prevention 112 (2018) 105-115.
[10]. Sanjay Kumar Singh, "Road Traffic Accidents in India: Issues and Challenges", Transportation Research Procedia 25 (2017) 4708–4719.
[11]. Malik H. (2014), Case Studies on Road Safety Audits of Transportation and Highway Administration, volume 9, issue10, 2014.
[12]. Road Safety Audit and Safety Impact Assessment – European Transportation Safety Council – Brussels, 2012.
[13]. Tang, J., Levett, S. (2010), Driver behaviour and crash profiles at Seagull T-junctions on high speed rural roads, Journal of the Australasian College of Road Safety, May 2010 Vol 21 No 2.
[14]. Feasibility report of Four Lanning of Gurugram Faridabad road and Ballabgarh Sohna Road with other connecting roads, 2017.
[15]. Sharma Abhinandan (2017), "Concession Agreement along with Schedules for the Project", volume 5, issue 7, 2017.
[16]. Accidents report of India 2018 by MORT&H Govt. of India.
[17]. Litsas (2002), "Safety Audit Policy and Procedures of New Traffic Signs", vol. 6, issue 8, 2002.
[18]. Sandeep et al. (2012), "Case report on road safety analysis on Indian Highways, Vol 41 No. 09, Aug, 2012.
[19]. Indian Highways Vol 42 No. 29 Sept, 2014
[20]. (Ram & Prakash, 2010), Performance analysis and identification of hazardous points on national Highways, Vol 4, issue 10 Oct, 2010.
[21]. S K Singh and Ashish Misra (2004), Road Accident Analysis: A case Study of Patna Cityî, Urban Transport Journal. 2. P Pramada VALLI (2004), ìRoad Accident Models for Large Metropolitan Cities of Indiaî, International Association of Traffic and Safety Science Research, Volume 29, No. 1, 2005.
[22]. Singh, R. K. and Suman, S. K., Accident Analysis and Prediction of Model on National Highways, International Journal of Advanced Technology in Civil Engineering, ISSN: 2231 ñ5721, Volume-1, Issue-2, 2012.
[23]. International Journal of Civil Engineering, Vol. 9, No. 1, March 2011
[24]. National Transportation, Planning and Research Centre (Kerala State Council for Science, Technology & Environment) – Safe Savari – Monthly Status Report – July & Aug, 2011.
[25]. Litsas, S., Rakha, H. (2013), Evaluation of Continuous Green T-Intersections on Isolated Under-Saturated Four-Lane Highways, Transportation Research Board 2013 Annual Meeting, 2013.
[26]. Mandeep Sindhu, Paramjeet Malik, "Research Paper on Risk Analysis of BOT Scheme", International Journal of All Research Education and Scientific Methods (IJARESM), ISSN: 2455-6211, Volume 4, Issue 7, July- 2016.
[27]. Mingardo, G. (2008), 'Effecten van Park en Ride in Rotterdam', EURICUR, Rotterdam.
[28]. Tumlin J., Millard-Ball A. (2004), "The Mythology of Parking", Line Magazine, Dec 2004.
[29]. Mandeep Sindhu, "Study of Waste Polythene in Road Construction and its Methodologies", IJRAR- International Journal of Research and Analytical Reviews, Volume 5 , Issue 2, April – June 2018, E ISSN 2348 –1269, P ISSN 2349-5138, 2018.