

EFFECTIVE IMPLEMENTATION OF THE ‘KATHMANDU - TERAI FAST TRACK’ ROAD PROJECT

Sachet Khatiwada*

Department of Civil Engineering (Graduated)
Pulchowk Campus (IOE), Tribhuvan University
Kathmandu, Nepal

*Corresponding Author: 071bce138@pcampus.edu.np

Rajan Aryal

Department of Civil Engineering (Graduated)
Pulchowk Campus (IOE), Tribhuvan University
Kathmandu, Nepal

Abstract—Amidst all odds, the construction of Kathmandu - Terai Fast Track is ongoing. However, considering our past failures in terms of maintaining road safety, raising awareness and thorough utilization of existing road infrastructures; we must be wary of repeating the same mistakes in the implementation phase of the fast track. Therefore, to optimize the advantages that can be attained from it, this paper aims to highlight the benefits of KTFT as well as point out some challenges that may occur in the operation phase. In addition to that, it also proposes some strategies that can be adopted to empower the expressway further.

Index Terms—Fast Track, Expressway, Transportation

I. INTRODUCTION

The Kathmandu - Terai Fast Track (KTFT) has been revered as the project of national pride and is considered a great addition to the strategic road network of Nepal. It has been a popular topic of discussion ever since the concept of such a road was first envisioned in 1991 [25], but the idea never really took form until 2013, when the track was opened by the Nepal Army [20]. After the track was opened, some international companies showed interest in the project. ADB's initial estimate showed 7000 vehicles would ply per day on that road. However, the survey only showed 3000 vehicles per day. As a result, the potential bidders abandoned the project. After a while, in 2015 an Indian firm: Infrastructure Leasing and Financial Services Limited decided to make the DPR for the project [28]. However, foreign involvement was heavily criticized by the public. Therefore, ultimately the project was handed over to Nepal Army in May 2017 [20]. Ever since then, the construction work has been going smoothly and is expected to meet the four-year deadline.

As the construction work progresses and ultimately nears completion, we are left to think about the benefits and utilization of said infrastructure. The fast track will connect Khokana (Lalitpur) to Nijgadh, traversing the hilly terrain with a short 72.5 km (proposed) corridor of four lanes. The road will follow a route from

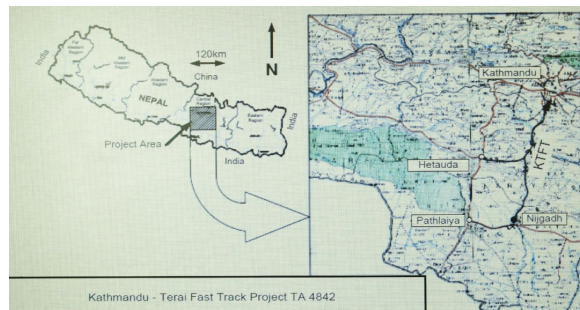


Fig. 1. KTFT road project (Source: EIA, 2014)

Khokana to south along the Bagmati river to Malta [1]. It will then approach Thingan and cross through a tunnel to run through the southern valleys that form the catchments of the Bakiya River, and then it'll reach Chhatiwan where it goes south to the East-West Highway near Nijgadh [1]. The road passes through human settlements, agricultural land, and forests with the help of multiple bridges and tunnels, thereby it is much shorter. This enhanced accessibility can be instrumental in to expedite the slow economic growth of the nation. Some major benefits are the faster transportation of people, goods and services among major cities of terai and the capital; better connectivity of the capital to the Indian border; reduction in the shipping costs of local as well as imported goods; possibility of a massive increase in small scale income-generating activities in the vicinity of the expressway. But reaping these benefits is not just dependent on the construction; it rather depends on how effectively we use the infrastructure and incorporate it to work in coordination with the existing network and modes.

II. NEED FOR THE EFFECTIVE IMPLEMENTATION

A. Better accessibility to Terai

Tribhuvan Highway, which connects Kathmandu to Birgunj, is 159.66 Km [22]. Whereas, KTFT which connects Kathmandu to Nijgadh is 72.6 Km (proposed) allowing for shorter travel distance and higher speeds,

resulting in the reduction of travel time from 5 hours to just above an hour. This facilitates access to facilities like education, health, jobs, new markets, etc.

TABLE I
JOURNEY FROM KATHMANDU TO NIJGADH

S.No.	Highways	Tribhuvan HW	KTFT
1.	Distance	135 km	72.5 km
2.	Time	6.5 hours	1 hour
3.	Fuel (Rs. 111/liter)	Rs. 1,500	Rs. 806

(Assuming a car with fuel economy of 10l/100 km)

In the fiscal year 2074/75 (2017/18) Nepal imported goods worth NRs. 1.2 trillion and exported goods worth NRs. 81 billion. Among those over 65% of imports came from India and over 56% of exports go to India [9]. Moreover, 40% of the total goods supplied to Kathmandu come from Birgunj dry port [5]. The KTFT could facilitate efficient transportation of those goods. Similarly, 11.8% of total imports and 27.93% of total exports are handled by the Tribhuvan International Airport (TIA) [9]. Connecting the TIA to KTFT would allow for transportation of the aerial imports to Nijgadh, Hetauda, Birgunj, and other cities in terai. Thus, proper implementation of KTFT allows for faster, cheaper and safer transportation of these goods to desired markets.

Similarly, local businesses can also benefit from the fast track. The cheaper transportation helps in reducing the shipping costs, which reduces the cost of goods at the consumers' end. Likewise, the enhanced connectivity can open new doors for local as well as international tourism. We can expect a surge in local tourism to and from terai since the journey that previously took many hours can now be undertaken in just a couple hours. Another one of the major benefits of the KTFT is to facilitate the Nijgadh International Airport (NIA), which is currently in the pipeline. Effective utilization of the fast track is crucial not only for the feasibility of NIA but also for its operation since it will have to connect the airport to the capital in a fast and efficient manner.

B. Economic growth

The construction of KTFT brings Terai and Kathmandu virtually closer. It can facilitate a travel time of about an hour between Kathmandu and Nijgadh, which unfortunately is the current time to travel between Bhaktapur and Kathmandu at peak hour, due to heavy traffic. Due to this, the daily fuel savings could potentially reach more than Nrs 5 billion [27]. To break it down, two-wheelers could save up to 730 KL of fuel each year; whereas cars and heavy vehicles could save 12,775 and 45,168 KL respectively [27]. Moreover, assuming a daily estimate of 5000 vehicles, this road could save about 27,000 hours per day. This increased proximity can have several positive implications.

Province no. 3 has about 68% of the total industries in the country [8]. These range from agriculture

and forestry-based to energy and production-based industries. The fast track can provide access to new markets and customers to these industries. The availability of a larger customer base can motivate local industries to increase trade, production and introduce new technologies leading to a wholesome economic development. This can also have consequences ranging from- companies setting up branches and expanding their businesses in terai; to even decentralization of some government offices beyond Kathmandu valley. Thus, proper management of the fast track can result in the dispersion of economic activities and may even result in the formation of new growth centers.

Similarly, KTFT can also benefit the tourism industry. In 2017, 17.1% of tourists visited from India, followed closely by 11.1% from China and 8.4% from the USA [8]. Currently, most of the tourists visit Nepal through the overcrowded TIA, which time and again suffers due to its small capacity resulting in flight delays and cancellations. However, the enhanced connectivity brought about by the presence of KTFT can provide a viable option to tourists that come to Nepal through the southern border. The Indian tourists, as well as tourists of other nationalities visiting through India, will have the option to travel by road and avoid the unprecedented delays at airports. Thus, the fast track can be a reliable alternative for tourists arriving from south of the border, which can consequently ease the traffic of TIA.

C. Overpopulation of Kathmandu Valley

A major concentration of reliable facilities like education, jobs, hospitals, businesses, airport, etc. has led to the flocking of people towards Kathmandu. As per the Census report of 2011, over 1.7 million people live in Kathmandu, and the population growth rate is 4.78% per year. This has led to a population density of 4,416 people per sq km. But in the city region, the population density is a whopping 16,216 people per sq km [12]; this has brought about a set of problems like unplanned urbanization, air and water pollution followed by health issues, reduction of arable land, etc.

In 2011, the total number of households in Kathmandu has almost doubled since 2001 to 436,344 [12]. This unregulated growth of population and housing has led to overcrowding of houses and disregard of housing regulations, which is detrimental in a seismically vulnerable zone like Kathmandu. On the other hand, the quality of air and water is rapidly degrading and people are prone to health problems like tuberculosis, bronchitis, pneumonia, anemia, cholera, hepatitis, gastroenteritis, typhoid, etc. [10]. Similarly, the haphazard growth of housing has resulted in encroachment of arable land, affecting the livelihood of farmers and increasing the dependence on imported agricultural products [11]. All these factors are slowly making Kathmandu unlivable. However, after the construction

of KTFT people can reach Kathmandu from terai within an hour. Since the travel time and distance will become less of an issue, people from farther away can easily enter Kathmandu to access its facilities, if need be, without having to settle there. In such a scenario the trend of urbanization can spread to the capital of Province No. 3: Hetauda, Birgunj, and Nijgadh [28]; therefore counterbalancing the excessive population growth in Kathmandu. Since these are bustling towns with a more favorable environment than Kathmandu, after the completion of fast track they can develop into organized residential as well as administrative zones that can support the economic center: Kathmandu. Thus, the overcrowding problem of Kathmandu can be eased by realizing the concept of a greater Kathmandu.

D. Safe operation of KTFT

Road safety has always been an issue in thriving cities, but the lack of success in dealing with those issues in Nepal is alarming. Most of the problems regarding road safety have been ascribed to the poor condition of roads and lack of effective road safety regulations. Moreover, weak governance has plagued the streets of Nepal since the authorities are unable to enforce new policies. And on top of that road user behavior is a major issue when it comes to accidents.

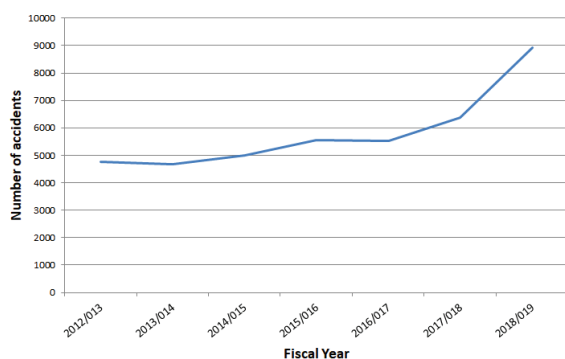


Fig. 2. Fiscal year vs. Number of accidents (Source: traffic.nepalpolice.gov.np)

In the last fiscal year (2018/19) there were a total of 8,918 road accidents with 254 fatalities in Kathmandu valley [24]. This may be an overwhelming figure, but the accidents in fiscal year 2019/20 are on track to beat even that number. In just the first month there have been 1,070 accidents with 16 fatalities [24]. Considering the already vulnerable scenario of Nepali Roads, the addition of another more advanced infrastructure can introduce some new challenges such as median crossing while changing lanes has been seen as a major cause of accidents in Chinese expressways [29]. Moreover, the high speeds can lead to inadequate safety distance between the vehicles, which often causes rear-end collisions. Excessive speeds at curves can also cause off-road accidents. Therefore, on top of already rampant problems, new issues will be added, and we must be able to ease people into the concept

of using an expressway to prevent them. Thus, the implementation process can focus on educating people; installation of traffic control devices like lights, signs, delineators; and formulation of safety regulations to ensure safe operation of the KTFT.

E. Construction cost

The KTFT project is one of the biggest road infrastructure projects in Nepal. The execution of this project has been estimated to cost around NRs. 175 billion [16]. Moreover, the Government of Nepal is self-funding the project and its execution is being handled in-house by the Nepal Army. All of these factors require this project to be successful and operate efficiently so that the anticipated benefits can be acquired. It is quite expensive compared to the estimated cost of similar projects like the Kathmandu - Kulekhani - Hetauda Tunnel Highway. However, this cost is somewhat justified as the KTFT not only provides fast and efficient transport with immense time and fuel savings, it is also perfectly situated to support the Nijgadh International Airport (NIA) and the proposed East-West Electric Railway. It has been expected to generate an Economic Internal Rate of Return (EIRR) of 31% [28]. Moreover, the success of this project could potentially pave the way for other revolutionary projects in the future. This is all the more reason to assimilate the infrastructure effectively in the existing transport ecosystem of Nepal.

III. CHALLENGES IN THE WAY

A. Inability of the governing bodies to act decisively

The people of Nepal have only just begun to experience a stable government, but all the speculations regarding how a stable government would be strong, calculated and decisive could not have been more wrong. Time and again we have implemented rules and regulations, only to bend over under pressure and scrap them altogether. This fickle nature has been a major problem when it comes to implementing road safety regulations.

This pattern of implementing underperforming policies and taking indecisive actions can be observed by taking past incidents as examples. First of all, on May 30, 2017, the Metropolitan Traffic Police Division (MTPD) implemented a jaywalking fine on the pedestrians and if they were unable to pay the fine then they had to attend a road safety class. This rule was met with public outrage since not all places had physical infrastructures for crossing [13]. Although not welcomed at first, a gradual effort to place zebra crossings at required locations had made this rule more acceptable to people. But, upon the request of the Home Minister, the provision was withdrawn within a couple of weeks [13]. Since then efforts to control jaywalking have seen limited success. Firstly, in this instance even though the rule was necessary, it was enforced prematurely without considering whether it

is practical or not. Consequently, the lack of zebra crossings and overhead bridges made it impossible for people to cross roads without violating the rules. However, just when the placement of crossing facilities was starting to make a good impact, this rule was scrapped, bringing us back to where we started.

A similar example of an underperforming rule can be seen in the case of the tripper truck restrictions. After causing a slew of accidents, a restriction was placed on the tripper trucks; they were allowed to ply only from 8 pm to 5 am. This practice seemed effective as the accidents significantly reduced. Since there was only a time restriction the over-speeding and reckless behavior was left unchecked which led to accidents, prompting the authorities to revise the restrictions and add a speed limit of 30 Km/h [14]. Thus, the indecisive nature of the governing bodies has significantly challenged the progress of road safety regulations in Nepal. Therefore, it has to be overcome to develop transportation in Nepal.

B. Road user behavior

Proper road user behavior is crucial when it comes to providing a safe and efficient mode of transportation. No matter how good the infrastructures or the safety measures are, in the absence of good road user behavior they cannot serve their purpose. In Nepal, it is one of the major causes of accidents. It may either be a reluctance to follow the rules or prioritizing their trips over safety, poor road user behavior is widespread in Nepal.

An analysis of the accidents occurred in Kathmandu - Bhaktapur section of Arniko Highway shows that careless road users and over speeding were the major causes of those accidents, amounting to 83% and 10% of the accidents respectively [6]. Another instance of poor road user behavior can be seen in the Koteswor - Kalanki ring road, where to control the surge of accidents a speed limit of 50 Km/h was set on the main lane and 20 Km/h on the service lane of the 10.5 Km stretch of road. After the implementation of the rule, more than 1000 cases of over speeding were apprehended in less than a month [15]. Although these are urban roads, the statistics reflect the general characteristics and behavioral patterns of prospective users of the KTFT.

This tendency is most rampant in motorcycle riders. They tend to take advantage of the mobility of their vehicles, often at the expense of personal safety and disregard of the regulations. As a result, from 2014 to 2015 a total of 1,971 victims of motorcycle/scooter accidents were reported in Kathmandu valley alone [7]. Thus, this disregard for rules and ignorance of general safety needs to be rectified to promote safe and efficient transportation on the KTFT and overall in the roads of Nepal.

C. Establishing smooth connectivity to the KTFT

After completion of the KTFT, the next challenge will be to ensure it is adequately supported by and connected to the neighboring highways and cities. In the absence of supporting roads, the fast track will just be a glorified husk of an expressway. The provision of two major connectors, to Pathliya and Hetauda, is being done along with the construction of the fast track. The expansion of the 18.3 km section of EastWest Highway from two to four lanes will be done to facilitate transportation from Nijgadh to Pathliya [1]. And a 17.6 km long spur road will be provided to connect the expressway to Hetauda [1]. Similarly, smooth connectivity to the airport also should be ensured, given that TIA is the only international airport in operation. Currently, the best route from TIA to the zero point of fast track at Khokana is TIA- Koteswor- Ekantakuna- Zero point. The current travel time along this route is 30 minutes. The road condition from TIA to Koteswor is good, but the section from Koteswor to Ekantakuna is a part of the expanded ring road which has had safety issues due to the lack of proper safety measures. Thus, this time of 30 minutes can be reduced by providing safety measures along the ring road and allowing for higher speeds. In addition to that, the section from Ekantakuna to the zero point has to be further improved and possibly expanded to accommodate the high inflow of traffic brought about by the KTFT.

D. Environmental impact

The construction of such a huge infrastructure is bound to have environmental challenges. The environmental impact assessment of the KTFT divides these effects into two categories- environmental effects during the construction phase and environmental effects in the operational phase [1].

Some major effects during the construction phase can be the pollution of air by dust particles due to the use of blasting, quarrying and other construction equipment. Moreover, movement of heavy vehicles during the construction can spread oil and chemical particle into the atmosphere, affecting the flora and fauna in the vicinity. Since a significant portion of the road passes through forest land, clearing of forests in such a huge quantity will expose the land leaving it vulnerable to erosion, and harming the rare, protected and endangered species. The road alignment also passes through the cultivated land, leaving a huge barren area. Surface water and groundwater bodies in the project area will get contaminated with various chemicals used in construction procedures [1].

In addition to that, in the operation phase, a whole new series of problems arise. The new road will bring a myriad of vehicles in the project area which will release vehicle exhaust in huge quantities, adding to the polluted air. Moreover, the new infrastructure is bound to cause the growth of the pre-existing human

settlements in its vicinity, which will lead to the exploitation of nearby forests and the pollution of nearby rivers. The ease of access due to the road may lead to encroachment of forest area and illegal poaching of wild animals and plants. Also, the expansion of the human settlement beyond the integrated settlement area will create new environmental problems and the destruction of arable land and forest [1].

IV. STRATEGIES

A. Emergency Information System (EIS)

The Department of Roads has currently provided the EIS service only in BP Highway (Sindhuli road). This service enables the user to access vital information regarding the condition of the road, in advance, via their smartphones or the web. Information on incidents like heavy rainfall, flood, landslides, and road accidents along the highway can be attained with the help of this service. In addition to that, this information is also made available to concerned offices of district administration and traffic police for carrying out immediate rescue operation and clearance of the traffic blockage [17]. Similar service can be installed in the KTFT to ensure optimal conditions of road operation and to prevent loss of life by accidents. Moreover, a Crash Investigation System (CIS) can be introduced in conjunction with the EIS. In the event of a crash, the CIS could investigate said crash by onsite inspection and interviews [23]. The data thus collected can be recorded and analyzed to identify existing safety issues and the effectiveness of the existing safety measures. Furthermore, it would enable us to identify emerging safety problems and act preemptively to handle them before it is too late.

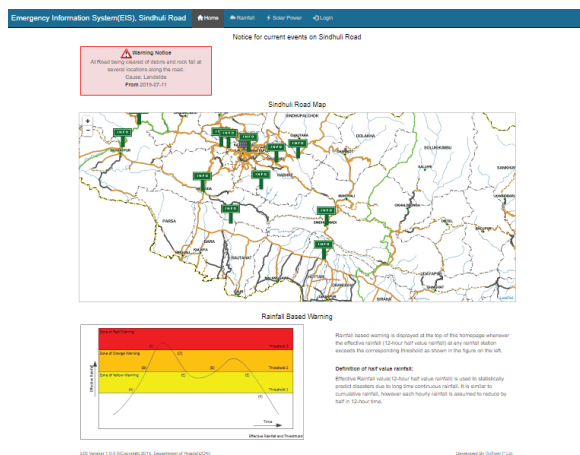


Fig. 3. EIS for Sindhuli Road (Source: eis.dor.gov.np)

B. Multimodal transportation system

The multimodal transportation system is a set of different modes of transport that travelers can use in different combinations according to their needs and preferences to reach their destination [30]. With the

completion of KTFT right around the corner and the ongoing construction of the East-West railway, we will soon have the major ingredients required to develop a multimodal transportation system in Nepal. Furthermore, the planned NIA and the anticipated development of inland waterways can help to build a more wholesome system. Different modes may offer different advantages when it comes to time, cost, environmental impact, safety, and convenience; but a multimodal transportation system can be used to incorporate the benefits of different modes while overcoming their shortcomings.

Nepal Intermodal Transportation Development Board (NITDB) has been established by the Government of Nepal to manage goods transport logistics for facilitating the domestic supply market and international trade [4]. It uses the concept of intermodal transportation to overcome transport logistic constraints. But this concept of using different modes can also be implemented with passenger transport. Instead of optimizing their modes, different operators can work together under a single multimodal operator to develop an integrated system that can optimize transportation as a whole. Major components in a multimodal network are the transfer points that connect modes forming a larger network and where the users can change modes [30]. Integrating different modes eliminates the need to wait and search for the next ride, personally transfer the luggage, and make payments at each prospective transfer point. In a theoretical system, a single multimodal ticket may be purchased via the multimodal operator, which would entitle the ticket holder to possibly a door to door trip with effortless transfers across modes without significant lag [3]. Such an integrated system would not only streamline freight transport; it would also help develop efficient and seamless passenger transport with minimum delay. In addition to that, the accessibility will further be enhanced which can have consequences ranging from a boom in local and international tourism to the burgeoning of new and existing industries.

C. Operation and maintenance

The past failures in the operation of new roads do not bode well for the government, as reflected in the case of Arniko Highway and the expanded ring road. Therefore, the attitude of 'let's make the rules as we go' should be avoided. So, the road safety regulations, traffic operations, and vehicular restrictions should be worked out before the highway becomes fully operational.

Considering how 5000 vehicles are supposed to traverse this road, a traffic operations unit has to be put in place. This unit would be responsible for overseeing safe and smooth traffic flow, management and optimization of the traffic control devices like the traffic lights, delineators, road signs, and so on. The

operations unit can also monitor, manage and document the live status of the road and provide real-time traffic information to people. Moreover, since this road allows for breakneck speeds, a minor inconvenience in the pavement can have ghastly consequences. Thus, maintenance works should be carried out to get the most out of this road. These works should range from regular inspection and tune-up which ensures the long life of the pavement, to prompt response in addressing the cracks or failures that appear gradually with time or as a result of crashes, debris fall, etc. In addition to that, a Structural Health Monitoring system can be put in place to constantly monitor the health of the pavement, bridges, and tunnels.

Furthermore, awareness programs should also be conducted beforehand. Since the expressway is a new concept for the people of Nepal, they should be informed about the new highway code of conduct and about how they should navigate the new road. In addition to that, the policymakers have also struggled with instating changes to the existing systems. They are often met with criticisms and protests. Thus, raising awareness about the necessity and effectiveness of an upcoming change can help calm down the storm. Moreover, it can also help identify the current requirements of people and draft a more thorough and need-based policy.

D. Land use regulation

Transportation and land use are both dynamic systems that influence each other and evolve continuously. To ensure food security, secured human settlement, ecological balance and sustainable development, the Government of Nepal adopted a National Land Use Policy in 2013 [2]; which was updated to 'Land Use Policy, 2015' after the 2015 earthquake. However, we are yet to see some solid results of its execution.

At present, the vicinity of the KTFT is surrounded by residential, agricultural and forest land zones. Therefore, forests near the settlements become vulnerable to illegal felling of trees, hunting, and poaching of wildlife, and haphazard appropriation of rare and endangered species; they should be zoned adequately and use of their resources be regulated as per the Land Use Policy (2015). Furthermore, as per the policy, the strategized protection and optimum use of natural, historical, cultural and religious zones should be enforced unequivocally. And the affected forests should be afforested and protected. The emerging residential, commercial and industrial zones should be monitored carefully, to keep the settlement hygienic, well-facilitated and to ensure that the industrial effluents are properly addressed. Keeping the interaction between transportation and land use in mind, the land developers and landowners should be motivated to work for the common goal of promoting healthy urban settlement. We have already seen the consequences of unplanned urbanization in Kathmandu. Therefore,

new policies should be implemented, granting firm control over land ownership, land acquisition, land fragmentation, and land use in the new residential as well as agricultural zones.

V. OTHER POSSIBILITIES

The KTFT undoubtedly is a great infrastructure, which will revolutionize the economic, political and social landscapes of Nepal. It also bridges the technological gap between existing and future infrastructures. Moreover, it will be the foundation for the development of multimodal transportation in Nepal and be instrumental in bringing all the envisioned infrastructures together.

While the Nepal Army is toiling to complete this project, another road connecting Hetauda to Kathmandu is in the works. The Kanti Lok Path is a feeder road being renovated and is expected to enter the operational phase by October 2019; before the KTFT [18]. This 92 Km road is being widened up to 8.5 m, so that it may facilitate smoother and faster transportation of goods and services [18]. Although it is a significant improvement from any of the previous highways for the same route, after the fast track comes in operation it may become obsolete unless we are efficient in our planning and management. Its significance can be revitalized by shifting the function to that of support. We can use this road as an option to the expressway in special scenarios. First of all, it can act as a makeshift valve to prevent the overflow of traffic in the KTFT. Whenever the vehicles are flowing at capacity in the expressway, a further entry can be diverted to this corridor. Moreover, it is no surprise that Kathmandu is vulnerable to seismic threats, and the overpopulation with unplanned urbanization doesn't help either. In the event of an earthquake, when support becomes a priority: the KTFT can be used exclusively to provide food, water, and medical supplies, whereas the Kanti Lok path can be used for evacuation. Of course, the temporary shift in roles can be reverted once the tension normalizes. Similarly, this adaptive strategy can also be utilized during political emergencies, tactical maneuvers, social and cultural events, and so on that cause massive flow in one direction.



Fig. 4. EWER network with supporting links (Source: ktm2day.com)

In addition to that, the East-West Electric Railway (EWER) is also under construction. This 945 Km railroad runs across the country from Mechi (East) to Mahakali (West). It has been divided into nine central railway sections with additional links connecting to Indian borders and major cities like Kathmandu, Pokhara, and Birgunj. The central rail with its entire supporting links will add up to 1,376 Km [19]. One of the major links of concern here is the Kathmandu-Birjung railway link, which has been aligned to pass through Nijgadh. Furthermore, the Bardibas- Simara section of the central railway also passes through Nijgadh. These alignments place the railway links to adequately support and supplement the KTFT and the proposed NIA. Therefore, Nijgadh is going to be the most accessible city in Nepal, which will bring about a gradual shift in consensus regarding its residential desirability. Consequently, it will be in a position to become an economic and cultural melting pot, not unlike the current Kathmandu and Pokhara. Thus, it will further empower the concept of greater Kathmandu. This long term plan formulated to connect major commercial and industrial centers across the country to the southern border and the capital has been aimed at strengthening the economic development of the nation, and lead to emerging growth centers all over the country [19].

VI. CONCLUSION

The Kathmandu Terai Fast Track is undoubtedly a game-changer for the transport sector and economic prosperity of Nepal. Moreover, with proper implementation strategies, it can help solve the problem of unplanned urbanization in the Kathmandu valley. However, this task is not without obstacles. The mass clearing of forests and laying of an expressway through agricultural land is a huge blow to the environment as well as the forest ecosystem. Similarly, overcoming the history of lax management and formulation of ineffective policies is an uphill battle, nevertheless, it is surmountable. Now moving ahead, we should be mindful of the impacts the expressway and the vehicles plying on it have on nature and its inhabitants. So, a foolproof operation and management strategy should be implemented in conjunction with raising awareness and strict land-use regulation. In addition to that, further research should be done on the Emergency Information System and newer technology should be used to improve its efficacy. Also, with the emergence of railways and the ongoing study regarding the possibility of waterways, we should make efforts to develop a multimodal transport initiative. This will allow for a much more coherent and serviceable system.

All things considered, the Kathmandu - Terai Fast Track promises a socio-economic revolution in Nepal. And this dream is achievable as long as we can evolve with it and incorporate innovative strategies and new technology in our transportation systems.

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