

An Analytical Study of Types, Importance and Concerns of Highways in India

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Abstract – Roads are an integral part of the transport system. A country's road network should be efficient in order to maximize economic and social benefits. Highways are major roads and quicker routes which originally built to connect cities and towns. They play a significant role in achieving national development and contributing to the overall performance and social functioning of the community. Civil engineering plans, design and built highways in a country. Modern techniques have been brought into the field of highway construction. Highways in today's era are famous for their capacity, efficiency and durability. They have unique importance in the development of a country. They are directly connected with the economic condition of a nation. The development and betterment in roads and highways brings the development of the concerned country. Highways are of different kinds and can be classified on various grounds. In India, Highway construction faces some problems and concerns. The present research paper is an attempt to study the Types, Importance and Concerns of Highways in India.

Keywords: Highway, Engineering, Types, Importance and Concerns of Highways.

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INTRODUCTION

Highway is considered as an important mode of transportation. Highway engineering is one of the branches of civil engineering. It deals with the process of design, construction and maintenance of different types of roads in India. Highway construction and engineering includes planning, designing, and building of highways. History stands witness that good roads lead to prosperity for distant societies. If a road is well planned and then executed according to the plan, a highway can open the gates of growth and development. Highways connect two or more places and ensure that industries, employment, and development follow. Bridges, traffic lights, pavements, bike paths, and lane dividers make up a safe highway. Modern highways are known for their high capacity, efficiency, and planned construction. Highway networks are very important for the growth of a region. Highways open new trade routes and almost every industrial region in the world is connected to the major highway network system of that particular country.

Apart from the design, construction and maintenance of different types of roads, civil engineering also includes the study of the following topics related to highways:

- A. Development, planning and locations of roads;
- B. Materials required for their construction

- C. Highway traffic performance and its' control
- D. Drainage of roads etc.

Classification of roads: Roads are classified into different categories as under:-

- 1. According to location
- 2. According to importance
- 3. According to traffic
- 4. According to tonnage

Classification of roads according to location: According to location and financial responsibility, non-urban roads in India are classified into the following five categories:-

- 1. National Highways (NH)
- 2. State Highways (SH)
- 3. Major District Roads (MDR's)
- 4. Other District Roads (ODR's)
- 5. Village Roads (VR's)

This classification of roads was done as per recommendations made in the Nagpur plan finalized the Indian Roads Congress in 1943. This classification is, therefore, popularly known as IRC classification of road.

The different categories of roads according to this classification are discussed below:-

- A. National highways:** The main highways running through the length and breadth of the country connecting major parts, foreign highways and capitals of states etc. are known as National Highways (NH's). These highways constitute the main arteries of transport in the country and are also of military importance. National highways should have the carriageway of atleast two lane widths. They should have the modern type of surfacing. The responsibility of construction and maintenance of these roads lies with the central government.
- B. State highways:** The highways linking the district headquarters and important cities within the state or connecting them with National highways or with highways of the neighboring states are known as state highways (SH's). These highways are also called provincial highways. These highways serve as arterial routes of traffic to and from district roads within the state. State highways should preferably be of two lane width. They should also have a modern type of surfacing. The responsibility of construction and maintenance of these road lies with state governments. However, the central government gives grant for the development of these roads.
- C. Major district roads:** The important roads within a district serving areas of production and markets and connecting these places with each other or with the main highways are known as Major District Roads(MDR's).
- D. Other District Roads:** The roads serving rural areas of production and providing them with outlet to market centers, Tehsil headquarters, block development headquarters, railway stations etc. are known as Other District Roads (ODR's).
- E. Village Roads:** The roads connecting villages or group of villages with each other or with the nearest road of higher category are known as Village roads.

Importance of Highway transportation: Highway transportation is the means of detail distribution between homes, shops, factories etc. It is only the roads which can carry goods from and to aero drams,

harbours and railway stations. Considering the utility of roads anywhere in the different parts of a country; they can be rightly compared to arterials in a human body. Just as arteries maintain man's health by providing circulation of blood; similarly Roads promote nation's wealth by keeping it's people and goods moving. Thus, we see that progress and well-being of a nation depends much on roads. In fact, roads are the life lines of nation's economy. The importance or necessity of highway transportation can be easily judged from the following purposes or advantages of roads:-

1. They facilitate, conveyance of people, goods, raw-materials, manufactured articles etc. speedily and easily in the different parts of a country.
2. They act as the only source of communication in regions of high altitudes i.e. in mountainous regions.
3. They help in growth of trade and other economical activities in and outside the villagers and towns by establishing contact between towns and villages.
4. They help in providing efficient distribution of agricultural products and natural resources all over the country.
5. They help in price stabilization of commodities due to mobility of products all over the country.
6. They help in cultural and social advancement of people and making the villagers active and alert members of the community.
7. They help in promoting the cultural and social ties among people living in different part of a country and thus strengthen the rational unity.
8. They help in providing improved medical facilities quickly to human beings, especially to those who live in rural areas.
9. They provide more employment opportunities.
10. They enhance land value and thus bring better revenue.
11. They serve as feeders for airway, waterways and railways.
12. They help in reducing distress among the people, caused due to famine, by supplying them food and clothing quickly.
13. They help in maintaining better law and order in a country.

14. They play a very important role in the defense of a country during war days.

Lastly, it can be said that roads are the symbol of a country's progress and thus development made by any country can be judged by the quality and network of its road system.

CONCERNS OF HIGHWAYS IN INDIA:

Every road or highway should be constructed in a way that guarantees and ensures comfortable, convenient and most importantly, safe transportation of people and various kinds of goods and materials. There are many concerns, problems and challenges which a developing country like India can face. India is a sub-continent as it has various geographical diversities which create hindrances and problems in highways construction. There are also other factors also which may arise these sorts of concerns. Some of them are discussed as under:

1. **Lack of proper maintenance:** Indian roads are lacking appropriate and timely maintenance mainly because of inadequate fund. There has always been a shortage of fund from what is required. On an average, the shortfall is in the order of 40% for National Highways measured over a period from 1980 to 2000. According to a study of world bank it has been confirmed that loss due to inadequate capacity, insufficient pavement thickness and poorly maintained road is in the tune of 3 lakh crore rupees per annum. The losses are in terms of excess fuel consumption and vehicle maintenance cost. Losses due to time, health and life have not been considered.
2. **Overloading:** Due to poor enforcement in most of the states, overloading has almost become a right. According to a recent survey made by CRRI, the Vehicle Damage Factor (An average of factors by which the vehicles are weighed more than legal axle load) in a NH was found to be as high as 23. Due to overloading, road is getting damaged in the fourth power order. If a vehicle is overloaded by two times, it is causing two to the power four- sixteen times damage to the road. For higher axle vehicles, the tendency of overloading is less.
3. **Encroachment and Unplanned Ribbon Development:** Again, it is the problem due to poor enforcement. Specially, SH, MDR, ODR and VRs in some of the states in India are badly suffering from this problem. It is mainly

causing obstruction to road drainage, free sight distance, road safety etc.

4. **Road Safety:** The World Health Organization Compilation of road network safety data for major economies found India to have the highest number of road fatalities in the world with 1,05,000 road accidents caused deaths in 2006. Over 2004-2007, India had a road fatality rate of 132 death per million citizen compared to 131 deaths per million citizen in USA. Non-fatal road accident rates reported on Indian roads was 429 accidents per million citizen compared to 412 in China and 1101 in USA. The report also notes that not all road accidents in India are reported and recorded.
5. **Density per Capita:** India with around 21 lakh kms of paved road by 2011, averages about 1.75 kms of paved roads per 1000 people and ranked 36th position. USA tops the list with 21.1 kms per 1000 people. On the contrary India ranked 2nd in number of mobile phone users, 4th in number of internet users, 9th in GDP, 7th in motor-vehicle production.
6. **Pollution:** According to a study, more than 70% of the sources of the polluting agents in the air of metro cities in India are coming from transport sector. Lower road density contributes to congestion which not only reduces average speed of the vehicles but also contributes to lower fuel efficiency of motor vehicles and more fuel consumption of operating in lower speed. This is causing more pollutants like hydrocarbons, NOx, SOx, Methane, CO, CO₂ from motor vehicles to come out – all of which cause health problems, adverse climatic effects.

CONCLUSION

Highways are considered as the quickest routes and major and wide type of roads. Highways planning, construction, classification and maintenance are the subject matter of civil engineering. Highways are of different kinds. Different countries define them in their own grounds, yet there are some common platforms of their classification. In India, Highways construction has been prevailing in closing decades of 20th century and opening decades of 21st century. High construction has some hindrances and concerns in India which should be removed. In recent periods, new trends in highway construction are emerging out and India should adopt these innovations for more advancement and development.

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