

IMPORTANCE OF HIGHWAY ENGINEERING IN RELATION TO SOCIO-ECONOMIC DEVELOPMENT OF A COUNTRY.

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. Highway engineering is a sub of transportation engineering but in actual fact, they are both interwoven and dependent on each other as other modes of transportation such as airways, seaways and railways are reliant on highway engineering. Take for example the rail has over 90% of its tracks built on land and often times crosses the highway, go along the highway and sometimes pass under the highway (tunnel). Likewise is the airplanes use up most of their travel time in the air but they still have to take off and land on taxi-ways (highways) at the airports. The design, geometry and maintenance of such ways are done by the highway engineer.

Highway and Transport facilities are an important part of urban infrastructure. Their quality and functionality have a crucial impact on the daily life of every person and on the whole society. It is important to know that highway engineering combines different knowledge such as geotechnics, urban planning, traffic engineering and economics. The highway infrastructure stages are planning, construction, management and maintenance. All the stages have to consider security, sustainable development and cost efficiency. In addition, infrastructures must be friendly with the landscape and should be comfortable to the user.

Tapping natural resources, markets and maintaining a competitive edge over other regions in a nation are closely linked to the quality of highway system. The speed, cost and capacity of highway system have significant impact on the economic vitality of an area and the ability to make maximum use of its natural resources. An examination of most developed and industrialized societies indicate that they are noted for their high quality transportation services (highways included). Nations with well-developed maritime systems (such as the British Empire in the 1900s) once ruled vast colonies around the globe. In modern times, countries with advanced transportation systems, such as the United States, Canada, Japan and those in the Western Europe, are the leaders in industry and commerce. Without the ability to transport

manufactured goods, raw material, and technical know-how, a country is simply unable to maximize the comparative advantage it may have in the form of natural or human resources. A country such as Japan, for example, with little in the way of natural resources, relies heavily on transportation in order to import raw materials and to export manufactured products. Most imported and exported material pass through the highway, therefore, the quality, level of service and the capacity of the highway has a major influence on the income generated by a nation.

Take as an example, Nigeria is a country with many natural resources such as tin and columbite located in Jos, bitumen located in agbabu, Ondo State, crude oil in south, marble, timber, limestone, coal, cotton, etc and cash crops such as oil palm in south/ west, cocoa, etc located in different geographical locations with hundreds of kilometers to factories, seaport, rail terminals, airports and markets, one would see the need for a good highway system considering the fact that Nigeria is not an island where water ways might be very efficient but with just about nine states sharing the coast with only about two states having their coast developed for import and export.

Good highway mechanics, in and of itself, will not assure success in the market place because there are other factors that can as well bring success such as demand and supply; however, the absence of excellent transportation services such as a good highway will contribute to its failure. Thus if a society wishes to develop and grow, it must have a strong internal transportation system (highway inclusive) as well as excellent linkages to other regions around it and the rest of the world. No doubt the western European countries have excellent highway system linking from one country to another and the capacity is adequate.

Transportation is a derived demand, created by the needs and desires of people to move themselves and or their goods from one place to another. It is a necessary condition for human interaction and economic survival.

The availability of high quality highway systems can strongly influence the growth and development of a nation. Good transportation permits the specialization of industry or commerce, reduces cost for raw materials or manufactured goods, and increases competition

between regions, resulting in lower costs and greater choice for the consumer. Good quality highway is also a necessary element of government services such as delivering mails, defending a nation and retaining control of its territories. Throughout history, transportation systems such as those that existed during the Roman Empire and those that exist now in the US, were developed and built to ensure easy mobilization of armies in the event of a national emergency.

The improvement of a region's economic position by virtue of improved highway does not come without costs. Building vast highway systems requires capital, enormous resources of energy, material and land. In major cities, transportation can consume as much as half of all the land area. An aerial view of any major metropolis will reveal vast acreage used for railway terminal, airport terminals, parking lots and freeways.

Transportation and highway has other negative effects as well. Travel is not without danger; every mode of transportation brings to mind some major disaster, be it air which is infrequent but dramatic (Dana, Bellview, Sosoliso, Zeppelin Hindenberg, 9/11) or water (Titanic, Costa Concordia), rail (Brétigny-sur-Orge, France; Santiago de Compostela derailment, Spain) and of course highway fatalities that each year claim about 40,000 lives (in US). In addition highway creates noise, spoils the natural beauty of an area, changes the environment, pollutes air and water and consumes energy resources.

The society has indicated a willingness to accept some risks and some change of the natural environment to gain the benefits of efficient highway and/or transport systems and a major task for the modern transport engineer is to balance the society's needs for fast and efficient transportation with the costs involved so that the most efficient and cost effective system is created. In carrying out this task, the transportation engineer must work closely with the public and elected officials and must be aware of the modern engineering practices to ensure that the highest quality transportation systems are built consistent with the available funds and accepted social policy.

Society also values many social benefits of transportation. Bringing medical and other services to rural areas and enabling people to socialize who live some distance apart are only a few of the benefits that highway provides.

In Nigeria and some other countries like the US, almost 100 percent of the energy used to drive transportation on highways come petroleum resources. This shows that the transport sector uses a lot of crude oil a nation produces. Taking Nigeria as an example, 90% of Nigeria's income is being generated from crude oil or as the case may be petroleum. The largest share of this is being utilized for transportation and highway takes the largest share. The rail mostly utilizes coal, and the rail network presently functioning can be counted. Water transport is so unpopular within the country; therefore their petroleum utility is low. The air transport expends a lot but it still cannot compare with the highway, which over 90% of Nigerians are subscribed to. It therefore shows that the highway is very important in terms of revenue generation and income for the government. Also, it reveals that the highway system should be the most important mode of transportation in Nigeria and therefore concentration of government to this mode of transportation should be more than any other.

A good way of income for government is to place a toll on some of the highways. Tolling stations are very necessary now because the amount of money being budgeted for maintenance of these highways constantly reduce every year in comparison to the number of highways that are either being built, maintained or reconstructed. Tolling will help government get something back for smooth operation of these highways.

In the US, transportation industries employ over 10% of the work force in jobs as diverse as those of gas station attendants, airline pilots, truck drivers, highway construction workers, barge operators, pipeline welders, railroad train workers, bus drivers, and highway patrol officers.

Penultimately, a good highway system must take into consideration aesthetics. Even though it is not the most important component to be considered when a highway is to be constructed, it is not by far the least. A highway is an aesthetic object with its own characteristics; straights, curves, cambers, rises and falls, intersections, green zones, traffic control mechanism, together with its associated structures- bridges, tunnels, road barriers, embankments, traffic roundabouts and lampposts. Related to this is its environment; villages, towns, farms, forests

and lake views. A good highway system must be safe, economical and be appealing to the users.

A road by itself, without traffic, is like a city without residents. Travelling on the road, keeping on the road is considered as a public and social event. (Popoola O.O, 2013)

Lastly, it should be noted that highway engineering is a branch of civil engineering that involves the planning, design, construction, operation, and maintenance of roads, bridges, and tunnels to ensure safe and effective transportation of people goods and services.

Consequently, highway engineers must be mindful of future traffic flows, design of highway intersections and interchanges, geometric alignment and design, highway pavement materials and design, structural design of pavement thickness, and pavement maintenance at a reasonable cost (economy) and also putting safety and aesthetic value into consideration.

Assignment 2

1. In not more than four pages (1500 words) discuss about the dependence of other modes of transportation on the highway transport system.
2. Prepare a slide (15-20) showing the importance of highway engineering in relation to socio-economic development of a country (slide must contain diagrams, illustrations, bullet point detailing and must be brief) use power point or prezi
3. Travelling on the highway is not without danger. Discuss in not more than 1500 words
4. To illustrate the importance of highway engineering, discuss its versatility

Submission:

Deadline for submission 10.00 am, 19th September 2018.

Soft and hard copies to be submitted. Soft copy to be submitted to: vicfema2k5@yahoo.com.

Typed, double spaced, fonts size 12, Times New Roman.

Tables, graphs, diagrams, references included.

Marks would be awarded according to content, organization, logical reasoning and referencing.

** Harvard referencing style should be adopted.

** Failure to submit either the soft or hard copies before deadline attract zero marks.

** No submission at all attracts zero mark and you shall not be allowed in for subsequent classes.

** Answer any of Question 1, 3 or 4 plus Question 2 [there would be groups]