

Network Analysis in GIS: A Tool for Transportation and Utility Management – A Case Study of Nigerian Transportation and Utility Management

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Key words:

ABSTRACT

Over the past several years, Nigeria as a developing country has witnessed a lot of infrastructural developments. Several roads have been constructed, telephone lines and water pipelines laid, schools built, and so on from which many individuals and corporate organizations are making their living. The structures provide services which social or economic and many individuals and organizations depend on for their livelihood.

Nevertheless, these essential items of socio-economic development are often not managed effectively if at all. Putting structures in place is a good thing but the full benefit is only realized when such structures are managed in a way that the beneficiaries can use them painlessly. For example, in an organized society, users of public transport system often know at what time they are likely to find a bus at a particular bus stop. This is because routing information is provided for the use of such infrastructure.

In Nigeria, commuters and transport operators go through rigour in finding their ways to their destination even if they have to pass through longer routes. A single telephone line serving an area may be allocated to two people because of lack of adequate information on the nearest service wire that will serve a new customer. The shortest route to the nearest fire station cannot be determined because of lack of tool that will extract such information and present it when needed.

Practically, these infrastructures have a common feature i.e. they are linear in nature. Pathfinding and allocation procedures built into a GIS can be used to create highly realistic models of flow through these networks. Linear networks representing roads (or streets), telephone lines, waterways, and other related phenomena could be analyzed in a GIS environment from a single data model.

This paper considers the technicalities of the creation of a GIS environment for interactive graphical pathfinding and allocation procedures that can produce models easy to interpret and for an efficient management of the transportation industry and utilities in Nigeria.

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