

## **ABSTRACT**

Designing an efficient Fiber to the Home (FTTH) network requires the integration of geographic and technical data to produce an optimal design. This research uses QGIS (Quantum Geographic Information System) to design and manage FTTH networks in certain areas. QGIS, as an open-source GIS software, enables the collection, analysis, and visualization of relevant spatial data, including topographic maps, land use, and existing infrastructure. This study involves steps ranging from data collection and cleaning, workflow design, to simulation and evaluation of network designs. Simulation results show that QGIS can design efficient fiber optic cable routes by minimizing costs and interference, as well as prioritizing areas with high demand. Spatial analysis in QGIS helps identify optimal locations for infrastructure placement and considers various factors such as population density, topography, and accessibility. Additionally, QGIS enables real-time monitoring and management of FTTH networks, improving operational efficiency and response to disruptions.

FTTH infrastructure development recommendations involve using QGIS to plan routes that avoid difficult terrain, utilize existing infrastructure, and design networks that are scalable and resilient to environmental risks. With this approach, QGIS supports better planning, efficient management, and sustainable development of FTTH networks in the future.

Keywords: QGIS, Fiber to the Home (FTTH), Spatial analysis