The importance of performance evaluation of mobile networks is inspired by the need to utilize the limited radio resource in the most efficient manner. This study forms a basis for the regular inspection and optimization of mobile networks in the University of Ilorin, as well as creates a guide for path loss modeling suitable for the campus terrain. The authors in [19], conducted a pilot study to benchmark and evaluate the QoS experienced by mobile wireless users in Pakistan by deploying an android application (My Speed Test PK) for mobile customers to measure the performance of the five broadband operators (Ufone, Telenor, Zong, Warid, and Mobilink) in Pakistan. While the operators focus on metrics like the bit error rate (BER), frame erasure rate (FER), and mean opinion score (MOS), the Nigerian Communications Commission (NCC) has identified some measurable key performance indicators (KPIs) to evaluate the success of network operators in Nigeria vis-a-vis subscribers' perception. As a national regulatory body vested to establish minimum QoS standards in service delivery for mobile network operators (MNOs) and internet service providers (ISPs), the NCC requires that each network provider reports quarterly, on customer satisfaction in (rural, urban and suburban) Nigeria [13]. Results from the study emphasized the need for optimal coverage on all the mobile networks, as well as to have the radio frequency (RF) air interface parameters configured to avoid problems of ping-pong handovers, and poor power control, which causes interference and low RSSI among mobile stations (MSs). A related study in [5] employed the drive test method with statistical analysis models (chi-square and Fisher's tests) for the performance benchmarking of GSM and Universal Mobile Telecommunications System (UMTS) network operators in Ankara, Turkey. The continuous increase in demand, for high-quality service, coupled with the future telecommunication network target of providing integrated services with multimedia applications, over low-powered mobile computing devices, has further increased the need for evaluating the performance of mobile networks [1 – 4]. This justifies previous statistics by the NCC in May 2016 to April 2017, that amongst the four major MNOs, only one performed outstandingly (satisfying the minimum requirement and beyond) in network accessibility, while one of the MNOs performed poorly in network retainability [14]. From the drive test analysis, the problem identified across the three GSM clusters were – reduced power output, poor transmission line, increased interference, coverage hole, cross feeder, overshooting, amongst others. However, from technical and regulatory perspectives, network performance evaluation is necessary for assessing and measuring the coverage, capacity, and quality of mobile networks with respect to the service level agreement (SLA) signed with the regulators. While past studies have critically evaluated the performance of GSM and WCDMA/UMTS networks from customers' viewpoint, the study in [25] demystifies the root cause of poor network signal strength and its impact on the QoS provisioning by MNOs. In a populated urban area with a literate population such as the University of Ilorin, radio resource availability and reliability is a factor that determines the success of mobile communication. This incessant complaint which has made many staff and students, each, to subscribe to more than one network operators' service, is an indicator of poor QoS in the University of Ilorin, and by extension most urban centers in Nigeria. The analysis of the performance obtained by mobile wirel meticulous measurement for the mobile network operators (EE, O2, Vodafone, and Three) in the United Kingdom [23]. It has, increasingly, become evident and pronounced that the Nigerian telecommunication sector has been plagued with problems, causing

.frustration among consumers