

# Quality of Service in WiMAX: Real World Aspects of Social & Environmental influences on Mobility

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## ABSTRACT

In today's technological world, users of mobile wireless devices are predominantly on the move while still enjoying connectivity of the Internet. How people use their mobile devices differ in many ways, not only from a technological point of view e.g. browsing the web, sending emails, SMS, downloading music/apps, or keeping up with friends on facebook, etc. But also from a geographical point of view, the user's physical location, whether this is seated stationary in a park or shopping centre, where the user may only change location if the connection is poor, or actively mobile while interacting via the Internet, e.g. walking to work/college, while using VoIP/Skype or streaming media clips. Theoretically modelled nodes have an uninterrupted straight path to their next destination in simulations, whereas in the real world this is extremely unlikely to be true with the average human meandering down the street, while concentrating on their mobile device. It is important to determine through simulating the proposed QoS protocols with WiMAX connectivity, whether the perceived improvement will actually function under the planned usage, consequently it is therefore vital to replicate the reality of user behaviour. This work investigates a variety of mobility models including Transportation Theory, Random Walk, and Gauss Markov models, and how it affects connectivity within WiMAX. Each model has been simulated using NS3 and compared to ascertain the most effective method to replicate typical user movement to ensure that today's Mobile Ad hoc Networks (MANET) have been designed with the mobile user in mind.

**Keywords:** Quality of Service, QoS, WiMAX, streamed media, Mobility Models, Transportation Theory, Random Walk, Browian model, Guass Markov