A quantum mechanical (QM) simulator was used to determine the amount of carrier wavefunction penetration into gate dielectric. The amount of penetration affects the inversion charge density Q_{inv}, inversion charge centroid, and most importantly carrier mobility. It is shown that interface scattering due to wavefunction penetration is in better agreement with the universal mobility data then the surface roughness scattering mechanism. The interface scattering allows the extension of the universal mobility model from SiO_2 to high-K gate dielectrics.