To go a little deeper into the topic of carrier scattering in 3D semiconductors, three good starting points are:


Ridley also has a nice discussion of energy and momentum conservation in electron-phonon scattering.


For a discussion of carrier scattering in quantum wells, see:


The treatment of electrons and phonons and electron-phonon scattering in quantum wells and quantum wires is treated by Stroscio and Dutta.


For an introduction to phonon scattering, see Chapter 9, Sec. 9.4 in: