Two-ray ground-reflection model

- One LOS path, one reflected path.
- At small distances, power falls off proportional to d^2 (free space loss on both paths).
- Above some critical distance dc, received power given by:

$$P_r \approx P_t \left[\frac{\sqrt{G} h_t h_r}{d^2}\right]^2$$

where G approximates the combined transmit and receiver gains of both multipath components.

- Above dc, power falls off proportional to d^4 and is independent of signal wavelength (frequency)
- Model not generally accurate for cities or indoors. [5]

2-Ray Path Loss

$$PL_{2-ray} = 40 \log_{10}(d) - 10 \log_{10}(G {h_{tr}}^2 {h_{tt}}^2)$$

d: distance in km
f: carrier frequency in Megahertz
h_{tt}: receiver antenna height in meters
$G(h_{tr})$: transmitter antenna height in dB