HATA-OKUMURA MODEL

The Hata-Okumura model is best suited for large cell coverage (distances up to 100 km) and it can extrapolate predictions up to the 2GHz band. This model has been proven to be accurate and is used by computer simulation tools. Here is the analytical approach to the model:

$PL = 69.55 + 26.16 \log (f) - 13.82 \log (h_t) - a (h_m) + [44.9 - 6.55 \log (h_t)] \log (d)$ dB

$a (h_m) = [1.1 \log(f) - 0.7] h_m - [1.56 \log(f) - 0.8]$ dB for midsize city

where f - operating frequency (MHz)

h_t - transmitting station antenna height (m)

h_m - mobile unit antenna height (m)

$a(h_m)$ - correction factor for mobile unit antenna height (dB)

d - distance from transmitting station

Using the following parameters: f = 1500 MHz, h_t = 40 m, h_m = 1.5 m, the loss predictions for this model is shown graphically in Figure 1.1.

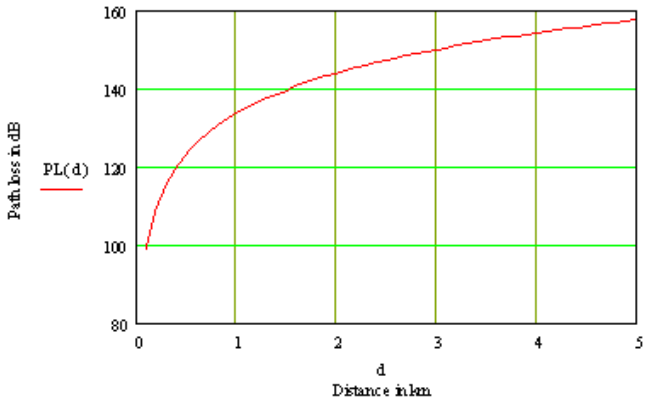

Figure 1.1 Hata-Okumura model

Reference:

1. Y. Okumura, E. Ohmori, T. Kawano, and K. Fukuda, "Field Strength and Its Variability in VHF and UHF Land-Mobile Radio Service," Review of the Electrical Communication Laboratory, 16, pp. 825-873, September-October, 1968.
2. http://wcrg.engr.ucf.edu