* Obtaining the Mobile Point to Point Model (Lee Model):

The Mobile point to point model is obtained in three steps

a) Generating a standared Condition

b) obtain an area to area prediction Model

c) a Mobile point to point model using area to area prediction

The philosphy of developing this model is to try to separate two Effects i,e one Caused by natural Terrain Contour & other is human made Structure, on the received Signal strength.

Generating a standard Conditions: The advantage of using these standard Values is to obtain directly a predicted value in decibles above 1 mw expressed in dBm.

	Standard Condition		Correction factors.
At Base Station:-	Transmitted power $P_t = 10w$ (40dBm)	then	$\alpha_1 = 10 \log \frac{P_t'}{10}$
	Antenna Height $h_1 = 100ft$ (30m)		$\alpha_2 = 20 \log \frac{h_1'}{h_1}$
	Antenna gain $g_1 = 6dB/pole$		$\alpha_3 = g_{t_2}' - 6$
At Mobile unit:-	Antenna Height $h_2 = 10ft$ (3m).		$\alpha_4 = 10 \log \frac{h_2'}{h_2}$
	Antenna gain $g_m = 0 dB/dipole$		$\alpha_5 = g_m'$

Obtain area to area prediction Curves for human made Structures:

→ The area to area prediction Curves are different in different areas. In this area to area prediction, all areas are Considered to be flat Even though the date may be obtained from nonflat areas. because that the area to area prediction is an average process. The standard deviation of the average value indicates the degree of Terrain roughness

→ The path loss Curve obtained on virtually flat ground indicates the Effects of the Signal loss due to Solely human made Structures. This means that the different path loss Curves obtained in Each City Show the different human made Structure in that City

→ To do this, we may have to measure Signal strengths at these high Spots & low Spots along different paths in Surroundings of Cell Site represents the Signal received as if it is from a flat area affected only by a different local human made Structured Environment

→ Any area to area prediction model Can be used as a first step toward achieving the point to point prediction model.

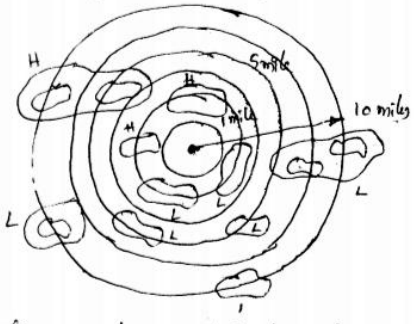
→ when the Structures are uniformly distributed, depending on the density (Avg Separation b/w buildings), the 1m² intercept could be high or low, but the Slope may also kept at 40dB/dec

→ An area to area prediction model can be represented by two parameters a) The 1mi intercept point
b) The path loss slope

→ The 1mi intercept point is the power received at a distance of 1mi from the transmitter

→ Set up a transmitting antenna at the center of general area. As long as the building height is comparable to the others in the area, the antenna location is not critical.

→ Take 6 or 7 measured data points around the 1mi intercept & around the 10 mi boundary based on high & low spots. Then compute the average of the 1mi data points & of the 10mi data points. By connecting the two values, the path loss slope can be obtained



→ If the terrain of the hilly area is generally sloped, then we have to convert the data points that were measured on the sloped terrain to a fictiously flat terrain in that area.

→ The conversion is based on the effective antenna height gain as

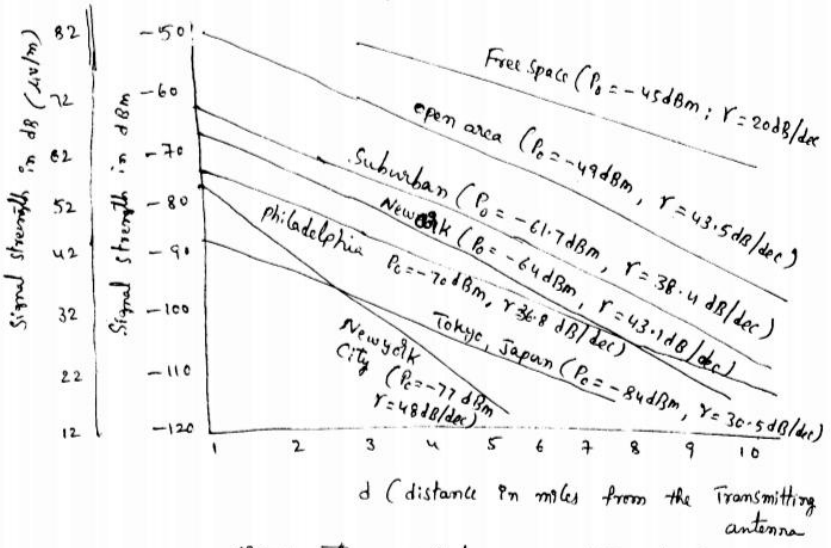
ΔG = effective antenna height gain = $20 \log \frac{h_e}{h_1}$.

Here h_1 is the actual height

h_e is the effective antenna height at either 1mi or 10mi locations.

~~The phase difference between a Direct path & Ground reflected path.~~

The Suburban area curve is a commonly used curve.



propagation path loss in different cities