

3

Basic Cellular Systems Engineering

In this chapter, we introduce the basic systems engineering aspects of a cellular system by discussing them as they apply to conventional frequency-division multiple-access (FDMA) cellular systems. These systems engineering aspects include the conventions of telephone traffic theory, the conceptual basis of cellular systems, and the tradeoffs that determine the parameters of cellular systems.

3.1 Review of Telephone Traffic Theory

3.1.1 Telephone Connectivity

The placement of a telephone call requires that a connection be made between the caller's telephone and that of the called party. The connection provided for a particular telephone call is typically a combination of wire and radio links. As illustrated in Figure 3.1, the telephone system provides the connection by switching the needed links over to the use of the call for its duration.

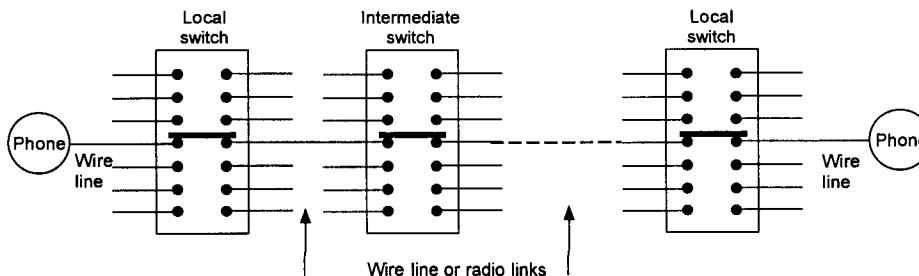


Figure 3.1 Telephone connectivity.