**Cellular networks and mobile networks**

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**ABSTRACT:**

A cellular network or mobile network is a communication network where the last link is wireless**.** The network is distributed over landareas called cells, each served by at least one fixed location transceiver, but normally three cell sites or base transceiver stations. These basic stations provide the cell with the network coverage which can be used for transmission of voice, data and others. A cell typically uses a different set of frequencies from neighbouring cells, to avoid interference and provided guaranteed service quality within each cell.

When joined together these cells provide radio coverage over a wide geographic area. This enables a large numbers of portable transceivers(e.g., mobile phones, tablets etc….equipped with mobile broadband modems , pagers ,etc…) to communicate with each other and with fixed transceivers and telephones anywhere in the network ,via base stations ,even if some of transceivers are moving through more than one cell duration transmission.

Cellular network offer a number of desirable features:

1. more capacity than a single large transmitter, since the same frequency can be used for multiple links as long as they are in different cells
2. mobile device useless power than with a single transmitter or satellite since the cell towers are closer
3. larger coverage area than a single terrestrial transmitter since additional cells towers can be added indefinitely and are not limited by the horizon

Major telecommunications providers have deployed voice and data cellular networks over most of the inhibited land area of the earth. This allows mobile and computing devices to be connected to the public switched telephone network public internet. Private cellular network can be used for research or for large organizations and fleets, such as dispatch for local public safety agencies or a taxicab company.

The contents include in this are:

1. Concepts

2. Cell signal encoding

3. Frequency reuse

4. Directional antennas

5. Broadcast messages and paging

6. Movement from cell to cell and handing over

7. Mobile phone network

7.1. Structure of the mobile phone cellular network

7.2. Small cells

7.3. Cellular handover in mobile phone networks

7.4. Cellular frequency choice in mobile phone networks

7.5. Coverage comparison of different frequencies

In a [cellular radio](https://en.wikipedia.org/wiki/Cellular_radio) system, a land area to be supplied with radio service is divided into cells, in a pattern which depends on terrain and reception characteristics but which can consist of roughly hexagonal, square, circular or some other regular shapes, although hexagonal cells are conventional. To distinguish signals from several different transmitters, [time-division multiple access](https://en.wikipedia.org/wiki/Time-division_multiple_access) (TDMA), [frequency-division multiple access](https://en.wikipedia.org/wiki/Frequency-division_multiple_access) (FDMA), [code-division multiple access](https://en.wikipedia.org/wiki/Code-division_multiple_access) (CDMA), and [orthogonal frequency-division multiple access](https://en.wikipedia.org/wiki/Orthogonal_frequency-division_multiple_access) (OFDMA) were developed. Practically every cellular system has some kind of broadcast mechanism. This can be used directly for distributing information to multiple mobiles.