

## How does mobile phone communication work?

The expansion of mobile phones brought with it the possibility of making and receiving calls with a personal telephone almost anywhere in the world, and even being able to move around while talking.

This requires a network of multiple base stations (cell towers) that provide coverage to different areas of the territory, enabling location and communication by electromagnetic waves. Where population density is higher, more cells with less coverage and more frequencies will be needed, in order to allow a greater number of simultaneous communications.

1. As you walk around the city, your mobile phone connects by waves to a neighbouring base station that detects your proximity, identifies your SIM card, and checks it against your home location register (HLR)
2. The base station then connects to the mobile switching centre (MSC) where your SIM is registered and where the location of your mobile is constantly updated.
3. When you decide to make a call, your mobile switching centre (MSC) connects to the mobile switching centre (MSC) where the SIM card of the person you want to call is registered.
4. If that person has their mobile switched on, they will have been detected by the base station to which they are currently connected.
5. That base station sends a call signal to the person's mobile. If they accept the call, the connection between both phones is finally established.
6. If you and the other person move around, communication would still be maintained thanks to signal transfer between base stations (handover).