Some Basics

- What is needed to run a mobile telephony system?
- A way to organize our allotted frequencies
- A standard to define how phones interact with the fixed transmitters
- Phones must identify themselves to the network
- A connection to other networks
- A way to handle voice and various forms of data
- A way to locate a phone when a call comes in

Organizing Frequencies

- A “cell” is a set of the available channels

Cells

- Frequencies in a cell cannot be used in a neighboring cell
- Systems must be designed to serve as many customers as possible
- Fewer cells means more channels per cell but more chance of interference
- Systems have been designed with 5, 7, or 11 sets of channels
- Note: CDMA systems use cells but do not divide up the channels - more later
Hand-offs
- Phone moves from one cell to another
- Phone must tune to a new channel
- System must re-route the call to the new transmitter site
- The hand-off can be to another system through the inter-system connections

Incoming Calls
- Much harder than landline calls (and harder than outgoing calls)
- The system originating the call may not know that the target phone is mobile
  - In fact, that system may have no knowledge of how to locate a mobile even if it does
- The solution usually involves
  - Data bases to keep track of phone identities and locations
  - Specialized networks to get at those data bases