Power point presentation on
cell splitting and sectoring

MADE BY:

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MIET (342/08)

CELL?

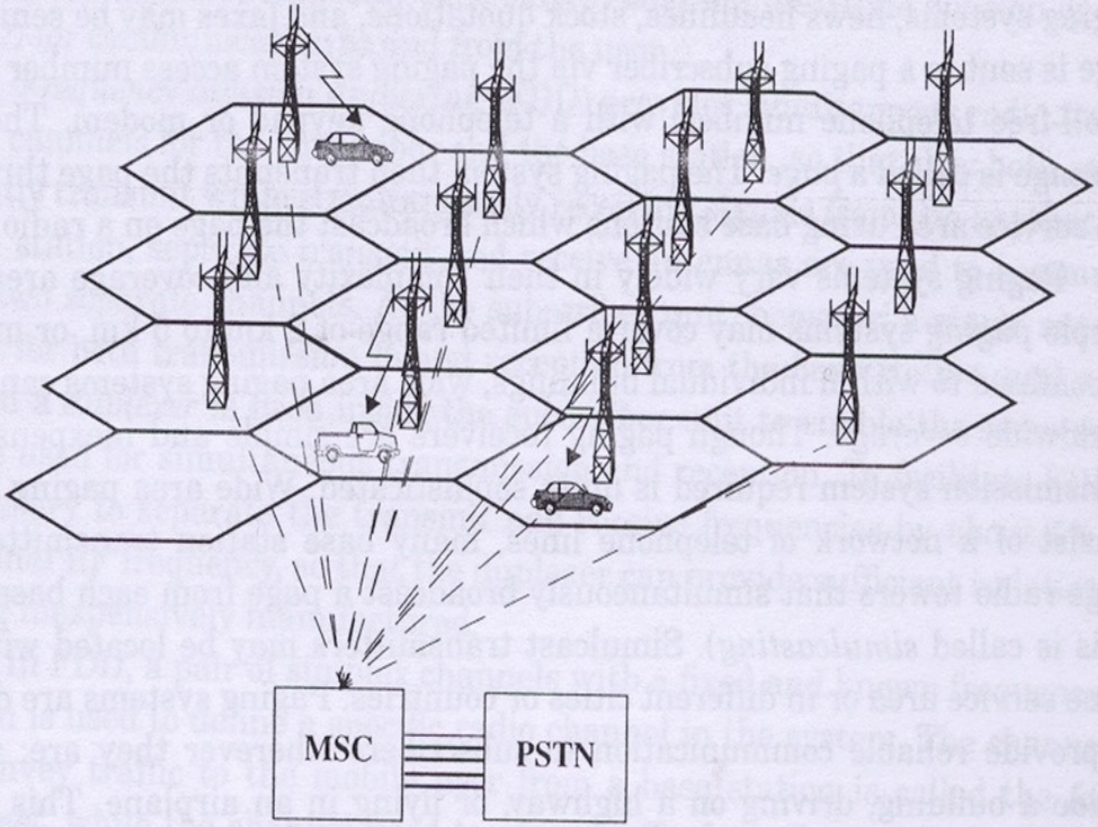
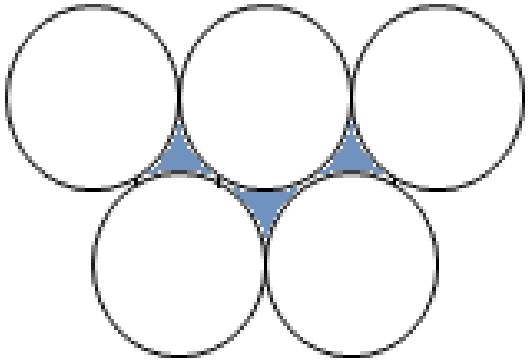


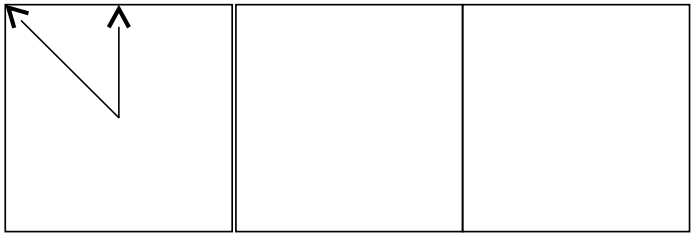
Figure 1.5
An illustration of a cellular system. The towers represent base stations which provide radio access between mobile users and the Mobile Switching Center (MSC).

- LARGER AREA DIVIDED INTO SMALL NO. OF AREAS
- SHAPE IS HEXAGONAL
- EACH WITH ITS OWN BASE STATION AND SET OF FREQUENCIES.

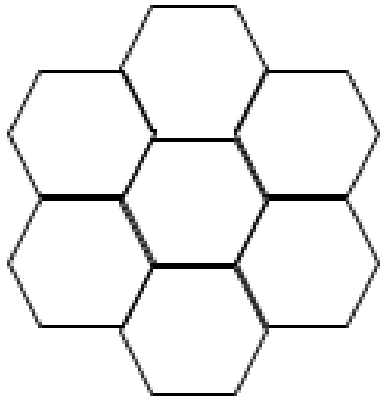
Why hexagonal cell ?



circular

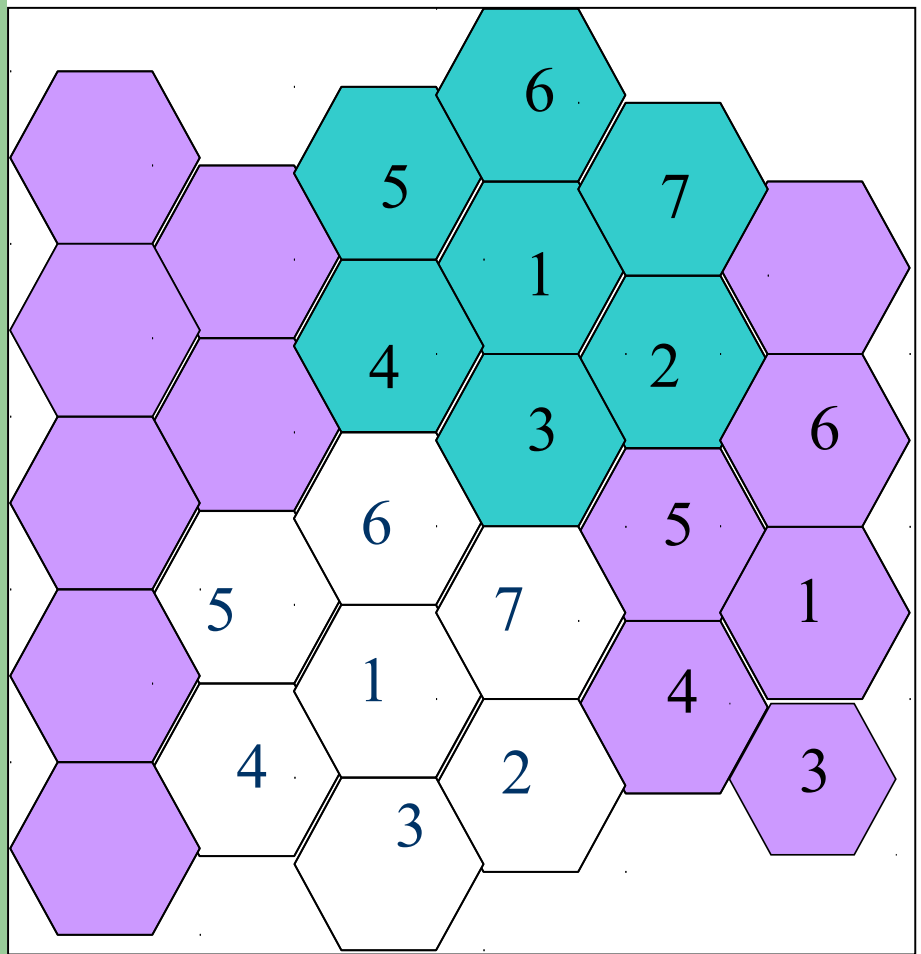


square



hexagonal

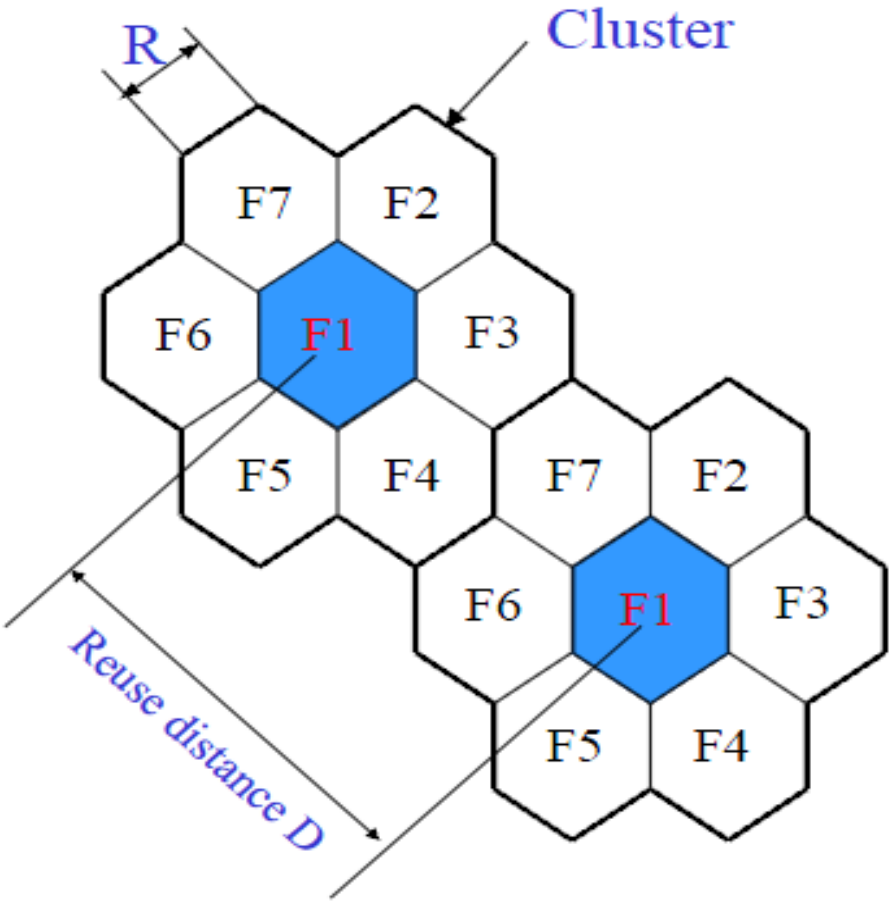
FREQUENCY REUSE



- Each cell is assigned a part of the available frequency spectrum.
- same part of the frequency spectrum more than once. This is called frequency reuse.

Reuse Distance

- For hexagonal cells reuse distance---
  D= R.√3N
- Reuse factor---
  D/R= √3N



Channel capacity?

- C = MKN = MS

C= capacity

M= number of clusters

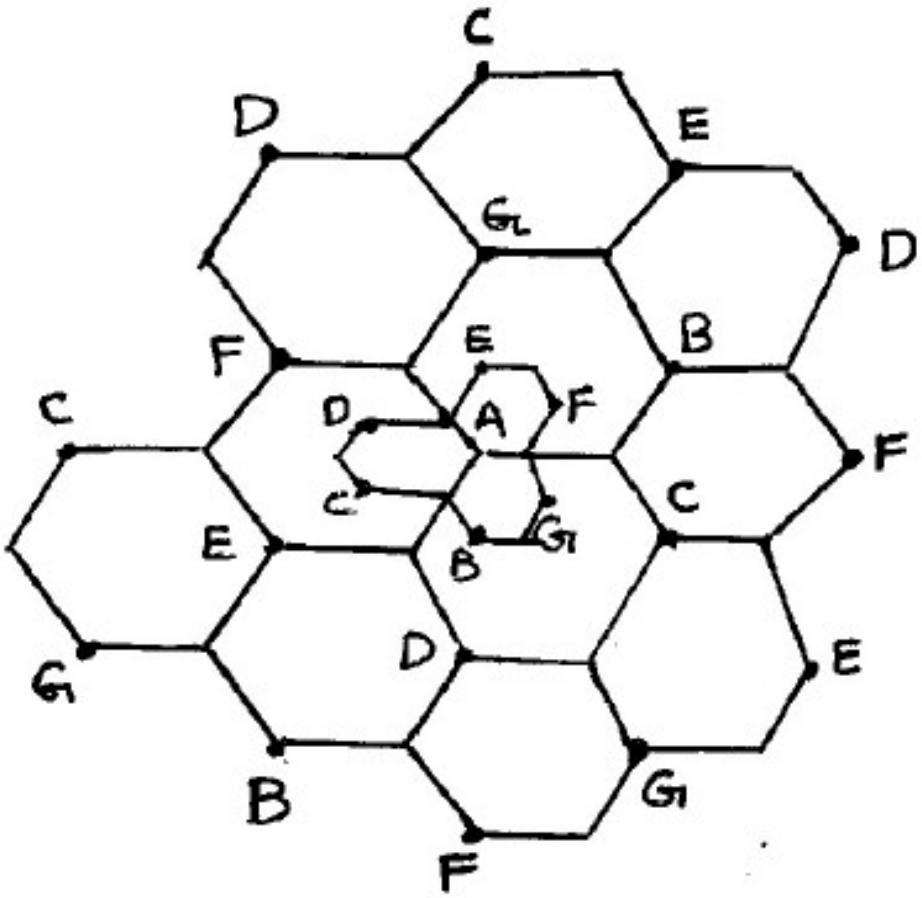
K= allotted channel to a cell

N= no of cells in a cluster.

Why cell splitting and sectoring?

- As users increases channel capacity decreases.
- Techniques are needed to provide extra channels.
- cell splitting and sectoring increases capacity.

Cell splitting



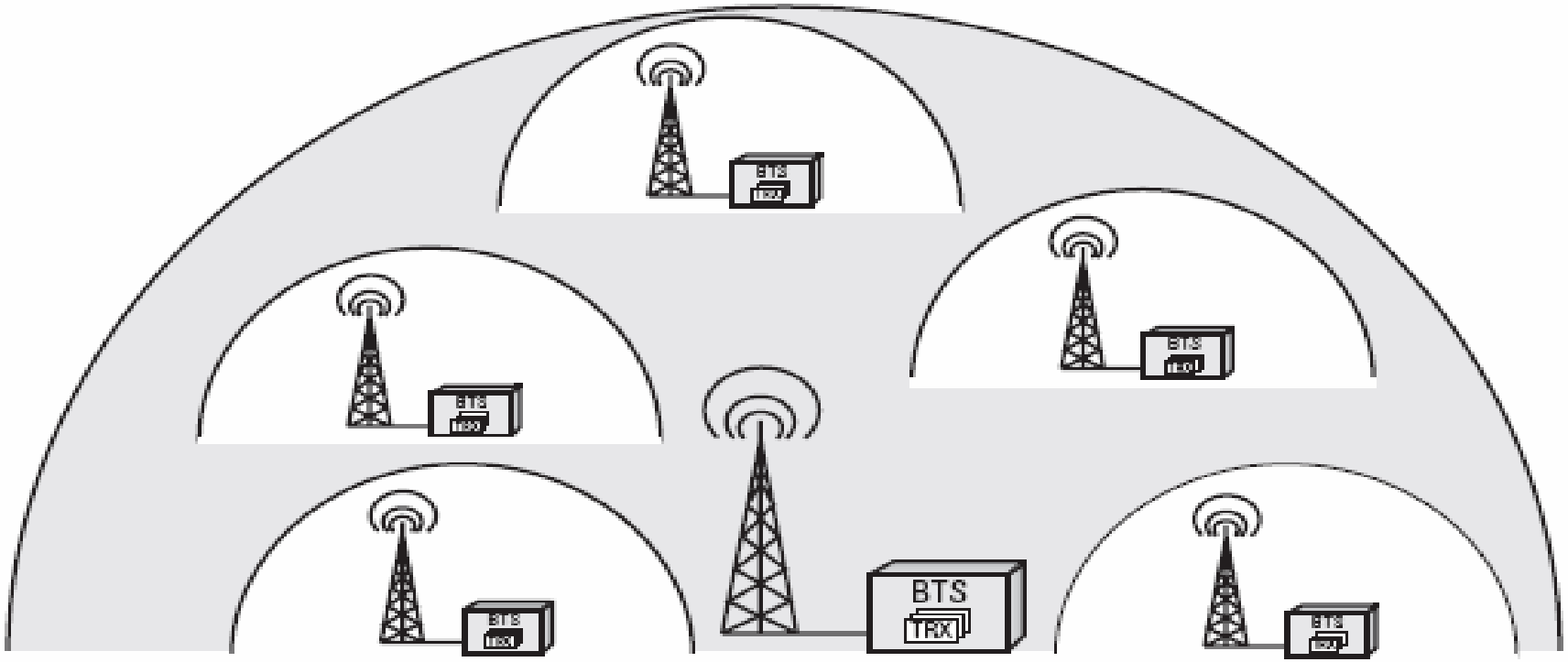
- The process of subdividing a congested cell into smaller cell.
- Each with its own base station and a corresponding reduction in antenna height.
- leads to increase in capacity

Limitations:

- Handoffs are more frequent.
- Channel assignments become difficult.
- All cells are not split simultaneously so special care have to be taken for proper allocation of problem.

Umbrella approach:

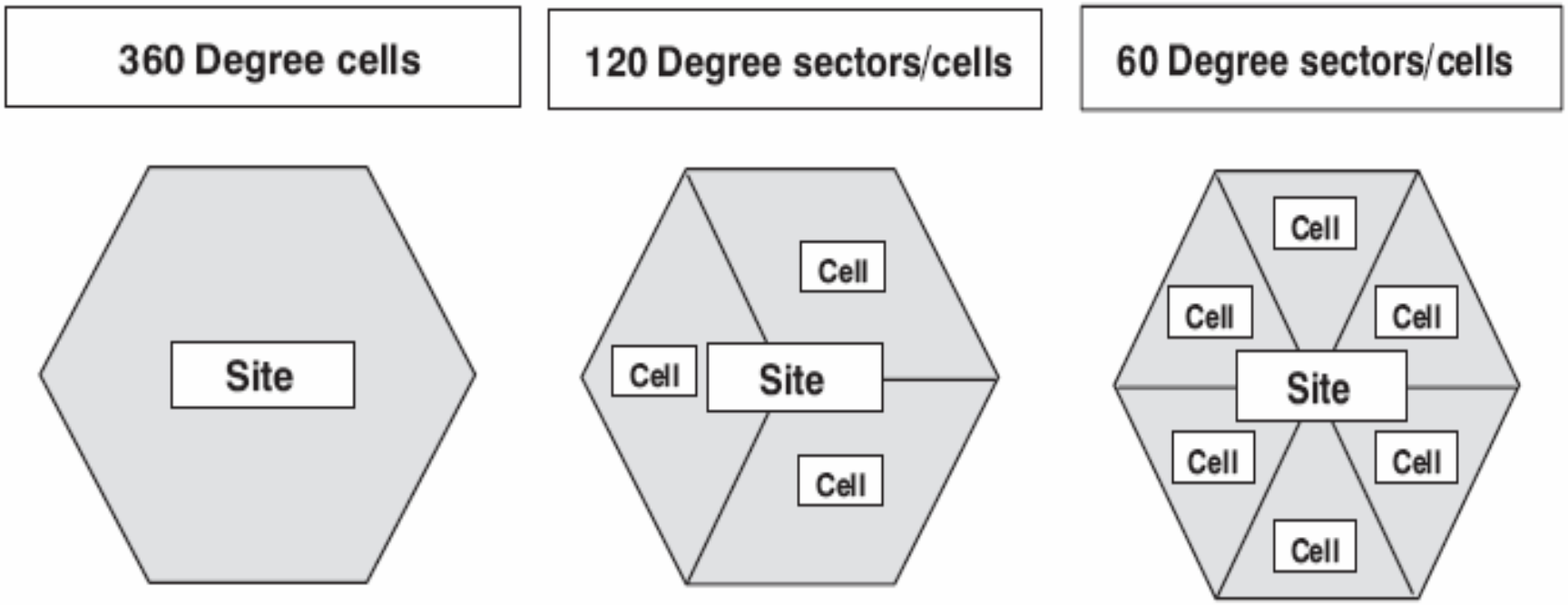
Handoff issues must be addressed so that high speed and low speed traffic can be accommodated simultaneously.



Cell sectoring:

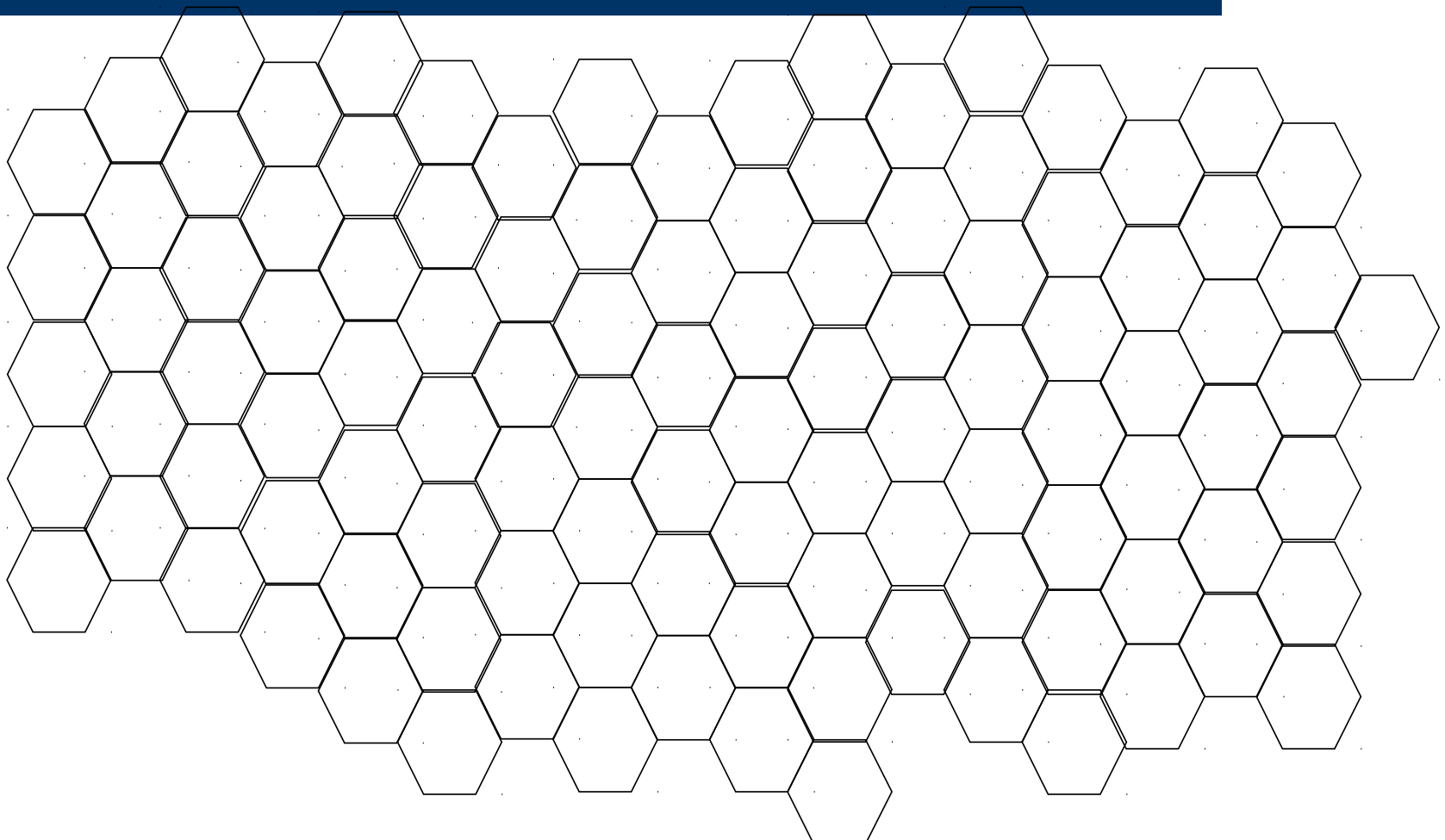
- To overcome some limitations like co-channel interference, cell sectoring is done.
- Involves replacing an omni- directional antenna at the base station by several directional antennas,

Different sectors:



Advantages:

- It improves S/I ratio.
- It reduces interference which increases capacity.
- It enables to reduce the cluster size and provides an additional freedom in assigning channels.



Limitations:

- Increased number of antennas at each base station.
- Decrease in trunk efficiency.
- Loss of traffic.
- Since sectoring reduces the coverage area of a particular group of channels, the number of handoffs increases as well.

THANK YOU