

I can't find my exact cross, I think it is handwritten buried in the case file boxes. Here is the outline I made and worked from:

Stuff to ask:

Because you are not providing the all important multiple cell tower information that would have made my clients cell phone location a no-brainer; I am now forced to ask you a million questions in the hope that we can somehow closely approximate his phone location. Before I start, is there any way that you can retrieve the critical missing information?

No, why was it lost? [It wasn't because it was favorable to my case?]

Lets start with network activity. On the day/night in question was there any unusual activity within the network? How do you know? OR how can we approximate anything if you don't know? When was network maintenance performed? What was performed? You can't tell me?

Lets go to cell activity. On the day/night in question was there any unusual cell activity within the network? How do you know? OR how can we approximate anything if you don't know? When was cell maintenance performed? What was performed? You can't tell me?

The most important question is: Where is the triangulation (trilaterization) data? The network switch communicated with multiple (hopefully more than three) towers when connecting these cell phone calls. Where is this data? Rather than inferring where a cell phone is from one source and attaching a probability guess. Let's triangulate and know where a cell phone is.

Additional questions:

The State usually focuses on signal strength and infers from this proximity of location to a fixed cell tower. This is a simplistic view of wireless communication since a wireless network needs to consider a host of factors for network loading and balancing.

Questions within the network:

- What were the weather conditions?
- Were there any thunderstorms?
- Any lightning strikes?

- Were any towers affected?

- Were there any emergency repairs on the towers or network?
- Were there any scheduled repairs, maintenance, upgrades?

Answer: Obviously this has an effect on which towers are servicing the call.

Questions within the network:

a.. What was the call volume on the network switch? b.. What was the call volume on the connecting tower? c.. What was the call volume on surrounding towers? d.. Was this a busy time of day? e.. Were there any large crowd gatherings as in a sports arena environment? f.. Were there any traffic accidents or congestions?

Answer: To accomplish load balancing (use all towers nearly equally) the network switch could assign a tower that is not nearest to the cell phone handset.

Questions about the cell phone handset:

- a.. The make and the model of the cell phone?
- The wattage output of the cell phone?
- The generation of the phone?
- The bandwidth of the cell phone?
- Whether the phone call was made inside or outside?
- Whether the phone call was made in an urban or rural environment?

Answer: These are not all important but could have an effect on communication.

Questions about the cell tower:

- The topography of the area a cell phone tower is located?
- Whether the cell tower is located in an urban or rural environment?
- The number of antennas on the cell tower?
- The height of the antennas on the cell tower?
- The location of the antennas on the cell tower?
- The direction of the antennas on the cell tower?
- The angle of the antennas on the cell tower?
- The number of cones on a cell tower?
- The height of the cones on the cell tower?
- The direction of the cones on the cell tower?
- The angle of the cones on the cell tower?
- The height of the cell tower?
- How high the cell tower is above sea level?
- The fractional percentage of channel assignments of the cell tower?
- The number of cell phone providers utilizing a tower?
- The number of cell phone providers within a call region?
- The performance of maintenance on the cell towers?
- The wattage output of the cell tower?
- The range of the cell tower?

Answer: For a cell phone handset to communicate with a cell tower depends on a multitude of factors, completely independent from distance and signal strength.

For jury – explaining:

Consider a two dimensional analogy: RF radiation is like dropping a pebble in a still pond. The ripples travel as circles and do not stop until the edges of the pond are reached. Similarly, a cell phone's omnidirectional signal travels out as expanding hemispheres until their energy is exhausted or they meet an obstruction and are absorbed. An unobstructed cell phone signal can travel between for 20-30 miles.

For locating and tracking purposes: Let us assume a flat earth model. As the signal reaches the first three towers, we record the time, then we subtract the time stamp of the first tower from the second tower. This time difference multiplied by the speed of light yields a distance. We use this as the radius of circle one. Similarly, the time difference between tower one and tower three yields the radius of a circle two. The intersection of those two circles usually yields two location points. Additional towers would resolve the ambiguity. This is the two-dimensional case. The three-dimensional case involves intersecting spheres or intersecting two-sheeted hyperboloids.

I hope this explanation helps.