

## Coverage Plots

On the first map we have the call area that the Dinosaur Park site is currently handling. Customers that are calling from the yellow, red and blue spaces you see to the west and southeast of the Dinosaur Park site are using that tower to connect their calls. Obviously, that is quite a bit of area for one site to be servicing.

Eventually, so many people are going to be attempting calls in these areas, the site will not be able to handle the number of call requests. The site will begin to "Block" users from making or receiving calls during the busy hours of the day and night. Not only is that frustrating for our customers, but in the case of an emergency call such as 911, the call will not go through at all.

All wireless companies are limited in the total number of calls a particular site can handle by two things. The first one is frequency spectrum and the second, the technology that the particular company uses to process customer calls.

Cellular and PCS are limited to a fixed amount of frequency spectrum by the FCC. In turn each company uses a technology to get the most amount of calls out of that spectrum with the least number of sites. In the case of Verizon Wireless, our technology is CDMA, which allows us to handle a large number of good quality calls very efficiently. Recently we upgraded our CDMA technology to what is called "1X" or "CDMA-2000". "1X" expands voice capacity and provides higher speed data services than the older version technology (which we continue to support) using the same amount of spectrum.

There comes a point as in the case of the Dinosaur Park site that no more calls can be handled without blocking. We expect to reach that point within the next year or so. The only solution at that point is to build sites closer to the customers so that Dinosaur Park's signal is weaker and consequently the call is placed on the new, "offload" site.

This also has the added benefit to allow residents to be able to place calls in their homes and businesses since the signal will be stronger from the new site than the one from Dinosaur Park that is farther away. We have seen a large amount of traffic growth during the 9pm to 10pm hour showing that people want to make calls from home. We expect to see even more use from homes as people abandon their landline phone for wireless ones. We are seeing some of this taking place already.

However it should be emphasized that in-building coverage is not the prime purpose of this site. The prime purpose of this site is to offload Dinosaur Park. This will be true for the hand full of sites we will need to build in the Rapid City area over the next couple of years. Dinosaur park will block calls and run out of growth capacity very soon and only more properly placed sites will allow Rapid City residents and

visitors to place calls when they need to. The Canyon Lake site will help slow down the time frame when Dinosaur Park's capacity is fully exhausted.

On the second map, if you look at the Canyon Lake site, you will see a small gray patch around the site. This is typical of a capacity site, they cover a more localized area. To be an effective capacity site, as alluded to before the tower must be lower and closer to users. The Dinosaur park site is a tower located on a very high location covering a very populated area. In order to effectively push calls off of the tall site we must build shorter sites hence the request for a 150-foot tower at Canyon Lake.

One might think that we should build the site even shorter to be closer to the customer. This however would not work because it would require the construction of more towers since the useable coverage area would be smaller. A by-product of this situation would be the possibility of driving towers into residential areas where it would not be practical to build sites. This height provides the compromise between providing a stronger signal to overcome Dinosaur Park's signal yet covering enough area so that we don't have to build more sites in the area anytime soon.

This second map also points out the problem of pushing traffic off of Dinosaur Park. Canyon Lake's coverage is in fact "pushed in" by the coverage of the very tall Dinosaur Park site.

Dinosaur Park is so tall it covers most, if not all of Rapid City and extends out 10's of miles. Because it covers so much area it handles a large volume of calls. By adding sites such as Canyon Lake, we can begin to off-load a significant volume of calls from the Dinosaur Park site.

Though Rapid City has areas that need improved coverage the increased usage of wireless by residents and visitors will require sites that will add more call capacity to the system and will require sites that "coverage maps" will not always show the need for.