

## **Need a Rural Solution to your Broadband Woes?**

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If you've been following the Mendocino Broadband group's efforts, you know that the arrival of broadband here in the county -- especially the rural area, is still a ways out.

I live in rural Mendocino, about 10 miles outside of Willits and in mountainous terrain, both issues obstacles to getting decent internet access. With this paper, I hope to share with you a possible solution to meet your internet needs, by yourself, today.

The solution involves wireless mobile broadband and entails identifying the cell providers available to your location, getting a good strong signal and then purchasing the modem and data plan offered.

Do you have good and reliable cell phone reception where you are at (e.g. 4 to 5 bars, consistently)? If so, skip to the section on Getting Internet.

### **Cell Phone Provider**

Cell phone reception is our first hurdle to overcome. Cell phone reception is affected by many factors, the two most important being the shadowing of the signal by nearby mountains and the distance from the tower. Your first step is to figure out where the nearby cell towers are and who (what provider) is using them. We don't depend on the cell phone provider to give us this information since many of them feel it is proprietary. Use a website like <http://opensignal.com/>

Now that we know the location of nearby towers and which companies are using them, we'll need to use a topography map to determine the terrain shadowing between you and the tower. For example, if you are in a deep valley with the cell tower beyond, you may not be able to count on that provider for a good signal (look for another). If you are more than 5 miles, again there may be a problem, both in signal travel time and in its strength. Look for a tower that looks like it might work for you, then note the cell provider operating it. One caveat here: if the provider is T-Mobile, they have no intention of providing more than 2G (2<sup>nd</sup> Generation) in Mendocino rural regions so strike them from your list.

Our goal is to have a reasonably reliable signal (2-3 bars) that we can build upon. We will be boosting that strength using techniques oil well workers and truck drivers have been using in remote parts of our country for years – that of a reliable booster<sup>1</sup>.

Talk with friends and neighbors – does anyone have service with the cell providers you have identified? If so, see if you can get them to come by and try their phone in your location. If not, go to the cell provider's local retail store and see if there is someone there that might be willing to come out and try your location (reimburse them for gas).

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<sup>1</sup> for a good article on this, go to [http://www.ehelpfultips.com/how\\_to\\_get\\_better\\_cell\\_phone\\_rec.htm](http://www.ehelpfultips.com/how_to_get_better_cell_phone_rec.htm)

As a last resort, you can sign up for service and take the phone home to try it yourself, though there is usually a \$35 charge if it does not work to get out of the contract.

### **Boosting the Cell Signal**

Have you found a service that gives you reasonable signal strength at your location? If it is 4 to 5 bars, you are in business and you should skip to the next section. If you have 1 to 3 bars, we will need to boost that signal before continuing. To do that, you will need to order a cell phone booster and install it in your location. This will cost about \$230 and will involve mounting an antenna outside pointing to the tower you have previously identified for your cell provider.

While there are many so-called 'boosters' out there, ranging from stick-on foil antennas, to phone cradles with antennae built in, many, if not most do not work (or will not work well enough for us rural folk). My recommendation is that you go directly to the industry leader Wilson Electronics. Amazon sells most of their units and their customer reviews are helpful in evaluating a product you may be interested in; but their website <http://www.wilsonelectronics.com/> has a good guide as to what system works with what cell provider (frequencies and formats vary, see FAQ). My suggestion is that you purchase the Wilson Electronics Desk Top (DT) unit part number #801247.

This unit comes with everything you need, including the booster, antennae and cabling. The cost, with shipping should be around \$230. The instructions are superb and once the antennae were in place and wired (and a small tweak to the gain adjustment), the performance has been flawless. Even better, this unit can handle multiple people using cell phones (even to different cell carriers provided their towers are in the direction your antenna points to), as well as data (internet).

Follow the instructions and you should be able to boost your signal to 4 or 5 bars. This signal strength is important for the next and final step.

### **Getting Internet**

All phones these days go over the internet (Voice over IP) and have for some time. With the proliferation of 'Smart Phones' cell providers are now offering internet access to everyone, even moving to data-based pricing for all of their services.

You will need to go to your cell provider and look at their USB-based broadband modem solutions as well as their data plans. These data plans typically range from 2 Gigabyte (2 billion bytes) upwards and start around \$20-25/month with a 2 year contract. To be safe, I recommend you bringing your computer down to the store to make sure the modem you are offered will work with your system. The first one I was given took a week of working with tech support before we realized it would not work and tried another (a lot of fuel wasted in driving back and forth).

Your speeds will vary based on all of the conditions we outlined in the previous sections; but what I am seeing here in my area is over 5Mbps (million bits per second) download and over 700Kbs uploads with US Cellular and AT&T. Verizon's speeds are similar. The goal is to be able to be with a carrier that has 4G (4<sup>th</sup> Generation). Note that as more people start using data through your tower, these speeds may drop; but price and speed-wise, it sure beats satellite!

Good luck and I hope this helps!

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