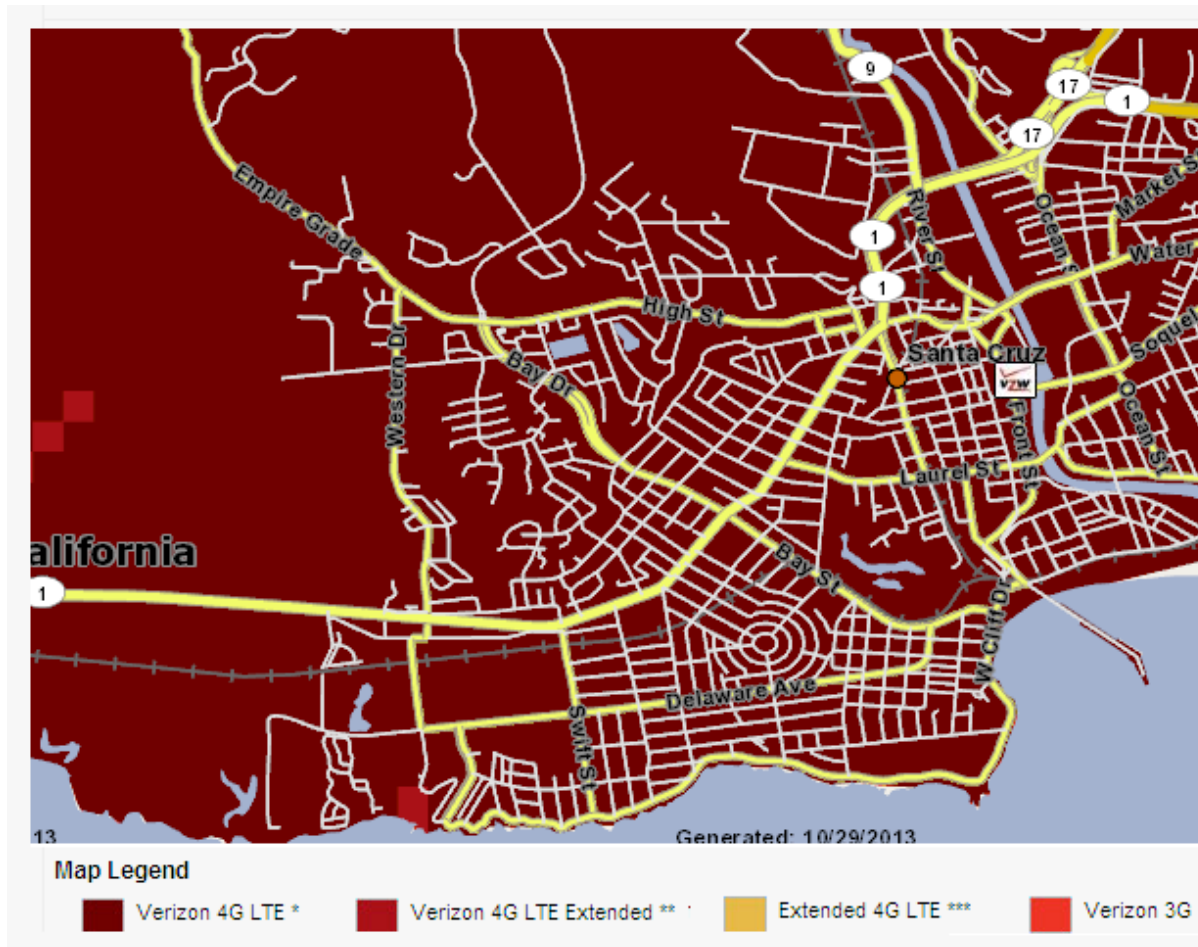# Can you hear me now ?

14 May 2013

Verizon service locator

Radio services

A tablet you use for surveying should not be introduced (connected) to any wi-fi hotspots you might encounter on your survey mission. The tablet prefers to use wi-fi and, unless that is what you want to survey, that is not a good thing.

I believe it may be possible to disable one of the cellular radios to make the tablet be 3G only or 4G only. I haven't done that; I want Samsung and Verizon to work together to do the *right thing* whatever that is. In surveying, I have seen the tablet hunt between the radios, and it seems like it knows what it is doing – prefering 4G when available.

GPS backup

The safest way to do a survey is to print a map of your survey area and write the time next to each point as you take it. Use the clock on the face of the Tablet device – because that is the time that will be recorded with the data.

Both CalSPEED from the CPUC and the Ookla SpeedTest program will record the time with each measurement. The time will never be wrong. The GPS coordinates could be off. If the tablet finds that it needs switch between 3G and 4G, it may reset the GPS receiver and cause a large position error before it settles again. If the map is available, the position of measured points can be fixed. If you find a point where you cannot get a signal, you need to indicate this on your map. I put "NC" next to their time stamps. The reason is that Ookla will not make a record unless the test completes. And if your survey includes interior spaces, GPS may give bad results. GPS is amazingly robust, but if it doesn't know where it is, it may make stuff up.

HOME

You can get to the home screen from the arrow that points up in the tool tray at the bottom of the display.

First step is to engage the map and let GPS settle on your location.

Find yourself

The position icon (triangle w circle) will drift around on the screen and the circle of uncertainty will get smaller as the tablet finds more satellite signals.

When the icon stops moving, I use the tool at the bottom of the tray on the far left (go back arrow) to get to the home screen.

Then from the home screen, select your performance measurement tool. Two are possible: Ookla and CalSpeed.

Outdoor surveys should not be done from inside a vehicle.

Doing Ookla first. . .
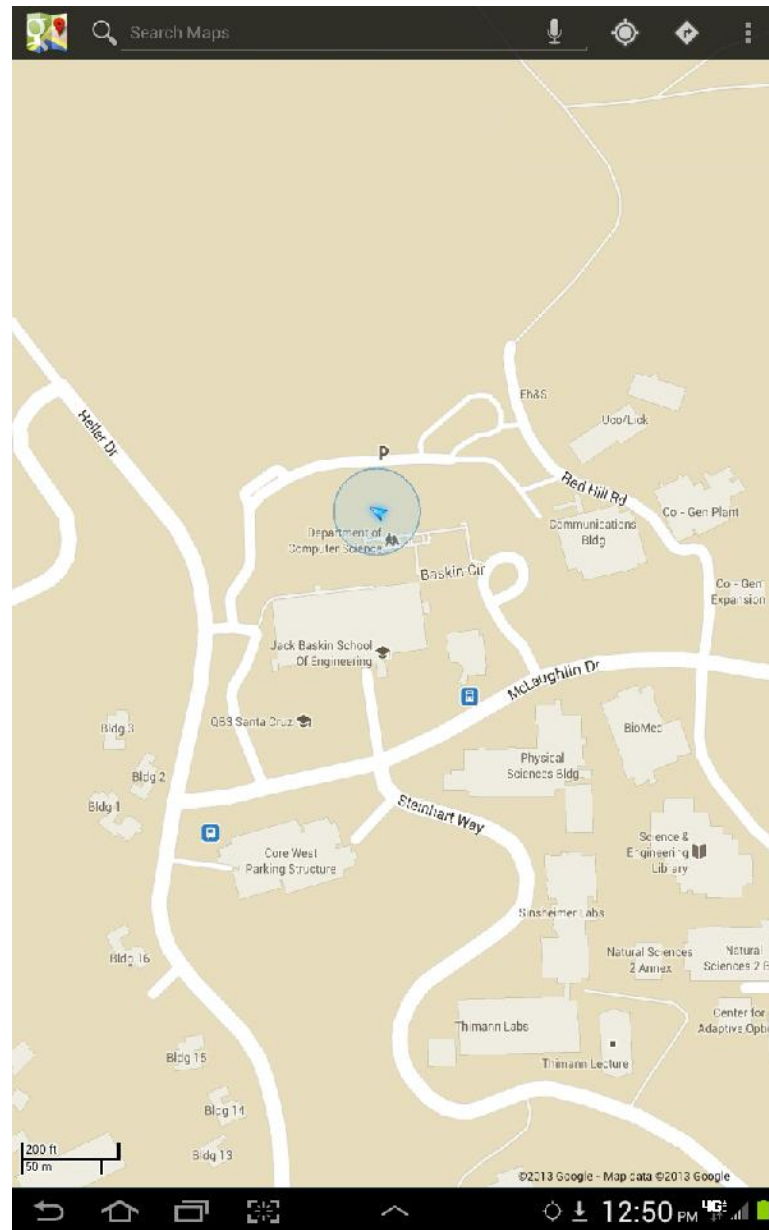
Pick the **Speed Test** icon to get to this screen. The application is checking for connectivity and choosing a server to test against. If this is successful, the screen will appear as in the next slide and the start button will be active. If it can't find a signal, it will tell you that you can try again.

It is OK to click through **Try Again** and give it another chance. But if you are in a truly dead zone, there is no way to get Ookla to start.

There is a tools icon – the gear – that lets you select whether speeds display in Mbps or Kbps. Leave at Kbps. Next to the green battery icon is the signal bars graph. It must say either 3G or 4G for the test to run. It is possible to have *bars* but no connectivity. This happens near the ocean.
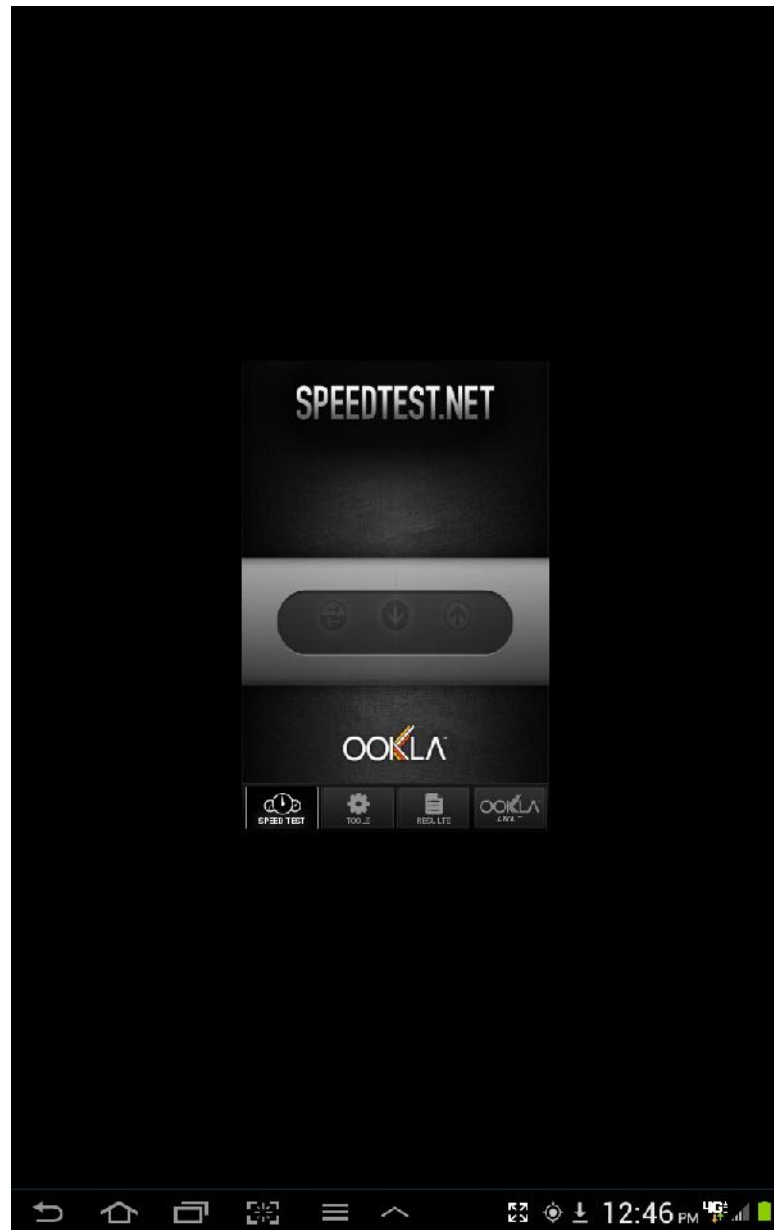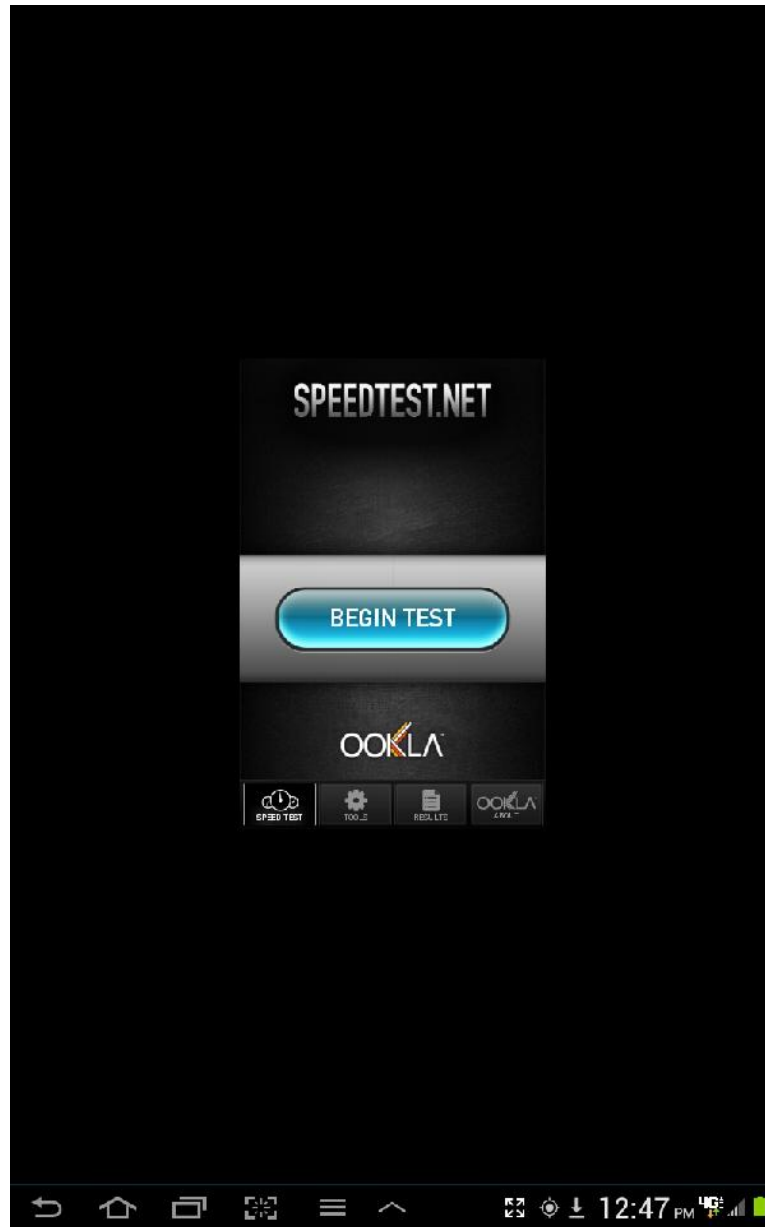
Ready to start testing

In this picture, the network has been acquired and the best test server has been selected.

Wait 10 seconds after if offers to let you start before you push the button. This is to make sure that GPS has a chance to settle.

GPS gets switched off and on a lot to save power and adding a delay seems to make it more likely to get good coordinates.

Ookla SpeedTest running

There are progress bars for download and upload. There is a speedometer to show the present value. Below the speedometer are small graphs that show the evolving history.

The test may appear to stall. It does not deal gracefully with truly fringe service, especially in the upload direction.

The test should take between 20 and 60 seconds. If connectivity is good, the test will run fast. If the data rate is low, the test will take longer.

Measurement finished

There are three numbers along the top – latency, download, upload

If you find that the measurement stalls, be patient. If that doesn't work and you look for the reset button, I don't think there is one. What I have done is carry the tablet to an area that does have coverage. The tablet will acquire the signal and complete the test. By then, the test will have been running a long time and the recorded speed will be suitably slow for a failed measurement. You should still record the test on your paper map as failed. But the point is – you need to get the application to finish so you can start the next measurement. It is possible to reset the app by power cycling the tablet. This is not fast.
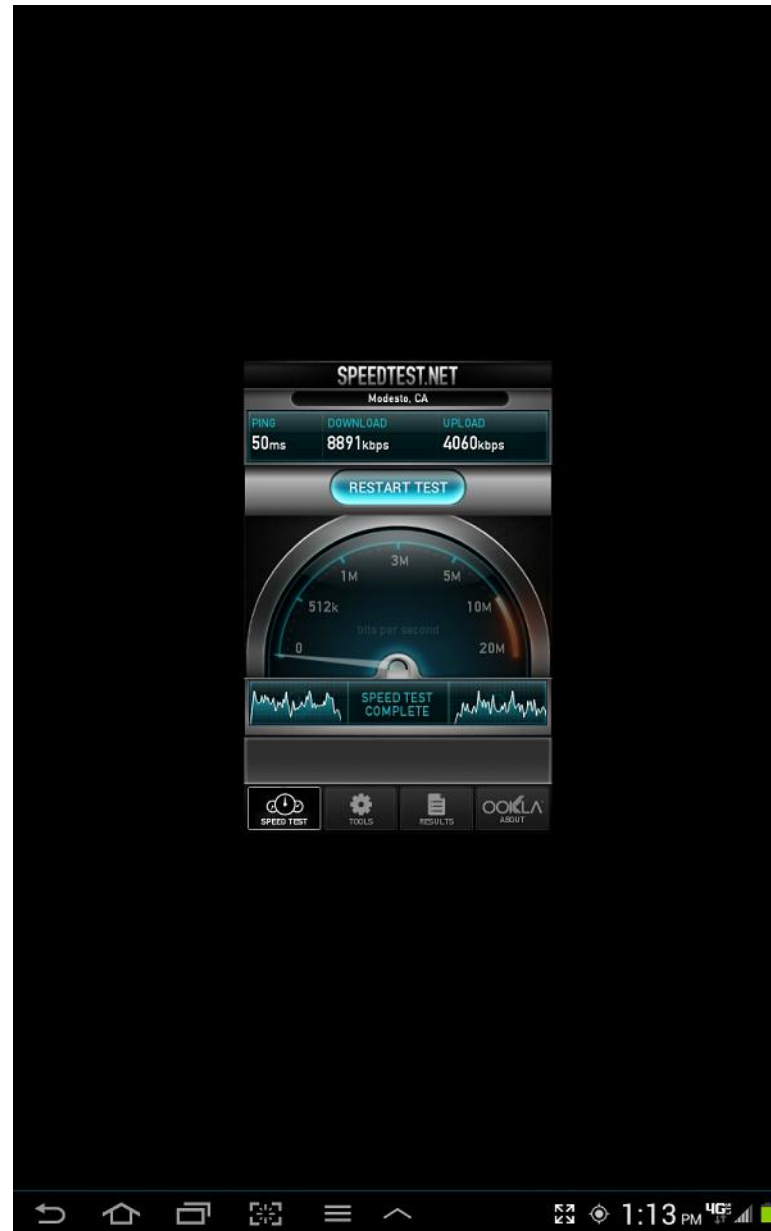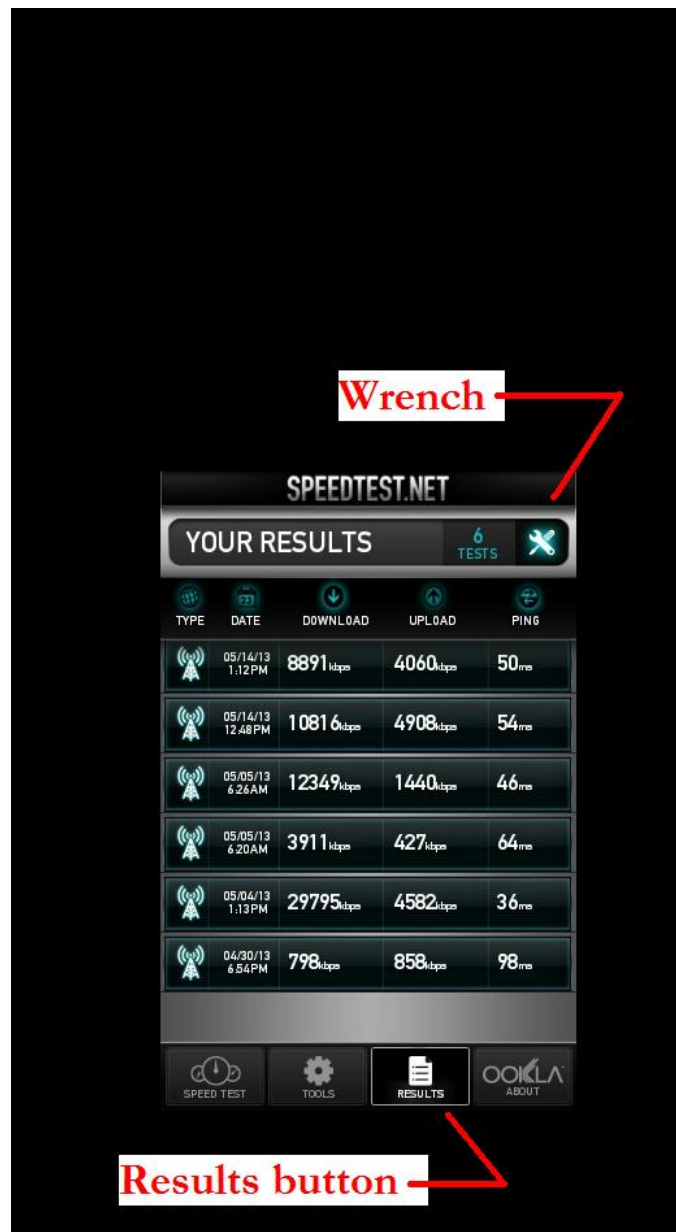
Results

The results button at the bottom will bring you to this screen. If you press the wrench, options will appear at the very bottom of the application window. The wrench is a toggle. Press it again and they go away.

The options permit you to email all the data and erase all the data. Careful here – erase means ERASE. It will not ask if you are sure (y/n)? It just clears all the data.

If you select emailing the data you will see what is on the next slide.

Sending . . .

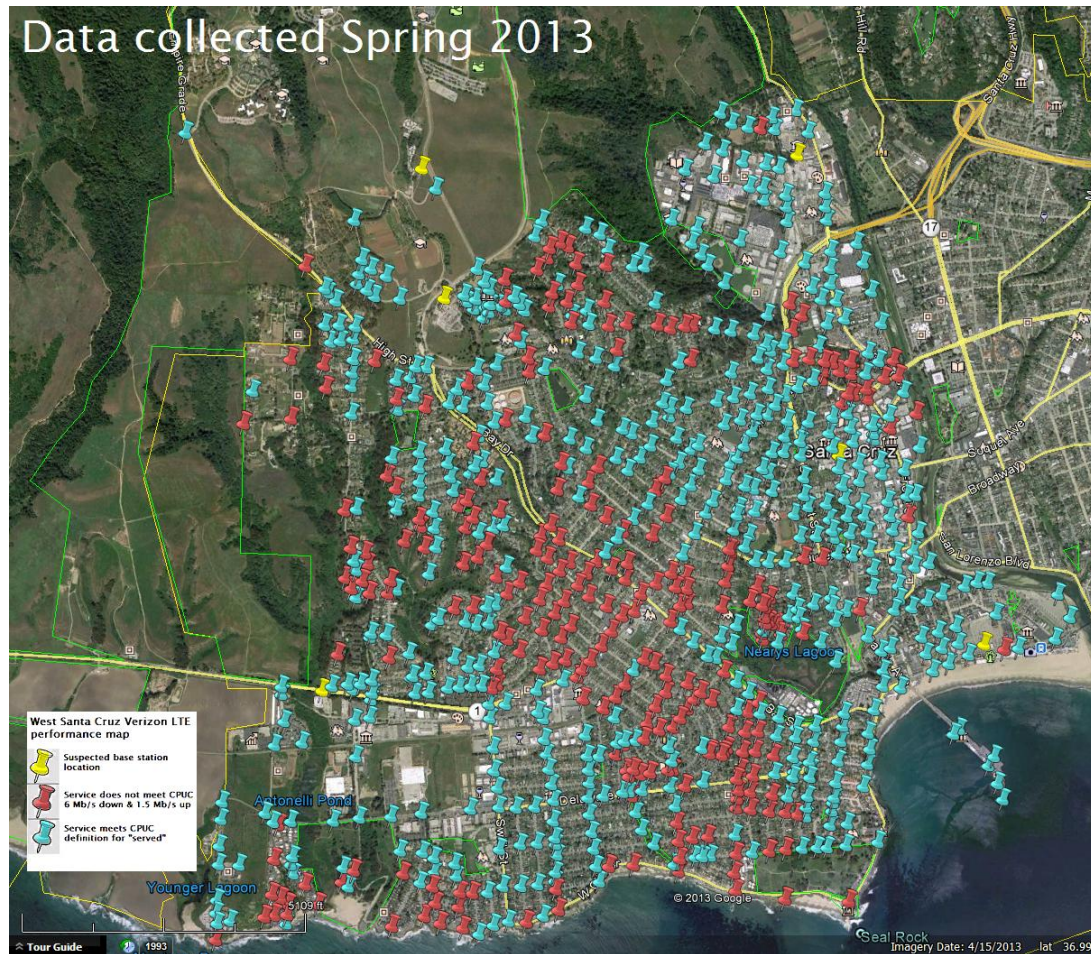Fill in a valid email address and send.

CPUC CalSPEED

The CalSpeed program sends all test results directly to the project's data collectors as they are accumulated.

GPS Robustness

I have no experience. If the GPS problems are in part an Android implementation *feature*, following the protocol of letting the position settle on the map application and recording the time stamp on a paper map is prudent.
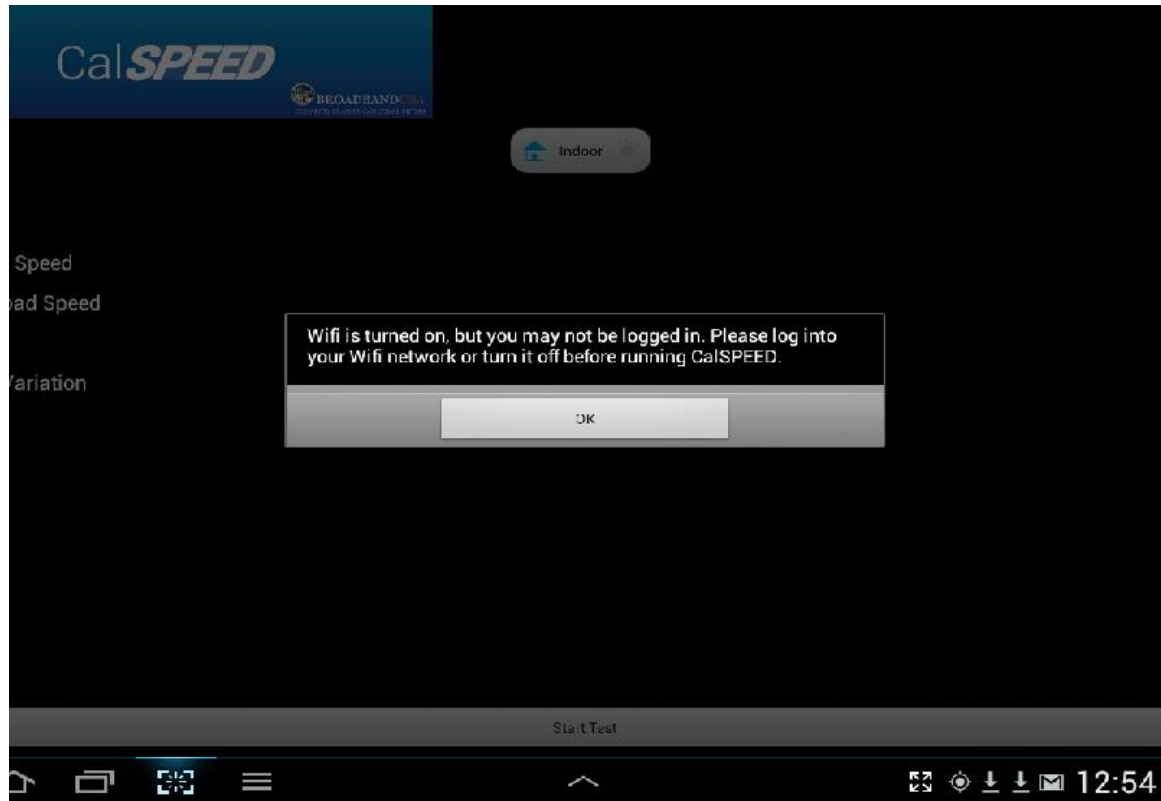
About 500 points

Data collected Spring 2013

West Santa Cruz Verizon LTE performance map

- Suspected base station location
- Service does not meet CPUC 6 Mb/s down & 1.5 Mb/s up
- Service meets CPUC definition for "served"

References

http://people.ucsc.edu/~warner/verizon-SC.kml


http://people.ucsc.edu/~warner/verizon.CSV

Extra Slides

CalSpeed will not run if WiFi is turned on but the tablet is not connected. If you are connected to WiFi, the test will use that and not test cellular. The tablet wants to use WiFi and you may find that turning it off needs to be done more than once. Setting the indoor/outdoor button is on an honor basis.

Turn off WiFi

The gear is the icon for the settings menu. The WiFi on/off switch is at the top.
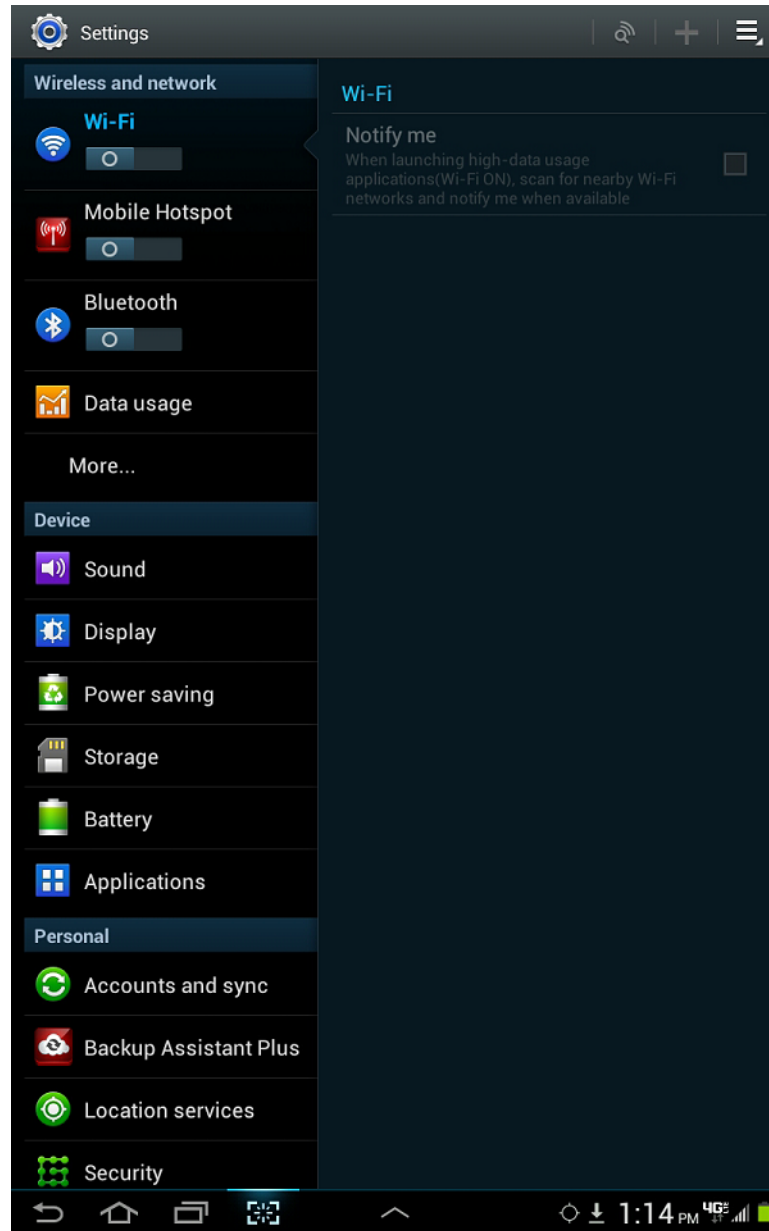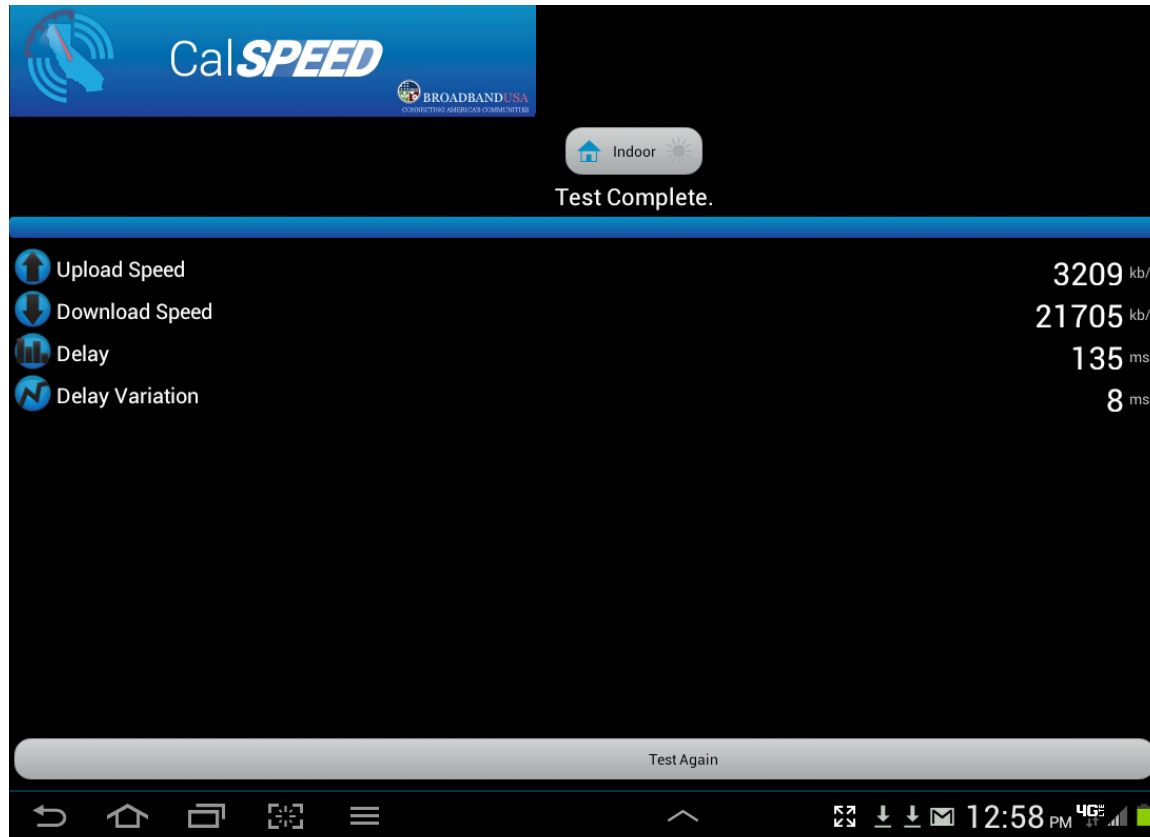
It is too late to set the indoor/outdoor switch after the data has been collected. The tests all run twice and only the final result is shown on this screen, but all the data is retained.

CalSPEED results

CalSpeed puts its results in a folder called **Uploaded**. You can find this behind the **My files** icon. CalSPEED does record at least some test failures. This is better than Ookla. Unfortunately in the one failure measurement recorded here (#3) GPS was not recorded. Tests are done 2X to test servers on both the East and West coast. The details are all in the files. This makes the test take a lot longer. It is possible to grab a bunch of these files and email them in a single message.