Verizon data coverage at Monterey Dunes

Comparison of CalSpeed and Ookla as survey tools

23 May 2013

In hindsight, Monterey Dunes was a poor choice for a study that compares Ookla Speedtest.net and CalSpeed. Coverage in this area is basically the cellular equivalent of fumes. Radio diffraction and self-interference provides what appears to be random peaks and valleys in the coverage. Handsets work hard to find a signal, repetitively resetting their radios and switching between 3G and 4G. This appears to cause collateral damage to GPS information and makes measurements appear "all over the map."

Our field survey instructions call for annotating a paper map with measurement time stamps from the tablet's clock which is always displayed. Here we had to wholesale replace the GPS coordinates for both CalSpeed and Ookla with coordinates picked from the map using the time stamp as the common key. Both test programs record the radio in use (LTE, Ehrpd or Wi-Fi) at a point in the test. But if the handset switched radios in the middle of a test, this is not recorded and the indication can be misleading.

We believe that ocean reflections are an important component of the radio environment. We expect that the peaks and troughs in coverage will therefore shift with tidal changes in sea level.

That the agreement between CalSpeed and Ookla measurements is good is not a surprise. Under the hood, they are both using iperf with multiple streams for their TCP measurements. CalSpeed reports successful and failed tests; Ookla records only tests that complete successfully. Ookla failures can only be picked up from notes that the surveyor leaves on the paper maps, and this is an imperfect process -- especially when the surveyor is running two surveys for comparison but carrying a single map. Ookla appears to be willing to wait forever for a test to complete while CalSpeed will give up and report a failure. But this difference manifests only within a speed band well below the CPUC's service targets.

Google map files from which the following pictures are drawn are:

 Http://people.ucsc.edu/~warner/monterey-dunes-ookla.kml
 Http://people.ucsc.edu/~warner/monterey-dunes-calspeed.kml

Monterey Dunes Verizon CalSpeed Performance

- Suspected base station location
- Service does not meet CPUC 6 Mb/s down & 1.5 Mb/s up
- Service meets CPUC definition for "served"
- Dead zone. No Signal

Monterey Dunes Way

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Google

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