TEACHING

Three Bands, Three Kinds of Road

By **Keith Parsons, CWNE #3** · 2026-06-10 · originally on LinkedIn

A good Wi-Fi analogy is the physics, told so a human can hold it. That is why David Coleman's land the way they do, and his three-band highway is the one I reach for most.

Last week I praised his graphics, and a lot of you asked me to explain the RF underneath one of them. Happy to, because praise is cheap if it does not teach.

David's "Where Do Your Clients Actually Go?" graphic draws the three Wi-Fi bands as three kinds of road. The 2.4 GHz band is the service road. The 5 GHz band is the main highway. The 6 GHz band is the express lane, the toll road. Look at any real client list and you can watch them sort themselves onto those three roads.

2.4 GHz, the service road. The longer wavelength travels farther, so the band reaches into the far corners of a building. The catch is room. In the US you get only 3 non-overlapping 20 MHz channels in the whole band, 1, 6, and 11. Pack more in and they bleed into each other. Worse, the band is unlicensed turf shared with emitters that are not Wi-Fi at all: Bluetooth, microwave ovens, Zigbee, baby monitors. So you have three lanes, heavy traffic, and cross-traffic you do not control. Slow and congested is not an insult to the band. It just is.

5 GHz, the main highway. Far more channels than 2.4 GHz, which means many more lanes, and far less non-Wi-Fi cross-traffic. The tradeoff is range: shorter wavelength does not punch through walls as well. This is the workhorse band, where most of your clients actually live and where most of your real capacity comes from.

6 GHz, the express lane. A large block of clean, contiguous spectrum with little of the legacy congestion, plus Preferred Scanning Channels that let capable clients find a 6 GHz Access Point fast. The catch is the toll pass. Only Wi-Fi 6E and Wi-Fi 7 hardware can drive on it. No modern radio in the client, no entry. Clean and fast, for the cars that can pay the toll.

This craft is worth studying. David did not dumb the RF down to get the analogy. He found the everyday thing, three kinds of road, that already obeys the same rules the spectrum

does, then let your intuition do the work the channel charts were going to do anyway.

Here is the test of a working analogy. A clever one fades by next week. A working one lets the reader predict the next thing on their own, without you in the room. Hand someone David's three roads and they can already guess why their old 2.4 GHz-only printer keeps stalling and why their new laptop flies on 6 GHz, before you say a word. That is teaching that keeps working after you leave.

When you explain the bands to someone who does not live in RF, which road do you draw first, and does your analogy still hold when they try to reason forward with it?

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