TV White Spaces
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TVWS extends Wi-Fi into new spectrum with better coverage

- TVWS has superior propagation and extends the reach of wireless networks and it enables:
  - Wireless networking with longer range
    - TVWS Wi-Fi network can be established with fewer APs / Repeaters
    - TVWS Wi-Fi as a supplement to current Wi-Fi, can fill the coverage holes that are not covered by current Wi-Fi.

TVWS delivers ~3x range, ~9x total area, compared to 2.4 GHz
Beachfront or Beachhead

- **Beachfront**
  - TV White Spaces has many interesting technical attributes ....

- **Beachhead**
  - Will there be a viable market?
  - Will chip makers invest?

- **The Chasm**
  - Mandatory sensing – too many false positives and not future proof
  - Uncertainty market access based on delays in FCC rulings
  - Too many holes in the spectral Swiss Cheese
Different views of the Beach

**Niche Market**
- $500 TVWS Radio
  - Experimental Prototypes
  - Limited Niche Applications
- Investment
  - Minimal development costs

**Consumer Market**
- $5 TVWS Radio
  - Consumer Products
  - Mass market and new innovative applications
- Investment
  - Significant (per product company)
  - Many millions per chip development
Creating a Beachhead for TVWS

**The Chasm**
- Mandatory sensing – too many false positives and not future proof
- Uncertainty market access based on delays in FCC rulings
- Too many holes in the spectral Swiss Cheese
- Standards
- Ecosystem of products
- Market

**Bridging the Chasm**
- FCC rule changes required (optional sensing, multiple databases, etc.)
- FCC rule changes and consistency of support for TVWS
- FCC guidelines, re-banding and better microphone policies
- Wi-Fi Alliance and IEEE 802.11
  - Real product vendor participation
- Vendor investments in products as extensions of existing Wi-Fi products
- Consumer mass market
  - Laptops, phones, routers, and yet to be invented innovations